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AUD-L6 - Acoustic Environments and Spatial Audio II  
BIO-P3 - Neuro Image and Signal Processing

Thursday, 7 May, 11:30 - 13:30

SPE-L12 - Speech Separation and Extraction II: Multi-channel  
SPE-P12 - Machine Learning for Speech Synthesis II  
SS-L17 - Model Based Deep Learning
IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP 2020

SPE-P13 - Speech Separation and Extraction III
S&T-P7 - Show and Tell 7
SS-L18 - Anomaly Detection and Intent Inference in Object Tracking
IOT-P1 - Internet of Things
HLT-P3 - Language Understanding and Modeling
SPTM-P8 - Signal Processing over Networks
SPTM-P9 - Estimation Theory and Methods II
SPCOM-P3 - MIMO and Multi-antenna Systems
MLSP-L5 - Neural Networks Applications I
SAM-L4 - Learning Models and Methods for Multi-sensor Systems
MMSP-P2 - Deep Learning for Multimedia Processing and Analysis I
MLSP-P12 - Applications in Video and Image Processing II
MLSP-P11 - Neural Networks and Pattern Recognition
IVMSP-L5 - Image/Video Storage, and Retrieval
MLSP-L4 - Generative Adversarial Networks
MLSP-L6 - Sparsity Aware Processing and Learning
AUD-L7 - Signal Enhancement and Restoration I
BIO-L4 - Biomedical Signal Processing

Thursday, 7 May, 16:30 - 18:30

BIO-P4 - Physiological Signal Processing
AUD-L8 - Acoustic Sensor Array Signal Processing II
CI-L2 - Computational Optics
IVMSP-P11 - Image/Video Processing II
IVMSP-P10 - Inverse Problems in Image/Video Processing III
DIS-P2 - Algorithm and Architecture Co-optimization
IVMSP-P12 - Perception and Quality Models
MLSP-L7 - Machine Learning Applications III
MLSP-L8 - Tensor-based Signal Processing
MMSP-P3 - Multimedia Signal Processing
SS-L21 - Advances in Signal Processing for Environmental Studies
SS-L20 - Sustainable Networking and Computing through Machine Learning
HLT-P4 - Machine Learning for Language Processing II
SS-L19 - Hardware-Efficient Large-Scale Antenna Arrays: The Stage for Symbol-Level Precoding
SS-P1 - Signal Processing Education: Trends and Innovations
S&T-P8 - Show and Tell 8
IDSP-L2 - Industry Session on Large-Scale Distributed Learning Strategies
SPE-L13 - Speech Recognition: Representations and Embeddings
COLL-L1 - Session 3H: Processing of Highly complex, Heterogeneous, High-dimension data
SPE-P15 - Speech Recognition: Adaptation
SPE-P14 - Speech Production
SPE-L14 - Speaker Recognition/Identification/Verification

Friday, 8 May

Friday, 8 May, 08:00 - 10:00
BIO-P5 - Bio Image and Signal Processing
AUD-P10 - Music Signal Processing I
MLSP-L10 - Deep Neural Network Structures
IFS-P1 - Information Hiding, Biometrics and Security
IVMSP-L7 - Point Cloud and Depth Processing
IVMSP-L6 - Image/Video Synthesis, Rendering and Visualization
MMSP-L1 - Signal Processing for Multimedia Applications II
MLSP-L9 - Autoencoders
SPCOM-P4 - Design and Implementation of Communication Systems
SAM-P5 - Localisation and Tracking
SAM-P6 - Detection, Estimation and Classification
SPTM-P10 - Detection and Classification
SS-L24 - AMP and other Approximate Bayesian Inference Techniques
HLT-L2 - Language Modeling
COLL-L2 - Session 3R: Robustness Reproducibility Replicability
SS-L22 - Signal Processing for IoT
SS-L23 - Deep Graph Learning
SPE-P18 - Speaker Recognition Systems, Data and Features
SPE-P17 - Speech Enhancement IV
SPE-P16 - Word Spotting

Friday, 8 May, 11:45 - 13:45
BIO-L5 - Medical Image Analysis
AUD-P11 - Signal Enhancement and Restoration II
AUD-L9 - Music Signal Processing II
IFS-P2 - Anonymization, Security and Privacy
DIS-P3 - Design and Implementation of Signal Processing Systems for Wireless Communication Systems
IVMSP-L8 - Multi-scale and Wavelet Processing
MMSP-L2 - Deep Learning for Multimedia Processing and Analysis II
MLSP-P14 - Topics in Machine Learning
SS-P2 - Unconventional Sensing
MLSP-P13 - Neural Networks Applications II
SPTM-L7 - Bayesian Signal Processing II
SPCOM-P5 - Communication Signal Analysis and Optimization
SS-L25 - Advances in Low-Resolution Sampling and Signal Processing
SPTM-L8 - Sparsity-Aware Processing II
SPE-P20 - Speech Recognition: Acoustic Modelling II
HLT-L3 - Spoken Language Understanding and Dialogue II
SPE-P19 - Machine Learning for Speech Synthesis III
SPE-L16 - Speaker Diarization
SPE-L15 - Emotion Recognition
S&T-P9 - Show and Tell 9
HLT-P5 - Multilingual Processing of Language

**Friday, 8 May, 15:15 - 17:15**

SPE-P23 - Speech Recognition: General Topics
SPE-L17 - Paralinguistics Modeling
SPE-P21 - Voice Conversion
MLSP-L12 - Sequential Learning
SPE-P22 - Large Vocabulary Continuous Speech Recognition and Search
SS-L26 - Signal Processing for Beyond 5G Communications
SS-L27 - Signal Processing for Sensing, Information Fusion, and Situational Awareness in Autonomous Systems
SPCOM-L2 - Channel Estimation
DIS-P4 - Design and Implementation of Emerging Signal Processing Systems
MLSP-L11 - Attention Networks
MLSP-P15 - Neural Network Algorithms
MLSP-P16 - Neural Networks Applications III
IVMSP-L9 - Image/Video Coding II
IVMSP-L10 - Image/Video Processing III
IDSP-P1 - Emerging Signal Processing Applications
IFS-P3 - Multimedia Forensics and Biometrics
AUD-P12 - Audio, Speech and Music Analysis
BIO-P6 - Biomedical Image Segmentation
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Audio and Acoustic Signal Processing

Tuesday, 5 May, 11:30 - 13:30

AUD-L1 - Music Information Retrieval I

AUD-L1.1: ADDRESSING THE CONFOUNDS OF ACCOMPANIMENTS IN SINGER IDENTIFICATION
Hsieh, Tsung-Han, Academia Sinica, Taiwan Cheng, Kai-Hsiang, Academia Sinica, Taiwan Fan, Zhe-Cheng, Academia Sinica, Taiwan Yang, Yu-Ching, KKBOX Inc., Taiwan Yang, Yi-Hsuan, Academia Sinica, Taiwan

AUD-L1.2: DISENTANGLLED MULTIDIMENSIONAL METRIC LEARNING FOR MUSIC SIMILARITY
Lee, Jongpil, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Bryan, Nicholas J., Adobe, United States Salamon, Justin, Adobe, United States Jin, Zeyu, Adobe, United States Nam, Juhan, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

AUD-L1.3: LEARNING THE HELIX TOPOLOGY OF MUSICAL PITCH
Lostanlen, Vincent, Cornell Lab of Ornithology, France Sridhar, Sripathi, New York University, France McFee, Brian, New York University, United States Farnsworth, Andrew, Cornell Lab of Ornithology, United States Bello, Juan Pablo, New York University, United States

AUD-L1.4: AUDIO-BASED AUTO-TAGGING WITH CONTEXTUAL TAGS FOR MUSIC

AUD-L1.5: ACCURATE AND SCALABLE VERSION IDENTIFICATION USING MUSICALLY-MOTIVATED EMBEDDINGS
Yesiler, Furkan, Universitat Pompeu Fabra, Spain Serrà, Joan, Dolby Laboratories, Spain Gómez, Emilia, Universitat Pompeu Fabra, Spain

AUD-L1.6: SIMILARITY LEARNING FOR COVER SONG IDENTIFICATION USING CROSS-SIMILARITY MATRICES OF MULTI-LEVEL DEEP SEQUENCES
Jiang, Chaoya, Peking University, China Yang, Deshun, Peking University, China Chen, Xiaoou, Peking University, China
AUD-L2 - Deep Learning for Source Separation

**AUD-L2.1: TWO-STEP SOUND SOURCE SEPARATION: TRAINING ON LEARNED LATENT TARGETS**
Tzinis, Efthymios, University of Illinois at Urbana-Champaign, United States
Venkataramani, Shrikant, University of Illinois at Urbana-Champaign, United States
Wang, Zhepei, University of Illinois at Urbana-Champaign, United States
Subakan, Cem, Mila-Quebec Artificial Intelligence Institute, Canada
Smaragdis, Paris, University of Illinois at Urbana-Champaign, Adobe Research, United States

**AUD-L2.2: A MULTI-PHASE GAMMATONE FILTERBANK FOR SPEECH SEPARATION VIA TASNET**
Ditter, David, Universität Hamburg, Germany
Gerkmann, Timo, Universität Hamburg, Germany

**AUD-L2.3: IMPROVING VOICE SEPARATION BY INCORPORATING END-TO-END SPEECH RECOGNITION**
Takahashi, Naoya, Sony Corporation, Japan
Singh, Mayank, Indian Institute of Technology Bombay, India
Basak, Sakya, Indian Institute of Science, India
Sudarsanam, Parthasarathy, Sony India Software Centre, India
Ganapathy, Sriram, Indian Institute of Science, India
Mitsufuji, Yuki, Sony Corporation, Japan

**AUD-L2.4: DUAL-PATH RNN: EFFICIENT LONG SEQUENCE MODELING FOR TIME-DOMAIN SINGLE-CHANNEL SPEECH SEPARATION**
Luo, Yi, Columbia University, United States
Chen, Zhuo, Microsoft, United States
Yoshioka, Takuya, Microsoft, United States

**AUD-L2.5: CONTROLLING THE PERCEIVED SOUND QUALITY FOR DIALOGUE ENHANCEMENT WITH DEEP LEARNING**
Uhle, Christian, Fraunhofer Institute for Integrated Circuits IIS, Germany
Torcoli, Matteo, Fraunhofer Institute for Integrated Circuits IIS, Germany
Paulus, Jouni, Fraunhofer Institute for Integrated Circuits IIS, Germany

**AUD-L2.6: UNSUPERVISED TRAINING FOR DEEP SPEECH SOURCE SEPARATION WITH KULLBACK-LEIBLER DIVERGENCE BASED PROBABILISTIC LOSS FUNCTION**
Togami, Masahito, LINE Corporation, Japan
Masuyama, Yoshiki, Waseda University, Japan
Komatsu, Tatsuya, LINE Corporation, Japan
Nakagome, Yu, Waseda University, Japan
Wednesday, 6 May, 09:00 - 11:00

AUD-L3 - Acoustic Event Detection

AUD-L3.1: A FRAMEWORK FOR THE ROBUST EVALUATION OF SOUND EVENT DETECTION

Bilen, Cagdas, AudioAnalytic, United Kingdom Ferroni, Giacomo, AudioAnalytic, United Kingdom Tuveri, Francesco, AudioAnalytic, United Kingdom Azcarreta, Juan, AudioAnalytic, United Kingdom Krstulovic, Sacha, AudioAnalytic, United Kingdom

AUD-L3.2: WEAKLY-SUPERVISED SOUND EVENT DETECTION WITH SELF-ATTENTION

Miyazaki, Koichi, LINE Corporation, Japan Komatsu, Tatsuya, LINE Corporation, Japan Hayashi, Tomoki, Nagoya University, Japan Watanabe, Shinji, Johns Hopkins University, United States Toda, Tomoki, Nagoya University, Japan Takeda, Kazuya, Nagoya University, Japan

AUD-L3.3: A SEQUENCE MATCHING NETWORK FOR POLYPHONIC SOUND EVENT LOCALIZATION AND DETECTION

Nguyen, Thi Ngoc Tho, Nanyang Technological University, Singapore Jones, Douglas L., University of Illinois at Urbana-Champaign, United States Gan, Woon-Seng, Nanyang Technological University, Singapore

AUD-L3.4: FEW-SHOT ACOUSTIC EVENT DETECTION VIA META LEARNING


AUD-L3.5: FEW-SHOT SOUND EVENT DETECTION

Wang, Yu, New York University, United States Salamon, Justin, Adobe, United States Bryan, Nicholas J., Adobe, United States Bello, Juan Pablo, New York University, United States

AUD-L3.6: SOUND EVENT DETECTION IN SYNTHETIC DOMESTIC ENVIRONMENTS

Serizel, Romain, Université de Lorraine, CNRS, Inria, Loria, France Turpault, Nicolas, Université de Lorraine, CNRS, Inria, Loria, France Shah, Ankit, Carnegie Mellon University, United States Salamon, Justin, Adobe Research, United States
Wednesday, 6 May, 11:30 - 13:30

AUD-L4 - Audio and Speech Source Separation

AUD-L4.1: LEARNING TO SEPARATE SOUNDS FROM WEAKLY LABELED SCENES
Pishdadian, Fatemeh, Northwestern University, United States
Wichern, Gordon, Mitsubishi Electric Research Laboratories (MERL), United States
Le Roux, Jonathan, Mitsubishi Electric Research Laboratories (MERL), United States

AUD-L4.2: IMPROVING UNIVERSAL SOUND SEPARATION USING SOUND CLASSIFICATION
Tzinis, Efthymios, University of Illinois at Urbana-Champaign, United States
Wisdom, Scott, Google, United States
Hershey, John R., Google, United States
Jansen, Aren, Google, United States
Ellis, Daniel P. W., Google Research, United States

AUD-L4.3: SOURCE SEPARATION WITH WEAKLY LABELLED DATA: AN APPROACH TO COMPUTATIONAL AUDITORY SCENE ANALYSIS
Kong, Qiuqiang, ByteDance, United States
Wang, Yuxuan, ByteDance, United States
Song, Xuchen, ByteDance, United States
Cao, Yin, University of Surrey, United Kingdom
Wang, Wenwu, University of Surrey, United Kingdom
Plumbley, Mark D., University of Surrey, United Kingdom

AUD-L4.4: BOOSTED LOCALITY SENSITIVE HASHING: DISCRIMINATIVE BINARY CODES FOR SOURCE SEPARATION
Kim, Sunwoo, Indiana University Bloomington, United States
Yang, Haici, Indiana University Bloomington, United States
Kim, Minje, Indiana University Bloomington, United States

AUD-L4.5: A FREQUENCY-DOMAIN BSS METHOD BASED ON L1 NORM, UNITARY CONSTRAINT, AND CAYLEY TRANSFORM
Emura, Satoru, NTT, Japan
Sawada, Hiroshi, NTT, Japan
Araki, Shoko, NTT, Japan
Harada, Noboru, NTT, Japan

AUD-L4.6: END-TO-END NON-NEGATIVE AUTOENCODERS FOR SOUND SOURCE SEPARATION
Venkataramani, Shrikant, University of Illinois at Urbana-Champaign, United States
Tzinis, Efthymios, University of Illinois at Urbana-Champaign, United States
Smaragdis, Paris, Adobe Research, United States

AUD-L5 - Classification of Acoustic Scenes and Events

AUD-L5.1: COINCIDENCE, CATEGORIZATION, AND CONSOLIDATION: LEARNING TO RECOGNIZE SOUNDS WITH MINIMAL SUPERVISION
Jansen, Aren, Google Research, United States Ellis, Daniel P. W., Google Research, United States Hershey, Shawn, Google Research, United States Moore, R. Channing, Google Research, United States Plakal, Manoj, Google Research, United States Popat, Ashok, Google Research, United States Saurous, Rif A., Google Research, United States

AUD-L5.2: ACOUSTIC SCENE CLASSIFICATION FOR MISMATCHED RECORDING DEVICES USING HEATED-UP SOFTMAX AND SPECTRUM CORRECTION
Nguyen, Truc, Graz University of Technology, Austria Pernkopf, Franz, Graz University of Technology, Austria Kosmider, Michal, Samsung R&D Institute, Poland

AUD-L5.3: LIMITATIONS OF WEAK LABELS FOR EMBEDDING AND TAGGING
Turpault, Nicolas, Université de Lorraine, CNRS, Inria, Loria, France Serizel, Romain, Université de Lorraine, CNRS, Inria, Loria, France Vincent, Emmanuel, Université de Lorraine, CNRS, Inria, Loria, France

AUD-L5.4: MT-GCN FOR MULTI-LABEL AUDIO TAGGING WITH NOISY LABELS
Shrivastava, Harsh, National University of Singapore and MIDAS Lab, IIIT-D, India Yin, Yifang, National University of Singapore, Singapore Shah, Rajiv Ratn, MIDAS Labs, IIIT Delhi, India Zimmermann, Roger, National University of Singapore, Singapore

AUD-L5.5: ACOUSTIC SCENE CLASSIFICATION USING DEEP RESIDUAL NETWORKS WITH LATE FUSION OF SEPARATED HIGH AND LOW FREQUENCY PATHS
McDonnell, Mark D., University of South Australia, Australia Gao, Wei, University of South Australia, Australia

AUD-L5.6: END-TO-END AUDITORY OBJECT RECOGNITION VIA INCEPTION NUCLEUS
Ebrahimpour, Mohammad, University of California, Merced, United States Shea, Timothy, Accenture Technology Labs, United States Danielescu, Andreea,
Accenture Technology Labs, United States Noelle, David, University of California, Merced, United States Kello, Chris, University of California, Merced, United States
AUD-L6 - Acoustic Environments and Spatial Audio II

AUD-L6.1: TRANSLATION OF A HIGHER ORDER AMBISONICS SOUND SCENE BASED ON PARAMETRIC DECOMPOSITION
Kentgens, Maximilian, RWTH Aachen University, Germany Behler, Andreas, RWTH Aachen University, Germany Jax, Peter, RWTH Aachen University, Germany

AUD-L6.2: BLASTER: AN OFF-GRID METHOD FOR BLIND AND REGULARIZED ACOUSTIC ECHOES RETRIEVAL
Di Carlo, Diego, Inria Rennes - Bretagne Atlantique, France Elvira, Clément, Inria Rennes - Bretagne Atlantique, France Deleforge, Antoine, Inria Nancy - Grand Est, France Bertin, Nancy, CNRS IRISA, France Gribonval, Rémi, Univ Lyon - Inria, France

AUD-L6.3: EVALUATION OF SENSOR SELF-NOISE IN BINAURAL RENDERING OF SPHERICAL MICROPHONE ARRAY SIGNALS
Helmholz, Hannes, Chalmers University of Technology, Sweden Ahrens, Jens, Chalmers University of Technology, Sweden Alon, David L., Facebook Reality Labs, United States Garí, Sebastià V. Amengual, Facebook Reality Labs, United States Mehra, Ravish, Facebook Reality Labs, United States

AUD-L6.4: MUTUAL-INFORMATION-BASED SENSOR PLACEMENT FOR SPATIAL SOUND FIELD RECORDING
Ariga, Kentaro, University of Tokyo, Japan Nishida, Tomoya, University of Tokyo, Japan Koyama, Shoichi, University of Tokyo, Japan Ueno, Natsuki, University of Tokyo, Japan Saruwatari, Hiroshi, University of Tokyo, Japan

AUD-L6.5: FAST ACOUSTIC SCATTERING USING CONVOLUTIONAL NEURAL NETWORKS
Fan, Ziqi, University of Florida, United States Vineet, Vibhav, Microsoft Research, United States Gamper, Hannes, Microsoft Research, United States Raghuvanshi, Nikunj, Microsoft Research, United States

AUD-L6.6: FREQUENCY-DEPENDENT DIRECTIONAL FEEDBACK DELAY NETWORK
Alary, Benoit, Aalto University, Finland Politis, Archontis, Tampere University, Finland
AUD-L7 - Signal Enhancement and Restoration I

AUD-L7.1: SPEECH ENHANCEMENT USING SELF-ADAPTATION AND MULTI-HEAD SELF-ATTENTION
Koizumi, Yuma, NTT Corporation, Japan Yatabe, Kohei, Waseda University, Japan Delcroix, Marc, NTT Corporation, Japan Masuyama, Yoshiki, Waseda University, Japan Takeuchi, Daiki, Waseda University, Japan

AUD-L7.2: PEVD-BASED SPEECH ENHANCEMENT IN REVERBERANT ENVIRONMENTS
Neo, Vincent W., Imperial College London, United Kingdom Evers, Christine, Imperial College London, United Kingdom Naylor, Patrick A., Imperial College London, United Kingdom

AUD-L7.3: DNN-BASED SPEECH PRESENCE PROBABILITY ESTIMATION FOR MULTI-FRAME SINGLE-MICROPHONE SPEECH ENHANCEMENT
Tammen, Marvin, University of Oldenburg, Germany Fischer, Dörte, University of Oldenburg, Germany Meyer, Bernd T., University of Oldenburg, Germany Doclo, Simón, University of Oldenburg, Germany

AUD-L7.4: NONLINEAR SPATIAL FILTERING FOR MULTICHANNEL SPEECH ENHANCEMENT IN INHOMOGENEOUS NOISE FIELDS
Tesch, Kristina, Universität Hamburg, Germany Gerkmann, Timo, Universität Hamburg, Germany

AUD-L7.5: GENERALIZED COHERENCE-BASED SIGNAL ENHANCEMENT

AUD-L7.6: SPEAKER INDEPENDENCE OF NEURAL VOCODERS AND THEIR EFFECT ON PARAMETRIC RESYNTHESIS SPEECH ENHANCEMENT
Maiti, Soumi, Graduate Center, City University of New York, United States Mandel, Michael I, Brooklyn College, City University of New York, United States
Thursday, 7 May, 16:30 - 18:30

AUD-L8 - Acoustic Sensor Array Signal Processing II

AUD-L8.1: ROBUST AND STEERABLE KRONECKER PRODUCT DIFFERENTIAL BEAMFORMING WITH RECTANGULAR MICROPHONE ARRAYS

Huang, Gongping, Technion - Israel Institute of Technology, Israel
Benesty, Jacob, University of Quebec, Canada
Chen, Jingdong, Northwestern Polytechnical University, China
Cohen, Israel, Technion - Israel Institute of Technology, Israel

AUD-L8.2: JOINTLY OPTIMAL DEREVERBERATION AND BEAMFORMING

Boeddeker, Christoph, Paderborn University, Germany
Nakatani, Tomohiro, NTT Corporation, Germany
Kinoshita, Keisuke, NTT Corporation, Germany
Haeb-Umbach, Reinhold, Paderborn University, Germany

AUD-L8.3: EXPLOITING RAYS IN BLIND LOCALIZATION OF DISTRIBUTED SENSOR ARRAYS

Woźniak, Szymon, AGH University of Science and Technology, Poland
Kowalczyk, Konrad, AGH University of Science and Technology, Poland

AUD-L8.4: A NOVEL METHOD FOR OBTAINING DIFFUSE FIELD MEASUREMENTS FOR MICROPHONE CALIBRATION

Akbar, Noman, Australian National University, Australia
Dickins, Glenn, Australian National University, Australia
Thomas, Mark R. P., Dolby Laboratories USA, United States
Samarasinghe, Prasanga N., Australian National University, Australia
Abhayapala, Thushara D., Australian National University, Australia

AUD-L8.5: MULTI-CHANNEL SPEECH SOURCE SEPARATION AND DEREVERBERATION WITH SEQUENTIAL INTEGRATION OF DETERMINED AND UNDERDETERMINED MODELS

Togami, Masahito, LINE Corporation, Japan

AUD-L8.6: FAST AND STABLE BLIND SOURCE SEPARATION WITH RANK-1 UPDATES

Scheibler, Robin, Tokyo Metropolitan University, Japan
Ono, Nobutaka, Tokyo Metropolitan University, Japan
AUD-L9 - Music Signal Processing II

AUD-L9.1: MODELING PLATE AND SPRING REVERBERATION USING A DSP-INFORMED DEEP NEURAL NETWORK
Martínez Ramírez, Marco A., Queen Mary University of London, United Kingdom
Benetos, Emmanouil, Queen Mary University of London, United Kingdom
Reiss, Joshua D., Queen Mary University of London, United Kingdom

AUD-L9.2: DEEP AUTOTUNER: A PITCH CORRECTING NETWORK FOR SINGING PERFORMANCES
Wager, Sanna, Indiana University Bloomington, United States
Tzanetakis, George, University of Victoria, Canada
Wang, Cheng-i, Smule, Inc, United States
Kim, Minje, Indiana University Bloomington, United States

AUD-L9.3: PERCEPTUAL LOSS FUNCTION FOR NEURAL MODELLING OF AUDIO SYSTEMS
Wright, Alec, Aalto University, Finland
Välimäki, Vesa, Aalto University, Finland

AUD-L9.4: ONE-SHOT PARAMETRIC AUDIO PRODUCTION STYLE TRANSFER WITH APPLICATION TO FREQUENCY EQUALIZATION
Mimilakis, Stylianos I., Fraunhofer-IDMT, Germany
Bryan, Nicholas J., Adobe, United States
Smaragdis, Paris, Adobe and University of Illinois at Urbana-Champaign, United States

AUD-L9.5: SPEECH-TO-SINGING CONVERSION IN AN ENCODER-DECODER FRAMEWORK
Parekh, Jayneel, Telecom Paris, Institut Polytechnique de Paris, France
Rao, Preeti, Indian Institute of Technology Bombay, India
Yang, Yi-Hsuan, Academia Sinica, Taiwan

AUD-L9.6: TENSORFLOW AUDIO MODELS IN ESSENTIA
Alonso-Jiménez, Pablo, Universitat Pompeu Fabra, Spain
Bogdanov, Dmitry, Universitat Pompeu Fabra, Spain
Pons, Jordi, Dolby Laboratories, Spain
Serra, Xavier, Universitat Pompeu Fabra, Spain
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<th>Title</th>
<th>Authors</th>
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<td>AUD-P1</td>
<td><strong>AUD-P1.1: ANOMALOUS SOUND DETECTION BASED ON INTERPOLATION DEEP NEURAL NETWORK</strong></td>
<td>Suefusa, Kaori, Hitachi, Ltd., Japan Nishida, Tomoya, University of Tokyo, Japan Harsh, Purohit, Hitachi, Ltd., Japan Tanabe, Ryo, Hitachi, Ltd., Japan Endo, Takashi, Hitachi, Ltd., Japan Kawaguchi, Yohei, Hitachi, Ltd., Japan</td>
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<td><strong>AUD-P1.2: A-CRNN: A DOMAIN ADAPTATION MODEL FOR SOUND EVENT DETECTION</strong></td>
<td>Wei, Wei, National University of Singapore, Singapore Zhu, Hongning, Fudan University, China Benetos, Emmanouil, Queen Mary University of London, United Kingdom Wang, Ye, National University of Singapore, Singapore</td>
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<td><strong>AUD-P1.3: SPIDERNET: ATTENTION NETWORK FOR ONE-SHOT ANOMALY DETECTION IN SOUNDS</strong></td>
<td>Koizumi, Yuma, NTT Corporation, Japan Yasuda, Masahiro, NTT Corporation, Japan Murata, Shin, NTT Corporation, Japan Saito, Shoichiro, NTT Corporation, Japan Uematsu, Hisashi, NTT Corporation, Japan Harada, Noboru, NTT Corporation, Japan</td>
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<td><strong>AUD-P1.4: SOUND EVENT DETECTION VIA DILATED CONVOLUTIONAL RECURRENT NEURAL NETWORKS</strong></td>
<td>Li, Yanxiong, South China University of Technology, China Liu, Mingle, South China University of Technology, China Drossos, Konstantinos, Tampere University, Finland Virtanen, Tuomas, Tampere University, Finland</td>
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<td><strong>AUD-P1.5: A DEEP NEURAL NETWORK-DRIVEN FEATURE LEARNING METHOD FOR POLYPHONIC ACOUSTIC EVENT DETECTION FROM REAL-LIFE RECORDINGS</strong></td>
<td>Mulimani, Manjunath, Manipal Institute of Technology Manipal, India Kademani, Akash B, Symbiosis Institute of Technology, India Koolagudi, Shashidhar G, National Institute of Technology Karnataka, India</td>
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<td><strong>AUD-P1.6: WEAKLY LABELLED AUDIO TAGGING VIA CONVOLUTIONAL NETWORKS WITH SPATIAL AND CHANNEL-WISE ATTENTION</strong></td>
<td>Hong, Sixin, Peking University, China Zou, Yuexian, Peking University, China Wang, Wenwu, University of Surrey, United Kingdom Cao, Meng, Peking University, China</td>
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AUD-P1.7: A STUDY ON THE TRANSFERABILITY OF ADVERSARIAL ATTACKS IN SOUND EVENT CLASSIFICATION

Subramanian, Vinod, Queen Mary University of London, United Kingdom
Pankajakshan, Arjun, Queen Mary University of London, United Kingdom
Benetos, Emmanouil, Queen Mary University of London, United Kingdom
Xu, Ning, ROLI Ltd., United Kingdom
McDonald, SKoT, ROLI Ltd., United Kingdom
Sandler, Mark, Queen Mary University of London, United Kingdom

AUD-P1.8: PROPELLER NOISE DETECTION WITH DEEP LEARNING

Mahiout, Thomas, Thales, France
Fillatre, Lionel, UCA, France
Deruaz-Pepin, Laurent, Thales, France

AUD-P1.9: DURATION ROBUST WEAKLY SUPERVISED SOUND EVENT DETECTION

Dinkel, Heinrich, Shanghai Jiao Tong University, China
Yu, Kai, Shanghai Jiao Tong University, China

AUD-P1.10: A COMPARISON OF POOLING METHODS ON LSTM MODELS FOR RARE ACOUSTIC EVENT CLASSIFICATION

Kao, Chieh-Chi, Amazon, Inc., United States
Sun, Ming, Amazon, Inc., United States
Wang, Weiran, Salesforce Research, United States
Wang, Chao, Amazon, Inc., United States

AUD-P1.11: AN ONTOLOGY-AWARE FRAMEWORK FOR AUDIO EVENT CLASSIFICATION

Sun, Yiwei, Pennsylvania State University, United States
Ghaffarzadegan, Shabnam, Bosch Research and Technology Center, United States

AUD-P1.12: TASK-AWARE MEAN TEACHER METHOD FOR LARGE SCALE WEAKLY LABELED SEMI-SUPERVISED SOUND EVENT DETECTION

Yan, Jie, University of Science and Technology of China, China
Song, Yan, University of Science and Technology of China, China
Dai, Li-Rong, University of Science and Technology of China, China
McLoughlin, Ian, University of Kent, United Kingdom
AUD-P2 - Deep Learning for Speech and Audio

AUD-P2.1: WAWENETS: A NO-REFERENCE CONVOLUTIONAL WAVEFORM-BASED APPROACH TO ESTIMATING NARROWBAND AND WIDEBAND SPEECH QUALITY
Catellier, Andrew, Institute for Telecommunication Sciences, United States
Voran, Stephen, Institute for Telecommunication Sciences, United States

AUD-P2.2: A NEURAL NETWORK FOR MONAURAL INTRUSIVE SPEECH INTELLIGIBILITY PREDICTION
Pedersen, Mathias Bach, Aalborg University, Denmark
Andersen, Asger Heidemann, Oticon A/S, Denmark
Jensen, Søren Holdt, Aalborg University, Denmark
Jensen, Jesper, Aalborg University, Denmark

AUD-P2.3: SOURCE CODING OF AUDIO SIGNALS WITH A GENERATIVE MODEL
Fejgin, Roy, Dolby Laboratories, United States
Klejsa, Janusz, Dolby Sweden AB, Sweden
Villemoes, Lars, Dolby Sweden AB, Sweden
Zhou, Cong, Dolby Laboratories, United States

AUD-P2.4: FULL-REFERENCE SPEECH QUALITY ESTIMATION WITH ATTENTIONAL SIAMESE NEURAL NETWORKS
Mittag, Gabriel, Technische Universität Berlin, Germany
Möller, Sebastian, Technische Universität Berlin, Germany

AUD-P2.5: ENHANCED METHOD OF AUDIO CODING USING CNN-BASED SPECTRAL RECOVERY WITH ADAPTIVE STRUCTURE
Shin, Seong-Hyeon, Kwangwoon University, Korea (South)
Beack, Seung Kwon, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Lim, Wootaek, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Park, Hochong, Kwangwoon University, Korea (South)

AUD-P2.6: AUDIO CODEC ENHANCEMENT WITH GENERATIVE ADVERSARIAL NETWORKS
Biswa, Arijit, Dolby Germany GmbH, Germany
Jia, Dai, Dolby Laboratories, China

AUD-P2.7: EFFICIENT AND SCALABLE NEURAL RESIDUAL WAVEFORM CODING WITH COLLABORATIVE QUANTIZATION
Zhen, Kai, Indiana University, United States
Lee, Mi Suk, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Sung, Jongmo, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Beack, Seungkwon, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Kim, Minje, Indiana University, United States

**AUD-P2.8: A DUAL-STAGED CONTEXT AGGREGATION METHOD TOWARDS EFFICIENT END-TO-END SPEECH ENHANCEMENT**

Zhen, Kai, Indiana University, United States
Lee, Mi Suk, Electronics and Telecommunications Research Institute (ETRI), Korea (South)
Kim, Minje, Indiana University, United States

**AUD-P2.9: A RECURRENT VARIATIONAL AUTOENCODER FOR SPEECH ENHANCEMENT**

Leglaive, Simon, CentraleSupélec, IETR, France
Alameda-Pineda, Xavier, Inria Grenoble Rhône-Alpes, France
Girin, Laurent, Univ. Grenoble Alpes, Grenoble INP, GIPSA-lab, France
Horaud, Radu, Inria Grenoble Rhone-Alpes, France

**AUD-P2.10: SPEAKERFILTER: DEEP LEARNING-BASED TARGET SPEAKER EXTRACTION USING ANCHOR SPEECH**

He, ShuLin, Inner Mongolia University, China
Li, Hao, Inner Mongolia University, China
Zhang, XueLiang, Inner Mongolia University, China

**AUD-P2.11: TACKLING REAL NOISY REVERBERANT MEETINGS WITH ALL-NEURAL SOURCE SEPARATION, COUNTING, AND DIARIZATION SYSTEM**

Kinoshita, Keisuke, NTT Corporation, Japan
Delcroix, Marc, NTT Corporation, Japan
Araki, Shoko, NTT Corporation, Japan
Nakatani, Tomohiro, NTT Corporation, Japan

**AUD-P2.12: TIME-DOMAIN AUDIO SOURCE SEPARATION BASED ON WAVE-U-NET COMBINED WITH DISCRETE WAVELET TRANSFORM**

Nakamura, Tomohiko, University of Tokyo, Japan
Saruwatari, Hiroshi, University of Tokyo, Japan
Tuesday, 5 May, 16:30 - 18:30

**AUD-P3 - Acoustic Environments and Spatial Audio I**

**AUD-P3.1: AUDITORY MODEL BASED SUBSETTING OF HEAD-RELATED TRANSFER FUNCTION DATASETS**

Spagnol, Simone, Aalborg University, Denmark

**AUD-P3.2: IMPULSE RESPONSE DATA AUGMENTATION AND DEEP NEURAL NETWORKS FOR BLIND ROOM ACOUSTIC PARAMETER ESTIMATION**

Bryan, Nicholas J., Adobe, United States

**AUD-P3.4: INDIVIDUAL DISTANCE-DEPENDENT HRTFS MODELING THROUGH A FEW ANTHROPOMETRIC MEASUREMENTS**

Zhang, Mengfan, Peking University, China Wu, Xihong, Peking University, China Qu, Tianshu, Peking University, China

**AUD-P3.5: EFFICIENT REPRESENTATION AND SPARSE SAMPLING OF HEAD-RELATED TRANSFER FUNCTIONS USING PHASE-CORRECTION BASED ON EAR ALIGNMENT**

Ben-Hur, Zamir, Ben-Gurion University of the Negev, Israel Alon, David L., Facebook Inc, United States Mehra, Ravish, Facebook Inc, United States Rafaely, Boaz, Ben-Gurion University of the Negev, Israel

**AUD-P3.6: EVALUATION OF DEEP-LEARNING-BASED VOICE ACTIVITY DETECTORS AND ROOM IMPULSE RESPONSE MODELS IN REVERBERANT ENVIRONMENTS**

Ivry, Amir, Technion - Israel Institute of Technology, Israel Cohen, Israel, Technion - Israel Institute of Technology, Israel Berdugo, Baruch, Technion - Israel Institute of Technology, Israel

**AUD-P3.7: A MINIMAL PERSONALIZATION OF DYNAMIC BINAURAL SYNTHESIS WITH MIXED STRUCTURAL MODELING AND SCATTERING DELAY NETWORKS**

Geronazzo, Michele, Aalborg University, Denmark Tissières, Jason, GN Group, Denmark Serafin, Stefania, Aalborg University, Denmark

**AUD-P3.8: SOUND TEXTURE SYNTHESIS USING RI SPECTROGRAMS**

Caracalla, Hugo, Institut de Recherche et Coordination Acoustique/Musique (IRCAM), France Roebel, Axel, Institut de Recherche et Coordination Acoustique/Musique (IRCAM), France
AUD-P3.9: TIME DOMAIN VELOCITY VECTOR FOR RETRACING THE MULTIPATH PROPAGATION
Daniel, Jérôme, Orange, France Kitić, Srđan, Orange, France

AUD-P3.10: ACOUSTIC MATCHING BY EMBEDDING IMPULSE RESPONSES
Su, Jiaqi, Princeton University, United States Jin, Zeyu, Adobe Research, United States Finkelstein, Adam, Princeton University, United States

AUD-P3.11: JOINT ESTIMATION OF ACOUSTIC PARAMETERS FROM SINGLE-MICROPHONE SPEECH OBSERVATIONS
Looney, David, Pindrop, United Kingdom Gaubitch, Nikolay D., Pindrop, United Kingdom

AUD-P3.12: A FAST REDUCED-RANK SOUND ZONE CONTROL ALGORITHM USING THE CONJUGATE GRADIENT METHOD
Shi, Liming, Aalborg University, Denmark Lee, Taewoong, Aalborg University, Denmark Zhang, Lijun, Northwestern Polytechnical University, China Nielsen, Jesper Kjær, Aalborg University, Denmark Christensen, Mads Græsbøll, Aalborg University, Denmark
Wednesday, 6 May, 09:00 - 11:00

**AUD-P4 - Feedback, Noise, and Reverberation**

**AUD-P4.1: AN EMPIRICAL STUDY ON ACOUSTIC FEEDBACK PATH ACROSS HEARING AID USERS**
Guo, Meng, Demant, Denmark

**AUD-P4.2: LOW COMPLEXITY NLMS FOR MULTIPLE LOUDSPEAKER ACOUSTIC ECHO CANCELLER USING RELATIVE LOUDSPEAKER TRANSFER FUNCTIONS**
Schwartz, Ofer, CEVA-DSP, Israel Habets, Emanuël A. P., International Audio Laboratories Erlangen, Germany Gannot, Sharon, Bar-Ilan University, Israel

**AUD-P4.3: A MULTICHANNEL KALMAN-BASED WIENER FILTER APPROACH FOR SPEAKER INTERFERENCE REDUCTION IN MEETINGS**
Meyer, Patrick, Technische Universität Braunschweig, Germany Elshamy, Samy, Technische Universität Braunschweig, Germany Fingscheidt, Tim, Technische Universität Braunschweig, Germany

**AUD-P4.4: PRIMARY PATH ESTIMATOR BASED ON INDIVIDUAL SECONDARY PATH FOR ANC HEADPHONES**
Fabry, Johannes, RWTH Aachen University, Germany Jax, Peter, RWTH Aachen University, Germany

**AUD-P4.5: EFFICIENT MULTICHANNEL NONLINEAR ACOUSTIC ECHO CANCELLATION BASED ON A COOPERATIVE STRATEGY**
Halimeh, Mhd Modar, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Kellermann, Walter, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

**AUD-P4.6: ACTIVE CONTROL OF LINE SPECTRAL NOISE WITH SIMULTANEOUS SECONDARY PATH MODELING WITHOUT AUXILIARY NOISE**
Hu, Meiling, Nanjing University, China Lu, Jing, Nanjing University, China

**AUD-P4.7: ROBUST FREQUENCY-DOMAIN RECURSIVE LEAST M-ESTIMATE ADAPTIVE FILTER FOR ACOUSTIC SYSTEM IDENTIFICATION**
He, Hongsen, Southwest University of Science and Technology, China Chen, Jingdong, Northwestern Polytechnical University, China Benesty, Jacob, University of Quebec, Canada Yu, Yi, Southwest University of Science and Technology, China
AUD-P4.8: NEAREST KRONECKER PRODUCT DECOMPOSITION BASED NORMALIZED LEAST MEAN SQUARE ALGORITHM
Bhattacharjee, Sankha Subhra, Indian Institute of Technology Gandhinagar, India
George, Nithin, Indian Institute of Technology Gandhinagar, India

AUD-P4.9: JOINT BEAMFORMING AND REVERBERATION CANCELLATION USING A CONSTRAINED KALMAN FILTER WITH MULTICHANNEL LINEAR PREDICTION
Hashemgeloogerdi, Sahar, University of Rochester, United States
Braun, Sebastian, Microsoft Research, United States

AUD-P4.10: OPTIMAL LEAK FACTOR SELECTION FOR THE OUTPUT-CONSTRAINED LEAKY FILTERED-INPUT LEAST MEAN SQUARE ALGORITHM
Shi, Dongyuan, Digital Signal Processing Lab, Nanyang Technological University, Singapore
Lam, Bhan, Nanyang Technological University, Singapore
Gan, Woon-Seng, Nanyang Technological University, Singapore
Wen, Shulin, Digital Signal Processing Lab, Nanyang Technological University, Singapore

AUD-P4.11: MULTI-MICROPHONE COMPLEX SPECTRAL MAPPING FOR SPEECH DEREVERBERATION
Wang, Zhong-Qiu, Ohio State University, United States
Wang, Deliang, Ohio State University, United States

AUD-P4.12: PREDICTING WORD ERROR RATE FOR REVERBERANT SPEECH
Gamper, Hannes, Microsoft Research, United States
Emmanouilidou, Dimitra, Microsoft Research, United States
Braun, Sebastian, Microsoft Research, United States
Tashev, Ivan, Microsoft Research, United States
Wednesday, 6 May, 09:00 - 11:00

AUD-P5 - Music Information Retrieval II

AUD-P5.1: AUTOMATIC LYRICS ALIGNMENT AND TRANSCRIPTION IN POLYPHONIC MUSIC: DOES BACKGROUND MUSIC HELP?
Gupta, Chitralekha, National University of Singapore, Singapore Yilmaz, Emre, National University of Singapore, Singapore Li, Haizhou, National University of Singapore, Singapore

AUD-P5.2: LOCAL KEY ESTIMATION IN CLASSICAL MUSIC RECORDINGS: A CROSS-VERSION STUDY ON SCHUBERT’S WINTERREISE
Schreiber, Hendrik, International Audio Laboratories Erlangen, Germany Weiß, Christof, International Audio Laboratories Erlangen, Germany Müller, Meinard, International Audio Laboratories Erlangen, Germany

AUD-P5.3: IMPROVING MUSIC TRANSCRIPTION BY PRE-STACKING A U-NET
Pedersoli, Fabrizio, University of Victoria, Canada Tzanetakis, George, University of Victoria, Canada Yi, Kwang Moo, University of Victoria, Canada

AUD-P5.4: LEARNING TO RANK MUSIC TRACKS USING TRIPLET LOSS
Prétet, Laure, Creaminal, France Richard, Gaël, LTCI, Télécom Paris, France Peeters, Geoffroy, LTCI, Télécom Paris, France

AUD-P5.5: TRANSFORMER VAE: A HIERARCHICAL MODEL FOR STRUCTURE-AWARE AND INTERPRETABLE MUSIC REPRESENTATION LEARNING
Jiang, Junyan, Carnegie Mellon University, United States Xia, Gus, New York University Shanghai, China Carlton, Dave, Hooktheory, LLC, United States Anderson, Chris, Hooktheory, LLC, United States Miyakawa, Ryan, Hooktheory, LLC, United States

AUD-P5.6: A COMPARATIVE STUDY OF WESTERN AND CHINESE CLASSICAL MUSIC BASED ON SOUNDSCAPE MODELS
Fan, Jianyu, Simon Fraser University, Canada Yang, Yi-Hsuan, Academia Sinica, Taiwan Dong, Kui, Dartmouth College, United States Pasquier, Philippe, Simon Fraser University, Canada

AUD-P5.7: AUDIO-BASED DETECTION OF EXPLICIT CONTENT IN MUSIC

**AUD-P5.8: NEW METRICS FOR EVALUATING THE ACCURACY OF FUNDAMENTAL FREQUENCY ESTIMATION APPROACHES IN MUSICAL SIGNALS**

Devaney, Johanna, Brooklyn College, City University of New York, United States

**AUD-P5.9: DATA-DRIVEN HARMONIC FILTERS FOR AUDIO REPRESENTATION LEARNING**

Won, Minz, Universitat Pompeu Fabra, Spain Chun, Sanghyuk, Naver Corporation, Korea (South) Nieto, Oriol, Pandora Media Inc., United States Serra, Xavier, Universitat Pompeu Fabra, Spain

**AUD-P5.10: LEARNING A REPRESENTATION FOR COVER SONG IDENTIFICATION USING CONVOLUTIONAL NEURAL NETWORK**

Yu, Zhesong, Peking University, China Xu, Xiaoshuo, Peking University, China Chen, Xiaoou, Peking University, China Yang, Deshun, Peking University, China

**AUD-P5.11: TOWARDS LINKING THE LAKH AND IMSLP DATASETS**

Tsai, TJ, Harvey Mudd College, United States

**AUD-P5.12: A MULTI-DILATION AND MULTI-RESOLUTION FULLY CONVOLUTIONAL NETWORK FOR SINGING MELODY EXTRACTION**

Gao, Ping, National Chiao Tung University, Taiwan You, Cheng-You, National Chiao Tung University, Taiwan Chi, Tai-Shih, National Chiao Tung University, Taiwan
AUD-P6.1: AN IMPROVED SOLUTION TO THE FREQUENCY-ININVARIANT BEAMFORMING WITH CONCENTRIC CIRCULAR MICROPHONE ARRAYS
Zhao, Xudong, Northwestern Polytechnical University, China Huang, Gongping, Israel Institute of Technology, Israel Chen, Jingdong, Northwestern Polytechnical University, China Benesty, Jacob, University of Quebec, Canada

AUD-P6.2: BINAURAL AUDIO SOURCE REMIXING WITH MICROPHONE ARRAY LISTENING DEVICES
Corey, Ryan, University of Illinois at Urbana-Champaign, United States Singer, Andrew, University of Illinois at Urbana-Champaign, United States

AUD-P6.3: EXPLOITING PERIODICITY FEATURES FOR JOINT DETECTION AND DOA ESTIMATION OF SPEECH SOURCES USING CONVOLUTIONAL NEURAL NETWORKS
Varzandeh, Reza, HoerTech gGmbH, Germany Adiloğlu, Kamil, HörTech gGmbH, Germany Doclo, Simon, University of Oldenburg, Germany Hohmann, Volker, University of Oldenburg, Germany

AUD-P6.4: UNSUPERVISED MULTIPLE SOURCE LOCALIZATION USING RELATIVE HARMONIC COEFFICIENTS
Hu, Yonggang, Australian National University, Australia Samarasinghe, Prasanga N., Australian National University, Australia Abhayapala, Thushara D., Australian National University, Australia Gannot, Sharon, Bar-Ilan University, Israel

AUD-P6.5: DATA-DRIVEN WIND SPEED ESTIMATION USING MULTIPLE MICROPHONES

AUD-P6.7: A DYNAMIC STREAM WEIGHT BACKPROP KALMAN FILTER FOR AUDIOVISUAL SPEAKER TRACKING
Schymura, Christopher, Ruhr-Universität Bochum, Germany Ochiai, Tsubasa, NTT Corporation, Japan Delcroix, Marc, NTT Corporation, Japan Kinoshita, Keisuke, NTT Corporation, Japan Nakatani, Tomohiro, NTT Corporation, Japan Araki, Shoko, NTT Corporation, Japan Kolossa, Dorothea, Ruhr-Universität Bochum, Germany
AUD-P6.8: MAXIMUM LIKELIHOOD MULTI-SPEAKER DIRECTION OF
ARRIVAL ESTIMATION UTILIZING A WEIGHTED HISTOGRAM
Hadad, Elior, Bar-Ilan University, Israel Gannot, Sharon, Bar-Ilan University, Israel

AUD-P6.9: OVERDETERMINED INDEPENDENT VECTOR ANALYSIS
Ikeshita, Rintaro, NTT Corporation, Japan Nakatani, Tomohiro, NTT Corporation, Japan Araki, Shoko, NTT Corporation, Japan

AUD-P6.10: SPATIALLY GUIDED INDEPENDENT VECTOR ANALYSIS
Brendel, Andreas, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Haubner, Thomas, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Kellermann, Walter, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

AUD-P6.11: FAST INDEPENDENT VECTOR EXTRACTION BY ITERATIVE SINR
MAXIMIZATION
Scheibler, Robin, Tokyo Metropolitan University, Japan Ono, Nobutaka, Tokyo Metropolitan University, Japan

AUD-P6.12: REGULARIZED FAST MULTICHANNEL NONNEGATIVE MATRIX
FACTORIZATION WITH ILRMA-BASED PRIOR DISTRIBUTION OF JOINT-
DIAGONALIZATION PROCESS
Kamo, Keigo, University of Tokyo, Japan Kubo, Yuki, University of Tokyo, Japan Takamune, Norihiro, University of Tokyo, Japan Kitamura, Daichi, National Institute of Technology, Kagawa College, Japan Saruwatari, Hiroshi, University of Tokyo, Japan Takahashi, Yu, Yamaha Corporation, Japan Kondo, Kazunobu, Yamaha Corporation, Japan
AUD-P7 - Audio Classification

AUD-P7.1: BEYOND THE DCASE 2017 CHALLENGE ON RARE SOUND EVENT DETECTION: A PROPOSAL FOR A MORE REALISTIC TRAINING AND TEST FRAMEWORK
Baumann, Jan, Technische Universität Braunschweig, Germany Lohrenz, Timo, Technische Universität Braunschweig, Germany Roy, Alexander, IAV GmbH, Germany Fingscheidt, Tim, Technische Universität Braunschweig, Germany

AUD-P7.2: METRIC LEARNING WITH BACKGROUND NOISE CLASS FOR FEW-SHOT DETECTION OF RARE SOUND EVENTS
Shimada, Kazuki, Sony Corporation, Japan Koyama, Yuichiro, Sony Corporation, Japan Inoue, Akira, Sony Corporation, Japan

AUD-P7.3: SOUND EVENT DETECTION BY MULTITASK LEARNING OF SOUND EVENTS AND SCENES WITH SOFT SCENE LABELS
Imoto, Keisuke, Ritsumeikan University, Japan Tonami, Noriyuki, Ritsumeikan University, Japan Koizumi, Yuma, Nippon Telegraph and Telephone Corporation, Japan Yasuda, Masahiro, Nippon Telegraph and Telephone Corporation, Japan Yamanishi, Ryosuke, Ritsumeikan University, Japan Yamashita, Yoichi, Ritsumeikan University, Japan

AUD-P7.4: GUIDED LEARNING FOR WEAKLY-LABELED SEMI-SUPERVISED SOUND EVENT DETECTION
Lin, Liwei, Institute of Computing Technology, Chinese Academy of Sciences, China Wang, Xiangdong, Institute of Computing Technology, Chinese Academy of Sciences, China Liu, Hong, Institute of Computing Technology, Chinese Academy of Sciences, China Qian, Yueliang, Institute of Computing Technology, Chinese Academy of Sciences, China

AUD-P7.5: STAGED TRAINING STRATEGY AND MULTI-ACTIVATION FOR AUDIO TAGGING WITH NOISY AND SPARSE MULTI-LABEL DATA
He, Kexin, Tsinghua University, China Shen, Yuhan, Northeastern University, United States Zhang, Wei-Qiang, Tsinghua University, China Liu, Jia, Tsinghua University, China

AUD-P7.6: LEARNING WITH OUT-OF-DISTRIBUTION DATA FOR AUDIO CLASSIFICATION
Iqbal, Turab, University of Surrey, United Kingdom Cao, Yin, University of Surrey, United Kingdom Kong, Qiuqiang, University of Surrey, United Kingdom
Plumbley, Mark D., University of Surrey, United Kingdom Wang, Wenwu, University of Surrey, United Kingdom

AUD-P7.7: MULTI-BRANCH LEARNING FOR WEAKLY-LABELED SOUND EVENT DETECTION
Huang, Yuxin, Institute of Computing Technology, Chinese Academy of Sciences, China Wang, Xiangdong, Institute of Computing Technology, Chinese Academy of Sciences, China Lin, Liwei, Institute of Computing Technology, Chinese Academy of Sciences, China Liu, Hong, Institute of Computing Technology, Chinese Academy of Sciences, China Qian, Yueliang, Institute of Computing Technology, Chinese Academy of Sciences, China

AUD-P7.8: SCENE-DEPENDENT ACOUSTIC EVENT DETECTION WITH SCENE CONDITIONING AND FAKE-SCENE-CONDITIONED LOSS
Komatsu, Tatsuya, LINE Corporation, Japan Imoto, Keisuke, Ritsumeikan University, Japan Togami, Masahito, LINE Corporation, Japan

AUD-P7.9: SOUND EVENT LOCALIZATION BASED ON SOUND INTENSITY VECTOR REFINED BY DNN-BASED DENOISING AND SOURCE SEPARATION
Yasuda, Masahiro, NTT Corporation, Japan Koizumi, Yuma, NTT Corporation, Japan Saito, Shoichiro, NTT Corporation, Japan Uematsu, Hisashi, NTT Corporation, Japan Imoto, Keisuke, Ritsumeikan University, Japan

AUD-P7.10: HIGH-RESOLUTION ATTENTION NETWORK WITH ACOUSTIC SEGMENT MODEL FOR ACOUSTIC SCENE CLASSIFICATION
Bai, Xue, University of Science and Technology of China, China Du, Jun, University of Science and Technology of China, China Pan, Jia, University of Science and Technology of China, China Zhou, Heng-Shun, University of Science and Technology of China, China Tu, Yan-Hui, University of Science and Technology of China, China Lee, Chin-Hui, Georgia Institute of Technology, United States

AUD-P7.11: POLYPHONIC SOUND EVENT DETECTION USING TRANSPOSED CONVOLUTIONAL RECURRENT NEURAL NETWORK
Chatterjee, Chandra Churh, Jalpaiguri Government Engineering College, India Mulimani, Manjunath, Manipal Institute of Technology Manipal, India Koolagudi, Shashidhar G, National Institute of Technology Karnataka, India

AUD-P7.12: SECOST: SEQUENTIAL CO-SUPERVISION FOR LARGE SCALE WEAKLY LABELED AUDIO EVENT DETECTION
Kumar, Anurag, Facebook Inc, United States Ithapu, Vamsi Krishna, Facebook, United States
Wednesday, 6 May, 16:30 - 18:30

**AUD-P8 - Source Separation and Array Processing**

**AUD-P8.1: DEEP SPEECH EXTRACTION WITH TIME-VARYING SPATIAL FILTERING GUIDED BY DESIRED DIRECTION ATTRACTOR**

Nakagome, Yu, Waseda University, Japan
Togami, Masahito, LINE Corporation, Japan
Ogawa, Tetsuji, Waseda University, Japan
Kobayashi, Tetsunori, Waseda University, Japan

**AUD-P8.2: ADAPTIVE BLIND AUDIO SOURCE EXTRACTION SUPERVISED BY DOMINANT SPEAKER IDENTIFICATION USING X-VECTORS**

Janský, Jakub, Technical University of Liberec, Czech Republic
Málek, Jiří, Technical University of Liberec, Czech Republic
Čmejla, Jaroslav, Technical University of Liberec, Czech Republic
Kounovský, Tomáš, Technical University of Liberec, Czech Republic
Koldovský, Zbyněk, Technical University of Liberec, Czech Republic
Žďánský, Jindřich, Technical University of Liberec, Czech Republic

**AUD-P8.3: PASSIVE JOINT LOCALIZATION AND SYNCHRONIZATION OF DISTRIBUTED MICROPHONE ARRAYS**

Woźniak, Szymon, AGH University of Science and Technology, Poland
Kowalczyk, Konrad, AGH University of Science and Technology, Poland

**AUD-P8.4: CONVERGENCE-GUARANTEED INDEPENDENT POSITIVE SEMIDEFINITE TENSOR ANALYSIS BASED ON STUDENT’S T DISTRIBUTION**

Kondo, Tatsuki, University of Tokyo, Japan
Fukushige, Kanta, University of Tokyo, Japan
Kitamura, Daichi, National Institute of Technology, Kagawa College, Japan
Saruwatari, Hiroshi, University of Tokyo, Japan
Ikeshita, Rintaro, NTT Corporation, Japan
Nakatani, Tomohiro, NTT Corporation, Japan

**AUD-P8.5: DETERMINED SOURCE SEPARATION USING THE SPARSITY OF IMPULSE RESPONSES**

Takahashi, Yuki, Ritsumeikan University, Japan
Kitahara, Daichi, Ritsumeikan University, Japan
Matsuura, Koichiro, Ritsumeikan University, Japan
Hirabayashi, Akira, Ritsumeikan University, Japan

**AUD-P8.6: IMPROVING SPEAKER DISCRIMINATION OF TARGET SPEECH EXTRACTION WITH TIME-DOMAIN SPEAKERBEAM**

Delcroix, Marc, NTT Corporation, Japan
Ochiai, Tsubasa, NTT Corporation, Japan
Žmolíková, Kateřina, Brno University of Technology, Czech Republic
Kinoshita, Masahiro, NTT Corporation, Japan
Keisuke, NTT Corporation, Japan Tawara, Naohiro, NTT Corporation, Japan
Nakatani, Tomohiro, NTT Corporation, Japan Araki, Shoko, NTT Corporation, Japan

AUD-P8.7: WHAMR!: NOISY AND REVERBERANT SINGLE-CHANNEL SPEECH SEPARATION
Maciejewski, Matthew, Johns Hopkins University, United States Wichern, Gordon, Mitsubishi Electric Research Laboratories (MERL), United States McQuinn, Emmett, Whisper AI, United States Le Roux, Jonathan, Mitsubishi Electric Research Laboratories (MERL), United States

AUD-P8.8: EIGENBEAM-ESPRIT FOR DOA-VECTOR ESTIMATION
Herzog, Adrian, Friedrich-Alexander Universität Erlangen, Germany Habets, Emanuël A. P., Friedrich-Alexander Universität Erlangen, Germany

AUD-P8.12: BILEVEL OPTIMIZATION USING STATIONARY POINT OF LOWER-LEVEL OBJECTIVE FUNCTION
Nakajima, Hiroaki, University of Tokyo, Japan Kitamura, Daichi, National Institute of Technology, Kagawa College, Japan Takamune, Norihiro, University of Tokyo, Japan Saruwatari, Hiroshi, University of Tokyo, Japan Ono, Nobutaka, Tokyo Metropolitan University, Japan
### AUD-P9 - Topics in Audio Analysis and Classification

**AUD-P9.1: IMPACT OF A SHIFT-ININVARIANT HARMONIC PHASE MODEL IN FULLY PARAMETRIC HARMONIC VOICE REPRESENTATION AND TIME/FREQUENCY SYNTHESIS**
Ferreira, Aníbal, University of Porto, Portugal Silva, João, University of Porto, Portugal Brito, Francisca, University of Porto, Portugal Sinha, Deepen, ATC Labs, United States

**AUD-P9.2: HEARING AID RESEARCH DATA SET FOR ACOUSTIC ENVIRONMENT RECOGNITION**
Hüwel, Andreas, HoerTech gGmbH, Germany Adiloğlu, Kamil, HörTech gGmbH, Germany Bach, Jörg-Hendrik, HoerTech gGmbH, Germany

**AUD-P9.3: AUDIO FEATURE EXTRACTION FOR VEHICLE ENGINE NOISE CLASSIFICATION**
Becker, Luca, Ruhr-Universität Bochum, Germany Nelus, Alexandru, Ruhr-Universität Bochum, Germany Gauer, Johannes, Ruhr-Universität Bochum, Germany Rudolph, Lars, Ruhr-Universität Bochum, Germany Martin, Rainer, Ruhr-Universität Bochum, Germany

**AUD-P9.4: TIME-FREQUENCY FEATURE DECOMPOSITION BASED ON SOUND DURATION FOR ACOUSTIC SCENE CLASSIFICATION**
Wu, Yuzhong, Chinese University of Hong Kong, Hong Kong SAR of China Lee, Tan, Chinese University of Hong Kong, Hong Kong SAR of China

**AUD-P9.5: VGGSOUND: A LARGE-SCALE AUDIO-VISUAL DATASET**
Chen, Honglie, University of Oxford, United Kingdom Xie, Weidi, University of Oxford, United Kingdom Vedaldi, Andrea, University of Oxford, United Kingdom Zisserman, Andrew, University of Oxford, United Kingdom

**AUD-P9.6: TRANSFER LEARNING FROM YOUTUBE SOUNDTRACKS TO TAG ARCTIC ECOACOUSTIC RECORDINGS**
Çoban, Enis Berk, Graduate Center, City University of New York, United States Pir, Dara, Guttman Community College, CUNY, United States So, Richard, Staten Island Technical High School, United States Mandel, Michael I, Brooklyn College, City University of New York, United States

**AUD-P9.7: DATA AUGMENTATION USING EMPIRICAL MODE DECOMPOSITION ON NEURAL NETWORKS TO CLASSIFY IMPACT NOISE IN VEHICLE**
Nam, Gue-Hwan, Hyundai Mobis, Korea (South) Bu, Seok-Jun, Yonsei University, Korea (South) Park, Na-Mu, Yonsei University, Korea (South) Seo, Jae-Yong, Hyundai Mobis, Korea (South) Jo, Hyeon-Cheol, Hyundai Mobis, Korea (South) Jeong, Won-Tae, Hyundai Mobis, Korea (South)

**AUD-P9.8: CLOTHO: AN AUDIO CAPTIONING DATASET**

Drossos, Konstantinos, Tampere University, Finland Lipping, Samuel, Tampere University, Finland Virtanen, Tuomas, Tampere University, Finland

**AUD-P9.9: ROBUST FUNDAMENTAL FREQUENCY ESTIMATION IN COLOURED NOISE**

Esquivel Jaramillo, Alfredo, Aalborg University, Denmark Jakobsson, Andreas, Lund University, Sweden Nielsen, Jesper Kjær, Aalborg University, Denmark Christensen, Mads Græsbøll, Aalborg University, Denmark

**AUD-P9.10: EFFICIENT BIRD SOUND DETECTION ON THE BELA EMBEDDED SYSTEM**

Solomes, Alexandru-Marius, Queen Mary University of London, United Kingdom Stowell, Dan, Queen Mary University of London, United Kingdom

**AUD-P9.11: IMPROVING AUTOMATED SEGMENTATION OF RADIO SHOWS WITH AUDIO EMBEDDINGS**

Berlage, Oberon, University of Amsterdam, Netherlands Lux, Klaus-Michael, Radboud Universiteit Nijmegen, Netherlands Graus, David, FD Mediagroep, Netherlands

**AUD-P9.12: SECL-UMONS DATABASE FOR SOUND EVENT CLASSIFICATION AND LOCALIZATION**

Brousmiche, Mathilde, Université de Mons, Belgium Rouat, Jean, Université de Sherbrooke, Canada Dupont, Stéphane, Université de Mons, Belgium
AUD-P10 - Music Signal Processing I

AUD-P10.1: SYNTHESIZING ENGAGING MUSIC USING DYNAMIC MODELS OF STATISTICAL SURPRISAL
Kothinti, Sandeep Reddy, Johns Hopkins University, United States Skerritt-Davis, Benjamin, Johns Hopkins University, United States Nair, Aditya, University of Washington, United States Elhilali, Mounya, Johns Hopkins University, United States

AUD-P10.2: HARMONICS BASED REPRESENTATION IN CLARINET TONE QUALITY EVALUATION
Wang, Yixin, Xi’an Jiaotong University, China Guan, Xiaohong, Xi’an Jiaotong University, China Du, Youjian, Xi’an Jiaotong University, China Nan, Nan, Xi’an Jiaotong University, China

AUD-P10.3: SIMULTANEOUS SEPARATION AND TRANSCRIPTION OF MIXTURES WITH MULTIPLE POLYPHONIC AND PERCUSSIVE INSTRUMENTS
Manilow, Ethan, Northwestern University, United States Seetharaman, Prem, Northwestern University, United States Pardo, Bryan, Northwestern University, United States

AUD-P10.4: THE ROLE OF ANNOTATION FUSION METHODS IN THE STUDY OF HUMAN-REPORTED EMOTION EXPERIENCE DURING MUSIC LISTENING
Greer, Timothy, University of Southern California, United States Mundnich, Karel, University of Southern California, United States Sachs, Matthew, Columbia University, United States Narayanan, Shrikanth, University of Southern California, United States

AUD-P10.5: CONTENT BASED SINGING VOICE EXTRACTION FROM A MUSICAL MIXTURE
Chandna, Pritish, Universitat Pompeu Fabra, Spain Blaauw, Merlijn, Universitat Pompeu Fabra, Spain Bonada, Jordi, Universitat Pompeu Fabra, Spain Gómez, Emilia, Universitat Pompeu Fabra, Spain

AUD-P10.6: NEURAL PERCUSSIVE SYNTHESIS PARAMETERISED BY HIGH-LEVEL TIMBRAL FEATURES
Ramires, António, Universitat Pompeu Fabra, Spain Chandna, Pritish, Universitat Pompeu Fabra, Spain Favory, Xavier, Universitat Pompeu Fabra, Spain Gómez,
Emilia, Universitat Pompeu Fabra; Joint Research Centre, European Commission, Spain
Serra, Xavier, Universitat Pompeu Fabra, Spain

**AUD-P10.7: NON-GRIFFIN–LIM TYPE SIGNAL RECOVERY FROM MAGNITUDE SPECTROGRAM**
Nakatsu, Ryusei, Ritsumeikan University, Japan
Kitahara, Daichi, Ritsumeikan University, Japan
Hirabayashi, Akira, Ritsumeikan University, Japan

**AUD-P10.8: VAPAR SYNTH - A VARIATIONAL PARAMETRIC MODEL FOR AUDIO SYNTHESIS**
Subramani, Krishna, Indian Institute of Technology Bombay, India
Rao, Preeti, Indian Institute of Technology Bombay, India
D’Hooge, Alexandre, ENS Paris-Saclay, France

**AUD-P10.9: BANDWIDTH EXTENSION OF MUSICAL AUDIO SIGNALS WITH NO SIDE INFORMATION USING DILATED CONVOLUTIONAL NEURAL NETWORKS**
Lagrange, Mathieu, LS2N, France
Gontier, Félix, LS2N, France

**AUD-P10.10: TOWARDS REAL-TIME SINGLE-CHANNEL SINGING-VOICE SEPARATION WITH PRUNED MULTI-SCALED DENSENETS**
Huber, Markus, Graz University of Technology, Austria
Schindler, Günther, Heidelberg University, Germany
Roth, Wolfgang, Graz University of Technology, Austria
Fröning, Holger, Heidelberg University, Germany
Schörkhuber, Christian, sonible GmbH, Austria
Pernkopf, Franz, Graz University of Technology, Austria

**AUD-P10.11: STATE-BASED TRANSCRIPTION OF COMPONENTS OF CARNATIC MUSIC**
Viraraghavan, Venkata, Tata Consultancy Services, India
Pal, Arpan, Tata Consultancy Services, India
Murthy, Hema, Indian Institute of Technology Madras, India
Aravind, R, Indian Institute of Technology Madras, India

**AUD-P10.12: META-LEARNING EXTRACTORS FOR MUSIC SOURCE SEPARATION**
Samuel, David, Charles University, Czech Republic
Ganeshan, Aditya, Preferred Networks, Japan
Naradowsky, Jason, Preferred Networks, Japan
AUD-P11 - Signal Enhancement and Restoration II

AUD-P11.1: CONSISTENCY-AWARE MULTI-CHANNEL SPEECH ENHANCEMENT USING DEEP NEURAL NETWORKS
Masuyama, Yoshiki, Waseda University, Japan Togami, Masahito, LINE Corporation, Japan Komatsu, Tatsuya, LINE Corporation, Japan

AUD-P11.2: PHASE RECONSTRUCTION BASED ON RECURRENT PHASE UNWRAPPING WITH DEEP NEURAL NETWORKS
Masuyama, Yoshiki, Waseda University, Japan Yatabe, Kohei, Waseda University, Japan Koizumi, Yuma, NTT Corporation, Japan Oikawa, Yasuhiro, Waseda University, Japan Harada, Noboru, NTT Corporation, Japan

AUD-P11.3: PERFORMANCE STUDY OF A CONVOLUTIONAL TIME-DOMAIN AUDIO SEPARATION NETWORK FOR REAL-TIME SPEECH DENOISING
Sonning, Samuel, Google, Sweden Schüldt, Christian, Google, Sweden Erdogan, Hakan, Google, United States Wisdom, Scott, Google, United States

AUD-P11.4: CHANNEL-ATTENTION DENSE U-NET FOR MULTICHANNEL SPEECH ENHANCEMENT
Tolooshams, Bahareh, Harvard University, United States Giri, Ritwik, Amazon Web Services, United States Song, Andrew, Massachusetts Institute of Technology, United States Isik, Umut, Amazon Web Services, United States Krishnaswamy, Arvindh, Amazon Web Services, United States

AUD-P11.5: A COMPOSITE DNN ARCHITECTURE FOR SPEECH ENHANCEMENT
Yemini, Yochai, Bar-Ilan University, Israel Chazan, Shlomo E., Bar-Ilan University, Israel Goldberger, Jacob, Bar-Ilan University, Israel Gannot, Sharon, Bar-Ilan University, Israel

AUD-P11.6: GEOMETRICALLY CONSTRAINED INDEPENDENT VECTOR ANALYSIS FOR DIRECTIONAL SPEECH ENHANCEMENT
Li, Li, University of Tsukuba, Japan Koishida, Kazuhito, Microsoft Corporation, United States

AUD-P11.7: REAL-TIME SPEECH ENHANCEMENT USING EQUILIBRIATED RNN
Takeuchi, Daiki, Waseda University, Japan Yatabe, Kohei, Waseda University, Japan Koizumi, Yuma, NTT Corporation, Japan Oikawa, Yasuhiro, Waseda University, Japan Harada, Noboru, NTT Corporation, Japan

AUD-P11.8: SUBSPACE-BASED SPEECH CORRELATION VECTOR ESTIMATION FOR SINGLE-MICROPHONE MULTI-FRAME MVDR FILTERING
Fischer, Dörte, University of Oldenburg, Germany Doclo, Simon, University of Oldenburg, Germany

AUD-P11.9: SPEECH ENHANCEMENT USING A TWO-STAGE NETWORK FOR AN EFFICIENT BOOSTING STRATEGY
Kim, Juntae, KaKao, Korea (South)

AUD-P11.10: TIME-FREQUENCY LOSS FOR CNN BASED SPEECH SUPER-RESOLUTION
Wang, Heming, Ohio State University, United States Wang, Deliang, Ohio State University, United States

AUD-P11.11: TIME-DOMAIN NEURAL NETWORK APPROACH FOR SPEECH BANDWIDTH EXTENSION
Hao, Xiang, Northwestern Polytechnical University, China Xu, Chenglin, Nanyang Technological University, Singapore Hou, Nana, Nanyang Technological University, Singapore Xie, Lei, Northwestern Polytechnical University, China Chng, Eng Siong, Nanyang Technological University, Singapore Li, Haizhou, National University of Singapore, Singapore

AUD-P11.12: WEIGHTED SPEECH DISTORTION LOSSES FOR NEURAL-NETWORK-BASED REAL-TIME SPEECH ENHANCEMENT
Xia, Yangyang, Carnegie Mellon University, United States Braun, Sebastian, Microsoft Research, United States Reddy, Chandan, Microsoft Corporation, United States Dubey, Harishchandra, Microsoft Corporation, United States Cutler, Ross, Microsoft Corporation, United States Tashev, Ivan, Microsoft Research, United States
Friday, 8 May, 15:15 - 17:15

AUD-P12 - Audio, Speech and Music Analysis

AUD-P12.1: SNORER DIARISATION BASED ON DEEP NEURAL NETWORK EMBEDDINGS
Romero, Hector E., University of Sheffield, United Kingdom
Ma, Ning, University of Sheffield, United Kingdom
Brown, Guy J., University of Sheffield, United Kingdom

AUD-P12.2: PLAYING TECHNIQUE RECOGNITION BY JOINT TIME–FREQUENCY SCATTERING
Wang, Changhong, Queen Mary University of London, United Kingdom
Lostanlen, Vincent, New York University, United States
Benetos, Emmanouil, Queen Mary University of London, United Kingdom
Chew, Elaine, IRCAM, France

AUD-P12.3: PRIVACY AWARE ACOUSTIC SCENE SYNTHESIS USING DEEP SPECTRAL FEATURE INVERSION
Gontier, Félix, LS2N, France
Lagrange, Mathieu, LS2N, France
Lavandier, Catherine, Etis, Université de Cergy-Pontoise, France
Petiot, Jean-François, LS2N, France

AUD-P12.4: ROBUSTNESS ASSESSMENT OF AUTOMATIC REINKE’S EDEMA DIAGNOSIS SYSTEMS
Madriga, Mario, Universidad de Extremadura, Spain
Campos-Roca, Yolanda, Universidad de Extremadura, Spain
Pérez, Carlos J., Universidad de Extremadura, Spain

AUD-P12.5: WHOSECOUGH: IN-THE-WILD COUGHER VERIFICATION USING MULTITASK LEARNING
Whitehill, Matt, University of Washington, United States
Garrison, Jake, Google, Inc., United States
Patel, Shwetak, University of Washington, United States

AUD-P12.6: CHIRPING UP THE RIGHT TREE: INCORPORATING BIOLOGICAL TAXONOMIES INTO DEEP BIOACOUSTIC CLASSIFIERS
Cramer, Jason, New York University, United States
Lostanlen, Vincent, Cornell Lab of Ornithology, United States
Farisworth, Andrew, Cornell University, United States
Salamon, Justin, Adobe, United States
Bello, Juan Pablo, New York University, United States

AUD-P12.7: BEAMFORMING DESIGN FOR HIGH-RESOLUTION LOW-INTENSITY FOCUSED ULTRASOUND NEUROMODULATION
Fan, Boqiang, Rice University, United States
Goodman, Wayne, Baylor College of Medicine, United States
Cho, Raymond, Baylor College of Medicine, United States
Sheth, Sameer, Baylor College of Medicine, United States
Bouchard, Richard, University of Texas MD Anderson Cancer Center, United States
Aazhang, Behnaam, Rice University, United States

AUD-P12.8: AN ATTENTION ENHANCED MULTI-TASK MODEL FOR OBJECTIVE SPEECH ASSESSMENT IN REAL-WORLD ENVIRONMENTS
Dong, Xuan, Indiana University, United States
Williamson, Donald S., Indiana University, United States

AUD-P12.9: HUMBUG ZOONIVERSE: A CROWD-SOURCED ACOUSTIC MOSQUITO DATASET
Kiskin, Ivan, University of Oxford, United Kingdom
Cobb, Adam, University of Oxford, United Kingdom
Wang, Lawrence, University of Oxford, United Kingdom
Roberts, Stephen, University of Oxford, United Kingdom

AUD-P12.10: SUBJECTIVE QUALITY ESTIMATION USING PESQ FOR HANDSFREE TERMINALS
Kurihara, Sachiko, NTT Corporation, Japan
Fukui, Masahiro, NTT Corporation, Japan
Shimauchi, Suehiro, Kanazawa Institute of Technology, Japan
Harada, Noboru, NTT Corporation, Japan

AUD-P12.11: VOICE ACTIVITY DETECTION FOR TRANSIENT NOISY ENVIRONMENT BASED ON DIFFUSION NETS
Ivry, Amir, Technion - Israel Institute of Technology, Israel
Berdugo, Baruch, Technion - Israel Institute of Technology, Israel
Cohen, Israel, Technion - Israel Institute of Technology, Israel

AUD-P12.12: GRIFFIN–LIM LIKE PHASE RECOVERY VIA ALTERNATING DIRECTION METHOD OF MULTIPLIERS
Masuyama, Yoshiki, Waseda University, Japan
Yatabe, Kohei, Waseda University, Japan
Oikawa, Yasuhiro, Waseda University, Japan
Biomedical Imaging and Signal Processing

Tuesday, 5 May, 11:30 - 13:30

**BIO-L1 - Bioelectrical Signal Processing**

**BIO-L1.1: CLASSIFICATION OF EPILEPTIC IEEG SIGNALS BY CNN AND DATA AUGMENTATION**
Zhao, Xuyang, Saitama Institute of Technology, Japan Solé-Casals, Jordi, University of Vic–Central University of Catalonia, Spain Li, Binhua, Nankai University, China Huang, Zihao, Nankai University, China Wang, Andong, Nanjing University of Science and Technology, China Cao, Jianting, Saitama Institute of Technology, China Tanaka, Toshihisa, Tokyo University of Agriculture and Technology, Japan Zhao, Qibin, RIKEN Center for Advanced Intelligence Project, Japan

**BIO-L1.2: FRACTIONAL FOURIER TRANSFORM BASED QRS COMPLEX DETECTION IN ECG SIGNAL**
Yaqoob, Touseef, Information Technology University Lahore, Pakistan Aziz, Saira, Information Technology University Lahore, Pakistan Ahmed, Sajid, Information Technology University Lahore, Pakistan Amin, Osama, Information Technology University Lahore, Pakistan Alouini, Mohamed-Slim, King Abdullah University of Science and Technology (KAUST), United Kingdom

**BIO-L1.3: CROSS-DOMAIN JOINT DICTIONARY LEARNING FOR ECG RECONSTRUCTION FROM PPG**
Tian, Xin, University of Maryland, College Park, United States Zhu, Qiang, University of Maryland, College Park, United States Li, Yuenan, University of Maryland, College Park, United States Wu, Min, University of Maryland, College Park, United States

**BIO-L1.4: AN LSTM BASED ARCHITECTURE TO RELATE SPEECH STIMULUS TO EEG**
Jalilpour Monesi, Mohammad, Katholieke Universiteit Leuven, Belgium Accou, Bernd, Katholieke Universiteit Leuven, Belgium Montoya-Martinez, Jair, Katholieke Universiteit Leuven, Belgium Francart, Tom, Katholieke Universiteit Leuven, Belgium Van Hamme, Hugo, Katholieke Universiteit Leuven, Belgium

**BIO-L1.5: JOINT SEMI-SUPERVISED FEATURE AUTO-WEIGHTING AND CLASSIFICATION MODEL FOR EEG-BASED CROSS-SUBJECT SLEEP QUALITY EVALUATION**
Peng, Yong, Hangzhou Dianzi University, China Li, Qingxi, Hangzhou Dianzi University, China Kong, Wanzeng, Hangzhou Dianzi University, China Zhang, Jianhai, Hangzhou Dianzi University, China Lu, Bao-Liang, Shanghai Jiao Tong University, China Cichocki, Andrzej, Skolkovo Institute of Science and Technology (Skoltech), Russia

**BIO-L1.6: REVERSAL NO LONGER MATTERS: ATTENTION-BASED ARRHYTHMIA DETECTION WITH LEAD-REVERSAL ECG DATA**

Cao, Zheng, Tsinghua University, China Shi, Jialin, Tsinghua University, China Wu, Ji, Tsinghua University, China
Tuesday, 5 May, 16:30 - 18:30

**BIO-L2 - Biological Image Analysis**

**BIO-L2.1: AUGMENTING MOLECULAR IMAGES WITH VECTOR REPRESENTATIONS AS A FEATURIZATION TECHNIQUE FOR DRUG CLASSIFICATION**

de Marchi, Daniel, University of North Carolina, United States
Budhiraja, Amarjit, University of North Carolina - Chapel Hill, United States

**BIO-L2.2: MULTI-MODAL SELF-SUPERVISED PRE-TRAINING FOR JOINT OPTIC DISC AND CUP SEGMENTATION IN EYE FUNDUS IMAGES**

Hervella, Álvaro S., Universidade da Coruña, Spain
Ramos, Lucía, Universidade da Coruña, Spain
Rouco, José, Universidade da Coruña, Spain
Novo, Jorge, Universidade da Coruña, Spain
Ortega, Marcos, Universidade da Coruña, Spain

**BIO-L2.3: DENSE MAPPING OF INTRACELLULAR DIFFUSION AND DRIFT FROM SINGLE-PARTICLE TRACKING DATA ANALYSIS**

Salomon, Antoine, Inria, France
Augusto Valades-Cruz, Cesar, Inria, France
Leconte, Ludovic, CNRS/Institut Curie, France
Kervrann, Charles, Inria, France

**BIO-L2.4: A DEEP GRADIENT BOOSTING NETWORK FOR OPTIC DISC AND CUP SEGMENTATION**

Liu, Qing, Central South University, China
Zou, Beiji, Central South University, China
Zhao, Yang, Central South University, China
Liang, Yixiong, Central South University, China

**BIO-L2.5: ADAPTIVE ELASTIC LOSS BASED ON PROGRESSIVE INTER-CLASS ASSOCIATION FOR CERVICAL HISTOLOGY IMAGE SEGMENTATION**

Meng, Zhu, Beijing University of Posts and Telecommunications, China
Zhao, Zhicheng, Beijing University of Posts and Telecommunications, China
Su, Fei, Beijing University of Posts and Telecommunications, China
Wang, Weibao, Singularity.AI Technology Co., Ltd, China

**BIO-L2.6: A BIDIRECTIONAL CONTEXT PROPAGATION NETWORK FOR URINE SEDIMENT PARTICLE DETECTION IN MICROSCOPIC IMAGES**

Yan, Meng, Central South University, China
Liu, Qing, Central South University, China
Yin, Zhihua, Central South University, China
Wang, Du, Central South University, China
Liang, Yixiong, Central South University, China
BIO-L3 - Signal Processing in Biometrics

**BIO-L3.1: THE SWAX BENCHMARK: ATTACKING BIOMETRIC SYSTEMS WITH WAX FIGURES**

Vareto, Rafael Henrique, Universidade Federal de Minas Gerais, Brazil Saldanha, Araceli Marcia, Universidade Federal de Minas Gerais, Brazil Schwartz, William Robson, Universidade Federal de Minas Gerais, Brazil

**BIO-L3.2: RESTING-STATE EEG-BASED BIOMETRICS WITH SIGNALS FEATURES EXTRACTED BY MULTIVARIATE EMPIRICAL MODE DECOMPOSITION**

Ma, Matthew King-Hang, Chinese University of Hong Kong, Hong Kong SAR of China Lee, Tan, Chinese University of Hong Kong, Hong Kong SAR of China Fong, Manson Cheuk-Man, Hong Kong Polytechnic University, Hong Kong SAR of China Wang, William Shiyuan, Hong Kong Polytechnic University, Hong Kong SAR of China

**BIO-L3.3: AUTO-FAS: SEARCHING LIGHTWEIGHT NETWORKS FOR FACE ANTI-SPOOFING**

Yu, Zitong, University of Oulu, Finland Qin, Yunxiao, Northwestern Polytechnical University, China Xu, Xiaqing, Aibee, China Zhao, Chenxu, Aibee, China Wang, Zezheng, Aibee, China Lei, Zhen, Institute of Automation, Chinese Academy of Sciences, China Zhao, Guoying, University of Oulu, Finland

**BIO-L3.4: CHRONOLOGICAL AGE ESTIMATION UNDER THE GUIDANCE OF AGE-RELATED FACIAL ATTRIBUTES**

Xie, Jiu-Cheng, University of Macau, Macao SAR of China Pun, Chi-Man, University of Macau, Macao SAR of China

**BIO-L3.5: DOMAIN ADAPTATION FOR GENERALIZATION OF FACE PRESENTATION ATTACK DETECTION IN MOBILE SETTINGS WITH MINIMAL INFORMATION**

Mohammadi, Amir, Idiap Research Institute, Switzerland Bhattacharjee, Sushil, Idiap Research Institute, Switzerland Marcel, Sebastien, Idiap Research Institute, Switzerland

**BIO-L3.6: A LIGHTWEIGHT MULTI-LABEL SEGMENTATION NETWORK FOR MOBILE IRIS BIOMETRICS**

Wang, Caifong, University of Chinese Academy of Sciences, China Wang, Yunlong, Institute of Automation, Chinese Academy of Sciences, China Xu,
Thursday, 7 May, 11:30 - 13:30

**BIO-L4 - Biomedical Signal Processing**

**BIO-L4.1: MODELING BEHAVIORAL CONSISTENCY IN LARGE-SCALE WEARABLE RECORDINGS OF HUMAN BIO-BEHAVIORAL SIGNALS**

Feng, Tiantian, Signal Analysis and Interpretation Lab, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

**BIO-L4.2: MODELING BEHAVIOR AS MUTUAL DEPENDENCY BETWEEN PHYSIOLOGICAL SIGNALS AND INDOOR LOCATION IN LARGE-SCALE WEARABLE SENSOR STUDY**

Feng, Tiantian, Signal Analysis and Interpretation Lab, University of Southern California, United States Booth, Brandon, Signal Analysis and Interpretation Lab, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

**BIO-L4.3: MULTICHANNEL SIGNAL CLASSIFICATION USING VECTOR AUTOREGRESSIO**

Haboub, Amine, Hamad Bin Khalifa University, Qatar Baali, Hamza, Hamad Bin Khalifa University, Qatar Bouzerdoum, Abdesselam, Hamad Bin Khalifa University, Qatar

**BIO-L4.4: EFFICIENT ALGORITHM TO IMPLEMENT SLIDING SINGULAR SPECTRUM ANALYSIS WITH APPLICATION TO BIOMEDICAL SIGNAL DENOISING**

Saeed, Muzammil, Royal Holloway, University of London, United Kingdom Took, Clive Cheong, Royal Holloway, University of London, United Kingdom Alty, Stephen, Royal Holloway, University of London, United Kingdom

**BIO-L4.5: STRATEGIC ATTENTION LEARNING FOR MODALITY TRANSLATION**

Martinez, Jonathan, Texas A&M University, United States Akbari, Ali, Texas A&M University, United States Sel, Kaan, Texas A&M University, United States Jafari, Roozbeh, Texas A&M University, United States

**BIO-L4.6: SPARSE CSP ALGORITHM VIA JOINT SPATIO-TEMPORAL FILTERING**

Jiang, Aimin, Hohai University, China Shang, Jing, Hohai University, China Cheng, Weigao, Hohai University, China Liu, Xiaofeng, Hohai University, China Kwan,
Hon Keung, University of Windsor, Canada Zhu, Yanping, Changzhou University, China
Friday, 8 May, 11:45 - 13:45

**BIO-L5 - Medical Image Analysis**

**BIO-L5.1: HUMAN-MACHINE COLLABORATION FOR MEDICAL IMAGE SEGMENTATION**

Ravanbakhsh, Mahdyar, University of Genova, Italy
Tschernezki, Vadim, SAP ML Research Berlin, Germany
Last, Felix, SAP ML Research Berlin, Germany
Klein, Tassilo, SAP ML Research Berlin, Germany
Batmanghelich, Kayhan, University of Pittsburgh, United States
Tresp, Volker, Ludwig Maximilian University, Germany
Nabi, Moin, SAP ML Research Berlin, Germany

**BIO-L5.2: MIXUP MULTI-ATTENTION MULTI-TASKING MODEL FOR EARLY-STAGE LEUKEMIA IDENTIFICATION**

Mathur, Puneet, University of Maryland, College Park, United States
Piplani, Mehak, MIDAS Labs, IIIT Delhi, India
Sawhney, Ramit, MIDAS Labs, IIIT Delhi, India
Jindal, Amit, MIDAS Labs, IIIT Delhi, India
Shah, Rajiv Ratn, MIDAS Labs, IIIT Delhi, India

**BIO-L5.3: CROSS-VIEW ATTENTION NETWORK FOR BREAST CANCER SCREENING FROM MULTI-VIEW MAMMOGRAMS**

Zhao, Xuran, Zhejiang Gongshang University, China
Yu, Luyang, Zhejiang Gongshang University, China
Wang, Xun, Zhejiang Gongshang University, China

**BIO-L5.4:UNET 3+: A FULL-SCALE CONNECTED UNET FOR MEDICAL IMAGE SEGMENTATION**

Huang, Huimin, Zhejiang University, China
Lin, Lanfen, Zhejiang University, China
Tong, Ruofeng, Zhejiang University, China
Hu, Hongjie, Sir Run Run Shaw Hospital, China
Zhang, Qiaowei, Sir Run Run Shaw Hospital, China
Iwamoto, Yutaro, Ritsumeikan University, Japan
Han, Xianhua, Ritsumeikan University, China
Chen, Yen-Wei, Ritsumeikan University, China
Wu, Jian, Zhejiang University, China

**BIO-L5.5: UNSUPERVISED CONTENT-PRESERVED ADAPTATION NETWORK FOR CLASSIFICATION OF PULMONARY TEXTURES FROM DIFFERENT CT SCANNERS**

Xu, Rui, Dalian University of Technology, China
Cong, Zhen, Dalian University of Technology, China
Ye, Xincheng, Dalian University of Technology, China
Kido, Shoji, Osaka University, Japan
Tomiyama, Noriyuki, Osaka University, Japan

**BIO-L5.6: CLASSIFY AND EXPLAIN: AN INTERPRETABLE CONVOLUTIONAL NEURAL NETWORK FOR LUNG CANCER DIAGNOSIS**
Li, Yaowei, Harbin Institute of Technology, China Gu, Donghao, Harbin Institute of Technology, China Wen, Zhaojing, Harbin Institute of Technology, China Jiang, Feng, Harbin Institute of Technology, China Liu, Shaohui, Harbin Institute of Technology, China
BIO-P1 - Biomedical Imaging and Analysis

BIO-P1.1: ROBUST GLOBAL OPTIMIZED AFFINE REGISTRATION METHOD FOR MICROSCOPIC IMAGES OF BIOLOGICAL TISSUE
Lv, Yanan, University of Chinese Academy of Sciences, China Chen, Xi, Chinese Academy of Sciences, China Shu, Chang, University of Chinese Academy of Sciences, China Han, Hua, Chinese Academy of Sciences, China

BIO-P1.2: EMPIRICAL SURE-GUIDED MICROSCOPY SUPER-RESOLUTION IMAGE RECONSTRUCTION FROM CONFOCAL MULTI-ARRAY DETECTORS
Prigent, Sylvain, France-BioImaging, France Dutertre, Stéphanie, University of Rennes 1, UMS Biosit, M Ric, France Kervrann, Charles, Inria Centre Rennes-Bretagne Atlantique, France

BIO-P1.3: ENCODING TEMPORAL INFORMATION FOR AUTOMATIC DEPRESSION RECOGNITION FROM FACIAL ANALYSIS
Carneiro de Melo, Wheidima, University of Oulu, Finland Granger, Eric, École de Technologie Supérieure, Canada Bordallo Lopez, Miguel, VTT Technical Research Centre of Finland, Finland

BIO-P1.4: RETINAL VESSEL SEGMENTATION VIA A SEMANTICS AND MULTI-SCALE AGGREGATION NETWORK
Xu, Rui, Dalian University of Technology, China Ye, Xinchen, Dalian University of Technology, China Jiang, Guiliang, Dalian University of Technology, China Liu, Tiantian, Dalian University of Technology, China Li, Liang, Ritsumeikan University, Japan Tanaka, Satoshi, Ritsumeikan University, Japan

BIO-P1.5: ADAPTIVE MATCHED FILTER USING NON-TARGET FREE TRAINING DATA
Miri Rekavandi, Aref, University of Melbourne, Australia Seghouane, Abd-Krim, University of Melbourne, Australia Evans, Robin, University of Melbourne, Australia

BIO-P1.6: FEATURE DRIFT RESILIENT TRACKING OF THE CAROTID ARTERY WALL USING UNSCENTED KALMAN FILTERING WITH DATA FUSION
Dorazil, Jan, Technische Universität Wien, Czech Republic Repp, Rene, Technische Universität Wien, Austria Kropfreiter, Thomas, Technische Universität Wien, Austria Prüller, Richard, Technische Universität Wien, Austria Říha, Kamil, Brno University of Technology, Czech Republic Hlawatsch, Franz, Technische Universität Wien, Austria
**BIO-P1.7: TRACING NETWORK EVOLUTION USING THE PARAFAC2 MODEL**
Roald, Marie, Simula Metropolitan Center for Digital Engineering, Norway
Bhinge, Suchita, University of Maryland, Baltimore County, United States
Jia, Chunyng, University of Maryland, Baltimore County, United States
Calhoun, Vince, Georgia State University, United States
Adalı, Tülay, University of Maryland, Baltimore County, United States
Acar, Evrim, Simula Metropolitan Center for Digital Engineering, Norway

**BIO-P1.8: A MODEL-BASED DEEP NETWORK FOR MRI RECONSTRUCTION USING APPROXIMATE MESSAGE PASSING ALGORITHM**
Qiao, Xiaoyu, Chongqing University, China
Du, Jinglong, Chongqing University, China
Wang, Lulu, Chongqing University, China
He, Zhongshi, Chongqing University, China
Jia, Yuanyuan, Chongqing Medical University, China

**BIO-P1.9: ONLINE POSITRON EMISSION TOMOGRAPHY BY ONLINE PORTFOLIO SELECTION**
Li, Yen-Huan, National Taiwan University, Taiwan

**BIO-P1.10: SPACE FILLING CURVES FOR MRI SAMPLING**
Sharma, Shubham, Indian Institute of Science, India
K.V.S., Hari, Indian Institute of Science, India
Leus, Geert, Delft University of Technology, Netherlands

**BIO-P1.11: K-SPACE TRAJECTORY DESIGN FOR REDUCED MRI SCAN TIME**
Sharma, Shubham, Indian Institute of Science, India
K.V.S., Hari, Indian Institute of Science, India
Leus, Geert, Delft University of Technology, Netherlands

**BIO-P1.12: RETHINKING RETINAL LANDMARK LOCALIZATION AS POSE ESTIMATION: NAIVE SINGLE STACKED NETWORK FOR OPTIC DISK AND FOVEA DETECTION**
R. Maiya, Shishira, University of Maryland, College Park, United States
Mathur, Puneet, University of Maryland, College Park, United States
BIO-P2 - Biomedical Signal Analysis

BIO-P2.1: HIDDEN MARKOV MODELS FOR SEPSIS DETECTION IN PRETERM INFANTS
Honoré, Antoine, KTH Royal Institute of Technology, Sweden Liu, Dong, KTH Royal Institute of Technology, Sweden Forsberg, David, Karolinska Institutet, Sweden Coste, Karen, Karolinska Institutet, Sweden Herlenius, Eric, Karolinska Institutet, Sweden Chatterjee, Saikat, KTH Royal Institute of Technology, Sweden Skoglund, Mikael, KTH Royal Institute of Technology, Sweden

BIO-P2.2: BLOOD PRESSURE ESTIMATION FROM PPG SIGNALS USING CONVOLUTIONAL NEURAL NETWORKS AND SIAMESE NETWORK
Schlesinger, Oded, Technion - Israel Institute of Technology, Israel Vigderhouse, Nitai, Technion - Israel Institute of Technology, Israel Eytan, Danny, Technion - Israel Institute of Technology, Israel Moshe, Yair, Technion - Israel Institute of Technology, Israel

BIO-P2.3: SPEECH BREATHING ESTIMATION USING DEEP LEARNING METHODS
Nallanthighal, Venkata Srikanth, Philips Research, Eindhoven and Radboud University, Nijmegen, Netherlands Härmä, Aki, Philips Research, Eindhoven, Netherlands Strik, Helmer, Radboud University, Netherlands

BIO-P2.4: A FAST NON-CONTACT VITAL SIGNS DETECTION METHOD BASED ON REGIONAL HIDDEN MARKOV MODEL IN A 77GHZ LFMCW RADAR SYSTEM
Mei, Zengyang, Southeast University, China Wu, Qisong, Southeast University, China Hu, Zhengyu, Southeast University, China Tao, Jun, Southeast University, China

BIO-P2.5: ROBUST LIKELIHOOD RATIO TEST USING ALPHA-DIVERGENCE
Miri Rekavandi, Aref, University of Melbourne, Australia Seghouane, Abd-Krim, University of Melbourne, Australia Evans, Robin, University of Melbourne, Australia

BIO-P2.6: USING X-VECTORS TO AUTOMATICALLY DETECT PARKINSON’S DISEASE FROM SPEECH
Moro-Velazquez, Laureano, Johns Hopkins University, United States Villalba, Jesús, Johns Hopkins University, United States Dehak, Najim, Johns Hopkins University, United States
BIO-P2.7: LEARNING A COMMON GRANGER CAUSALITY NETWORK USING A NON-CONVEX REGULARIZATION
Manomaisaowapak, Parinthorn, Chulalongkorn University, Thailand Songsiri, Jitkomut, Chulalongkorn University, Thailand

BIO-P2.8: SYNTHETIC DATA GENERATION THROUGH STATISTICAL EXPLOSION: IMPROVING CLASSIFICATION ACCURACY OF CORONARY ARTERY DISEASE USING PPG
Bhattacharya, Sakyajit, Tata Consultancy Services, India Mazumder, Oishee, Tata Consultancy Services, India Roy, Dibyendu, Tata Consultancy Services, India Sinha, Aniruddha, Tata Consultancy Services, India Ghose, Avik, Tata Consultancy Services, India

BIO-P2.9: HIGH-ACCURACY CLASSIFICATION OF ATTENTION DEFICIT HYPERACTIVITY DISORDER WITH L2,1-NORM LINEAR DISCRIMINANT ANALYSIS
Tang, Yibin, Hohai University, China Li, Xuefei, Hohai University, China Chen, Ying, Columbia University, United States Zhong, Yuan, Nanjing Normal University, China Jiang, Aimin, Hohai University, China Liu, Xiaofeng, Hohai University, China

BIO-P2.10: A NEURAL NETWORK-BASED SPIKE SORTING FEATURE MAP THAT RESOLVES SPIKE OVERLAP IN THE FEATURE SPACE
Wouters, Jasper, Katholieke Universiteit Leuven, Belgium Kloosterman, Fabian, Neuro-Electronics Research Flanders, Belgium Bertrand, Alexander, Katholieke Universiteit Leuven, Belgium

BIO-P2.11: GAIT PHASE SEGMENTATION USING WEIGHTED DYNAMIC TIME WARPING AND K-NEAREST NEIGHBORS GRAPH EMBEDDING
Chen, Tze-Shen, National Tsing Hua University, Taiwan Lin, Ting-Ya, National Tsing Hua University, Taiwan Hong, Y.-W. Peter, National Tsing Hua University, Taiwan

BIO-P2.12: AUTOMATIC CLASSIFICATION OF VOLUMES OF WATER USING SWALLOW SOUNDS FROM CERVICAL AUSCULTATION
Subramani, Siddharth, Indian Institute of Science, India Rao M V, Achuth, Indian Institute of Science, India Giridhar, Divya, Indian Institute of Science, India Hegde, Prasanna Suresh, Health Care Ltd Global Enterprises, India Kumar Ghosh, Prasanta, Indian Institute of Science, Bangalore, India
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<td>BIO-P3.1</td>
<td>CONDITIONAL DOMAIN ADVERSARIAL TRANSFER FOR ROBUST CROSS-SITE ADHD CLASSIFICATION USING FUNCTIONAL MRI</td>
<td>Huang, Ya-Lin, National Tsing Hua University, Taiwan Hsieh, Wan-Ting, National Tsing Hua University, Taiwan Yang, Hao-Chun, National Tsing Hua University, Taiwan Lee, Chi-Chun, National Tsing Hua University, Taiwan</td>
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<td>BIO-P3.2</td>
<td>EEG CONNECTIVITY - INFORMED COOPERATIVE ADAPTIVE LINE ENHANCER FOR RECOGNITION OF BRAIN STATE</td>
<td>Sanei, Saeid, Nottingham Trent University, United Kingdom Took, Clive Cheong, Royal Holloway, University of London, United Kingdom Jarchi, Delaram, University of Essex, United Kingdom Prochazke, Ales, Institute of Chemical Engineering, Czech Republic</td>
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<td>BIO-P3.3</td>
<td>ONLINE GRAPH TOPOLOGY INFERENCE WITH KERNELS FOR BRAIN CONNECTIVITY ESTIMATION</td>
<td>Moscu, Mircea, Université Côte d’Azur, France Borsoi, Ricardo, Université Côte d’Azur, France Richard, Cédric, Université Côte d’Azur, France</td>
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<td>BIO-P3.4</td>
<td>MINIMAL ADVERSARIAL PERTURBATIONS IN MOBILE HEALTH APPLICATIONS: THE EPILEPTIC BRAIN ACTIVITY CASE STUDY</td>
<td>Aminifar, Amir, Uppsala University, Sweden</td>
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<td>BIO-P3.5</td>
<td>DETECTING AUTISM SPECTRUM DISORDER USING TOPOLOGICAL DATA ANALYSIS</td>
<td>Majumder, Shouvik, IISER Kolkata, India Apicella, Fabio, University of Pisa, Italy Muratori, Filippo, University of Pisa, Italy Das, Koel, IISER Kolkata, India</td>
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<td>BIO-P3.6</td>
<td>MULTI-VIEW BAYESIAN GENERATIVE MODEL FOR MULTI-SUBJECT FMRI DATA ON BRAIN DECODING OF VIEWED IMAGE CATEGORIES</td>
<td>Akamatsu, Yusuke, Hokkaido University, Japan Harakawa, Ryosuke, Nagaoka University of Technology, Japan Ogawa, Takahiro, Hokkaido University, Japan Haseyama, Miki, Hokkaido University, Japan</td>
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<td>TIME-FREQUENCY ANALYSIS OF UNIMODAL SENSORY PROCESSING IN AUTISM SPECTRUM DISORDER</td>
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D'Croz-Baron, David F., Texas Tech University, United States Baker, Mary C., Texas Tech University, United States Karp, Tanja, Texas Tech University, United States

**BIO-P3.8: AUTOMATIC EPILEPTIC SEIZURE ONSET-OFFSET DETECTION BASED ON CNN IN SCALP EEG**
Boonyakitanont, Poomipat, Chulalongkorn University, Thailand Lek-uthai, Apiwat, Chulalongkorn University, Thailand Songsiri, Jitkomut, Chulalongkorn University, Thailand

**BIO-P3.9: ENHANCE FEATURE REPRESENTATION OF ELECTROENCEPHALOGRAM FOR SEIZURE DETECTION**
Wang, Danyang, Shanghai University, China Fang, Yuchun, Shanghai University, China Li, Yifan, Shanghai University, China Chai, Changfeng, Changhai Hospital of Shanghai, China

**BIO-P3.10: SPEECH SYNTHESIS USING EEG**
Krishna, Gautam, University of Texas at Austin, United States Tran, Co, University of Texas at Austin, United States Han, Yan, University of Texas at Austin, United States Carnahan, Mason, University of Texas at Austin, United States Tewfik, Ahmed, University of Texas at Austin, United States

**BIO-P3.11: EEG FEATURE SELECTION USING ORTHOGONAL REGRESSION: APPLICATION TO EMOTION RECOGNITION**
Xu, Xueyuan, Beijing Normal University, China Wei, Fulin, Beijing Normal University, China Zhu, Zhiyuan, Beijing Normal University, China Liu, Jianhong, Beijing Normal University, China Wu, Xia, Beijing Normal University, China

**BIO-P3.12: SCALPNET: DETECTION OF SPATIOTEMPORAL ABNORMAL INTERVALS IN EPILEPTIC EEG USING CONVOLUTIONAL NEURAL NETWORKS**
Sakai, Takahiko, Tokyo University of Agriculture and Technology, Japan Shoji, Taku, Tokyo University of Agriculture and Technology, Japan Yoshida, Noboru, Juntendo University Nerima Hospital, Japan Fukumori, Kosuke, Tokyo University of Agriculture and Technology, Japan Tanaka, Yuichi, Tokyo University of Agriculture and Technology, Japan Tanaka, Toshihisa, Tokyo University of Agriculture and Technology, Japan
BIO-P4.1: A SEMI-SUPERVISED APPROACH FOR IDENTIFYING ABNORMAL HEART SOUNDS USING VARIATIONAL AUTOENCODER
Banerjee, Rohan, Tata Consultancy Services, India Ghose, Avik, Tata Consultancy Services, India

BIO-P4.2: DETECTION OF S1 AND S2 LOCATIONS IN PHONOCARDIOGRAM SIGNALS USING ZERO FREQUENCY FILTER
Prasad, RaviShankar, Idiap Research Institute, Switzerland Yilmaz, Gurkan, Swiss Center for Electronics and Microtechnology, Switzerland Chetelat, Olivier, Swiss Center for Electronics and Microtechnology, Switzerland Magimai.-Doss, Mathew, Idiap Research Institute, Switzerland

BIO-P4.3: MENTAL FATIGUE PREDICTION FROM MULTI-CHANNEL ECOG SIGNAL
Yao, Lin, Cornell University, United States Baker, Jonathan, Weill Cornell Medicine, United States Ryoo, Jae-Wook, Weill Cornell Medicine, United States Schiff, Nicholas, Weill Cornell Medicine, United States Purpura, Keith, Weill Cornell Medicine, United States Shoaran, Mahsa, Cornell University, United States

BIO-P4.4: THE EFFECT OF DATA AUGMENTATION ON CLASSIFICATION OF ATRIAL FIBRILLATION IN SHORT SINGLE-LEAD ECG SIGNALS USING DEEP NEURAL NETWORKS
Nejati Hatamian, Faezeh, Fraunhofer Institute for Integrated Circuits IIS, Germany Ravikumar, Nishant, University of Leeds, United Kingdom Vesal, Sulaiman, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Kemeth, Felix P., Fraunhofer Institute for Integrated Circuits IIS, Germany Struck, Matthias, Fraunhofer Institute for Integrated Circuits IIS, Germany Maier, Andreas, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

BIO-P4.5: ATRIAL FIBRILLATION RISK PREDICTION FROM ELECTROCARDIOGRAM AND RELATED HEALTH DATA WITH DEEP NEURAL NETWORK
Chen, Yi-Huan, University of Illinois at Chicago, United States Twing, Aamir Husain, University of Illinois Hospital, United States Badawi, Diaa, University of Illinois at Chicago, United States Danavi, Joseph, University of Illinois Hospital, United States McCauley, Mark, University of Illinois Hospital, United States Cetin, Ahmet Enis, University of Illinois at Chicago, United States
BIO-P4.6: ADAPTIVE REGION AGGREGATION NETWORK: UNSUPERVISED DOMAIN ADAPTATION WITH ADVERSARIAL TRAINING FOR ECG DELINEATION
Chen, Ming, Tsinghua University, China Wang, Guijin, Tsinghua University, China Chen, Hui, Tsinghua University, China Ding, Zijian, Tsinghua University, China

BIO-P4.7: MATCHING PURSUIT BASED DYNAMIC PHASE-AMPLITUDE COUPLING MEASURE
Munia, Tamanna Tabassum Khan, Michigan State University, United States Aviyente, Selin, Michigan State University, United States

BIO-P4.8: MULTITAPER SPECTRAL GRANGER CAUSALITY WITH APPLICATION TO SSVEP
Anderson, Rachele, Lund University, Sweden Sandsten, Maria, Lund University, Sweden

BIO-P4.9: CROSS-DOMAIN ADAPTATION FOR BIOMETRIC IDENTIFICATION USING PHOTOPLETHYSMOGRAM
Lee, Eugene, National Chiao Tung University, Taiwan Ho, Annie, National Chiao Tung University, Taiwan Wang, Yi-Ting, National Chiao Tung University, Taiwan Huang, Cheng-Han, National Chiao Tung University, Taiwan Lee, Chien-Yi, National Chiao Tung University, Taiwan

BIO-P4.10: EXPLORING BIO-BEHAVIORAL SIGNAL TRAJECTORIES OF STATE ANXIETY DURING PUBLIC SPEAKING
Nirjhar, Ehsanul Haque, Texas A&M University, United States Behzadan, Amir, Texas A&M University, United States Chaspari, Theodora, Texas A&M University, United States

BIO-P4.11: REAL-TIME HAND GESTURE RECOGNITION USING TEMPORAL MUSCLE ACTIVATION MAPS OF MULTI-CHANNEL SEMG SIGNALS
De Silva, Ashwin, University of Moratuwa, Sri Lanka Perera, Malsha Vijini, University of Moratuwa, Sri Lanka Wickramasinghe, Kithmin, University of Moratuwa, Sri Lanka Mohamed Naim, Asma, University of Moratuwa, Sri Lanka Lalitharatne, Thilina Dulantha, University of Moratuwa, Sri Lanka Kappel, Simon Lind, University of Moratuwa, Sri Lanka

BIO-P4.12: XCEPTIONTIME: INDEPENDENT TIME-WINDOW XCEPTIONTIME ARCHITECTURE FOR HAND GESTURE CLASSIFICATION
Rahimian, Elahe, Concordia University, Canada Zabihi, Soheil, Concordia University, Canada Atashzar, Farokh, New York University, United States Asif,
Amir, Concordia University, Canada Mohammadi, Arash, Concordia University, Canada
BIO-P5 - Bio Image and Signal Processing

**BIO-P5.1: DISCOVERING CAUSALITIES FROM CARDIOTOCOGRAPHY SIGNALS USING IMPROVED CONVERGENT CROSS MAPPING WITH GAUSSIAN PROCESSES**

Feng, Guanchao, Stony Brook University, United States Quirk, J. Gerald, Stony Brook University Hospital, United States Djuric, Petar, Stony Brook University, United States

**BIO-P5.2: LAI-NET: LOCAL-ANCESTRY INFERENCE WITH NEURAL NETWORKS**

Mas Montserrat, Daniel, Purdue University, United States Bustamante, Carlos, Stanford University, United States Ioannidis, Alexander, Stanford University, United States

**BIO-P5.3: PREDICTION OF INDIVIDUAL PROGRESSION RATE IN PARKINSON’S DISEASE USING CLINICAL MEASURES AND BIOMECHANICAL MEASURES OF GAIT AND POSTURAL STABILITY**

Raval, Vyom, University of Texas at Dallas, United States Nguyen, Kevin, University of Texas Southwestern Medical Center, United States Gerald, Ashley, University of Texas Southwestern Medical Center, United States Dewey, Richard, University of Texas Southwestern Medical Center, United States Montillo, Albert, University of Texas Southwestern Medical Center, United States

**BIO-P5.4: DEEP MATRIX COMPLETION ON GRAPHS: APPLICATION IN DRUG TARGET INTERACTION PREDICTION**

Mongia, Aanchal, Indian Institute of Technology Delhi, India Majumdar, Angshul, Indian Institute of Technology Delhi, India

**BIO-P5.5: IDENTIFICATION OF ESSENTIAL PROTEINS USING A NOVEL MULTI-OBJECTIVE OPTIMIZATION METHOD**

Wu, Chong, City University of Hong Kong, Hong Kong SAR of China Zhang, Houwang, China University of Geosciences, China Zhang, Le, Tongji University, China Zheng, Hanying, China University of Geosciences, China

**BIO-P5.7: DEEP JAMES-STEIN NEURAL NETWORKS FOR BRAIN-COMPUTER INTERFACES**

Angjelichinoski, Marko, Duke University, United States Soltani, Mohammadreza, Duke University, United States Choi, John, New York University, United States
Pesaran, Bijan, New York University, United States Tarokh, Vahid, Duke University, United States

**BIO-P5.8: FORMULATING DIVERGENCE FRAMEWORK FOR MULTICLASS MOTOR IMAGERY EEG BRAIN COMPUTER INTERFACE**

Kumar, Satyam, Indian Institute of Technology Kanpur, India Reddy, Tharun Kumar, Indian Institute of Technology Kanpur, India Arora, Vipul, Indian Institute of Technology Kanpur, India Behera, Laxmidhar, Indian Institute of Technology Kanpur, India

**BIO-P5.9: SUBJECT TRANSFER FRAMEWORK BASED ON SOURCE SELECTION AND SEMI-SUPERVISED STYLE TRANSFER MAPPING FOR SEMG PATTERN RECOGNITION**

Kanoga, Suguru, National Institute of Advanced Industrial Science and Technology (AIST), Japan Hoshino, Takayuki, National Institute of Advanced Industrial Science and Technology (AIST), Japan Asoh, Hideki, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**BIO-P5.10: DECODING MOVEMENT IMAGINATION AND EXECUTION FROM EEG SIGNALS USING BCI-TRANSFER LEARNING METHOD BASED ON RELATION NETWORK**

Lee, Do-Yeun, Korea University, Korea (South) Jeong, Ji-Hoon, Korea University, Korea (South) Shim, Kyung-Hwan, Korea University, Korea (South) Lee, Seong-Whan, Korea University, Korea (South)

**BIO-P5.11: CLASSIFICATION OF HIGH-DIMENSIONAL MOTOR IMAGERY TASKS BASED ON AN END-TO-END ROLE ASSIGNED CONVOLUTIONAL NEURAL NETWORK**

Lee, Byeong-Hoo, Korea University, Korea (South) Jeong, Ji-Hoon, Korea University, Korea (South) Shim, Kyung-Hwan, Korea University, Korea (South) Lee, Seong-Whan, Korea University, Korea (South)

**BIO-P5.12: CHANNEL SELECTION OVER RIEMANNIAN MANIFOLD WITH NON-STATIONARITY CONSIDERATION FOR BRAIN-COMPUTER INTERFACE APPLICATIONS**

Sadatnejad, Khadijeh, INRIA sud-ouest, France Roc, Aline, INRIA sud-ouest, France Pillette, Lea, INRIA sud-ouest, France Appriou, Aurelien, INRIA sud-ouest, France Monseigne, Thibaut, INRIA sud-ouest, France Lotte, Fabien, INRIA sud-ouest, France
BIO-P6 - Biomedical Image Segmentation

BIO-P6.1: A SEGMENTATION BASED ROBUST DEEP LEARNING FRAMEWORK FOR MULTIMODAL RETINAL IMAGE REGISTRATION

Wang, Yiqian, University of California, San Diego, United States
Zhang, Junkang, University of California, San Diego, United States
An, Cheolhong, University of California, San Diego, United States
Cavichini, Melina, University of California, San Diego, United States
Jhingan, Mahima, University of California, San Diego, United States
Amador-Patarroyo, Manuel J., University of California, San Diego, United States
Long, Christopher P., University of California, San Diego, United States
Bartsch, Dirk-Uwe G., University of California, San Diego, United States
Freeman, William R., University of California, San Diego, United States
Nguyen, Truong Q., University of California, San Diego, United States

BIO-P6.2: DENSE RESIDUAL NETWORK FOR RETINAL VESSEL SEGMENTATION

Guo, Changlu, Budapest University of Technology and Economics, Hungary
Szemenyei, Márton, Budapest University of Technology and Economics, Hungary
Yi, Yugen, Jiangxi Normal University, China
Xue, Ying, Eötvös Loránd University, Hungary
Zhou, Wei, Shenyang Aerospace University, China
Li, Yangyuan, Budapest University of Technology and Economics, Hungary

BIO-P6.3: LIGHTWEIGHT V-NET FOR LIVER SEGMENTATION

Lei, Tao, Shaanxi University of Science and Technology, China
Zhou, Wenzheng, Shaanxi University of Science and Technology, China
Zhang, Yuxiao, Shaanxi University of Science and Technology, China
Wang, Risheng, Shaanxi University of Science and Technology, China
Meng, Hongying, Brunel University London, United Kingdom
Nandi, Asoke K., Brunel University London, United Kingdom

BIO-P6.4: ACU-NET: A 3D ATTENTION CONTEXT U-NET FOR MULTIPLE SCLEROSIS LESION SEGMENTATION

Hu, Chuan, Ministry of Education Beijing University of Posts and Telecommunications, China
Kang, Guixia, Ministry of Education Beijing University of Posts and Telecommunications, China
Hou, Beibei, Ministry of Education Beijing University of Posts and Telecommunications, China
Ma, Yiyuan, Ministry of Education Beijing University of Posts and Telecommunications, China
Su, Zichen, Ministry of Education Beijing University of Posts and Telecommunications, China
BIO-P6.5: EDNFC-NET: CONVOLUTIONAL NEURAL NETWORK WITH NESTED FEATURE CONCATENATION FOR NUCLEI-INSTANCE SEGMENTATION

Gehlot, Shiv, Indraprastha Institute of Information Technology Delhi, India
Gupta, Anubha, Indraprastha Institute of Information Technology Delhi, India
Gupta, Ritu, All India Institute of Medical Sciences, New Delhi, India

BIO-P6.6: AN UNSUPERVISED RETINAL VESSEL EXTRACTION AND SEGMENTATION METHOD BASED ON A TUBE MARKED POINT PROCESS MODEL

Li, Tianyu, Purdue University, United States
Comer, Mary, Purdue University, United States
Zerubia, Josiane, Inria and Université Côte d’Azur, France

BIO-P6.7: KALM: KEY AREA LOCALIZATION MECHANISM FOR ABNORMALITY DETECTION IN MUSCULOSKELETAL RADIOGRAPHS

Huang, Wei, Northwestern Polytechnical University, China
Xiong, Zhitong, Northwestern Polytechnical University, China
Wang, Qi, Northwestern Polytechnical University, China
Li, Xuelong, Northwestern Polytechnical University, China

BIO-P6.8: COMBINING CGAN AND MIL FOR HOTSPOT SEGMENTATION IN BONE SCINTIGRAPHY

Xu, Hang, Shanghai Jiao Tong University, China
Geng, Shijie, Shanghai Jiao Tong University, China
Qiao, Yu, Shanghai Jiao Tong University, China
Xu, Kuan, Shanghai Jiao Tong University, China
Gu, Yueyang, Shanghai Jiao Tong University, China

BIO-P6.9: A NONINVASIVE METHOD TO DETECT DIABETES MELLITUS AND LUNG CANCER USING THE STACKED SPARSE AUTOENCODER

Zhang, Qi, University of Macau, Macao SAR of China
Zhou, Jianhang, University of Macau, Macao SAR of China
Zhang, Bob, University of Macau, Macao SAR of China

BIO-P6.10: A MULTI-SCALED RECEPTIVE FIELD LEARNING APPROACH FOR MEDICAL IMAGE SEGMENTATION

Guo, Pengcheng, Inner Mongolia University, China
Su, Xiangdong, Inner Mongolia University, China
Zhang, Haoran, Inner Mongolia University, China
Wang, Meng, Inner Mongolia University, China
Bao, Feilong, Inner Mongolia University, China
BIO-P6.11: AUTOMATIC DATA AUGMENTATION VIA DEEP REINFORCEMENT LEARNING FOR EFFECTIVE KIDNEY TUMOR SEGMENTATION
Qin, Tiexin, Nanjing University, China Wang, Ziyuan, Nanjing University, China He, Kelei, Nanjing University, China Shi, Yinghuan, Nanjing University, China Gao, Yang, Nanjing University, China Shen, Dinggang, University of North Carolina - Chapel Hill, United States

BIO-P6.12: CROSS-STAINED SEGMENTATION FROM RENAL BIOPSY IMAGES USING MULTI-LEVEL ADVERSARIAL LEARNING
Mei, Ke, Beijing University of Posts and Telecommunications, China Zhu, Chuang, Beijing University of Posts and Telecommunications, China Jiang, Lei, Peking University People’s Hospital, China Liu, Jun, Beijing University of Posts and Telecommunications, China Qiao, Yuanyuan, Beijing University of Posts and Telecommunications, China

Computational Imaging
Thursday, 7 May, 09:00 - 11:00

CI-L1 - Computational Imaging

CI-L1.1: BLIND MULTI-SPECTRAL IMAGE PAN-SHARPENING
Yu, Lantao, Rice University, United States Liu, Dehong, Mitsubishi Electric Research Laboratories (MERL), United States Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States Ma, Yanting, Mitsubishi Electric Research Laboratories (MERL), United States

CI-L1.2: A FORWARD-BACKWARD ALGORITHM FOR REWEIGHTED PROCEDURES: APPLICATION TO RADIO-ASTRONOMICAL IMAGING
Repetti, Audrey, Heriot-Watt University, United Kingdom Wiaux, Yves, Heriot-Watt University, United Kingdom

CI-L1.3: CRA: A GENERIC COMPRESSION RATIO ADAPTER FOR END-TO-END DATA-DRIVEN IMAGE COMPRESSIVE SENSING RECONSTRUCTION FRAMEWORKS
Zhang, Zhikang, Arizona State University, United States Xu, Kai, Arizona State University, United States Ren, Fengbo, Arizona State University, United States
CI-L1.4: REVEALING HIDDEN DRAWINGS IN LEONARDO’S ‘THE VIRGIN OF THE ROCKS’ FROM_MACRO X-RAY FLUORESCENCE SCANNING DATA THROUGH ELEMENT LINE LOCALISATION

Yan, Su, Imperial College London, United Kingdom Huang, Jun-Jie, Imperial College London, United Kingdom Daly, Nathan, The National Gallery, United Kingdom Higgitt, Catherine, The National Gallery, United Kingdom Dragotti, Pier Luigi, Imperial College London, United Kingdom

CI-L1.5: 3D UNKNOWN VIEW TOMOGRAPHY VIA ROTATION INVARIANTS

Zehni, Mona, University of Illinois at Urbana-Champaign, United States Huang, Shuai, University of Illinois at Urbana-Champaign, United States Dokmanic, Ivan, University of Illinois at Urbana-Champaign, United States Zhao, Zhizhen, University of Illinois at Urbana-Champaign, United States

CI-L1.6: MODELLING SEA CLUTTER IN SAR IMAGES USING LAPLACE-RICIAN DISTRIBUTION

Karakus, Oktay, University of Bristol, United Kingdom Kuruoglu, Ercan E., Tsinghua-Berkeley Shenzhen Institute, China Achim, Alin, University of Bristol, United Kingdom
Thursday, 7 May, 16:30 - 18:30

CI-L2 - Computational Optics

CI-L2.1: VOLUME RECONSTRUCTION FOR LIGHT FIELD MICROSCOPY
Verinaz-Jadan, Herman, Imperial College London, United Kingdom Song, Pingfan, Imperial College London, United Kingdom Howe, Carmel L., Imperial College London, United Kingdom Foust, Amanda J., Imperial College London, United Kingdom Dragotti, Pier Luigi, Imperial College London, United Kingdom

CI-L2.2: DEEP EXPOSURE FUSION WITH DEGHOSTING VIA HOMOGRAPHY ESTIMATION AND ATTENTION LEARNING
Chen, Sheng-Yeh, National Taiwan University, Taiwan Chuang, Yung-Yu, National Taiwan University, Taiwan

CI-L2.3: SINGLE-SHOT REAL-TIME MULTIPLE-PATH TIME-OF-FLIGHT DEPTH IMAGING FOR MULTI-APERTURE AND MACRO-PIXEL SENSORS
Heredia Conde, Miguel, University of Siegen, Germany Kagawa, Keiichiro, Shizuoka University, Japan Kokado, Tomoya, Shizuoka University, Japan Kawahito, Shoji, Shizuoka University, Japan Loffeld, Otmar, University of Siegen, Germany

CI-L2.4: FAST OPTICAL SYSTEM IDENTIFICATION BY NUMERICAL INTERFEROMETRY
Gupta, Sidharth, University of Illinois at Urbana-Champaign, United States Gribonval, Rémi, Inria, France Daudet, Laurent, LightOn, France Dokmanić, Ivan, University of Illinois at Urbana-Champaign, United States

CI-L2.5: FOURIER PHASE RETRIEVAL WITH ARBITRARY REFERENCE SIGNAL
Arab, Fahimeh, University of California, Riverside, United States Asif, M. Salman, University of California, Riverside, United States

CI-L2.6: PRECONDITIONED GHOST IMAGING VIA SPARSITY CONSTRAINT
Tong, Zhishen, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China Wang, Jian, Fudan University, China Han, Shensheng, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China
### CI-P1 - Computational Imaging Method and Applications

**CI-P1.1: MULTISPECTRAL FUSION OF RGB AND NIR IMAGES USING WEIGHTED LEAST SQUARES AND ALTERNATING GUIDANCE**  
Zhou, Kailong, Xidian University, China Jung, Cheolkon, Xidian University, China

**CI-P1.2: COLOR AND ANGULAR RECONSTRUCTION OF LIGHT FIELDS FROM INCOMPLETE-COLOR CODED PROJECTIONS**  
Nguyen, Hoai-Nam, Inria Rennes - Bretagne Atlantique, France Guillemot, Christine, Inria Rennes - Bretagne Atlantique, France

**CI-P1.3: CROSS IMAGE CUBIC INTERPOLATOR FOR SPATIALLY VARYING EXPOSURES**  
Li, Zhengguo, Institute for Infocomm Research, Singapore Zheng, Jinghong, Institute for Infocomm Research, Singapore Xie, Shoulie, Institute for Infocomm Research, Singapore Shu, Haiyan, Institute for Infocomm Research, Singapore

**CI-P1.4: DISCRIMINANT AND SPARSITY BASED LEAST SQUARES REGRESSION WITH L1 REGULARIZATION FOR FEATURE REPRESENTATION**  
Zhao, Shuping, University of Macau, China Zhang, Bob, University of Macau, China Li, Shuyi, University of Macau, China

**CI-P1.5: DEEP META-RELATION NETWORK FOR VISUAL FEW-SHOT LEARNING**  
Zhang, Fahong, Northwestern Polytechnical University, China Wang, Qi, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China

**CI-P1.6: A SEMI-SUPERVISED RANK TRACKING ALGORITHM FOR ON-LINE UNMIXING OF HYPERSPECTRAL IMAGES**  
Nus, Ludivine, Université de Lorraine, France Miron, Sebastian, Université de Lorraine, France Jaillais, Benoît, INRA-ONIRIS, StatSC Unité de Statistique, Sensométrie, Chimiométrie, France Moussaoui, Said, Ecole Centrale Nantes, France Brie, David, Université de Lorraine, France

**CI-P1.7: INVERSE MULTIPLE SCATTERING WITH PHASELESS MEASUREMENTS**  
Lodhi, Muhammad Asad, Rutgers University, United States Ma, Yanting, Mitsubishi Electric Research Laboratories (MERL), United States Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States
Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States
Liu, Dehong, Mitsubishi Electric Research Laboratories (MERL), United States

**CI-P1.8: MULTI-POLARIZATION INFORMATION FUSION FOR OBJECT CONTOUR DISPLAY IN PASSIVE MILLIMETER-WAVE AND TERAHERTZ SECURITY IMAGING**

Cheng, Yayun, Tsinghua University, China
Zhao, Ziran, Tsinghua University, China
Wang, Yingxin, Tsinghua University, China
Niu, Yingying, Tsinghua University, China

**CI-P1.9: CHARACTERIZATION OF A SNAPSHOT FOURIER TRANSFORM IMAGINGSPECTROMETER BASED ON AN ARRAY OF FABRY-PEROT INTERFEROMETERS**

Picone, Daniele, Grenoble Images Parole Signal Automatique (GIPSA-lab), France
Dolet, Aneline, Grenoble Images Parole Signal Automatique (GIPSA-lab), France
Gousset, Silvère, Institut de Planétologie et d’Astrophysique de Grenoble (IPAG), France
Voisin, Didier, Institut Géosciences de l’Environnement (IGE), France
Dalla Mura, Mauro, Grenoble Images Parole Signal Automatique (GIPSA-lab), France
Le Coarer, Etienne, Institut de Planétologie et d’Astrophysique de Grenoble (IPAG), France

**CI-P1.10: SHADOW REMOVAL OF TEXT DOCUMENT IMAGES BY ESTIMATING LOCAL AND GLOBAL BACKGROUND COLORS**

Wang, Jian-Ren, National Taiwan University, Taiwan
Chuang, Yung-Yu, National Taiwan University, Taiwan

**CI-P1.11: AN EFFICIENT COUPLED DICTIONARY LEARNING METHOD**

Veshki, Farshad G., Aalto University, Finland
Vorobyov, Sergiy A., Aalto University, Finland
Collaborative Sessions

Thursday, 7 May, 16:30 - 18:30

**COLL-L1 - Session 3H: Processing of Highly complex, Heterogeneous, High-dimension data**

**COLL-L1.1: IMAGE FUSION USING JOINT SPARSE REPRESENTATIONS AND COUPLED DICTIONARY LEARNING**
Ghorbani Veshki, Farshad, Aalto university, Finland Ouzir, Nora, Aalto university, Finland Vorobyov, Sergiy A., Aalto University, Finland

**COLL-L1.2: CLUSTERING OF NONNEGATIVE DATA AND AN APPLICATION TO MATRIX COMPLETION**
Strohmeier, Christopher, University of California, Los Angeles, United States Needell, Deanna, University of California, Los Angeles, United States

**COLL-L1.3: SAMPLING OF SURFACES AND LEARNING FUNCTIONS IN HIGH DIMENSIONS**
Zou, Qing, University of Iowa, United States Jacob, Mathews, University of Iowa, United States

**COLL-L1.4: STOCK MOVEMENT PREDICTION THAT INTEGRATES HETEROGENEOUS DATA SOURCES USING DILATED CAUSAL CONVOLUTION NETWORKS WITH ATTENTION**
Daiya, Divyanshu, LNM Institute of Information Technology, India Wu, Min-Sheng, National Tsing Hua University, Taiwan Lin, Che, National Taiwan University, Taiwan

**COLL-L1.5: LARGE-SCALE WEAKLY-SUPERVISED CONTENT EMBEDDINGS FOR MUSIC RECOMMENDATION AND TAGGING**
Huang, Qingqing, Google, United States Jansen, Aren, Google, United States Zhang, Li, Google, United States Ellis, Daniel P. W., Google Research, United States Saurous, Rif A., Google, United States Anderson, John, Google, United States

**COLL-L1.6: SUPERVISED CANONICAL CORRELATION ANALYSIS OF DATA ON SYMMETRIC POSITIVE DEFINITE MANIFOLDS BY RIEMANNIAN DIMENSIONALITY REDUCTION**
Fallah, Faezeh, University of Stuttgart, Germany Yang, Bin, University of Stuttgart, Germany
Friday, 8 May, 08:00 - 10:00

**COLL-L2 - Session 3R: Robustness Reproducibility Replicability**

**COLL-L2.1: THE EMPIRICAL DUALITY GAP OF CONSTRAINED STATISTICAL LEARNING**
Chamon, Luiz, University of Pennsylvania, United States Paternain, Santiago, University of Pennsylvania, United States Calvo-Fullana, Miguel, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States

**COLL-L2.2: CONTEXT AND UNCERTAINTY MODELING FOR ONLINE SPEAKER CHANGE DETECTION**
Aronowitz, Hagai, IBM Research AI, Israel Zhu, Weizhong, IBM Research AI, United States

**COLL-L2.3: MODELING UNCERTAINTY IN PREDICTING EMOTIONAL ATTRIBUTES FROM SPONTANEOUS SPEECH**
Sridhar, Kusha, University of Texas at Austin, United States Busso, Carlos, University of Texas at Austin, United States

**COLL-L2.4: ACCURACY-ROBUSTNESS TRADE-OFF FOR POSITIVELY WEIGHTED NEURAL NETWORKS**
Neacsu, Ana, University Politehica of Bucharest, Romania Pesquet, Jean-Christophe, Université Paris-Saclay, CentraleSupélec, Inria, France Burileanu, Corneliu, University Politehica of Bucharest, Romania

**COLL-L2.5: TOWARDS A NEW UNDERSTANDING OF THE TRAINING OF NEURAL NETWORKS WITH MISLABELED TRAINING DATA**
Gish, Herbert, Raytheon BBN Technologies, United States Silovsky, Jan, Apple, United States Sung, Man-Ling, Chinese University of Hong Kong, China Siu, Man-Hung, Apple, United States Hartmann, William, Raytheon BBN Technologies, United States Jiang, Zhuolin, Raytheon BBN Technologies, United States

**COLL-L2.6: ON NETWORK SCIENCE AND MUTUAL INFORMATION FOR EXPLAINING DEEP NEURAL NETWORKS**
Davis, Brian, Carnegie Mellon University, United States Bhatt, Uman, Carnegie Mellon University, United States Bhardwaj, Kartikeya, Carnegie Mellon University, United States Marculescu, Radu, Carnegie Mellon University, United States Moura, José, Carnegie Mellon University, United States
Design and Implementation of Signal Processing Systems

Wednesday, 6 May, 11:30 - 13:30

DIS-L1 - Array-based Architectures for Energy-efficient Signal Processing Systems

DIS-L1.1: EXPLORING ENERGY EFFICIENT QUANTUM-RESISTANT SIGNAL PROCESSING USING ARRAY PROCESSORS
Nejatollahi, Hamid, University of California, Irvine, United States Shahhosseini, Sina, University of California, Irvine, United States Cammarota, Rosario, Intel AI, Privacy and Security Research, United States Dutt, Nikil, University of California, Irvine, United States

DIS-L1.2: DMAZERUNNER: OPTIMIZING CONVOLUTIONS ON DATAFLOW ACCELERATORS
Dave, Shail, Arizona State University, United States Shrivastava, Aviral, Arizona State University, United States Kim, Youngbin, Yonsei University, Korea (South) Avancha, Sasikanth, Intel, India Lee, Kyoungwoo, Yonsei University, Korea (South)

DIS-L1.3: EXPLORATION METHODOLOGY FOR BTI-INDUCED FAILURES ON RRAM-BASED EDGE AI SYSTEMS
Levisse, Alexandre, Embedded Systems Laboratory (ESL) EPFL, Switzerland Rios, Marco, Embedded Systems Laboratory (ESL) EPFL, Switzerland Peon, Miguel, Embedded Systems Laboratory (ESL) EPFL, Switzerland Atienza, David, Embedded Systems Laboratory (ESL) EPFL, Switzerland

DIS-L1.4: TIME-Predictable SOFTWARE-DEFINED ARCHITECTURE WITH SDF-BASED COMPILER FLOW FOR 5G BASEBAND PROCESSING
Venkataramani, Vanchinathan, National University of Singapore, Singapore Bodin, Bruno, National University of Singapore, Singapore Kulkarni, Aditi, National University of Singapore, Singapore Mitra, Tulika, National University of Singapore, Singapore Peh, Li-Shiuan, National University of Singapore, Singapore

DIS-L1.5: ACCELERATING LINEAR ALGEBRA KERNELS ON A MASSIVELY PARALLEL RECONFIGURABLE ARCHITECTURE
Soorishetty, Anuraag, Arizona State University, United States Zhou, Jian, Arizona State University, United States Pal, Subhankar, University of Michigan, United States Blaauw, David, University of Michigan, United States Kim, Hun-Seok, University of Michigan, United States Mudge, Trevor, University of Michigan, United States Dreslinski, Ronald, University of Michigan, United States Chakrabarti, Chaitali, Arizona State University, United States

**DIS-L1.6: ENERGY EFFICIENT ACCELERATION OF FLOATING POINT APPLICATIONS ONTO CGRA**

Das, Satyajit, Indian Institute of Technology Palakkad, India Prasad, Rohit, Universite Bretagne-Sud, France Martin, Kevin J. M., Universite Bretagne-Sud, France Coussy, Philippe, Universite Bretagne-Sud, France
Tuesday, 5 May, 16:30 - 18:30

**DIS-P1 - Signal Processing for Emerging Applications: Machine Learning**

**DIS-P1.1: FAST AND ACCURATE EMBEDDED DCNN FOR RGB-D BASED SIGN LANGUAGE RECOGNITION**
Wang, Ching-Chen, National Tsing Hua University, Taiwan Chiu, Ching-Te, National Tsing Hua University, Taiwan Huang, Chao-Tsung, National Tsing Hua University, Taiwan Ding, Yu-Chun, National Tsing Hua University, Taiwan Wang, Li-Wei, National Tsing Hua University, Taiwan

**DIS-P1.2: D2NA: DAY-TO-NIGHT ADAPTATION FOR VISION BASED PARKING MANAGEMENT SYSTEM**
Zheng, Wei-Zhong, National Chung Cheng University, Taiwan Tran, Vu-Hoang, Ho Chi Minh City University of Technology and Education, Viet Nam Huang, Ching-Chun, National Chiao Tung University, Taiwan

**DIS-P1.3: ENERGAN: A GENERATIVE ADVERSARIAL NETWORK FOR ENERGY DISAGGREGATION**
Kaselimi, Maria, National Technical University of Athens, Greece Voulodimos, Athanasios, University of West Attica, Greece Protopapadakis, Eftychios, National Technical University of Athens, Greece Doulamis, Nikolaos, National Technical University of Athens, Greece Doulamis, Anastasios, National Technical University of Athens, Greece

**DIS-P1.4: ENHANCING THE LABELLING OF AUDIO SAMPLES FOR AUTOMATIC INSTRUMENT CLASSIFICATION BASED ON NEURAL NETWORKS**
Castel-Branco, Gonçalo, Instituto de Telecomunicações, University of Coimbra, Portugal Falcao, Gabriel, Instituto de Telecomunicações, University of Coimbra, Portugal Perdigão, Fernando, Instituto de Telecomunicações, University of Coimbra, Portugal

**DIS-P1.5: DEEP-NEURAL-NETWORK BASED FALL-BACK MECHANISM IN INTERFERENCE-AWARE RECEIVER DESIGN**

**DIS-P1.6: DNN-CHIP PREDICTOR: AN ANALYTICAL PERFORMANCE PREDICTOR FOR DNN ACCELERATORS WITH VARIOUS DATAFLOWS AND HARDWARE ARCHITECTURES**
Zhao, Yang, Rice University, United States Li, Chaojian, Rice University, United States Wang, Yue, Rice University, United States Xu, Pengfei, Rice University, United States Zhang, Yongan, Rice University, United States Lin, Yingyan, Rice University, United States

**DIS-P1.7: LOW-COMPLEXITY FIXED-POINT CONVOLUTIONAL NEURAL NETWORKS FOR AUTOMATIC TARGET RECOGNITION**

Dbouk, Hassan, University of Illinois at Urbana-Champaign, United States Geng, Hanfei, University of Illinois at Urbana-Champaign, United States Vineyard, Craig M., Sandia National Laboratories, United States Shanbhag, Naresh R., University of Illinois at Urbana-Champaign, United States

**DIS-P1.8: ACCELERATING DISTRIBUTED DEEP LEARNING BY ADAPTIVE GRADIENT QUANTIZATION**

Guo, Jinrong, Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences, China Liu, Wantao, Institute of Information Engineering, Chinese Academy of Sciences, China Wang, Wang, Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences, China Han, Jizhong, Institute of Information Engineering, Chinese Academy of Sciences, China Li, Ruixuan, Institute of Information Engineering, Chinese Academy of Sciences, China Lu, Yijun, Alibaba Cloud Computing Co. Ltd., China Hu, Songlin, Institute of Information Engineering, Chinese Academy of Sciences; School of Cyber Security, University of Chinese Academy of Sciences, China

**DIS-P1.9: LUPULUS: A FLEXIBLE HARDWARE ACCELERATOR FOR NEURAL NETWORKS**


**DIS-P1.10: DEPTH ESTIMATION FROM SINGLE IMAGE THROUGH MULTI-PATH-MULTI-RATE DIVERSE FEATURE EXTRACTOR**

Lo, Wen-Yi, National Tsing Hua University, Taiwan Chiu, Ching-Te, National Tsing Hua University, Taiwan Luo, Jie-Yu, National Tsing Hua University, Taiwan

**DIS-P1.11: OBJECT DETECTION WITH COLOR AND DEPTH IMAGES WITH MULTI-REDUCED REGION PROPOSAL NETWORK AND MULTI-POOLING**
Lin, Jiou-Ai, National Tsing Hua University, Taiwan Chiu, Ching-Te, National Tsing Hua University, Taiwan Cheng, Yen-Yu, National Tsing Hua University, Taiwan

**DIS-P1.12: DEBLURRING AND SUPER-RESOLUTION USING DEEP GATED FUSION ATTENTION NETWORKS FOR FACE IMAGES**

Yang, Chao-Hsun, National Tsing Hua University, Taiwan Chang, Long-Wen, National Tsing Hua University, Taiwan
Thursday, 7 May, 16:30 - 18:30

DIS-P2 - Algorithm and Architecture Co-optimization

DIS-P2.1: INDOOR HEADING DIRECTION ESTIMATION USING RF SIGNALS
Fan, Yusen, University of Maryland, United States
Zhang, Feng, Origin Wireless Inc, United States
Wu, Chenshu, University of Maryland, United States
Wang, Beibei, Origin Wireless Inc, United States
Liu, K. J. Ray, University of Maryland, College Park, United States

DIS-P2.2: AN IMPROVED SELECTIVE ACTIVE NOISE CONTROL ALGORITHM BASED ON EMPIRICAL WAVELET TRANSFORM
Wen, Shulin, Nanyang Technological University, Singapore
Gan, Woon-Seng, Nanyang Technological University, Singapore
Shi, Dongyuan, Nanyang Technological University, Singapore

DIS-P2.3: TOWARDS REAL-TIME, MULTI-VIEW VIDEO STEREOPSIS
Ke, Jianwei, University of Wisconsin-Madison, United States
Watras, Alex, University of Wisconsin-Madison, United States
Kim, Jae-Jun, University of Wisconsin-Madison, United States
Liu, Hewei, University of Wisconsin-Madison, United States
Jiang, Hongrui, University of Wisconsin-Madison, United States
Hu, Yu Hen, University of Wisconsin-Madison, United States

DIS-P2.4: ERNET FAMILY: HARDWARE-ORIENTED CNN MODELS FOR COMPUTATIONAL IMAGING USING BLOCK-BASED INFERENCE
Huang, Chao-Tsung, National Tsing Hua University, Taiwan

DIS-P2.5: A DSP ACCELERATION FRAMEWORK FOR SOFTWARE-DEFINED RADIOS ON X86_64
Georgis, Georgios, University of Surrey, United Kingdom
Thanos, Alexios, University of Surrey, United Kingdom
Filo, Marcin, University of Surrey, United Kingdom
Nikitopoulos, Konstantinos, University of Surrey, United Kingdom

DIS-P2.6: FAST SINGLE-VIEW 3D OBJECT RECONSTRUCTION WITH FINE DETAILS THROUGH DILATED DOWNSAMPLE AND MULTI-PATH UPSAMPLE DEEP NEURAL NETWORK
Hsu, Chia-Ho, National Tsing Hua University, Taiwan
Chiu, Ching-Te, National Tsing Hua University, Taiwan
Kuan, Chia-Yu, National Tsing Hua University, Taiwan

DIS-P2.7: PROCESSING CONVOLUTIONAL NEURAL NETWORKS ON CACHE
DIS-P2.8: LIGHTWEIGHT HARDWARE IMPLEMENTATION OF VVC TRANSFORM BLOCK FOR ASIC DECODER

Farhat, Ibrahim, VITEC, France Hamidouche, Wassim, INSA Rennes, France Grill, Adrien, VITEC, France Menard, Daniel, INSA Rennes, France Déforges, Olivier, Institut d’Electronique et de Télécommunications de Rennes / Institut Nationnal des Sciences Appliquées, France

DIS-P2.9: RGB-D BASED MULTI-MODAL DEEP LEARNING FOR FACE IDENTIFICATION

Lin, Tzu-Ying, National Tsing Hua University, Taiwan Chiu, Ching-Te, National Tsing Hua University, Taiwan Tang, Ching-Tung, National Tsing Hua University, Taiwan

DIS-P2.10: A REAL TIME IMPLEMENTATION OF A BAYER DOMAIN IMAGE DEBLURRING CORE FOR OPTICAL BLUR COMPENSATION

Lee, Han-Sol, Samsung Electronics, Korea (South) Heo, Eundoo, Samsung Electronics, Korea (South) Lee, Wonseok, Samsung Electronics, Korea (South) Ahn, Do-Chang, Samsung Electronics, Korea (South) Cheon, Jeonghyeon, Samsung Electronics, Korea (South) Kim, Kyungho, Samsung Electronics, Korea (South) Lee, Kyunghwan, Samsung Electronics, Korea (South) Lee, Jeongguk, Samsung Electronics, Korea (South) Choi, Yunseok, Samsung Electronics, Korea (South) Chang, Soonkeun, Samsung Electronics, Korea (South)

DIS-P2.11: SELF-ATTENTIVE SENTIMENTAL SENTENCE EMBEDDING FOR SENTIMENT ANALYSIS

Lin, Sheng-Chieh, Academia Sinica, Taiwan Su, Wen-Yuh, National Chengchi University, Taiwan Chien, Po-Chuan, Academia Sinica, Taiwan Tsai, Ming-Feng, National Chengchi University, Taiwan Wang, Chuan-Ju, Academia Sinica, Taiwan

DIS-P2.12: DECIDABLE VARIABLE-RATE DATAFLOW FOR HETEROGENEOUS SIGNAL PROCESSING SYSTEMS

Ma, Yujunrong, University of Maryland, United States Wu, Jiahao, University of Maryland, United States Bhattacharyya, Shuvra, University of Maryland, United States Boutellier, Jani, University of Vaasa, Finland
Friday, 8 May, 11:45 - 13:45

**DIS-P3 - Design and Implementation of Signal Processing Systems for Wireless Communication Systems**

**DIS-P3.1: BACK-TO-BACK BUTTERFLY NETWORK, AN ADAPTIVE PERMUTATION NETWORK FOR NEW COMMUNICATION STANDARDS**

Harb, Hassan, Lab-STICC, France Chavet, Cyrille, Lab-STICC, France

**DIS-P3.2: 1.5GBIT/S 4.9W HYPERSONTAL IMAGE ENCODERS ON A LOW-POWER PARALLEL HETEROGENEOUS PROCESSING PLATFORM**

Ferraz, Óscar, Instituto de Telecomunicações, University of Coimbra, Portugal Silva, Vitor, Instituto de Telecomunicações, University of Coimbra, Portugal Falcao, Gabriel, Instituto de Telecomunicações, University of Coimbra, Portugal

**DIS-P3.3: DESIGN OF A CONVERGENCE-AWARE BASED EXPECTATION PROPAGATION ALGORITHM FOR UPLINK MIMO SCMA SYSTEMS**

Lin, Jih-Yang, National Central University, Taiwan Tsai, Pei-Yun, National Central University, Taiwan

**DIS-P3.4: BIPARTITE BELIEF PROPAGATION POLAR DECODING WITH BIT-FLIPPING**

Gong, Zihao, Southeast University, China Shen, Yifei, Southeast University, China Ji, Houren, Southeast University, China Song, Wenqing, Nanjing University, China Zhang, Zaichen, Southeast University, China You, Xiaohu, Southeast University, China

**DIS-P3.5: LOW-COMPLEXITY LSTM-ASSISTED BIT-FLIPPING ALGORITHM FOR SUCCESSIVE CANCELLATION LIST POLAR DECODER**

Chen, Chun-Hsiang, National Taiwan University, Taiwan Teng, Chieh-Fang, National Taiwan University, Taiwan Wu, An-Yeu, National Taiwan University, Taiwan

**DIS-P3.6: ADAPTIVE NORMALIZATION FOR FORECASTING LIMIT ORDER BOOK DATA USING CONVOLUTIONAL NEURAL NETWORKS**

Passalis, Nikolaos, Aristotle University of Thessaloniki, Greece Tefas, Anastasios, Aristotle University of Thessaloniki, Greece Kanniainen, Juho, Tampere University, Finland Gabboj, Moncef, Tampere University, Finland Iosifidis, Alexandros, Aarhus University, Denmark

**DIS-P3.7: GREEDY HYBRID RATE ADAPTATION IN DYNAMIC WIRELESS COMMUNICATION ENVIRONMENT**
Zhao, Yapeng, Shanghai University, China Kang, Kai, Shanghai Advanced Research Institute, Chinese Academy of Sciences, China Qian, Hua, Shanghai Advanced Research Institute, Chinese Academy of Sciences, China Luo, Xiliang, ShanghaiTech University, China Jin, Yanliang, Shanghai University, China

**DIS-P3.8: A WIFI-BASED PASSIVE FALL DETECTION SYSTEM**

Hu, Yuqian, University of Maryland, College Park, United States Zhang, Feng, University of Maryland, College Park, United States Wu, Chenshu, University of Maryland, College Park, United States Wang, Beibei, University of Maryland, College Park, United States Liu, K. J. Ray, University of Maryland, College Park, United States

**DIS-P3.9: PROGRAMMABLE DATAFLOW ACCELERATORS: A 5G OFDM MODULATION/DEMODULATION CASE STUDY**

Wu, Yun, Queen’s University Belfast, United Kingdom Wang, Peng, Queen’s University Belfast, United Kingdom McAllister, John, Queen’s University Belfast, United Kingdom

**DIS-P3.10: SIMPLIFIED DYNAMIC SC-FLIP POLAR DECODING**

Ercan, Furkan, McGill University, Canada Tonnellier, Thibaud, McGill University, Canada Doan, Nghia, McGill University, Canada Gross, Warren J., McGill University, Canada

**DIS-P3.11: REAL-TIME, UNIVERSAL, AND ROBUST ADVERSARIAL ATTACKS AGAINST SPEAKER RECOGNITION SYSTEMS**

Xie, Yi, Rutgers University, United States Shi, Cong, Rutgers University, United States Li, Zhuohang, University of Tennessee, Knoxville, United States Liu, Jian, University of Tennessee, Knoxville, United States Chen, Yingying, Rutgers University, United States Yuan, Bo, Rutgers University, United States

**DIS-P3.12: AN ODORANT ENCODING MACHINE FOR SAMPLING, RECONSTRUCTION AND ROBUST REPRESENTATION OF ODORANT IDENTITY**

Lazar, Aurel A., Columbia University, United States Liu, Tingkai, Columbia University, United States Yeh, Chung-Heng, Columbia University, United States
Friday, 8 May, 15:15 - 17:15

DIS-P4 - Design and Implementation of Emerging Signal Processing Systems

DIS-P4.1: FIR FILTER DESIGN AND IMPLEMENTATION FOR PHASE-BASED PROCESSING
Huang, Shih-Yao, National Tsing Hua University, Taiwan
Chen, Wei-Chih, National Tsing Hua University, Taiwan
Huang, Chao-Tsung, National Tsing Hua University, Taiwan

DIS-P4.2: FIXED-POINT OPTIMIZATION OF TRANSFORMER NEURAL NETWORK
Boo, Yoonho, Seoul National University, Korea (South)
Sung, Wonyong, Seoul National University, Korea (South)

DIS-P4.3: A FIFO BASED ACCELERATOR FOR CONVOLUTIONAL NEURAL NETWORKS
Panchbhaiyye, Vineet, Santa Clara University, United States
Ogunfunmi, Tokunbo, Santa Clara University, United States

DIS-P4.4: SOFT-OUTPUT FINITE ALPHABET EQUALIZATION FOR MMWAVE MASSIVE MIMO
Castañeda, Oscar, Cornell Tech, United States
Jacobsson, Sven, Ericsson Research, Sweden
Durisi, Giuseppe, Chalmers University of Technology, Sweden
Goldstein, Tom, University of Maryland, United States
Studer, Christoph, Cornell Tech, United States

DIS-P4.5: DIVERSITY AND SPARSITY: A NEW PERSPECTIVE ON INDEX TRACKING
Zheng, Yu, Southwestern University of Finance and Economics, China
Hospedales, Timothy M., University of Edinburgh, United Kingdom
Yang, Yongxin, University of Edinburgh, United Kingdom

DIS-P4.6: SPARSE BEAMSPACE EQUALIZATION FOR MASSIVE MU-MIMO MMWAVE SYSTEMS
Mirfarshbafan, Seyed Hadi, Cornell Tech, United States
Studer, Christoph, Cornell Tech, United States

DIS-P4.7: THRESHOLD-ADJUSTED ORB STRATEGIES WITH GENETIC ALGORITHM AND PROTECTIVE CLOSING STRATEGY ON TAIWAN FUTURES MARKET
Syu, Jia-Hao, National Taiwan University, Taiwan Wu, Mu-En, National Taipei University of Technology, Taiwan Chen, Chun-Hao, Tamkang University, Taiwan Ho, Jan-Ming, Academia Sinica, Taiwan

**DIS-P4.8: CAN EVERY ANALOG SYSTEM BE SIMULATED ON A DIGITAL COMPUTER?**
Boche, Holger, Technische Universität München, Germany Pohl, Volker, Technische Universität München, Germany

**DIS-P4.9: LOW-COMPLEXITY COMPRESSED ALIGNMENT-AIDED COMPRESSIVE ANALYSIS FOR REAL-TIME ELECTROCARDIOGRAPHY TELEMONITORING**
Pua, Yo-Woei, National Taiwan University, Taiwan Chou, Ching-Yao, National Taiwan University, Taiwan Wu, An-Yeu, National Taiwan University, Taiwan

**DIS-P4.10: REDUCED-COMPLEXITY SINGULAR VALUE DECOMPOSITION FOR TUCKER DECOMPOSITION: ALGORITHM AND HARDWARE**
Hu, Xiaofeng, Rutgers University, United States Deng, Chunhua, Rutgers University, United States Yuan, Bo, Rutgers University, United States

**DIS-P4.11: AN EARLY TERMINATION SCHEME FOR SUCCESSIVE CANCELLATION LIST DECODING OF POLAR CODES**
Lee, Huang-Chang, Chang Gung University, Taiwan Pao, Yu-Sheng, Tsing Hua University, Taiwan Chi, Cheng-Yi, Tsing Hua University, Taiwan Lee, Hsin-Yu, Tsing Hua University, Taiwan Ueng, Yeong-Luh, Tsing Hua University, Taiwan

**DIS-P4.12: LOW-LATENCY LIGHTWEIGHT STREAMING SPEECH RECOGNITION WITH 8-BIT QUANTIZED SIMPLE GATED CONVOLUTIONAL NEURAL NETWORKS**
Park, Jinhwan, Seoul National University, Korea (South) Qian, Xue, Seoul National University, Korea (South) Jo, Youngmin, Seoul National University, Korea (South) Sung, Wonyong, Seoul National University, Korea (South)
Human Language Technology

Thursday, 7 May, 09:00 - 11:00

HLT-L1 - Spoken Language Translation

HLT-L1.1: END-END SPEECH-TO-TEXT TRANSLATION WITH MODALITY AGNOSTIC META-LEARNING
Indurthi, Sathish Reddy, Samsung Research, Korea (South) Han, Houjeung, Samsung Research, Korea (South) Lakumarapu, Nikhil Kumar, Samsung Research, Korea (South) Lee, Beomseok, Samsung Research, Korea (South) Chung, Insoo, Samsung Research, Korea (South) Kim, Sangha, Samsung Research, Korea (South) Kim, Chanwoo, Samsung Research, Korea (South)

HLT-L1.2: ANALYZING ASR PRETRAINING FOR LOW-RESOURCE SPEECH-TO-TEXT TRANSLATION
Stoian, Mihaela C., University of Edinburgh, Romania Bansal, Sameer, University of Edinburgh, United Kingdom Goldwater, Sharon, University of Edinburgh, United Kingdom

HLT-L1.3: INSTANCE-BASED MODEL ADAPTATION FOR DIRECT SPEECH TRANSLATION
Di Gangi, Mattia Antonino, Fondazione Bruno Kessler and University of Trento, Italy Nguyen, Viet Nhat, University of Trento, Italy Negri, Matteo, Fondazione Bruno Kessler, Italy Turchi, Marco, Fondazione Bruno Kessler, Italy

HLT-L1.4: RE-TRANSLATION STRATEGIES FOR LONG FORM, SIMULTANEOUS, SPOKEN LANGUAGE TRANSLATION
Arivazhagan, Naveen, Google, United States Cherry, Colin, Google, Canada I, Te, Google, United States Macherey, Wolfgang, Google, United States Baljekar, Pallavi, Google, Canada Foster, George, Google, Canada

HLT-L1.5: SKINAUGMENT: AUTO-ENCODING SPEAKER CONVERSIONS FOR AUTOMATIC SPEECH TRANSLATION
McCarthy, Arya D., Johns Hopkins University, United States Puzon, Liezl, Facebook, United States Pino, Juan, Facebook, United States

HLT-L1.6: END-TO-END SPEECH TRANSLATION WITH SELF-CONTAINED VOCABULARY MANIPULATION
Friday, 8 May, 08:00 - 10:00

HLT-L2 - Language Modeling

HLT-L2.1: AN EMPIRICAL STUDY OF TRANSFORMER-BASED NEURAL LANGUAGE MODEL ADAPTATION

Li, Ke, Johns Hopkins University, United States
Liu, Zhe, Facebook, United States
He, Tianxing, Massachusetts Institute of Technology, United States
Huang, Hongzhao, Facebook, United States
Peng, Fuchun, Facebook, United States
Povey, Daniel, [None], United States
Khudanpur, Sanjeev, Johns Hopkins University, United States

HLT-L2.2: LOW-BIT QUANTIZATION OF RECURRENT NEURAL NETWORK LANGUAGE MODELS USING ALTERNATING DIRECTION METHODS OF MULTIPLIERS

Xu, Junhao, Chinese University of Hong Kong, China
Chen, Xie, Microsoft, China
Hu, Shoukang, Chinese University of Hong Kong, China
Yu, Jianwei, Chinese University of Hong Kong, China
Liu, Xunying, Chinese University of Hong Kong, China
Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China

HLT-L2.3: AUDIO-ATTENTION DISCRIMINATIVE LANGUAGE MODEL FOR ASR RESCORING

Gandhe, Ankur, Amazon, Inc., United States
Rastrow, Ariya, Amazon, Inc., United States

HLT-L2.4: TRAINING CODE-SWITCHING LANGUAGE MODEL WITH MONOLINGUAL DATA

Chuang, Shun-Po, National Taiwan University, Taiwan
Sung, Tzu-Wei, University of California, San Diego, Taiwan
Lee, Hung-Yi, National Taiwan University, Taiwan

HLT-L2.5: DOMAIN ROBUST, FAST, AND COMPACT NEURAL LANGUAGE MODELS

Gerstenberger, Alexander, RWTH Aachen University, Germany
Irie, Kazuki, RWTH Aachen University, Germany
Golik, Pavel, AppTek GmbH, Germany
Beck, Eugen, RWTH Aachen University, Germany
Ney, Hermann, RWTH Aachen University, Germany

HLT-L2.6: A RANDOM GOSSIP BMUF PROCESS FOR NEURAL LANGUAGE MODELING
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Tian, Jinchuan, Tencent, China  
Han, Lei, Tencent, China  
Wang, Guangsen, Tencent, China  
Song, Xingchen, Tsinghua University, China  
Su, Dan, Tencent, China  
Yu, Dong, Tencent, United States
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HLT-L3 - Spoken Language Understanding and Dialogue II

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HLT-L3.2: PRE-TRAINING FOR QUERY REWRITING IN A SPOKEN LANGUAGE UNDERSTANDING SYSTEM

HLT-L3.3: END-TO-END ARCHITECTURES FOR ASR-FREE SPOKEN LANGUAGE UNDERSTANDING
Palogiannidi, Elisavet, Omilia Conversational Intelligence, Greece Gkinis, Ioannis, Omilia Conversational Intelligence, Greece Mastrapas, George, Omilia Conversational Intelligence, Greece Mizera, Petr, Omilia Conversational Intelligence, Czech Republic Stafylakis, Themios, Omilia Conversational Intelligence, Greece

HLT-L3.4: END-TO-END SPOKEN LANGUAGE UNDERSTANDING WITHOUT MATCHED LANGUAGE SPEECH MODEL PRETRAINING DATA
Price, Ryan, Interactions, LLC., United States

HLT-L3.5: LEVERAGING UNPAIRED TEXT DATA FOR TRAINING END-TO-END SPEECH-TO-INTENT SYSTEMS
Huang, Yinghui, IBM, United States Kuo, Hong-Kwang, IBM, United States Thomas, Samuel, IBM, United States Kons, Zvi, IBM, Israel Audhkhasi, Kartik, IBM, United States Kingsbury, Brian, IBM, United States Hoory, Ron, IBM, Israel Picheny, Michael, IBM, United States

HLT-L3.6: GENERATING EMPATHETIC RESPONSES BY LOOKING AHEAD THE USER’S SENTIMENT
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HLT-P1.12: DESIGN CONSIDERATIONS FOR HYPOTHESIS REJECTION MODULES IN SPOKEN LANGUAGE UNDERSTANDING SYSTEMS

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Tachibana, Hideyuki, PKSHA Technology, Inc., Japan Katayama, Yotaro, PKSHA Technology, Inc., Japan

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Chen, Qian, Alibaba Group, China Chen, Mengzhe, Alibaba Group, China Li, Bo, Alibaba Group, China Wang, Wen, Alibaba Group, United States

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**HLT-P2.11: ACCOUNTING FOR MICROPROSODY IN MODELING INTONATION**

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Tyagi, Akshit, University of Massachusetts, Amherst, United States Sharma, Varun, University of Massachusetts, Amherst, United States Gupta, Rahul, Amazon, Inc., United States Samson, Lynn, University of Massachusetts, Amherst, United States Zhuang, Nan, University of Massachusetts, Amherst, United States Wang, Zihang, University of Massachusetts, Amherst, United States Campbell, Bill, Amazon, Inc., United States

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Tripathi, Pushkar, Facebook, United States

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Wu, Zhen-Yu, National Taiwan University of Science and Technology, Taiwan
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Lo, Tien-Hong, National Taiwan Normal University, Taiwan
Chen, Berlin, National Taiwan Normal University; ASUS AICS, Taiwan

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Narayanan, Shrikanth, University of Southern California, United States

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Iacobacci, Ignacio, Huawei Noah’s Ark Lab, United Kingdom

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Lopez, Adam, University of Edinburgh, United Kingdom
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**HLT-P4.9: SEMI-SUPERVISED SENTENCE CLASSIFICATION BASED ON USER POLARITY IN THE SOCIAL SCENARIOS**

Ma, Bing, Beijing University of Posts and Telecommunications, China Sun, Haifeng, Beijing University of Posts and Telecommunications, China Wang, Jingyu, Beijing University of Posts and Telecommunications, China Qi, Qi, Beijing University of Posts and Telecommunications, China Liao, Jianxin, Beijing University of Posts and Telecommunications, China

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**HLT-P4.12: LEARNING TO GENERATE DIVERSE QUESTIONS FROM KEYWORDS**

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HLT-P5 - Multilingual Processing of Language

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Iranzo-Sánchez, Javier, Universitat Politècnica de València, Spain Silvestre-Cerdà, Joan Albert, Universitat Politècnica de València, Spain Jorge, Javier, Universitat Politècnica de València, Spain Roselló, Nahuel, Universitat Politècnica de València, Spain Giménez, Adrià, Universitat Politècnica de València, Spain Sanchis, Albert, Universitat Politècnica de València, Spain Civera, Jorge, Universitat Politècnica de València, Spain Juan, Alfons, Universitat Politècnica de València, Spain

**HLT-P5.2: MULTILINGUAL GRAPHEME-TO-PHONEME CONVERSION WITH BYTE REPRESENTATION**


**HLT-P5.3: LANGUAGE-AGNOSTIC MULTILINGUAL MODELING**

Datta, Arindrima, Google LLC, United States Ramabhadran, Bhuvana, Google LLC, United States Emond, Jesse, Google LLC, United States Kannan, Anjuli, Google LLC, United States Roark, Brian, Google LLC, United States

**HLT-P5.4: ADI17: A FINE-GRAINED ARABIC DIALECT IDENTIFICATION DATASET**

Shon, Suwon, ASAPP Inc, United States Ali, Ahmed, Qatar Computing Research Institute, Qatar Samih, Younes, Qatar Computing Research Institute, Qatar Mubarak, Hamdy, Qatar Computing Research Institute, Qatar Glass, James, Massachusetts Institute of Technology, United States

**HLT-P5.5: UNIVERSAL PHONE RECOGNITION WITH A MULTILINGUAL ALLOPHONE SYSTEM**

Li, Xinjian, Carnegie Mellon University, United States Dalmia, Siddharth, Carnegie Mellon University, United States Li, Juncheng, Carnegie Mellon University, United States Littell, Patrick, National Research Council of Canada, Canada Lee, Matthew, SIL International, United States Yao, Jiali, ByteDance AI Lab, China Anastasopoulos, Antonios, Carnegie Mellon University, United States Mortensen, David, Carnegie Mellon University, United States Neubig, Graham, Carnegie
Mellon University, United States
Black, Alan, Carnegie Mellon University, United States
Metze, Florian, Carnegie Mellon University, United States

**HLT-P5.6: COUPLED TRAINING OF SEQUENCE-TO-SEQUENCE MODELS FOR ACCENTED SPEECH RECOGNITION**

Unni, Vinit, Indian Institute of Technology Bombay, India
Joshi, Nitish, Indian Institute of Technology Bombay, India
Jyothi, Preethi, Indian Institute of Technology Bombay, India

**HLT-P5.7: ADDRESSING ACCENT MISMATCH IN MANDARIN-ENGLISH CODE-SWITCHING SPEECH RECOGNITION**

Tan, Zhili, Microsoft, China
Fan, Xinghua, Microsoft, China
Zhu, Hui, Microsoft, China
Lin, Ed, Microsoft, China

**HLT-P5.8: DETECTING MISMATCH BETWEEN TEXT SCRIPT AND VOICE-OVER USING UTTERANCE VERIFICATION BASED ON PHONEME RECOGNITION RANKING**

Jeong, Yoonjae, NCsoft, Korea (South)
Cho, Hoon-Young, NCsoft, Korea (South)

**HLT-P5.9: DNN-BASED SPEECH RECOGNITION FOR GLOBALPHONE LANGUAGES**

Tachbelie, Martha Yifiru, University of Bremen, Germany
Abulimiti, Ayimunishagu, University of Bremen, Germany
Abate, Solomon Teferra, University of Bremen, Germany
Schultz, Tanja, University of Bremen, Germany

**HLT-P5.10: DEEP NEURAL NETWORKS BASED AUTOMATIC SPEECH RECOGNITION FOR FOUR ETHIOPIAN LANGUAGES**

Abate, Solomon Teferra, University of Bremen, Germany
Tachbelie, Martha Yifiru, University of Bremen, Germany
Schultz, Tanja, University of Bremen, Germany

**HLT-P5.11: IMPROVING THE PERFORMANCE OF TRANSFORMER BASED LOW RESOURCE SPEECH RECOGNITION FOR INDIAN LANGUAGES**

M. Shetty, Vishwas, Indian Institute of Technology Madras, India
Sagaya Mary NJ, Metilda, Indian Institute of Technology Madras, India
Umesh, Srinivasan, Indian Institute of Technology Madras, India

**HLT-P5.12: IMPROVING LANGUAGE IDENTIFICATION FOR MULTILINGUAL SPEAKERS**

Titus, Andrew, Apple, United States
Silovsky, Jan, Apple, United States
Chen, Nanxin, Apple and Johns Hopkins University, United States
Hsiao, Roger, Apple,
Industry DSP

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**IDSP-L1 - Signal Processing for Emerging Industry Applications**

**IDSP-L1.1: FAST START-UP ALGORITHM FOR ADAPTIVE NOISE CANCELLERS WITH NOVEL SNR ESTIMATION AND STEPSIZE CONTROL**
Sugiyama, Akihiko, Yahoo Japan Corporation, Japan

**IDSP-L1.2: ROBUST AND COMPUTATIONALLY-EFFICIENT ANOMALY DETECTION USING POWERS-OF-TWO NETWORKS**
Muneeb, Usama, University of Illinois at Chicago, United States Koyuncu, Erdem, University of Illinois at Chicago, United States Keshtkarjahromi, Yasaman, Seagate Technology LLC, United States Seferoglu, Hulya, University of Illinois at Chicago, United States Erden, Mehmet Fatih, Seagate Technology LLC, United States Cetin, Ahmet Enis, University of Illinois at Chicago, United States

**IDSP-L1.3: SEMI-SUPERVISED OPTIMAL TRANSPORT METHODS FOR DETECTING ANOMALIES**
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Sim, Khe Chai, Google, United States
Zadrazil, Petr, Google, United States
Kabel, Andreas, Google, United States
Beaufays, Francoise, Google, United States
Motta, Giovanni, Google, United States

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Cui, Xiaodong, IBM, United States
Kayi, Abdullah, IBM, United States
Liu, Mingrui, University of Iowa, United States
Finkler, Ulrich, IBM, United States
Kingsbury, Brian, IBM, United States
Saon, George, IBM, United States
Mroueh, Youssef, IBM, United States
Buyuktosunoglu, Alper, IBM, United States
Das, Payel, IBM, United States
Kung, David, IBM, United States
Picheny, Michael, IBM, United States

**IDSP-L2.3: PARALLELIZING ADAM OPTIMIZER WITH BLOCKWISE MODEL-UPDATE FILTERING**

Chen, Kai, Microsoft Research Asia, China
Ding, Haisong, University of Science and Technology of China, China
Huo, Qiang, Microsoft Research Asia, China
IDSP-P1 - Emerging Signal Processing Applications

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Togami, Masahito, LINE Corporation, Japan

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IDSP-P1.5: MULTICHANNEL SIGNAL PROCESSING FOR ROAD SURFACE IDENTIFICATION
Safont, Gonzalo, Universitat Politècnica de València, Spain Salazar, Addisson, Universitat Politècnica de València, Spain Rodriguez, Alberto, Universidad Miguel Hernández de Elche, Spain Vergara, Luis, Universitat Politècnica de València, Spain

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IDSP-P1.7: STOCHASTIC GEOMETRY PLANNING OF ELECTRIC VEHICLES CHARGING STATIONS
Atat, Rachad, Texas A&M University at Qatar, Qatar Ismail, Muhammad, Tennessee Technological University, United States Serpedin, Erchin, Texas A&M University at Qatar, Qatar

**IDSP-P1.8: DISCRIMINANT GENERATIVE ADVERSARIAL NETWORKS WITH ITS APPLICATION TO EQUIPMENT HEALTH CLASSIFICATION**

Zheng, Shuai, Hitachi America Ltd, United States Gupta, Chetan, Hitachi America Ltd, United States

**IDSP-P1.9: POWER OPTIMIZATION USING EMBEDDED AUTOMATIC GAIN CONTROL ALGORITHM WITH PHOTOPLETHYSMOGRAPHY SIGNAL QUALITY CLASSIFICATION**

Foroozan, Foroohar, Analog Devices, Inc., United States Xue, Di, Analog Devices, Inc., Canada Fang, Ken, Analog Devices, Inc., Canada Wu, James, University of Toronto, Canada

**IDSP-P1.10: A GENERAL DIFFICULTY CONTROL ALGORITHM FOR PROOF-OF-WORK BASED BLOCKCHAINS**

Zhang, Shulai, Shanghai Jiao Tong University, China Ma, Xiaoli, Georgia Institute of Technology, United States

**IDSP-P1.11: A NEW APPLICATION OF ULTRASOUND SIGNAL PROCESSING FOR ARCHAEOLOGICAL CERAMIC CLASSIFICATION**

Salazar, Addisson, Universitat Politècnica de València, Spain Safont, Gonzalo, Universitat Politècnica de València, Spain Vergara, Luis, Universitat Politècnica de València, Spain
Information Forensics and Security

Tuesday, 5 May, 16:30 - 18:30

**IFS-L1 - Multimedia Forensics**

**IFS-L1.1: STEGANOGRAPHY AND ITS DETECTION IN JPEG IMAGES OBTAINED WITH THE “TRUNC” QUANTIZER**
Butora, Jan, Binghamton University, United States Fridrich, Jessica, Binghamton University, United States

**IFS-L1.2: JPEG STEGANOGRAPHY WITH SIDE INFORMATION FROM THE PROCESSING PIPELINE**
Giboulot, Quentin, Troyes University of Technology, France Cogranne, Rémi, Troyes University of Technology, France Bas, Patrick, French National Centre for Scientific Research (CNRS), France

**IFS-L1.3: SELECTION-CHANNEL-AWARE REVERSE JPEG COMPATIBILITY FOR HIGHLY RELIABLE STEGANALYSIS OF JPEG IMAGES**
Cogranne, Rémi, Troyes University of Technology, France

**IFS-L1.4: EMET: EMBEDDINGS FROM MULTILINGUAL-ENCODER TRANSFORMER FOR FAKE NEWS DETECTION**
Schwarz, Stephane, University of Campinas, Brazil Theóphilo, Antônio, University of Campinas, Brazil Rocha, Anderson, University of Campinas, Brazil

**IFS-L1.5: DEPTH MAP FINGERPRINTING AND SPlicing DETECTION**

**IFS-L1.6: A FRAMEWORK FOR PARAMETERS ESTIMATION OF IMAGE OPERATOR CHAIN**
Liao, Xin, Hunan University, China Huang, Zihang, Hunan University, China
IFS-L2 - Privacy, Biometrics and Information Security

**IFS-L2.1: PRIVACY-PRESERVING PHISHING WEB PAGE CLASSIFICATION VIA FULLY HOMOMORPHIC ENCRYPTION**

Chou, Edward, Stanford University, United States
Gururajan, Arun, Microsoft Corporation, United States
Laine, Kim, Microsoft Corporation, United States
Goel, Nitin Kumar, Microsoft Corporation, United States
Bertiger, Anna, Microsoft Corporation, United States
Stokes, Jack W., Microsoft Corporation, United States

**IFS-L2.2: PRIVACY-PRESERVING IMAGE SHARING VIA SPARSIFYING LAYERS ON CONVOLUTIONAL GROUPS**

Ferdowsi, Sohrab, University of Geneva, Switzerland
Razeghi, Behrooz, University of Geneva, United States
Holotyak, Taras, University of Geneva, Switzerland
Calmon, Flavio, Harvard University, Switzerland
Voloshynovskiy, Slava, University of Geneva, Switzerland

**IFS-L2.3: EVALUATING VOICE CONVERSION-BASED PRIVACY PROTECTION AGAINST INFORMED ATTACKERS**

Srivastava, Brij Mohan Lal, Inria, France
Vauquier, Nathalie, Inria, France
Sahidullah, Md, Inria, France
Bellel, Aurélien, Inria, France
Tommasi, Marc, Université de Lille, France
Vincent, Emmanuel, Inria, France

**IFS-L2.4: LOW-COMPLEXITY AND RELIABLE TRANSFORMS FOR PHYSICAL UNCLONABLE FUNCTIONS**

Günlü, Onur, Technische Universität Berlin, Germany
Schaefer, Rafael F., Technische Universität Berlin, Germany

**IFS-L2.5: ADVERSARIAL DETECTION OF COUNTERFEITED PRINTABLE GRAPHICAL CODES: TOWARDS “ADVERSARIAL GAMES” IN PHYSICAL WORLD**

Taran, Olga, University of Geneva, Switzerland
Bonev, Slavi, University of Geneva, Switzerland
Holotyak, Taras, University of Geneva, Switzerland
Voloshynovskiy, Slava, University of Geneva, Switzerland

**IFS-L2.6: PHYLOGENETIC MINIMUM SPANNING TREE RECONSTRUCTION USING AUTOENCODERS**

Castelletto, Riccardo, University of Padova, Italy
Milani, Simone, University of Padova, Italy
Bestagini, Paolo, Politecnico di Milano, Italy
IFS-P1.1: FCEM: A NOVEL FAST CORRELATION EXTRACT MODEL FOR REAL TIME STEGANALYSIS OF VOIP STREAM VIA MULTI-HEAD ATTENTION
Yang, Hao, Tsinghua University, China
Yang, ZhongLiang, Tsinghua University, China
Bao, Yongjian, Tsinghua University, China
Liu, Sheng, Tsinghua University, China
Huang, YongFeng, Tsinghua University, China

IFS-P1.2: APPROACHING OPTIMAL EMBEDDING IN AUDIO STEGANOGRAPHY WITH GAN
Yang, Jianhua, School of Data and Computer Science, Sun Yat-Sen University, Guangzhou, China
Zheng, Huilin, School of Data and Computer Science, Sun Yat-Sen University, Guangzhou, China
Kang, Xiangui, School of Data and Computer Science, Sun Yat-Sen University, Guangzhou, China
Shi, Yun-Qing, New Jersey Institute of Technology, United States

IFS-P1.3: MULTI-STAGE RESIDUAL HIDING FOR IMAGE-INTO-AUDIO STEGANOGRAPHY
Cui, Wenxue, Harbin Institute of Technology, China
Liu, Shaohui, Harbin Institute of Technology, China
Jiang, Feng, Harbin Institute of Technology, China
Yongliang, Alibaba Group, China
Zhao, Debin, Harbin Institute of Technology, China

IFS-P1.4: PATCH-LEVEL SELECTION AND BREADTH-FIRST PREDICTION STRATEGY FOR REVERSIBLE DATA HIDING
Wu, Hanzhou, Shanghai University, China

IFS-P1.5: DIGITAL WATERMARKING FOR PROTECTING AUDIO CLASSIFICATION DATASETS
Kim, Wansoo, Seoul National University, Korea (South)
Lee, Kyogu, Seoul National University, Korea (South)

IFS-P1.6: SALIENCY-BASED IMAGE CONTRAST ENHANCEMENT WITH REVERSIBLE DATA HIDING
Yang, Shilong, South China University of Technology, China

IFS-P1.7: UNSEEN FACE PRESENTATION ATTACK DETECTION WITH HYPERSONE LOSS
Li, Zhi, Nanyang Technological University, Singapore
Li, Haoliang, Nanyang Technological University, Singapore
Lam, Kwok-Yan, Nanyang Technological University, Singapore
IFS-P1.8: TEXCEPTION: A CHARACTER/WORD-LEVEL DEEP LEARNING MODEL FOR PHISHING URL DETECTION
Tajaddodianfar, Farid, Microsoft, United States Stokes, Jack W., Microsoft, United States Gururajan, Arun, Microsoft, United States

IFS-P1.9: CELL-PHONE CLASSIFICATION: A CONVOLUTIONAL NEURAL NETWORK APPROACH EXPLOITING ELECTROMAGNETIC EMANATIONS
Yilmaz, Baki Berkay, Georgia Institute of Technology, United States Ugurlu, Elvan Mert, Georgia Institute of Technology, United States Prvulovic, Milos, Georgia Institute of Technology, United States Zajic, Alenka, Georgia Institute of Technology, United States

IFS-P1.10: QUALITY-OF-SERVICE PREDICTION FOR PHYSICAL-LAYER SECURITY VIA SECRECY MAPS
Gutierrez-Estevez, Miguel A., Fraunhofer Heinrich Hertz Institute, Germany Utkovski, Zoran, Fraunhofer Heinrich Hertz Institute, Germany Agostini, Patrick, Fraunhofer Heinrich Hertz Institute, Germany Schäufele, Daniel, Fraunhofer Heinrich Hertz Institute, Germany Frey, Matthias, Technische Universität Berlin, Germany Bjelakovic, Igor, Technische Universität Berlin, Germany Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute, Germany

IFS-P1.11: SECURE IDENTIFICATION FOR GAUSSIAN CHANNELS
Labidi, Wafa, Technische Universität München, Germany Deppe, Christian, Technische Universität München, Germany Boche, Holger, Technische Universität München, Germany
IFS-P2 - Anonymization, Security and Privacy

**IFS-P2.1: ANTI-JAMMING ROUTING FOR INTERNET OF SATELLITES: A REINFORCEMENT LEARNING APPROACH**

Han, Chen, Army Engineering University, China Liu, Aijun, Army Engineering University, China Huo, Liangyu, Beihang University, China Wang, Haichao, Army Engineering University, China Liang, Xiaohu, Army Engineering University, China

**IFS-P2.2: ELECTRO-MAGNETIC SIDE-CHANNEL ATTACK THROUGH LEARNED DENOISING AND CLASSIFICATION**

Lemarchand, Florian, Institut d'Eléctronique et de Télécommunications de Rennes, France Marlin, Cyril, DGA-MI, France Montreuil, Florent, DGA-MI, France Nogues, Erwan, DGA-MI, France Pelcat, Maxime, Institut d'Eléctronique et de Télécommunications de Rennes, France

**IFS-P2.3: DETECTION OF MALICIOUS VBSCRIPT USING STATIC AND DYNAMIC ANALYSIS WITH RECURRENT DEEP LEARNING**

Stokes, Jack W., Microsoft Corporation, United States Agrawal, Rakshit, University of California, Santa Cruz, United States McDonald, Geoff, Microsoft Corporation, Canada

**IFS-P2.4: DYNAMIC ATTACK SCORING USING DISTRIBUTED LOCAL DETECTORS**

Zohrevand, Zahra, Simon Fraser University, Canada Glässer, Uwe, Simon Fraser University, Canada

**IFS-P2.5: HIJACKING TRACKER: A POWERFUL ADVERSARIAL ATTACK ON VISUAL TRACKING**

Yan, Xiyu, Tsinghua University, China Chen, Xuesong, Shenzhen Graduate School of Peking University, China Jiang, Yong, Tsinghua University, China Xia, Shu-Tao, Tsinghua University, China Zhao, Yong, Shenzhen Graduate School of Peking University, China Zheng, Feng, Southern University of Science and Technology, China

**IFS-P2.6: ADVMS: A MULTI-SOURCE MULTI-COST DEFENSE AGAINST ADVERSARIAL ATTACKS**

Wang, Xiao, Boston University, United States Wang, Siyue, Northeastern University, United States Chen, Pin-Yu, IBM Research, United States Lin, Xue, Northeastern University, United States Chin, Peter, Boston University, United States
IFS-P2.7: CLASSIFYING ANOMALIES FOR NETWORK SECURITY
Do, Emily, Massachusetts Institute Of Technology, United States Gadepally, Vijay, Lincoln Laboratory/Massachusetts Institute of Technology, United States

IFS-P2.8: A SWITCHING TRANSMISSION GAME WITH LATENCY AS THE USER’S COMMUNICATION UTILITY
Garnaev, Andrey, Rutgers University, United States Petropulu, Athina, Rutgers University, United States Trappe, Wade, Rutgers University, United States Poor, H. Vincent, Princeton University, United States

IFS-P2.9: AN EFFICIENT METHODOLOGY TO DE-ANONYMIZE THE 5G-NEW RADIO PHYSICAL DOWNLINK CONTROL CHANNEL
Gardner, Benjamin, Naval Postgraduate School, United States Roth, John, Naval Postgraduate School, United States

IFS-P2.10: JOINT LEARNING OF ASSIGNMENT AND REPRESENTATION FOR BIOMETRIC GROUP MEMBERSHIP
Gheisari, Marzieh, Inria, France Furon, Teddy, Inria, France Amsaleg, Laurent, IRISA, France

IFS-P2.11: PRIVATE FL-GAN: DIFFERENTIAL PRIVACY SYNTHETIC DATA GENERATION BASED ON FEDERATED LEARNING
Xin, Bangzhou, University of Science and Technology of China, China Yang, Wei, University of Science and Technology of China, China Geng, Yangyang, University of Science and Technology of China, China Chen, Sheng, University of Science and Technology of China, China Wang, Shaowei, Tencent Games, China Huang, Liusheng, University of Science and Technology of China, China
IFS-P3.1: AUGMENTATION DATA SYNTHESIS VIA GANS: BOOSTING LATENT FINGERPRINT RECONSTRUCTION
Xu, Ying, Tsinghua University, China
Wang, Yi, Chinese University of Hong Kong, China
Liang, Jiajun, Megvii Technology, China
Jiang, Yong, Tsinghua University, China

IFS-P3.2: LEARNING TO FOOL THE SPEAKER RECOGNITION
Li, Jiguo, Chinese Academy of Sciences, China
Zhang, Xinfeng, Chinese Academy of Sciences, China
Jia, Chuanmin, Peking University, China
Xu, Jizheng, ByteDance, China
Zhang, Li, ByteDance, United States
Wang, Yue, ByteDance, China
Ma, Siwei, Peking University, China

IFS-P3.3: TS-FEN: PROBING FEATURE SELECTION STRATEGY FOR FACE ANTI-SPOOFING
Peng, Dongmei, Wuhan University, China
Xiao, Jing, Wuhan University, China
Zhu, Rong, Wuhan University, China
Gao, Ge, Wuhan University, China

IFS-P3.4: IMPROVING CROSS-DATASET PERFORMANCE OF FACE PRESENTATION ATTACK DETECTION SYSTEMS USING FACE RECOGNITION DATASETS
Mohammadi, Amir, Idiap Research Institute, Switzerland
Bhattacharjee, Sushil, Idiap Research Institute, Switzerland
Marcel, Sebastien, Idiap Research Institute, Switzerland

IFS-P3.5: SSTNET: DETECTING MANIPULATED FACES THROUGH SPATIAL, STEGANALYSIS AND TEMPORAL FEATURES
Wu, Xi, Alibaba Group, China
Xie, Zhen, Alibaba Group, China
Gao, YuTao, Alibaba Group, China
Xiao, Yu, Alibaba Group, China

IFS-P3.6: MULTIMODAL VIOLENCE DETECTION IN VIDEOS
Peixoto, Bruno, University of Campinas, Brazil
Lavi, Bahram, University of Campinas, Brazil
Bestagini, Paolo, Politecnico di Milano, Italy
Dias, Zanoni, University of Campinas, Brazil
Rocha, Anderson, University of Campinas, Brazil

IFS-P3.7: OPEN SET VIDEO CAMERA MODEL VERIFICATION
Mayer, Owen, Drexel University, United States
Hosler, Brian, Drexel University, United States
Stamm, Matthew, Drexel University, United States
IFS-P3.8: MULTI-PATCH AGGREGATION MODELS FOR RESAMPLING DETECTION
Lamba, Mohit, Indian Institute of Technology Madras, India Mitra, Kaushik, Indian Institute of Technology Madras, India

IFS-P3.9: IMPROVING THE CHRONOLOGICAL SORTING OF IMAGES THROUGH OCCLUSION: A STUDY ON THE NOTRE-DAME CATHEDRAL FIRE
Padilha, Rafael, University of Campinas, Brazil Alcântara Andaló, Fernanda, University of Campinas, Brazil Rocha, Anderson, University of Campinas, Brazil

IFS-P3.10: EFFECTIVENESS OF RANDOM DEEP FEATURE SELECTION FOR SECURING IMAGE MANIPULATION DETECTORS AGAINST ADVERSARIAL EXAMPLES
Barni, Mauro, University of Siena, Italy Nowroozi, Ehsan, University of Siena, Italy Tondi, Benedetta, University of Siena, Italy Zhang, Bowen, Xidian University, China

IFS-P3.11: A DENSE U-NET WITH CROSS-LAYER INTERSECTION FOR DETECTION AND LOCALIZATION OF IMAGE FORGERY
Zhang, Rongyu, Sun Yat-Sen University, China Ni, Jiangqun, Sun Yat-Sen University, China
Signal Processing for Internet of Things

Thursday, 7 May, 11:30 - 13:30

IOT-P1 - Internet of Things

IOT-P1.1: INFORMATION FLOW OPTIMIZATION IN INFERENCE NETWORKS
Deshmukh, Aditya, University of Illinois at Urbana–Champaign, United States
Liu, Jing, University of Illinois at Urbana–Champaign, Veeravalli, Venugopal, University of Illinois at Urbana–Champaign, United States
Verma, Gunjan, U.S. Army Research Laboratory, United States

IOT-P1.2: EXPLOITING TWO-DIMENSIONAL SYMMETRY AND UNIMODALITY FOR MODEL-FREE SOURCE LOCALIZATION IN HARSH ENVIRONMENT
Chen, Junting, Chinese University of Hong Kong, Shenzhen, China

IOT-P1.3: UNCERTAINTY QUANTIFICATION FOR REMAINING USEFUL LIFETIME PREDICTION WITH MULTI-CHANNEL SENSORY DATA
Deng, Yingjun, Tianjin University, China
Wu, Huaming, Tianjin University, China
Jiang, Chao, Research Institute of Physical & Chemical Engineering of Nuclear Industry, China

IOT-P1.4: VIMO: VITAL SIGN MONITORING USING COMMODITY MILLIMETER WAVE RADIO
Wang, Fengyu, University of Maryland, College Park, United States
Zhang, Feng, University of Maryland, College Park, United States
Wu, Chenshu, University of Maryland, College Park, United States
Wang, Beibei, University of Maryland, College Park, United States
Liu, K. J. Ray, University of Maryland, College Park, United States

IOT-P1.5: TIME REVERSAL BASED ROBUST GESTURE RECOGNITION USING WIFI
Regani, Sai Deepika, University of Maryland, College Park, United States
Wang, Beibei, University of Maryland, College Park, United States
Wu, Min, University of Maryland, College Park, United States
Liu, K. J. Ray, University of Maryland, College Park, United States
IOT-P1.6: NONCOHERENT MAXIMUM-LIKELIHOOD DETECTION FOR AMBIENT BACKSCATTERING COMMUNICATIONS OVER AMBIENT OFDM SIGNALS
Darsena, Donatella, University of Naples Parthenope, Italy

IOT-P1.7: BANDIT SAMPLING FOR FASTER ACTIVITY AND DATA DETECTION IN MASSIVE RANDOM ACCESS
Dong, Jialin, ShanghaiTech University and Hong Kong Polytechnic University, China
Zhang, Jun, Hong Kong Polytechnic University, Hong Kong SAR of China
Shi, Yuanming, ShanghaiTech University, China

IOT-P1.8: CONSENSUS-BASED DISTRIBUTED CLUSTERING FOR IOT
Chen, Hui, Tongji University, China
Yu, Hao, Tongji University, China
Zhao, Shengjie, Tongji University, China
Shi, Qingjiang, Tongji University, China

IOT-P1.9: ENERGY-EFFICIENT 3D UAV TRAJECTORY DESIGN FOR DATA COLLECTION IN WIRELESS SENSOR NETWORKS
Bonilla Licea, Daniel, International University of Rabat, Morocco
Nurellari, Edmond, University of Lincoln, United Kingdom
Ghogho, Mounir, International University of Rabat, United Kingdom

IOT-P1.10: APPLICATION INFORMED MOTION SIGNAL PROCESSING FOR FINGER MOTION TRACKING USING WEARABLE SENSORS
Liu, Yilin, Pennsylvania State University, United States
Jiang, Fengyang, Pennsylvania State University, United States
Gowda, Mahanth, Pennsylvania State University, United States

IOT-P1.11: INSTANT ADAPTIVE LEARNING: AN ADAPTIVE FILTER BASED FAST LEARNING MODEL CONSTRUCTION FOR SENSOR SIGNAL TIME SERIES CLASSIFICATION ON EDGE DEVICES
Pal, Arpan, Tata Consultancy Services, India
Ukil, Arijit, Tata Consultancy Services, India
Deb, Trisrota, Tata Consultancy Services, India
Sahu, Ishan, Tata Consultancy Services, India
Majumdar, Angshul, Indraprastha Institute of Information Technology Delhi, India
Image, Video, and Multidimensional Signal Processing

Tuesday, 5 May, 11:30 - 13:30

**IVMSP-L1 - Inverse Problems in Image/Video Processing I**

**IVMSP-L1.1: SHAPE FROM BANDWIDTH: CENTRAL PROJECTION CASE**  
Elhami, Golnoosh, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland  
Scholefield, Adam, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland  
Vetterli, Martin, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

**IVMSP-L1.2: SEQUENTIAL DEEP UNROLLING WITH FLOW PRIORS FOR ROBUST VIDEO DERAINING**  
Xue, Xinwei, Dalian University of Technology, China  
Ding, Ying, Dalian University of Technology, China  
Mu, Pan, Dalian University of Technology, China  
Ma, Long, Dalian University of Technology, China  
Liu, Risheng, Dalian University of Technology, China

**IVMSP-L1.3: A FAST AND ACCURATE SUPER-RESOLUTION NETWORK USING PROGRESSIVE RESIDUAL LEARNING**  
Liu, Hong, Peking University Shenzhen Graduate School, China  
Lu, Zhisheng, Peking University Shenzhen Graduate School, China  
Shi, Wei, Peking University Shenzhen Graduate School, China  
Tu, Juanhui, Tencent, China

**IVMSP-L1.4: REV-AE: A LEARNED FRAME SET FOR IMAGE RECONSTRUCTION**  
Li, Shaohui, Shanghai Jiao Tong University, China  
Zheng, Ziyang, Shanghai Jiao Tong University, China  
Dai, Wenrui, Shanghai Jiao Tong University, China  
Zou, Junni, Shanghai Jiao Tong University, China  
Xiong, Hongkai, Shanghai Jiao Tong University, China

**IVMSP-L1.5: DECOMPOSED CYCLEGAN FOR SINGLE IMAGE DERAINING WITH UNPAIRED DATA**  
Han, Kewen, Nanjing University of Science and Technology, China  
Xiang, Xinguang, Nanjing University of Science and Technology, China

**IVMSP-L1.6: SLICENET: SLICE-WISE 3D SHAPES RECONSTRUCTION FROM SINGLE IMAGE**
Wu, Yunjie, Nanjing University, China Sun, Zhengxing, Nanjing University, China Song, Youcheng, Nanjing University, China Sun, Yunhan, Jiangsu University of Science and Technology, China Shi, Jinlong, Jiangsu University of Science and Technology, China
Wednesday, 6 May, 11:30 - 13:30

IVMSP-L2 - Image/Video Analysis II

IVMSP-L2.1: SIGHT TO SOUND: AN END-TO-END APPROACH FOR VISUAL PIANO TRANSCRIPTION
Koepke, A. Sophia, University of Oxford, United Kingdom Wiles, Olivia, University of Oxford, United Kingdom Moses, Yael, The Interdisciplinary Centre, Israel Zisserman, Andrew, University of Oxford, United Kingdom

IVMSP-L2.2: EXOCENTRIC TO EGOCENTRIC IMAGE GENERATION VIA PARALLEL GENERATIVE ADVERSARIAL NETWORK
Liu, Gaowen, Texas State University, United States Tang, Hao, University of Trento, Italy Latapie, Hugo, Cisco, United States Yan, Yan, Texas State University, United States

IVMSP-L2.3: FOCUS ON SEMANTIC CONSISTENCY FOR CROSS-DOMAIN CROWD UNDERSTANDING
Han, Tao, Northwestern Polytechnical University, China Gao, Junyu, Northwestern Polytechnical University, China Yuan, Yuan, Northwestern Polytechnical University, China Wang, Qi, Northwestern Polytechnical University, China

IVMSP-L2.4: IMPROVED REAL-TIME VISUAL TRACKING VIA ADVERSARIAL LEARNING
Zhong, Haoxiang, Tsinghua University, China Yan, Xiyu, Tsinghua University, China Jiang, Yong, Tsinghua University, China Xia, Shu-Tao, Tsinghua University, China

IVMSP-L2.5: SPATIAL-TEMPORAL FEATURE AGGREGATION NETWORK FOR VIDEO OBJECT DETECTION
Chen, Zhu, University of Science and Technology of China, China Li, Weihai, University of Science and Technology of China, China Fei, Chi, University of Science and Technology of China, China Liu, Bin, University of Science and Technology of China, China Yu, Nenghai, University of Science and Technology of China, China
IVMSP-L3 - Image Emerging Topics

IVMSP-L3.1: USING PANORAMIC VIDEOS FOR MULTI-PERSON LOCALIZATION AND TRACKING IN A 3D PANORAMIC COORDINATE
Yang, Fan, RIKEN, Center for Advanced Intelligence Project (AIP) & NARA Institute of Science and Technology, Japan
Li, Feiran, Osaka University, Japan
Wu, Yang, Kyoto University, Japan
Sakti, Sakriani, RIKEN, Center for Advanced Intelligence Project (AIP) & NARA Institute of Science and Technology, Japan
Nakamura, Satoshi, RIKEN, Center for Advanced Intelligence Project (AIP) & NARA Institute of Science and Technology, Japan

IVMSP-L3.2: POSITION CONSTRAINT LOSS FOR FASHION LANDMARK ESTIMATION
Liu, Hong, Peking University Shenzhen Graduate School, China
Song, Meijia, Peking University Shenzhen Graduate School, China
Shi, Wei, Peking University Shenzhen Graduate School, China
Li, Xia, Peking University Shenzhen Graduate School, China

IVMSP-L3.3: RECEPTIVE FIELD PYRAMID NETWORK FOR OBJECT DETECTION
Wu, Faming, Sun Yat-Sen University, China
Ma, Andy J, Sun Yat-Sen University, China
Pan, Yangshan, Sun Yat-Sen University, China
Gao, Yuan, Sun Yat-Sen University, China
Yan, Xiaowei, Sun Yat-Sen University, China

IVMSP-L3.4: ROBUST VISUAL TRACKING WITH CONTEXT-BASED ACTIVE OCCLUSION RECOGNITION
Gu, Yueyang, Shanghai Jiao Tong University, China
Qiao, Yu, Shanghai Jiao Tong University, China
Xu, Kuan, Shanghai Jiao Tong University, China
Fang, Xingqi, Shanghai Jiao Tong University, China

IVMSP-L3.5: LEVERAGING ORDINAL REGRESSION WITH SOFT LABELS FOR 3D HEAD POSE ESTIMATION FROM POINT SETS
Xiao, Shihua, University of Electronic Science and Technology of China, China
Sang, Nan, University of Electronic Science and Technology of China, China
Wang, Xupeng, University of Electronic Science and Technology of China, China
Ma, Xiangtian, University of Electronic Science and Technology of China, China
Wednesday, 6 May, 16:30 - 18:30

**IVMSP-L4 - Machine Learning For Image/Video Processing III**

**IVMSP-L4.1: SOLVING MISSING-ANNOTATION OBJECT DETECTION WITH BACKGROUND RECALIBRATION LOSS**
Zhang, Han, Carnegie Mellon University, United States
Chen, Fangyi, Carnegie Mellon University, United States
Shen, Zhiqiang, Carnegie Mellon University, United States
Hao, Qiqi, Beihang University, China
Zhu, Chenchen, Carnegie Mellon University, United States
Savvides, Marios, Carnegie Mellon University, United States

**IVMSP-L4.2: FACE FEATURE RECOVERY VIA TEMPORAL FUSION FOR PERSON SEARCH**
Fan, Cheng-Yu, National Taiwan University, Taiwan
Liu, Chao-Peng, National Taiwan University, Taiwan
Wang, Kuan-Chun, National Taiwan University, Taiwan
Jhan, Jiun-Hao, National Taiwan University, Taiwan
Wang, Yu-Chiang Frank, National Taiwan University, Taiwan
Chen, Jun-Cheng, Academia Sinica, Taiwan

**IVMSP-L4.3: EDGEFOOL: AN ADVERSARIAL IMAGE ENHANCEMENT FILTER**
Shahin Shamsabadi, Ali, Queen Mary University of London, United Kingdom
Oh, Changjae, Queen Mary University of London, United Kingdom
Cavallaro, Andrea, Queen Mary University of London, United Kingdom

**IVMSP-L4.4: FACIAL FEATURE EMBEDDED CYCLEGAN FOR VIS-NIR TRANSLATION**
Wang, Huijiao, Wuhan University, China
Zhang, Haijian, Wuhan University, China
Yu, Lei, Wuhan University, China
Wang, Li, Agency for Science, Technology and Research (A*STAR), Singapore
Yang, Xulei, Agency for Science, Technology and Research (A*STAR), Singapore

**IVMSP-L4.5: DEEP IMAGE DEBLURRING USING LOCAL CORRELATION BLOCK**
Su, Wei, Northwestern Polytechnical University, China
Yuan, Yuan, Northwestern Polytechnical University, China
Wang, Qi, Northwestern Polytechnical University, China

**IVMSP-L4.6: GLOBAL STRUCTURE GRAPH GUIDED FINE-GRAINED VEHICLE RECOGNITION**
Wang, Chuanming, Beijing University of Posts and Telecommunications, China
Fu, Huiyuan, Beijing University of Posts and Telecommunications, China
Ma, Huadong, Beijing University of Posts and Telecommunications, China
Thursday, 7 May, 11:30 - 13:30

**IVMSP-L5 - Image/Video Storage, and Retrieval**

**IVMSP-L5.1: TRIPLET LOSS FEATURE AGGREGATION FOR SCALABLE HASH**
Jia, Wei, University of Missouri Kansas City, United States
Li, Li, University of Missouri Kansas City, United States
Zhu, University of Missouri Kansas City, United States
Zhao, Shuai, Tencent, United States
Liu, Shan, Tencent, United States

**IVMSP-L5.2: HDMFH: HYPERGRAPH BASED DISCRETE MATRIX FACTORIZATION HASHING FOR MULTIMODAL RETRIEVAL**
Gao, Jing, Dalian University of Technology, China
Zhang, Wenjun, Dalian University of Technology, China
Chen, Zhikui, Dalian University of Technology, China
Zhong, Fangming, Dalian University of Technology, China

**IVMSP-L5.3: MULTI-SCALE DEEP FEATURE FUSION FOR VEHICLE RE-IDENTIFICATION**
Cheng, Yiting, Fudan University, China
Zhang, Chuanfa, Fudan University, China
Gu, Kangzheng, Fudan University, China
Qi, Lizhe, Fudan University, China
Gan, Zhongxue, Fudan University, China
Zhong, Wenqiang, Fudan University, China

**IVMSP-L5.4: CROWDSOURCING-BASED RANKING AGGREGATION FOR PERSON RE-IDENTIFICATION**
Yu, Yinxue, Wuhan University, China
Liang, Chao, Wuhan University, China
Ruan, Weijian, Wuhan University, China
Jiang, Longxiang, Wuhan University, China

**IVMSP-L5.5: DEEP MULTI-REGION HASHING**
Zhou, Quan, Shandong University, China
Nie, Xiushan, Shandong Jianzhu University, China
Shi, Yang, Shandong University, China
Liu, Xingbo, Shandong University, China
Yin, Yilong, Shandong University, China

**IVMSP-L5.6: SEMANTIC AUGMENTATION HASHING FOR ZERO-SHOT IMAGE RETRIEVAL**
Zhong, Fangming, Dalian University of Technology, China
Chen, Zhikui, Dalian University of Technology, China
Min, Geyong, University of Exeter, United Kingdom
Xia, Feng, Dalian University of Technology, China
Friday, 8 May, 08:00 - 10:00

**IVMSP-L6 - Image/Video Synthesis, Rendering and Visualization**

**IVMSP-L6.1: END-TO-END GENERATION OF TALKING FACES FROM NOISY SPEECH**

Eskimez, Sefik Emre, University of Rochester, United States Maddox, Ross K., University of Rochester, United States Xu, Chenliang, University of Rochester, United States Duan, Zhiyao, University of Rochester, United States

**IVMSP-L6.2: UNSUPERVISED IMAGE-TO-IMAGE TRANSLATION VIA FAIR REPRESENTATION OF GENDER BIAS**

Hwang, Sunhee, Yonsei University, Korea (South) Byun, Hyeran, Yonsei University, Korea (South)

**IVMSP-L6.3: VIDEO FRAME INTERPOLATION VIA EXCEPTIONAL MOTION-AWARE SYNTHESIS**

Park, Minho, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Lee, Sangmin, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Ro, Yong Man, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

**IVMSP-L6.4: LOOK GLOBALLY, AGE LOCALLY: FACE AGING WITH AN ATTENTION MECHANISM**

Zhu, Haiping, School of Computer Science, Fudan University, China Huang, Zhizhong, School of Computer Science, Fudan University, China Shan, Hongming, School of Computer Science, Fudan University, China Zhang, Junping, School of Computer Science, Fudan University, China

**IVMSP-L6.5: DESIGN-GAN: CROSS-CATEGORY FASHION TRANSLATION DRIVEN BY LANDMARK ATTENTION**

Lang, Yining, Alibaba and Beijing Institute of Technology, China He, Yuan, Alibaba, China Dong, Jianfeng, Zhejiang Gongshang University and Alibaba-Zhejiang University Joint Institute of Frontier Technologies, China Yang, Fan, Alibaba, China Xue, Hui, Alibaba, China

**IVMSP-L6.6: INTENSITY-IMAGE RECONSTRUCTION FOR EVENT CAMERAS USING CONVOLUTIONAL NEURAL NETWORK**

Chen, Yongwei, Peking University, China Chen, Weitong, Peking University, China Cao, Xixin, Peking University, China Hua, Qianting, Peking University, China
Friday, 8 May, 08:00 - 10:00

**IVMSP-L7 - Point Cloud and Depth Processing**

**IVMSP-L7.1: COLOUR COMPRESSION OF PLENOPTIC POINT CLOUDS USING RAHT-KLT WITH PRIOR COLOUR CLUSTERING AND SPECULAR/DIFFUSE COMPONENT SEPARATION**
Krivokuća, Maja, INRIA Rennes, France Guillemot, Christine, INRIA Rennes, France

**IVMSP-L7.2: SUPER-RESOLUTION OF 3D COLOR POINT CLOUDS VIA FAST GRAPH TOTAL VARIATION**
Dinesh, Chinthaka, Simon Fraser University, Canada Cheung, Gene, York University, Canada Bajić, Ivan V., Simon Fraser University, Canada

**IVMSP-L7.3: DEEP MONOCULAR VIDEO DEPTH ESTIMATION USING TEMPORAL ATTENTION**

**IVMSP-L7.4: ROBUST FULL-FOV DEPTH ESTIMATION IN TELE-WIDE CAMERA SYSTEM**
Guo, Kai, Samsung Electronics, Korea (South) Song, Seongwook, Samsung Electronics, Korea (South) Chang, Soonkeun, Samsung Electronics, Korea (South) Kim, Tae-ui, Samsung Electronics, Korea (South) Han, Seungmin, Samsung Electronics, Korea (South) Kim, Tae-ui, Samsung Electronics, Korea (South)

**IVMSP-L7.5: MANET: MULTI-SCALE AGGREGATED NETWORK FOR LIGHT FIELD DEPTH ESTIMATION**
Li, Yan, Université Libre De Bruxelles,, Belgium Zhang, Lu, INSA de Rennes, France Wang, Qiong, Zhejiang University of Technology, China Lafruit, Gauthier, Université Libre De Bruxelles, Belgium

**IVMSP-L7.6: EPI-NEIGHBORHOOD DISTRIBUTION BASED LIGHT FIELD DEPTH ESTIMATION**
Li, Junke, Tsinghua University, China Jin, Xin, Tsinghua University, China
**IVMSP-L8 - Multi-scale and Wavelet Processing**

**IVMSP-L8.1: STOCHASTIC MULTI-SCALE AGGREGATION NETWORK FOR CROWD COUNTING**

Wang, Mingjie, Memorial University of Newfoundland, University of Guelph, Canada
Cai, Hao, Memorial University of Newfoundland, University of Guelph, Canada
Zhou, Jun, Dalian University of Technology, China
Gong, Minglun, University of Guelph, Canada

**IVMSP-L8.2: MDR-SURV: A MULTI-SCALE DEEP LEARNING-BASED RADIOMICS FOR SURVIVAL PREDICTION IN PULMONARY MALIGNANCIES**

Afshar, Parnian, Concordia University, Canada
Oikonomou, Anastasia, University of Toronto, Canada
Plataniotis, Konstantinos N., University of Toronto, Canada
Mohammadi, Arash, Concordia University, Canada

**IVMSP-L8.3: LEARNING A GENERIC ADAPTIVE WAVELET SHRINKAGE FUNCTION FOR DENOISING**

Alt, Tobias, Saarland University, Germany
Weickert, Joachim, Saarland University, Germany

**IVMSP-L8.4: MULTI-SCALE RESIDUAL NETWORK FOR IMAGE CLASSIFICATION**

Zhong, Xian, Wuhan University of Technology, China
Gong, Ouobo, Wuhan University of Technology, China
Huang, Wenxin, Wuhan University, China
Yuan, Jingling, Wuhan University of Technology, China
Ma, Bo, University of Florida, United States
Liu, Ryan Wen, Wuhan University of Technology, China

**IVMSP-L8.5: DEEP MULTI-SCALE GABOR WAVELET NETWORK FOR IMAGE RESTORATION**

Dong, Hang, Xi’an Jiaotong University, China
Zhang, Xinyi, Xi’an Jiaotong University, China
Guo, Yu, Xi’an Jiaotong University, China
Wang, Fei, Xi’an Jiaotong University, China

**IVMSP-L8.6: RESIDUAL ATTENTION NETWORK FOR WAVELET DOMAIN SUPER-RESOLUTION**

Liu, Jing, School of Software Engineering, East China Normal University, China
Xie, Yuan, School of Software Engineering, East China Normal University, China
Song, Haichuan, School of Software Engineering, East China Normal University, China
Yuan, Wang, School of Software Engineering, East China Normal University, China
University, China Ma, Lizhuang, School of Software Engineering, East China Normal University, China
IVMSP-L9 - Image/Video Coding II

**IVMSP-L9.1: AN ADAPTIVE LINEAR ESTIMATOR BASED APPROACH TO BI-DIRECTIONAL MOTION COMPENSATED PREDICTION**

Li, Bohan, University of California, Santa Barbara, United States
Han, Jingning, Google LLC, United States
Rose, Kenneth, University of California, Santa Barbara, United States

**IVMSP-L9.2: SPHERICAL VIDEO CODING WITH GEOMETRY AND REGION ADAPTIVE TRANSFORM DOMAIN TEMPORAL PREDICTION**

Vishwanath, Bharath, University of California, Santa Barbara, United States
Rose, Kenneth, University of California, Santa Barbara, United States

**IVMSP-L9.3: VERSATILE VIDEO CODING AND SUPER-RESOLUTION FOR EFFICIENT DELIVERY OF 8K VIDEO WITH 4K BACKWARD-COMPATIBILITY**

Bonneau, Charles, IRT b<>com, France
Hamidouche, Wassim, Institut d'Electronique et de Télécommunications de Rennes / Institut Nationnal des Sciences Appliquées, France
Travers, Jean-François, TDF, France
Déforges, Olivier, Institut d'Electronique et de Télécommunications de Rennes / Institut Nationnal des Sciences Appliquées, France

**IVMSP-L9.4: ALTERNATIVE HALF-SAMPLE INTERPOLATION FILTERS FOR VERSATILE VIDEO CODING**

Henkel, Anastasia, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Zupancic, Ivan, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Bross, Benjamin, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Winken, Martin, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Schwarz, Heiko, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Marpe, Detlev, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany
Wiegand, Thomas, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany

**IVMSP-L9.5: JUST NOTICEABLE DISTORTION BASED PERCEPTUALLY LOSSLESS INTRA CODING**

Shen, Xuelin, City University of Hong Kong, Hong Kong SAR of China
Zhang, Xinfeng, University of Chinese Academy of Sciences, China
Wang, Shiqi, City University of Hong Kong, Hong Kong SAR of China
Kwong, Sam, City University of Hong Kong, Hong Kong SAR of China
Zhu, Guopu, Chinese Academy of Sciences, China
IVMSP-L9.6: EFFICIENT DEEP LEARNING-BASED LOSSY IMAGE COMPRESION VIA ASYMMETRIC AUTOENCODER AND PRUNING

Kim, Jun-Hyuk, Yonsei University, Korea (South) Choi, Jun-Ho, Yonsei University, Korea (South) Chang, Jaehyuk, NAVER WEBTOON Corp., Korea (South) Lee, Jong-Seok, Yonsei University, Korea (South)
IVMSP-L10 - Image/Video Processing III

**IVMSP-L10.1: DERIVING COMPACT FEATURE REPRESENTATIONS VIA ANNEALED CONTRACTION**

Shah, Muhammad, Carnegie Mellon University, United States
Raj, Bhiksha, Carnegie Mellon University, United States

**IVMSP-L10.2: FAST CLUSTERING WITH CO-CLUSTERING VIA DISCRETE NON-NEGATIVE MATRIX FACTORIZATION FOR IMAGE IDENTIFICATION**

Nie, Feiping, Northwestern Polytechnical University, China
Pei, Shenfei, Northwestern Polytechnical University, China
Wang, Rong, Northwestern Polytechnical University, China
Li, Xuelong, Northwestern Polytechnical University, China

**IVMSP-L10.3: COMPRESSIONS ADAPTIVE BILATERAL FILTERING**

Nair, Pravin, Indian Institute of Science, India
Gavaskar, Ruturaj, Indian Institute of Science, India
Chaudhury, Kunal Narayan, Indian Institute of Science, India

**IVMSP-L10.4: ATTENTION MECHANISM ENHANCED KERNEL PREDICTION NETWORKS FOR DENOISING OF BURST IMAGES**

Zhang, Bin, Southeast University, China
Jin, Shenyao, Jiangsu Industrial Technology Research Institute, China
Xia, Yili, Southeast University, China
Huang, Yongming, Southeast University, China
Xiong, Zixiang, Texas A&M University, United States

**IVMSP-L10.5: IMAGE RESTORATION VIA DATA-DEPENDENT PROXIMAL AVERAGED OPTIMIZATION**

Mu, Pan, Dalian University of Technology, China
Chen, Jian, Dalian University of Technology, China
Liu, Risheng, Dalian University of Technology, China
Zhong, Wei, Dalian University of Technology, China
Fan, Xin, Dalian University of Technology, China
Luo, Zhongxuan, Dalian University of Technology, China

**IVMSP-L10.6: MULTI-WAY MULTI-VIEW DEEP AUTOENCODER FOR IMAGE FEATURE LEARNING WITH MULTI-LEVEL GRAPH REGULARIZATION**

Fang, Zheng, Zhejiang University, China
Zhou, Sen, Netease Inc., China
Li, Xi, Zhejiang University, China
Zhu, Haoqi, Netease Inc., China
Tuesday, 5 May, 11:30 - 13:30

IVMSP-P1 - Image/Video Representation

IVMSP-P1.1: EXPOSURE INTERPOLATION VIA HYBRID LEARNING
Zheng, Chaobing, Wuhan University of Science and Technology, China Li, Zhengguo, Institute for Infocomm Research, Singapore Yang, Yi, Wuhan University of Science and Technology, China Wu, Shiqian, Wuhan University of Science and Technology, China

IVMSP-P1.2: LEARNING SPATIO-TEMPORAL REPRESENTATIONS WITH TEMPORAL SQUEEZE POOLING
Huang, Guoxi, University of York, United Kingdom Bors, Adrian, University of York, United Kingdom

IVMSP-P1.3: FINE-GRAINED GIANT PANDA IDENTIFICATION
Ding, Rizhi, Xi’an Jiaotong University, China Wang, Le, Xi’an Jiaotong University, China Zhang, Qilin, HERE Technologies, United States Niu, Zhenxing, Alibaba Group, China Zheng, Nanning, Xi’an Jiaotong University, China Hua, Gang, Wormpex AI Research, United States

IVMSP-P1.4: LEARNING FROM DANCES: POSE-IN Variant RE-IDENTIFICATION FOR MULTI-PERSON TRACKING
Ho, Hsuan-I, ETH Zürich, Switzerland Shim, Minho, Independent, Korea (South) Wee, Dongyoon, NAVER Corporation, Korea (South)

IVMSP-P1.5: LEARNING FRACTIONAL ORTHOGONAL LATENT CONSISTENT FEATURES FOR FACE HALLUCINATION AND RECOGNITION
Yuan, Yun-Hao, Yangzhou University, China Li, Jin, Yangzhou University, China Li, Yun, Yangzhou University, China Qiang, Jipeng, Yangzhou University, China Li, Bin, Yangzhou University, China

IVMSP-P1.6: SPARSE MODELING ON DISTRIBUTED ENCRYPTION DATA
Bandoh, Yukihiro, NTT, Japan Nakachi, Takayuki, NTT, Japan Kiya, Hitoshi, Tokyo Metropolitan University, Japan

IVMSP-P1.7: S-DOD-CNN: DOUBLY INJECTING SPATIALLY-PRESERVED OBJECT INFORMATION FOR EVENT RECOGNITION
Lee, Hyungtae, Booz Allen Hamilton Inc., United States Eum, Sungmin, Booz Allen Hamilton Inc., United States Kwon, Heesung, U.S. Army Research Laboratory, United States
IVMSP-P1.8: ANGULAR DISCRIMINATIVE DEEP FEATURE LEARNING FOR FACE VERIFICATION
Wu, Bowen, Midea Corporate Research Center, China Wu, Huaming, Tianjin University, China

IVMSP-P1.9: 3D DEFORMATION SIGNATURE FOR DYNAMIC FACE RECOGNITION
Shabayek, Abd El Rahman, University of Luxembourg, Luxembourg Aouada, Djamila, University of Luxembourg, Luxembourg Cherenkova, Kseniya, Artec 3D, Luxembourg Gusev, Gleb, Artec 3D, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

IVMSP-P1.10: ASR IS ALL YOU NEED: CROSS-MODAL DISTILLATION FOR LIP READING
Afouras, Triantafyllos, University of Oxford, United Kingdom Chung, Joon Son, University of Oxford and Naver Corporation, United Kingdom Zisserman, Andrew, University of Oxford, United Kingdom

IVMSP-P1.11: COLOR STABILIZATION FOR MULTI-CAMERA LIGHT-FIELD IMAGING
Vu Thanh, Olivier, INP Grenoble, France Canham, Trevor, Universitat Pompeu Fabra, Spain Vazquez-Corral, Javier, Universitat Pompeu Fabra, Spain Gil-Rodríguez, Raquel, Justus-Leibig Universität, Germany Bertalmio, Marcelo, Universitat Pompeu Fabra, Spain

IVMSP-P1.12: LEARNING SPATIO-TEMPORAL CONVOLUTIONAL NETWORK FOR REAL-TIME OBJECT TRACKING
Chen, Hanzao, South China University of Technology, China Xing, Xiaofen, South China University of Technology, China Xu, Xiangmin, South China University of Technology, China
Tuesday, 5 May, 16:30 - 18:30

IVMSP-P2 - Image/Video Coding I

IVMSP-P2.1: LEARNED LOSSLESS IMAGE COMPRESSION WITH A HYPERPRIOR AND DISCRETIZED GAUSSIAN MIXTURE LIKELIHOODS
Cheng, Zhengxue, Waseda University, Japan Sun, Heming, Waseda University, Japan Takeuchi, Masaru, Waseda University, Japan Katto, Jiro, Waseda University, Japan

IVMSP-P2.2: VARIABLE BITRATE IMAGE COMPRESSION WITH QUALITY SCALING FACTORS
Chen, Tong, Nanjing University, China Ma, Zhan, Nanjing University, China

IVMSP-P2.3: BINARY PROBABILITY MODEL FOR LEARNING BASED IMAGE COMPRESSION
Ladune, Théo, Orange, France Philippe, Pierrick, Orange, France Hamidouche, Wassim, INSA Rennes, France Zhang, Lu, INSA Rennes, France Déforges, Olivier, Institut d’Electronique et de Télécommunications de Rennes / Institut Nationnal des Sciences Appliquées, France

IVMSP-P2.4: IMPROVED PROBABILITY MODELLING FOR EXCEPTION HANDLING IN LOSSLESS SCREEN CONTENT CODING
Strutz, Tilo, Leipzig University of Telecommunications, Germany

IVMSP-P2.5: SPATIALLY ADAPTIVE INTRA MODE PRE-SELECTION FOR ERP 360 VIDEO CODING
Storch, Iago, Federal University of Pelotas, Brazil Zatt, Bruno, Federal University of Pelotas, Brazil Agostini, Luciano, Federal University of Pelotas, Brazil Corrêa, Guilherme, Federal University of Pelotas, Brazil da Silva Cruz, Luis A., University of Coimbra, Portugal Palomino, Daniel, Federal University of Pelotas, Brazil

IVMSP-P2.6: SEMI-REGULAR GEOMETRIC KERNEL ENCODING & RECONSTRUCTION FOR VIDEO COMPRESSION
Jiang, Xiaochong, Zhengzhou University, China Yang, Cheng, York University, Canada Cheung, Gene, York University, Canada Takamura, Seishi, NTT Corporation, Japan

IVMSP-P2.7: LEVERAGING CUBOIDS FOR BETTER MOTION MODELING IN HIGH EFFICIENCY VIDEO CODING
Ahmmed, Ashek, Charles Sturt University, Australia
Murshed, Manzur, Federation University, Australia
Paul, Manoranjan, Charles Sturt University, Australia

**IVMSP-P2.9: ADVERSARIAL VIDEO COMPRESSION GUIDED BY SOFT EDGE DETECTION**

Kim, Sungsoo, University of Texas at Austin, United States
Park, Jin Soo, University of Texas at Austin, United States
Bampis, Christos, Netflix Inc., United States
Lee, Jaeseong, University of Texas at Austin, United States
Markey, Mia, University of Texas at Austin, United States
Bovik, Alan, University of Texas at Austin, United States

**IVMSP-P2.10: COMpressing flow fields with edge-aware homogeneous diffusion inpainting**

Jost, Ferdinand, Saarland University, Germany
Peter, Pascal, Saarland University, Germany
Weickert, Joachim, Saarland University, Germany

**IVMSP-P2.11: ADAPTIVE RESOLUTION CHANGE USING UNCODED AREAS AND DICTIONARY LEARNING-BASED SUPER-RESOLUTION IN VERSATILE VIDEO CODING**

Schneider, Jens, RWTH Aachen University, Germany
Sauer, Johannes, RWTH Aachen University, Germany
Rohlfing, Christian, RWTH Aachen University, Germany

**IVMSP-P2.12: RDE-MOGA: AUTOMATIC SELECTION OF RATE-DISTORTION-ENERGY CONTROL POINTS FOR VIDEO ENCODERS USING MUTI-OBJECTIVE GENETIC ALGORITHM**

Machado, Italo, Federal University of Pelotas, Brazil
Aguiar, Marilton, Federal University of Pelotas, Brazil
Porto, Marcelo, Federal University of Pelotas, Brazil
Corrêa, Guilherme, Federal University of Pelotas, Brazil
Zatt, Bruno, Federal University of Pelotas, Brazil
IVMSP-P3 - Machine Learning For Image/Video Processing I

IVMSP-P3.1: A CONNECTED AUTO-ENCODERS BASED APPROACH FOR IMAGE SEPARATION WITH SIDE INFORMATION: WITH APPLICATIONS TO ART INVESTIGATION

Pu, Wei, University College London, United Kingdom
Sober, Barak, Duke University, United States
Daly, Nathan, National Gallery, United Kingdom
Higgitt, Catherine, National Gallery, United Kingdom
Daubechies, Ingrid, Duke University, United States
Rodrigues, Miguel, University College London, United Kingdom

IVMSP-P3.2: SELF-SUPERVISED ADVERSARIAL TRAINING

Chen, Kejiang, University of Science and Technology of China, China
Chen, Yuefeng, Alibaba group, China
Zhou, Hang, University of Science and Technology of China, China
Mao, Xiaofeng, Alibaba group, China
Li, Yuhong, Alibaba group, China
He, Yuan, Alibaba group, China
Xue, Hui, Alibaba group, China
Zhang, Weiming, University of Science and Technology of China, China
Yu, NengHai, University of Science and Technology of China, China

IVMSP-P3.3: GRAY-SCALE IMAGE COLORIZATION USING CYCLE-CONSISTENT GENERATIVE ADVERSARIAL NETWORKS WITH RESIDUAL STRUCTURE ENHANCER

Johari, Mohammad Mahdi, Sharif University of Technology, Iran
Behroozi, Hamid, Sharif University of Technology, Iran

IVMSP-P3.4: ALL YOU NEED IS A SECOND LOOK: TOWARDS TIGHTER ARBITRARY SHAPE TEXT DETECTION

Cao, Meng, Peking University, China
Zou, Yuexian, Peking University, China

IVMSP-P3.5: COMPARE LEARNING: BI-ATTENTION NETWORK FOR FEW-SHOT LEARNING

Ke, Li, Alibaba Group, China
Pan, Meng, Alibaba Group, China
Wen, Weigao, Alibaba Group, China
Li, Dong, Alibaba Group, China

IVMSP-P3.6: ARNET: ATTENTION-BASED REFINEMENT NETWORK FOR FEW-SHOT SEMANTIC SEGMENTATION

Li, Rusheng, Shen Zhen Graduate School, Peking University, China
Liu, Hanhui, Shen Zhen Graduate School, Peking University, China
Zhu, Yuesheng, Shen Zhen Graduate School, Peking University, China
Bai, Zhiqiang, Shen Zhen Graduate School, Peking University, China
IVMSP-P3.7: LIGHTDET: A LIGHTWEIGHT AND ACCURATE OBJECT DETECTION NETWORK

Tang, Qiankun, Institute of Computing Technology, Chinese Academy of Sciences, China
Li, Jie, Institute of Computing Technology, Chinese Academy of Sciences, China
Shi, Zhiping, Capital Normal University, China
Hu, Yu, Institute of Computing Technology, Chinese Academy of Sciences, China

IVMSP-P3.8: SELF-SUPERVISED DEEP LEARNING FOR FISHEYE IMAGE RECTIFICATION

Chao, Chun-Hao, National Taiwan University, Taiwan
Hsu, Pin-Lun, National Taiwan University, Taiwan
Lee, Hung-Yi, National Taiwan University, Taiwan
Wang, Yu-Chiang Frank, National Taiwan University, Taiwan

IVMSP-P3.9: SKETCHPPNET: A JOINT PIXEL AND POINT CONVOLUTIONAL NEURAL NETWORK FOR LOW RESOLUTION SKETCH IMAGE RECOGNITION

Zhu, Xianyi, Hunan University, China
Xiao, Yi, Hunan University, China
Zheng, Yan, Hunan University, China
Tan, Guanghua, Hunan University, China
Zhou, Shizhe, Hunan University, China

IVMSP-P3.10: ALL IN ONE NETWORK FOR DRIVER ATTENTION MONITORING

Yang, Dawei, Fudan University, China
Li, Xinlei, Fudan University, China
Dai, Xiaotian, University of York, United Kingdom
Zhang, Rui, Fudan University, China
Qi, Lizhe, Fudan University, China
Zhang, Wenqiang, Fudan University, China
Jiang, Zhe, University of York, United Kingdom

IVMSP-P3.11: UNSUPERVISED DOMAIN ADAPTATION FOR SEMANTIC SEGMENTATION WITH SYMMETRIC ADAPTATION CONSISTENCY

Li, Zongyao, Hokkaido University, Japan
Togo, Ren, Hokkaido University, Japan
Ogawa, Takahiro, Hokkaido University, Japan
Haseyama, Miki, Hokkaido University, Japan

IVMSP-P3.12: IQ-STAN: IMAGE QUALITY GUIDED SPATIO-TEMPORAL ATTENTION NETWORK FOR LICENSE PLATE RECOGNITION

Zhang, Cong, Northwestern Polytechnical University, China
Wang, Qi, Northwestern Polytechnical University, China
Li, Xuelong, Northwestern Polytechnical University, China
IVMSP-P4 - Image/Video Analysis I

IVMSP-P4.1: WEAKLY SUPERVISED SEMANTIC SEGMENTATION FOR REMOTE SENSING HYPERSPECTRAL IMAGING

Moliner, Eloi, Universitat Politecnica de Catalunya, Spain Salgueiro Romero, Luis, Universitat Politecnica de Catalunya, Spain Vilaplana, Veronica, Universitat Politecnica de Catalunya, Spain

IVMSP-P4.2: SOCIAL DATA ASSISTED MULTI-MODAL VIDEO ANALYSIS FOR SALIENCY DETECTION

Xia, Jiangyue, Tsinghua University, China Tian, Jingqi, Tsinghua University, China Xing, Jiankai, Tsinghua University, China Cheng, Jiawen, Tsinghua University, China Zhang, Jun, Tsinghua University, China Wen, Jiangtao, Tsinghua University, China Li, Zhengguang, Alibaba Group, China Lou, Jian, Alibaba Group, China

IVMSP-P4.3: VIEW-ANGLE INVARIANT OBJECT MONITORING WITHOUT IMAGE REGISTRATION

Zhang, Xin, Institute of Automation, Chinese Academy of Sciences, University of Chinese Academy of Sciences, China Huo, Chunlei, Institute of Automation, Chinese Academy of Sciences, University of Chinese Academy of Sciences, China Pan, Chunhong, Institute of Automation, Chinese Academy of Sciences, University of Chinese Academy of Sciences, China

IVMSP-P4.4: HIERARCHICAL SEQUENCE REPRESENTATION WITH GRAPH NETWORK

Chen, Da, Alibaba Group, China Wu, Xiang, Alibaba Group, China Dong, Jianfeng, Zhejiang Gongshang University, China He, Yuan, Alibaba Group, China Xue, Hui, Alibaba Group, China Mao, Feng, Alibaba Group, China

IVMSP-P4.5: MULTI IMAGE DEPTH FROM DEFOCUS NETWORK WITH BOUNDARY CUE FOR DUAL APERTURE CAMERA

Song, Gwangmo, Seoul National University, Korea (South) Kim, Yumee, Seoul National University, Korea (South) Chun, Kukjin, Seoul National University, Korea (South) Lee, Kyoung Mu, Seoul National University, Korea (South)

IVMSP-P4.6: HEIGHT AND WEIGHT ESTIMATION FROM UNCONSTRAINED IMAGES

Switzerland Achanta, Radhakrishna, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

**IVMSP-P4.7: SAMPLING STRATEGIES FOR GAN SYNTHETIC DATA**
Bhattarai, Binod, Imperial College London, United Kingdom Baek, Seungryul, Imperial College London, United Kingdom Bodur, Rumeysa, Imperial College London, United Kingdom Kim, Tae-Kyun, Imperial College London, United Kingdom

**IVMSP-P4.8: AUGLABEL: EXPLOITING WORD REPRESENTATIONS TO AUGMENT LABELS FOR FACE ATTRIBUTE CLASSIFICATION**
Bhattarai, Binod, Imperial College London, United Kingdom Bodur, Rumeysa, Imperial College London, United Kingdom Kim, Tae-Kyun, Imperial College London, United Kingdom

**IVMSP-P4.9: MULTI-TASK CENTER-OF-PRESSURE METRICS ESTIMATION FROM SKELETON USING GRAPH CONVOLUTIONAL NETWORK**
Du, Chen, University of California, San Diego, United States Graham, Sarah, University of California, San Diego, United States Jin, Shiwei, University of California, San Diego, United States Depp, Colin, University of California, San Diego, United States Nguyen, Truong Q., University of California, San Diego, United States

**IVMSP-P4.10: REGRESSION BEFORE CLASSIFICATION FOR TEMPORAL ACTION DETECTION**
Jin, Cece, Peking University Shenzhen Graduate School, China Zhang, Tao, Peking University Shenzhen Graduate School, China Kong, Weijie, Peking University Shenzhen Graduate School, China Li, Thomas H., Peking University, China Li, Ge, Peking University Shenzhen Graduate School, China

**IVMSP-P4.11: MULTI-TASK LEARNING IN AUTONOMOUS DRIVING SCENARIOS VIA ADAPTIVE FEATURE REFINEMENT NETWORKS**
Zhai, Mingliang, Harbin Engineering University, China Xiang, Xuezhi, Harbin Engineering University, China Lv, Ning, Harbin Engineering University, China Saddik, Abdulmotaleb El, University of Ottawa, Canada

**IVMSP-P4.12: A REAL-TIME DEEP NETWORK FOR CROWD COUNTING**
Shi, Xiaowen, East China Normal University, China Li, Xin, East China Normal University, China Wu, Caili, East China Normal University, China Kong, Shuchen, Videt Tech Ltd., China Yang, Jing, East China Normal University, China He, Liang, East China Normal University, China
IVMSP-P5.1: DRIFT DETECTION AND CORRECTION POST-TRACKING
Ghoniemy, Tarek, Concordia University, Canada Amer, Maria A., Concordia University, Canada

IVMSP-P5.2: INTERPRETABLE SELF-ATTENTION TEMPORAL REASONING FOR DRIVING BEHAVIOR UNDERSTANDING
Liu, Yi-Chieh, Georgia Institute of Technology, United States Hsieh, Yung-An, Georgia Institute of Technology, United States Chen, Min-Hung, Georgia Institute of Technology, United States Yang, Chao-Han Huck, Georgia Institute of Technology, United States Tegner, Jesper, King Abdullah University of Science and Technology (KAUST), United Arab Emirates Tsai, Yi-Chang James, Georgia Institute of Technology, United States

IVMSP-P5.3: NON-UNIFORM VIDEO TIME-LAPSE METHOD BASED ON MOTION SCENARIO AND STABILIZATION CONSTRAINT
Guo, Kai, Samsung Electronics, Korea (South) Kim, Nakhoon, Samsung Electronics, Korea (South) Seo, Duckchan, Samsung Electronics, Korea (South) Kim, Irina, Samsung Electronics, Korea (South) Chang, Soonkeun, Samsung Electronics, Korea (South) Min, Dong-Ki, Samsung Electronics, Korea (South) Lim, Sukhwan, Samsung Electronics, Korea (South)

IVMSP-P5.4: KEY ACTION AND JOINT CTC-ATTENTION BASED SIGN LANGUAGE RECOGNITION
Li, Haibo, Tianjin University, China Gao, Liqing, Tianjin University, China Han, Ruize, Tianjin University, China Wan, Liang, Tianjin University, China Feng, Wei, Tianjin University, China

IVMSP-P5.5: LEARNING GEOMETRIC FEATURES WITH DUAL-STREAM CNN FOR 3D ACTION RECOGNITION
Huynh-Thai, Thien, Kumoh National Institute of Technology, Korea (South) Hua, Cam-Hao, Kyung Hee University, Korea (South) Anh Tu, Nguyen, Nazarbayev University, Kazakhstan Kim, Dong-Seong, Kumoh National Institute of Technology, Korea (South)

IVMSP-P5.6: A DEEP LEARNING APPROACH TO OBJECT AFFORDANCE SEGMENTATION
Thermos, Spyridon, University of Thessaly, Greece Daras, Petros, Centre for Research and Technology Hellas, Greece Potamianos, Gerasimos, University of Thessaly, Greece

**IVMSP-P5.7: MULTI-VIEW SHAPE ESTIMATION OF TRANSPARENT CONTAINERS**

Xompero, Alessio, Queen Mary University of London, United Kingdom Sanchez-Matilla, Ricardo, Queen Mary University of London, United Kingdom Modas, Apostolos, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland Frossard, Pascal, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland Cavallaro, Andrea, Queen Mary University of London, United Kingdom

**IVMSP-P5.8: RETHINKING TEMPORAL-RELATED SAMPLE FOR HUMAN ACTION RECOGNITION**

Wang, Jinpeng, Sun Yat-Sen University, China Li, Shiren, Sun Yat-Sen University, China Duan, Zhikui, Foshan University, China Yuan, Zhihao, Sun Yat-Sen University, China

**IVMSP-P5.9: FDDWNET: A LIGHTWEIGHT CONVOLUTIONAL NEURAL NETWORK FOR REAL-TIME SEMANTIC SEGMENTATION**

Liu, Jia, Nanjing University of Posts and Telecommunications, China Zhou, Quan, Nanjing University of Posts and Telecommunications, China Qiang, Yong, Nanjing University of Posts and Telecommunications, China Kang, Bin, Nanjing University of Posts and Telecommunications, China Wu, Xiaofu, Nanjing University of Posts and Telecommunications, China Zheng, Baoyu, Nanjing University of Posts and Telecommunications, China

**IVMSP-P5.10: COMPLEX PAIRWISE ACTIVITY ANALYSIS VIA INSTANCE LEVEL EVOLUTION REASONING**

Paul, Sudipta, University of California, Riverside, United States Torres, Carlos, TwoSixLabs, LLC, United States Chandrasekaran, Shivkumar, Mayachitra, Inc, United States Roy-Chowdhury, Amit K., University of California, Riverside, United States

**IVMSP-P5.11: SCENE TEXT RECOGNITION WITH TEMPORAL CONVOLUTIONAL ENCODER**

Du, Xiangcheng, East China Normal University, China Ma, Tianlong, East China Normal University, China Zheng, Yingbin, Videt Tech Ltd., China Ye, Hao, Videt Tech Ltd., China Wu, Xingjiao, East China Normal University, China He, Liang, East China Normal University, China
IVMSP-P5.12: ENHANCED ACTION TUBELET DETECTOR FOR SPATIO-TEMPORAL VIDEO ACTION DETECTION

Wu, Yutang, Tongji University, China Wang, Hanli, Tongji University, China Wang, Shuheng, Tongji University, China Li, Qinyu, Tongji University, China
Wednesday, 6 May, 09:00 - 11:00

**IVMSP-P6 - Machine Learning For Image/Video Processing II**

**IVMSP-P6.1: SECURE FACE RECOGNITION IN EDGE AND CLOUD NETWORKS: FROM THE ENSEMBLE LEARNING PERSPECTIVE**

Wang, Yitu, Nippon Telegraph and Telephone Corporation, Japan
Nakachi, Takayuki, Nippon Telegraph and Telephone Corporation, Japan

**IVMSP-P6.2: LOW COMPLEXITY SINGLE IMAGE SUPER-RESOLUTION WITH CHANNEL SPLITTING AND FUSION NETWORK**

Zou, Minqiang, Nanjing University, China
Tang, Jie, Nanjing University, China
Wu, Gangshan, Nanjing University, China

**IVMSP-P6.3: LEARNING SPECTRAL-SPATIAL PRIOR VIA 3DDNCNN FOR HYPERSPECTRAL IMAGE DECONVOLUTION**

Wang, Xiuheng, Northwestern Polytechnical University, China
Chen, Jie, Northwestern Polytechnical University, China
Richard, Cédric, Université de la Côte d'Azur, France
Brie, David, Université de Lorraine, France

**IVMSP-P6.4: DYNAMICALLY MODULATED DEEP METRIC LEARNING FOR VISUAL SEARCH**

Manandhar, Dipu, Nanyang Technological University, Singapore
Bastan, Muhammet, Amazon, Inc., United States
Yap, Kim-Hui, Nanyang Technological University, Singapore

**IVMSP-P6.5: DEEP RESIDUAL NETWORK FOR MSFA RAW IMAGE DENOISING**

Pan, Zhihong, Baidu USA, United States
Li, Baopu, Baidu USA, United States
Cheng, Hsuchun, Baidu Shenzhen R&D, China
Bao, Yingze, Baidu USA, United States

**IVMSP-P6.6: MSPNET: MULTI-SUPERVISED PARALLEL NETWORK FOR CROWD COUNTING**

Wei, Bo, Northwestern Polytechnical University, China
Yuan, Yuan, Northwestern Polytechnical University, China

**IVMSP-P6.7: VIDEO QUESTION GENERATION VIA SEMANTIC RICH CROSS-MODAL SELF-ATTENTION NETWORKS LEARNING**

Wang, Yu-Siang, University of Toronto, Canada
Su, Hung-Ting, National Taiwan University, Taiwan
Chang, Chen-Hsi, National Taiwan University, Taiwan
Liu, Zhe-
Yu, National Taiwan University, Taiwan Hsu, Winston H., National Taiwan University, Taiwan

**IVMSP-P6.8: BLIND HYPERSONSPECTRAL UNMIXING USING DUAL BRANCH DEEP AUTOENCODER WITH ORTHOGONAL SPARSE PRIOR**

Dou, Zeyang, Beijing Institute of Technology, China Gao, Kun, Beijing Institute of Technology, China Zhang, Xiaodian, Beijing Institute of Technology, China Wang, Hong, Beijing Institute of Technology, China Wang, Junwei, Beijing Institute of Technology, China

**IVMSP-P6.9: CLASSIFICATION OF DEPTH AND SURFACE EDGES WITH DEEP FEATURES**

Li, Zhenhao, Shanghai Jiao Tong University, China Wu, Xiaolin, Shanghai Jiao Tong University, China

**IVMSP-P6.10: LEARNING TO CHARACTERIZE ADVERSARIAL SUBSPACES**

Mao, Xiaofeng, Alibaba Group, China Chen, Yuefeng, Alibaba Group, China Li, Yuhong, Alibaba Group, China He, Yuan, Alibaba Group, China Xue, Hui, Alibaba Group, China

**IVMSP-P6.11: VIDEO DEBLURRING VIA 3D CNN AND FOURIER ACCUMULATION LEARNING**

Yang, Fan, Nanjing University of Science and Technology, China Xiao, Liang, Nanjing University of Science and Technology, China Yang, Jingxiang, Nanjing University of Science and Technology, China

**IVMSP-P6.12: ENHANCED NON-LOCAL CASCADING NETWORK WITH ATTENTION MECHANISM FOR HYPERSONSPECTRAL IMAGE DENOISING**

Ma, Hanwen, Northwestern Polytechnical University, China Liu, Ganchao, Northwestern Polytechnical University, China Yuan, Yuan, Northwestern Polytechnical University, China
Thursday, 7 May, 09:00 - 11:00

IVMSP-P7 - Image/Video Processing I

IVMSP-P7.1: QUANTIZED TENSOR ROBUST PRINCIPAL COMPONENT ANALYSIS
Aidini, Anastasia, Foundation for Research and Technology-Hellas (FORTH), Greece Tsagkatakis, Grigorias, Foundation for Research and Technology-Hellas (FORTH), Greece Tsakalides, Panagiotis, Foundation for Research and Technology-Hellas (FORTH), Greece

IVMSP-P7.2: A NEW PERSPECTIVE FOR FLEXIBLE FEATURE GATHERING IN SCENE TEXT RECOGNITION VIA CHARACTER ANCHOR POOLING
Long, Shangbang, Peking University, China Guan, Yushuo, Peking University, China Bian, Kaigui, Peking University, China Yao, Cong, Megvii (Face++) Technology Inc, China

IVMSP-P7.3: HYBRID ACTIVE CONTOUR DRIVEN BY DOUBLE-WEIGHTED SIGNED PRESSURE FORCE FOR IMAGE SEGMENTATION
Fu, Xingyu, Chongqing University, China Fang, Bin, Chongqing University, China Zhou, Mingliang, Chongqing University, China Li, Jiajun, Chongqing University, China

IVMSP-P7.4: NEURAL CODING STRATEGIES FOR EVENT-BASED VISION DATA
Harrigan, Shane, Ulster University, United Kingdom Coleman, Sonya, Ulster University, United Kingdom Kerr, Dermot, Ulster University, United Kingdom Yogarajah, Pratheepan, Ulster University, United Kingdom Fang, Zheng, Northeastern University, China Wu, Chengdong, Northeastern University, China

IVMSP-P7.5: CAMERA CONFIGURATION DESIGN IN COOPERATIVE ACTIVE VISUAL 3D RECONSTRUCTION: A STATISTICAL APPROACH
An, Qier, Tsinghua University, China Shen, Yuan, Tsinghua University, China

IVMSP-P7.6: HAND-3D-STUDIO: A NEW MULTI-VIEW SYSTEM FOR 3D HAND RECONSTRUCTION
Zhao, Zhengyi, Southeast University, China Wang, Tianyao, Southeast University, China Xia, Siyu, Southeast University, China Wang, Yangang, Southeast University, China

IVMSP-P7.7: LEARNING ENDMEMBER DYNAMICS IN MULTITEMPORAL HYPERSPECTRAL DATA USING A STATE-SPACE MODEL FORMULATION
Drumetz, Lucas, IMT Atlantique, France Dalla Mura, Mauro, Grenoble INP - GIPSA-lab, France Tochon, Guillaume, LRDE EPITA, France Fablet, Ronan, IMT Atlantique, France

IVMSP-P7.8: LEARNING EATING ENVIRONMENTS THROUGH SCENE CLUSTERING

Yarlagadda, Sri Kalyan, Purdue University, United States Baireddy, Sriram, Purdue University, United States Güera, David, Purdue University, United States Boushey, Carol J., University of Hawaii, United States Kerr, Deborah A., Curtin University, Australia Zhu, Fengqing, Purdue University, United States
Thursday, 7 May, 09:00 - 11:00

**IVMSP-P8 - Inverse Problems in Image/Video Processing II**

**IVMSP-P8.1: A HYBRID STRUCTURAL SPARSE ERROR MODEL FOR IMAGE DEBLOCKING**

Zha, Zhiyuan, Nanyang Technological University, Singapore  
Yuan, Xin, Nokia Bell Labs, United States  
Zhou, Jiantao, University of Macau, China  
Zhu, Ce, University of Electronic Science and Technology of China, China  
Wen, Bihan, Nanyang Technological University, Singapore

**IVMSP-P8.2: REFLECTANCE-GUIDED, CONTRAST-ACCUMULATED HISTOGRAM EQUALIZATION**

Wu, Xiaomeng, NTT Corporation, Japan  
Kawanishi, Takahito, NTT Corporation, Japan  
Kashino, Kunio, NTT Corporation, Japan

**IVMSP-P8.3: BILATERAL RECURRENT NETWORK FOR SINGLE IMAGE DERAINING**

Shang, Wei, Tianjin University, China  
Zhu, Pengfei, Tianjin University, China  
Ren, Dongwei, Tianjin University, China  
Shi, Hong, Tianjin University, China

**IVMSP-P8.4: SRZOO: AN INTEGRATED REPOSITORY FOR SUPER-RESOLUTION USING DEEP LEARNING**

Choi, Jun-Ho, Yonsei University, Korea (South)  
Kim, Jun-Hyuk, Yonsei University, Korea (South)  
Lee, Jong-Seok, Yonsei University, Korea (South)

**IVMSP-P8.5: SUB-DIP: OPTIMIZATION ON A SUBSPACE WITH DEEP IMAGE PRIOR REGULARIZATION AND APPLICATION TO SUPERRESOLUTION**

Sagel, Alexander, fortiss - The Research Institute of the Free State of Bavaria, Germany  
Roumy, Aline, Inria, France  
Guillemot, Christine, Inria, France

**IVMSP-P8.6: PARSING MAP GUIDED MULTI-SCALE ATTENTION NETWORK FOR FACE HALLUCINATION**

Wang, Chanyang, Harbin Institute of Technology, China  
Zhong, Zhiwei, Harbin Institute of Technology, China  
Jiang, Junjun, Harbin Institute of Technology, China  
Zhai, Deming, Harbin Institute of Technology, China  
Liu, Xianming, Harbin Institute of Technology, China

**IVMSP-P8.7: A VARIATIONAL BAYESIAN APPROACH FOR MULTICHANNEL THROUGH-WALL RADAR IMAGING WITH LOW-RANK AND SPARSE PRIORS**
Tang, Van Ha, Le Quy Don Technical University, Viet Nam Bouzerdoum, Abdesselam, University of Wollongong, Australia Phung, Son Lam, University of Wollongong, Australia

**IVMSP-P8.8: SEMANTICGAN: GENERATIVE ADVERSARIAL NETWORKS FOR SEMANTIC IMAGE TO PHOTO-REALISTIC IMAGE TRANSLATION**

Liu, Junling, Peking University, China Zou, Yuexian, Peking University, China Yang, Dongming, Peking University, China

**IVMSP-P8.9: LEARNING BLIND DENOISING NETWORK FOR NOISY IMAGE DEBLURRING**

Chen, Meiya, Huazhong University of Science and Technology, China Chang, Yi, Huazhong University of Science and Technology, China Cao, Shuning, Huazhong University of Science and Technology, China Yan, Luxin, Huazhong University of Science and Technology, China

**IVMSP-P8.10: PIXEL-LEVEL SELF-PACED LEARNING FOR SUPER-RESOLUTION**

Lin, Wei, Northwestern Polytechnical University, China Gao, Junyu, Northwestern Polytechnical University, China Wang, Qi, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China

**IVMSP-P8.11: A RECURSIVE EDGE DETECTOR FOR COLOR FILTER ARRAY IMAGE**

Magnier, Baptiste, IMT Mines ALES, France Aberkane, Arezki, Audensiel, France Gorrity, Nicolas, Audensiel, France

**IVMSP-P8.12: IMAGE DE-RAINING VIA RDL: WHEN REWEIGHTED CONVOLUTIONAL SPARSE CODING MEETS DEEP LEARNING**

He, Jingwei, Wuhan University, China Yu, Lei, Wuhan University, China Yang, Wen, Wuhan University, China
IVMSP-P9 - Image/Video Analysis III

IVMSP-P9.1: CS-R-FCN: CROSS-SUPERVISED LEARNING FOR LARGE-SCALE OBJECT DETECTION
Guo, Ye, Tsinghua University, China Li, Yali, Tsinghua University, China Wang, Shengjin, Tsinghua University, China

IVMSP-P9.2: DILATED CONVOLUTIONAL NEURAL NETWORKS FOR PANORAMIC IMAGE SALIENCY PREDICTION
Dai, Feng, Institute of Computing Technology, Chinese Academy of Sciences, China Zhang, Youqiang, Institute of Computing Technology, Chinese Academy of Sciences, China Ma, Yike, Institute of Computing Technology, Chinese Academy of Sciences, China Li, Hongliang, University of Chinese Academy of Sciences, China Zhao, Qiang, Institute of Computing Technology, Chinese Academy of Sciences, China

IVMSP-P9.3: FINE-GRAINED ACTION RECOGNITION ON A NOVEL BASKETBALL DATASET
Gu, Xiaofan, East China Normal University, China Xue, Xinwei, East China Normal University, China Wang, Feng, East China Normal University, China

IVMSP-P9.4: ATTENTION GUIDED REGION DIVISION FOR CROWD COUNTING
Pan, Xiaoqi, Beihang University, China Mo, Hong, Beihang University, China Zhou, Zhong, Beihang University, China Wu, Wei, Beihang University, China

IVMSP-P9.5: SUPERPIXEL SEGMENTATION VIA CONVOLUTIONAL NEURAL NETWORKS WITH REGULARIZED INFORMATION MAXIMIZATION
Suzuki, Teppei, DENSO IT Laboratory, Inc., Japan

IVMSP-P9.6: STACKED POOLING FOR BOOSTING SCALE INVARIANCE OF CROWD COUNTING
Huang, Siyu, Baidu Research, China Li, Xi, Zhejiang University, China Cheng, Zhi-Qi, Carnegie Mellon University, United States Zhang, Zhongfei, State University of New York at Binghamton, United States Hauptmann, Alexander, Carnegie Mellon University, United States

IVMSP-P9.7: GFNET: A LIGHTWEIGHT GROUP FRAME NETWORK FOR EFFICIENT HUMAN ACTION RECOGNITION
IVMSP-P9.8: ROIMIX: PROPOSAL-FUSION AMONG MULTIPLE IMAGES FOR UNDERWATER OBJECT DETECTION
Lin, Wei-Hong, Peking University Shenzhen Graduate School, China Zhong, Jia-Xing, Peking University Shenzhen Graduate School, China Liu, Shan, Tencent America, United States Li, Thomas H., Peking University, China Li, Ge, Peking University Shenzhen Graduate School, China

IVMSP-P9.9: TREE OF SHAPES CUT FOR MATERIAL SEGMENTATION GUIDED BY A DESIGN
Baderot, Julien, Univ. Grenoble Alpes, CNRS, Grenoble INP, France Desvignes, Michel, Univ. Grenoble Alpes, CNRS, Grenoble INP, France Condat, Laurent, Univ. Grenoble Alpes, CNRS, Grenoble INP, France Dalla Mura, Mauro, Univ. Grenoble Alpes, CNRS, Grenoble INP, France

IVMSP-P9.10: DEEP FLOW COLLABORATIVE NETWORK FOR ONLINE VISUAL TRACKING
Liu, Peidong, Tsinghua University, China Yan, Xiyu, Tsinghua University, China Jiang, Yong, Tsinghua University, China Xia, Shu-Tao, Tsinghua University, China

IVMSP-P9.11: SALIENT OBJECT DETECTION BASED ON IMAGE BIT-MAP
Cao, Bangqi, University of Electronic Science and Technology of China, China Meng, Xiandong, Hong Kong University of Science and Technology, China Zhu, Shuyuan, University of Electronic Science and Technology of China, China Zeng, Bing, University of Electronic Science and Technology of China, China

IVMSP-P9.12: A NOVEL SALIENCY-DRIVEN OIL TANK DETECTION METHOD FOR SYNTHETIC APERTURE RADAR IMAGES
Zhang, Libao, Beijing Normal University, China Liu, Congyang, Beijing Normal University, China
Thursday, 7 May, 16:30 - 18:30

**IVMSP-P10 - Inverse Problems in Image/Video Processing III**

**IVMSP-P10.1: VIDEO FRAME INTERPOLATION VIA RESIDUE REFINEMENT**  
Li, Haopeng, Northwestern Polytechnical University, China  
Yuan, Yuan, Northwestern Polytechnical University, China  
Wang, Qi, Northwestern Polytechnical University, China

**IVMSP-P10.2: ATTENTION-GUIDED DERAINING NETWORK VIA STAGE-WISE LEARNING**  
Jiang, Kui, Wuhan University, China  
Wang, Zhongyuan, Wuhan University, China  
Yi, Peng, Wuhan University, China  
Chen, Chen, University of North Carolina - Charlotte, United States  
Yang, Yuhong, Wuhan University, China  
Tian, Xin, Wuhan University, China  
Jiang, Junjun, Harbin Institute of Technology, China

**IVMSP-P10.3: ATTENTION-MASK DENSE MERGER (ATTENDENSE) DEEP HDR FOR GHOST REMOVAL**  
Metwaly, Kareem, Pennsylvania State University, United States  
Monga, Vishal, Pennsylvania State University, United States

**IVMSP-P10.4: Y-NET: MULTI-SCALE FEATURE AGGREGATION NETWORK WITH WAVELET STRUCTURE SIMILARITY LOSS FUNCTION FOR SINGLE IMAGE DEHAZING**  
Yang, Hao-Hsiang, ASUS Intelligent Cloud Services, Taiwan  
Yang, Chao-Han, Huck, Georgia Institute of Technology, United States  
Tsai, Yi-Chang James, Georgia Institute of Technology, United States

**IVMSP-P10.5: IMAGE SUPER-RESOLUTION USING RESIDUAL GLOBAL CONTEXT NETWORK**  
Liu, Kuangye, Wuhan University, China  
Han, Zhen, Wuhan University, China  
Chen, Jun, Wuhan University, China  
Liu, Chunjia, Wuhan University, China  
Liu, Chunli, Wuhan University, China  
Wang, Zhongyuan, Wuhan University, China

**IVMSP-P10.6: PRINCIPLE-INSPIRED MULTI-SCALE AGGREGATION NETWORK FOR EXTREMELY LOW-LIGHT IMAGE ENHANCEMENT**  
Zhang, Jiaao, Dalian University of Technology, China  
Liu, Risheng, Dalian University of Technology, China  
Ma, Long, Dalian University of Technology, China  
Zhong, Wei, Dalian University of Technology, China  
Fan, Xin, Dalian University of Technology, China  
Luo, Zhongxuan, Dalian University of Technology, China
IVMSP-P10.7: NON-LOCAL NESTED RESIDUAL ATTENTION NETWORK FOR STEREO IMAGE SUPER-RESOLUTION

Xie, Wangduo, Shenzhen Graduate School of Peking University, China
Zhang, Jian, Shenzhen Graduate School of Peking University, China
Lu, Zhisheng, Shenzhen Graduate School of Peking University, China
Cao, Meng, Shenzhen Graduate School of Peking University, China
Zhao, Yong, Shenzhen Graduate School of Peking University, China

IVMSP-P10.8: OPENDENOISING: AN EXTENSIBLE BENCHMARK FOR BUILDING COMPARATIVE STUDIES OF IMAGE DENOISERS

Lemarchand, Florian, Institut d’Eléctronique et de Télécommunications de Rennes, France
Fernandes Montesuma, Eduardo, Institut d’Eléctronique et de Télécommunications de Rennes, France
Pelcat, Maxime, Institut d’Eléctronique et de Télécommunications de Rennes, France
Nogues, Erwan, DGA-MI, France

IVMSP-P10.9: SDTCN: SIMILARITY DRIVEN TRANSMISSION COMPUTING NETWORK FOR IMAGE DEHAZING

Zhang, Libao, Beijing Normal University, China
Wang, Shan, Beijing Normal University, China
Wang, Xiaohan, Beijing Normal University, China

IVMSP-P10.10: JOINT ENHANCEMENT AND DENOISING OF LOW LIGHT IMAGES VIA JND TRANSFORM

Yu, Long, Xidian University, China
Su, Haonan, Xidian University, China
Jung, Cheolkon, Xidian University, China

IVMSP-P10.11: ADVERSARIAL TEXT IMAGE SUPER-RESOLUTION USING SINKHORN DISTANCE

Geng, Cong, Shanghai Jiao Tong University, China
Chen, Li, Shanghai Jiao Tong University, China
Zhang, Xiaoyun, Shanghai Jiao Tong University, China
Gao, Zhiyong, Shanghai Jiao Tong University, China

IVMSP-P10.12: ADRN: ATTENTION-BASED DEEP RESIDUAL NETWORK FOR HYPERSPECTRAL IMAGE DENOISING

Zhao, Yongsen, Harbin Institute of Technology, China
Zhai, Deming, Harbin Institute of Technology, China
Jiang, Junjun, Harbin Institute of Technology, China
Liu, Xianming, Harbin Institute of Technology, China
Thursday, 7 May, 16:30 - 18:30

IVMSP-P11 - Image/Video Processing II

IVMSP-P11.1: WEAKLY SUPERVISED SEGMENTATION GUIDED HAND POSE ESTIMATION DURING INTERACTION WITH UNKNOWN OBJECTS
Zhang, Cairong, Tsinghua University, China Wang, Guijin, Tsinghua University, China Chen, Xinghao, Huawei, China Xie, Pengwei, Tsinghua University, China Yamasaki, Toshihiko, University of Tokyo, Japan

IVMSP-P11.2: SPARSE DIRECTED GRAPH LEARNING FOR HEAD MOVEMENT PREDICTION IN 360 VIDEO STREAMING
Zhang, Xue, York University, Canada Cheung, Gene, York University, Canada Le Callet, Patrick, Université de Nantes, France Tan, Jack Z. G., KanDao Technology Co. Ltd, China

IVMSP-P11.3: TRACKING TO IMPROVE DETECTION QUALITY IN LIDAR FOR AUTONOMOUS DRIVING

IVMSP-P11.4: CARTOON-TEXTURE DECOMPOSITION-BASED VARIATIONAL PANSHARPENING
Chen, Yuerong, Wuhan University, China Zhang, Mengliang, Wuhan University, China Li, Song, Wuhan University, China Wang, Zhongyuan, Wuhan University, China Tian, Xin, Wuhan University, China

IVMSP-P11.5: AN ALTERNATIVE SIGNATURE DESIGN USING L1 PRINCIPAL COMPONENTS FOR SPREAD-SPECTRUM STEGANOGRAPHY
Bailey, Colleen, University of North Texas, United States Chamadia, Shubham, Massachusetts General Hospital, United States Pados, Dimitris, Florida Atlantic University, United States

IVMSP-P11.6: PRIVACY-PRESERVING PATTERN RECOGNITION USING ENCRYPTED SPARSE REPRESENTATIONS IN L0 NORM MINIMIZATION
Nakachi, Takayuki, Nippon Telegraph and Telephone Corporation, Japan Wang, Yitu, Nippon Telegraph and Telephone Corporation, Japan Kiya, Hitoshi, Tokyo Metropolitan University, Japan

IVMSP-P11.7: FLEXIBLY-TUNABLE BITCUBE-BASED PERCEPTUAL ENCRYPTION WITHIN JPEG COMPRESSION
Shimizu, Kosuke, University of Tsukuba, Japan Suzuki, Taizo, University of Tsukuba, Japan

**IVMSP-P11.8: GYROSCOPE AIDED VIDEO STABILIZATION USING NONLINEAR REGRESSION ON SPECIAL ORTHOGONAL GROUP**

Hu, Xiao, Technical University of Denmark, Denmark Olesen, Daniel, Technical University of Denmark, Denmark Knudsen, Per, Technical University of Denmark, Denmark

**IVMSP-P11.9: SUPER-RESOLUTION VIA IMAGE-ADAPTED DENOISING CNNS: INCORPORATING EXTERNAL AND INTERNAL LEARNING**

Tirer, Tom, Tel Aviv University, Israel Giryes, Raja, Tel Aviv University, Israel

**IVMSP-P11.10: FAST HIGH-DIMENSIONAL KERNEL FILTERING**

Nair, Pravin, Indian Institute of Science, India Chaudhury, Kunal Narayan, Indian Institute of Science, India

**IVMSP-P11.12: ANISOTROPIC GUIDED FILTERING**

Ochotorena, Carlo Noel, De La Salle University, Philippines Yamashita, Yukihiko, Tokyo Institute of Technology, Japan
Thursday, 7 May, 16:30 - 18:30

IVMSP-P12 - Perception and Quality Models

IVMSP-P12.1: BBAND INDEX: A NO-REFERENCE BANDING ARTIFACT PREDICTOR
Tu, Zhengzhong, University of Texas at Austin, United States Lin, Jessie, Google, Inc., United States Wang, Yilin, Google, Inc., United States Adsumilli, Balu, Google, Inc., United States Bovik, Alan, University of Texas at Austin, United States

IVMSP-P12.2: LQAID: LOCALIZED QUALITY AWARE IMAGE DENOISING USING DEEP CONVOLUTIONAL NEURAL NETWORKS
Dendi, Sathya Veera Reddy, Indian Institute of Technology Hyderabad, India Dev, Chander, Indian Institute of Technology Hyderabad, India Kothari, Narayan, Indian Institute of Technology Hyderabad, India S. Channappayya, Sumohana, Indian Institute of Technology Hyderabad, India

IVMSP-P12.3: WEAKLY SUPERVISED CROWD-WISE ATTENTION FOR ROBUST CROWD COUNTING
Kong, Xiyu, Shanghai Jiao Tong University, China Zhao, Muming, Shanghai Jiao Tong University, China Zhang, Chongyang, Shanghai Jiao Tong University, China

IVMSP-P12.4: XPSNR: A LOW-COMPLEXITY EXTENSION OF THE PERCEPTUALLY WEIGHTED PEAK SIGNAL-TO-NOISE RATIO FOR HIGH- RESOLUTION VIDEO QUALITY ASSESSMENT
Helmrich, Christian, Fraunhofer Heinrich Hertz Institute, Germany Siekmann, Mischa, Fraunhofer Heinrich Hertz Institute, Germany Becker, Sören, Fraunhofer Heinrich Hertz Institute, Germany Bosse, Sebastian, Fraunhofer Heinrich Hertz Institute, Germany Marpe, Detlev, Fraunhofer Heinrich Hertz Institute, Germany Wiegand, Thomas, Fraunhofer Heinrich Hertz Institute, Germany

IVMSP-P12.5: NON-EXPERTS OR EXPERTS? STATISTICAL ANALYSES OF MOS USING DSIS METHOD
Sugito, Yasuko, NHK, Japan Bertalmio, Marcelo, Universitat Pompeu Fabra, Spain

IVMSP-P12.6: FULL REFERENCE VIDEO QUALITY MEASURES IMPROVEMENT USING NEURAL NETWORKS
Fotio Tiotsop, Lohic, Politecnico di Torino, Italy Servetti, Antonio, Politecnico di Torino, Italy Masala, Enrico, Politecnico di Torino, Italy
IVMSP-P12.7: LEARNING MULTI-SCALE ATTENTIVE FEATURES FOR SERIES PHOTO SELECTION

Huang, Jin, Shandong University, China Cui, Chaoran, Shandong University of Finance and Economics, China Zhang, Chunyun, Shandong University of Finance and Economics, China Shen, Zhen, Shandong University, China Yu, Jun, Shandong University, China Yin, Yilong, Shandong University, China

IVMSP-P12.8: SPATIO-TEMPORAL AND GEOMETRY CONSTRAINED NETWORK FOR AUTOMOBILE VISUAL ODOMETRY

Liu, Hong, Peking University, China Wei, Peng, Peking University, China Huang, Weibo, Peking University, China Hua, Guoliang, Peking University, China Meng, Fanyang, Peng Cheng Laboratory, China

IVMSP-P12.9: A COMPREHENSIVE FRAMEWORK FOR 2D-JND EXTENSION TO 360-DEG IMAGES

Jaballah, Sami, Université de Poitiers, France Bhavsar, Amegh, Université de Poitiers, France Larabi, Chaker, Université de Poitiers, France

IVMSP-P12.10: COMPOSITE DYNAMIC TEXTURE SYNTHESIS USING HIERARCHICAL LINEAR DYNAMICAL SYSTEM

Singh, Rishabh, University of Florida, United States Yu, Shujian, University of Florida, United States Principe, Jose, University of Florida, United States
MLSP-L1 - Adversarial Machine Learning

MLSP-L1.1: HEADLESS HORSEMAN: ADVERSARIAL ATTACKS ON TRANSFER LEARNING MODELS
Abdelkader, Ahmed, University of Maryland, United States
Curry, Michael, University of Maryland, United States
Fowl, Liam, University of Maryland, United States
Goldstein, Tom, University of Maryland, United States
Schwarzschild, Avi, University of Maryland, United States
Shu, Manli, University of Maryland, United States
Studer, Christoph, Cornell Tech, United States
Zhu, Chen, University of Maryland, United States

MLSP-L1.2: DETECTING ADVERSARIAL ATTACKS IN TIME-SERIES DATA
Abdu-Aguye, Mubarak, Egypt-Japan University of Science and Technology, Egypt
Gomaa, Walid, Egypt-Japan University of Science and Technology, Egypt
Makihara, Yasushi, Osaka University, Japan
Yagi, Yasushi, Osaka University, Japan

MLSP-L1.3: DETECTION OF ADVERSARIAL ATTACKS AND CHARACTERIZATION OF ADVERSARIAL SUBSPACE
Esmaeilpour, Mohammad, École de Technologie Supérieure, Canada
Cardinal, Patrick, École de Technologie Supérieure, Canada
Koerich, Alessandro, École de Technologie Supérieure, Canada

MLSP-L1.4: ADVERSARIAL EXAMPLE DETECTION BY CLASSIFICATION FOR DEEP SPEECH RECOGNITION
Samizade, Saeid, Aalborg University, Denmark
Tan, Zheng-Hua, Aalborg University, Denmark
Shen, Chao, Xi’an Jiaotong University, China
Guan, Xiaohong, Xi’an Jiaotong University, China

MLSP-L1.5: CHARACTERIZING SPEECH ADVERSARIAL EXAMPLES USING SELF-ATTENTION U-NET ENHANCEMENT
Yang, Chao-Han Huck, Georgia Institute of Technology, United States
Qi, Jun, Georgia Institute of Technology, United States
Chen, Pin-Yu, IBM Research, United States
Ma, Xiaoli, Georgia Institute of Technology, United States
Lee, Chin-Hui, Georgia Institute of Technology, United States

MLSP-L1.6: ACTION-MANIPULATION ATTACKS ON STOCHASTIC BANDITS
Liu, Guanlin, University of California, Davis, United States
Lai, Lifeng, University of California, Davis, United States
Wednesday, 6 May, 11:30 - 13:30

MLSP-L2 - Optimization Algorithms I

MLSP-L2.1: PRIMAL-DUAL STOCHASTIC SUBGRADIENT METHOD FOR LOG-DETERMINANT OPTIMIZATION

Wu, Songwei, Nanyang Technological University, Singapore
Yu, Hang, Nanyang Technological University, Singapore
Dauwels, Justin, Nanyang Technological University, Singapore

MLSP-L2.2: NEURAL NETWORK TRAINING WITH APPROXIMATE LOGARITHMIC COMPUTATIONS

Sanyal, Arnab, University of Southern California, United States
Beerel, Peter, University of Southern California, United States
Chugg, Keith, University of Southern California, United States

MLSP-L2.3: AUTOMATIC AND SIMULTANEOUS ADJUSTMENT OF LEARNING RATE AND MOMENTUM FOR STOCHASTIC GRADIENT-BASED OPTIMIZATION METHODS

Lancewicki, Tomer, eBay, United States
Kopru, Selcuk, eBay, United States

MLSP-L2.4: A STUDY OF GENERALIZATION OF STOCHASTIC MIRROR DESCENT ALGORITHMS ON OVERPARAMETERIZED NONLINEAR MODELS

Azizan, Navid, California Institute of Technology, United States
Lale, Sahin, California Institute of Technology, United States
Hassibi, Babak, California Institute of Technology, United States

MLSP-L2.5: ON DISTRIBUTED STOCHASTIC GRADIENT DESCENT FOR NONCONVEX FUNCTIONS IN THE PRESENCE OF BYZANTINES

Bulusu, Saikiran, Syracuse University, United States
Khanduri, Prashant, Syracuse University, United States
Sharma, Pranay, Syracuse University, United States
Varshney, Pramod, Syracuse University, United States

MLSP-L2.6: PRECONDITIONING ADMM FOR FAST DECENTRALIZED OPTIMIZATION

Ma, Meng, University of Minnesota, United States
Giannakis, Georgios B., University of Minnesota, United States
**Wednesday, 6 May, 16:30 - 18:30**

**MLSP-L3 - Optimization Algorithms II**

**MLSP-L3.1: EXTRAPOLATED ALTERNATING ALGORITHMS FOR APPROXIMATE CANONICAL POLYADIC DECOMPOSITION**

Man Shun Ang, Andersen, Université de Mons, Belgium E. Cohen, Jeremy, CNRS, France Hien, Le Thi Khanh, Université de Mons, Belgium Gillis, Nicolas, Université de Mons, Belgium

**MLSP-L3.2: SCALABLE KERNEL LEARNING VIA THE DISCRIMINANT INFORMATION**

Al, Mert, Princeton University, United States Hou, Zejiang, Princeton University, United States Kung, Sun-Yuan, Princeton University, United States

**MLSP-L3.3: ARSM GRADIENT ESTIMATOR FOR SUPERVISED LEARNING TO RANK**

Zamani Dadaneh, Siamak, Texas A&M University, United States Boluki, Shahin, Texas A&M University, United States Zhou, Mingyuan, University of Texas at Austin, United States Qian, Xiaoning, Texas A&M University, United States

**MLSP-L3.4: SOLVING NON-CONVEX NON-DIFFERENTIABLE MIN-MAX GAMES USING PROXIMAL GRADIENT METHOD**

Barazandeh, Babak, University of Southern California, United States Razaviyayn, Meisam, University of Southern California, United States

**MLSP-L3.5: A FAST AND ACCURATE FREQUENT DIRECTIONS ALGORITHM FOR LOW RANK APPROXIMATION VIA BLOCK KRYLOV ITERATION**

Yi, Qianxin, Xi’an Jiaotong University, China Wang, Chenhao, Xi’an Jiaotong University, China Liao, Xiwu, Xi’an Jiaotong University, China Wang, Yao, Xi’an Jiaotong University, China

**MLSP-L3.6: STOCHASTIC ADMM FOR BYZANTINE-ROBUST DISTRIBUTED LEARNING**

Lin, Feng, Sun Yat-Sen University, China Ling, Qing, Sun Yat-Sen University, China Li, Weiyu, University of Science and Technology of China, China Xiong, Zhiwei, University of Science and Technology of China, China
Thursday, 7 May, 11:30 - 13:30

**MLSP-L4 - Generative Adversarial Networks**

**MLSP-L4.1: UNIFIED SIGNAL COMPRESSION USING GENERATIVE ADVERSARIAL NETWORKS**
Liu, Bowen, University of Michigan, United States  
Cao, Ang, University of Michigan, United States  
Kim, Hun-Seok, University of Michigan, United States

**MLSP-L4.2: WIND: WASSERSTEIN INCEPTION DISTANCE FOR EVALUATING GENERATIVE ADVERSARIAL NETWORK PERFORMANCE**
Dimitrakopoulos, Panagiotis, University of Ioannina, Greece  
Sfikas, Giorgos, University of Ioannina, Greece  
Nikou, Christophoros, University of Ioannina, Greece

**MLSP-L4.3: TRACE NORM GENERATIVE ADVERSARIAL NETWORKS FOR SENSOR GENERATION AND FEATURE EXTRACTION**
Zheng, Shuai, Hitachi America Ltd, United States  
Gupta, Chetan, Hitachi America Ltd, United States

**MLSP-L4.4: MAHALANOBIS DISTANCE BASED ADVERSARIAL NETWORK FOR ANOMALY DETECTION**
Hou, Yubo, Institute for Infocomm Research, Singapore  
Chen, Zhenghua, Institute for Infocomm Research, Singapore  
Wu, Min, Institute for Infocomm Research, Singapore  
Foo, Chuan-Sheng, Institute for Infocomm Research, Singapore  
Li, Xiaoli, Institute for Infocomm Research, Singapore  
Shubair, Raed, Massachusetts Institute of Technology, United States

**MLSP-L4.5: COMMUTING CONDITIONAL GANS FOR MULTI-MODAL FUSION**
Roheda, Siddharth, North Carolina State University, United States  
Krim, Hamid, North Carolina State University, United States  
Riggan, Benjamin S., University of Nebraska-Lincoln, United States

**MLSP-L4.6: SEQUENCE-TO-SUBSEQUENCE LEARNING WITH CONDITIONAL GAN FOR POWER DISAGGREGATION**
Pan, Yungang, Shandong University, China  
Liu, Ke, Shandong University, China  
Shen, Zhaoyan, Shandong University, China  
Cai, Xiaojun, Shandong University, China  
Jia, Zhiping, Shandong University, China
Thursday, 7 May, 11:30 - 13:30

MLSP-L5 - Neural Networks Applications I

MLSP-L5.1: A BIN ENCODING TRAINING OF A SPIKING NEURAL NETWORK BASED VOICE ACTIVITY DETECTION

Dellaferreira, Giorgia, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Martinelli, Flavio, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Cernak, Milos, Logitech Europe, Switzerland

MLSP-L5.2: ECG HEARTBEAT CLASSIFICATION BASED ON MULTI-SCALE WAVELET CONVOLUTIONAL NEURAL NETWORKS

El Bouny, Lahcen, Hassan II University Of Casablanca, Morocco
Khalil, Mohammed, Hassan II University Of Casablanca, Morocco
Adib, Abdellah, Hassan II University Of Casablanca, Morocco

MLSP-L5.3: SELF-SUPERVISED LEARNING FOR ECG-BASED EMOTION RECOGNITION

Sarkar, Pritam, Queen's University, Canada
Etemad, Ali, Queen's University, Canada

MLSP-L5.4: EXPRESSION-GUIDED EEG REPRESENTATION LEARNING FOR EMOTION RECOGNITION

Rayatdoost, Soheil, University of Geneva, Switzerland
Rudrauf, David, University of Geneva, Switzerland
Soleymani, Mohammad, University of Southern California, United States

MLSP-L5.5: ATTENTION DRIVEN FUSION FOR MULTI-MODAL EMOTION RECOGNITION

Priyasad, Darshana, Queensland University of Technology, Australia
Fernando, Tharindu, Queensland University of Technology, Australia
Denman, Simon, Queensland University of Technology, Australia
Sridharan, Sridha, Queensland University of Technology, Australia
Fookes, Clinton, Queensland University of Technology, Australia

MLSP-L5.6: LEARNING THE SPATIO-TEMPORAL DYNAMICS OF PHYSICAL PROCESSES FROM PARTIAL OBSERVATIONS

Ayed, Ibrahim, Sorbonne Université, Theresis Lab Thales, France
de Bézenac, Emmanuel, Sorbonne Université, France
Pajot, Arthur, Sorbonne Université, France
Gallinari, Patrick, Sorbonne Université / Criteo AI Lab, France
Thursday, 7 May, 11:30 - 13:30

**MLSP-L6 - Sparsity Aware Processing and Learning**

**MLSP-L6.1: OPTIMAL LAPLACIAN REGULARIZATION FOR SPARSE SPECTRAL COMMUNITY DETECTION**

Dall'Amico, Lorenzo, GIPSA lab - Grenoble INP, France  
Couillet, Romain, GIPSA lab - Grenoble INP, France  
Tremblay, Nicolas, GIPSA lab - Grenoble INP, France

**MLSP-L6.2: ANOMALY DETECTION IN MIXED TIME-SERIES USING A CONVOLUTIONAL SPARSE REPRESENTATION WITH APPLICATION TO SPACECRAFT HEALTH MONITORING**

Pilastre, Barbara, TéSA, France  
Silva, Gustavo, Pontifica Universidad Catolica del Peru, Peru  
Boussouf, Loïc, Airbus Defence and Space, France  
D’Escrivan, Stéphane, CNES, France  
Rodriguez, Paul, Pontifica Universidad Catolica del Peru, Peru  
Tourneret, Jean-Yves, ENSEEIHT-IRIT/TéSA, France

**MLSP-L6.3: VARIATIONAL STUDENT: LEARNING COMPACT AND SPARSER NETWORKS IN KNOWLEDGE DISTILLATION FRAMEWORK**

Hegde, Srinidhi, TCS Research, India  
Prasad, Ranjitha, TCS Research, India  
Hebbalaguppe, Ramya, TCS Research, India  
Kumar, Vishwajeet, IIT Kharagpur, India

**MLSP-L6.4: LOW RANK ACTIVATIONS FOR TENSOR-BASED CONVOLUTIONAL SPARSE CODING**

Humbert, Pierre, CMLA - École normale supérieure Paris-Saclay, France  
Audiffren, Julien, CMLA - École normale supérieure Paris-Saclay, France  
Oudre, Laurent, L2TI Universite Paris 13, France  
Vayatis, Nicolas, CMLA - École normale supérieure Paris-Saclay, France
Thursday, 7 May, 16:30 - 18:30

MLSP-L7 - Machine Learning Applications III

MLSP-L7.1: ENERGY DISAGGREGATION USING FRACTIONAL CALCULUS
Schirmer, Pascal, University of Hertfordshire, United Kingdom Mporas, Iosif, University of Hertfordshire, United Kingdom

MLSP-L7.2: DYNA-BOLT: DOMAIN ADAPTIVE BINARY FACTORIZATION OF CURRENT WAVEFORMS FOR ENERGY DISAGGREGATION
Chen, Bingqing, Carnegie Mellon University, United States Liu, Jingxiao, Carnegie Mellon University, United States Lange, Henning, University of Washington, United States Berges, Mario, Carnegie Mellon University, United States

MLSP-L7.3: INDEPENDENT-VARIATION MATRIX FACTORIZATION WITH APPLICATION TO ENERGY DISAGGREGATION

MLSP-L7.4: UNSUPERVISED STYLE AND CONTENT SEPARATION BY MINIMIZING MUTUAL INFORMATION FOR SPEECH SYNTHESIS
Hu, Ting-Yao, Carnegie Mellon University, United States Shrivastava, Ashish, Apple, United States Tuzel, Oncel, Apple, United States Dhir, Chandra, Apple, United States

MLSP-L7.5: IMPROVING SINGING VOICE SEPARATION WITH THE WAVE-U-NET USING MINIMUM HYPERSPHERICAL ENERGY
Perez-Lapillo, Joaquin, City, University of London, United Kingdom Galkin, Oleksandr, City, University of London, United Kingdom Weyde, Tillman, City, University of London, United Kingdom

MLSP-L7.6: SINGING VOICE CONVERSION WITH DISENTANGLLED REPRESENTATIONS OF SINGER AND VOCAL TECHNIQUE USING VARIATIONAL AUTOENCODERS
Luo, Yin-Jyun, Singapore University of Technology and Design, Singapore Hsu, Chin-Cheng, University of Southern California, United States Agres, Kat, Agency for Science, Technology and Research (A*STAR), Singapore Herremans, Dorien, Singapore University of Technology and Design, Singapore
Thursday, 7 May, 16:30 - 18:30

**MLSP-L8 - Tensor-based Signal Processing**

**MLSP-L8.1: ONLINE TENSOR COMPLETION AND FREE SUBMODULE TRACKING WITH THE T-SVD**
Gilman, Kyle, University of Michigan, United States Balzano, Laura, University of Michigan, United States

**MLSP-L8.2: EXPLOITING COMMUTATIVITY CONDITION FOR CP DECOMPOSITION VIA APPROXIMATE SIMULTANEOUS DIAGONALIZATION**
Akema, Riku, Tokyo Institute of Technology, Japan Yamagishi, Masao, Tokyo Institute of Technology, Japan Yamada, Isao, Tokyo Institute of Technology, Japan

**MLSP-L8.3: A NOVEL RANK SELECTION SCHEME IN TENSOR RING DECOMPOSITION BASED ON REINFORCEMENT LEARNING FOR DEEP NEURAL NETWORKS**
Cheng, Zhiyu, Baidu USA, United States Li, Baopu, Baidu USA, United States Fan, Yanwen, Baidu, China Bao, Yingze, Baidu USA, United States

**MLSP-L8.4: SENSITIVITY IN TENSOR DECOMPOSITION**
Tichavsky, Petr, Academy of Sciences of the Czech Republic, Czech Republic Phan, Anh-Huy, Skolkovo Institute of Science and Technology (Skoltech), Russia Cichocki, Andrzej, Skolkovo Institute of Science and Technology (Skoltech), Russia

**MLSP-L8.5: ESTIMATING STRUCTURAL MISSING VALUES VIA LOW-TUBAL-RANK TENSOR COMPLETION**
Wang, Hailin, Southwest University, China Zhang, Feng, Southwest University, China Wang, Jianjun, Southwest University, China Wang, Yao, Xi’an Jiaotong University, China

**MLSP-L8.6: LOW-TUBAL-RANK TENSOR RECOVERY FROM ONE-BIT MEASUREMENTS**
Hou, Jingyao, Southwest University, China Zhang, Feng, Southwest University, China Wang, Yao, Xi’an Jiaotong University, China Wang, Jianjun, Southwest University, China
Friday, 8 May, 08:00 - 10:00

MLSP-L9 - Autoencoders

MLSP-L9.1: CONTINUAL LEARNING THROUGH ONE-CLASS CLASSIFICATION USING VAE

Wiewel, Felix, University of Stuttgart, Germany Brendle, Andreas, University of Stuttgart, Germany Yang, Bin, University of Stuttgart, Germany

MLSP-L9.2: ESTIMATION OF POST-NONLINEAR CAUSAL MODELS USING AUTOENCODING STRUCTURE

Uemura, Kento, Fujitsu Laboratories Ltd., Japan Shimizu, Shohei, Shiga University, Japan

MLSP-L9.3: FROM SYMBOLS TO SIGNALS: SYMBOLIC VARIATIONAL AUTOENCODERS

Devaraj, Chinmaya, University of Maryland, United States Chowdhury, Aritra, GE Research, United States Jain, Arpit, GE Research, United States Kubricht, James, GE Research, United States Peter, Tu, GE Research, United States Santamaria-Pang, Alberto, GE Research, United States

MLSP-L9.4: GRAPH AUTO-ENCODER FOR GRAPH SIGNAL DENOISING

Huu Do, Tien, Vrije Universiteit Brussel, Belgium Nguyen, Minh Duc, Vrije Universiteit Brussel, Belgium Deligiannis, Nikos, Vrije Universiteit Brussel, Belgium

MLSP-L9.5: A PRIORI ESTIMATES OF THE GENERALIZATION ERROR FOR AUTOENCODERS

Dou, Zehao, Peking University, China E, Weinan, Princeton University, United States Ma, Chao, Princeton University, United States
Friday, 8 May, 08:00 - 10:00

MLSP-L10 - Deep Neural Network Structures

MLSP-L10.1: GFCN: A NEW GRAPH CONVOLUTIONAL NETWORK BASED ON PARALLEL FLOWS
Ji, Feng, Nanyang Technological University, Singapore Yang, Jielong, Nanyang Technological University, Singapore Zhang, Qiang, Nanyang Technological University, Singapore Tay, Wee Peng, Nanyang Technological University, Singapore

MLSP-L10.2: DEPTHWISE-STFT BASED SEPARABLE CONVOLUTIONAL NEURAL NETWORKS
Kumawat, Sudhakar, Indian Institute of Technology Gandhinagar, India Raman, Shanmuganathan, Indian Institute of Technology Gandhinagar, India

MLSP-L10.3: SEMI-IMPILCIT STOCHASTIC RECURRENT NEURAL NETWORKS
Hajiramezanali, Ehsan, Texas A&M University, United States Hasanzadeh, Arman, Texas A&M University, United States Duffield, Nick, Texas A&M University, United States Narayanan, Krishna, Texas A&M University, United States Zhou, Mingyuan, University of Texas at Austin, United States Qian, Xiaoning, Texas A&M University, United States

MLSP-L10.4: FEEDBACK RECURRENT AUTOENCODER
Yang, Yang, Qualcomm Inc., United States Sautière, Guillaume, Qualcomm Inc., Netherlands Ryu, Jongha, Qualcomm Inc., United States Cohen, Taco, Qualcomm Inc., Netherlands

MLSP-L10.5: INDYLSTMS: INDEPENDENTLY RECURRENT LSTMS
Gonnet, Pedro, Google Research, Switzerland Deselaers, Thomas, Google Research, Switzerland

MLSP-L10.6: NEURAL ATTENTIVE MULTIVIEW MACHINES
Barkan, Oren, Microsoft, Israel Katz, Ori, Microsoft, Israel Koenigstein, Noam, Microsoft, Israel
MLSP-L11 - Attention Networks

MLSP-L11.1: ATTENTIVE MODALITY HOPPING MECHANISM FOR SPEECH EMOTION RECOGNITION
Yoon, Seunghyun, Seoul National University, Korea (South) Dey, Subhadeep, Idiap Research Institute, Swaziland Lee, Hwanhee, Seoul National University, Korea (South) Jung, Kyomin, Seoul National University, Korea (South)

MLSP-L11.2: FACIAL EMOTION RECOGNITION USING LIGHT FIELD IMAGES WITH DEEP ATTENTION-BASED BIDIRECTIONAL LSTM
Sepas-Moghaddam, Alireza, Queen’s University, Canada Etemad, Ali, Queen’s University, Canada Pereira, Fernando, Instituto Superior Técnico, Universidade de Lisboa, Portugal Lobato Correia, Paulo, Instituto Superior Técnico, Universidade de Lisboa, Portugal

MLSP-L11.3: A REGULARIZED ATTENTION MECHANISM FOR GRAPH ATTENTION NETWORKS
Shanthamallu, Uday Shankar, Arizona State University, United States Thiagarajan, Jayaraman J, Lawrence Livermore National Laboratory, United States Spanias, Andreas, Arizona State University, United States

MLSP-L11.4: ATTENTIVE ITEM2VEC: NEURAL ATTENTIVE USER REPRESENTATIONS
Barkan, Oren, Microsoft, Israel Caciularu, Avi, Bar-Ilan University, Israel Katz, Ori, Microsoft, Israel Koenigstein, Noam, Microsoft, Israel

MLSP-L11.5: AUDIO SOUND DETERMINATION USING FEATURE SPACE ATTENTION BASED CONVOLUTION RECURRENT NEURAL NETWORK
Xia, Xianjun, Tencent, China Pan, Jingjing, China University of Mining and Technology, China Wang, Yannan, Tencent, China

MLSP-L11.6: SPATIAL ATTENTIONAL BILINEAR 3D CONVOLUTIONAL NETWORK FOR VIDEO-BASED AUTISM SPECTRUM DISORDER DETECTION
Sun, Kangbo, Shanghai Jiao Tong University, China Li, Lin, Shanghai Jiao Tong University, China Li, Lianqiang, Shanghai Jiao Tong University, China He, Ningyu, Shanghai Jiao Tong University, China Zhu, Jie, Shanghai Jiao Tong University, China
MLSP-L12 - Sequential Learning

MLSP-L12.1: LINEAR THOMPSON SAMPLING UNDER UNKNOWN LINEAR CONSTRAINTS
Moradipari, Ahmadreza, UC Santa Barbara, United States Alizadeh, Mahnoosh, UC Santa Barbara, United States Thrampoulidis, Christos, UC Santa Barbara, United States

MLSP-L12.2: OVERLAPPED STATE HIDDEN SEMI-MARKOV MODEL FOR GROUPED MULTIPLE SEQUENCES
Narimatsu, Hiromi, University of Electro-Communications / NTT Communication Science Laboratories, Japan Kasai, Hiroyuki, Waseda University, Japan

MLSP-L12.3: ONLINE COMMUNITY DETECTION BY SPECTRAL CUSUM
Zhang, Minghe, Georgia Institute of Technology, United States Xie, Liyan, Georgia Institute of Technology, United States Xie, Yao, Georgia Institute of Technology, United States

MLSP-L12.4: ENHANCED ADVERSARIAL STRATEGICALLY-TIMED ATTACKS AGAINST DEEP REINFORCEMENT LEARNING
Yang, Chao-Han Huck, Georgia Institute of Technology, United States Qi, Jun, Georgia Institute of Technology, United States Chen, Pin-Yu, IBM Research, United States Ouyang, Yi, Preferred Network America, United States Hung, I-Te Danny, Columbia University, United States Lee, Chin-Hui, Georgia Institute of Technology, United States Ma, Xiaoli, Georgia Institute of Technology, United States

MLSP-L12.5: PREFERENCE-AWARE MASK FOR SESSION-BASED RECOMMENDATION WITH BIDIRECTIONAL TRANSFORMER
Zhang, Yuanxing, Peking University, China Zhao, Pengyu, Peking University, China Guan, Yushuo, Peking University, China Chen, Lin, Yale University, China Bian, Kaigui, Peking University, China Song, Lingyang, Peking University, China Cui, Bin, Peking University, China Li, Xiaoming, Peking University, China
MLSP-P1 - Dictionary Learning, Representation Learning and Matrix Completion

MLSP-P1.1: LOW MUTUAL AND AVERAGE COHERENCE DICTIONARY LEARNING USING CONVEX APPROXIMATION
Parsa, Javad, Sharif University of Technology, Iran Sadeghi, Mostafa, Inria Grenoble Rhône-Alpes, France Babaie-Zadeh, Massoud, Sharif University of Technology, Iran Jutten, Christian, GIPSA-Lab, France

MLSP-P1.2: ROBUST ONLINE MATRIX COMPLETION WITH GAUSSIAN MIXTURE MODEL
Liu, Chunsheng, National University of Defense Technology, China Chen, Chunlei, Weifang University, China Shan, Hong, National University of Defense Technology, China Wang, Bin, National University of Defense Technology, China

MLSP-P1.3: DEEP NEURAL NETWORK BASED MATRIX COMPLETION FOR INTERNET OF THINGS NETWORK LOCALIZATION
Kim, Sunwoo, Seoul National University, Korea (South) Nguyen, Luong Trung, Seoul National University, Korea (South) Shim, Byonghyo, Seoul National University, Korea (South)

MLSP-P1.4: BRINGING IN THE OUTLIERS: A SPARSE SUBSPACE CLUSTERING APPROACH TO LEARN A DICTIONARY OF MOUSE ULTRASONIC VOCALIZATIONS
Wang, Jiaxi, University of Southern California, United States Mundnich, Karel, University of Southern California, United States Knoll, Allison, University of Southern California, United States Levitt, Pat, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

MLSP-P1.5: ONE-BIT COMPRESSED SENSING USING GENERATIVE MODELS
Joseph, Geethu, Syracuse University, United States Kafle, Swatantra, Syracuse University, United States Varshney, Pramod, Syracuse University, United States

MLSP-P1.6: HYBRID DEEP-SEMANTIC MATRIX FACTORIZATION FOR TAG-AWARE PERSONALIZED RECOMMENDATION
Xu, Zhenghua, Hebei University of Technology, China Yuan, Di, Hebei University of Technology, China Lukasiewicz, Thomas, University of Oxford, United Kingdom Chen, Cheng, China Academy of Electronics and Information
Technology, China Miao, Yishu, University of Oxford, United Kingdom Xu, Guizhi, Hebei University of Technology, China

**MLSP-P1.7: SUPERVISED ENCODING FOR DISCRETE REPRESENTATION LEARNING**

Le, Cat, Duke University, United States Zhou, Yi, University of Utah, United States Ding, Jie, University of Minnesota, United States Tarokh, Vahid, Duke University, United States

**MLSP-P1.8: LEARNING DATA REPRESENTATION AND EMOTION ASSESSMENT FROM PHYSIOLOGICAL DATA**

Joaquim, Miguel, Universidade de Lisboa, Portugal Maçorano, Rita, Universidade de Lisboa, Portugal Canais, Francisca, Universidade de Lisboa, Portugal Ramos, Rafael, Universidade de Lisboa, Portugal Fred, Ana, Instituto Superior Técnico, Universidade de Lisboa, Portugal Torrado, Marco, Universidade de Lisboa, Portugal Ferreira, Hugo, Universidade de Lisboa, Portugal

**MLSP-P1.9: FEATURE SELECTION UNDER ORTHOGONAL REGRESSION WITH REDUNDANCY MINIMIZING**

Xu, Xueyuan, Beijing Normal University, China Wu, Xia, Beijing Normal University, China

**MLSP-P1.10: THE PICASSO ALGORITHM FOR BAYESIAN LOCALIZATION VIA PAIRED COMPARISONS IN A UNION OF SUBSPACES MODEL**

Canal, Gregory, Georgia Institute of Technology, United States Connor, Marissa, Georgia Institute of Technology, United States Jin, Jihui, Georgia Institute of Technology, United States Nadagouda, Namrata, Georgia Institute of Technology, United States O'Shaughnessy, Matthew, Georgia Institute of Technology, United States Rozell, Christopher, Georgia Institute of Technology, United States Davenport, Mark, Georgia Institute of Technology, United States

**MLSP-P1.11: LEARNING SEMI-SUPERVISED ANONYMIZED REPRESENTATIONS BY MUTUAL INFORMATION**

Feutry, Clement, CentraleSupelec-CNRS-Universite Paris Sud, France Piantanida, Pablo, CentraleSupelec-CNRS-Universite Paris Sud, France Duhamel, Pierre, CNRS-CentraleSupelec-Universite Paris Sud, France

**MLSP-P1.12: LEARNING LOCAL STRUCTURE OF REPRESENTATIVE POINTS FOR POINT CLOUD CLASSIFICATION AND SEMANTIC SEGMENTATION**

Li, Xincheng, Tianjin University, China Pang, Yanwei, Tianjin University, China Wu, Yuefeng, Tianjin University, China Li, Yazhao, Tianjin University, China
Tuesday, 5 May, 11:30 - 13:30

MLSP-P2 - Applications in Speech and Audio

MLSP-P2.1: TOWARDS BLIND QUALITY ASSESSMENT OF CONCERT AUDIO RECORDINGS USING DEEP NEURAL NETWORKS

Simou, Nikonas, University of Crete, Greece Mastorakis, Yannis, Foundation for Research and Technology-Hellas (FORTH), Greece Stefanakis, Nikolaos, Foundation for Research and Technology-Hellas (FORTH), Greece

MLSP-P2.3: MULTI-LABEL SOUND EVENT RETRIEVAL USING A DEEP LEARNING-BASED SIAMESE STRUCTURE WITH A PAIRWISE PRESENCE MATRIX

Fan, Jianyu, Simon Fraser University, Canada Nichols, Eric, Microsoft, United States Tompkins, Daniel, Microsoft, United States Méndez Méndez, Ana Elisa, New York University, United States Elizalde, Benjamin, Carnegie Mellon University, United States Pasquier, Philippe, Simon Fraser University, Canada

MLSP-P2.4: SPEECH-DRIVEN FACIAL ANIMATION USING POLYNOMIAL FUSION OF FEATURES

Kefalas, Triantafyllos, Imperial College London, United Kingdom Vougioukas, Konstantinos, Imperial College London, United Kingdom Panagakis, Yannis, Imperial College London, United Kingdom Petridis, Stavros, Imperial College London and Samsung AI Centre Cambridge, United Kingdom Kossaifi, Jean, Imperial College London and Samsung AI Centre Cambridge, United Kingdom Pantic, Maja, Imperial College London and Samsung AI Centre Cambridge, United Kingdom

MLSP-P2.5: SED-MDD: TOWARDS SENTENCE DEPENDENT END-TO-END MISPRONUNCIATION DETECTION AND DIAGNOSIS

Feng, Yiqing, Harbin Institute of Technology, China Fu, Guanyu, Harbin Institute of Technology, China Chen, Qingcai, Harbin Institute of Technology, China Chen, Kai, Harbin Institute of Technology, China

MLSP-P2.6: GENERATIVE PRE-TRAINING FOR SPEECH WITH AUTOREGRESSIVE PREDICTIVE CODING

Chung, Yu-An, Massachusetts Institute of Technology, United States Glass, James, Massachusetts Institute of Technology, United States

MLSP-P2.7: STARGAN FOR EMOTIONAL SPEECH CONVERSION: VALIDATED BY DATA AUGMENTATION OF END-TO-END EMOTION RECOGNITION
Rizos, Georgios, Imperial College London, United Kingdom
Baird, Alice, University of Augsburg, Germany
Elliott, Max, Imperial College London, United Kingdom
Schuller, Björn, Imperial College London, United Kingdom

MLSP-P2.8: MULTIMODAL TRANSFORMER FUSION FOR CONTINUOUS EMOTION RECOGNITION
Huang, Jian, Institute of Automation, Chinese Academy of Sciences, China
Tao, Jianhua, Institute of Automation, Chinese Academy of Sciences, China
Liu, Bin, Institute of Automation, Chinese Academy of Sciences, China
Lian, Zheng, Institute of Automation, Chinese Academy of Sciences, China
Niu, Mingyue, Institute of Automation, Chinese Academy of Sciences, China

MLSP-P2.9: HKA: A HIERARCHICAL KNOWLEDGE ATTENTION MECHANISM FOR MULTI-TURN DIALOGUE SYSTEM
Song, Jian, Tsinghua University, China
Zhang, Kailai, Tsinghua University, China
Wu, Ji, Tsinghua University, China

MLSP-P2.10: SUBMODULAR RANK AGGREGATION ON SCORE-BASED PERMUTATIONS FOR DISTRIBUTED AUTOMATIC SPEECH RECOGNITION
Qi, Jun, Georgia Institute of Technology, United States
Yang, Chao-Han Huck, Georgia Institute of Technology, United States
Tejedor, Javier, Universidad San Pablo-CEU, CEU Universities, Spain

MLSP-P2.11: BRIDGING MIXTURE DENSITY NETWORKS WITH META-LEARNING FOR AUTOMATIC SPEAKER IDENTIFICATION
Li, Ruirui, University of California, Los Angeles, United States
Jiang, Jyun-Yu, University of California, Los Angeles, United States
Wu, Xian, University of Notre Dame, United States
Mao, Hongda, Amazon, Inc., United States
Hsieh, Chu-Cheng, Amazon, Inc., United States
Wang, Wei, University of California, Los Angeles, United States

MLSP-P2.12: PITCH ESTIMATION VIA SELF-SUPERVISION
Gfeller, Beat, Google, Switzerland
Frank, Christian, Google, Switzerland
Roblek, Dominik, Google, Switzerland
Sharifi, Matt, Google, Switzerland
Tagliasacchi, Marco, Google, Switzerland
Velimirovic, Mihajlo, Google, Switzerland
Tuesday, 5 May, 16:30 - 18:30

MLSP-P3 - Reinforcement and Sequential Learning

MLSP-P3.1: HIERARCHICAL CACHING VIA DEEP REINFORCEMENT LEARNING
Sadeghi, Alireza, University of Minnesota, United States
Wang, Gang, University of Minnesota, United States
Giannakis, Georgios B., University of Minnesota, United States

MLSP-P3.2: LEARNING NETWORK REPRESENTATION THROUGH REINFORCEMENT LEARNING
Shen, Siqi, National University of Defense Technology, China
Fu, Yongquan, National University of Defense Technology, China
Jia, Adele Lu, China Agricultural University, China
Su, Huayou, National University of Defense Technology, China
Wang, Qinglin, National University of Defense Technology, China
Wang, Chengsong, National University of Defense Technology, China
Dou, Yong, National University of Defense Technology, China

MLSP-P3.3: ATTENTION-BASED CURIOSITY-DRIVEN EXPLORATION IN DEEP REINFORCEMENT LEARNING
Reizinger, Patrik, Budapest University of Technology and Economics, Hungary
Szemenyei, Márton, Budapest University of Technology and Economics, Hungary

MLSP-P3.4: STABILIZING MULTI-AGENT DEEP REINFORCEMENT LEARNING BY IMPLICITLY ESTIMATING OTHER AGENTS’ BEHAVIORS
Jin, Yue, Tsinghua University, China
Wei, Shuangqing, Louisiana State University, United States
Yuan, Jian, Tsinghua University, China
Zhang, Xudong, Tsinghua University, China
Wang, Chao, Tsinghua University, China

MLSP-P3.5: QOS-AWARE FLOW CONTROL FOR POWER-EFFICIENT DATA CENTER NETWORKS WITH DEEP REINFORCEMENT LEARNING
Sun, Penghao, National Digital Switching System Engineering & Technological R&D Center, China
Guo, Zehua, Beijing Institute of Technology, China
Liu, Sen, Central South University, China
Lan, Julong, Central South University, China
Hu, Yuxiang, Central South University, China

MLSP-P3.6: IMPROVING THE SCALABILITY OF DEEP REINFORCEMENT LEARNING-BASED ROUTING WITH CONTROL ON PARTIAL NODES
Sun, Penghao, National Digital Switching System Engineering & Technological R&D Center, China
Lan, Julong, National Digital Switching System Engineering & Technological R&D Center, China
Guo, Zehua, Beijing Institute of Technology,
China Xu, Yang, Fudan University, China Hu, Yuxiang, National Digital Switching System Engineering & Technological R&D Center, China

**MLSP-P3.7: GENERALIZED LINEAR BANDITS WITH SAFETY CONSTRAINTS**

Amani, Sanae, University of California, Santa Barbara, United States Alizadeh, Mahnoosh, University of California, Santa Barbara, United States Thrampoulidis, Christos, University of California, Santa Barbara, United States

**MLSP-P3.8: FROM VIDEO GAME TO REAL ROBOT: THE TRANSFER BETWEEN ACTION SPACES**

Karttunen, Janne, Karelics Oy, Finland Kanervisto, Anssi, University of Eastern Finland, Finland Kyrki, Ville, Aalto University, Finland Hautamäki, Ville, University of Eastern Finland, Finland

**MLSP-P3.9: CORRELATED MULTI-ARMED BANDITS WITH A LATENT RANDOM SOURCE**

Gupta, Samarth, Carnegie Mellon University, United States Joshi, Gauri, Carnegie Mellon University, United States Yagan, Osman, Carnegie Mellon University, United States

**MLSP-P3.10: ADAPTIVE SEQUENTIAL INTERPOLATOR USING ACTIVE LEARNING FOR EFFICIENT EMULATION OF COMPLEX SYSTEMS**

Martino, Luca, Universidad Rey Juan Carlos, Spain Heestermans Svendsen, Daniel, Universitat de Valencia, Spain Vicent, Jorge, Universitat de Valencia and Magellium Company in Geoinformation and Image Processing, France Camps-Valls, Gustau, Universitat de Valencia, Spain

**MLSP-P3.11: CONTINUAL LEARNING FOR INFINITE HIERARCHICAL CHANGE-POINT DETECTION**

Moreno-Muñoz, Pablo, Universidad Carlos III de Madrid, Spain Ramírez, David, Universidad Carlos III de Madrid, Spain Artés-Rodríguez, Antonio, Universidad Carlos III de Madrid, Spain
Tuesday, 5 May, 16:30 - 18:30

**MLSP-P4 - Adversarial Attacks and Fast Algorithms**

**MLSP-P4.2: COST AWARE ADVERSARIAL LEARNING**
De Silva, Shashini, Oregon State University, United States
Kim, Jinsub, Oregon State University, United States
Raich, Raviv, Oregon State University, United States

**MLSP-P4.3: ON DIVERGENCE APPROXIMATIONS FOR UNSUPERVISED TRAINING OF DEEP DENOISERS BASED ON STEIN’S UNBIASED RISK ESTIMATOR**
Soltanayev, Shakarim, Ulsan National Institute of Science and Technology, Korea (South)
Giryes, Raja, Tel Aviv University, Israel
Chun, Se Young, Ulsan National Institute of Science and Technology, Korea (South)
Eldar, Yonina, Weizmann Institute of Science, Israel

**MLSP-P4.4: VARIABLE METRIC PROXIMAL GRADIENT METHOD WITH DIAGONAL BARZILAI-BORWEIN STEPSIZE**
Park, Youngsuk, Stanford university, United States
Dhar, Sauptik, LG Sillicon Valley Lab, United States
Boyd, Stephen, Stanford university, United States
Shah, Mohak, LG Sillicon Valley Lab, United States

**MLSP-P4.5: REVISIT OF ESTIMATE SEQUENCE FOR ACCELERATED GRADIENT METHOD**
Li, Bingcong, University of minnesota, United States
Coutino, Mario, Delft University of Technology, Netherlands
Giannakis, Georgios B., University of minnesota, United States

**MLSP-P4.6: A GENERALIZATION OF PRINCIPAL COMPONENT ANALYSIS**
Battaglino, Samuele, University of Illinois at Chicago, United States
Koyuncu, Erdem, University of Illinois at Chicago, United States

**MLSP-P4.7: AN EASY-TO-IMPLEMENT FRAMEWORK OF FAST SUBSPACE CLUSTERING FOR BIG DATA SETS**
Meng, Linghang, Tsinghua University, China
Jiao, Yuchen, Tsinghua University, China
Gu, Yuantao, Tsinghua University, China

**MLSP-P4.8: INVESTIGATING GENERALIZATION IN NEURAL NETWORKS UNDER OPTIMALLY EVOLVED TRAINING PERTURBATIONS**
Chaudhury, Subhajit, University of Tokyo, Japan
Yamasaki, Toshihiko, University of Tokyo, Japan
MLSP-P4.9: HETEROGENEOUS DOMAIN GENERALIZATION VIA DOMAIN MIXUP

Wang, Yufei, University of Electronic Science and Technology of China, China Li, Haoliang, Nanyang Technological University, Singapore Kot, Alex Chichung, Nanyang Technological University, Singapore

MLSP-P4.10: PRESERVATION OF ANOMALOUS SUBGROUPS ON VARIATIONAL AUTOENCODER TRANSFORMED DATA


MLSP-P4.11: LEARN-BY-CALIBRATING: USING CALIBRATION AS A TRAINING OBJECTIVE

J. Thiagarajan, Jayaraman, Lawrence Livermore National Labs, United States Venkatesh, Bindya, Arizona State University, United States Rajan, Deepta, IBM Research, United States
Wednesday, 6 May, 09:00 - 11:00

**MLSP-P5 - Applications in Video and Image Processing I**

**MLSP-P5.1: ESRGAN+: FURTHER IMPROVING ENHANCED SUPER-RESOLUTION GENERATIVE ADVERSARIAL NETWORK**
Rakotonirina, Nathanaël Carraz, Université d’Antananarivo, Madagascar
Rasoanaivo, Andry, Université d’Antananarivo, Madagascar

**MLSP-P5.3: EFFICIENT IMAGE SUPER RESOLUTION VIA CHANNEL DISCRIMINATIVE DEEP NEURAL NETWORK PRUNING**
Hou, Zejiang, Princeton University, United States
Kung, Sun-Yuan, Princeton University, United States

**MLSP-P5.4: MULTI-RESOLUTION OVERLAPPING STRIPES NETWORK FOR PERSON RE-IDENTIFICATION**
Okay, Arda Efe, University of Miami, United States
AlGhamdi, Manal, Umm AlQura University, Saudi Arabia
Westendorp, Robert, FORTINET Technologies (Canada) ULC, Canada
Abdel-Mottaleb, Mohamed, University of Miami, United States

**MLSP-P5.5: PERSON IDENTIFICATION USING DEEP CONVOLUTIONAL NEURAL NETWORKS ON SHORT-TERM SIGNALS FROM WEARABLE SENSORS**
Retsinas, George, National Technical University of Athens, Greece
Filintisis, Panagiotis P., National Technical University of Athens, Greece
Efthymiou, Niki, National Technical University of Athens, Greece
Theodosis, Emmanouil, National Technical University of Athens, Greece
Zlatintsi, Athanasia, National Technical University of Athens, Greece
Maragos, Petros, National Technical University of Athens, Greece

**MLSP-P5.6: LOCAL-GLOBAL FEATURE FOR VIDEO-BASED ONE-SHOT PERSON RE-IDENTIFICATION**
Zhao, Chao, Nanjing University of Science and Technology, China
Zhenyu, Nanjing University of Science and Technology, China
Yang, Jian, Nanjing University of Science and Technology, China
Yan, Yan, Nanjing University of Science and Technology, China

**MLSP-P5.7: GLOBAL AND LOCAL DISCRIMINATIVE PATCHES EXPLOITING FOR ACTION RECOGNITION**
Wu, Jintao, Shanghai Jiao Tong University, China Luo, Wu, Shanghai Jiao Tong University, China Liu, Weiwei, Shanghai Jiao Tong University, China Zhang, Chongyang, Shanghai Jiao Tong University, China

MLSP-P5.9: DISENTANGLING CONTROLLABLE OBJECT THROUGH VIDEO PREDICTION IMPROVES VISUAL REINFORCEMENT LEARNING
Zhong, Yuanyi, University of Illinois at Urbana-Champaign, United States Schwing, Alexander, University of Illinois at Urbana-Champaign, United States Peng, Jian, University of Illinois at Urbana-Champaign, United States

MLSP-P5.10: DYNAMIC VARIATIONAL AUTOENCODERS FOR VISUAL PROCESS MODELING
Sagel, Alexander, fortiss - The Research Institute of the Free State of Bavaria, Germany Shen, Hao, fortiss - The Research Institute of the Free State of Bavaria, Germany

MLSP-P5.11: A NOVEL TWO-PATHWAY ENCODER-DECODER NETWORK FOR 3D FACE RECONSTRUCTION
Li, Xianfeng, South China University of Technology, China Weng, Zichun, South China University of Technology, China Liang, Juntao, South China University of Technology, China Cai, Lei, South China University of Technology, China Xiang, Youjun, South China University of Technology, China Fu, Yuli, South China University of Technology, China

MLSP-P5.12: RATE ASSIGNMENT IN 360-DEGREE VIDEO TILED STREAMING USING RANDOM FOREST REGRESSION
Skupin, Robert, Fraunhofer Heinrich Hertz Institute, Germany Bitterschulte, Kai, Fraunhofer Heinrich Hertz Institute, Germany Sanchez, Yago, Fraunhofer Heinrich Hertz Institute, Germany Hellge, Cornelius, Fraunhofer Heinrich Hertz Institute, Germany Schierl, Thomas, Fraunhofer Heinrich Hertz Institute, Germany
Wednesday, 6 May, 09:00 - 11:00

MLSP-P6 - Pattern Recognition and Machine Learning

MLSP-P6.1: IMPROVING CONVERGENT CROSS MAPPING FOR CAUSAL DISCOVERY WITH GAUSSIAN PROCESSES
Feng, Guanchao, Stony Brook University, United States
Yu, Kezi, IQVIA, United States
Wang, Yunlong, IQVIA, United States
Yuan, Yilian, IQVIA, United States
Djuric, Petar, Stony Brook University, United States

MLSP-P6.2: LABEL REUSE FOR EFFICIENT SEMI-SUPERVISED LEARNING
Hsieh, Tsung-Hung, Academia Sinica, Taiwan
Chen, Jun-Cheng, Academia Sinica, Taiwan
Chen, Chu-Song, Academia Sinica, Taiwan

MLSP-P6.3: DECENTRALIZED OPTIMIZATION WITH NON-IDENTICAL SAMPLING IN PRESENCE OF STRAGGLERS
Adikari, Tharindu, University of Toronto, Canada
Draper, Stark, University of Toronto, Canada

MLSP-P6.4: CONTENT VS CONTEXT: HOW ABOUT "WALKING HAND-IN-HAND" FOR IMAGE CLUSTERING?
Hu, Shizhe, Zhengzhou University, China
Hou, Zhenquan, Zhengzhou University, China
Lou, Zhengzheng, Zhengzhou University, China
Ye, Yangdong, Zhengzhou University, China

MLSP-P6.5: FIXED SMOOTH CONVOLUTIONAL LAYER FOR AVOIDING CHECKERBOARD ARTIFACTS IN CNNS
Kinoshita, Yuma, Tokyo Metropolitan University, Japan
Kiya, Hitoshi, Tokyo Metropolitan University, Japan

MLSP-P6.6: THIS DATASET DOES NOT EXIST: TRAINING MODELS FROM GENERATED IMAGES
Besnier, Victor, Sorbonne University, France
Jain, Himalaya, Valeo AI, France
Bursuc, Andrei, Valeo AI, France
Cord, Matthieu, Valeo AI, France
Pérez, Patrick, Valeo AI, France

MLSP-P6.7: LET-SNE: A HYBRID APPROACH TO DATA EMBEDDING AND VISUALIZATION OF HYPERSPECTRAL IMAGERY
Shukla, Megh, Mercedes-Benz Research and Development India Pvt. Ltd., India
Banerjee, Biplab, Indian Institute of Technology Bombay, India
Buddhiraju, Krishna Mohan, Indian Institute of Technology Bombay, India
MLSP-P6.8: ADVERSARIAL MIXUP SYNTHESIS TRAINING FOR UNSUPERVISED DOMAIN ADAPTATION
Tang, Yuhua, National University of Defense Technology, China Lin, Zhipeng, National University of Defense Technology, China Wang, Haotian, National University of Defense Technology, China Xu, Liyang, National University of Defense Technology, China

MLSP-P6.9: RATE-INvariant AUTOENCoding OF TIME-SERIES
Koneripalli, Kaushik, Arizona State University, United States Lohit, Suhas, Arizona State University, United States Anirudh, Rushil, Lawrence Livermore National Laboratory, United States Turaga, Pavan, Arizona State University, United States

MLSP-P6.10: SELF-PACED PROBABILISTIC PRINCIPAL COMPONENT ANALYSIS FOR DATA WITH OUTLIERS
Zhao, Bowen, Tsinghua University, China Xiao, Xi, Tsinghua University, China Zhang, Wanpeng, Tsinghua University, China Zhang, Bin, Peng Cheng Laboratory, China Gan, Guojun, University of Connecticut, United States Xia, Shu-Tao, Tsinghua University, China

MLSP-P6.11: CORRDROP: CORRELATION BASED DROPOUT FOR CONVOLUTIONAL NEURAL NETWORKS
Zeng, Yuyuan, Tsinghua University, China Dai, Tao, Tsinghua University, China Xia, Shu-Tao, Tsinghua University, China

MLSP-P6.12: WITCHCRAFT: EFFICIENT PGD ATTACKS WITH RANDOM STEP SIZE
Chiang, Ping-Yeh, University of Maryland, Taiwan Geiping, Jonas, University of Siegen, Germany Goldblum, Micah, University of Maryland, United States Goldstein, Tom, University of Maryland, United States Ni, Renkun, University of Maryland, China Reich, Steven, University of Maryland, United States Shafahi, Ali, University of Maryland, United States
Wednesday, 6 May, 16:30 - 18:30

**MLSP-P7 - Machine Learning Applications I**

**MLSP-P7.1: THE FIFTHNET CHROMA EXTRACTOR**
O’Hanlon, Ken, Queen Mary University of London, United Kingdom
Sandler, Mark, Queen Mary University of London, United Kingdom

**MLSP-P7.2: ROBUST MARINE BUOY PLACEMENT FOR SHIP DETECTION USING DROPOUT K-MEANS**
Ng, Yuting, Duke University, United States
Pereira, João M., Duke University, United States
Garagic, Denis, BAE Systems FAST Labs, United States
Tarokh, Vahid, Duke University, United States

**MLSP-P7.3: ON-THE-FLY FEATURE SELECTION AND CLASSIFICATION WITH APPLICATION TO CIVIC ENGAGEMENT PLATFORMS**
Warahena Liyanage, Yasitha, University at Albany, State University of New York, United States
Zois, Daphney-Stavroula, University at Albany, State University of New York, United States
Chelmis, Charalampos, University at Albany, State University of New York, United States

**MLSP-P7.4: GLOBAL TRAFFIC STATE RECOVERY VIA LOCAL OBSERVATIONS WITH GENERATIVE ADVERSARIAL NETWORKS**
He, Mingcheng, Shanghai Jiao Tong University, China
Luo, Xiliang, ShanghaiTech University, China
Wang, Zixin, ShanghaiTech University, China
Yang, Fuqian, ShanghaiTech University, China
Qian, Hua, Shanghai Advanced Research Institute, Chinese Academy of Sciences, China
Hua, Cunqing, Shanghai Jiao Tong University, China

**MLSP-P7.5: FORECASTING SPARSE TRAFFIC CONGESTION PATTERNS USING MESSAGE-PASSING RNNS**
Iyer, Shiva, New York University, United States
An, Ulzee, New York University, United States
Subramanian, Lakshminarayanan, New York University, United States

**MLSP-P7.6: ENERGY DISAGGREGATION FROM LOW SAMPLING FREQUENCY MEASUREMENTS USING MULTI-LAYER ZERO CROSSING RATE**
Schirmer, Pascal, University of Hertfordshire, United Kingdom
Mporas, Iosif, University of Hertfordshire, United Kingdom

**MLSP-P7.7: DECODING 5G-NR COMMUNICATIONS VIA DEEP LEARNING**
Henarejos, Pol, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
Vázquez, Miguel Ángel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain

**MLSP-P7.8: BODY MOVEMENT GENERATION FOR EXPRESSIVE VIOLIN PERFORMANCE APPLYING NEURAL NETWORKS**

Liu, Jun-Wei, Taipei Municipal Jianguo High School, Taiwan
Lin, Hung-Yi, Taipei Municipal Jianguo High School, Taiwan
Huang, Yu-Fen, Academia Sinica, Taiwan
Kao, Hsuan-Kai, Academia Sinica, Taiwan
Su, Li, Academia Sinica, Taiwan

**MLSP-P7.9: SEQUENTIAL VESSEL TRAJECTORY IDENTIFICATION USING TRUNCATED VITERBI ALGORITHM**

Dong, Zheng, University of Science and Technology of China, China
Yang, Yifei, Tsinghua University, China
Xie, Yao, Georgia Institute of Technology, United States

**MLSP-P7.10: A PROTOTYPICAL TRIPLET LOSS FOR COVER DETECTION**

Doras, Guillaume, Sacem, France
Peeters, Geoffroy, Telecom Paris, France

**MLSP-P7.11: AUTOMOTIVE RADAR SIGNAL INTERFERENCE MITIGATION USING RNN WITH SELF ATTENTION**

Mun, Jiwoo, Seoul National University, Korea (South)
Ha, Seokhyeon, Seoul National University, Korea (South)
Lee, Jungwoo, Seoul National University, Korea (South)

**MLSP-P7.12: A LARGE-SCALE DEEP ARCHITECTURE FOR PERSONALIZED GROCERY BASKET RECOMMENDATIONS**

Mantha, Aditya, Walmart Labs, United States
Arora, Yokila, Walmart Labs, United States
Gupta, Shubham, Walmart Labs, United States
Kanumala, Praveenkumar, Walmart Labs, United States
Liu, Zhiwei, Walmart Labs, United States
Achan, Kannan, Walmart Labs, United States
Wednesday, 6 May, 16:30 - 18:30

MLSP-P8 - Machine Learning Applications II

MLSP-P8.1: BLIND BOUNDED SOURCE SEPARATION USING NEURAL NETWORKS WITH LOCAL LEARNING RULES
Erdogan, Alper, Koc University, Turkey Pehlevan, Cengiz, Harvard University, United States

MLSP-P8.2: MODELING PIECE-WISE STATIONARY TIME SERIES
Wu, Daoping, Purdue University, United States Gundimeda, Suhas, Purdue University, United States Mou, Shao Shuai, Purdue University, United States Quinn, Christopher, Purdue University, United States

MLSP-P8.3: MULTIVARIATE TROPICAL REGRESSION AND PIECEWISE-LINEAR SURFACE FITTING
Maragos, Petros, National Technical University of Athens, Greece Theodosis, Emmanouil, Harvard University, United States

MLSP-P8.4: REVEALING BACKDOORS, POST-TRAINING, IN DNN CLASSIFIERS VIA NOVEL INFEERENCE ON OPTIMIZED PERTURBATIONS INDUCING GROUP MISCLASSIFICATION
Xiang, Zhen, Pennsylvania State University, United States Miller, David, Anomalee, Inc., United States Kesidis, George, Pennsylvania State University, United States

MLSP-P8.5: CLASSIFYING PARTIALLY LABELED NETWORKED DATA VIA LOGISTIC NETWORK LASSO
Tran, Nguyen, Aalto University, Finland Ambos, Henrik, Aalto University, Finland Jung, Alexander, Aalto University, Finland

MLSP-P8.6: NEURAL TIME WARPING FOR MULTIPLE SEQUENCE ALIGNMENT

MLSP-P8.7: LANCE: EFFICIENT LOW-PRECISION QUANTIZED WINOGRAD CONVOLUTION FOR NEURAL NETWORKS BASED ON GRAPHICS PROCESSING UNITS
Li, Guangli, Institute of Computing Technology, Chinese Academy of Sciences, China Liu, Lei, Institute of Computing Technology, Chinese Academy of Sciences,
China Wang, Xueying, Institute of Computing Technology, Chinese Academy of Sciences, China Ma, Xiu, Jilin University, China Feng, Xiaobing, Institute of Computing Technology, Chinese Academy of Sciences, China

**MLSP-P8.8: MEDIA CLASSIFICATION WITH BAYESIAN OPTIMIZATION AND VAPNIK-CHERVONENKIS (VC) BOUNDS**

Bharitkar, Sunil, HP Inc., United States

**MLSP-P8.9: BATMAN: BAYESIAN TARGET MODELLING FOR ACTIVE INFERENCE**

Koudahl, Magnus T., Eindhoven University of Technology, Netherlands de Vries, Bert, Eindhoven University of Technology and GN Hearing, Netherlands

**MLSP-P8.10: DEEP LEARNING ABILITIES TO CLASSIFY INTRICATE VARIATIONS IN TEMPORAL DYNAMICS OF MULTIVARIATE TIME SERIES**

Liotet, Pierre, Ecole normale supérieure Paris-Saclay, France Abry, Patrice, Ecole Normale Superieure de Lyon, France Leonarduzzi, Roberto, Ecole Normale Superieure, France Senneret, Marc, Vivienne Investissement, France Jaffrès, Laurent, Vivienne Investissement, France Perrin, Geral, Vivienne Investissement, France

**MLSP-P8.11: ASSIMILATION-BASED LEARNING OF CHAOTIC DYNAMICAL SYSTEMS FROM NOISY AND PARTIAL DATA**

Nguyen, Duong, IMT Atlantique, Lab-STICC, France Ouala, Said, IMT Atlantique, Lab-STICC, France Drumetz, Lucas, IMT Atlantique, Lab-STICC, France Fablet, Ronan, IMT Atlantique, Lab-STICC, France

**MLSP-P8.12: GATED MULTI-LAYER CONVOLUTIONAL FEATURE EXTRACTION NETWORK FOR ROBUST PEDESTRIAN DETECTION**

Liu, Tianrui, Imperial College London, United Kingdom Huang, Jun-Jie, Imperial College London, United Kingdom Dai, Tianhong, Imperial College London, United Kingdom Ren, Guangyu, Imperial College London, United Kingdom Stathaki, Tania, Imperial College London, United Kingdom
### Thursday, 7 May, 09:00 - 11:00

**MLSP-P9 - Graphical, Kernel and Tensor Methods**

**MLSP-P9.1: KERNEL RIDGE REGRESSION WITH AUTOCORRELATION PRIOR: OPTIMAL MODEL AND CROSS-VALIDATION**
Tanaka, Akira, Hokkaido University, Japan Imai, Hideyuki, Hokkaido University, Japan

**MLSP-P9.2: GENERALIZED KERNEL-BASED DYNAMIC MODE DECOMPOSITION**
Héas, Patrick, Inria & Irmar, Univ. Rennes, France Herzet, Cédric, Inria & Irmar, Univ. Rennes, France Combès, Benoit, Inria & Irisa, Univ. Rennes, France

**MLSP-P9.3: AN ONLINE KERNEL SCALAR QUANTIZATION SCHEME FOR SIGNAL CLASSIFICATION**
Guo, Jing, Purdue University, United States Raj, Raghu, U.S. Naval Research Laboratory, United States Love, David, Purdue University, United States

**MLSP-P9.4: SELF-DRIVEN GRAPH VOLterra MODELS FOR HIGHER-ORDER LINK PREDICTION**
Coutino, Mario, Delft University of Technology, Netherlands Karanikolas, Georgios V., University of Minnesota, United States Leus, Geert, Delft University of Technology, Netherlands Giannakis, Georgios B., University of Minnesota, United States

**MLSP-P9.5: GRAPH CONSTRUCTION FROM DATA BY NON-NEGATIVE KERNEL REGRESSION**
Shekkizhar, Sarath, University of Southern California, United States Ortega, Antonio, University of Southern California, United States

**MLSP-P9.6: STRUCTURED CITATION TREND PREDICTION USING GRAPH NEURAL NETWORKS**
Cummings, Daniel, Intel, United States Nassar, Marcel, Intel, United States

**MLSP-P9.7: REVISITING FAST SPECTRAL CLUSTERING WITH ANCHOR GRAPH**
Wang, Cheng-Long, Northwestern Polytechnical University, China Nie, Feiping, Northwestern Polytechnical University, China Wang, Rong, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China
MLSP-P9.8: A GRAPH NETWORK MODEL FOR DISTRIBUTED LEARNING WITH LIMITED BANDWIDTH LINKS AND PRIVACY CONSTRAINTS
Parras, Juan, Universidad Politécnica de Madrid, Spain Zazo, Santiago, Universidad Politécnica de Madrid, Spain

MLSP-P9.9: GRAPH REGULARIZED TENSOR TRAIN DECOMPOSITION
Sofuoglu, Seyyid Emre, Michigan State University, United States Aviyente, Selin, Michigan State University, United States

MLSP-P9.10: WEIGHTED KRYLOV-LEVENBERG-MARQUARDT METHOD FOR CANONICAL POLYADIC TENSOR DECOMPOSITION
Tichavsky, Petr, Academy of Sciences of the Czech Republic, Czech Republic Phan, Anh-Huy, Skolkovo Institute of Science and Technology (Skoltech), Russia Cichocki, Andrzej, Skolkovo Institute of Science and Technology (Skoltech), Russia

MLSP-P9.11: LOW-COMPLEXITY LEVENBERG-MARQUARDT ALGORITHM FOR TENSOR CANONICAL POLYADIC DECOMPOSITION
Huang, Kejun, University of Florida, United States Fu, Xiao, Oregon State University, United States

MLSP-P9.12: A MOMENT-BASED APPROACH FOR GUARANTEED TENSOR DECOMPOSITION
Marmin, Arthur, Université Paris-Saclay, CentraleSupélec, Inria, France Castella, Marc, CNRS, Télécom SudParis, Institut Polytechnique de Paris, France Pesquet, Jean-Christophe, Université Paris-Saclay, CentraleSupélec, Inria, France
Thursday, 7 May, 09:00 - 11:00

**MLSP-P10 - Learning Methods**

**MLSP-P10.1: LEARNING DIVERSE SUB-POLICIES VIA A TASK-AGNOSTIC REGULARIZATION ON ACTION DISTRIBUTIONS.**

Huo, Liangyu, Beihang University, China Wang, Zulin, Beihang University, China Xu, Mai, Beihang University, China Song, Yuhang, University of Oxford, United Kingdom

**MLSP-P10.2: FEDERATED LEARNING WITH MUTUALLY COOPERATING DEVICES: A CONSENSUS APPROACH TOWARDS SERVER-LESS MODEL OPTIMIZATION**

Savazzi, Stefano, Consiglio Nazionale delle Ricerche CNR-IEIIT, Italy Nicoli, Monica, Politecnico di Milano, Italy Rampa, Vittorio, Consiglio Nazionale delle Ricerche CNR-IEIIT, Italy Kianoush, Sanaz, Consiglio Nazionale delle Ricerche CNR-IEIIT, Italy

**MLSP-P10.3: NO-REGRET NON-CONVEX ONLINE META-LEARNING**

Zhuang, Zhenxun, Boston University, United States Wang, Yunlong, IQVIA Inc., United States Yu, Kezi, IQVIA Inc., United States Lu, Songtao, IBM, United States

**MLSP-P10.4: ASYNCHRONOUS DECENTRALIZED LEARNING OF A NEURAL NETWORK**

Liang, Xinyue, KTH Royal Institute of Technology, Sweden M. Javid, Alireza, KTH Royal Institute of Technology, Sweden Skoglund, Mikael, KTH Royal Institute of Technology, Sweden Chatterjee, Saikat, KTH Royal Institute of Technology, Sweden

**MLSP-P10.5: LEARNING PERCEPTION AND PLANNING WITH DEEP ACTIVE INFERENCE**

Çatal, Ozan, Ghent University - imec, Belgium Verbelen, Tim, Ghent University - imec, Belgium Nauta, Johannes, Ghent University - imec, Belgium De Boom, Cedric, Ghent University - imec, Belgium Dhoedt, Bart, Ghent University - imec, Belgium

**MLSP-P10.6: PROJECTION FREE DYNAMIC ONLINE LEARNING**

Kalhan, Deepak Singh, Indian Institute of Technology Kanpur, India Bedi, Amrit Singh, U.S. Army Research Laboratory, United States Koppel, Alec, U.S. Army Research Laboratory, India Rajawat, Ketan, Indian Institute of Technology Kanpur, India Gupta, Abhishek Kumar, Indian Institute of Technology Kanpur, India Banerjee, Adrish, Indian Institute of Technology Kanpur, India
MLSP-P10.7: LEARNING PARTIAL DIFFERENTIAL EQUATIONS FROM DATA USING NEURAL NETWORKS
Hasan, Ali, Duke University, United States Pereira, João M., Duke University, United States Ravier, Robert, Duke University, United States Farsiu, Sina, Duke University, United States Tarokh, Vahid, Duke University, United States

MLSP-P10.8: ACTIVE LEARNING WITH UNSUPERVISED ENSEMBLES OF CLASSIFIERS
Traganitis, Panagiotis, University of Minnesota, United States Berberidis, Dimitrios, Carnegie Mellon University, United States Giannakis, Georgios B., University of Minnesota, United States

MLSP-P10.9: NASIL: NEURAL ARCHITECTURE SEARCH WITH IMITATION LEARNING
S. Fard, Farzaneh, Fluent.ai, Canada Rad, Arash, Fluent.ai, Canada Singh Tomar, Vikrant, Fluent.ai, Canada

MLSP-P10.10: MULTI-VIEW CLUSTERING VIA MIXED EMBEDDING APPROXIMATION
Wu, Danyang, Northwestern Polytechnical University, China Nie, Feiping, Northwestern Polytechnical University, China Wang, Rong, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China

MLSP-P10.11: SIGNAL CLUSTERING WITH CLASS-INDEPENDENT SEGMENTATION
Gasperini, Stefano, Technische Universität München, Germany Paschali, Magdalini, Technische Universität München, Germany Hopke, Carsten, Airbus Defence and Space GmbH, Germany Wittmann, David, Airbus Defence and Space GmbH, Germany Navab, Nassir, Technische Universität München, Germany
MLSP-P11 - Neural Networks and Pattern Recognition

MLSP-P11.1: MANGO: A PYTHON LIBRARY FOR PARALLEL HYPERPARAMETER TUNING
Sandha, Sandeep Singh, University of California, Los Angeles, United States
Aggarwal, Mohit, Arm, United States Fedorov, Igor, Arm, United States
Srivastava, Mani, University of California, Los Angeles, United States

MLSP-P11.2: ANYTIME MINIBATCH WITH DELAYED GRADIENTS: SYSTEM PERFORMANCE AND CONVERGENCE ANALYSIS
Al-Lawati, Haider, University of Toronto, Canada Draper, Stark, University of Toronto, Canada

MLSP-P11.3: ON EXPONENTIALLY CONSISTENCY OF LINKAGE-BASED HIERARCHICAL CLUSTERING ALGORITHM USING KOLMOGOROV-SMIRNOV DISTANCE
Wang, Tiexing, Syracuse University, United States Liu, Yang, Syracuse University, United States Chen, Biao, Syracuse University, United States

MLSP-P11.5: A NEURAL NETWORK BASED ON FIRST PRINCIPLES
Baggenstoss, Paul, Fraunhofer FKIE, Germany

MLSP-P11.6: AL2: PROGRESSIVE ACTIVATION LOSS FOR LEARNING GENERAL REPRESENTATIONS IN CLASSIFICATION NEURAL NETWORKS

MLSP-P11.7: LABEL PROPAGATION ADAPTIVE RESONANCE THEORY FOR SEMI-SUPERVISED CONTINUOUS LEARNING
Kim, Taehyeong, Seoul National University, Korea (South) Hwang, Injune, Seoul National University, Korea (South) Kang, Gi-Cheon, Seoul National University, Korea (South) Choi, Won-Seok, Seoul National University, Korea (South) Kim, Hyunseo, Seoul National University, Korea (South) Zhang, Byoung-Tak, Seoul National University, Korea (South)

MLSP-P11.8: A PROBABILISTIC SCHEME FOR REPRESENTATION LEARNING WITH RADIAL TRANSFORM IMAGES
Salehinejad, Hojjat, University of Toronto, Canada Valaee, Shahrokh, University of Toronto, Canada

MLSP-P11.9: PERCEPTION-DISTORTION TRADE-OFF WITH RESTRICTED BOLTZMANN MACHINES

Cannella, Chris, Duke University, United States Ding, Jie, University of Minnesota, United States Soltani, Mohammadreza, Duke University, United States Zhou, Yi, University of Utah, United States Tarokh, Vahid, Duke University, United States

MLSP-P11.10: AN EFFICIENT ALTERNATIVE TO NETWORK PRUNING THROUGH ENSEMBLE LEARNING

Pöllot, Martin, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Zhang, Rui, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Kaup, André, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

MLSP-P11.11: A NOVEL PRUNING APPROACH FOR BAGGING ENSEMBLE REGRESSION BASED ON SPARSE REPRESENTATION

Khorashadi-Zadeh, Amir Ehsan, Sharif University of Technology, Iran Babaie-Zadeh, Massoud, Sharif University of Technology, Iran Jutten, Christian, University Grenoble Alpes, France

MLSP-P11.12: K-AUTOENCODERS DEEP CLUSTERING

Opochinsky, Yaniv, Bar-Ilan University, Israel Chazan, Shlomo E., Bar-Ilan University, Israel Gannot, Sharon, Bar-Ilan University, Israel Goldberger, Jacob, Bar-Ilan University, Israel
MLSP-P12 - Applications in Video and Image Processing II

MLSP-P12.1: MOGA: SEARCHING BEYOND MOBILENETV3
Chu, Xiangxiang, Xiaomi, China Zhang, Bo, Xiaomi, China Xu, Ruijun, Xiaomi, China

MLSP-P12.2: META METRIC LEARNING FOR HIGHLY IMBALANCED AERIAL SCENE CLASSIFICATION
Guan, Jian, Harbin Engineering University, China Liu, Jiabei, Harbin Engineering University, China Sun, Jianguo, Harbin Engineering University, China Feng, Pengming, State Key Laboratory of Space-Ground Integrated Information Technology, China Shuai, Tong, CETC Key Laboratory of Aerospace Information Applications, China Wang, Wenwu, University of Surrey, United Kingdom

MLSP-P12.3: SYNTHETIC CROWD AND PEDESTRIAN GENERATOR FOR DEEP LEARNING PROBLEMS
Khadka, A, Kingston University, United Kingdom Remagnino, P, Kingston University, United Kingdom Argyriou, V, Kingston University, United Kingdom

MLSP-P12.4: TOSO: STUDENT’S-T DISTRIBUTION AIDED ONE-STAGE ORIENTATION TARGET DETECTION IN REMOTE SENSING IMAGES
Feng, Pengming, State Key Laboratory of Space-Ground Integrated Information Technology, China Lin, Youtian, Harbin Engineering University, China Guan, Jian, Harbin Engineering University, China He, Guangjun, State Key Laboratory of Space-Ground Integrated Information Technology, China Shi, Huifeng, State Key Laboratory of Space-Ground Integrated Information Technology, China Chambers, Jonathon, University of Leicester, United Kingdom

MLSP-P12.5: IMPROVING DEEP LEARNING CLASSIFICATION OF JPEG2000 IMAGES OVER BANDLIMITED NETWORKS
Chamain, Lahiru D., University of California, Davis, United States Ding, Zhi, University of California, Davis, United States

MLSP-P12.6: AUGMENTED GRAD-CAM: HEAT-MAPS SUPER RESOLUTION THROUGH AUGMENTATION
Morbidelli, Pietro, Politecnico di Milano, Italy Carrera, Diego, STMicroelectronics, Italy Rossi, Beatrice, STMicroelectronics, Italy Fragneto, Pasqualina, STMicroelectronics, Italy Boracchi, Giacomo, Politecnico di Milano, Italy

MLSP-P12.7: BBA-NET: A BI-BRANCH ATTENTION NETWORK FOR CROWD COUNTING
Hou, Yi, National Engineering Laboratory for Video Technology, Peking University, China Li, Chengyang, Key Lab of Petroleum Data Mining, China University of Petroleum (Beijing), China Yang, Fan, National Engineering Laboratory for Video Technology, Peking University, China Zhu, Liping, Key Lab of Petroleum Data Mining, China University of Petroleum (Beijing), China Ma, Cong, National Engineering Laboratory for Video Technology, Peking University, China Jia, Huizhu, National Engineering Laboratory for Video Technology, Peking University, China Xie, Xiaodong, National Engineering Laboratory for Video Technology, Peking University, China

**MLSP-P12.8: DEEP METRIC LEARNING BASED ON CENTER-RANKED LOSS FOR GAIT RECOGNITION**

Su, Jingran, Northwestern Polytechnical University, China Zhao, Yang, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China

**MLSP-P12.9: CHANNEL ATTENTION BASED GENERATIVE NETWORK FOR ROBUST VISUAL TRACKING**

Hu, Ying, Nanjing University of Science and Technology, China Xuan, Hanyu, Nanjing University of Science and Technology, China Yang, Jian, Nanjing University of Science and Technology, China Yan, Yan, Nanjing University of Science and Technology, China

**MLSP-P12.10: CROSS-VAE: TOWARDS DISETANGLING EXPRESSION FROM IDENTITY FOR HUMAN FACES**

Wu, Haozhe, Tsinghua University, China Jia, Jia, Tsinghua University, China Xie, Lingxi, Huawei Noah’s Ark Lab, China Qi, Guojun, Futurewei Technologies, China Shi, Yuanchun, Tsinghua University, China Tian, Qi, Huawei Noah’s Ark Lab, China

**MLSP-P12.11: ENHANCE PART-BASED MODEL FOR PERSON REIDENTIFICATION WITH FUSED MULTI-SCALE FEATURES**

Lin, Xipeng, Nanjing University, China Yang, Yubin, Nanjing University, China Niu, Zhonghan, Nanjing University, China

**MLSP-P12.12: TEXT-TO-IMAGE SYNTHESIS METHOD EVALUATION BASED ON VISUAL PATTERNS**

Sommer, William Lund, Aarhus University, Denmark Iosifidis, Alexandros, Aarhus University, Denmark
**Friday, 8 May, 11:45 - 13:45**

**MLSP-P13 - Neural Networks Applications II**

**MLSP-P13.1: DETECTION OF MILD DYSPNEA FROM PAIRS OF SPEECH RECORDINGS**

Boelders, Sander, Eindhoven University of Technology, Netherlands
Nallanthighal, Venkata Srikanth, Philips Research and Radboud University, Netherlands
Menkovski, Vlado, Eindhoven University of Technology, Netherlands
Härmä, Aki, Philips Research, Netherlands

**MLSP-P13.2: A HYBRID MODEL FOR BIPOLAR DISORDER CLASSIFICATION FROM VISUAL INFORMATION**

Abaei, Niloufar, University of Ottawa, Canada
Al Osman, Hussein, University of Ottawa, Canada

**MLSP-P13.3: AUTOMATIC EVENT DETECTION OF REM SLEEP WITHOUT ATONIA FROM POLYSOMNOGRAPHY SIGNALS USING DEEP NEURAL NETWORKS**

Wallis, Phillip, Oregon Health & Science University, United States
Yaeger, Daniel, Oregon Health & Science University, United States
Kain, Alexander, Oregon Health & Science University, United States
Song, Xubo, Oregon Health & Science University, United States
Lim, Miranda, Oregon Health & Science University / Veterans Affairs Portland Health Care System, United States

**MLSP-P13.4: A DEEP LEARNING ARCHITECTURE FOR EPILEPTIC SEIZURE CLASSIFICATION BASED ON OBJECT AND ACTION RECOGNITION**

Karácsony, Tamás, INESC TEC - Institute for Systems and Computer Engineering, Technology and Science, Portugal
Loesch-Biffar, Anna Mira, University of Munich, Germany
Vollmar, Christian, University of Munich, Germany
Noachtar, Soheyl, University of Munich, Germany
Paulo Silva, Joao, INESC TEC - Institute for Systems and Computer Engineering, Technology and Science, Portugal

**MLSP-P13.5: TRANSFORMING SEISMOCARDIOGRAMS INTO ELECTROCARDIOGRAMS BY APPLYING CONVOLUTIONAL AUTOENCODES**

Haescher, Marian, Fraunhofer Gesellschaft, Germany
Höpfner, Florian, Fraunhofer Gesellschaft, Germany
Chodan, Wencke, Fraunhofer Gesellschaft, Germany
Kraft, Dimitri, Universität Rostock, Germany
Aehnelt, Mario, Fraunhofer Gesellschaft, Germany
Urban, Bodo, Universität Rostock, Germany
MLSP-P13.6: IMPROVED NEAREST NEIGHBOR DENSITY-BASED CLUSTERING TECHNIQUES WITH APPLICATION TO HYPERSONTICAL IMAGES
Cariou, Claude, Univ Rennes, CNRS, France Chehdi, Kacem, Univ Rennes, CNRS, France Le Moan, Steven, Massey University, New Zealand

MLSP-P13.7: OBJECT SURFACE ESTIMATION FROM RADAR IMAGES
Bialer, Oded, General Motors, Israel Shapiro, David, General Motors, Israel Jonas, Amnon, General Motors, Israel

MLSP-P13.8: COUNTING DENSE OBJECTS IN REMOTE SENSING IMAGES
Gao, Guangshuai, Beihang University, China Liu, Qingjie, Beihang University, China Wang, Yunhong, Beihang University, China

MLSP-P13.9: HPRNN: A HIERARCHICAL SEQUENCE PREDICTION MODEL FOR LONG-TERM WEATHER RADAR ECHO EXTRAPOLATION
Jing, Jinrui, National University of Defense Technology, China Li, Qian, National University of Defense Technology, China Peng, Xuan, National University of Defense Technology, China Ma, Qiang, National University of Defense Technology, China Tang, Shaoen, National University of Defense Technology, China

MLSP-P13.10: ACCURATE 6D OBJECT POSE ESTIMATION BY POSE CONDITIONED MESH RECONSTRUCTION
Castro, Pedro, Imperial College London, United Kingdom Armagan, Anil, Imperial College London, United Kingdom Kim, Tae-Kyun, Imperial College London, United Kingdom

MLSP-P13.11: CPWC: CONTEXTUAL POINT WISE CONVOLUTION FOR OBJECT RECOGNITION
Mazumder, Pratik, Indian Institute of Technology Kanpur, India Singh, Pravendra, Indian Institute of Technology Kanpur, India Namboodiri, Vinay, Indian Institute of Technology Kanpur, India

MLSP-P13.12: ELECTRIC ANALOG CIRCUIT DESIGN WITH HYPERNETWORKS AND A DIFFERENTIAL SIMULATOR
Rotman, Michael, Tel Aviv University, Israel Wolf, Lior, Tel Aviv University, Israel
MLSP-P14 - Topics in Machine Learning

MLSP-P14.1: MULTI-TASK LEARNING VIA SA-FPN AND EJ-HEAD
Ni, Feng, Peking University, China Luo, Zhipeng, DeepBlue Technology (Shanghai) Co., Ltd, China Cao, Xixin, Peking University, China Xu, Zhenyu, DeepBlue Technology (Shanghai) Co., Ltd, China Yao, Yuehan, DeepBlue Technology (Shanghai) Co., Ltd, China

MLSP-P14.2: DIFFERENTIABLE BRANCHING IN DEEP NETWORKS FOR FAST INFERENCE
Scardapane, Simone, Sapienza University of Rome, Italy Comminiello, Danilo, Sapienza University of Rome, Italy Scarpiniti, Michele, Sapienza University of Rome, Italy Bacarelli, Enzo, Sapienza University of Rome, Italy Uncini, Aurelio, Sapienza University of Rome, Italy

MLSP-P14.3: MULTI-STEP ONLINE UNSUPERVISED DOMAIN ADAPTATION
Moon, J. H., Purdue University, United States Das, Debasmit, Purdue University, United States Lee, C. S. George, Purdue University, United States

MLSP-P14.4: SELF-ADAPTIVE FEATURE FOOL
Liu, Xinyi, Tsinghua University, China Bai, Yang, Tsinghua University, China Xia, Shu-Tao, Tsinghua University, China Jiang, Yong, Tsinghua University, China

MLSP-P14.5: MULTI-MOTIFGAN (MMGAN): MOTIF-TARGETED GRAPH GENERATION AND PREDICTION
Gamage, Anuththari, University of Illinois at Urbana–Champaign, United States Chien, Eli, University of Illinois at Urbana–Champaign, United States Peng, Jianhao, University of Illinois at Urbana–Champaign, United States Milenkovic, Olgica, University of Illinois at Urbana–Champaign, United States

MLSP-P14.6: FEDERATED CLASSIFICATION WITH LOW COMPLEXITY REPRODUCING KERNEL HILBERT SPACE REPRESENTATIONS
Peifer, Maria, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States

MLSP-P14.7: MAXPOLYNOMIAL DIVISION WITH APPLICATION TO NEURAL NETWORK SIMPLIFICATION
Smyrnis, Georgios, National Technical University of Athens, Greece Maragos, Petros, National Technical University of Athens, Greece Retsinas, George, National Technical University of Athens, Greece
MLSP-P14.8: BALANCED BINARY NEURAL NETWORKS WITH GATED RESIDUAL
Shen, Mingzhu, Beihang University, China Liu, Xianglong, Beihang University, China Gong, Ruihao, Beihang University, China Han, Kai, University of Chinese Academy of Sciences, China

MLSP-P14.9: A GEOMETRIC APPROACH FOR UNSUPERVISED SIMILARITY LEARNING
Dutta, Ujjal K. R., Indian Institute of Technology Madras, India C, Chandra Sekhar, Indian Institute of Technology Madras, India

MLSP-P14.10: GRADIENT DELAY ANALYSIS IN ASYNCHRONOUS DISTRIBUTED OPTIMIZATION
Al-Lawati, Haider, University of Toronto, Canada Draper, Stark, University of Toronto, Canada

MLSP-P14.11: SEQUENTIAL IOT DATA AUGMENTATION USING GENERATIVE ADVERSARIAL NETWORKS
Tschuchnig, Maximilian Ernst, Salzburg University of Applied Sciences, Austria Ferner, Cornelia, Salzburg University of Applied Sciences, Austria Wegenkittl, Stefan, Salzburg University of Applied Sciences, Austria

MLSP-P14.12: ROBUST RANK CONSTRAINED SPARSE LEARNING: A GRAPH-BASED METHOD FOR CLUSTERING
Liu, Ran, Northwestern Polytechnical University, China Chen, Mulin, Northwestern Polytechnical University, China Wang, Qi, Northwestern Polytechnical University, China Li, Xuelong, Northwestern Polytechnical University, China
MLSP-P15 - Neural Network Algorithms

MLSP-P15.1: EFFICIENT DECOUPLED NEURAL ARCHITECTURE SEARCH BY STRUCTURE AND OPERATION SAMPLING

Lee, Heung-Chang, Hana Institute of Technology, Korea (South) Kim, Do-Guk, Hana Institute of Technology, Korea (South) Han, Bohyung, Seoul National University, Korea (South)

MLSP-P15.2: WEIGHT SHARING AND DEEP LEARNING FOR SPECTRAL DATA

Larsen, Jacob Søgaard, Technical University of Denmark, Denmark Clemmensen, Line, Technical University of Denmark, Denmark

MLSP-P15.3: COMPLEX TRANSFORMER: A FRAMEWORK FOR MODELING COMPLEX-VALUED SEQUENCE

Yang, Muqiao, Carnegie Mellon University, United States Ma, Martin Q., Carnegie Mellon University, United States Li, Dongyu, Carnegie Mellon University, United States Tsai, Yao-Hung Hubert, Carnegie Mellon University, United States Salakhutdinov, Ruslan, Carnegie Mellon University, United States

MLSP-P15.4: HIGH-DIMENSIONAL NEURAL FEATURE USING RECTIFIED LINEAR UNIT AND RANDOM MATRIX INSTANCE

M. Javid, Alireza, KTH Royal Institute of Technology, Sweden Venkitaraman, Arun, KTH Royal Institute of Technology, Sweden Skoglund, Mikael, KTH Royal Institute of Technology, Sweden Chatterjee, Saikat, KTH Royal Institute of Technology, Sweden

MLSP-P15.5: PROJECTED WEIGHT REGULARIZATION TO IMPROVE NEURAL NETWORK GENERALIZATION

Zhang, Guoqiang, university of Technology Sydney, Australia Kenta, Niwa, NTT Media Intelligence Laboratories, Japan Kleijn, W. Bastiaan, Victoria University of Wellington, New Zealand

MLSP-P15.7: DEEP CLUSTERING FOR DOMAIN ADAPTATION

Gao, Boyan, University of Edinburgh, United Kingdom Yang, Yongxin, University of Edinburgh, United Kingdom Gouk, Henry, University of Edinburgh, United Kingdom Hospedales, Timothy M., University of Edinburgh, United Kingdom

MLSP-P15.8: DEEP CLUSTERING WITH CONCRETE K-MEANS
Gao, Boyan, University of Edinburgh, United Kingdom
Yang, Yongxin, University of Edinburgh, United Kingdom
Gouk, Henry, University of Edinburgh, United Kingdom
Hospedales, Timothy M., University of Edinburgh, United Kingdom

**MLSP-P15.9: POLARIZING FRONT ENDS FOR ROBUST CNNS**
Bakiskan, Can, University of California, Santa Barbara, United States
Gopalakrishnan, Soorya, University of California, Santa Barbara, United States
Cekic, Metehan, University of California, Santa Barbara, United States
Madhow, Upamanyu, University of California, Santa Barbara, United States
Pedarsani, Ramtin, University of California, Santa Barbara, United States

**MLSP-P15.10: ADAPTIVE DISTRIBUTED STOCHASTIC GRADIENT DESCENT FOR MINIMIZING DELAY IN THE PRESENCE OF STRAGGLERS**
Kas Hanna, Serge, Rutgers University, United States
Bitar, Rawad, Rutgers University, United States
Parag, Parimal, Indian Institute of Science, India
Dasari, Venkat, U.S. Army Research Laboratory, India
El Rouayheb, Salim, Rutgers University, United States

**MLSP-P15.11: A MODEL OF DOUBLE DESCENT FOR HIGH-DIMENSIONAL LOGISTIC REGRESSION**
Deng, Zeyu, University of California, Santa Barbara, United States
Kammoun, Abla, King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Thrampoulidis, Christos, University of California, Santa Barbara, United States

**MLSP-P15.12: LOCALIZED LINEAR REGRESSION IN NETWORKED DATA**
Jung, Alexander, Aalto University, Finland
Tran, Nguyen, Aalto University, Finland
Friday, 8 May, 15:15 - 17:15

MLSP-P16 - Neural Networks Applications III

MLSP-P16.1: EFFICIENT SCENE TEXT DETECTION WITH TEXTUAL ATTENTION TOWER
Zhang, Liang, Xidian University, China Liu, Yufei, Xidian University, China Xiao, Hang, OrionStar Ltd., China Yang, Lu, Xidian University, China Zhu, Guangming, Xidian University, China Shah, Syed Afaq, Murdoch University, Australia Bennamoun, Mohammed, University of Western Australia, Australia Shen, Peiyi, Xidian University, China

MLSP-P16.2: A HYBRID APPROACH FOR THERMOGRAPHIC IMAGING WITH DEEP LEARNING
Kovács, Péter, Johannes Kepler University Linz, Austria Lehner, Bernhard, Silicon Austria Labs, Austria Thommerer, Gregor, University of Applied Sciences Upper Austria, Austria Mayr, Günther, University of Applied Sciences Upper Austria, Austria Burgholzer, Peter, Research Center for Non Destructive Testing (RECENDT), Austria Huemer, Mario, Johannes Kepler University Linz, Austria

MLSP-P16.3: KNOWLEDGE ENHANCED LATENT RELEVANCE MINING FOR QUESTION ANSWERING
Wang, Dong, Tsinghua Shenzhen International Graduate School, Tsinghua University, China Shen, Ying, Sun Yat-Sen University, China Zheng, Hai-Tao, Tsinghua Shenzhen International Graduate School, Tsinghua University, China

MLSP-P16.4: MULTI-LABEL CONSISTENT CONVOLUTIONAL TRANSFORM LEARNING: APPLICATION TO NON-INTRUSIVE LOAD MONITORING
Singh, Shikha, Indraprastha Institute of Information Technology Delhi, India Maggu, Jyoti, Indraprastha Institute of Information Technology Delhi, India Majumdar, Angshul, Indraprastha Institute of Information Technology Delhi, India Chouzenoux, Emilie, Inria Saclay, OPIS, Center for Visual Computing, France Chierchia, Giovanni, Université Paris Est, ESIEE, France

MLSP-P16.5: RESILIENT DISTRIBUTED RECOVERY OF LARGE FIELDS
Chen, Yuan, Carnegie Mellon University, United States Kar, Soummya, Carnegie Mellon University, United States Moura, José, Carnegie Mellon University, United States

MLSP-P16.6: TRAINING LSTM FOR UNSUPERVISED ANOMALY DETECTION WITHOUT A PRIORI KNOWLEDGE
Cherdo, Yann, Mantu, France de Kerret, Paul, Mantu, France Pawlak, Renaud, Mantu, France

**MLSP-P16.7: UNSUPERVISED PERSON RE-IDENTIFICATION USING MULTI-BRANCH FEATURE COMPENSATION NETWORK AND LINK-BASED CLUSTER DISSIMILARITY METRIC**

Pan, Lin, Peking University, China Qi, Gege, Peking University, China Guo, Biao, Peking University, China Zhu, Yuesheng, Peking University, China

**MLSP-P16.8: DEEP-SST-EDDIES: A DEEP LEARNING FRAMEWORK TO DETECT OCEANIC EDDIES IN SEA SURFACE TEMPERATURE IMAGES**

Moschos, Evangelos, École Polytechnique, France Schwander, Olivier, Sorbonne Université, France Stegner, Alexandre, École Polytechnique, France Gallinari, Patrick, Sorbonne Université / Criteo AI Lab, France

**MLSP-P16.9: INTERPRETABILITY-GUIDED CONVOLUTIONAL NEURAL NETWORKS FOR SEISMIC FAULT SEGMENTATION**

Liu, Zhining, University of Electronic Science and Technology of China, China Zhou, Cheng, University of Electronic Science and Technology of China, China Hu, Guangmin, University of Electronic Science and Technology of China, China Song, Chengyun, Chongqing University of Technology, China

**MLSP-P16.10: TOWARDS HIGH-PERFORMANCE OBJECT DETECTION: TASK-SPECIFIC DESIGN CONSIDERING CLASSIFICATION AND LOCALIZATION SEPARATION**

Kim, Jung Uk, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Kim, Seong Tae, Technische Universität München, Germany Kim, Eun Sung, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Moon, Sang-Keun, Korea Electric Power Corporation (KEPCO) Research Institute, Korea (South) Ro, Yong Man, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

**MLSP-P16.11: ANOMALY DETECTION FOR TIME SERIES USING VAE-LSTM HYBRID MODEL**

Lin, Shuyu, University of Oxford, United Kingdom Clark, Ronald, Imperial College London, United Kingdom Birke, Robert, ABB Future Labs, Switzerland Schoenborn, Sandro, ABB Future Labs, Switzerland Trigoni, Niki, University of Oxford, United Kingdom Roberts, Stephen, University of Oxford, United Kingdom

**MLSP-P16.12: HYDRANET: A REAL-TIME WAVEFORM SEPARATION NETWORK**
Torgard Kaspersen, Esbern, Aalborg University, Denmark Kounalakis, Tsampikos, Danish Technological Institute, Denmark Erkut, Cumhur, Aalborg University, Denmark
Multimedia Signal Processing

Friday, 8 May, 08:00 - 10:00

**MMSP-L1 - Signal Processing for Multimedia Applications II**

**MMSP-L1.1: STORING DIGITAL DATA INTO DNA: A COMPARATIVE STUDY OF QUATERNARY CODE CONSTRUCTION**

Dimopoulou, Melpomeni, Université Côte d’Azur, CNRS, I3S, France
Antonini, Marc, Université Côte d’Azur, CNRS, I3S, France
Barbry, Pascal, Université Côte d’Azur, CNRS, IPMC, France
Appuswamy, Raja, EURECOM, France

**MMSP-L1.2: A NEW MULTIHYPOTHESIS PREDICTION SCHEME FOR COMPRRESSED VIDEO SENSING RECONSTRUCTION**

Zheng, Shuai, Xidian University, China
Zhang, Xiao-Ping, Ryerson University, Canada
Chen, Jian, Xidian University, China
Kuo, Yonghong, Xidian University, China

**MMSP-L1.3: BIT ALLOCATION FOR MULTI-TASK COLLABORATIVE INTELLIGENCE**

Ranjbar Alvar, Saeed, Simon Fraser University, Canada
Bajić, Ivan V., Simon Fraser University, Canada

**MMSP-L1.4: MOTION FEEDBACK DESIGN FOR VIDEO FRAME INTERPOLATION**

Hu, Mengshun, Wuhan University, China
Liao, Liang, national institute of informatics, Japan
Xiao, Jing, Wuhan University and Suzhou Institute of Wuhan University, China
Gu, Lin, national institute of informatics, Japan
Satoh, Shin’ichi, national institute of informatics, Japan

**MMSP-L1.5: TRILINGUAL SEMANTIC EMBEDDINGS OF VISUALLY GROUNDED SPEECH WITH SELF-ATTENTION MECHANISMS**

Ohishi, Yasunori, NTT Corporation, Japan
Kimura, Akisato, NTT Corporation, Japan
Kawanishi, Takahito, NTT Corporation, Japan
Kashino, Kunio, NTT Corporation, Japan
Harwath, David, Massachusetts Institute of Technology, United States
Glass, James, Massachusetts Institute of Technology, United States

**MMSP-L1.6: TOWARDS POSE-INvariant LIP-READING**

Cheng, Shiyang, Samsung, United Kingdom
Ma, Pingchuan, Imperial College London, United Kingdom
Tzimiropoulos, Georgios, University of Nottingham
and Samsung, United Kingdom Petridis, Stavros, Imperial College London and Samsung, United Kingdom Bulat, Adrian, Samsung, United Kingdom Shen, Jie, Imperial College London and Samsung, United Kingdom Pantic, Maja, Imperial College London and Samsung, United Kingdom
MMSP-L2 - Deep Learning for Multimedia Processing and Analysis II

**MMSP-L2.1: A SIAMESE CONTENT-ATTENTIVE GRAPH CONVOLUTIONAL NETWORK FOR PERSONALITY RECOGNITION USING PHYSIOLOGY**
Yang, Hao-Chun, National Tsing Hua University, Taiwan
Lee, Chi-Chun, National Tsing Hua University, Taiwan

**MMSP-L2.2: SELF-SUPERVISED LEARNING FOR AUDIO-VISUAL SPEAKER DIARIZATION**
Ding, Yifan, University of Central Florida, United States
Xu, Yong, Tencent AI Lab, United States
Zhang, Shi-Xiong, Tencent AI Lab, United States
Cong, Yahuan, Beijing University of Posts and Telecommunications, United States
Wang, Liqiang, University of Central Florida, United States

**MMSP-L2.3: WHAT MAKES THE SOUND?: A DUAL-MODALITY INTERACTING NETWORK FOR AUDIO-VISUAL EVENT LOCALIZATION**
Ramaswamy, Janani, Indian Institute of Technology Madras, India

**MMSP-L2.4: ATTENTIONAL FUSED TEMPORAL TRANSFORMATION NETWORK FOR VIDEO ACTION RECOGNITION**
Yang, Ke, National University of Defense Technology, China
Wang, Zhiyuan, National Innovation Institute of Defense Technology, China
Dai, Huadong, National Innovation Institute of Defense Technology, China
Shen, Tianlong, National Innovation Institute of Defense Technology, China
Qiao, Peng, National University of Defense Technology, China
Niu, Xin, National University of Defense Technology, China
Jiang, Jie, National University of Defense Technology, China
Li, Dongsheng, National University of Defense Technology, China
Dou, Yong, National University of Defense Technology, China

**MMSP-L2.5: DEEP PRODUCT QUANTIZATION MODULE FOR EFFICIENT IMAGE RETRIEVAL**
Liu, Meihan, Peking University, China
Dai, Yongxing, Peking University, China
Bai, Yan, Peking University, China
Duan, Ling-Yu, Peking University, China

**MMSP-L2.6: THE OPEN BRANDS DATASET: UNIFIED BRAND DETECTION AND RECOGNITION AT SCALE**
Jin, Xuan, Alibaba Group, China
Su, Wei, Alibaba Group, China
Zhang, Rong, Alibaba Group, China
He, Yuan, Alibaba Group, China
Xue, Hui, Alibaba Group, China

Wednesday, 6 May, 16:30 - 18:30

**MMSP-P1 - Signal Processing for Multimedia Applications I**

**MMSP-P1.1: SPECTROGRAM ANALYSIS VIA SELF-ATTENTION FOR REALIZING CROSS-MODEL VISUAL-AUDIO GENERATION**
Tan, Huadong, Hefei University of Technology, China Wu, Guang, Hefei University of Technology, China Zhao, Pengcheng, Hefei University of Technology, China Chen, Yanxiang, Hefei University of Technology, China

**MMSP-P1.2: DGAN: DISENTANGLED REPRESENTATION LEARNING FOR ANISOTROPIC BRDF RECONSTRUCTION**
Hu, Zhongyun, Northwestern Polytechnical University, China Wang, Xue, Northwestern Polytechnical University, China Wang, Qing, Northwestern Polytechnical University, China

**MMSP-P1.3: APB2FACE: AUDIO-GUIDED FACE REENACTMENT WITH AUXILIARY POSE AND BLINK SIGNALS**
Zhang, Jiangning, Zhejiang University, China Liu, Liang, Zhejiang University, China Xue, Zhucun, Wuhan University, China Liu, Yong, Zhejiang University, China

**MMSP-P1.4: MOTION DYNAMICS IMPROVE SPEAKER-INDEPENDENT LIPREADING**
Riva, Matteo, Dalle Molle Institute for Artificial Intelligence (IDSIA) / Università degli Studi di Milano-Bicocca, Switzerland Wand, Michael, Dalle Molle Institute for Artificial Intelligence (IDSIA), Switzerland Schmidhuber, Jürgen, Dalle Molle Institute for Artificial Intelligence (IDSIA), Switzerland

**MMSP-P1.5: MULTI-LAYER CONTENT INTERACTION THROUGH QUATERNION PRODUCT FOR VISUAL QUESTION ANSWERING**
Shi, Lei, Beijing University of Posts and Telecommunications, China Geng, Shijie, Rutgers University, China Shuang, Kai, Beijing University of Posts and Telecommunications, China Hori, Chiori, Mitsubishi Electric Research Laboratories (MERL), China Liu, Songxiang, Chinese University of Hong Kong, China Gao, Peng, Mitsubishi Electric Research Laboratories (MERL), China Su, Sen, Beijing University of Posts and Telecommunications, China

**MMSP-P1.6: LINEAR MODEL-BASED INTRA PREDICTION IN VVC TEST MODEL**
Ghaznavi-Youvalari, Ramin, Nokia Technologies, Finland
MMSP-P1.7: INTRA FRAME RATE CONTROL FOR VERSATILE VIDEO CODING WITH QUADRATIC RATE-DISTORTION MODELLING

Chen, Yi, City University of Hong Kong, Hong Kong SAR of China Kwong, Sam, City University of Hong Kong, Hong Kong SAR of China Zhou, Mingliang, Chongqing University, China Wang, Shiqi, City University of Hong Kong, Hong Kong SAR of China Zhu, Guopu, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China Wang, Yi, Southern University of Science and Technology, China

MMSP-P1.8: PERFORMANCE COMPARISON OF LOSSLESS COMPRESSION STRATEGIES FOR DYNAMIC VISION SENSOR DATA

Iqbal, Khurram, Kingston University, United Kingdom Khan, Nabeel, Kingston University, United Kingdom Martini, Maria G., Kingston University, United Kingdom

MMSP-P1.9: ENCODER-RECURRENT DECODER NETWORK FOR SINGLE IMAGE DEHAZING

Dang, An, National Central University, Taiwan Vu, Toan, National Central University, Taiwan Wang, Jia-Ching, National Central University, Taiwan

MMSP-P1.10: DENOISING OF EVENT-BASED SENSORS WITH SPATIAL-TEMPORAL CORRELATION

Wu, Jinjian, School of Artificial Intelligence, Xidian University, China Ma, Chuanwei, School of Artificial Intelligence, Xidian University, China Yu, Xiaojie, Xidian University, China Shi, Guangming, School of Artificial Intelligence, Xidian University, China
Thursday, 7 May, 11:30 - 13:30

MMSP-P2 - Deep Learning for Multimedia Processing and Analysis I

MMSP-P2.1: A VISUAL-PILOT DEEP FUSION FOR TARGET SPEECH SEPARATION IN MULTI-TALKER NOISY ENVIRONMENT
Li, Yun, Alibaba Group, United States Liu, Zhang, Alibaba Group, China Na, Yueyue, Alibaba Group, China Wang, Ziteng, Alibaba Group, China Tian, Biao, Alibaba Group, China Fu, Qiang, Alibaba Group, China

MMSP-P2.2: C3DVQA: FULL-REFERENCE VIDEO QUALITY ASSESSMENT WITH 3D CONVOLUTIONAL NEURAL NETWORK
Xu, Munan, Peking University Shenzhen Graduate School, China Chen, Junming, Peking University Shenzhen Graduate School, China Wang, Haqi, Tencent, China Liu, Shan, Tencent, China Li, Ge, Peking University Shenzhen Graduate School, China Bai, Zhiqiang, Peking University Shenzhen Graduate School, China

MMSP-P2.3: EXPLORING ENTITY-LEVEL SPATIAL RELATIONSHIPS FOR IMAGE-TEXT MATCHING
Xia, Yaxian, Peking University, China Huang, Lun, Peking University, China Wang, Wenmin, Peking University; Macau University of Science and Technology, China Wei, Xiao-Yong, Peng Cheng Laboratory, China Chen, Jie, Peking University; Peng Cheng Laboratory, China

MMSP-P2.4: A DEEP MULTIMODAL APPROACH FOR MAP IMAGE CLASSIFICATION
Sawada, Tomoya, Doshisha University, Japan Katsurai, Marie, Doshisha University, Japan

MMSP-P2.5: SELECTIVE CONVOLUTIONAL NETWORK: AN EFFICIENT OBJECT DETECTOR WITH IGNORING BACKGROUND
Ling, Hefei, Huazhong University of Science and Technology, China Qin, Yangyang, Huazhong University of Science and Technology, China Zhang, Li, Huazhong University of Science and Technology, China Shi, Yuxuan, Huazhong University of Science and Technology, China Li, Ping, Huazhong University of Science and Technology, China

MMSP-P2.6: BACK-AND-FORTH PREDICTION FOR DEEP TENSOR COMPRESSION
Choi, Hyomin, Simon Fraser University, Canada Cohen, Robert A., Simon Fraser University, Canada Bajić, Ivan V., Simon Fraser University, Canada
MMSP-P2.7: EFFECTIVE PIPELINE FOR COMPRESSING DEEP OBJECT DETECTORS
Yao, Yiwu, Peking University, China Fang, Zheng, Zhejiang University, China Dong, Bin, R&D Center, NetEase Inc, China Zhou, Sen, R&D Center, NetEase Inc, China

MMSP-P2.8: GATED MECHANISM FOR ATTENTION BASED MULTIMODAL SENTIMENT ANALYSIS
Kumar, Ayush, Observe.AI, India Vepa, Jithendra, Observe.AI, India

MMSP-P2.9: MULTITASK LEARNING AND MULTISTAGE FUSION FOR DIMENSIONAL AUDIOVISUAL EMOTION RECOGNITION
Atmaja, Bagus Tris, Japan Advanced Institute of Science and Technology, Japan Akagi, Masato, Japan Advanced Institute of Science and Technology, Japan

MMSP-P2.10: OBJECT DETECTION AND 3D ESTIMATION VIA AN FMCW RADAR USING A FULLY CONVOLUTIONAL NETWORK
Zhang, Guoqiang, University of Technology Sydney, Australia Li, Haopeng, Qamcom Research and Technology AB, Sweden Wenger, Fabian, Qamcom Research and Technology AB, Sweden
MMSP-P3 - Multimedia Signal Processing

**MMSP-P3.1: AVA ACTIVE SPEAKER: AN AUDIO-VISUAL DATASET FOR ACTIVE SPEAKER DETECTION**


**MMSP-P3.2: SUPERVISED DEEP HASHING FOR EFFICIENT AUDIO EVENT RETRIEVAL**

Jati, Arindam, University of Southern California, United States Emmanouilidou, Dimitra, Microsoft Research, United States

**MMSP-P3.3: AN LSTM-BASED DYNAMIC CHORD PROGRESSION GENERATION SYSTEM FOR INTERACTIVE MUSIC PERFORMANCE**

Garoufis, Christos, National Technical University of Athens, Greece Zlatintsi, Athanasia, National Technical University of Athens, Greece Maragos, Petros, National Technical University of Athens, Greece

**MMSP-P3.5: ENSEMBLE NETWORK FOR RANKING IMAGES BASED ON VISUAL APPEAL**

Singh, Sachin, Indian Institute of Technology Kanpur, India Sanchez, Victor, University of Warwick, United Kingdom Guha, Tanaya, University of Warwick, United Kingdom

**MMSP-P3.6: TRAPEZOIDAL SEGMENT SEQUENCING: A NOVEL APPROACH FOR FUSION OF HUMAN-PRODUCED CONTINUOUS ANNOTATIONS**

Booth, Brandon, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

**MMSP-P3.7: SEQUENCE-TO-SEQUENCE LABANOTATION GENERATION BASED ON MOTION CAPTURE DATA**

Li, Min, Beijing Jiaotong University, China Miao, Zhenjiang, Beijing Jiaotong University, China Ma, Cong, Beijing Jiaotong University, China
MMSP-P3.8: POSE REFINEMENT: BRIDGING THE GAP BETWEEN UNSUPERVISED LEARNING AND GEOMETRIC METHODS FOR VISUAL ODOMETRY
Zhang, Lanqing, Peking University Shenzhen Graduate School, China
Li, Ge, Peking University Shenzhen Graduate School, China
Li, Thomas H., Peking University, China

MMSP-P3.9: MULTIMODAL ACTIVE SPEAKER DETECTION AND VIRTUAL CINEMATOGRAPHY FOR VIDEO CONFERENCING
Cutler, Ross, Microsoft, United States
Mehran, Ramin, Zillow, United States
Johnson, Sam, Facebook, United States
Zhang, Cha, Microsoft, United States
Kirk, Adam, Omnivor, United States
Whyte, Oliver, Omnivor, United States
Kowdle, Adarsh, perceptiveIO, United States

MMSP-P3.10: A NEW VARIATIONAL METHOD FOR DEEP SUPERVISED SEMANTIC IMAGE HASHING
Zhuang, Furen, University of Illinois at Urbana-Champaign, United States
Moulin, Pierre, University of Illinois at Urbana-Champaign, United States
Show and Tell Demonstrations

Tuesday, 5 May, 11:30 - 13:30

S&T-P1 - Show and Tell 1

Talk Only S&T-P1.1: REAL-TIME EPILEPTIC SEIZURE DETECTION DURING SLEEP USING PASSIVE INFRARED (PIR) SENSORS

Hanosh, Ouday, University of Illinois at Chicago, United States Cetin, Ahmet Enis, University of Illinois at Chicago, United States Ansari, Rashid, University of Illinois at Chicago, United States

Abstract: According to World Health Organization (WHO), millions of people suffer from epilepsy, which is a chronic disorder of the brain. Sudden Unexplained Death in Epilepsy (SUDEP) is considered as one of the most dangerous threats to the patients who suffer from convulsive seizures during sleep. In this presentation we will demonstrate how we can detect epileptic seizures during sleep using Passive Infrared Sensors (PIR). The causes of the SUDEP are still unknown, and the patients with epileptic seizures can experience death in bed, likely after an unwitnessed convulsive seizure. Alerting caregivers to intervene during a seizure will help to prevent the SUDEP. Most of the current approaches to detect epileptic seizures at home rely on contact-based sensors and cameras. We developed a privacy-safe, non-contact PIR sensor based system that can alert caregivers during a convulsive seizure [1]. During a convulsive seizure the whole body experiences rapid, rhythmic and sometimes violent shaking movements, often with loss of consciousness. The PIR sensor monitoring the sleeping person generates a chaotic looking signal during a seizure. This signal can be distinguished from other ordinary body movements using a machine learning algorithm. We developed an algorithm using Hidden Markov models (HMM) and a convolutional neural network to classify the sensor data set into either occurrence or non-occurrence of epileptic convulsive seizures. The PIR sensor-based seizure detection system is a contact-free system. Epileptic seizures can be detected from 1 meter up to 11 meters distance between the sensor and the subject. During the demonstration, we will simulate a seizure by shaking our body in front of our system and generate an alarm. Reference: [1] Hanosh, O., Ansari, R., Younis, Cetin, AE (2019). Real-Time Epileptic Seizure Detection during Sleep using Passive Infrared Sensors. IEEE Sensors Journal.
Talk Only S&T-P1.2: ERTIS: REAL-TIME 3D ACOUSTIC SONAR IMAGING USING SPARSE MICROPHONE ARRAYS

Jansen, Wouter, University of Antwerp, Belgium Verellen, Thomas, University of Antwerp, Belgium Kerstens, Robin, University of Antwerp, Belgium Laurijssen, Dennis, University of Antwerp, Belgium Steckel, Jan, University of Antwerp, Belgium

Abstract: In recent years, our research group has developed state of the art 3D sonar sensors which use a low-cost MEMS microphone array for real-time acoustic imaging in air. Using this sensor, various robotic applications have been developed, including obstacle avoidance, corridor following and SLAM. The developed sensor is capable of localizing an arbitrary number of reflectors, and generates 2D (range versus azimuth) or 3D (range versus azimuth and elevation) acoustic images of the environment by emitting a broadband, spatially omnidirectional acoustic emission. This emission is reflected back by the environment to the microphone array. Using array beamforming algorithms an acoustic image of the environment is created, which subsequently can be either visualized or used in various control algorithms. In this show-and-tell demonstration we will demonstrate the real-time imaging capabilities of our eRTIS 3D Sonar sensor. Using a ground-truth sensing mechanism using LIDAR, we show the 3D point-clouds generated obtained by analyzing acoustic reflections obtained from our sonar sensor. The overlay of the 3D LIDAR and Sonar point-clouds allows the visitor of the show-and-tell session to experience 3D perception of the world through acoustic imaging. A previous version of this demonstration has been shown on the IEEE Sensors Conference 2019, where we won best demonstration award for our setup. A movie can be found here: https://www.youtube.com/watch?v=NV9Wkc2j6CY

Talk Only S&T-P1.4: DEMO PROPOSAL FOR SINGLE-INPUT MULTI-OUTPUT SUB-NYQUIST RADAR WITH UNKNOWN PULSE SHAPE

Eldar, Yonina, Weizmann Institute of Science, Israel Mulleti, Satish, Weizmann Institute of Science, Israel Zhan, Zhan, Weizmann Institute of Science, Israel Namer, Moshe, Weizmann Institute of Science, Israel Shavit, Yariv, Weizmann Institute of Science, Israel

Abstract: In this demo, we present a single-input multi-output (SIMO) radar system that operates at a sub-Nyquist rate without assuming any priori knowledge of the transmit pulse shape. Shannon-Nyquist sampling technique is the most widely used analog to digital conversion (ADC) method where the sampling rate is equal to twice the bandwidth of the signal to be sampled. In active radar imaging, the transmit pulse is narrow in time and hence has a wide bandwidth. This results in a high sampling rate and expensive ADCs. However, in
radar imaging, the received signal has a structure that can be exploited to reduce the sampling rate. Specifically, the received signal consists of a stream of time-shifted and amplitude scaled copies of the transmit pulse. By assuming that the transmit pulse is known, the received signal has a finite rate of innovation and hence can be sampled within the Xampling framework where the ADC operate in the sub-Nyquist regime. However, in practice, the transmit pulse is distorted while propagation and hence, one cannot use an existing sub-Nyquist framework. In this demo, we present the implementation of recently proposed sub-Nyquist framework with unknown pulse shape [1]. Specifically, we demonstrate that low-rate sampling is still possible if the signal is received through multiple antennas. In this case, the problem of estimating the target can be posed as a sparse multichannel blind deconvolution problem and we show that it is possible to uniquely identify the targets from compressed measurements. Our demonstration platform consists of a Vector Signal generator with delay capabilities transmitting in two different RF channels into a four channel oscilloscope. The prototype will be presented along with a dedicated GUI depicting the computed performance measures and allowing comparison to sub-Nyquist scheme with a known pulse. References: 1. S. Mulleti, K. Lee, and Y. C. Eldar, “Identifiability Conditions for Compressive Multichannel Blind Deconvolution,” arXiv preprint arXiv:2001.00613, 2020
Talk Only S&T-P2.1: NUS AUTO LYRIX ALIGN

Gupta, Chitralekha, National University of Singapore, Singapore Yilmaz, Emre, National University of Singapore, Singapore Li, Haizhou, National University of Singapore, Singapore

Abstract: NUS Auto Lyrix Align is a system that automatically provides word-level alignment of a given lyrics text to a given polyphonic song. Automatic lyrics alignment in polyphonic music is a challenging task because the singing vocals are corrupted by the background music. In this system, we use an acoustic model that has been trained on music genre-specific characteristics of polyphonic music. With such a genre-based approach, we explicitly model the music without removing it during acoustic modeling. This algorithm has been submitted to ICASSP 2020, also has outperformed all other systems in the International Music Information Retrieval Evaluation eXchange platform MIREX 2019, with mean absolute word alignment error of less than 200 ms across all test datasets. For the first time, we present our algorithm in the form of an interactive web interface, where a user can upload a song as an mp3 file or a youtube link along with its lyrics text file. The system processes the inputs and outputs word-level time-aligned lyrics. The aligned lyrics are displayed on the screen in karaoke fashion, i.e. scrolling highlighting of the words as the audio plays. The user may download the word-aligned output file in json or txt format, which is compatible with Audacity. A video demonstrating our system is shown here:


Talk Only S&T-P2.2: CHOIR SINGING SYNTHESIS FOR REHEARSAL TOOLS WITH LARGE-SCALE MULTILINGUAL REPERTOIRES
Sarasúa, Álvaro, Voctro Labs, Spain Janer, Jordi, Voctro Labs, Spain Mayor, Oscar, Voctro Labs, Spain Bonada, Jordi, Universitat Pompeu Fabra, Spain Blaauw, Merlijn, Universitat Pompeu Fabra, Spain

Abstract: Advances in the quality of recent Text-to-Speech Synthesis (TTS) based on Deep Learning (DL) made a large impact for its wide application range in industry and simultaneous social awareness. In the music domain, Singing Voice Synthesis (SVS) profited from similar advances in realism and expressive control. The SVS approaches take into account musical constraints, and specific datasets need to be recorded and annotated. Although virtual singers are not new, today DL-based systems that generate synthetic media are gaining attention in academia, industry as well as in media production. One of the renowned research labs working on Singing Technologies is the MTG-UPF in Barcelona. Together with its spin-off company Voctro Labs, they have developed a Choir Singing Synthesis system that models a professional choir of 16 singers in multiple languages. The system combines a novel work on F0-modelling introduced at ICASSP 2020, with the Neural Parametric Singing Synthesis (NPSS) algorithm developed by coauthors. It takes the notes and corresponding lyrics as input, and generates a synthetic output for different voices. It includes a Hybrid DNN-Parametric F0-model trained on studio recordings by singers in four registers (soprano, alto, tenor and bass), capturing the specific intonation patterns. Timbre is also modelled independently for the different four registers, allowing to synthesize realistic replicas of each voice type and pitch range. A multilingual dataset was recorded in four languages, thanks to the diction proficiency of professional singers in Western choral music repertoire. This demo shows an interactive web-based prototype. Attendants will have the opportunity to listen to the realistic synthetic choir (e.g. https://soundcloud.com/phonos-upf/demo-2), as well as to practice their singing skills on the interactive rehearsal tool (https://trompa.netlify.com/). The work presented is partially funded by the TROMPA EU Project (Grant No 770376).

Talk Only S&T-P2.3: A SINGLE-WAVELENGTH REAL-TIME MATERIAL-SENSING CAMERA BASED ON TIME-OF-FLIGHT MEASUREMENTS

Heredia Conde, Miguel, University of Siegen, Germany Loffeld, Otmar, University of Siegen, Germany Kerstein, Thomas, pmdtechnologies ag, Germany Buxbaum, Bernd, pmdtechnologies ag, Germany

Abstract: Time-of-Flight (ToF) cameras provide a fast and robust way of acquiring the 3D shape of real scenes. Dense depth images can be generated at tens of frame per second. 3D shapes can be then segmented and objects classified, but can we directly sense the objects’ material using just a ToF
camera? This live demonstration proves the answer to be affirmative. This possibility has only very recently been unveiled and we are, to the best of our knowledge, the first providing a live demonstrator showing the feasibility of this approach. Differently from mainstream research on material classification, we do not make use of costly hyperspectral measurements, but of single-wavelength ToF measurements. Depending on the nature of the material, the probing function arising from the modulation/demodulation sensing scheme (e.g., a sinusoid in CW-ToF) will be further convolved with a different impulse response function that is characteristic of the material. If the material is perfectly opaque and plain this response function is a Dirac delta function. If not, phenomena like internal reflections will produce bandlimited response functions. Using a multi-frequency CW-ToF system we are able to extract the main Fourier coefficients of such bandlimited functions, thus offering an accurate approximation thereof and enabling native material recognition. This novel approach opens the door for low-cost ToF cameras to enter high-impact applications, e.g., those requiring distinguishing biological material from artificial ones, typically with markedly different inner light diffusion characteristics. The demonstrator consists of our material sensing camera, connected to a computer that shows a real-time video of “material images”. The camera observes a dynamic scene containing real-life objects of different materials. Objects can be removed from the scene and new objects can be incorporated. The spectators will enjoy a literal “hands-on” interaction, and will also be able to challenge the system with their own items.
Talk Only S&T-P3.2: A NOVEL METHOD FOR OBTAINING DIFFUSE FIELD MEASUREMENTS FOR MICROPHONE CALIBRATION

Akbar, Noman, Australian National University, Australia Dickens, Glenn, Australian National University, Australia Thomas, Mark R. P., Dolby Laboratories, United States Samarasinghe, Prasanga N., Australian National University, Australia Abhayapala, Thushara D., Australian National University, Australia

Abstract: NOVELTY OF THE DEMO: Is it possible to obtain a diffused field response of a microphone array and perform calibration in under a minute? If such a method exists, is it possible to achieve an accuracy of half a dB from the expected response? The answer to both questions is “yes”. We will demonstrate a novel, straightforward, and cost-effective method of obtaining diffuse field measurements for microphone calibration. TECHNICAL CONTENTS: This demo is associated with an accepted paper at ICASSP 2020. The paper describing the proposed method entitled “A novel method for obtaining diffuse field measurements for microphone calibration” has been accepted for presentation in a lecture session. As such, this demo will be of high-interest to the attendees of ICASSP and will significantly improve the quality of presentation of the accepted paper. Technical details of the proposed method will be easily available to the ICASSP attendees in the form of the accepted paper.

HARDWARE AND INTERACTIVE DEMO SETUP: We will setup a 1.8m diameter 26-speaker rhombic tricontrahedron array and calibrate a higher-order microphone array using the proposed method. Participants at ICASSP will be invited to calibrate a microphone array using the hardware setup and the frequency response of the microphone array will be displayed on a laptop screen. A Participant will be able to see the result of his/her trial and also see a comparison between their results with those obtained by other participants. The demo will include a 1-2 minute talk describing the proposed method and its novel aspects. VIDEOS ASSOCIATED WITH THE DEMO: • A 26-speaker rhombic tricontrahedron array will be used in the demo https://vimeo.com/361493511 • Videos demonstrating the proposed method https://vimeo.com/367536785 https://vimeo.com/367536766

Talk Only S&T-P3.3: PRE-TRAINING IN DEEP REINFORCEMENT LEARNING FOR AUTOMATIC SPEECH RECOGNITION

Rajapakshe, Thejan, University of Southern Queensland, Sri Lanka Rana, Rajib, University of Southern Queensland, Australia Latif, Siddique, University of Southern Queensland, Australia Khalifa, Sara, Commonwealth Scientific and
Industrial Research Organisation, Australia Schuller, Björn, Imperial College London, United Kingdom

**Abstract:** Deep reinforcement learning (deep RL) is a combination of deep learning and reinforcement learning principles. It creates efficient methods that can learn by interacting with its environment. Deep RL led to breakthroughs in many complex tasks that were previously difficult to solve. However, deep RL requires a large amount of training time that makes it difficult to use in various real-life applications like human-computer interaction (HCI). Therefore, in this work, pre-training in deep RL has been studied to reduce the training time and improve the performance in speech recognition. Implementation of the policy model in RL was done using the well-known Tensorflow python library. It includes a combination of Convolutional Neural Network (CNN) Layers and Long-Short Term Memory (LSTM) layers. The use of CNN and LSTM indulges us the ability to increase the performance for speech recognition tasks. We considered RL in playing a guessing game of speech commands. After considering the ground truth by the environment, a reward is given. For a correct guessing a positive reward, and for a false guessing a negative reward is given. The study was carried out by using the publicly available Speech Commands Dataset. Initially, the policy model was pre-trained in a separate sub-set of the selected dataset before RL starts. The REINFORCE algorithm was used to approximate the policy gradient. The average score was compared between "with" and "without" pre-training paradigms. The score after 10,000 episodes with pre-training has increased by about 50% in higher class classifiers. Results show that pre-training helps to achieve considerably better results in a lower number of episodes. Moreover, the velocity of the score has increased in "with pre-training" rather than in "without pre-training" experiments. In the proposed model, it uses pre-training knowledge to achieve a better score while reducing the convergence time.

**Talk Only S&T-P3.4: DEMO PROPOSAL FOR JOINT RADAR AND COMMUNICATION SYSTEM BASED ON INDEX MODULATION**

Eldar, Yonina, Weizmann Institute of Science, Israel Shlezinger, Nir, Weizmann Institute of Science, Israel Ma, Dingyou, Tsinghua University, China Shavit, Yariv, Weizmann Institute of Science, Israel Jin, Jidong, Tsinghua University, China Namer, Moshe, Weizmann Institute of Science, Israel

**Abstract:** In this demo we present a radar system capable of transmitting digital communication messages to a remote receiver using a transmission scheme, operating as a dual-function radar-communication (DFRC) system. Many applications, such as vehicular systems, utilize both radar and communication functionalities. These systems share many similarities in hardware architecture
and signal processing methods, which motivates the study of DFRC systems, i.e., systems implementing both radar and communication functionalities using the same platform. Such joint designs have several benefits, including a reduction of the system volume, reduced cost, and the ability to naturally mitigate the cross interference between radar and communications. Therefore, the joint design of radar and communication systems has been the focus of a growing research attention. In this demo, we present an implementation of a DFRC scheme recently proposed in [1]-[2]. This scheme combines frequency agile radar with index modulation for conveying digital messages at minimal degradation to the radar performance. In the proposed demo we implement the DFRC transmitter while simulating the radar target using a radar echo generator (REG). Our demonstration platform consists of a control unit implementing over-the-air joint-waveform signaling using a dedicated antenna array of 16 elements capable of both receiving and transmitting, as well as an REG which generates the reflecting radar echos for controllable targets. Using a dedicated GUI, our demo will illustrate the operation of the DFRC system, computing its radar and communication performance measures in real-time, and demonstrating the feasibility of the concept of index-modulation based DFRC systems. [1] T. Huang, N. Shlezinger, X. Xu, Y. Liu, and Y. C. Eldar, “MAJoRCom: A dual-function radar communication system using index modulation,” arXiv preprint arXiv:1909.04223, 2019. [2] T. Huang, N. Shlezinger, X. Xu, D. Ma, Y. Liu, and Y. C. Eldar, “Multi-carrier agile phased array radar,” arXiv preprint arXiv:1906.06289, 2019
Talk Only S&T-P4.1: ROBUST END-TO-END KEYWORD SPOTTING AND VOICE COMMAND RECOGNITION FOR MOBILE GAME

An, Shounan, Netmarble, Korea (South)

Abstract: We present an effective method to solve a small-footprint keyword spotting (KWS) and voice command based user interface for mobile game. For KWS task, our goal is to design and implement a computationally very light deep neural network model into mobile device, in the same time to improve the accuracy in various noisy environments. We propose a simple yet effective convolutional neural network (CNN) with Google’s tensorflow-lite for android and Apple’s core ML for iOS deployment. Tensorflow provides post training integer quantization and with tensorflow-lite we could deploy 8-bit quantization model into android device. Meanwhile, we choose Apple’s core ML for it’s better performance than tensorflow-lite for iOS device. The size of our CNN model is 0.2 MB with 7 MB memory usage totally, and the CPU usage is around 1% (test phone: Galaxy S8 and iPhone 8). To improve the overall accuracy of KWS in noisy environments, we design a hybrid thresholding method, which make use of both average inference score and volume of incoming speech signal. We also propose a voice command SDK which running game command recognition on-the-fly inside the mobile device as well. We design a convolutional recurrent neural network transducer (CNN-RNN-T) as our automatic speech recognition (ASR) model. Text-to-speech (TTS) was applied to generate game command voices with various data augmentation techniques. Our CNN-RNN-T’s character error rate (CER) is 17%, the model size is 7 MB and the processing time is less than 1 second for 3 seconds incoming speech signal, which provides real-time voice command recognition for further game actions. To the best of our knowledge, this is the first work try to resolve both KWS and voice command recognition running inside device for mobile game. We will perform live demonstration of KWS and game command based user interface integrated into a full-sized, production-quality mobile game A3: Still Alive, which is one of the major games from Netmarble this year and will be available on market soon.

Talk Only S&T-P4.2: ENRICHED SPEECH FOR EFFORTLESS LISTENING

Chermaz, Carol, University of Edinburgh, United Kingdom
PV, Muhammed Shifas, University of Crete, Greece
Raman, Sneha, University of the Basque Country, Spain
Govender, Avashna, University of Edinburgh, United Kingdom
Paul, Dipjyoti, University of Crete, Greece
Simantiraki, Olympia, University of the Basque Country, Spain
Abstract: Human-machine speech interaction is increasingly common in the industrialised world. A (natural or synthetic) speech output that is optimised for high intelligibility and low cognitive load is of interest for both academia and industry: ENRICH (www.enrich-etn.eu) is a unique initiative - handling these topics from a joint perspective. The group has a special focus on the role of technology for individuals with different abilities in speech or hearing, with the aim of improving social inclusion by making communication easier. We would like to propose a series of demos, interleaved by the common thread of enriched speech for effortless listening. All demos are computer-based, with simple GUIs and headphones. 1)(NELE) Near End Listening Enhancement in realistic scenarios: The user can listen to speech playback in different simulated real-world acoustic scenarios, with or without NELE; they can enter the words they heard and calculate their intelligibility score. 2)Noise-aware speech enrichment using DNNs (Deep Neural Networks): The user can record their speech and subsequently listen to their utterance cleared from the noisy background and enhanced. 3)Enrichment of oesophageal speech with voice conversion based on LSTM (Long Shot-Term Memory) neural networks: A video of a patient emitting oesophageal speech is shown; the same speech is processed with a neural approach, reintroducing missing features like pitch. 4)Transforming casual speech into clear speech using Tacotron and WaveRNN vocoder and personalising synthetic voices with speaker embeddings extracted from a limited amount of data: The user can record their speech; the utterance is transcribed and speaker features are used to produce a synthetic voice that speaks clearly and sounds similar to the user. 5)Personalising speech playback: The user can modify arbitrary features of a recorded voice to maximise perceived intelligibility. They can see how their choices compare against average responses. Modifications include F0 (using STRAIGHT), spectral location of speech band and spectral tilt.

Talk Only S&T-P4.3: DEEPJSCC: THE FUTURE OF WIRELESS VIDEO TRANSMISSION

Tung, Tze-Yang, Imperial College London, United Kingdom Kurka, David, Imperial College London, United Kingdom Gündüz, Deniz, Imperial College London, United Kingdom

Abstract: We propose a demonstration of a joint source-channel coding (JSCC) scheme, called DeepJSCC, for wireless video transmission. Unlike conventional digital communication systems, which rely on separate source and channel coding, DeepJSCC is a purely data-driven end-to-end approach inspired by recent developments in deep learning. The encoder and decoder of DeepJSCC consist of a pair of neural networks that are optimized jointly through training.
DeepJSCC can learn to transmit over the air without any explicit code design and achieve similar or better performance than conventional transmission schemes. Moreover, DeepJSCC is able to avoid the "cliff effect", which the conventional digital designs suffer from. The cliff effect refers to the complete failure of digital transmission when the channel condition deteriorates. In contrast, DeepJSCC provides graceful degradation of video quality with the channel quality (as in analog transmission). Thus, DeepJSCC does not suffer from drop out of video as conventional digital communication systems do. The demonstration consists of a pair of software defined radios that act as the transmitter and receiver. We will first show the cliff effect that the conventional digital communication suffers from with live plots of channel quality vs video quality as well as the video itself. Next, we will implement DeepJSCC on the same hardware showing the smooth adjustment of the video quality with varying channel quality. Interactivity will consist of attendants moving the radio to introduce channel distortions and they will be able to see the effects of distortions they introduce on a live video. We believe this demonstration will inspire audiences on the power of deep learning for solving the challenges of wireless video transmission, and how it can revolutionize the future of communications, which has so far depended on a strictly modular design consisting of many complex expert-designed components. Sample images and results: https://ipc-lab.github.io/deepJSCC-demo/

Talk Only S&T-P4.4: DEMO PROPOSAL FOR DATA-DRIVEN SYMBOL DETECTION AND ONLINE CHANNEL TRACKING VIA MODEL-BASED MACHINE LEARNING

Eldar, Yonina, Weizmann Institute of Science, Israel Shlezinger, Nir, Weizmann Institute of Science, Israel Namer, Moshe, Weizmann Institute of Science, Israel Shavit, Yariv, Weizmann Institute of Science, Israel

Abstract: Recent years have witnessed a dramatically growing interest in machine learning (ML). These data-driven methods have demonstrated an unprecedented success in various applications. The benefits of ML over traditional model-based approaches are twofold: First, ML methods are independent of the underlying model, and thus can operate efficiently in scenarios where this model is unknown, or its parameters cannot be accurately estimated; Second, when the model is complex, ML algorithms have demonstrated the ability to disentangle the meaningful semantic information from the observed data. Nonetheless, not every problem should be solved using deep neural networks (DNNs). In fact, in scenarios for which model-based algorithms exist and are computationally feasible, which is the case in various communications setups, analytical methods are typically preferable over ML
schemes due to their theoretical performance guarantees and possible proven optimality. In our work [1] we derived a data-driven receiver, referred to as ViterbiNet, which integrates DNNs into the Viterbi algorithm. ViterbiNet utilizes ML methods to learn only the channel-model-based computations of the Viterbi algorithm, and thus integrates ML into algorithmic symbol detection. The resulting receiver thus learns to implement Viterbi detection from a small set of labeled data and is capable of tracking time-varying channel conditions using online training. The focus of the demo is to demonstrate the ability of ViterbiNet to track channel variations online exploiting the inherent structure of error correction codes [1]. We utilize DNN accelerators to demonstrate how ViterbiNet can track varying channel conditions in real-time, utilizing its decoded output for retraining. The demo will include a GUI demonstrating the channel variations and the corresponding adaptation of the data-driven symbol detector, illustrating the feasibility of the concept of online training for model-based ML methods in communications. [1] N. Shlezinger et al, “ViterbiNet: A deep learning based Viterbi algorithm for symbol detection,” arXiv:1905.10750.
Wednesday, 6 May, 16:30 - 18:30

S&T-P5 - Show and Tell 5

Talk Only S&T-P5.1: REALISTIC REAL-TIME VOICE SWAPPING FROM SINGLE UNPAIRED SENTENCES

Provinciali, Carlo, Columbia University, United States
Liu, Yihong, Columbia University, United States
Kim, Junghoo, Columbia University, United States
Drori, Iddo, Columbia University, United States

Abstract: We demonstrate a system that allows two speakers to swap their voices from any two unpaired sentences such that the result is indistinguishable from real voices and performed in real-time on a laptop. Each of the two speakers takes turns pronouncing any unpaired single short sentences into a microphone. Our demo plays the original voice recordings, then swaps the speakers’ voices, playing the words pronounced by the first speaker with the second’s speaker voice and vice-versa. The two input voices are processed in two distinct ways; one to extract the text of each speech, and one to learn each speaker’s unique voice profile. We extract the text from speakers’ A speech by using state of the art pre-trained voice-to-text models. We then pass the audio from speaker B through an encoder, which derives an embedding that describes speakers’ B distinctive features. Next, we use the text extracted from speaker A and the embeddings of speaker B to synthesize the Mel spectrogram, which is fed into a vocoder to generate the final audio of speakers’ A sentence with speakers’ B voice. The same process is mirrored with speaker A and B’s roles swapped. Our implementation leverages pre-trained neural networks: an encoder, synthesizer, and vocoder models, for a realistic real-time performance.

Talk Only S&T-P5.2: VIDEO-DRIVEN SPEECH RECONSTRUCTION

Mira, Rodrigo, Imperial College London and Samsung AI, United Kingdom
Ma, Pingchuan, Imperial College London, United Kingdom
Vougioukas, Konstantinos, Imperial College London, United Kingdom
Petridis, Stavros, Imperial College London and Samsung AI Centre Cambridge, United Kingdom
Schuller, Björn, Imperial College London, United Kingdom and University of Augsburg, Germany
Pantic, Maja, Imperial College London and Samsung AI Centre Cambridge, United Kingdom

Abstract: This demo will showcase our video-to-audio model which attempts to reconstruct speech from short videos of spoken statements. Our model does so in a completely end-to-end manner where raw audio is generated based on the input video. This approach bypasses the need for separate lip-reading and text-to-speech models. The advantage of such an approach is that it does not require large transcribed datasets and it is not based on intermediate
representations like text which remove any intonation and emotional content from the speech. This demo will show for the first time the feasibility of end-to-end video-driven speech reconstruction for unseen speakers. The model is based on generative adversarial networks and achieves the state-of-the-art performance on seen speakers on the GRID dataset in terms of word error rate and speech quality and intelligibility. It is also the first model which can generate high quality and intelligible speech for unseen speakers. Additionally, this model is the first to produce intelligible speech when trained and tested on LRW, an ‘in the wild’ dataset which contains thousands of utterances taken from television broadcasts. The demo will be interactive, involving recording live video from a new participant. The previously unseen speaker will be asked to utter a short sentence in front of the camera, but no audio will be recorded. This video will then be fed into the model and it will (in only a few seconds) produce a new version of the same video which will feature the reproduced speech generated by our end-to-end model. The proposed model can have a significant impact on videoconferencing by alleviating common issues such as noisy environments, gaps in the audio and unvoiced syllables. The demo will be the first step in demonstrating the potential of this technology which we believe will be very attractive and relevant to the ICASSP audience. Samples of our work can be found on https://sites.google.com/view/speech-synthesis/home/extension.

Talk Only S&T-P5.3: MACHINE LEARNING-BASED ADAPTIVE RECEIVE FILTERING: PROOF-OF-CONCEPT ON AN SDR PLATFORM

Mehlhose, Matthias, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany Awan, Daniyal Amir, Technische Universität Berlin, Germany Cavalcante, Renato L. G., Fraunhofer Heinrich Hertz Institute, Germany Kurras, Martin, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany Stanczak, Slawomir, Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, Germany

Abstract: The constant demand for low latency and high data rates in a modern mobile communications network creates new scientific challenges in each new generation. An accurate reconstruction of transmission data of as many users as possible at the base station is a task that can become mathematically very complex in today’s mobile networks. The scientific community and our group at Fraunhofer Institute for Telecommunications (Heinrich Hertz Institute, HHI) are therefore investigating and comparing new methods such as NOMA with conventional orthogonal multi-user recognition techniques such as OFDMA. In combination with a large number of antennas on the receiving base station, a practical implementation can become very complex. In addition, subsequent
errors in estimation with methods such as successive interference cancellation (SIC) can make it impossible for some users to reconstruct the data reliably if a large number of users are affected by incorrectly estimated parameters (such as user channels, covariance matrix, noise variance, etc.). In our demonstrator, we show how a receiver based on machine learning (ML) can help with this task. With low complexity, the modulation symbols for each user are detected without the need to estimate the typical parameters. All users send their pilots and data alternately on the same resources (frequency and time). The regular pilot phases are used to relearn changes in the channel. The method has the potential to contribute significantly to latency reduction through parallel implementation.

**Talk Only S&T-P5.4: DEMO PROPOSAL FOR FAST-LEARNING SPARSE ANTENNA ARRAY FOR AUTOMOTIVE RADAR**

Eldar, Yonina, Weizmann Institute of Science, Israel Mulleti, Satish, Weizmann Institute of Science, Israel Namer, Moshe, Weizmann Institute of Science, Israel Shavit, Yariv, Weizmann Institute of Science, Israel Zhan, Zhan, Weizmann Institute of Science, Israel

**Abstract:** In this demo, we present fast-sparse array hardware built for tracking both slow- and fast-moving targets in an automotive application. Specifically, the direction of arrivals (DOA) of the moving targets are estimated at regular time-intervals by applying sparse arrays that are adaptively configured by using deep learning. High-resolution DOA estimation requires a large number of antenna elements which results in a high cost. To reduce cost and power while obtaining sufficient performance, sparse array structures are used where a subarray of the whole antenna array is utilized. Recently, we proposed a deep learning-based (DL) approach for antenna selection that has low computational complexity and optimum solution [1, 2]. In these works, the data labeling method is based on an exhaustive search where a best sparse array is selected among all possible configurations that minimize a predefined cost function. In addition, the proposed techniques assume that the targets are moving slowly between the scans. In this demo, we address these shortcomings and demonstrate a computationally efficient labeling technique and a modified sparse array configuration strategy that can track both slow- and fast-moving targets. The results are particularly useful for automotive applications, where the radars are required to track slowly moving objects such as pedestrians and fast-moving vehicles for efficient navigation. Our demonstration platform consists of a control unit implementing over-the-air dedicated antenna array of 16 elements capable of receiving signals in the ISM band (2.4 / 5 GHZ). By using a dedicated GUI, our demo will illustrate the DOA with sparse array of the receive
Abstract: Introduction of spectrum sharing in 3GPP Release 17 demands base-stations (BS) with the capability to characterize the wideband spectrum spanned over licensed, shared and unlicensed non-contiguous frequency bands. Since, multiple-antenna and beam-forming are de facto approaches to meet the throughput and quality-of-service requirements, characterization of spectrum is desired over time, frequency as well as spatial domains. Though narrowband signal characterization is well-explored, wideband spectrum needs careful design of analog and digital front-ends along with tight integration with the baseband algorithms. Furthermore, non-contiguous spectrum demands intelligence to identify the part(s) of spectrum to be characterized so that ample transmission opportunities are identified. From a complexity perspective, optimal trade-off between accurate characterization of as many bands as possible with fewer number of antennas is a challenging research problem. The proposed demonstration offers intelligent and reconfigurable architecture for non-contiguous wideband spectrum characterization (vacant/busy status, center frequency and direction-of-arrival). Here, reconfigurability allows the BS to select and digitize non-contiguous frequency bands by performing sparse sensing in temporal and spatial domain. This is achieved via sparse antenna-array and finite rate of innovation based sub-Nyquist sampling technique. Whereas by optimizing the above trade-off, the online learning based intelligence allows the BS to successfully characterize the spectrum with fewer number of hardware resources. Specifically, we setup this problem as multi-play multi-armed bandit, develop novel algorithm and validate the same in real radio environment. This demonstration has found significant traction both with academia as well as industry given the multitude of use cases in 5G requiring efficient sensing and spectrum characterization for enhanced system operation. Furthermore, we also extend this demonstration for cellular-radar coexistence scenario in which identified transmission opportunities are exploited by the Radar communication systems. The setup consists of transmitter USRP(s) to
generate directional wireless traffic with the desired distribution. The receiver, i.e. BS, consists of sparse antenna-array connected to the receiver USRP(s) synchronized via octoclock. The proposed signal processing and learning algorithms are realized in LabVIEW-NXG. We demonstrate the 34% gain in throughput (i.e. number of identified transmission opportunities) along with lower complexity with respect to state-of-the-art methods.
Talk Only S&T-P7.2: INTERACTIVE LOW LATENCY VIDEO STREAMING OF VOLUMETRIC CONTENT

Podborski, Dimitri, Fraunhofer Heinrich Hertz Institute, Germany Gül, Serhan, Fraunhofer Heinrich Hertz Institute, Germany Son, Jangwoo, Fraunhofer Heinrich Hertz Institute, Germany Bhullar, Gurdeep Singh, Fraunhofer Heinrich Hertz Institute, Germany Skupin, Robert, Fraunhofer Heinrich Hertz Institute, Germany Sanchez, Yago, Fraunhofer Heinrich Hertz Institute, Germany Schierl, Thomas, Fraunhofer Heinrich Hertz Institute, Germany Hellge, Cornelius, Fraunhofer Heinrich Hertz Institute, Germany

Abstract: Low latency video streaming of volumetric content is an emerging technology to enable immersive media experiences on mobile devices. Unlike 3DoF scenarios where users are restricted to changes of their head orientation at a single position, volumetric content allows users to move freely within the scene in 6DoF. Although the processing power of mobile devices has increased considerably, streaming volumetric content directly to such devices is still challenging. High-quality volumetric content requires significant data rate and network bandwidth. Although compression algorithms for volumetric video are being developed, no energy efficient hardware for decoding of volumetric data such as point clouds or meshes is available on existing mobile platforms. Moreover, software decoding may not be able to meet real-time processing requirements and increases the battery consumption. Our demonstration mitigates the above problem by offloading the rendering to a dedicated server at the network edge and avoids transmission of the original volumetric content to a mobile client. One major challenge of such cloud rendering is to meet end-to-end latency requirements and ensure a smooth user experience. Typically, placing the rendering engine at a 5G edge server can drastically reduce the network latency. The demonstration setup consists of a browser-based client that displays the 2D video containing the volumetric content and transmits user interactions to the rendering server through WebRTC data channels or websockets. On server side, a rendering engine generates an appropriate view of the volumetric content based on the user interaction. A fast GPU-based video encoder then compresses the rendered 2D view and transmits it to the client using the WebRTC protocol. The described system achieves a very low end-to-end latency, transmits the volumetric content at low bitrates and is suitable for deployment in thin client environments.
Talk Only S&T-P7.3: REAL-TIME SOUND EVENT DETECTION ON THE EDGE: PORTING VGGISH ON LOW-POWER IOT MICROCONTROLLERS

Cerutti, Gianmarco, Fondazione Bruno Kessler, Italy Brutti, Alessio, Fondazione Bruno Kessler, Italy Farella, Elisabetta, Fondazione Bruno Kessler, Italy

Abstract: Internet of Things (IoT) applications typically require a large number of heterogeneous devices to be distributed in the environment, which can generate large amounts of data for wireless transmission, affecting the energy requirements and lifetime of the devices. One strategy is computing on the very edge: performing advanced processing directly on the IoT node reduces the amount of transmitted data and the related power consumption. Thanks to recent improvements in embedded technology, commercial microcontrollers with consumptions in the range of mW and computational power to enable Artificial Intelligence (AI) at the “thing-level” are available. Sound event detection (SED) is an example of an emerging IoT-based application, driven by a growing interest in sensing technologies for smart cities. The recent release of new datasets and challenges (UrbanSound8K, AudioSet, ESC50, and DCASE) has led to substantial advances in terms of accuracy and robustness. Unfortunately, state-of-the-art algorithms employ very large neural networks, which are increasingly hungry of computational power and memory, preventing the development of applications for energy-neutral and cheap IoT devices. This show&tell presents our implementation of state of the art SED at the very edge, by optimizing deep learning techniques on very low-cost low-power embedded platforms, with severe constraints in terms of memory footprint and computational power. Using a student-teacher approach we make a state of the art neural network for sound event detection (based on VGGish) fit on current commercial microcontrollers by achieving extreme compression factors (from 70 millions to 20 thousand parameters). We implement our model on an ARM Cortex M4 using the CMSIS-NN library and adopting an efficient layer-wise 8-bit quantization of buffers and weights. Our real-time embedded implementation achieves 68% accuracy on Urbansound8k, with an inference time of 125 ms for each second of audio and a power consumption of 5.5 mW in just 34.3 kB of RAM.

Talk Only S&T-P7.4: REAL-TIME ACOUSTIC SCENE CLASSIFICATION FOR HEARING AIDS

Adiloğlu, Kamil, HörTech gGmbH, Germany Hüwel, Andreas, HörTech gGmbH, Germany Bach, Jörg-Hendrik, HörTech gGmbH, Germany

Abstract: Acoustic scene classification is a popular topic mostly combining the fields of audio signal processing and machine learning. Particularly the detection and classification of acoustic scenes and events (DCASE) challenge, which is held
each year, increased the interest of the researchers to this topic. However, the definition of the acoustic scenes and the corresponding databases for training the classifiers do not account for the requirements of a hearing aid application. Furthermore, the proposed methods to classify the provided databases do not consider neither the computational nor the time restrictions of a hearing aid. For these reasons, we recorded typical scenes — so called listening situations — using two different types of binaural hearing aid shells for hearing aid scene classification applications. The first hearing aid is an in-ear hearing aid and has one microphone one each side. The second hearing aid is a behind-the-ear hearing aid and contains two microphones on each side. Performing long recording sessions in different listening situations, annotating and cutting them into 10s snippets and finally mixing them with speech, we compiled a database with 14 different classes. We computed the LogMel features of the snippets and trained a convolutional neural network (CNN) on these features using PyTorch. Finally, we implemented a real-time capable version of this network on our real-time capable signal processing platform the master hearing aid (MHA) in C++. The MHA can load the pre-trained CNN using the LibTorch library and can perform one forward iteration through the network given the input features. The system we would like to demonstrate at ICASSP in the Show & Tell session captures the binaural input signal using hearing aid shells, which an artificial head is wearing. We will play a sequence of test sounds on a loudspeaker (or possibly using headphones, if loudspeakers are now allowed), for which the true labels of the listening situations are known. The binaural signal is sent through an external sound card to the mini-PC, where the MHA is running. For each 10s chunks, the LogMel features are computed and one forward iteration of the CNN is executed. The output of the CNN is a softmax layer, which we take the maximum to determine the predicted listening situation out of possible 14 listening situations. The predicted listening situation is shown to the user on a GUI. This whole chain runs in real-time with a total delay of 10s as we perform the prediction on 10s input signals.
Talk Only S&T-P8.1: SPECTRAL CO-DESIGN PROTOTYPE FOR AUTOMOTIVE MIMO RADAR MIMO COMMUNICATIONS SYSTEM

Alaee-Kerahroodi, Mohammad, University of Luxembourg, Luxembourg
Kumar, Sumit, University of Luxembourg, Luxembourg
Joshi, Himani, Indian Institute of Technology Delhi, India
Kumar Mishra, Vijay, Indian Institute of Technology Delhi, United States
M. R., Bhavani Shankar, University of Luxembourg, Luxembourg
Ottersten, Björn, University of Luxembourg, Luxembourg

Abstract: Futuristic smart vehicle technologies are envisioned to operate a large number of sensors to provide greater in-vehicle and inter-vehicle activities, safety, efficiency, and connectivity. In this context, integrating the communications and radar sensors is of critical importance to minimize the hardware footprint and share the spectrum. We present a spectrum-sharing prototype that demonstrates the common transmitter-receiver design (co-design), of Multiple-Input Multiple-Output (MIMO) Radar and vehicle-to-vehicle (V2V) MIMO communications (MRMC). Both systems share the same antenna and operate via multiplexing on a pulse-to-pulse basis within a coherent processing interval. The co-designed radar embeds the communications symbols in a novel, optimized, discrete-phase sequence, which is robust to the quantization errors introduced by digital-to-analog converters. The MRMC receiver, which operates in real-time, is capable of separating the semi-orthogonal transmit signals and decoding the communications constellation. The prototype is developed using General Purpose Processor (GPP) based Software Defined Radios (SDRs): NI USRP 2943R (1.2GHz - 6GHz) and Ettus USRP B210 (70 MHz – 6 GHz). Unlike our MRMC coexistence prototype, the co-design demo incorporates a joint MIMO radar/communication transmitter whose baseband processing is performed inside GPP using Labview NXG 3.1. The prototype offers flexibility to choose from a variety of radar waveforms, including optimized discrete-phase as other well-known sequences (e.g. Binary, frank, Golomb), and frequency modulation along with on-the-fly reconfigurable multiplexing operation. Communication symbols for multiplexing are drawn from IEEE-802.11p, (10 MHz, being used for V2V communications). The radar tasks include target range, Doppler, angle of arrival estimation while the communication receiver decodes IEEE-802.11p MAC frames. We presented our first MRMC co-design prototype at SPAWC 2019 without the full MIMO capability, especially direction-of-arrival (DoA) recovery. In the current submission, we have incorporated advanced MIMO functionality in radar and communications set-ups, such as a new co-designed waveform for an entire
coherent processing interval of the radar, space-time processing, and DoA estimation. Our MRMC co-design prototype effectively demonstrates a joint waveform transmission and recovery in multi-functional, shared multiple antenna systems.

**Talk Only S&T-P8.2: TITLE: COGNITIVE JOINT MIMO RADAR MIMO COMMUNICATIONS (C-MRMC) PROTOTYPE**

Alaee-Kerahroodi, Mohammad, University of Luxembourg, Luxembourg Kumar, Sumit, University of Luxembourg, Luxembourg Kumar Mishra, Vijay, University of Luxembourg, United States M. R., Bhavani Shankar, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**Abstract:** Cognitive radars optimize both transmit and receive processing to adjust to the dynamic target environment while aiming to enhance their behavioral agility by learning through experience in sensing and processing. In classical radar systems, the adaptability is limited to the receiver only. We present a Software Defined Radio (SDR) prototype that demonstrates cognitive optimization of radar transmit waveform, for the first time, to mitigate the interference to a spectrally coexisting communication link. The radar operates a multiple-input multiple-output (MIMO) array while the communication is a downlink multi-user MIMO system. Both the systems have independent transmit-receive (Tx/Rx) units and the radar system adapts its transmission to reduce its interference to the communication link. Further, on the Rx, it estimates the interference covariance matrix to enhance the detection performance. The radar achieves this adaptation by periodically acquiring the channel state information (CSI), which includes the frequencies and level of interference. The CSI is then used to design novel radar waveforms to enable coexistence. We have used Ettus USRP B210 and NI-USRP 2944R (70 MHz – 6 GHz) SDR. Baseband processing for 10 MHz, MIMO radar and MIMO communications is performed in CPU using Labview NXG 3.1 and GNU Radio 3.7 respectively. Our prototype incorporates the flexibility to update the radar waveform on-the-fly based on cognitive optimization under different constraints e.g., discrete phase. Our radar toolbox is capable of detecting target range, Doppler, angle of arrival. The MIMO communication implements an OFDM (IEEE 802.11p) Tx/Rx link with appropriate MIMO receiver processing in real-time and decodes layer-2 frames. Preliminary lab validation indicates our C-MRMC prototype achieves performance enhancements in both radar metrics (better detection at lower false alarm) and communication performance (lower synchronization failure and frame error rate) compared to non-adaptive radar transmission. Our C-MRMC prototype greatly expands the scope of the emerging signal processing research on joint sensing-communications to
multiple antenna systems, thereby fitting well with the theme and audience of ICASSP.

**Talk Only S&T-P8.3: USER TUNEABLE SOUND ZONES**

Lee, Taewoong, Aalborg University, Denmark
Shi, Liming, Aalborg University, Denmark
Nielsen, Jesper Kjær, Aalborg University, Denmark
Christensen, Mads Græsbøll, Aalborg University, Denmark

**Abstract:** Creating sound zones has been an active area of research since it was first introduced. Generally, this can be done either by maximizing an acoustic contrast that represents the acoustic potential energy ratio between the bright and dark zones or by minimizing a reproduction error between the desired and reproduced sound fields. However, the former suffers from severe distortion in the reproduced sound field, whereas the latter suffers from poor acoustic contrast. Recently, a flexible and general framework for sound zone control that is referred to as the variable span trade-off (VAST) filter has been proposed. The VAST framework allows the user to control the trade-off between the acoustic contrast and the signal distortion by adjusting user parameters. Unfortunately, the parameters are not physically meaningful and the user has to tune them for different source material and acoustic environment. In this demo, we demonstrate a precise and accurate control across the reproduced sound fields obtained by reformulating the problem using physically meaningful constraints, such as the signal distortion and the acoustic contrast. On top of this, we also demonstrate perceptually optimized sound zones by taking the characteristics of the input signals and of human auditory system into account (see https://youtu.be/msLp0Xeo0rk for more on the perceptually optimized sound zones). The demo consists in a MATLAB program (see https://youtu.be/SUyq8jBoQ?t=1568) which allows the user to select and specify one constraint from a list of physically meaningful constraints and listen to the resulting reproduced sound fields not only in the zones but at an arbitrary point on a plane in a room. To this end, one will experience and compare the results from different positions and constraints.

**Talk Only S&T-P8.4: IS YOUR HEARING AID ALGORITHM REALLY WORKING?**

Grimm, Giso, University of Oldenburg, Germany
Kayser, Hendrik, University of Oldenburg, Germany
Llorach, Gerard, Hörzentrum Oldenburg GmbH, Germany
Hohmann, Volker, Hörzentrum Oldenburg GmbH, Germany

**Abstract:** When developing new hearing aid algorithms, it is difficult to systematically evaluate their performance in realistic every-day life situations. Laboratory setups and computer simulations are usually limited to very controlled and simple acoustic situations. However, software solutions are
moving towards more realistic evaluation and simulation tools for hearing devices: The open Master Hearing Aid (openMHA) is a real-time low-latency software for simulation and development of hearing aid algorithms. TASCAR is an acoustic rendering engine specially designed for real-time interaction and dynamic sources for audiological purposes. The novelty of this work is the integration of the two open source tools, leading to a better analysis, understanding and evaluation of hearing aid algorithms in realistic situations. Two different demonstrations will be shown. In the first one, participants will be able to navigate through an audiovisual simulation of a street. The audiovisual scene contains dynamic sources such as vehicles and pedestrians, as well as conversations between four talkers. Participants will be able to select different hearing aid algorithms, which interact in real-time with the scene. Additionally, the SNR benefit of the hearing aid will be shown in real-time according to the head orientation and positioning in the scene. In the second demo, the Portable Hearing Lab (PHL) will be shown, a device for the evaluation of hearing aid algorithms in field experiments. This device runs openMHA on a portable processing hardware featuring behind-the-ear hearing aids. The PHL will also be available for participants to try. The demonstration will provide an outlook of tools and methodologies for testing hearing aids in controlled realistic audiovisual simulations and field experiments.
Talk Only S&T-P9.2: ADVISER: A TOOLKIT FOR DEVELOPING MULTIMODAL AND SOCIALLY-ENGAGED CONVERSATIONAL AGENTS

Li, Chia-Yu, University of Stuttgart, Germany Ortega, Daniel, University of Stuttgart, Germany Väth, Dirk, University of Stuttgart, Germany Lux, Florian, University of Stuttgart, Germany Vanderlyn, Lindsey, University of Stuttgart, Germany Schmidt, Maximilian, University of Stuttgart, Germany Neumann, Michael, University of Stuttgart, Germany Voelkel, Moritz, University of Stuttgart, Germany Denisov, Pavel, University of Stuttgart, Germany Jenne, Sabrina, University of Stuttgart, Germany Kacarevic, Zorica, University of Stuttgart, Germany Vu, Ngoc Thang, University of Stuttgart, Germany

Abstract: Dialog systems or chatbots, both text-based and multimodal, have received much attention in recent years, with an increasing number of dialog systems in both industrial contexts such as Amazon Alexa, Apple Siri, Microsoft Cortana, Google Duplex and XiaoIce, as well as academia such as MuMMER and Alana. However, open-source toolkits and frameworks for developing such systems are rare, especially for developing multimodal dialog systems comprised of speech, text and vision. Most of the existing toolkits are designed for developing systems focusing on core dialog components, with or without the option to access external speech processing services. To the best of our knowledge, there are only two toolkits MuMMER (Foster et al., 2016), and \psi (Bohus et al., 2017), which support multimodal processing and leverage social signals for conversational agents. Both provide a great platform for building dialog systems, however, the former is not open-source and the latter is based on the .NET platform, which could be less convenient for non-technical users such as linguists and cognitive scientists, who play an important role in dialog research. In this demonstration, we introduce ADVISER, a new option for building multimodal (speech, text, gaze and vision) dialog systems, which is open-source and Python based for easy usage and fast prototyping. The toolkit is designed in such a way that it is modular, flexible, transparent and user-friendly for both technically experienced and less technically experienced users. ADVISER focuses on task-oriented dialog systems that support users in fulfilling certain goals with a minimal number of dialog turns, while being friendly and likeable by considering social signals such as emotional states and engagement levels.

Talk Only S&T-P9.4: LEARNING TO TRANSFER MULTI-SPEAKER EMOTIONAL PROSODY TO A NEUTRAL SPEAKER
Abstract: Most recent emotional speech synthesizers have been studied with a large training data. These systems require a sufficient number of audios to be recorded with respect to different emotions for each speaker. Acquiring emotional speech is more expensive than acquiring neutral speech because it requires professional acting ability to express natural emotional utterance in the voice recording environment. Thus, it would be economical, beneficial to transfer decent emotional prosody to neutral voice. We demonstrate our system can learn to speak the emotional speech of multiple speakers from their emotional audios, and transfer emotional prosody to the voice of a speaker who provides only neutral speech. Our system is a neural network architecture that synthesizes speech directly from text and emotion and speaker identifiers. This architecture is mainly composed of two components: modified Tacotron 2 and original WaveGlow. Tacotron 2 is a recurrent sequence-to-sequence network that maps character embeddings to mel-spectrograms; WaveGlow is a vocoder to synthesize time-domain waveforms from those spectrograms. The modified Tacotron 2 has been trained to synthesize speech from text depending on emotions and speakers by modification of injecting emotion and speaker encoding into the decoder part of Tacotron 2. This allows the system to learn to synthesize not only emotional speech of speakers with emotional audios but also that of a speaker without emotional audios. In this demo, audience can interactively enter any sentence to the speech synthesis system. Additionally, speech synthesis markup language (SSML) has been incorporated to easily control prosody of spoken input text. With the provided SSML, audience can manipulate emotion and speaker as well as three basic components: rate, volume, and pitch for fine-tuning. These three components are controllable at the character-level. The positions of characters spoken in the mel-spectrogram are estimated from which characters are highly attended to generate each mel-spectrogram.
SAM-L1 - Direction of Arrival Estimation

SAM-L1.1: DOA ESTIMATION IN SYSTEMS WITH NONLINEARITIES FOR MMWAVE COMMUNICATIONS
Sant, Aditya, University of California, San Diego, United States Rao, Bhaskar D., University of California, San Diego, United States

SAM-L1.2: WIDEBAND DIRECTION OF ARRIVAL ESTIMATION WITH SPARSE LINEAR ARRAYS
Wang, Feiyu, Delft University of Technology, Netherlands Tian, Zhi, George Mason University, United States Fang, Jun, University of Electronic Science and Technology of China, China Leus, Geert, Delft University of Technology, Netherlands

SAM-L1.3: FOURTH ORDER CUMULANT BASED ACTIVE DIRECTION OF ARRIVAL ESTIMATION USING COPRIME ARRAYS
Fu, Zhe, University of Nantes, France Charge, Pascal, University of Nantes, France Wang, Yide, University of Nantes, France

SAM-L1.4: ON REGULARIZATION PARAMETER FOR L0-SPARSE COVARIANCE FITTING BASED DOA ESTIMATION
Delmer, Alice, Thales / ENS Paris-Saclay, France Ferreol, Anne, Thales / ENS Paris-Saclay, France Larzabal, Pascal, Universite Paris-Sud, France

SAM-L1.5: EFFECTIVE APPROXIMATE MAXIMUM LIKELIHOOD ESTIMATION OF ANGLES OF ARRIVAL FOR NON-COHERENT SUB-ARRAYS
Tirer, Tom, Tel Aviv University, Israel Bialer, Oded, General Motors, Israel

SAM-L1.6: TWO-DIMENSIONAL DOA ESTIMATION FOR COPRIME PLANAR ARRAY: A COARRAY TENSOR-BASED SOLUTION
Zheng, Hang, Zhejiang University, China Zhou, Chengwei, Zhejiang University, China Gu, Yujie, Temple University, China Shi, Zhiguo, Zhejiang University, China
SAM-L2 - MIMO Systems and MIMO Radar

**SAM-L2.1: MULTI-CONSTRAINT SPECTRAL CO-DESIGN FOR COLOCATED MIMO RADAR AND MIMO COMMUNICATIONS**

Dokhani, Sayed Hossein, University of Luxembourg, Luxembourg Shankar M. R., Bhavani, University of Luxembourg, Luxembourg Mishra, Kumar Vijay, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SAM-L2.2: TENSOR DECOMPOSITION-BASED BEAMSPACE ESPRIT ALGORITHM FOR MULTIDIMENSIONAL HARMONIC RETRIEVAL**

Wen, Fuxi, Chalmers University of Technology, Sweden So, Hing Cheung, City University of Hong Kong, Hong Kong SAR of China Wymeersch, Henk, Chalmers University of Technology, Sweden

**SAM-L2.3: INFORMATION THEORETIC APPROACH FOR WAVEFORM DESIGN IN COEXISTING MIMO RADAR AND MIMO COMMUNICATIONS**

Alaee-Kerahroodi, Mohammad, University of Luxembourg, Luxembourg Shankar M. R., Bhavani, University of Luxembourg, Luxembourg Mishra, Kumar Vijay, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SAM-L2.4: TRANSMIT BEAMPATTERN SHAPING VIA WAVEFORM DESIGN IN COGNITIVE MIMO RADAR**

Raei, Ehsan, University of Luxembourg, Luxembourg Alaee-Kerahroodi, Mohammad, University of Luxembourg, Luxembourg Shankar M. R., Bhavani, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SAM-L2.5: MULTILINEAR GENERALIZED SINGULAR VALUE DECOMPOSITION (ML-GSVD) WITH APPLICATION TO COORDINATED BEAMFORMING IN MULTI-USER MIMO SYSTEMS**

Khamidullina, Liana, Ilmenau University of Technology, Germany de Almeida, André L. F., Federal University of Ceará, Brazil Haardt, Martin, Ilmenau University of Technology, Germany
Thursday, 7 May, 09:00 - 11:00

SAM-L3 - Sparse Arrays and Sparse Sensing

**SAM-L3.1: SPARSE LOW-REDUNDANCY LINEAR ARRAY WITH UNIFORM SUM CO-ARRAY**

Rajamäki, Robin, Aalto University, Finland
Koivunen, Visa, Aalto University, Finland

**SAM-L3.2: COMPRESSED SENSING BASED CHANNEL ESTIMATION AND OPEN-LOOP TRAINING DESIGN FOR HYBRID ANALOG-DIGITAL MASSIVE MIMO SYSTEMS**

Ardah, Khaled, Communications Research Laboratory (CRL), Ilmenau University of Technology, Germany
Sokal, Bruno, Communications Research Laboratory (CRL), Ilmenau University of Technology, Germany
de Almeida, André L. F., Wireless Telecom Research Group (GTEL), Federal University of Ceará, Brazil
Haardt, Martin, Communications Research Laboratory (CRL), Ilmenau University of Technology, Germany

**SAM-L3.3: DISPERSIVE GRID-FREE ORTHOGONAL MATCHING PURSUIT FOR MODAL ESTIMATION IN OCEAN ACOUSTICS**

Paviet-Salomon, Thomas, ENSTA Bretagne/Lab-STICC (UMR 6285), France
Dorffer, Clément, ENSTA Bretagne/Lab-STICC (UMR 6285), France
Bonnel, Julien, Woods Hole Oceanographic Institution, United States
Nicolas, Barbara, CNRS/Creatis (UMR 5220), France
Chonavel, Thierry, IMT Atlantique/Lab-STICC (UMR 6285), France
Dremeau, Angélique, ENSTA Bretagne/Lab-STICC (UMR 6285), France

**SAM-L3.4: GREEDY SPARSE ARRAY DESIGN FOR OPTIMAL LOCALIZATION UNDER SPATIALLY PRIORITIZED SOURCE DISTRIBUTION**

Gershon, Yotam, Technion - Israel Institute of Technology, Israel
Buchris, Yaakov, Technion - Israel Institute of Technology, Israel
Cohen, Israel, Technion - Israel Institute of Technology, Israel

**SAM-L3.5: COMPRESSIVE 2-D OFF-GRID DOA ESTIMATION FOR PROPELLER CAVITATION LOCALIZATION**

Park, Yongsung, University of California, San Diego, United States
Gerstoft, Peter, University of California, San Diego, United States

**SAM-L3.6: THE COMPRESSED NESTED ARRAY FOR UNDERDETERMINED DOA ESTIMATION BY FOURTH-ORDER DIFFERENCE COARRAY**
Thursday, 7 May, 11:30 - 13:30

SAM-L4 - Learning Models and Methods for Multi-sensor Systems

SAM-L4.1: MODEL ORDER SELECTION IN DOA SCENARIOS VIA CROSS-ENTROPY BASED MACHINE LEARNING TECHNIQUES
Barthelme, Andreas, Technical University Munich, Germany Wiesmayr, Reinhard, Technical University Munich, Germany Utschick, Wolfgang, Technical University Munich, Germany

SAM-L4.2: UNSUPERVISED CHANGE DETECTION FOR MULTIMODAL REMOTE SENSING IMAGES VIA COUPLED DICTIONARY LEARNING AND SPARSE CODING
Ferraris, Vinicius, University of São Paulo, Brazil Dobigeon, Nicolas, University of Toulouse, France Cavalcanti, Yanna, University of Toulouse, France Oberlin, Thomas, University of Toulouse, France Chabert, Marie, University of Toulouse, France

SAM-L4.3: FAST DIRECTION-OF-ARRIVAL ESTIMATION OF MULTIPLE TARGETS USING DEEP LEARNING AND SPARSE ARRAYS
Papageorgiou, Georgios K., Heriot-Watt University, United Kingdom Sellathurai, Mathini, Heriot-Watt University, United Kingdom

SAM-L4.4: LEARNING BASED RECONFIGURABLE SUB-NYQUIST SAMPLING FRAMEWORK FOR ULTRA-WIDEBAND ANGULAR SENSING
Joshi, Himani, Indian Institute of Technology Delhi, India Alaee-Kerahroodi, Mohammad, University of Luxembourg, Luxembourg Kumar, Achanna A, TCS Innovations Lab, India Shankar M. R., Bhavani, University of Luxembourg, Luxembourg Darak, Sumit J, Indian Institute of Technology Delhi, India

SAM-L4.5: RAW WAVEFORM BASED END-TO-END DEEP CONVOLUTIONAL NETWORK FOR SPATIAL LOCALIZATION OF MULTIPLE ACOUSTIC SOURCES
Sundar, Harshavardhan, Amazon, Inc., United States Wang, Weiran, Salesforce Research, United States Sun, Ming, Amazon, Inc., United States Wang, Chao, Amazon, Inc., United States

SAM-L4.6: DNN-BASED MASK ESTIMATION INTEGRATING SPECTRAL AND SPATIAL FEATURES FOR ROBUST BEAMFORMING
Deng, Chengyun, Didi Chuxing, China Song, Hui, Didi Chuxing, China Zhang, Yi, Didi Chuxing, China Sha, Yongtao, Didi Chuxing, China Li, Xiangang, Didi Chuxing, China
Tuesday, 5 May, 11:30 - 13:30

SAM-P1 - Radar and Acoustic Array Processing

SAM-P1.1: DIRECTION OF ARRIVAL ESTIMATION FOR REVERBERANT SPEECH BASED ON ENHANCED DECOMPOSITION OF THE DIRECT SOUND
Madmoni, Lior, Ben-Gurion University of the Negev, Israel Rafaely, Boaz, Ben-Gurion University of the Negev, Israel

SAM-P1.2: RAY SEPARATION AND SOURCE DEPTH ESTIMATION BASED ON SOUND PRESSURE FIELD TRANSFORMATION
Wei, Runyu, Institute of Acoustics, Chinese Academy of Sciences, China Ma, Xiaochuan, Institute of Acoustics, Chinese Academy of Sciences, China Li, Xuan, Institute of Acoustics, Chinese Academy of Sciences, China

SAM-P1.3: REGULARIZED BEAMFORMER FOR THE SPHERICAL MICROPHONE ARRAY TO COPE WITH THE WHITE NOISE AMPLIFICATION
Wang, Lei, Idiap Research Institute, Switzerland Zhu, Jie, Shanghai Jiao Tong University, China

SAM-P1.4: INTERPOLATION AND RANGE EXTRAPOLATION OF SOUND SOURCE DIRECTIVITY BASED ON A SPHERICAL WAVE PROPAGATION MODEL
Ahrens, Jens, Chalmers University of Technology, Sweden Bilbao, Stefan, University of Edinburgh, United Kingdom

SAM-P1.5: POLARIZATION PARAMETERS ESTIMATION WITH SCALAR SENSOR ARRAYS
Dai, Minghui, Nanjing University of Science and Technology, China Ma, Xiaofeng, Nanjing University of Science and Technology, China Liu, Wei, University of Sheffield, United Kingdom Sheng, Weixing, Nanjing University of Science and Technology, China

SAM-P1.6: DNN-BASED DISTRIBUTED MULTICHANNEL MASK ESTIMATION FOR SPEECH ENHANCEMENT IN MICROPHONE ARRAYS
Furnon, Nicolas, Université de Lorraine, France Serizel, Romain, Université de Lorraine, France Illina, Irina, Université de Lorraine, France Essid, Slim, Télécom ParisTech, France

SAM-P1.7: ASYMPTOTICALLY OPTIMAL BLIND CALIBRATION OF ACOUSTIC VECTOR SENSOR UNIFORM LINEAR ARRAYS
Weiss, Amir, Weizmann Institute of Science, Israel Nadler, Boaz, Weizmann Institute of Science, Israel Yeredor, Arie, Tel Aviv University, Israel

**SAM-P1.8: OPTIMIZED SENSOR SELECTION FOR JOINT RADAR-COMMUNICATION SYSTEMS**

Ahmed, Ammar, Temple University, United States Zhang, Shuimei, Temple University, United States Zhang, Yimin D., Temple University, United States

**SAM-P1.9: FREQUENCY DIVERSE ARRAY RADAR: A CLOSED-FORM SOLUTION TO DESIGN WEIGHTS FOR DESIRED BEAMPATTERN**

Zubair, Muhammad, Information Technology University Lahore, Pakistan Ahmed, Sajid, Information Technology University Lahore, Pakistan Alouini, Mohamed-Slim, King Abdullah University of Science and Technology (KAUST), United Kingdom

**SAM-P1.10: ROBUST CFAR RADAR DETECTION USING A K-NEAREST NEIGHBORS RULE**

Coluccia, Angelo, University of Salento, Italy Fascista, Alessio, University of Salento, Italy Ricci, Giuseppe, University of Salento, Italy

**SAM-P1.11: CRAMER-RAO BOUND ON DOA ESTIMATION OF FINITE BANDWIDTH SIGNALS USING A MOVING SENSOR**

Arora, Aakash, University of Luxembourg, Luxembourg Mysore R, Bhavani Shankar, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SAM-P1.12: THEORETICAL ANALYSIS OF MULTI-CARRIER AGILE PHASED ARRAY RADAR**

Huang, Tianyao, Tsinghua University, China Shlezinger, Nir, Weizmann Institute of Science, Israel Xu, Xingyu, Tsinghua University, China Ma, Dingyou, Tsinghua University, China Liu, Yimin, Tsinghua University, China Eldar, Yonina, Weizmann Institute of Science, Israel
Tuesday, 5 May, 11:30 - 13:30

SAM-P2 - Beamforming, Relaying and Source Separation

SAM-P2.1: CONVOLUTIONAL BEAMSPACE FOR ARRAY SIGNAL PROCESSING

Vaidyanathan, P. P., California Institute of Technology, United States
Chen, Po-Chih, California Institute of Technology, United States

SAM-P2.2: EFFICIENT ESTIMATION OF MIXING MATRIX USING A TWO-SENSOR ARRAY

Yan, Qinmengying, Wuhan University, China
Sun, Siyu, Wuhan University, China
Zhang, Haijian, Wuhan University, China
Hua, Guang, Wuhan University, China

SAM-P2.3: RIEMANNIAN GEOMETRY AND CRAMÉR-RAO BOUND FOR BLIND SEPARATION OF GAUSSIAN SOURCES

Bouchard, Florent, Univ. Savoie Mont Blanc, France
Breloy, Arnaud, Univ. Paris Nanterre, France
Renaux, Alexandre, Univ. Paris Sud, France
Ginolhac, Guillaume, Univ. Savoie Mont Blanc, France

SAM-P2.4: BEAMFORMED FEATURE FOR LEARNING-BASED DUAL-CHANNEL SPEECH SEPARATION

Li, Hao, Inner Mongolia University, China
Zhang, Xueliang, Inner Mongolia University, China
Gao, Guanglai, Inner Mongolia University, China

SAM-P2.5: TRANSMIT BEAMFORMING DESIGN WITH RECEIVED-INTERFERENCE POWER CONSTRAINTS: THE ZERO-FORCING RELAXATION

Lagunas, Eva, University of Luxembourg, Luxembourg
Pérez-Neira, Ana Isabel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
Lagunas, Miguel Angel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
Vázquez, Miguel Ángel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain

SAM-P2.6: FOREGROUND SIGNATURE EXTRACTION FOR AN INTIMATE MIXING MODEL IN HYPERSPECTRAL IMAGE CLASSIFICATION

Hollis, Jarrod, Oregon State University, United States
Raich, Raviv, Oregon State University, United States
Kim, Jinsub, Oregon State University, United States
Fishbain, Barak, Technion - Israel Institute of Technology, Israel
Kendler, Shai, Technion - Israel Institute of Technology, Israel

SAM-P2.7: PIXEL-WISE LINEAR/NONLINEAR NONNEGATIVE MATRIX FACTORIZATION FOR UNMIXING OF HYPERSPECTRAL DATA
Zhu, Fei, Tianjin University, China Honeine, Paul, Universite de Rouen Normandie, France Chen, Jie, Northwestern Polytechnical University, China

**SAM-P2.8: BEAM ELIMINATION BASED ON SEQUENTIALLY ESTIMATED A POSTERIORI PROBABILITIES OF WINNING**

Khalili Marandi, Mostafa, Technische Universität Dresden, Germany Rave, Wolfgang, Technische Universität Dresden, Germany Fettweis, Gerhard, Technische Universität Dresden, Germany

**SAM-P2.9: TWO-ELEMENT BIOMIMETIC ANTENNA ARRAY DESIGN AND PERFORMANCE**

Kozick, Richard, Bucknell University, United States Dagefu, Fikadu, U.S. Army Research Laboratory, United States Sadler, Brian, U.S. Army Research Laboratory, United States

**SAM-P2.10: DISTRIBUTED EQUALIZATION AND POWER ALLOCATION FOR MULTI-CARRIER BIDIRECTIONAL FILTER-AND-FORWARD RELAY NETWORKS**

KianiHarchegani, Sharareh, University of Ontario Institute of Technology, Canada ShahbazPanahi, Shahram, University of Ontario Institute of Technology, Canada Dong, Min, University of Ontario Institute of Technology, Canada Boudreau, Gary, Ericsson Canada, Canada

**SAM-P2.11: UPSCALING VECTOR APPROXIMATE MESSAGE PASSING**

Skuratovs, Nikolajs, University of Edinburgh, United Kingdom Davies, Michael, University of Edinburgh, United Kingdom
Wednesday, 6 May, 11:30 - 13:30

SAM-P3 - Sparsity, Super-Resolution and Imaging

**SAM-P3.1: ATOMIC NORM BASED LOCALIZATION OF FAR-FIELD AND NEAR-FIELD SIGNALS WITH GENERALIZED SYMMETRIC ARRAYS**
Wu, Xiaohuan, Nanjing University of Posts and Telecommunications, China Zhu, Wei-Ping, Concordia University, Canada Yan, Jun, Nanjing University of Posts and Telecommunications, China

**SAM-P3.2: A NOVEL MOVING SPARSE ARRAY GEOMETRY WITH INCREASED DEGREES OF FREEDOM**
Li, Shuang, Chongqing University of Technology, China Zhang, Xiao-Ping, Ryerson University, Canada

**SAM-P3.3: CLUTTER IDENTIFICATION BASED ON SPARSE RECOVERY AND L1-TYPE PROBABILISTIC DISTANCE MEASURES**
Zhu, Yuansheng, University of Pittsburgh, United States Xiang, Yijian, Washington University in St. Louis, United States Sen, Satyabrata, Oak Ridge National Laboratory, United States Dagois, Elise, University of Pittsburgh, United States Nehorai, Aray, Washington University in St. Louis, United States Akcakaya, Murat, University of Pittsburgh, United States

**SAM-P3.4: ADAPTIVE SUBSPACE DETECTORS FOR OFF-GRID MISMATCHED TARGETS**
Bosse, Jonathan, ONERA, France Rabaste, Olivier, ONERA, France Ovarlez, Jean-Philippe, ONERA, France

**SAM-P3.5: A METHOD FOR MILLIMETER-WAVE IMAGING OF CONCEALED OBJECTS VIA DE-ALIASING**
Wang, Weiwei, Xidian University, China Yang, Kehu, Xidian University, China

**SAM-P3.6: A FAST SPARSE COVARIANCE-BASED FITTING METHOD FOR DOA ESTIMATION VIA NON-NEGATIVE LEAST SQUARES**
Zheng, Chundi, Foshan University, China Chen, Huihui, Foshan University, China Wang, Aiguo, Foshan University, China

**SAM-P3.7: EXTENDED CYCLIC COORDINATE DESCENT FOR ROBUST ROW-SPARSE SIGNAL RECONSTRUCTION IN THE PRESENCE OF OUTLIERS**
Huang, Huiping, Technische Universität Darmstadt, Germany So, Hing Cheung, City University of Hong Kong, Hong Kong SAR of China Zoubir, Abdelhak M., Technische Universität Darmstadt, Germany
SAM-P3.8: LOW-RANK TOEPLITZ MATRIX ESTIMATION VIA RANDOM ULTRA-SPARSE RULERS

Lawrence, Hannah, Flatiron Institute, United States Li, Jerry, Microsoft Research, United States Musco, Cameron, University of Massachusetts, Amherst, United States Musco, Christopher, NYU Tandon School of Engineering, United States

SAM-P3.9: URTIS: A SMALL 3D IMAGING SONAR SENSOR FOR ROBOTIC APPLICATIONS

Verellen, Thomas, University of Antwerp, Belgium Kerstens, Robin, University of Antwerp, Belgium Laurijssen, Dennis, University of Antwerp, Belgium Steckel, Jan, University of Antwerp, Belgium

SAM-P3.10: A PARTIAL RELAXATION DOA ESTIMATOR BASED ON ORTHOGONAL MATCHING PURSUIT

Trinh-Hoang, Minh, Technische Universität Darmstadt, Germany Ma, Wing-Kin, Chinese University of Hong Kong, Hong Kong SAR of China Pesavento, Marius, Technische Universität Darmstadt, Germany

SAM-P3.11: VARIABLE PROJECTION FOR MULTIPLE FREQUENCY ESTIMATION

Garcia Guzman, Yuneisy E., Johannes Kepler University Linz, Austria Kovács, Péter, Johannes Kepler University Linz, Austria Huemer, Mario, Johannes Kepler University Linz, Austria

SAM-P3.12: FUSIONNDVI: A NOVEL FUSION METHOD FOR NDVI IN REMOTE SENSING

Zhang, Mengliang, Wuhan University, China Zhao, Ziping, Hong Kong University of Science and Technology, Hong Kong SAR of China Chen, Yuerong, Wuhan University, China Wang, Zhongyuan, Wuhan University, China Tian, Xin, Wuhan University, China
### SAM-P4 - Robustness, Decompositions, Calibration and Bounds

**SAM-P4.1: ROBUST MUSIC ESTIMATION UNDER ARRAY RESPONSE UNCERTAINTY**

Bazzi, Ahmad, CEVA, France Slock, Dirk, EURECOM, France

**SAM-P4.2: L1-NORM HIGHER-ORDER ORTHOGONAL ITERATIONS FOR ROBUST TENSOR ANALYSIS**

Chachlakis, Dimitris, Rochester Institute of Technology, United States Prater-Bennette, Ashley, AFRL, United States Markopoulos, Panos, Rochester Institute of Technology, United States

**SAM-P4.3: SENSOR SELECTION FOR MODEL-FREE SOURCE LOCALIZATION: WHERE LESS IS MORE**

Tohidi, Ehsan, EURECOM, France Chen, Junting, Chinese University of Hong Kong, China Gesbert, David, EURECOM, France

**SAM-P4.4: ANOMALY DETECTION WITH TRAINING DATA IN HYPERSPECTRAL IMAGERY**

Liu, Jun, University of Science and Technology of China, China Feng, Yutong, University of Science and Technology of China, China Liu, Weijian, Wuhan Electronic Information Institute, China Orlando, Danilo, Università degli Studi “Niccolò Cusano”, Italy Li, Hongbin, Stevens Institute of Technology, United States

**SAM-P4.5: LEAST-SQUARES DOA ESTIMATION WITH AN INFORMED PHASE UNWRAPPING AND FULL BANDWIDTH ROBUSTNESS**

Bohlender, Alexander, Ghent University - imec, Belgium Spriet, Ann, NXP Semiconductors, Belgium Tirry, Wouter, NXP Semiconductors, Belgium Madhu, Nilesh, Ghent University - imec, Belgium

**SAM-P4.6: AN ADMM-BASED APPROACH TO ROBUST ARRAY PATTERN SYNTHESIS**

Yang, Jintai, University of Electronic Science and Technology of China, China Lin, Jingran, University of Electronic Science and Technology of China, China Shi, Qingjiang, Tongji University, China Li, Qiang, University of Electronic Science and Technology of China, China

**SAM-P4.7: ERROR PRESERVING CORRECTION: A METHOD FOR CP DECOMPOSITION AT A TARGET ERROR BOUND**
Phan, Anh-Huy, Skolkovo Institute of Science and Technology (Skoltech), Russia
Tichavsky, Petr, Czech Academy of Sciences, Czech Republic
Cichocki, Andrzej, Skolkovo Institute of Science and Technology (Skoltech), Russia

**SAM-P4.8: JOINT BLIND CALIBRATION AND TIME-DELAY ESTIMATION FOR MULTIBAND RANGING**
Kazaz, Tarik, Delft University of Technology, Netherlands
Coutino, Mario, Delft University of Technology, Netherlands
Janssen, Gerard, Delft University of Technology, Netherlands
van der Veen, Alle-Jan, Delft University of Technology, Netherlands

**SAM-P4.9: UPGRADE METHODS FOR STRATIFIED SENSOR NETWORK SELF-CALIBRATION**
Larsson, Martin, Lund University, Sweden
Flood, Gabrielle, Lund University, Sweden
Oskarsson, Magnus, Lund University, Sweden
Åström, Karl, Lund University, Sweden

**SAM-P4.10: AUDIO-VISUAL CALIBRATION WITH POLYNOMIAL REGRESSION FOR 2-D PROJECTION USING SVD-PHAT**
Grondin, Francois, Massachusetts Institute of Technology, United States
Tang, Hao, Massachusetts Institute of Technology, United States
Glass, James, Massachusetts Institute of Technology, United States

**SAM-P4.11: WEIGHTED NULL VECTOR INITIALIZATION AND ITS APPLICATION TO PHASE RETRIEVAL**
Liu, Kaihui, Dongguan University of Technology, China
Li, Lingling, Shanghai Jiao Tong University, China
Wan, Liangtian, Dalian University of Technology, China
**SAM-P5 - Localisation and Tracking**

**SAM-P5.2: NON-ITERATIVE SUBSPACE-BASED DOA ESTIMATION IN THE PRESENCE OF NONUNIFORM NOISE**
Esfandiari, Majdoddin, Aalto University, Finland
Vorobyov, Sergiy A., Aalto University, Finland
Alibani, Simin, Shiraz University, Iran
Karimi, Mahmood, Shiraz University, Iran

**SAM-P5.3: LOW-COMPLEXITY ACCURATE MMWAVE POSITIONING FOR SINGLE-ANTENNA USERS BASED ON ANGLE-OF-DEPARTURE AND ADAPTIVE BEAMFORMING**
Fascista, Alessio, University of Salento, Italy
Coluccia, Angelo, University of Salento, Italy
Wymeersch, Henk, Chalmers University, Sweden
Seco-Granados, Gonzalo, Universitat Autonoma de Barcelona, Spain

**SAM-P5.4: ACCURATE LOCALIZATION OF AUV IN MOTION BY EXPLICIT SOLUTION USING TIME DELAYS**
Jia, Tianyi, Northwestern Polytechnical University, China
Ho, K. C., University of Missouri, United States
Wang, Haiyan, Northwestern Polytechnical University, China
Shen, Xiaohong, Northwestern Polytechnical University, China

**SAM-P5.5: DRSS-BASED LOCALISATION USING WEIGHTED INSTRUMENTAL VARIABLES AND SELECTIVE POWER MEASUREMENT**
Li, Jun, University of South Australia, Australia
Dogancay, Kutluyil, University of South Australia, Australia
Nguyen, Ngoc Hung, University of South Australia, Australia
Law, Yee Wei, University of South Australia, Australia

**SAM-P5.6: A SIMPLE AND EFFICIENT ITERATIVE METHOD FOR TOA LOCALIZATION**
Zou, Yanbin, Shantou University, China
Liu, Huaping, Oregon State University, United States

**SAM-P5.7: DISTRIBUTED TRACKING AND CIRCUMNAVIGATION USING BEARING MEASUREMENTS**
Parayil, Anjaly, U.S. Army Research Laboratory, United States
Georges, Jemin, U.S. Army Research Laboratory, United States

**SAM-P5.8: JOINT MULTITARGET TRACKING AND DYNAMIC NETWORK LOCALIZATION IN THE UNDERWATER DOMAIN**
Mendrzik, Rico, Hamburg University of Technology, Germany Brambilla, Mattia, Politecnico di Milano, Italy Allmann, Clemens, Fraunhofer FKIE, Germany Nicoli, Monica, Politecnico di Milano, Italy Koch, Wolfgang, Fraunhofer FKIE, Germany Bauch, Gerhard, Hamburg University of Technology, Germany LePage, Kevin, NATO STO Centre for Maritime Research and Experimentation, Italy Braca, Paolo, NATO STO Centre for Maritime Research and Experimentation, Italy

**SAM-P5.9: ROBUST TDOA INDOOR TRACKING USING CONSTRAINED MEASUREMENT FILTERING AND GRID-BASED FILTERING**

Huang, Rui, Southeast University, China Tao, Jun, Southeast University, China Yang, Le, University of Canterbury, New Zealand Xue, Yanbo, Kanzhun Technology, China Wu, Qisong, Southeast University, China

**SAM-P5.10: EXTENDED OBJECT TRACKING USING HIERARCHICAL TRUNCATION MEASUREMENT MODEL WITH AUTOMOTIVE RADAR**

Xia, Yuxuan, Chalmers University of Technology, Sweden Wang, Pu, Mitsubishi Electric Research Laboratories (MERL), United States Berntorp, Karl, Mitsubishi Electric Research Laboratories (MERL), United States Koike-Akino, Toshiaki, Mitsubishi Electric Research Laboratories (MERL), United States Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States Pajovic, Milutin, Mitsubishi Electric Research Laboratories (MERL), United States Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States Orlik, Philip V., Mitsubishi Electric Research Laboratories (MERL), United States

**SAM-P5.11: DOA TRACKING VIA SIGNAL-SUBSPACE PROJECTOR UPDATE**

Zhuang, Jie, University of Electronic Science and Technology of China, China Tan, Tianhan, University of Electronic Science and Technology of China, China Chen, Daolin, University of Electronic Science and Technology of China, China Kang, Jiancheng, University of Electronic Science and Technology of China, China
Friday, 8 May, 08:00 - 10:00

SAM-P6 - Detection, Estimation and Classification

**SAM-P6.1: BLIND DETERMINATION OF THE NUMBER OF SOURCES USING DISTANCE CORRELATION**

Weiss, Amir, Tel Aviv University, Israel
Yeredor, Arie, Tel Aviv University, Israel

**SAM-P6.2: PARAMETER ESTIMATION OF IN-CITY FRONTAL RAINFALL PROPAGATION**

Hadar, Mor, Tel Aviv University, Israel
Ostrometzky, Jonatan, Columbia University, United States
Messer, Hagit, Tel Aviv University, Israel

**SAM-P6.3: ML AND EM ESTIMATION OF SAMPLING INTERVALS OF SENSOR DEVICES**

Nishimura, Ryouichi, National Institute of Information and Communications Technology (NICT), Japan
Suzuki, Yôiti, National Institute of Information and Communications Technology (NICT), Japan

**SAM-P6.4: ASYMPTOTIC STOCHASTIC ANALYSIS OF PARTIALLY RELAXED DML**

Schenck, David, Technische Universität Darmstadt, Germany
Mestre, Xavier, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
Pesavento, Marius, Technische Universität Darmstadt, Germany

**SAM-P6.5: THEORETICAL PERFORMANCE BOUND OF UPLINK CHANNEL ESTIMATION ACCURACY IN MASSIVE MIMO**

Osinsky, Alexander, Skolkovo Institute of Science and Technology (Skoltech), Russia
Ivanov, Andrey, Skolkovo Institute of Science and Technology (Skoltech), Russia
Yarotsky, Dmitry, Skolkovo Institute of Science and Technology (Skoltech), Russia

**SAM-P6.6: SIGNAL-AWARE BROADBAND DOA ESTIMATION USING ATTENTION MECHANISMS**

Mack, Wolfgang, University Erlangen-Nuremberg, Germany
Bharadwaj, Ullas, Fraunhofer, Germany
Chakrabarty, Soumitro, Fraunhofer, Germany
Habets, Emanuël A. P., University Erlangen-Nuremberg, Germany

**SAM-P6.7: STATIC VISUAL SPATIAL PRIORS FOR DOA ESTIMATION**

Swietojanski, Pawel, University of New South Wales, Australia
Miksik, Ondrej, Microsoft, Switzerland

**SAM-P6.8: MIRRORED ARRAYS FOR DIRECTION-OF-ARRIVAL ESTIMATION**
Zhu, Dong, Tsinghua University, China Li, Gang, Tsinghua University, China Zhang, Xiao-Ping, Ryerson University, Canada

**SAM-P6.9: TIME DIFFERENCE OF ARRIVAL ESTIMATION FROM FREQUENCY-SLIDING GENERALIZED CROSS-CORRELATIONS USING CONVOLUTIONAL NEURAL NETWORKS**

Comanducci, Luca, Politecnico di Milano, Italy Cobos, Maximo, Universitat de València, Spain Antonacci, Fabio, Politecnico di Milano, Italy Sarti, Augusto, Politecnico di Milano, Italy

**SAM-P6.10: GROUP-UTILITY METRIC FOR EFFICIENT SENSOR SELECTION AND REMOVAL IN LCMV BEAMFORMERS**

Mundanad Narayanan, Abhijith, Katholieke Universiteit Leuven, Belgium Bertrand, Alexander, Katholieke Universiteit Leuven, Belgium

**SAM-P6.11: ACCURATE SEMIDEFINITE RELAXATION METHOD FOR 3-D RIGID BODY LOCALIZATION USING AOA**

Wang, Gang, Ningbo University, China Ho, K. C., University of Missouri, United States

**SAM-P6.12: CRAMÉR-RAO BOUNDS FOR FLAW LOCALIZATION IN SUBSAMPLED MULTISTATIC MULTICHANNEL ULTRASOUND NDT DATA**

Peréz, Eduardo, Technische Universität Ilmenau, Germany Kirchhof, Jan, Fraunhofer Institute for Nondestructive Testing IZFP, Germany Semper, Sebastian, Technische Universität Ilmenau, Germany Krieg, Fabian, Fraunhofer Institute for Nondestructive Testing IZFP, Germany Römer, Florian, Fraunhofer Institute for Nondestructive Testing IZFP, Germany
IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP 2020

Signal Processing for Communications and Networking

Wednesday, 6 May, 16:30 - 18:30

SPCOM-L1 - Networks and Resource Allocation

SPCOM-L1.1: AGE OF INFORMATION WITH FINITE HORIZON AND PARTIAL UPDATES
Ramirez, David, Princeton University, United States Erkip, Elza, New York University, United States Poor, H. Vincent, Princeton University, United States

SPCOM-L1.2: ROBUST ONLINE MIRROR SADDLE-POINT METHOD FOR CONSTRAINED RESOURCE ALLOCATION
Tampubolon, Ezra, Technische Universität München, Germany Boche, Holger, Technische Universität München, Germany

SPCOM-L1.3: REAL-TIME TASK OFFLOADING FOR LARGE-SCALE MOBILE EDGE COMPUTING
Xu, Yizhen, University of Sydney, Australia Cheng, Peng, University of Sydney, Australia Chen, Zhuo, Csiro, Australia Ding, Ming, Csiro, Australia Li, Yonghui, University of Sydney, Australia Vucetic, Branka, University of Sydney, Australia

SPCOM-L1.4: SIMPLE CACHING SCHEMES FOR NON-HOMOGENEOUS MISO CACHE-AIDED COMMUNICATION VIA CONVEXITY
Bergel, Itsik, Bar-Ilan University, Israel Mohajer, Soheil, University of Minnesota, United States

SPCOM-L1.5: DYNAMIC RESOURCE OPTIMIZATION AND ALTITUDE SELECTION IN UAV-BASED MULTI-ACCESS EDGE COMPUTING
Costanzo, Francesca, Sapienza University of Rome, Italy Di Lorenzo, Paolo, Sapienza University of Rome, Italy Barbarossa, Sergio, Sapienza University of Rome, Italy

SPCOM-L1.6: JOINT RESOURCE ALLOCATION AND ROUTING FOR SERVICE FUNCTION CHAINING WITH IN-SUBNETWORK PROCESSING
Reyhanian, Navid, University of Minnesota, United States Farmanbar, Hamid, Huawei, Canada Mohajer, Soheil, University of Minnesota, United States Luo,
Zhi-Quan, Shenzhen Research Institute of Big Data, Chinese University of Hong Kong, Shenzhen, China
SPCOM-L2 - Channel Estimation

SPCOM-L2.1: ONLINE CHANNEL ESTIMATION FOR HYBRID BEAMFORMING ARCHITECTURES

Fink, Jochen, Fraunhofer Heinrich Hertz Institute, Germany Cavalcante, Renato L. G., Fraunhofer Heinrich Hertz Institute, Germany Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute, Germany

SPCOM-L2.2: AN OPTIMAL CHANNEL ESTIMATION SCHEME FOR INTELLIGENT REFLECTING SURFACES BASED ON A MINIMUM VARIANCE UNBIASED ESTIMATOR

Jensen, Tobias Lindstrøm, Aalborg University, Denmark De Carvalho, Elisabeth, Aalborg University, Denmark

SPCOM-L2.3: LOW-RANK MMWAVE MIMO CHANNEL ESTIMATION IN ONE-BIT RECEIVERS

Myers, Nitin Jonathan, University of Texas at Austin, United States Tran, Kayla N., University of Texas at Austin, United States Heath Jr., Robert W., University of Texas at Austin, United States

SPCOM-L2.4: CHANNEL CHARTING: AN EUCLIDEAN DISTANCE MATRIX COMPLETION PERSPECTIVE

Agostini, Patrick, Fraunhofer Heinrich Hertz Institute, Germany Utkovski, Zoran, Fraunhofer Heinrich Hertz Institute, Germany Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute, Germany

SPCOM-L2.5: MMSE-BASED CHANNEL ESTIMATION FOR HYBRID BEAMFORMING MASSIVE MIMO WITH CORRELATED CHANNELS

Mirzaei, Javad, University of Toronto, Canada Sohrabi, Foad, University of Toronto, Canada Adve, Raviraj, University of Toronto, Canada ShahbazPanahi, Shahram, Ontario Tech University, Canada
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<td>Q-LEARNING BASED PREDICTIVE RELAY SELECTION FOR OPTIMAL RELAY BEAMFORMING</td>
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<td>PEER TO PEER OFFLOADING WITH DELAYED FEEDBACK: AN ADVERSARY BANDIT APPROACH</td>
<td>Yang, Miao, ShanghaiTech University, China Zhu, Hongbin, ShanghaiTech University, China Wang, Haifeng, Shanghai Institute of Microsystem and Information Technology, China Koucheryavy, Yevgeni, Tampere University, Finland Samouylov, Konstantin, Peoples’ Friendship University of Russia, Russia Qian, Hua, Shanghai Advanced Research Institute, Chinese Academy of Sciences, China</td>
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<td>SPCOM-P1.5</td>
<td>TRANSFERABLE POLICIES FOR LARGE SCALE WIRELESS NETWORKS WITH GRAPH NEURAL NETWORKS</td>
<td>Eisen, Mark, Intel Corporation, United States Ribeiro, Alejandro, University of Pennsylvania, United States</td>
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<td>SPCOM-P1.6</td>
<td>A ZEROTH-ORDER LEARNING ALGORITHM FOR ERGODIC OPTIMIZATION OF WIRELESS SYSTEMS WITH NO MODELS AND NO GRADIENTS</td>
<td>Kalogerias, Dionysios, University of Pennsylvania, United States Eisen, Mark, Intel Corporation, United States Pappas, George, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States</td>
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SPCOM-P1.7: JOINT SPARSE RECOVERY USING DEEP UNFOLDING WITH APPLICATION TO MASSIVE RANDOM ACCESS
Sabulal, Anand P., Indian Institute of Technology Madras, India Bhashyam, Srikrishna, Indian Institute of Technology Madras, India

SPCOM-P1.8: LEARNING-BASED CONTENT CACHING AND USER CLUSTERING: A DEEP DETERMINISTIC POLICY GRADIENT APPROACH
Chan, Kun-Lin, National Chiao Tung University, Taiwan Chien, Feng-Tsun, National Chiao Tung University, Taiwan

SPCOM-P1.9: LEARNING-AIDED CONTENT PLACEMENT IN CACHING-ENABLED FOG COMPUTING SYSTEMS USING THOMPSON SAMPLING
Zhu, Junge, ShanghaiTech University, China Huang, Xi, ShanghaiTech University, China Shao, Ziyu, ShanghaiTech University, China

SPCOM-P1.10: JOINT CODING AND MODULATION IN THE ULTRA-SHORT BLOCKLENGTH REGIME FOR BERNOLLI-GAUSSIAN IMPULSIVE NOISE CHANNELS USING AUTOENCODERS
Vedula, Kirty, Worcester Polytechnic Institute, United States Paffenroth, Randy, Worcester Polytechnic Institute, United States Brown III, D. Richard, Worcester Polytechnic Institute, United States

SPCOM-P1.11: DEEP JOINT SOURCE-CHANNEL CODING FOR WIRELESS IMAGE RETRIEVAL
Jankowski, Mikolaj, Imperial College London, United Kingdom Gündüz, Deniz, Imperial College London, United Kingdom Mikolajczyk, Krystian, Imperial College London, United Kingdom

SPCOM-P1.12: META-LEARNING TO COMMUNICATE: FAST END-TO-END TRAINING FOR FADING CHANNELS
Park, Sangwoo, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Simeone, Osvaldo, King’s College London, Italy Kang, Joonhyuk, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)
**Thursday, 7 May, 09:00 - 11:00**

**SPCOM-P2 - Modulation, Detection and Decoding**

**SPCOM-P2.1: COMPLEXITY REDUCTION METHODS FOR INDEX MODULATION BASED DUAL-FUNCTION RADAR COMMUNICATION SYSTEMS**

Huang, Tianyao, Tsinghua University, China
Shlezinger, Nir, Weizmann Institute of Science, Israel
Xu, Xingyu, Tsinghua University, China
Liu, Yimin, Tsinghua University, China
Eldar, Yonina, Weizmann Institute of Science, Israel

**SPCOM-P2.2: EQUALIZATION OF OFDM WAVEFORMS WITH INSUFFICIENT CYCLIC PREFIX**

Gregoratti, David, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
Mestre, Xavier, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain

**SPCOM-P2.3: FASTER-THAN-NYQUIST SIGNALING VIA SPATIOTEMPORAL SYMBOL-LEVEL PRECODING FOR MULTI-USER MISO REDUNDANT TRANSMISSIONS**

Alves Martins, Wallace, University of Luxembourg & Federal University of Rio de Janeiro, Luxembourg
Spano, Danilo, University of Luxembourg, Luxembourg
Chatzinotas, Symeon, University of Luxembourg, Luxembourg
Ottersten, Björn, University of Luxembourg, Luxembourg

**SPCOM-P2.4: OPTIMIZED SINGLE CARRIER TRANSCEIVER FOR FUTURE SUB-TERAHERTZ APPLICATIONS**

Bicaïs, Simon, CEA Leti, Minatec Campus, France
Doré, Jean-Baptiste, CEA Leti, Minatec Campus, France
Gougeon, Grégory, Siradel, France
Corre, Yoann, Siradel, France

**SPCOM-P2.5: POWER SPECTRUM OPTIMIZATION FOR CAPACITY OF THE EXTENDED SPECTRUM HYBRID FIBER COAX NETWORK**

Strobel, Rainer, Intel, Germany
Hewavithana, Thushara, Intel, Germany

**SPCOM-P2.6: A LOW-LATENCY SUCCESSIVE CANCELLATION HYBRID DECODER FOR CONVOLUTIONAL POLAR CODES**

Wang, Yu, National University of Defense Technology, China
Qiu, Shikai, National University of Defense Technology, China
Chen, Lirui, National University of Defense Technology, China
Wang, Qinglin, National University of Defense Technology, China
Zhang, Yang, National University of Defense Technology, China
IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP 2020

Technology, China Liu, Cang, National University of Defense Technology, China Xing, Zuocheng, National University of Defense Technology, China

**SPCOM-P2.7: NEAR CAPACITY RCQD CONSTELLATIONS FOR PAPR REDUCTION OF OFDM SYSTEMS**

Arbi, Tarak, ENSTA Paris, France Nasr, Imen, SUP’COM, Tunisia Geller, Benoit, ENSTA Paris, France

**SPCOM-P2.8: FULLY PIPELINED ITERATION UNROLLED DECODERS THE ROAD TO TB/S TURBO DECODING**

Weithoffer, Stefan, IMT Atlantique, France Klaimi, Rami, IMT Atlantique, France Abdel Nour, Charbel, IMT Atlantique, France Wehn, Norbert, Technical University of Kaiserslautern, Germany Douillard, Catherine, IMT Atlantique, France

**SPCOM-P2.9: ZERO-CROSSING PRECODING WITH MAXIMUM DISTANCE TO THE DECISION THRESHOLD FOR CHANNELS WITH 1-BIT QUANTIZATION AND OVERSAMPLING**

V. Melo, Diana M., Pontifical Catholic University of Rio de Janeiro, Brazil Landau, Lukas T. N., Pontifical Catholic University of Rio de Janeiro, Brazil de Lamare, Rodrigo C., Pontifical Catholic University of Rio de Janeiro, Brazil

**SPCOM-P2.10: ACHIEVING FULLY-DIGITAL PERFORMANCE BY HYBRID ANALOG/DIGITAL BEAMFORMING IN WIDE-BAND MASSIVE-MIMO SYSTEMS**

Morsali, Alireza, McGill University, Canada Champagne, Benoit, McGill University, Canada

**SPCOM-P2.11: ENERGY-EFFICIENT BIT ALLOCATION FOR RESOLUTION-ADAPTIVE ADC IN MULTIUSER LARGE-SCALE MIMO SYSTEMS: GLOBAL OPTIMALITY**

Nguyen, Kien-Giang, University of Oulu, Finland Vu, Quang-Doanh, University of Oulu, Finland Tran, Le-Nam, University College Dublin, Ireland Juntti, Markku, University of Oulu, Finland

**SPCOM-P2.12: GENERALIZED SPATIAL MODULATION FOR WIRELESS TERABITS SYSTEMS UNDER SUB-THZ CHANNEL WITH RF IMPAIRMENTS**

Saad, Majed, IETR-CentraleSupélec, France Bader, Faouzi, IETR-CentraleSupélec and ISEP, France Chamas Al Ghouwayel, Ali, Lebanese International University, Lebanon Hijazi, Hussein, Lebanese International University, Lebanon Bouhel, Nizar, IETR-CentraleSupélec, France Palicot, Jacques, IETR-CentraleSupélec, France
SPCOM-P3 - MIMO and Multi-antenna Systems

SPCOM-P3.1: EFFICIENT TECHNIQUES FOR IN-BAND SYSTEM INFORMATION BROADCAST IN MULTI-CELL MASSIVE MIMO

Jayachandran, Jinu, Indian Institute of Technology Delhi, India Biswas, Kamal, Indian Institute of Technology Delhi, India Mohammed, Saif Khan, Indian Institute of Technology Delhi, India Larsson, Erik G., Linköping University, Sweden

SPCOM-P3.2: OPTIMAL DESIGN OF ENERGY-EFFICIENT CELL-FREE MASSIVE MIMO: JOINT POWER ALLOCATION AND LOAD BALANCING

Van Chien, Trinh, Linköping University, Sweden Björnson, Emil, Linköping University, Sweden G. Larsson, Erik, Linköping University, Sweden

SPCOM-P3.3: LARGE-SCALE FADING PRECODING FOR MAXIMIZING THE PRODUCT OF SINRS

Demir, Özlem Tugfe, Linköping University, Sweden Björnson, Emil, Linköping University, Sweden

SPCOM-P3.4: PROXIMAL DISTANCE ALGORITHM FOR NONCONVEX QCQP WITH BEAMFORMING APPLICATIONS

Li, Qiang, University of Electronic Science and Technology of China, China Liu, Yatao, Chinese University of Hong Kong, Hong Kong SAR of China Shao, Mingjie, Chinese University of Hong Kong, Hong Kong SAR of China Ma, Wing-Kin, Chinese University of Hong Kong, Hong Kong SAR of China

SPCOM-P3.5: CLOUD-DRIVEN MULTI-WAY MULTIPLE-ANTENNA RELAY SYSTEMS: BEST-USER-LINK SELECTION AND JOINT MMSE DETECTION

Duarte, Flavio L., Pontifical Catholic University of Rio de Janeiro, Brazil de Lamare, Rodrigo C., Pontifical Catholic University of Rio de Janeiro, Brazil

SPCOM-P3.6: A COMPLEXITY EFFICIENT DMT-OPTIMAL TREE PRUNING BASED SPHERE DECODING

Neinavaie, Mohammad, Aalto University, Finland Derakhtian, Mostafa, Shiraz University, Iran Vorobyov, Sergiy A., Aalto University, Finland

SPCOM-P3.7: A MODEL-FREE APPROACH TO DISTRIBUTED TRANSMIT BEAMFORMING

George, Jemin, CCDC Army Research Laboratory, United States Yilmaz, Cemal, North Carolina State University, United States Parayil, Anjaly, CCDC Army
Research Laboratory, United States Chakrabortty, Aranya, North Carolina State University, United States

**SPCOM-P3.8: INTELLIGENT REFLECTING SURFACE FOR MASSIVE DEVICE CONNECTIVITY: JOINT ACTIVITY DETECTION AND CHANNEL ESTIMATION**

Xia, Shuhao, ShanghaiTech University, China Shi, Yuanming, ShanghaiTech University, China

**SPCOM-P3.9: CHANNEL COVARIANCE ESTIMATION IN MULTIUSER MASSIVE MIMO SYSTEMS WITH AN APPROACH BASED ON INFINITE DIMENSIONAL HILBERT SPACES**

Cavalcante, Renato L. G., Fraunhofer Heinrich Hertz Institute / TU Berlin, Germany Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute / TU Berlin, Germany

**SPCOM-P3.10: ELIMINATING OUT-OF-CELL INTERFERENCE IN CELLULAR MASSIVE MIMO WITH A SINGLE ADDITIONAL TRANSCEIVER**

Erez, Uri, Tel Aviv University, Israel Leshem, Amir, Bar-Ilan University, Israel

**SPCOM-P3.11: FAVORABLE PROPAGATION AND LINEAR MULTIUSER DETECTION FOR DISTRIBUTED ANTENNA SYSTEMS**

Gholami, Roya, EURECOM, France Cottatellucci, Laura, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Slock, Dirk, EURECOM, France

**SPCOM-P3.12: DISTRIBUTED NON-ORTHOGONAL PILOT DESIGN FOR MULTI-CELL MASSIVE MIMO SYSTEMS**

Wu, Yue, Tsinghua University, China Ma, Shaodan, University of Macau, China Gu, Yuantao, Tsinghua University, China
SPCOM-P4 - Design and Implementation of Communication Systems

SPCOM-P4.1: DISTRIBUTED DETECTION OF SPARSE SIGNALS WITH 1-BIT DATA IN TWO-LEVEL TWO-DEGREE TREE-STRUCTURED SENSOR NETWORKS
Li, Chengxi, Tsinghua University, China Li, Gang, Tsinghua University, China Varshney, Pramod, Syracuse University, United States

SPCOM-P4.2: OBJECTIVE BAYESIAN DETECTION UNDER SPATIALLY CORRELATED GAUSSIAN OBSERVATIONS FOR MULTI-ANTENNA COGNITIVE RADIO NETWORK
Al-Ali, Mohannad H., Basrah University, Iraq Ho, K. C., University of Missouri, United States

SPCOM-P4.3: A GATED HYPERNET DECODER FOR POLAR CODES
Nachmani, Eliya, Tel Aviv University, Facebook, Israel Wolf, Lior, Tel Aviv University, Facebook, Israel

SPCOM-P4.4: WEIGHTED GRADIENT CODING WITH LEVERAGE SCORE SAMPLING
Charalambides, Neophytos, University of Michigan, United States Pilanci, Mert, Stanford University, United States Hero, Alfred, University of Michigan, United States

SPCOM-P4.5: LOW-COMPLEXITY 5G SLAM WITH CKF-PHD FILTER
Kim, Hyowon, Hanyang University, Korea (South) Granström, Karl, Chalmers University of Technology, Sweden Kim, Sunwoo, Hanyang University, Korea (South) Wymeersch, Henk, Chalmers University of Technology, Sweden

SPCOM-P4.6: THE EFFECT OF POWER ALLOCATION ON VISIBLE LIGHT COMMUNICATION USING COMMERCIAL PHOSPHOR-CONVERTED LED LAMP FOR INDIRECT ILLUMINATION
Dowhuszko, Alexis, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain Ilter, Mehmet, Aalto University, Finland Pinho, Paulo, Aalto University, Finland Hämäläinen, Jyri, Aalto University, Finland

SPCOM-P4.7: ROBUST TRANSMISSION OVER CHANNELS WITH CHANNEL UNCERTAINTY: AN ALGORITHMIC PERSPECTIVE
Boche, Holger, Technische Universität München, Germany Schaefer, Rafael F., Technische Universität Berlin, Germany Poor, H. Vincent, Princeton University, United States

**SPCOM-P4.8: DEEP JOINT SOURCE-CHANNEL CODING OF IMAGES WITH FEEDBACK**

Burth Kurka, David, Imperial College London, United Kingdom Gündüz, Deniz, Imperial College London, United Kingdom

**SPCOM-P4.9: A LEARNING APPROACH TO COOPERATIVE COMMUNICATION SYSTEM DESIGN**

Lu, Yuxin, Hong Kong University of Science and Technology, Hong Kong SAR of China Cheng, Peng, University of Sydney, Australia Chen, Zhuo, Commonwealth Scientific and Industrial Research Organisation, Australia Mow, Wai Ho, Hong Kong University of Science and Technology, Hong Kong SAR of China Li, Yonghui, University of Sydney, Australia

**SPCOM-P4.10: A STACKED-AUTOENCODER BASED END-TO-END LEARNING FRAMEWORK FOR DECODE-AND-FORWARD RELAY NETWORKS**

Gupta, Ankit, Heriot-Watt University, United Kingdom Sellathurai, Mathini, Heriot-Watt University, United Kingdom

**SPCOM-P4.11: A NEW SAMPLING SCHEME FOR DISTRIBUTED BLIND SPECTRUM SENSING USING ENERGY DETECTORS**

Wang, Tsang-Yi, National Sun Yat-sen University, Taiwan Chien, Feng-Tsun, National Chiao Tung University, Taiwan Hsieh, Chi-Kai, National Chiao Tung University, Taiwan

**SPCOM-P4.12: SWIFT-LINK: A COMPRESSION BEAM ALIGNMENT ALGORITHM FOR PRACTICAL MMWAVE RADIOS**

Myers, Nitin Jonathan, University of Texas at Austin, United States Mezghani, Amine, University of Manitoba, Canada Heath Jr., Robert W., University of Texas at Austin, United States
SPCOM-P5.1: ON THROUGHPUT OF MILLIMETER WAVE MIMO SYSTEMS WITH LOW RESOLUTION ADCS
Khalili, Abbas, New York University, United States Shahsavari, Shahram, University of Waterloo, Canada Shirani, Farhad, New York University, United States Erkip, Elza, New York University, United States C. Eldar, Yonina, Weizmann institute of Science, Israel

SPCOM-P5.2: RELIABLE AND SECURE TRANSMISSION FOR FUTURE NETWORKS
Hua, Yingbo, University of California, Riverside, United States

SPCOM-P5.3: ON POLAR CODING FOR FINITE BLOCKLENGTH SECRET KEY GENERATION OVER WIRELESS CHANNELS
Hentilä, Henri, Aalto University, Finland Shkel, Yanina, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland Koivunen, Visa, Aalto University, Finland Poor, H. Vincent, Princeton University, United States

SPCOM-P5.4: AN ENHANCED DECODING ALGORITHM FOR CODED COMPRESSED SENSING
Amalladinne, Vamsi, Texas A&M University, United States Chamberland, Jean-Francois, Texas A&M University, United States Narayanan, Krishna, Texas A&M University, United States

SPCOM-P5.5: OPTIMAL WINDOW DESIGN FOR W-OFDM
Hussain, Khawar, University of Vigo, Spain Lopez-Valcarce, Roberto, University of Vigo, Spain

SPCOM-P5.6: COMPUTABILITY OF THE PEAK VALUE OF BANDLIMITED SIGNALS
Boche, Holger, Technische Universität München, Germany Mönich, Ullrich, Technische Universität München, Germany

SPCOM-P5.7: JOINT SCHEDULING AND BEAMFORMING FOR DELAY SENSITIVE TRAFFIC WITH PRIORITIES AND DEADLINES
Hadar, Ido, Bar-Ilan University, Israel Leshem, Amir, Bar-Ilan University, Israel

SPCOM-P5.8: ARBITRARY LENGTH PERFECT INTEGER SEQUENCES USING ALL-PASS POLYNOMIAL
Pei, Soo-Chang, National Taiwan University, Taiwan Chang, Kuo-Wei, Chunghwa Telecom Co Ltd Telecommunication Laboratories, Taiwan

**SPCOM-P5.9: PERFORMANCE ANALYSIS AND CONSTELLATION OPTIMIZATION OF STAR-QAM-AIDED DIFFERENTIAL FASTER-THAN-NYQUIST SIGNALING**

Sagayama, Chie, Tokyo University of Agriculture and Technology, Japan Ishihara, Takumi, Tokyo University of Agriculture and Technology, Japan Sugiura, Shinya, University of Tokyo, Japan

**SPCOM-P5.10: CONNECTIONS BETWEEN SPECTRAL PROPERTIES OF ASYMPTOTIC MAPPINGS AND SOLUTIONS TO WIRELESS NETWORK PROBLEMS**

Cavalcante, Renato L. G., Fraunhofer Heinrich Hertz Institute / TU Berlin, Germany Liao, Qi, Nokia Bell Labs, Germany Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute / TU Berlin, Germany

**SPCOM-P5.11: ROBUST HYBRID PRECODING FOR INTERFERENCE EXPLOITATION IN MASSIVE MIMO SYSTEMS**

Hegde, Ganapati, Technische Universität Darmstadt, Germany Masouros, Christos, University College London, United Kingdom Pesavento, Marius, Technische Universität Darmstadt, Germany

**SPCOM-P5.12: DIFFERENTIALLY MODULATED SPECTRALLY EFFICIENT FREQUENCY-DIVISION MULTIPLEXING**

Osaki, Seichiroh, Tokyo University of Agriculture and Technology, Japan Nakao, Miyu, Tokyo University of Agriculture and Technology, Japan Ishihara, Takumi, Tokyo University of Agriculture and Technology, Japan Sugiura, Shinya, University of Tokyo, Japan
SPE-L1 - End-to-end Speech Recognition I: Streaming

SPE-L1.1: A STREAMING ON-DEVICE END-TO-END MODEL SURPASSING SERVER-SIDE CONVENTIONAL MODEL QUALITY AND LATENCY


SPE-L1.2: MINIMUM LATENCY TRAINING STRATEGIES FOR STREAMING SEQUENCE-TO-SEQUENCE ASR

Inaguma, Hirofumi, Kyoto University, Japan Gaur, Yashesh, Microsoft Corporation, Japan Lu, Liang, Microsoft Corporation, Japan Li, Jinyu, Microsoft Corporation, Japan Gong, Yifan, Microsoft Corporation, Japan

SPE-L1.3: TOWARDS FAST AND ACCURATE STREAMING END-TO-END ASR


SPE-L1.4: STREAMING AUTOMATIC SPEECH RECOGNITION WITH THE TRANSFORMER MODEL
Moritz, Niko, Mitsubishi Electric Research Laboratories (MERL), United States  
Hori, Takaaki, Mitsubishi Electric Research Laboratories (MERL), United States  
Le Roux, Jonathan, Mitsubishi Electric Research Laboratories (MERL), United States

**SPE-L1.5: CIF: CONTINUOUS INTEGRATE-AND-FIRE FOR END-TO-END SPEECH RECOGNITION**

Dong, Linhao, Institute of Automation, Chinese Academy of Sciences, China  
Xu, Bo, Institute of Automation, Chinese Academy of Sciences, China

**SPE-L1.6: TRANSFORMER-BASED ONLINE CTC/ATTENTION END-TO-END SPEECH RECOGNITION ARCHITECTURE**

Miao, Haoran, Key Laboratory of Speech Acoustics and Content Understanding, China  
Cheng, Gaofeng, Key Laboratory of Speech Acoustics and Content Understanding, China  
Gao, Changfeng, Key Laboratory of Speech Acoustics and Content Understanding, China  
Zhang, Pengyuan, Key Laboratory of Speech Acoustics and Content Understanding, China  
Yan, Yonghong, Key Laboratory of Speech Acoustics and Content Understanding, China
Tuesday, 5 May, 11:30 - 13:30

**SPE-L2 - Language Disorders**

**SPE-L2.1: DETECTING MULTIPLE SPEECH DISFLUENCIES USING A DEEP RESIDUAL NETWORK WITH BIDIRECTIONAL LONG SHORT-TERM MEMORY**

Kourkounakis, Tedd, Queen’s University, Canada Hajavi, Amirhossein, Queen’s University, Canada Etemad, Ali, Queen’s University, Canada

**SPE-L2.2: EXPLORING APPROPRIATE ACOUSTIC AND LANGUAGE MODELLING CHOICES FOR CONTINUOUS DYSARTHRIC SPEECH RECOGNITION**

Yue, Zhengjun, university of sheffield, United Kingdom Xiong, Feifei, university of sheffield, United Kingdom Christensen, Heidi, university of sheffield, United Kingdom Barker, Jon, university of sheffield, United Kingdom

**SPE-L2.3: SYNTHETIC SPEECH REFERENCES FOR AUTOMATIC PATHOLOGICAL SPEECH INTELLIGIBILITY ASSESSMENT**

Janbakhshi, Parvaneh, Idiap Research Institute, Switzerland Kodrasi, Ina, Idiap Research Institute, Switzerland Bourlard, Hervé, Idiap Research Institute, Switzerland

**SPE-L2.4: TWO-STEP ACOUSTIC MODEL ADAPTATION FOR DYSARTHRIC SPEECH RECOGNITION**

Takashima, Ryoichi, Kobe University, Japan Takiguchi, Tetsuya, Kobe University, Japan Ariki, Yasuo, Kobe University, Japan

**SPE-L2.5: DYSARTHRIC SPEECH RECOGNITION WITH LATTICE-FREE MMI**

Hermann, Enno, Idiap Research Institute, Switzerland Magimai.-Doss, Mathew, Idiap Research Institute, Switzerland

**SPE-L2.6: IMPROVED SPEAKER INDEPENDENT DYSARTHRIA INTELLIGIBILITY CLASSIFICATION USING DEEPSPEECH POSTERIORS**

Tripathi, Ayush, Tata Consultancy Services, India Bhosale, Swapnil, Tata Consultancy Services, India Kopparapu, Sunil Kumar, Tata Consultancy Services, India
Tuesday, 5 May, 16:30 - 18:30

**SPE-L3 - End-to-end Speech Recognition II: New Models**

**SPE-L3.1: JOINT PHONEME-GRAPHEME MODEL FOR END-TO-END SPEECH RECOGNITION**

Kubo, Yotaro, Google, Japan Bacchiani, Michiel, Google, Japan

**SPE-L3.2: QUARTZNET: DEEP AUTOMATIC SPEECH RECOGNITION WITH 1D TIME-CHANNEL SEPARABLE CONVOLUTIONS**

Kriman, Samuel, University of Illinois at Urbana-Champaign, United States Beliaev, Stanislav, University of Saint Petersburg, Russia Ginsburg, Boris, NVIDIA, United States Huang, Jocelyn, NVIDIA, United States Kuchaiev, Oleksii, NVIDIA, United States Lavrukhin, Vitaly, NVIDIA, United States Leary, Ryan, NVIDIA, United States Li, Jason, NVIDIA, United States Zhang, Yang, NVIDIA, United States

**SPE-L3.3: END-TO-END MULTI-TALKER OVERLAPPING SPEECH RECOGNITION**

Tripathi, Anshuman, Google, United States Lu, Han, Google, United States Sak, Hasim, Google, United States

**SPE-L3.4: END-TO-END MULTI-SPEAKER SPEECH RECOGNITION WITH TRANSFORMER**

Chang, Xuankai, Johns Hopkins University, United States Zhang, Wangyou, Shanghai Jiao Tong University, China Qian, Yanmin, Shanghai Jiao Tong University, China Le Roux, Jonathan, Mitsubishi Electric Research Laboratories (MERL), United States Watanabe, Shinji, Johns Hopkins University, United States

**SPE-L3.5: HYBRID AUTOREGRESSIVE TRANSDUCER (HAT)**

Variani, Ehsan, Google, United States Rybach, David, Google, United States Allauzen, Cyril, Google, United States Riley, Michael, Google, United States

**SPE-L3.6: LIGHTWEIGHT AND EFFICIENT END-TO-END SPEECH RECOGNITION USING LOW-RANK TRANSFORMER**

Winata, Genta Indra, Hong Kong University of Science and Technology, Hong Kong SAR of China Cahyawijaya, Samuel, Hong Kong University of Science and Technology, Hong Kong SAR of China Lin, Zhaojiang, Hong Kong University of Science and Technology, Hong Kong SAR of China Liu, Zihan, Hong Kong University of Science and Technology, Hong Kong SAR of China Fung, Pascale, Hong Kong University of Science and Technology, Hong Kong SAR of China
SPE-L4 - Machine Learning for Language Processing I

SPE-L4.1: SPOKEN LANGUAGE ACQUISITION BASED ON REINFORCEMENT LEARNING AND WORD UNIT SEGMENTATION
Gao, Shengzhou, Tokyo Institute of Technology, Japan Hou, Wenxin, Tokyo Institute of Technology, Japan Tanaka, Tomohiro, Tokyo Institute of Technology, Japan Shinozaki, Takahiro, Tokyo Institute of Technology, Japan

SPE-L4.2: HOW MUCH SELF-ATTENTION DO WE NEED? TRADING ATTENTION FOR FEED-FORWARD LAYERS
Irie, Kazuki, RWTH Aachen University, Germany Gerstenberger, Alexander, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-L4.3: LEARNING RECURRENT NEURAL NETWORK LANGUAGE MODELS WITH CONTEXT-SENSITIVE LABEL SMOOTHING FOR AUTOMATIC SPEECH RECOGNITION
Song, Minguang, University of Missouri, United States Zhao, Yunxin, University of Missouri, United States Wang, Shaojun, PAII Inc, United States Han, Mei, PAII Inc, United States

SPE-L4.4: SEMI-SUPERVISED LEARNING FOR TEXT CLASSIFICATION BY LAYER PARTITIONING
Li, Alexander Hanbo, Amazon, Inc., United States Sethy, Abhinav, Amazon, Inc., United States

SPE-L4.5: INTEGRATING DISCRETE AND NEURAL FEATURES VIA MIXED-FEATURE TRANS-DIMENSIONAL RANDOM FIELD LANGUAGE MODELS
Gao, Silin, Tsinghua University, China Ou, Zhijian, Tsinghua University, China Yang, Wei, State Grid Customer Service Center, China Xu, Huifang, China Electric Power Research Institute, China

SPE-L4.6: GATED ATTENTIVE CONVOLUTIONAL NETWORK DIALOGUE STATE TRACKER
Liu, Sihong, Beijing University Of Posts And Telecommunications, China Liu, Songyan, Beijing University of Posts and Telecommunications, China Xu, Weiran, Beijing University Of Posts And Telecommunications, China
SPE-L5 - Speech Synthesis and Voice Conversion I

SPE-L5.1: USING VAES AND NORMALIZING FLOWS FOR ONE-SHOT TEXT-TO-SPEECH SYNTHESIS OF EXPRESSIVE SPEECH

SPE-L5.2: ZERO-SHOT MULTI-SPEAKER TEXT-TO-SPEECH WITH STATE-OF-THE-ART NEURAL SPEAKER EMBEDDINGS
Cooper, Erica, National Institute of Informatics, Japan Lai, Cheng-I, Massachusetts Institute of Technology, United States Yasuda, Yusuke, National Institute of Informatics, Japan Fang, Fuming, National Institute of Informatics, Japan Wang, Xin, National Institute of Informatics, Japan Chen, Nanxin, Johns Hopkins University, United States Yamagishi, Junichi, National Institute of Informatics, Japan

SPE-L5.3: MELLOTRON: MULTISPEAKER EXPRESSIVE VOICE SYNTHESIS BY CONDITIONING ON RHYTHM, PITCH AND GLOBAL STYLE TOKENS
Valle, Rafael, NVIDIA, United States Li, Jason, NVIDIA, United States Prenger, Ryan, NVIDIA, United States Catanzaro, Bryan, NVIDIA, United States

SPE-L5.4: LOCATION-RELATIVE ATTENTION MECHANISMS FOR ROBUST LONG-FORM SPEECH SYNTHESIS
Battenberg, Eric, Google, United States Skerry-Ryan, RJ, Google, United States Mariooryad, Soroosh, Google, United States Stanton, Daisy, Google, United States Kao, David, Google, United States Shannon, Matt, Google, United States Bagby, Tom, Google, United States

SPE-L5.5: PARALLEL WAVEGAN: A FAST WAVEFORM GENERATION MODEL BASED ON GENERATIVE ADVERSARIAL NETWORKS WITH MULTI-RESOLUTION SPECTROGRAM
Yamamoto, Ryuichi, LINE Corporation, Japan Song, Eunwoo, Naver Corporation, Korea (South) Kim, Jae-Min, Naver Corporation, Korea (South)

SPE-L5.6: GAUSSIAN LPCNET FOR MULTISAMPLE SPEECH SYNTHESIS
Popov, Vadim, Huawei Technologies, Russia Kudinov, Mikhail, Huawei Technologies, Russia Sadekova, Tasnima, Huawei Technologies, Russia
Wednesday, 6 May, 09:00 - 11:00

**SPE-L6 - Speech Enhancement II: Single Channel**

**SPE-L6.1: A COMPUTATIONALLY LIGHT ALGORITHM FOR BAYESIAN SPEECH ENHANCEMENT WITH SNR MARGINALIZATION**
Thaleiser, Stefan, Ruhr-Universität Bochum, Germany Enzner, Gerald, Ruhr-Universität Bochum, Germany

**SPE-L6.2: LOW-LATENCY SINGLE CHANNEL SPEECH ENHANCEMENT USING U-NET CONVOLUTIONAL NEURAL NETWORKS**
Bulut, Ahmet E., Center for Robust Speech Systems, University of Texas at Dallas, United States Koishida, Kazuhito, Microsoft Corporation, United States

**SPE-L6.3: A CROSS-TASK TRANSFER LEARNING APPROACH TO ADAPTING DEEP SPEECH ENHANCEMENT MODELS TO UNSEEN BACKGROUND NOISE USING PAIRED SENONE CLASSIFIERS**
Wang, Sicheng, Georgia Institute of Technology, United States Li, Wei, Georgia Institute of Technology, United States Siniscalchi, Sabato Marco, Kore University of Enna, Italy Lee, Chin-Hui, Georgia Institute of Technology, United States

**SPE-L6.4: MONAURAL SPEECH ENHANCEMENT USING INTRA-SPECTRAL RECURRENT LAYERS IN THE MAGNITUDE AND PHASE RESPONSES**
Nayem, Khandokar Md., Indiana University, United States Williamson, Donald S., Indiana University, United States

**SPE-L6.5: A MAXIMUM LIKELIHOOD APPROACH TO MULTI-OBJECTIVE LEARNING USING GENERALIZED GAUSSIAN DISTRIBUTIONS FOR DNN-BASED SPEECH ENHANCEMENT**
Niu, Shu-Tong, University of Science and Technology of China, China Du, Jun, University of Science and Technology of China, China Chai, Li, University of Science and Technology of China, China Lee, Chin-Hui, Georgia Institute of Technology, United States

**SPE-L6.6: PAGAN: A PHASE-ADAPTED GENERATIVE ADVERSARIAL NETWORKS FOR SPEECH ENHANCEMENT**
Li, Peishuo, Tsinghua University, China Jiang, Zihang, Tsinghua University, China Yin, Shouyi, Tsinghua University, China Song, Dandan, TsingMicro Co. Ltd., China Ouyang, Peng, TsingMicro Co. Ltd., China Liu, Leibo, Tsinghua University, China Wei, Shaojun, Tsinghua University, China
SPE-L7 - Speech Perception and Psychoacoustics

SPE-L7.1: HUMANGAN: GENERATIVE ADVERSARIAL NETWORK WITH HUMAN-BASED DISCRIMINATOR AND ITS EVALUATION IN SPEECH PERCEPTION MODELING
Fujii, Kazuki, National Institute of Technology, Tokuyama College, Japan
Saito, Yuki, University of Tokyo, Japan
Takamichi, Shinnosuke, University of Tokyo, Japan
Baba, Yukino, University of Tsukuba, Japan
Saruwatari, Hiroshi, University of Tokyo, Japan

SPE-L7.2: THE PROCESSING OF MANDARIN CHINESE TONAL ALTERNATIONS IN CONTEXTS: AN EYE-TRACKING STUDY
Tu, Jung-yueh, National Chengchi University, Taiwan
Chien, Yu-Fu, Fudan University, China
DePaul University, United States

SPE-L7.3: ON THE IMPACT OF LANGUAGE FAMILIARITY IN TALKER CHANGE DETECTION
Sharma, Neeraj, Carnegie Mellon University, United States
Krishnamohan, Venkat, Indian Institute of Science, India
Ganapathy, Sriram, Indian Institute of Science, India
Gangopadhayay, Ahana, Washington University in St. Louis, United States
Fink, Lauren, University of California, Davis, United States

SPE-L7.4: EFFECTS OF SPECTRAL TILT ON LISTENERS’ PREFERENCES AND INTELLIGIBILITY
Simantiraki, Olympia, University of the Basque Country, Spain
Cooke, Martin, Ikerbasque (Basque Science Foundation), Spain
Pantazis, Yannis, Institute of Applied and Computational Mathematics, FORTH, Greece

SPE-L7.5: EFFECT OF FRICATION DURATION AND FORMANT TRANSITIONS ON THE PERCEPTION OF FRICATIVES IN VCV UTTERANCES
Nataraj, K S, Indian Institute of Technology Bombay, India
Pandey, Prem Chand, Indian Institute of Technology Bombay, India
Dasgupta, Hirak, Indian Institute of Technology Bombay, India

SPE-L7.6: CURRICULUM LEARNING FOR SPEECH EMOTION RECOGNITION FROM CROWDSOURCED LABELS
Lotfian, Reza, Cogito, United States
Busso, Carlos, University of Texas at Austin, United States
### SPE-L8.1: FULLY-HIERARCHICAL FINE-GRAINED PROSODY MODELING FOR INTERPRETABLE SPEECH SYNTHESIS

Sun, Guangzhi, Cambridge University, United Kingdom
Zhang, Yu, Google, United States
Weiss, Ron, Google, United Kingdom
Cao, Yuan, Google, United Kingdom
Zen, Heiga, Google, United Kingdom
Wu, Yonghui, Google, United Kingdom

### SPE-L8.2: TRANSFERRING NEURAL SPEECH WAVEFORM SYNTHESIZERS TO MUSICAL INSTRUMENT SOUNDS GENERATION

Zhao, Yi, National Institute of Informatics, Japan
Wang, Xin, National Institute of Informatics, Japan
Juvela, Lauri, Aalto University, Finland
Yamagishi, Junichi, National Institute of Informatics, Japan

### SPE-L8.3: TEACHER-STUDENT TRAINING FOR ROBUST TACOTRON-BASED TTS

Liu, Rui, Inner Mongolia University, China
Sisman, Berrak, National University of Singapore, Singapore
Li, Jingdong, Inner Mongolia University, China
Bao, Feilong, Inner Mongolia University, China
Gao, Guanglai, Inner Mongolia University, China
Li, Haizhou, National University of Singapore, Singapore

### SPE-L8.4: MANY-TO-MANY VOICE CONVERSION USING CONDITIONAL CYCLE-CONSISTENT ADVERSARIAL NETWORKS

Lee, Shindong, Korea University, Korea (South)
Ko, BongGu, Korea University, Korea (South)
Lee, Keonnyeong, Korea University, Korea (South)
Yoo, In-Chul, Korea University, Korea (South)
Yook, Dongsuk, Korea University, Korea (South)

### SPE-L8.5: F0-CONSISTENT MANY-TO-MANY NON-PARALLEL VOICE CONVERSION VIA CONDITIONAL AUTOENCODER

Qian, Kaizhi, University of Illinois at Urbana-Champaign, United States
Jin, Zeyu, Adobe, United States
Hasegawa-Johnson, Mark, University of Illinois at Urbana-Champaign, United States
Mysore, Gautham, Adobe, United States

### SPE-L8.6: END-TO-END ACCENT CONVERSION WITHOUT USING NATIVE UTTERANCES

Liu, Songxiang, Chinese University of Hong Kong, China
Wang, Disong, Chinese University of Hong Kong, China
Cao, Yuewen, Chinese University of Hong Kong, China
Sun, Lif, SpeechX Limited, China
Wu, Xixin, Chinese University of Hong Kong, China
Kang, Shiyan, Tencent, China
Wu, Zhiyong, Tsinghua University,
China Liu, Xunying, Chinese University of Hong Kong, China Su, Dan, Tencent, China Yu, Dong, Tencent, China Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China
SPE-L9 - Multimodal Processing of Language

SPE-L9.1: COGANS FOR UNSUPERVISED VISUAL SPEECH ADAPTATION TO NEW SPEAKERS
Fernandez-Lopez, Adriana, Pompeu Fabra University, Spain Karaali, Ali, Trinity College Dublin, Ireland Harte, Naomi, Trinity College Dublin, Ireland Sukno, Federico M., Pompeu Fabra University, Spain

SPE-L9.2: VISUALLY GUIDED SELF SUPERVISED LEARNING OF SPEECH REPRESENTATIONS
Shukla, Abhinav, Imperial College London, United Kingdom Vougioukas, Konstantinos, Imperial College London, United Kingdom Ma, Pingchuan, Imperial College London, United Kingdom Petridis, Stavros, Imperial College London, United Kingdom Pantic, Maja, Imperial College London, United Kingdom

SPE-L9.3: LOOKING ENHANCES LISTENING: RECOVERING MISSING SPEECH USING IMAGES
Srinivasan, Tejas, Carnegie Mellon University, United States Sanabria, Ramon, University of Edinburgh, United Kingdom Metze, Florian, Carnegie Mellon University, United States

SPE-L9.4: TOWARDS MULTILINGUAL SIGN LANGUAGE RECOGNITION
Tornay, Sandrine, Idiap Research Institute, Switzerland Razavi, Marzieh, Telepathy Labs GmbH, Switzerland Magimai.-Doss, Mathew, Idiap Research Institute, Switzerland

SPE-L9.5: AUTOMATIC IDENTIFICATION OF SPEAKERS FROM HEAD GESTURES IN A NARRATION
Vadiraj, Sanjeev Kadagathur, Indian Institute of Science, Bangalore, India Rao MV, Achuth, Indian Institute of Science, Bangalore, India Kumar Ghosh, Prasanta, Indian Institute of Science, Bangalore, India

SPE-L9.6: LIPREADING USING TEMPORAL CONVOLUTIONAL NETWORKS
Martinez, Brais, Samsung, United Kingdom Ma, Pingchuan, Imperial College London, United Kingdom Petridis, Stavros, Imperial College London, United Kingdom Pantic, Maja, Imperial College London and Samsung, United Kingdom
Thursday, 7 May, 09:00 - 11:00

**SPE-L10 - Speech Recognition: Confidence, Errors and OOVs**

**SPE-L10.1: ON MODELING ASR WORD CONFIDENCE**
Jeon, Woojay, Apple, United States Jordan, Maxwell, Apple, United States Krishnamoorthy, Mahesh, Apple, United States

**SPE-L10.2: CONFIDENCE ESTIMATION FOR BLACK BOX AUTOMATIC SPEECH RECOGNITION SYSTEMS USING LATTICE RECURRENT NEURAL NETWORKS**
Kastanos, Alexandros, University of Cambridge, United Kingdom Ragni, Anton, University of Sheffield, United Kingdom Gales, Mark, University of Cambridge, United Kingdom

**SPE-L10.3: OOV RECOVERY WITH EFFICIENT 2ND PASS DECODING AND OPEN- VOCABULARY WORD-LEVEL RNNLM RESCORING FOR HYBRID ASR**
Zhang, Xiaohui, Johns Hopkins University, United States Povey, Daniel, Johns Hopkins University, United States Khudanpur, Sanjeev, Johns Hopkins University, United States

**SPE-L10.4: END TO END SPEECH RECOGNITION ERROR PREDICTION WITH SEQUENCE TO SEQUENCE LEARNING**
Serai, Prashant, Ohio State University, United States Stiff, Adam, Ohio State University, United States Fosler-Lussier, Eric, Ohio State University, United States

**SPE-L10.5: ASR ERROR CORRECTION AND DOMAIN ADAPTATION USING MACHINE TRANSLATION**
Mani, Anirudh, Abridge AI, United States Palaskar, Shruti, Carnegie Mellon University, United States Venkat Meripo, Nimshi, Abridge AI, United States Konam, Sandeep, Abridge AI, United States Metze, Florian, Carnegie Mellon University, United States

**SPE-L10.6: JOINT CONTEXTUAL MODELING FOR ASR CORRECTION AND LANGUAGE UNDERSTANDING**
Technologies Inc, United States Bell, Franziska, Uber Technologies Inc, United States Tur, Gokhan, Uber Technologies Inc, United States
Thursday, 7 May, 09:00 - 11:00

SPE-L11 - Speech Separation and Extraction I: Single Channel

SPE-L11.1: DEEP CASA FOR TALKER-INDEPENDENT MONOAURAL SPEECH SEPARATION
Liu, Yuzhou, Ohio State University, United States
Delfarah, Masood, Ohio State University, United States
Wang, Deliang, Ohio State University, United States

SPE-L11.2: DEMYSTIFYING TASNET: A DISSECTING APPROACH
Heitkaemper, Jens, Paderborn University, Germany
Jakobeit, Darius, Paderborn University, Germany
Boeddeker, Christoph, Paderborn University, Germany
Drude, Lukas, Paderborn University, Germany
Haeb-Umbach, Reinhold, Paderborn University, Germany

SPE-L11.3: FILTERBANK DESIGN FOR END-TO-END SPEECH SEPARATION
Pariente, Manuel, INRIA Nancy, France
Cornell, Samuele, Università Politecnica delle Marche, Italy
Deleforge, Antoine, INRIA Nancy, France
Vincent, Emmanuel, INRIA Nancy, France

SPE-L11.4: INTERRUPTED AND CASCADED PERMUTATION ININVARIANT TRAINING FOR SPEECH SEPARATION
Yang, Gene-Ping, National Taiwan University, Taiwan
Wu, Szu-Lin, National Taiwan University, Taiwan
Mao, Yao-Wen, National Taiwan University, Taiwan
Lee, Hung-yi, National Taiwan University, Taiwan
Lee, Lin-shan, National Taiwan University, Taiwan

SPE-L11.5: MIXUP-BREAKDOWN: A CONSISTENCY TRAINING METHOD FOR IMPROVING GENERALIZATION OF SPEECH SEPARATION MODELS
Lam, Max W. Y., Tencent AI Lab, China
Wang, Jun, Tencent AI Lab, China
Su, Dan, Tencent AI Lab, China
Yu, Dong, Tencent AI Lab, United States

SPE-L11.6: AN ONLINE SPEAKER-AWARE SPEECH SEPARATION APPROACH BASED ON TIME-DOMAIN REPRESENTATION
Wang, Hui, University of Science and Technology of China, China
Song, Yan, University of Science and Technology of China, China
Li, Zeng-Xi, Microsoft China, China
McLoughlin, Ian, School of Computing, University of Kent, United Kingdom
Dai, Li-Rong, University of Science and Technology of China, China
Thursday, 7 May, 11:30 - 13:30

SPE-L12 - Speech Separation and Extraction II: Multi-channel

SPE-L12.1: BEAM-TASNET: TIME-DOMAIN AUDIO SEPARATION NETWORK MEETS FREQUENCY-DOMAIN BEAMFORMER

SPE-L12.2: ON END-TO-END MULTI-CHANNEL TIME DOMAIN SPEECH SEPARATION IN REVERBERANT ENVIRONMENTS
Zhang, Jisi, University of Sheffield, United Kingdom Zorila, Catalin, Toshiba Cambridge Research Laboratory, United Kingdom Doddipatla, Rama, Toshiba Cambridge Research Laboratory, United Kingdom Barker, Jon, University of Sheffield, United Kingdom

SPE-L12.3: END-TO-END MICROPHONE PERMUTATION AND NUMBER INVARIANT MULTI-CHANNEL SPEECH SEPARATION
Luo, Yi, Columbia University, United States Chen, Zhuo, Microsoft, United States Mesgarani, Nima, Columbia University, United States Yoshioka, Takuya, Microsoft, United States

SPE-L12.4: DNN-SUPPORTED MASK-BASED CONVOLUTIONAL BEAMFORMING FOR SIMULTANEOUS DENOISING, DEREVERBERATION, AND SOURCE SEPARATION
Nakatani, Tomohiro, NTT Corporation, Japan Takahashi, Riki, Tsukuba University, Japan Ochiai, Tsubasa, NTT Corporation, Japan Kinoshita, Keisuke, NTT Corporation, Japan Ikeshita, Rintaro, NTT Corporation, Japan Delcroix, Marc, NTT Corporation, Japan Araki, Shoko, NTT Corporation, Japan

SPE-L12.5: REAL-TIME BINAURAL SPEECH SEPARATION WITH PRESERVED SPATIAL CUES
Han, Cong, Columbia University, United States Luo, Yi, Columbia University, United States Mesgarani, Nima, Columbia University, United States

SPE-L12.6: SLOGD: SPEAKER LOCATION GUIDED DEFLATION APPROACH TO SPEECH SEPARATION
Sivasankaran, Sunit, Inria-Nancy, France Vincent, Emmanuel, Inria-Nancy, France Fohr, Dominique, Loria, France
SPE-L13 - Speech Recognition: Representations and Embeddings

SPE-L13.1: MULTILINGUAL ACOUSTIC WORD EMBEDDING MODELS FOR PROCESSING ZERO-RESOURCE LANGUAGES
Kamper, Herman, Stellenbosch University, South Africa Matusevych, Yevgen, University of Edinburgh, United Kingdom Goldwater, Sharon, University of Edinburgh, United Kingdom

SPE-L13.2: MOCKINGJAY: UNSUPERVISED SPEECH REPRESENTATION LEARNING WITH DEEP BIDIRECTIONAL TRANSFORMER ENCODERS
Liu, Andy T., National Taiwan University, Taiwan Yang, Shu-wen, National Taiwan University, Taiwan Chi, Po-Han, National Taiwan University, Taiwan Hsu, Po-chun, National Taiwan University, Taiwan Lee, Hung-yi, National Taiwan University, Taiwan

SPE-L13.3: RECURRENT NEURAL AUDIOVISUAL WORD EMBEDDINGS FOR SYNCHRONIZED SPEECH AND REAL-TIME MRI
Köse, Öykü Deniz, Boğaziçi University, Turkey Saraçlar, Murat, Boğaziçi University, Turkey

SPE-L13.4: DEEP CONTEXTUALIZED ACOUSTIC REPRESENTATIONS FOR SEMI-SUPERVISED SPEECH RECOGNITION

SPE-L13.5: WHAT DOES A NETWORK LAYER HEAR? ANALYZING HIDDEN REPRESENTATIONS OF END-TO-END ASR THROUGH SPEECH SYNTHESIS
Li, Chung-Yi, National Taiwan University, Taiwan Yuan, Pei-Chieh, National Taiwan University, Taiwan Lee, Hung-Yi, National Taiwan University, Taiwan

SPE-L13.6: LEARNING A SUBWORD INVENTORY JOINTLY WITH END-TO-END AUTOMATIC SPEECH RECOGNITION
Drexler, Jennifer, Massachusetts Institute of Technology, United States Glass, James, Massachusetts Institute of Technology, United States
Thursday, 7 May, 16:30 - 18:30

SPE-L14 - Speaker Recognition/Identification/Verification

SPE-L14.1: MULTIPLE POINTS INPUT FOR CONVOLUTIONAL NEURAL NETWORKS IN REPLAY ATTACK DETECTION
Yoon, Sung-Hyun, University of Seoul, Korea (South) Yu, Ha-Jin, University of Seoul, Korea (South)

SPE-L14.2: INFORMATION MAXIMIZED VARIATIONAL DOMAIN ADVERSARIAL LEARNING FOR SPEAKER VERIFICATION
Tu, Youzhi, Hong Kong Polytechnic University, Hong Kong SAR of China Mak, Man-Wai, Hong Kong Polytechnic University, Hong Kong SAR of China Chien, Jen-Tzung, National Chiao Tung University, Taiwan

SPE-L14.3: TEXT ADAPTATION FOR SPEAKER VERIFICATION WITH SPEAKER-TEXT FACTORIZED EMBEDDINGS
Yang, Yexin, Shanghai Jiao Tong University, China Wang, Shuai, Shanghai Jiao Tong University, China Gong, Xun, Shanghai Jiao Tong University, China Qian, Yanmin, Shanghai Jiao Tong University, China Yu, Kai, Shanghai Jiao Tong University, China

SPE-L14.4: VOICEAI SYSTEMS TO NIST SRE19 EVALUATION: ROBUST SPEAKER RECOGNITION ON CONVERSATIONAL TELEPHONE SPEECH
Li, Rongjin, VoiceAI Technologies, Co. Ltd., China Chen, Dongpeng, VoiceAI Technologies, Co. Ltd., China Zhang, Weibin, VoiceAI Technologies, Co. Ltd., China

SPE-L14.5: MULTI-RESOLUTION MULTI-HEAD ATTENTION IN DEEP SPEAKER EMBEDDING
Wang, Zhiming, Ant Financial Services Group, China Yao, Kaisheng, Ant Financial Services Group, China Li, Xiaolong, Ant Financial Services Group, China Fang, Shuo, Ant Financial Services Group, China

SPE-L14.6: WITHIN-SAMPLE VARIABILITY-INVARIANT LOSS FOR ROBUST SPEAKER RECOGNITION UNDER NOISY ENVIRONMENTS
Cai, Danwei, Duke University, United States Cai, Weicheng, Duke Kunshan University, China Li, Ming, Duke University, United States
SPE-L15 - Emotion Recognition

SPE-L15.1: SPEECH EMOTION RECOGNITION WITH DUAL-SEQUENCE LSTM ARCHITECTURE
Wang, Jianyou, Duke University, United States Xue, Michael, Duke University, United States Culhane, Ryan, Duke University, United States Diao, Enmao, Duke University, United States Ding, Jie, University of Minnesota Twin Cities, United States Tarokh, Vahid, Duke University, United States

SPE-L15.2: A DIALOGICAL EMOTION DECODER FOR SPEECH EMOTION RECOGNITION IN SPOKEN DIALOG
Yeh, Sung-Lin, National Tsing Hua University, Taiwan Lin, Yun-Shao, National Tsing Hua University, Taiwan Lee, Chi-Chun, National Tsing Hua University, Taiwan

SPE-L15.3: FUSION APPROACHES FOR EMOTION RECOGNITION FROM SPEECH USING ACOUSTIC AND TEXT-BASED FEATURES
Pepino, Leonardo, Universidad de Buenos Aires-CONICET, Argentina Riera, Pablo, Universidad de Buenos Aires-CONICET, Argentina Ferrer, Luciana, Universidad de Buenos Aires-CONICET, Argentina Gravano, Agustín, Universidad de Buenos Aires, Argentina

SPE-L15.4: MULTI-TIME-SCALE CONVOLUTION FOR EMOTION RECOGNITION FROM SPEECH AUDIO SIGNALS
Guizzo, Eric, City, University of London, United Kingdom Weyde, Tillman, City, University of London, United Kingdom Barnett Leveson, Jack, City, University of London, United Kingdom

SPE-L15.5: ORDINAL LEARNING FOR EMOTION RECOGNITION IN CUSTOMER SERVICE CALLS
Han, Wenjing, Kuaishou Technology Corp., China Jiang, Tao, Kuaishou Technology Corp., China Li, Yan, Kuaishou Technology Corp., China Schuller, Björn, Imperial College London, United Kingdom Ruan, Huabin, Tsinghua University, China

SPE-L15.6: HGFM : A HIERARCHICAL GRAINED AND FEATURE MODEL FOR ACOUSTIC EMOTION RECOGNITION
Xu, Yunfeng, Hebei University of Science and Technology, China Xu, Hua, Tsinghua University, China Zou, Jiyun, Hebei University of Science and Technology, China
Friday, 8 May, 11:45 - 13:45

SPE-L16 - Speaker Diarization

SPE-L16.1: SPEAKER DIARIZATION USING LATENT SPACE CLUSTERING IN GENERATIVE ADVERSARIAL NETWORK
Pal, Monisankha, University of Southern California, United States
Kumar, Manoj, University of Southern California, United States
Peri, Raghuveer, University of Southern California, United States
Park, Tae Jin, University of Southern California, United States
Kim, So Hyun, Weill Cornell Medicine, United States
Lord, Catherine, University of California, Los Angeles, United States
Bishop, Somer, University of California, San Francisco, United States
Shrikanth, University of Southern California, United States

SPE-L16.2: MULTIMODAL SPEAKER DIARIZATION OF REAL-WORLD MEETINGS USING D-VECTORS WITH SPATIAL FEATURES
Kang, Wonjune, Massachusetts Institute of Technology, United States
Roy, Brandon, Massachusetts Institute of Technology, United States
Chow, Wesley, Cortico, United States

SPE-L16.3: SPEAKER DIARIZATION WITH REGION PROPOSAL NETWORK
Huang, Zili, Johns Hopkins University, United States
Watanabe, Shinji, Johns Hopkins University, United States
Fujita, Yusuke, Hitachi, Japan
Garca, Paola, Johns Hopkins University, United States
Shao, Yiwen, Johns Hopkins University, United States
Povey, Daniel, Johns Hopkins University, United States
Khudanpur, Sanjeev, Johns Hopkins University, United States

SPE-L16.4: OPTIMIZING BAYESIAN HMM BASED X-VECTOR CLUSTERING FOR THE SECOND DIHARD SPEECH DIARIZATION CHALLENGE
Diez, Mireia, Brno University of Technology, Czech Republic
Burget, Lukáš, Brno University of Technology, Czech Republic
Landini, Federico, Brno University of Technology, Czech Republic
Wang, Shuai, Shanghai Jiao Tong University, China
Cernocky, Honza, Brno University of Technology, Czech Republic

SPE-L16.5: A MEMORY AUGMENTED ARCHITECTURE FOR CONTINUOUS SPEAKER IDENTIFICATION IN MEETINGS
Flemotomos, Nikolaos, University of Southern California, United States
Dimitriadis, Dimitrios, Microsoft, United States

SPE-L16.6: BUT SYSTEM FOR THE SECOND DIHARD SPEECH DIARIZATION CHALLENGE
Landini, Federico, Brno University of Technology, Czech Republic Wang, Shuai, Shanghai Jiao Tong University, China Diez, Mireia, Brno University of Technology, Czech Republic Burget, Lukáš, Brno University of Technology, Czech Republic Matějka, Pavel, Brno University of Technology, Czech Republic Žmolíková, Kateřina, Brno University of Technology, Czech Republic Mošner, Ladislav, Brno University of Technology, Czech Republic Silnova, Anna, Brno University of Technology, Czech Republic Plchot, Oldřich, Brno University of Technology, Czech Republic Novotný, Ondřej, Brno University of Technology, Czech Republic Zeinali, Hossein, Brno University of Technology, Czech Republic Rohdin, Johan, Brno University of Technology, Czech Republic
Friday, 8 May, 15:15 - 17:15

**SPE-L17 - Paralinguistics Modeling**

**SPE-L17.1: ESTIMATING THE DEGREE OF SLEEPINESS BY INTEGRATING ARTICULATORY FEATURE KNOWLEDGE IN RAW WAVEFORM BASED CNNS**

Fritsch, Julian, Idiap Research Institute, Switzerland
Dubagunta, S. Pavankumar, Idiap Research Institute, Switzerland
Magimai.-Doss, Mathew, Idiap Research Institute, Switzerland

**SPE-L17.2: AUTOMATIC PREDICTION OF SUICIDAL RISK IN MILITARY COUPLES USING MULTIMODAL INTERACTION CUES FROM COUPLES CONVERSATIONS**

Nallan Chakravarthula, Sandeep, University of Southern California, United States
Nasir, Md, University of Southern California, United States
Tseng, Shao-Yen, University of Southern California, United States
Li, Haoqi, University of Southern California, United States
Park, Tae Jin, University of Southern California, United States
Baucom, Brian, University of Utah, United States
Bryan, Craig, University of Utah, United States
Narayanan, Shrikanth, University of Southern California, United States
Georgiou, Panayiotis, University of Southern California, United States

**SPE-L17.3: COMPARISON OF USER MODELS BASED ON GMM-UBM AND I-VECTORS FOR SPEECH, HANDWRITING, AND GAIT ASSESSMENT OF PARKINSON’S DISEASE PATIENTS**

Vasquez-Correa, Juan Camilo, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany
Bocklet, Tobias, Technische Hochschule, Germany
Orozco-Arroyave, Juan Rafael, University of Antioquia, Colombia
Nöth, Elmar, Friedrich-Alexander Universität Erlangen-Nürnberg, Colombia

**SPE-L17.4: EXPLOITING VOCAL TRACT COORDINATION USING DILATED CNNS FOR DEPRESSION DETECTION IN NATURALISTIC ENVIRONMENTS**

Huang, Zhaocheng, University of New South Wales, Australia
Epps, Julien, University of New South Wales, Australia
Joachim, Dale, Sonde Health, United States

**SPE-L17.5: DEEP LEARNING BASED PREDICTION OF HYPERNASALITY FOR CLINICAL APPLICATIONS**

C Mathad, Vikram, Arizona State University, United States
Chapman, Kathy, University of Utah, United States
Liss, Julie, Arizona State University, United States
Scherer, Nancy, Arizona State University, United States
Berisha, Visar, Arizona State University, United States
SPE-L17.6: LANGUAGE INDEPENDENT GENDER IDENTIFICATION FROM RAW WAVEFORM USING MULTI-SCALE CONVOLUTIONAL NEURAL NETWORKS

D N, Krishna, Youplus India, India D, Amrutha, Youplus India, India Reddy, Sai Sumith, Youplus India, India Acharya, Anudeepa, Youplus India, India Aashish Garapati, Prabhu, Youplus India, India B J, Triveni, Youplus India, India
SPE-P1 - Adversarial/Discriminative Training and Spoofing for Speaker Recognition

SPE-P1.1: DEFENSE AGAINST ADVERSARIAL ATTACKS ON SPOOFING COUNTERMEASURES OF ASV
Wu, Haibin, National Taiwan University, China Liu, Songxiang, Chinese University of Hong Kong, China Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China Lee, Hung-yi, National Taiwan University, Taiwan

SPE-P1.2: TEXT-INDEPENDENT SPEAKER VERIFICATION WITH ADVERSARIAL LEARNING ON SHORT UTTERANCES
Liu, Kai, Huawei Technologies Co Ltd, China Zhou, Huan, Huawei Technologies Co Ltd, China

SPE-P1.3: CHANNEL INVARIANT SPEAKER EMBEDDING LEARNING WITH JOINT MULTI-TASK AND ADVERSARIAL TRAINING
Chen, Zhengyang, Shanghai Jiao Tong University, China Wang, Shuai, Shanghai Jiao Tong University, China Qian, Yanmin, Shanghai Jiao Tong University, China Yu, Kai, Shanghai Jiao Tong University, China

SPE-P1.4: ADVERSARIAL ATTACKS ON GMM I-VECTOR BASED SPEAKER VERIFICATION SYSTEMS
Li, Xu, Chinese University of Hong Kong, Hong Kong SAR of China Zhong, Jinghua, Chinese University of Hong Kong, Hong Kong SAR of China Wu, Xixin, Chinese University of Hong Kong, Hong Kong SAR of China Yu, Jianwei, Chinese University of Hong Kong, Hong Kong SAR of China Liu, Xunying, Chinese University of Hong Kong, Hong Kong SAR of China Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China

SPE-P1.5: ORTHOGONAL TRAINING FOR TEXT-INDEPENDENT SPEAKER VERIFICATION
Zhu, Yingke, Hong Kong University of Science and Technology, Hong Kong SAR of China Mak, Brian, Hong Kong University of Science and Technology, Hong Kong SAR of China

SPE-P1.6: ASSESSING THE SCOPE OF GENERALIZED COUNTERMEASURES FOR ANTI-SPOOFING
Das, Rohan Kumar, National University of Singapore, Singapore Yang, Jichen, National University of Singapore, Singapore Li, Haizhou, National University of Singapore, Singapore
SPE-P1.7: IMPROVING SPEAKER-ATTRIBUTE ESTIMATION BY VOTING BASED ON SPEAKER CLUSTER INFORMATION

Tawara, Naohiro, NTT Communication Science Laboratories, Japan Kamiyama, Hosana, NTT Media Intelligence Laboratories, Japan Kobashikawa, Satoshi, NTT Media Intelligence Laboratories, Japan Ogawa, Atsunori, NTT Communication Science Laboratories, Japan

SPE-P1.8: AN ENSEMBLE BASED APPROACH FOR GENERALIZED DETECTION OF SPOOFING ATTACKS TO AUTOMATIC SPEAKER RECOGNIZERS

Monteiro, Joao, Institut National de la Recherche Scientifique, Canada Alam, Jahangir, Centre de Recherche Informatique de Montreal, Canada Falk, Tiago, Institut National de la Recherche Scientifique, Canada

SPE-P1.9: A DISCRIMINATIVE CONDITION-AWARE BACKEND FOR SPEAKER VERIFICATION

Ferrer, Luciana, UBA-CONICET, Argentina McLaren, Mitchell, SRI International, United States

SPE-P1.10: ADVERSARIAL MULTI-TASK LEARNING FOR SPEAKER NORMALIZATION IN REPLAY DETECTION

Suthokumar, Gajan, University of New South Wales, Australia Sethu, Vidhyasaharan, University of New South Wales, Australia Sriskandaraja, Kaavya, University of New South Wales, Australia Ambikairajah, Eliathamby, University of New South Wales, Australia

SPE-P1.11: ROBUST SPEAKER RECOGNITION USING UNSUPERVISED ADVERSARIAL INVARIANCE

Peri, Raghuveer, University of Southern California, United States Pal, Monisankha, University of Southern California, United States Jati, Arindam, University of Southern California, United States Somandepalli, Krishna, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

SPE-P1.12: A GENERALIZED FRAMEWORK FOR DOMAIN ADAPTATION OF PLDA IN SPEAKER RECOGNITION

Wang, Qiongqiong, NEC, Japan Okabe, Koji, NEC, Japan Lee, Kong Aik, NEC, Japan Koshinaka, Takafumi, NEC, Japan
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<td>SPE-P2.1</td>
<td>CP-GAN: CONTEXT PYRAMID GENERATIVE ADVERSARIAL NETWORK FOR SPEECH ENHANCEMENT</td>
<td>Liu, Gang, Sun Yat-Sen University, China Gong, Ke, DarkMatter AI Research, China Liang, Xiaodan, Sun Yat-Sen University, China Chen, Zhiguang, Sun Yat-Sen University, China</td>
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<td>SPE-P2.2</td>
<td>DENSELY CONNECTED NEURAL NETWORK WITH DILATED CONVOLUTIONS FOR REAL-TIME SPEECH ENHANCEMENT IN THE TIME DOMAIN</td>
<td>Pandey, Ashutosh, Ohio State University, United States Wang, DeLiang, Ohio State University, United States</td>
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<td>SPE-P2.3</td>
<td>PAN: PHONEME- AWARE NETWORK FOR MONAURAL SPEECH ENHANCEMENT</td>
<td>Du, Zhihao, Harbin Institute of Technology, China Lei, Ming, Alibaba Group, China Han, Jiqing, Harbin Institute of Technology, China Zhang, Shiliang, Alibaba Group, China</td>
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<td>SPE-P2.4</td>
<td>EFFICIENT TRAINABLE FRONT-ENDS FOR NEURAL SPEECH ENHANCEMENT</td>
<td>Casebeer, Jonah, University of Illinois at Urbana-Champaign, United States Isik, Umut, Amazon Web Services, United States Venkataramani, Shrikant, University of Illinois at Urbana-Champaign, United States Krishnaswamy, Arvindh, Amazon Web Services, United States</td>
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<td>SPE-P2.5</td>
<td>INVERTIBLE DNN-BASED NONLINEAR TIME-FREQUENCY TRANSFORM FOR SPEECH ENHANCEMENT</td>
<td>Takeuchi, Daiki, Waseda University, Japan Yatabe, Kohei, Waseda University, Japan Koizumi, Yuma, NTT Corporation, Japan Oikawa, Yasuhiro, Waseda University, Japan Harada, Noboru, NTT Corporation, Japan</td>
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<td>SPE-P2.6</td>
<td>T-GSA: TRANSFORMER WITH GAUSSIAN-WEIGHTED SELF-ATTENTION FOR SPEECH ENHANCEMENT</td>
<td>Kim, Jaeyoung, Google, United States El-Khamy, Mostafa, Samsung Semiconductor, Inc., United States Lee, Jungwon, Samsung Semiconductor, Inc., United States</td>
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<td>SPE-P2.7</td>
<td>REDUNDANT CONVOLUTIONAL NETWORK WITH ATTENTION MECHANISM FOR MONAURAL SPEECH ENHANCEMENT</td>
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Lan, Tian, University of Electronic Science and Technology of China, China Lyu, Yilan, University of Electronic Science and Technology of China, China Hui, Guoqiang, University of Electronic Science and Technology of China, China Mokhosi, Refuoe, University of Electronic Science and Technology of China, China Li, Sen, University of Electronic Science and Technology of China, China Liu, Qiao, University of Electronic Science and Technology of China, China

**SPE-P2.8: RESIDUAL RECURRENT NEURAL NETWORK FOR SPEECH ENHANCEMENT**

Abdulbaqi, Jalal, Rutgers, The State University of New Jersey, United States Gu, Yue, Rutgers, The State University of New Jersey, United States Chen, Shuhong, Rutgers, The State University of New Jersey, United States Marsic, Ivan, Rutgers, The State University of New Jersey, United States

**SPE-P2.9: 2D-TO-2D MASK ESTIMATION FOR SPEECH ENHANCEMENT BASED ON FULLY CONVOLUTIONAL NEURAL NETWORK**

Tu, Yanhui, University of Science and Technology of China, China Du, Jun, University of Science and Technology of China, China Lee, Chin-Hui, Georgia Institute of Technology, United States

**SPE-P2.10: SELF-SUPERVISED DENOISING AUTOENCODER WITH LINEAR REGRESSION DECODER FOR SPEECH ENHANCEMENT**

Zezario, Ryandhimas Edo, Academia Sinica, Taiwan Hussain, Tassadaq, Academia Sinica, Taiwan Lu, Xugang, National Institute of Information and Communications Technology (NICT), Japan Wang, Hsin-Min, Academia Sinica, Taiwan Tsao, Yu, Academia Sinica, Taiwan

**SPE-P2.11: FULLY CONVOLUTIONAL RECURRENT NETWORKS FOR SPEECH ENHANCEMENT**

Strake, Maximilian, Technische Universität Braunschweig, Germany Defraene, Bruno, NXP Semiconductors, Belgium Fluyt, Kristoff, NXP Semiconductors, Belgium Tirry, Wouter, NXP Semiconductors, Belgium Fingscheidt, Tim, Technische Universität Braunschweig, Germany

**SPE-P2.12: PHONETIC FEEDBACK FOR SPEECH ENHANCEMENT WITH AND WITHOUT PARALLEL SPEECH DATA**

Plantinga, Peter, Ohio State University, United States Bagchi, Deblin, Ohio State University, United States Fosler-Lussier, Eric, Ohio State University, United States
Tuesday, 5 May, 16:30 - 18:30

**SPE-P3 - Machine Learning for Speech Synthesis I**

**SPE-P3.1: SCALABLE MULTILINGUAL FRONTEND FOR TTS**
Conkie, Alistair, Apple, United States Finch, Andrew, Apple, United States

**SPE-P3.2: A UNITED SEQUENCE-TO-SEQUENCE FRONT-END MODEL FOR MANDARIN TEXT-TO-SPEECH SYNTHESIS**
Pan, Junjie, ByteDance, China Yin, Xiang, ByteDance, China Zhang, Zhiling, Shanghai Jiao Tong University, China Liu, Shichao, ByteDance, China Zhang, Yang, ByteDance, China Ma, Zejun, ByteDance, China Wang, Yuxuan, ByteDance, China

**SPE-P3.3: A HYBRID TEXT NORMALIZATION SYSTEM USING MULTI-HEAD SELF-ATTENTION FOR MANDARIN**
Zhang, Junhui, ByteDance, China Pan, Junjie, ByteDance, China Yin, Xiang, ByteDance, China Li, Chen, ByteDance, China Liu, Shichao, ByteDance, China Zhang, Yang, ByteDance, China Wang, Yuxuan, ByteDance, China Ma, Zejun, ByteDance, China

**SPE-P3.4: GENERATING DIVERSE AND NATURAL TEXT-TO-SPEECH SAMPLES USING A QUANTIZED FINE-GRAINED VAE AND AUTOREGRESSIVE PROSODY PRIOR**
Sun, Guangzhi, Cambridge University, United Kingdom Zhang, Yu, Google, United States Weiss, Ron, Google, United States Cao, Yuan, Google, United States Zen, Heiga, Google, United States Rosenberg, Andrew, Google, United States Ramabhadran, Bhuvana, Google, United States Wu, Yonghui, Google, United States

**SPE-P3.5: IMPROVING PROSODY WITH LINGUISTIC AND BERT DERIVED FEATURES IN MULTI-SPEAKER BASED MANDARIN CHINESE NEURAL TTS**
Xiao, Yujia, Microsoft China, China He, Lei, Microsoft China, China Ming, Huaiqing, Microsoft China, China Soong, Frank K., Microsoft Research Asia, China

**SPE-P3.6: FOCUSING ON ATTENTION: PROSODY TRANSFER AND ADAPTATIVE OPTIMIZATION STRATEGY FOR MULTI-SPEAKER END-TO-END SPEECH SYNTHESIS**
Fu, Ruibo, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, China Tao, Jianhua, National Laboratory of
Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, China
Wen, Zhengqi, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, China
Yi, Jiangyan, National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, China

SPE-P3.7: ALIGNTTS: EFFICIENT FEED-FORWARD TEXT-TO-SPEECH SYSTEM WITHOUT EXPLICIT ALIGNMENT
Zeng, Zhen, Ping An Technology (Shenzhen) Co., Ltd., China
Wang, Jianzong, Ping An Technology (Shenzhen) Co., Ltd., China
Cheng, Ning, Ping An Technology (Shenzhen) Co., Ltd., China
Xia, Tian, Ping An Technology (Shenzhen) Co., Ltd., China
Xiao, Jing, Ping An Technology (Shenzhen) Co., Ltd., China

SPE-P3.8: GRAPHTTS: GRAPH-TO-SEQUENCE MODELLING IN NEURAL TEXT-TO-SPEECH
Sun, Aolan, Ping An Technology (Shenzhen) Co., Ltd., China
Wang, Jianzong, Ping An Technology (Shenzhen) Co., Ltd., China
Cheng, Ning, Ping An Technology (Shenzhen) Co., Ltd., China
Peng, Huayi, Ping An Technology (Shenzhen) Co., Ltd., China
Zeng, Zhen, Ping An Technology (Shenzhen) Co., Ltd., China

SPE-P3.9: EFFECT OF CHOICE OF PROBABILITY DISTRIBUTION, RANDOMNESS, AND SEARCH METHODS FOR ALIGNMENT MODELING IN SEQUENCE-TO-SEQUENCE TEXT-TO-SPEECH SYNTHESIS USING HARD ALIGNMENT
Yasuda, Yusuke, National Institute of Informatics, Japan
Wang, Xin, National Institute of Informatics, Japan
Yamagishi, Junichi, National Institute of Informatics, Japan

SPE-P3.10: TRANSFORMER-BASED TEXT-TO-SPEECH WITH WEIGHTED FORCED ATTENTION
Okamoto, Takuma, National Institute of Information and Communications Technology (NICT), Japan
Toda, Tomoki, Nagoya University, Japan
Shiga, Yoshinori, National Institute of Information and Communications Technology (NICT), Japan
Kawai, Hisashi, National Institute of Information and Communications Technology (NICT), Japan

SPE-P3.11: IMPROVING END-TO-END SPEECH SYNTHESIS WITH LOCAL RECURRENT NEURAL NETWORK ENHANCED TRANSFORMER
Zheng, Yibin, Tencent, China Li, Xin-Hui, Tencent, China Xie, Fenglong, Tencent, China Lu, Li, Tencent, China

**SPE-P3.12: AN EFFECTIVE STYLE TOKEN WEIGHT CONTROL TECHNIQUE FOR END-TO-END EMOTIONAL SPEECH SYNTHESIS**

Kwon, Ohsung, Naver Corporation, Korea (South) Jang, Inseon, Electronics and Telecommunications Research Institute (ETRI), Korea (South) Ahn, ChungHyun, Electronics and Telecommunications Research Institute (ETRI), Korea (South) Kang, Hong-Goo, Yonsei University, Korea (South)
Tuesday, 5 May, 16:30 - 18:30

SPE-P4 - Speech Analysis and Coding

SPE-P4.1: GCI DETECTION FROM RAW SPEECH USING A FULLY-CONVOLUTIONAL NETWORK
Ardaillon, Luc, IRCAM, France Roebel, Axel, IRCAM, France

SPE-P4.2: FRAME-BASED OVERLAPPING SPEECH DETECTION USING CONVOLUTIONAL NEURAL NETWORKS
Yousefi, Midia, University of Texas at Dallas, United States Hansen, John H.L., University of Texas at Dallas, United States

SPE-P4.3: LEARNING DOMAIN INVARIANT REPRESENTATIONS FOR CHILD-ADULT CLASSIFICATION FROM SPEECH
Lahiri, Rimita, University of Southern California, United States Kumar, Manoj, University of Southern California, United States Bishop, Somer, University of California, San Francisco, United States Narayanan, Shrikanth, University of Southern California, United States

SPE-P4.4: SYLNET: AN ADAPTABLE END-TO-END SYLLABLE COUNT ESTIMATOR FOR SPEECH
Seshadri, Shreyas, Aalto University, Finland Räsänen, Okko, Tampere University of Technology, Finland

SPE-P4.5: SINGLE FREQUENCY FILTER BANK BASED LONG-TERM AVERAGE SPECTRA FOR HYPERNASALITY DETECTION AND ASSESSMENT IN CLEFT LIP AND PALATE SPEECH
Mohammad, Hashim Javid, International Institute of Information Technology, Hyderabad, India Gurugubelli, Krishna, International Institute of Information Technology, Hyderabad, India Vuppala, Anil Kumar, International Institute of Information Technology, Hyderabad, India

SPE-P4.6: AUTOREGRESSIVE PARAMETER ESTIMATION WITH DNN-BASED PRE-PROCESSING
Cui, Zihao, Beijing University of Technology, China Bao, Changchun, Beijing University of Technology, China Nielsen, Jesper Kjær, Aalborg University, Denmark Christensen, Mads Græsbøll, Aalborg University, Denmark

SPE-P4.7: ENHANCEMENT OF CODED SPEECH USING A MASK-BASED POST-FILTER
Korse, Srikanth, Fraunhofer Institute for Integrated Circuits IIS, Germany Gupta, Kishan, AudioLabs-IIS, Germany Fuchs, Guillaume, AudioLabs-IIS, Germany

**SPE-P4.8: ROBUST LOW RATE SPEECH CODING BASED ON CLONED NETWORKS AND WAVENET**

Lim, Felicia, Google, United States Kleijn, W. Bastiaan, Victoria University of Wellington, New Zealand Chinen, Michael, Google, United States Skoglund, Jan, Google, United States

**SPE-P4.9: MIXTURE FACTORIZED AUTO-ENCODER FOR UNSUPERVISED HIERARCHICAL DEEP FACTORIZATION OF SPEECH SIGNAL**

Peng, Zhiyuan, Chinese University of Hong Kong, Hong Kong SAR of China Feng, Siyuan, Chinese University of Hong Kong, Hong Kong SAR of China Lee, Tan, Chinese University of Hong Kong, Hong Kong SAR of China

**SPE-P4.10: A NOVEL APPROACH FOR INTELLIGIBILITY ASSESSMENT IN DYSARTHRIC SUBJECTS**

Tripathi, Ayush, Tata Consultancy Services, India Bhosale, Swapnil, Tata Consultancy Services, India Kopparapu, Sunil Kumar, Tata Consultancy Services, India

**SPE-P4.11: VOICE BASED CLASSIFICATION OF PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS, PARKINSON’S DISEASE AND HEALTHY CONTROLS WITH CNN-LSTM USING TRANSFER LEARNING**

Mallela, Jhansi, Indian Institute of Science, India Illa, Aravind, Indian Institute of Science, India B N, Suhas, Indian Institute of Science, India Udupa, Sathvik, Indian Institute of Science, India Belur, Yamini, National Institute of Mental Health and Neuro Sciences, India Atchayaram, Nalini, National Institute of Mental Health and Neuro Sciences, India Yadav, Ravi, National Institute of Mental Health and Neuro Sciences, India Reddy, Pradeep, National Institute of Mental Health and Neuro Sciences, India Gope, Dipanjan, Indian Institute of Science, India Ghosh, Prasanta Kumar, Indian Institute of Science, India

**SPE-P4.12: ANALYSIS OF ACOUSTIC FEATURES FOR SPEECH SOUND BASED CLASSIFICATION OF ASTHMATIC AND HEALTHY SUBJECTS**

Yadav, Shivani, Indian Institute of Science, India Keerthana, Merugu, Rajiv Gandhi University of Knowledge Technologies, Kadapa, India Gope, Dipanjan, Indian Institute of Science, India Krishnaswamy, Uma Maheswari, St. Johns National Academy of Health Sciences, India Ghosh, Prasanta Kumar, Indian Institute of Science, India
SPE-P5 - Deep Speaker Recognition Models

SPE-P5.1: FREQUENCY AND TEMPORAL CONVOLUTIONAL ATTENTION FOR TEXT-INDEPENDENT SPEAKER RECOGNITION
Yadav, Sarthak, Staqu Technologies, India Rai, Atul, Staqu Technologies, India

SPE-P5.2: FRAME-LEVEL PHONEME-INVARIANT SPEAKER EMBEDDING FOR TEXT-INDEPENDENT SPEAKER RECOGNITION ON EXTREMELY SHORT UTTERANCES
Tawara, Naohiro, NTT Communication Science Laboratories, Japan Ogawa, Atsunori, NTT Communication Science Laboratories, Japan Iwata, Tomoharu, NTT Communication Science Laboratories, Japan Delcroix, Marc, NTT Communication Science Laboratories, Japan Ogawa, Tetsuji, Waseda University, Japan

SPE-P5.3: PROTOTYPICAL NETWORKS FOR SMALL FOOTPRINT TEXT-INDEPENDENT SPEAKER VERIFICATION
Ko, Tom, South University of Science and Technology, China Chen, Yangbin, City University of Hong Kong, Hong Kong SAR of China Li, Qing, Hong Kong Polytechnic University, Hong Kong SAR of China

SPE-P5.4: TDMF: TASK-DRIVEN MULTILEVEL FRAMEWORK FOR END-TO-END SPEAKER VERIFICATION
Chen, Chen, Harbin Institute of Technology, China Han, Jiqing, Harbin Institute of Technology, China

SPE-P5.5: AN IMPROVED DEEP NEURAL NETWORK FOR MODELING SPEAKER CHARACTERISTICS AT DIFFERENT TEMPORAL SCALES
Gu, Bin, University of Science and Technology of China, China Guo, Wu, University of Science and Technology of China, China Dai, Li-Rong, University of Science and Technology of China, China Du, Jun, University of Science and Technology of China, China

SPE-P5.6: PARTIAL AUC OPTIMIZATION BASED DEEP SPEAKER EMBEDDINGS WITH CLASS-CENTER LEARNING FOR TEXT-INDEPENDENT SPEAKER VERIFICATION
Bai, Zhongxin, Northwestern Polytechnical University, China Zhang, Xiao-Lei, Northwestern Polytechnical University, China Chen, Jingdong, Northwestern Polytechnical University, China
SPE-P5.7: KNOWLEDGE DISTILLATION AND RANDOM ERASING DATA AUGMENTATION FOR TEXT-DEPENDENT SPEAKER VERIFICATION
Mingote, Victoria, University of Zaragoza, Spain Miguel, Antonio, University of Zaragoza, Spain Ribas, Dayana, University of Zaragoza, Spain Ortega, Alfonso, University of Zaragoza, Spain Lleida, Eduardo, University of Zaragoza, Spain

SPE-P5.8: DISENTANGLLED SPEECH EMBEDDINGS USING CROSS-MODAL SELF-SUPERVISION
Nagrani, Arsha, Oxford University, United Kingdom Chung, Joon Son, Oxford University, United Kingdom Albanie, Samuel, Oxford University, United Kingdom Zisserman, Andrew, Oxford University, United Kingdom

SPE-P5.9: IMPROVING DEEP CNN NETWORKS WITH LONG TEMPORAL CONTEXT FOR TEXT-INDEPENDENT SPEAKER VERIFICATION
Zhao, Yong, Microsoft Corporation, United States Zhou, Tianyan, Microsoft Corporation, United States Wu, Jian, Microsoft Corporation, United States

SPE-P5.10: MULTI-LEVEL DEEP NEURAL NETWORK ADAPTATION FOR SPEAKER VERIFICATION USING MMD AND CONSISTENCY REGULARIZATION
Lin, Weiwei, Hong Kong Polytechnic University, Hong Kong SAR of China Mak, Man-Mai, Hong Kong Polytechnic University, China Li, Na, Tencent AI Lab, China Su, Dan, Tencent AI Lab, China Yu, Dong, Tencent AI Lab, China

SPE-P5.11: MULTI-TASK LEARNING FOR SPEAKER VERIFICATION AND VOICE TRIGGER DETECTION
Sigtia, Siddharth, Apple, United States Marchi, Erik, Apple, United States Kajarekar, Sachin, Apple, United States Naik, Devang, Apple, United States Bridle, John, Apple, United States

SPE-P5.12: STATISTICS POOLING TIME DELAY NEURAL NETWORK BASED ON X-VECTOR FOR SPEAKER VERIFICATION
Hong, Qian-Bei, National Cheng Kung University and Academia Sinica, Taiwan Wu, Chung-Hsien, National Cheng Kung University and Academia Sinica, Taiwan Wang, Hsin-Min, National Cheng Kung University and Academia Sinica, Taiwan Huang, Chien-Lin, Ping An Technology (Shenzhen) Co., Ltd., United States
### SPE-P6.1: SNDCNN: SELF-NORMALIZING DEEP CNNS WITH SCALED EXPONENTIAL LINEAR UNITS FOR SPEECH RECOGNITION

Huang, Zhen, Apple, United States
Ng, Tim, Apple, United States
Liu, Leo, Apple, United States
Mason, Henry, Apple, United States
Zhuang, Xiaodan, Apple, United States
Liu, Daben, Apple, United States

### SPE-P6.2: ROBUST MULTI-CHANNEL SPEECH RECOGNITION USING FREQUENCY ALIGNED NETWORK

Park, Taejin, University of Southern California, United States
Kumatani, Kenichi, Amazon, Inc., United States
Wu, Minhua, Amazon, Inc., United States
Sundaram, Shiva, Amazon, Inc., United States

### SPE-P6.3: FULLY LEARNABLE FRONT-END FOR MULTI-CHANNEL ACOUSTIC MODELING USING SEMI-SUPERVISED LEARNING

Wager, Sanna, Indiana University, United States
Khare, Aparna, Amazon, Inc., United States
Wu, Minhua, Amazon, Inc., United States
Sundaram, Shiva, Amazon, Inc., United States

### SPE-P6.4: G2G: TTS-DRIVEN PRONUNCIATION LEARNING FOR GRAPHEMIC HYBRID ASR

Le, Duc, Facebook, United States
Koehler, Thilo, Facebook, United States
Fuegen, Christian, Facebook, United States
Seltzer, Michael L., Facebook, United States

### SPE-P6.5: TRANSFORMER-BASED ACOUSTIC MODELING FOR HYBRID SPEECH RECOGNITION

Wang, Yongqiang, Facebook, United States
Mohamed, Abdelrahman, Facebook, United States
Le, Duc, Facebook, United States
Chunxi, Facebook, United States
Xiao, Alex, Facebook, United States
Mahadeokar, Jay, Facebook, United States
Huang, Hongzhao, Facebook, United States
Tjandra, Andros, Facebook, United States
Zhang, Xiaohui, Facebook, United States
Zhang, Frank, Facebook, United States
Fuegen, Christian, Facebook, United States
Seltzer, Michael L., Facebook, United States

### SPE-P6.6: SPECAUGMENT ON LARGE SCALE DATASETS

Park, Daniel, Google, Inc., United States
Zhang, Yu, Google, Inc., United States
Chiu, Chung-Cheng, Google, Inc., United States
Chen, Youzheng, Google, Inc., United States
China Li, Bo, Google, Inc., United States  
Chan, William, Google, Inc., Canada  
Le, Quoc, Google, Inc., United States  
Wu, Yonghui, Google, Inc., United States

**SPE-P6.7: FAST TRAINING OF DEEP NEURAL NETWORKS FOR SPEECH RECOGNITION**

Cong, Guojing, IBM, United States  
Kingsbury, Brian, IBM, United States  
Yang, Chih-Chieh, IBM, United States  
Liu, Tianyi, Georgia Institute of Technology, United States

**SPE-P6.8: UNSUPERVISED PRE-TRAINING OF BIDIRECTIONAL SPEECH ENCODERS VIA MASKED RECONSTRUCTION**

Wang, Weiran, Amazon, Inc., United States  
Tang, Qingming, Amazon, Inc., United States  
Livescu, Karen, TTI-Chicago, United States

**SPE-P6.9: DISTILLING ATTENTION WEIGHTS FOR CTC-BASED ASR SYSTEMS**

Moriya, Takafumi, NTT Corporation, Japan  
Sato, Hiroshi, NTT Corporation, Japan  
Tanaka, Tomohiro, NTT Corporation, Japan  
Ashihara, Takanori, NTT Corporation, Japan  
Masumura, Ryo, NTT Corporation, Japan  
Shinohara, Yusuke, NTT Corporation, Japan

**SPE-P6.10: DEJA-VU: DOUBLE FEATURE PRESENTATION AND ITERATED LOSS IN DEEP TRANSFORMER NETWORKS**

Tjandra, Andros, Nara Institute of Science and Technology, Japan  
Liu, Chunxi, Facebook AI, United States  
Zhang, Frank, Facebook AI, United States  
Zhang, Xiaohui, Facebook AI, United States  
Wang, Yongqiang, Facebook AI, United States  
Synnaeve, Gabriel, Facebook AI, United States  
Nakamura, Satoshi, Nara Institute of Science and Technology, Japan  
Zweig, Geoffrey, Facebook AI, United States

**SPE-P6.11: FRAME-LEVEL MMI AS A SEQUENCE DISCRIMINATIVE TRAINING CRITERION FOR LVCSR**

Michel, Wilfried, RWTH Aachen University, Germany  
Schlüter, Ralf, RWTH Aachen University, Germany

**SPE-P6.12: CROSS LINGUAL TRANSFER LEARNING FOR ZERO-RESOURCE DOMAIN ADAPTATION**

Abad, Alberto, INESC-ID/IST, Portugal  
Bell, Peter, CSTR/University of Edinburgh, United Kingdom  
Carmantini, Andrea, CSTR/University of Edinburgh, United Kingdom  
Renals, Steve, CSTR/University of Edinburgh, United Kingdom
Wednesday, 6 May, 11:30 - 13:30

SPE-P7 - Speech Enhancement III: Hearing Aids and other Applications

SPE-P7.1: IMPROVING ROBUSTNESS OF DEEP LEARNING BASED MONAURAL SPEECH ENHANCEMENT AGAINST PROCESSING ARTIFACTS
Tan, Ke, Ohio State University, United States Wang, DeLiang, Ohio State University, United States

SPE-P7.2: CAD-AEC: CONTEXT-AWARE DEEP ACOUSTIC ECHO CANCELLATION
Fazel, Amin, Samsung, United States El-Khamy, Mostafa, Samsung, United States Lee, Jungwon, Samsung, United States

SPE-P7.3: ARTIFICIAL BANDWIDTH EXTENSION USING CONDITIONAL VARIATIONAL AUTO-ENCODERS AND ADVERSARIAL LEARNING
Bachhav, Pramod, EURECOM, France Todisco, Massimiliano, EURECOM, France Evans, Nicholas, EURECOM, France

SPE-P7.4: USING AUTOMATIC SPEECH RECOGNITION AND SPEECH SYNTHESIS TO IMPROVE THE INTELLIGIBILITY OF COCHLEAR IMPLANT USERS IN REVERBERANT LISTENING ENVIRONMENTS
Chu, Kevin, Duke University, United States Collins, Leslie, Duke University, United States Mainsah, Boyla, Duke University, United States

SPE-P7.5: SPEECH INTELLIGIBILITY ENHANCEMENT BY EQUALIZATION FOR IN-CAR APPLICATIONS
Gentet, Enguerrand, Groupe PSA, France David, Bertrand, LTCI Télécom Paris, France Denjean, Sébastien, Groupe PSA, France Richard, Gaël, LTCI Télécom Paris, France Roussarie, Vincent, Groupe PSA, France

SPE-P7.6: MAXIMUM LIKELIHOOD ESTIMATION OF THE INTERFERENCE-PLUS-NOISE CROSS POWER SPECTRAL DENSITY MATRIX FOR OWN VOICE RETRIEVAL
Hoang, Poul, Aalborg University, Denmark Tan, Zheng-Hua, Aalborg University, Denmark Lunner, Thomas, Oticon A/S, Denmark de Haan, Jan Mark, Oticon A/S, Denmark Jensen, Jesper, Oticon A/S, Denmark

SPE-P7.7: A CONSTRAINED MAXIMUM LIKELIHOOD ESTIMATOR OF SPEECH AND NOISE SPECTRA WITH APPLICATION TO MULTI-MICROPHONE NOISE REDUCTION
Zahedi, Adel, Oticon A/S, Denmark Pedersen, Michael Syskind, Oticon A/S, Denmark Østergaard, Jan, Aalborg University, Denmark Bramsløw, Lars, Oticon A/S, Denmark Christiansen, Thomas Ulrich, Oticon A/S, Denmark Jensen, Jesper, Oticon A/S, Denmark

SPE-P7.8: CLCNET: DEEP LEARNING-BASED NOISE REDUCTION FOR HEARING AIDS USING COMPLEX LINEAR CODING


SPE-P7.9: A TIME-FREQUENCY NETWORK WITH CHANNEL ATTENTION AND NON-LOCAL MODULES FOR ARTIFICIAL BANDWIDTH EXTENSION

Dong, Yuanjie, School of Computer Science and Technology, Wuhan University of Technology, China Li, Yaxing, School of Computer Science and Technology, Wuhan University of Technology, China Li, Xiaoqi, School of Computer Science and Technology, Wuhan University of Technology, China Xu, Shan, School of Computer Science and Technology, Wuhan University of Technology, China Wang, Dan, School of Computer Science and Technology, Wuhan University of Technology, China Zhang, Zhihui, School of Computer Science and Technology, Wuhan University of Technology, China Xiong, Shengwu, School of Computer Science and Technology, Wuhan University of Technology, China

SPE-P7.10: MASKING AND INPAINTING: A TWO-STAGE SPEECH ENHANCEMENT APPROACH FOR LOW SNR AND NON-STATIONARY NOISE

Hao, Xiang, Inner Mongolia University, China Su, Xiangdong, Inner Mongolia University, China Wen, Shixue, Sogou incorporated, China Wang, Zhiyu, Inner Mongolia University, China Pan, Yiqian, Sogou incorporated, China Bao, Feilong, Inner Mongolia University, China Chen, Wei, Sogou incorporated, China

SPE-P7.11: 3-D ACOUSTIC MODELING FOR FAR-FIELD MULTI-CHANNEL SPEECH RECOGNITION

Purushothaman, Anurenjan, Indian Institute of Science, Bangalore, India Sreeram, Anirudh, Indian Institute of Science, Bangalore, India Ganapathy, Sriram, Indian Institute of Science, Bangalore, India
Wednesday, 6 May, 11:30 - 13:30

**SPE-P8 - Robust Speech Recognition**

**SPE-P8.1: IMPROVING REVERBERANT SPEECH TRAINING USING DIFFUSE ACOUSTIC SIMULATION**

Tang, Zhenyu, University of Maryland, United States
Chen, Lianwu, Tencent AI Lab, United States
Wu, Bo, Tencent AI Lab, United States
Yu, Dong, Tencent AI Lab, United States
Manocha, Dinesh, University of Maryland, United States

**SPE-P8.2: LOW-FREQUENCY COMPENSATED SYNTHETIC IMPULSE RESPONSES FOR IMPROVED FAR-FIELD SPEECH RECOGNITION**

Tang, Zhenyu, University of Maryland, United States
Meng, Hsien-Yu, University of Maryland, United States
Manocha, Dinesh, University of Maryland, United States

**SPE-P8.3: AIPNET: GENERATIVE ADVERSARIAL PRE-TRAINING OF ACCENT-INVARIANT NETWORKS FOR END-TO-END SPEECH RECOGNITION**

Chen, Yi-Chen, National Taiwan University, Taiwan
Yang, Zhaojun, Facebook, United States
Yeh, Ching-Feng, Facebook, United States
Jain, Mahaveer, Facebook, United States
Seltzer, Michael L., Facebook, United States

**SPE-P8.4: AUDIO-VISUAL RECOGNITION OF OVERLAPPED SPEECH FOR THE LRS2 DATASET**

Yu, Jianwei, Chinese University of Hong Kong, Hong Kong SAR of China
Zhang, Shi-Xiong, Tencent AI Lab, United States
Wu, Jian, Tencent, China
Ghobrani, Shahram, University of Texas at Dallas, United States
Bo, Tencent, China
Kang, Shiyin, Tencent, China
Liu, Shansong, Chinese University of Hong Kong, Hong Kong SAR of China
Liu, Xunying, Chinese University of Hong Kong, Hong Kong SAR of China
Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China
Yu, Dong, Tencent, United States

**SPE-P8.5: MULTI-TASK SELF-SUPERVISED LEARNING FOR ROBUST SPEECH RECOGNITION**

Ravanelli, Mirco, Université de Montréal, Canada
Zhong, Jianyuan, University of Rochester, United States
Pascual, Santiago, Universitat Politecnica de Catalunya, Spain
Swietojanski, Pawel, University of New South Wales, Australia
Monteiro, Joao, Institut National de la Recherche Scientifique/Computer Research Institute of Montréal, Canada
Trmal, Jan, Johns Hopkins University, Canada
Bengio, Yoshua, Université de Montréal, Canada

**SPE-P8.6: END-TO-END MULTI-PERSON AUDIO/VISUAL AUTOMATIC SPEECH RECOGNITION**
SPE-P8.7: END-TO-END AUTOMATIC SPEECH RECOGNITION INTEGRATED WITH CTC-BASED VOICE ACTIVITY DETECTION
Yoshimura, Takenori, Nagoya University, Japan Hayashi, Tomoki, Nagoya University, Japan Takeda, Kazuya, Nagoya University, Japan Watanabe, Shinji, Johns Hopkins University, United States

SPE-P8.8: END-TO-END TRAINING OF TIME DOMAIN AUDIO SEPARATION AND RECOGNITION
von Neumann, Thilo, Paderborn University, Germany Kinoshita, Keisuke, NTT, Japan Drude, Lukas, Paderborn University, Germany Boeddeker, Christoph, Paderborn University, Germany Delcroix, Marc, NTT, Japan Nakatani, Tomohiro, NTT, Japan Haeb-Umbach, Reinhold, Paderborn University, Germany

SPE-P8.9: IMPROVING NOISE ROBUST AUTOMATIC SPEECH RECOGNITION WITH SINGLE-CHANNEL TIME-DOMAIN ENHANCEMENT NETWORK
Kinoshita, Keisuke, NTT, Japan Ochiai, Tsubasa, NTT, Japan Delcroix, Marc, NTT, Japan Nakatani, Tomohiro, NTT, Japan

SPE-P8.10: A PRACTICAL TWO-STAGE TRAINING STRATEGY FOR MULTI-STREAM END-TO-END SPEECH RECOGNITION
Li, Ruizhi, Johns Hopkins University, United States Sell, Gregory, Johns Hopkins University, United States Wang, Xiaofei, Microsoft, United States Watanabe, Shinji, Johns Hopkins University, United States Hermansky, Hynek, Johns Hopkins University, United States

SPE-P8.11: MULTI-SCALE OCTAVE CONVOLUTIONS FOR ROBUST SPEECH RECOGNITION
Rownicka, Joanna, University of Edinburgh, United Kingdom Bell, Peter, University of Edinburgh, United Kingdom Renals, Steve, University of Edinburgh, United Kingdom

SPE-P8.12: LEARNING NOISE INVARIANT FEATURES THROUGH TRANSFER LEARNING FOR ROBUST END-TO-END SPEECH RECOGNITION
Zhang, Shucong, University of Edinburgh, United Kingdom Do, Cong-Thanh, Toshiba Research Europe Limited Company, United Kingdom Doddipatla, Rama, Toshiba Research Europe Limited Company, United Kingdom Renals, Steve, University of Edinburgh, United Kingdom
Wednesday, 6 May, 16:30 - 18:30

SPE-P9 - End-to-end Speech Recognition III: General Topics

SPE-P9.1: IMPROVING SPEECH RECOGNITION USING CONSISTENT PREDICTIONS ON SYNTHESIZED SPEECH
Wang, Gary, Simon Fraser University, Canada Rosenberg, Andrew, Google, United States Chen, Zhehuai, Google, United States Zhang, Yu, Google, United States Ramabhadran, Bhuvana, Google, United States Wu, Yonghui, Google, United States Moreno, Pedro, Google, United States

SPE-P9.2: ATTENTION-BASED ASR WITH LIGHTWEIGHT AND DYNAMIC CONVOLUTIONS
Fujita, Yuya, Yahoo Japan Corporation, Japan Subramanian, Aswin Shanmugam, Johns Hopkins University, United States Omachi, Motoi, Yahoo Japan Corporation, Japan Watanabe, Shinji, Johns Hopkins University, United States

SPE-P9.3: AN ATTENTION-BASED JOINT ACOUSTIC AND TEXT ON-DEVICE END-TO-END MODEL

SPE-P9.4: STRUCTURED SPARSE ATTENTION FOR END-TO-END AUTOMATIC SPEECH RECOGNITION
Xue, Jiabin, Harbin Institute of Technology, China Zheng, Tieran, Harbin Institute of Technology, China Han, Jiqing, Harbin Institute of Technology, China

SPE-P9.5: RNN-TRANSUDER WITH STATELESS PREDICTION NETWORK
Ghodsi, Mohammadreza, Google, United States Liu, Xiaofeng, Google, United States Apfel, James, Google, United States Cabrera, Rodrigo, Google, United States Weinstein, Eugene, Google, United States

SPE-P9.6: SEQUENCE-LEVEL CONSISTENCY TRAINING FOR SEMI-SUPERVISED END-TO-END AUTOMATIC SPEECH RECOGNITION
Masumura, Ryo, NTT Corporation, Japan Ihori, Mana, NTT Corporation, Japan Takashima, Akihiko, NTT Corporation, Japan Moriya, Taka, NTT Corporation, Japan Ando, Atsushi, NTT Corporation, Japan Shinohara, Yusuke, NTT Corporation, Japan

SPE-P9.7: INDEPENDENT LANGUAGE MODELING ARCHITECTURE FOR END-TO-END ASR
Pham, Van Tung, Nanyang Technological University, Singapore Xu, Haihua, Nanyang Technological University, Singapore Khassanov, Yerbolat, Nazarbayev University, Kazakhstan Zeng, Zhiping, Nanyang Technological University, Singapore Chng, Eng Siong, Nanyang Technological University, Singapore Ni, Chongjia, Alibaba Group, Singapore Ma, Bin, Alibaba Group, Singapore Li, Haizhou, National University of Singapore, Singapore

SPE-P9.8: SPEAKER-AWARE TRAINING OF ATTENTION-BASED END-TO-END SPEECH RECOGNITION USING NEURAL SPEAKER EMBEDDINGS
Rouhe, Aku, Aalto University, Finland Kaseva, Tuomas, Aalto University, Finland Kurimo, Mikko, Aalto University, Finland

SPE-P9.9: GENERATING SYNTHETIC AUDIO DATA FOR ATTENTION-BASED SPEECH RECOGNITION SYSTEMS
Rossenbach, Nick, RWTH Aachen University, Germany Zeyer, Albert, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-P9.10: CORRECTION OF AUTOMATIC SPEECH RECOGNITION WITH TRANSFORMER SEQUENCE-TO-SEQUENCE MODEL
Hrinchuk, Oleksii, Moscow Institute of Physics and Technology, NVIDIA, Russia Popova, Mariya, Carnegie Mellon University and NVIDIA, United States Ginsburg, Boris, NVIDIA, United States

SPE-P9.11: EXPLORING PRE-TRAINING WITH ALIGNMENTS FOR RNN TRANSDUCER BASED END-TO-END SPEECH RECOGNITION
Hu, Hu, Georgia Institute of Technology, United States Zhao, Rui, Microsoft, United States Li, Jinyu, Microsoft, United States Lu, Liang, Microsoft, United States Gong, Yifan, Microsoft, United States

SPE-P9.12: SELF-TRAINING FOR END-TO-END SPEECH RECOGNITION
Kahn, Jacob, Facebook, United States Lee, Ann, Facebook, United States Hannun, Awni, Facebook, United States
Thursday, 7 May, 09:00 - 11:00

**SPE-P10 - Speaker Diarization and Characterization**

**SPE-P10.1: TOWARD BETTER SPEAKER EMBEDDINGS: AUTOMATED COLLECTION OF SPEECH SAMPLES FROM UNKNOWN DISTINCT SPEAKERS**

Pham, Minh, Worcester Polytechnic Institute, United States  
Li, Zeqian, Worcester Polytechnic Institute, United States  
Whitehill, Jacob, Worcester Polytechnic Institute, United States

**SPE-P10.2: CHANNEL ADVERSARIAL TRAINING FOR SPEAKER VERIFICATION AND DIARIZATION**

Luu, Chau, University of Edinburgh, United Kingdom  
Bell, Peter, University of Edinburgh, United Kingdom  
Renals, Steve, University of Edinburgh, United Kingdom

**SPE-P10.3: PROGRESSIVE MULTI-TARGET NETWORK BASED SPEECH ENHANCEMENT WITH SNR-PRESELECTION FOR ROBUST SPEAKER DIARIZATION**

Sun, Lei, University of Science and Technology of China, China  
Du, Jun, University of Science and Technology of China, China  
Zhang, Xueyang, IFLYTEK Research, China  
Gao, Tian, IFLYTEK Research, China  
Fang, Xin, IFLYTEK Research, China  
Lee, Chin-Hui, Georgia Institute of Technology, United States

**SPE-P10.4: IMPROVED LARGE-MARGIN SOFTMAX LOSS FOR SPEAKER DIARISATION**

Fathullah, Yassir, University of Cambridge, United Kingdom  
Zhang, Chao, University of Cambridge, United Kingdom  
Woodland, Philip, University of Cambridge, United Kingdom

**SPE-P10.5: SPEAKER DIARIZATION WITH SESSION-LEVEL SPEAKER EMBEDDING REFINEMENT USING GRAPH NEURAL NETWORKS**

Wang, Jixuan, University of Toronto, Canada  
Xiao, Xiong, Microsoft, Canada  
Wu, Jian, Microsoft, Canada  
Ramamurthy, Ranjani, Microsoft, Canada  
Rudzicz, Frank, University of Toronto, Canada

**SPE-P10.6: OVERLAP-AWARE DIARIZATION: RESEGMENTATION USING NEURAL END-TO-END OVERLAPPED SPEECH DETECTION**

Bullock, Latané, Rice University, United States  
Bredin, Hervé, LIMSI, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, France  
Perera, Leibny Paola Garcia, Johns Hopkins University, United States
SPE-P10.7: ON THE IMPORTANCE OF VOCAL TRACT CONSTRICTION FOR SPEAKER CHARACTERIZATION: THE WHISPERED SPEECH STUDY
Das, Rohan Kumar, National University of Singapore, Singapore Li, Haizhou, National University of Singapore, Singapore

SPE-P10.8: PYANNOTE.AUDIO: NEURAL BUILDING BLOCKS FOR SPEAKER DIARIZATION
Bredin, Hervé, LIMSI, CNRS, Université Paris-Saclay, France Yin, Ruiqing, LIMSI, CNRS, Université Paris-Saclay, France Coria, Juan Manuel, LIMSI, CNRS, Univ. Paris-Sud, Université Paris-Saclay, France Gelly, Gregory, LIMSI, CNRS, France Korshunov, Pavel, Idiap Research Institute, Switzerland Lavechin, Marvin, Ecole Normale Supérieure/INRIA, France Fustes, Diego, Toptal LLC, Spain Titeux, Hadrien, Université PSL, France Bouaziz, Wassim, Ecole Normale Supérieure/INRIA, France Gill, Marie-Philippe, Ecole de Technologie Supérieure, Université du Québec, Canada

SPE-P10.9: SPEAKER EMBEDDINGS INCORPORATING ACOUSTIC CONDITIONS FOR DIARIZATION
Higuchi, Yosuke, Waseda University, Japan Suzuki, Masayuki, IBM, Japan Kurata, Gakuto, IBM, Japan

SPE-P10.10: SUPERVISED ONLINE DIARIZATION WITH SAMPLE MEAN LOSS FOR MULTI-DOMAIN DATA
Fini, Enrico, PerVoice, Italy Brutti, Alessio, Fondazione Bruno Kessler, Italy

SPE-P10.11: INVESTIGATION OF SPECAUGMENT FOR DEEP SPEAKER EMBEDDING LEARNING
Wang, Shuai, Shanghai Jiao Tong University, China Rohdin, Johan, Brno University of Technology, Czech Republic Plchot, Oldřich, Brno University of Technology, Czech Republic Burget, Lukáš, Brno University of Technology, Czech Republic Yu, Kai, Shanghai Jiao Tong University, China Cernocky, Jan, Brno University of Technology, Czech Republic
Thursday, 7 May, 09:00 - 11:00

**SPE-P11 - Emotion**

**SPE-P11.1: SPEAKER-INVARIANT AFFECTIVE REPRESENTATION LEARNING VIA ADVERSARIAL TRAINING**

Li, Haoqi, University of Southern California, United States
Tu, Ming, JD AI Research, United States
Huang, Jing, JD AI Research, United States
Narayanan, Shrikanth, University of Southern California, United States
Georgiou, Panayiotis, University of Southern California, United States

**SPE-P11.2: SPEECH SENTIMENT ANALYSIS VIA PRE-TRAINED FEATURES FROM END-TO-END ASR MODELS**

Lu, Zhiyun, University of Southern California, United States
Cao, Liangliang, Google, Inc., United States
Zhang, Yu, Google, Inc., United States
Chiu, Chung-Cheng, Google, Inc., United States
Fan, James, Google, Inc., United States

**SPE-P11.3: GENDER DIFFERENCES ON THE PERCEPTION AND PRODUCTION OF UTTERANCES WITH WILLINGNESS AND RELUCTANCE IN CHINESE**

Li, Wenqian, Shanghai Jiao Tong University, China
Wong, Janice Wing-Sze, Hong Kong Baptist University, Hong Kong SAR of China
Tu, Jung-yueh, National Chengchi University, Taiwan

**SPE-P11.4: HIERARCHICAL ATTENTION TRANSFER NETWORKS FOR DEPRESSION ASSESSMENT FROM SPEECH**

Zhao, Ziping, Tianjin Normal University, China
Bao, Zhongtian, Tianjin Normal University, China
Zhang, Zixing, Imperial College London, United Kingdom
Cummins, Nicholas, University of Augsburg, Germany
Wang, Haishuai, Fairfield University, United States
Schuller, Björn, Imperial College London, United Kingdom

**SPE-P11.5: DETECTING EMOTION PRIMITIVES FROM SPEECH AND THEIR USE IN DISCERNING CATEGORICAL EMOTIONS**

Kowtha, Vasudha, University of Maryland, College Park, United States
Mitra, Vikramjit, Apple, United States
Bartels, Chris, Apple, United States
Marchi, Erik, Apple, United States
Booker, Sue, Apple, United States
Caruso, William, Apple, United States
Kajarekar, Sachin, Apple, United States
Naik, Devang, Apple, United States

**SPE-P11.6: X-VECTORS MEET EMOTIONS: A STUDY ON DEPENDENCIES BETWEEN EMOTION AND SPEAKER RECOGNITION**
Pappagari, Raghavendra, Johns Hopkins University, United States
Wang, Tianzi, Johns Hopkins University, United States
Villalba, Jesús, Johns Hopkins University, United States
Chen, Nanxin, Johns Hopkins University, United States
Dehak, Najim, Johns Hopkins University, United States

**SPE-P11.7: SPEECH EMOTION RECOGNITION WITH LOCAL-GLOBAL AWARE DEEP REPRESENTATION LEARNING**

Liu, Jiaxing, Tianjin University, China
Liu, Zhilei, Tianjin University, China
Wang, Longbiao, Tianjin University, China
Guo, Lili, Tianjin University, China
Dang, Jianwu, Japan Advanced Institute of Science and Technology, Japan

**SPE-P11.8: MULTI-HEAD ATTENTION FOR SPEECH EMOTION RECOGNITION WITH AUXILIARY LEARNING OF GENDER RECOGNITION**

Nediyanchath, Anish, Samsung R&D Institute India - Bangalore, India
Paramasivam, Periyasamy, Samsung R&D Institute India - Bangalore, India
Yenigalla, Promod, Samsung R&D Institute India - Bangalore, India

**SPE-P11.9: GENERATING AND PROTECTING AGAINST ADVERSARIAL ATTACKS FOR DEEP SPEECH-BASED EMOTION RECOGNITION MODELS**

Ren, Zhao, University of Augsburg, Germany
Baird, Alice, University of Augsburg, Germany
Han, Jing, University of Augsburg, Germany
Zhang, Zixing, Imperial College London, United Kingdom
Schuller, Björn, Imperial College London, United Kingdom and University of Augsburg, Germany

**SPE-P11.10: DEEP ENCODED LINGUISTIC AND ACOUSTIC CUES FOR ATTENTION BASED END TO END SPEECH EMOTION RECOGNITION**

Bhosale, Swapnil, TCS Research and Innovation, India
Chakraborty, Rupayan, TCS Research and Innovation, India
Kopparapu, Sunil Kumar, TCS Research and Innovation, India

**SPE-P11.11: MULTI-CONDITIONING AND DATA AUGMENTATION USING GENERATIVE NOISE MODEL FOR SPEECH EMOTION RECOGNITION IN NOISY CONDITIONS**

Tiwari, Upasana, TCS Research and Innovation, India
Soni, Meet, TCS Research and Innovation, India
Chakraborty, Rupayan, TCS Research and Innovation, India
Panda, Ashish, TCS Research and Innovation, India

**SPE-P11.12: A SELF-ATTENTIVE EMOTION RECOGNITION NETWORK**

Partaourides, Harris, Cyprus University of Technology, Cyprus
Papadamou, Kostantinos, Cyprus University of Technology, Cyprus
Kourtellis, Nicolas, Cyprus
Telefonica Research, Spain Leontiades, Ilias, Samsung AI, United Kingdom Chatzis, Sotirios, Cyprus University of Technology, Cyprus
Thursday, 7 May, 11:30 - 13:30

SPE-P12 - Machine Learning for Speech Synthesis II

**SPE-P12.1: EFFICIENT SHALLOW WAVENET VOCODER USING MULTIPLE SAMPLES OUTPUT BASED ON LAPLACIAN DISTRIBUTION AND LINEAR PREDICTION**

Lumban Tobing, Patrick, Nagoya University, Japan Wu, Yi-Chiao, Nagoya University, Japan Hayashi, Tomoki, Nagoya University, Japan Kobayashi, Kazuhiro, Nagoya University, Japan Toda, Tomoki, Nagoya University, Japan

**SPE-P12.2: FLOW-TTS: A NON-AUTOREGRESSIVE NETWORK FOR TEXT TO SPEECH BASED ON FLOW**

Miao, Chenfeng, Ping An Technology (Shenzhen) Co., Ltd., China Liang, Shuang, Ping An Technology (Shenzhen) Co., Ltd., China Chen, Minchuan, Ping An Technology (Shenzhen) Co., Ltd., China Ma, Jun, Ping An Technology (Shenzhen) Co., Ltd., China Wang, Shaojun, Ping An Technology (Shenzhen) Co., Ltd., China Xiao, Jing, Ping An Technology (Shenzhen) Co., Ltd., China

**SPE-P12.3: WAVEFFJORD: FFJORD-BASED VOCODER FOR STATISTICAL PARAMETRIC SPEECH SYNTHESIS**

Wu, Ning-Qian, University of Science and Technology of China, China Ling, Zhen-Hua, University of Science and Technology of China, China

**SPE-P12.4: IMPROVING LPCNET-BASED TEXT-TO-SPEECH WITH LINEAR PREDICTION-STRUCTURED MIXTURE DENSITY NETWORK**

Hwang, Min-Jae, Yonsei university, Korea (South) Song, Eunwoo, Naver corporation, Korea (South) Yamamoto, Ryuichi, LINE Corporation, Japan Soong, Frank K., Microsoft Research Asia, China Kang, Hong-Goo, Yonsei university, Korea (South)

**SPE-P12.5: DISENTANGLING TIMBRE AND SINGING STYLE WITH MULTI-SINGER SINGING SYNTHESIS SYSTEM**

Lee, Juheon, Seoul National University, Korea (South) Choi, Hyeong-Seok, Seoul National University, Korea (South) Koo, Junghyun, Seoul National University, Korea (South) Lee, Kyogu, Seoul National University, Korea (South)

**SPE-P12.6: SEQUENCE-TO-SEQUENCE SINGING SYNTHESIS USING THE FEED-FORWARD TRANSFORMER**

Blaauw, Merlijn, Universitat Pompeu Fabra, Spain Bonada, Jordi, Universitat Pompeu Fabra, Spain
SPE-P12.7: KOREAN SINGING VOICE SYNTHESIS BASED ON AUTO-REGRESSIVE BOUNDARY EQUILIBRIUM GAN

Choi, Soonbeom, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Kim, Wonil, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Park, Saebul, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Yong, Sangeon, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Nam, Juhan, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

SPE-P12.8: FAST AND HIGH-QUALITY SINGING VOICE SYNTHESIS SYSTEM BASED ON CONVOLUTIONAL NEURAL NETWORKS

Nakamura, Kazuhiro, Techno-Speech, Japan Takaki, Shinji, Techno-Speech, Japan Hashimoto, Kei, Techno-Speech, Japan Oura, Keiichiro, Techno-Speech, Japan Nankaku, Yoshihiko, Nagoya Institute of Technology, Japan Tokuda, Keiichi, Techno-Speech, Japan

SPE-P12.9: HYBRID NEURAL-PARAMETRIC F0 MODEL FOR SINGING SYNTHESIS

Bonada, Jordi, Universitat Pompeu Fabra, Spain Blaauw, Merlijn, Universitat Pompeu Fabra, Spain

SPE-P12.10: UTTERANCE-LEVEL SEQUENTIAL MODELING FOR DEEP GAUSSIAN PROCESS BASED SPEECH SYNTHESIS USING SIMPLE RECURRENT UNIT

Koriyama, Tomoki, University of Tokyo, Japan Saruwatari, Hiroshi, University of Tokyo, Japan

SPE-P12.11: EMOTIONAL SPEECH SYNTHESIS WITH RICH AND GRANULARIZED CONTROL

Um, Se-Yun, Yonsei University, Korea (South) Oh, Sangshin, Yonsei University, Korea (South) Byun, Kyungguen, Yonsei University, Korea (South) Jang, Inseon, Electronics and Telecommunications Research Institute (ETRI), Korea (South) Ahn, Chunghyun, Electronics and Telecommunications Research Institute (ETRI), Korea (South) Kang, Hong-Goo, Yonsei University, Korea (South)

SPE-P12.12: TOWARDS UNSUPERVISED SPEECH RECOGNITION AND SYNTHESIS WITH QUANTIZED SPEECH REPRESENTATION LEARNING

Liu, Alexander H., National Taiwan University, Taiwan Tu, Tao, National Taiwan University, Taiwan Lee, Hung-yi, National Taiwan University, Taiwan Lee, Lin-shan, National Taiwan University, Taiwan
SPE-P13 - Speech Separation and Extraction III

SPE-P13.1: AN EMPIRICAL STUDY OF CONV-TASNET
Kadioglu, Berkan, Northeastern University, United States Horgan, Michael, Dolby Laboratories, United States Liu, Xiaoyu, Dolby Laboratories, United States Pons, Jordi, Dolby Laboratories, United States Darcy, Dan, Dolby Laboratories, United States Kumar, Vivek, Dolby Laboratories, United States

SPE-P13.2: MASK-DEPENDENT PHASE ESTIMATION FOR MONOAURAL SPEAKER SEPARATION
Ni, Zhaoheng, Graduate Center, City University of New York, United States Mandel, Michael, Brooklyn College, City University of New York, United States

SPE-P13.3: JOINT PHONEME ALIGNMENT AND TEXT-INFORMED SPEECH SEPARATION ON HIGHLY CORRUPTED SPEECH

SPE-P13.4: SINGLE-CHANNEL SPEECH SEPARATION INTEGRATING PITCH INFORMATION BASED ON A MULTI TASK LEARNING FRAMEWORK
Li, Xiang, Peking University, China Liu, Rui, Peking University, China Song, Tao, Peking University, China Wu, Xihong, Peking University, China Chen, Jing, Peking University, China

SPE-P13.5: CONTINUOUS SPEECH SEPARATION: DATASET AND ANALYSIS
Chen, Zhuo, Microsoft, United States Yoshioka, Takuya, Microsoft, United States Lu, Liang, Microsoft, United States Zhou, Tianyan, Microsoft, United States Meng, Zhong, Microsoft, United States Luo, Yi, Microsoft, United States Wu, Jian, Microsoft, United States Xiao, Xiong, Microsoft, United States Li, Jinyu, Microsoft, United States

SPE-P13.6: THE SOUND OF MY VOICE: SPEAKER REPRESENTATION LOSS FOR TARGET VOICE SEPARATION
Mun, Seongkyu, Naver Corporation, Korea (South) Choe, Soyeon, Naver Corporation, Korea (South) Huh, Jaesung, Naver Corporation, Korea (South) Chung, Joon Son, Naver Corporation, Korea (South)

SPE-P13.7: SPEAKER-AWARE TARGET SPEAKER ENHANCEMENT BY JOINTLY LEARNING WITH SPEAKER EMBEDDING EXTRACTION
Ji, Xuan, Tencent, China
Yu, Meng, Tencent, United States
Zhang, Chunlei, Tencent, United States
Su, Dan, Tencent, China
Tao, Tencent, United States
Liu, Xiaoyu, Tencent, China
Yu, Dong, Tencent, United States

**SPE-P13.8: FAR-FIELD LOCATION GUIDED TARGET SPEECH EXTRACTION USING END-TO-END SPEECH RECOGNITION OBJECTIVES**

Subramanian, Aswin Shanmugam, Johns Hopkins University, United States
Weng, Chao, Tencent AI, United States
Yu, Meng, Tencent AI, United States
Zhang, Shi-Xiong, Tencent AI Lab, United States
Xu, Yong, Tencent AI, United States
Watanabe, Shinji, Johns Hopkins University, United States

**SPE-P13.9: A STUDY OF CHILD SPEECH EXTRACTION USING JOINT SPEECH ENHANCEMENT AND SEPARATION IN REALISTIC CONDITIONS**

Wang, Xin, University of Science and Technology of China, China
Du, Jun, University of Science and Technology of China, China
Cristia, Alejandrina, Laboratoire de Sciences Cognitives et Psycholinguistique, France
Sun, Lei, University of Science and Technology of China, China
Lee, Chin-Hui, Georgia Institute of Technology, United States

**SPE-P13.10: AN ANALYSIS OF SPEECH ENHANCEMENT AND RECOGNITION LOSSES IN LIMITED RESOURCES MULTI-TALKER SINGLE CHANNEL AUDIO-VISUAL ASR**

Pasa, Luca, University of Padova, Italy
Morrone, Giovanni, University of Modena and Reggio Emilia, Italy
Badino, Leonardo, Istituto Italiano di Tecnologia (IIT), Italy

**SPE-P13.11: DEEP AUDIO-VISUAL SPEECH SEPARATION WITH ATTENTION MECHANISM**

Li, Chenda, Shanghai Jiao Tong University, China
Qian, Yanmin, Shanghai Jiao Tong University, China

**SPE-P13.12: ENHANCING END-TO-END MULTI-CHANNEL SPEECH SEPARATION VIA SPATIAL FEATURE LEARNING**

Gu, Rongzhi, Peking University Shenzhen Graduate School, China
Zhang, Shixiong, Tencent AI Lab, United States
Chen, Lianwu, Tencent, China
Xu, Yong, Tencent, United States
Yu, Meng, Tencent, United States
Su, Dan, Tencent, China
Zou, Yuexian, Peking University Shenzhen Graduate School, China
Yu, Dong, Tencent, United States
SPE-P14 - Speech Production

SPE-P14.1: DETECTION AND ANALYSIS OF T/D DELETION IN LIBRISPEECH
Yuan, Jiahong, Baidu Research, United States Lin, Hui, LAIX Inc., China Liu, Yang, Amazon Alexa AI, United States

SPE-P14.2: PREDICTION OF VOICING AND THE F0 CONTOUR FROM ELECTROMAGNETIC ARTICULOGRAPHY DATA FOR ARTICULATION-TO-SPEECH SYNTHESIS
Stone, Simon, Technische Universität Dresden, Germany Schmidt, Philipp, Technische Universität Dresden, Germany Birkholz, Peter, Technische Universität Dresden, Germany

SPE-P14.3: A COMPARATIVE STUDY OF ESTIMATING ARTICULATORY MOVEMENTS FROM PHONEME SEQUENCES AND ACOUSTIC FEATURES
Singh, Abhayjeet, Indian Institute of Science, India Illa, Aravind, Indian Institute of Science, India Ghosh, Prasanta Kumar, Indian Institute of Science, India

SPE-P14.4: AUTOMATIC VOCAL TRACT LANDMARK TRACKING IN RTMRI USING FULLY CONVOLUTIONAL NETWORKS AND KALMAN FILTER
Asadiabadi, Sasan, Koc University, Turkey Erzin, Engin, Koc University, Turkey

SPE-P14.5: SPEECH-BASED PARAMETER ESTIMATION OF AN ASYMMETRIC VOCAL FOLD OSCILLATION MODEL AND ITS APPLICATION IN DISCRIMINATING VOCAL FOLD PATHOLOGIES
Zhao, Wenbo, Carnegie Mellon University, United States Singh, Rita, Carnegie Mellon University, United States

SPE-P14.6: END-TO-END ARTICULATORY MODELING FOR DYSARTHRIC ARTICULATORY ATTRIBUTE DETECTION
Lin, Yuqin, Tianjin University, China Wang, Longbiao, Tianjin University, China Dang, Jianwu, Tianjin University, China Li, Sheng, National Institute of Information and Communications Technology (NICT), Japan Ding, Chencheng, National Institute of Information and Communications Technology (NICT), Japan

SPE-P14.7: VOCAL TRACT ARTICULATORY CONTOUR DETECTION IN REAL-TIME MAGNETIC RESONANCE IMAGES USING SPATIO-TEMPORAL CONTEXT
Hebbar, S Ashwin, National Institute of Technology Karnataka, India Sharma, Rahul, University of Southern California, United States Somandepalli, Krishna,
University of Southern California, United States Toutios, Asterios, University of Southern California, United States Narayanan, Shrikanth, University of Southern California, United States

SPE-P14.8: RETRIEVING VOCAL-TRACT RESONANCE AND ANTI-RESONANCE FROM HIGH-PITCHED VOWELS USING A RAHMONIC SUBTRACTION TECHNIQUE

Zhang, Zhao, Tianjin University, China Honda, Kiyoshi, Tianjin University, China Wei, Jianguo, Tianjin University, China

SPE-P14.9: EPOCH EXTRACTION FROM A SPEECH SIGNAL USING GAMMATONE WAVELETS IN A SCATTERING NETWORK

Kulkarni, Pavan, Indian Institute of Science, India Sadasivan, Jishnu, Indian Institute of Science, India Adiga, Aniruddha, University of Virginia, United States Seelamantula, Chandra Sekhar, Indian Institute of Science, India

SPE-P14.10: STUDY OF CLOSED PHASE RESONANCE BANDWIDTHS FOR ORAL AND NASAL TRACTS USING ZERO TIME WINDOWING

Abbas, Haala Deeba, International Institute of Information Technology, Hyderabad, India Prasad, Ravi Shankar, Idiap Research Institute, Switzerland Nellore, Bhanu teja, International Institute of Information Technology, Hyderabad, India Gangashetty, Suryakanth V, International Institute of Information Technology, Hyderabad, India

SPE-P14.11: ALGORITHMIC EXPLORATION OF AMERICAN ENGLISH DIALECTS

Aksënova, Alëna, Stony Brook University, United States Bruguier, Antoine, Google LLC, United States Ritchart-Scott, Amanda, Google LLC, United States Mendlovic, Uri, Google LLC, Israel

SPE-P14.12: COMPARISON OF GLOTTAL CLOSURE INSTANTS DETECTION ALGORITHMS FOR EMOTIONAL SPEECH

Kadiri, Sudarsana Reddy, Aalto University, Finland Alku, Paavo, Aalto University, Finland B, Yegnanarayana, Indian Institute of Technology Hyderabad, India
SPE-P15 - Speech Recognition: Adaptation

SPE-P15.1: UNSUPERVISED SPEAKER ADAPTATION USING ATTENTION-BASED SPEAKER MEMORY FOR END-TO-END ASR
Sari, Leda, University of Illinois at Urbana-Champaign, United States
Moritz, Niko, Mitsubishi Electric Research Laboratories (MERL), United States
Hori, Takaaki, Mitsubishi Electric Research Laboratories (MERL), United States
Le Roux, Jonathan, Mitsubishi Electric Research Laboratories (MERL), United States

SPE-P15.2: L-VECTOR: NEURAL LABEL EMBEDDING FOR DOMAIN ADAPTATION
Meng, Zhong, Microsoft Corporation, United States
Hu, Hu, Georgia Institute of Technology, United States
Li, Jinyu, Microsoft Corporation, United States
Huang, Yan, Microsoft Corporation, United States
Gong, Yifan, Microsoft Corporation, United States
Lee, Chin-Hui, Georgia Institute of Technology, United States

SPE-P15.3: ACOUSTIC MODEL ADAPTATION FOR PRESENTATION TRANSCRIPTION AND INTELLIGENT MEETING ASSISTANT SYSTEMS
Huang, Yan, Microsoft Corporation, United States
Gong, Yifan, Microsoft Corporation, United States

SPE-P15.4: USING PERSONALIZED SPEECH SYNTHESIS AND NEURAL LANGUAGE GENERATOR FOR RAPID SPEAKER ADAPTATION
Huang, Yan, Microsoft Corporation, United States
He, Lei, Microsoft Corporation, United States
Wei, Wenning, Microsoft Corporation, United States
Gale, William, Microsoft Corporation, United States
Li, Jinyu, Microsoft Corporation, United States
Gong, Yifan, Microsoft Corporation, United States

SPE-P15.5: ATTENTION-BASED GATED SCALING ADAPTIVE ACOUSTIC MODEL FOR CTC-BASED SPEECH RECOGNITION
Ding, Fenglin, University of Science and Technology of China, China
Guo, Wu, University of Science and Technology of China, China
Dai, Li-Rong, University of Science and Technology of China, China
Du, Jun, University of Science and Technology of China, China

SPE-P15.6: ADAPTIVE KNOWLEDGE DISTILLATION BASED ON ENTROPY
Kwon, Kisoo, Samsung Electronics, Korea (South)
Na, Hwidong, Samsung Electronics, Korea (South)
Lee, Hoshik, Samsung Electronics, Korea (South)
Kim, Nam Soo, Seoul national university, Korea (South)
SPE-P15.7: UNSUPERVISED PRETRAINING TRANSFERS WELL ACROSS LANGUAGES

Rivière, Morgane, Facebook, France Joulin, Armand, Facebook, France Mazaré, Pierre-Emmanuel, Facebook, France Dupoux, Emmanuel, Facebook, France

SPE-P15.8: INCREMENTAL SEMI-SUPERVISED LEARNING FOR MULTI-GENRE SPEECH RECOGNITION

Khonglah, Banriskhem K., Idiap Research Institute, Switzerland Madikeri, Srikanth, Idiap Research Institute, Switzerland Dey, Subhadeep, Idiap Research Institute, Switzerland Bourlard, Hervé, Idiap Research Institute, Switzerland Motlicek, Petr, Idiap Research Institute, Switzerland Billa, Jayadev, Information Sciences Institute, University of Southern California, United States

SPE-P15.9: SOURCE DOMAIN DATA SELECTION FOR IMPROVED TRANSFER LEARNING TARGETING DYSARTHRIC SPEECH RECOGNITION

Xiong, Feifei, University of Sheffield, United Kingdom Barker, Jon, University of Sheffield, United Kingdom Yue, Zhengjun, University of Sheffield, United Kingdom Christensen, Heidi, University of Sheffield, United Kingdom

SPE-P15.10: STUDY OF FORMANT MODIFICATION FOR CHILDREN ASR

Kathania, Hemant Kumar, Aalto University, Finland Reddy Kadiri, Sudarsana, Aalto University, Finland Alku, Paavo, Aalto University, Finland Kurimo, Mikko, Aalto University, Finland

SPE-P15.11: PSEUDO LIKELIHOOD CORRECTION TECHNIQUE FOR LOW RESOURCE ACCENTED ASR

Rajpal, Avni, Indian Institute of Science, India Rao M V, Achuth, Indian Institute of Science, India Yarra, Chiranjeevi, Indian Institute of Science, India Aggarwal, Ritu, Indian Institute of Science, India Kumar Ghosh, Prasanta, Indian Institute of Science, India

SPE-P15.12: LIBRI-ADAPT: A NEW SPEECH DATASET FOR UNSUPERVISED DOMAIN ADAPTATION

Mathur, Akhil, University College London and Nokia Bell Labs, United Kingdom Kawsar, Fahim, Nokia Bell Labs, United Kingdom Berthouze, Nadia, University College London, United Kingdom Lane, Nicholas, University of Oxford, United Kingdom
Friday, 8 May, 08:00 - 10:00

SPE-P16 - Word Spotting

SPE-P16.1: MINING EFFECTIVE NEGATIVE TRAINING SAMPLES FOR KEYWORD SPOTTING
Hou, Jingyong, Northwestern Polytechnical University, China Shi, Yangyang, Mobvoi AI Lab, United States Ostendorf, Mari, University of Washington, United States Hwang, Mei-Yuh, Mobvoi AI Lab, United States Xie, Lei, Northwestern Polytechnical University, China

SPE-P16.2: MULTI-TASK LEARNING FOR VOICE TRIGGER DETECTION
Sigtia, Siddharth, Apple, United States Clark, Pascal, Apple, United States Haynes, Rob, Apple, United States Richards, Hywel, Apple, United States Bridle, John, Apple, United States

SPE-P16.3: SMALL-FOOTPRINT KEYWORD SPOTTING ON RAW AUDIO DATA WITH SINC-CONVOLUTIONS
Mittermaier, Simon, Technische Universität München, Germany Kürzinger, Ludwig, Technische Universität München, Germany Waschneck, Bernd, Infineon Technologies AG, Germany Rigoll, Gerhard, Technische Universität München, Germany

SPE-P16.4: LATTICE-BASED IMPROVEMENTS FOR VOICE TRIGGERING USING GRAPH NEURAL NETWORKS
Dighe, Pranay, Apple, United States Adya, Saurabh, Apple, United States Li, Nuoyu, Apple, United States Vishnubhotla, Srikant, Apple, United States Naik, Devang, Apple, United States Sagar, Adithya, Apple, United States Ma, Ying, Apple, United States Pulman, Stephen, Apple, United States Williams, Jason, Apple, United States

SPE-P16.5: INTEGRATION OF MULTI-LOOK BEAMFORMERS FOR MULTI-CHANNEL KEYWORD SPOTTING
Ji, Xuan, Tencent, China Yu, Meng, Tencent, United States Chen, Jie, Tencent, China Zheng, Jimeng, Tencent, China Su, Dan, Tencent, China Yu, Dong, Tencent, United States

SPE-P16.6: FAST LATTICE-FREE KEYWORD FILTERING FOR ACCELERATED SPOKEN TERM DETECTION
Wintrode, Jonathan, Raytheon Applied Signal Technology, United States Wilkes, Jenny, Raytheon Applied Signal Technology, United States
SPE-P16.7: TRAINING KEYWORD SPOTTERS WITH LIMITED AND SYNTHESIZED SPEECH DATA
Lin, James, Google Research, Switzerland Kilgour, Kevin, Google Research, Switzerland Roblek, Dominik, Google Research, Switzerland Sharifi, Matt, Google Research, Switzerland

SPE-P16.8: TOWARDS DATA-EFFICIENT MODELING FOR WAKE WORD SPOTTING

SPE-P16.9: ADAPTATION OF RNN TRANSDUCER WITH TEXT-TO-SPEECH TECHNOLOGY FOR KEYWORD SPOTTING
Sharma, Eva, Khoury College of Computer Sciences, Northeastern University, United States Ye, Guoli, Speech and Language Group, Microsoft, United States Wei, Wenning, Microsoft China, China Zhao, Rui, Speech and Language Group, Microsoft, United States Tian, Yao, Microsoft China, China Wu, Jian, Speech and Language Group, Microsoft, United States He, Lei, Microsoft China, China Lin, Ed, Microsoft China, China Gong, Yifan, Speech and Language Group, Microsoft, United States

SPE-P16.11: CRNN-CTC BASED MANDARIN KEYWORDS SPOTTING
Yan, Haikang, South China University of Technology, China He, Qianhua, South China University of Technology, China Xie, Wei, South China University of Technology, China
Friday, 8 May, 08:00 - 10:00

SPE-P17 - Speech Enhancement IV

SPE-P17.1: UNSUPERVISED NEURAL MASK ESTIMATOR FOR GENERALIZED EIGEN-VALUE BEAMFORMING BASED ASR

Kumar, Rohit, Indian Institute Science, India Sreeram, Anirudh, Indian Institute Science, India Purushothaman, Anurenjan, Indian Institute Science, India Ganapathy, Sriram, Indian Institute Science, India

SPE-P17.2: SPATIAL ATTENTION FOR FAR-FIELD SPEECH RECOGNITION WITH DEEP BEAMFORMING NEURAL NETWORKS

He, Weipeng, Idiap Research Institute, Switzerland Lu, Lu, Facebook, United States Zhang, Biqiao, Facebook, United States Mahadeokar, Jay, Facebook, United States Kalgaonkar, Kaustubh, Facebook, United States Fuegen, Christian, Facebook, United States

SPE-P17.3: TENSOR-TO-VVECTOR REGRESSION FOR MULTI-CHANNEL SPEECH ENHANCEMENT BASED ON TENSOR-TRAIN NETWORK

Qi, Jun, Georgia Institute of Technology, United States Hu, Hu, Georgia Institute of Technology, United States Wang, Yannan, Tencent, China Yang, Chao-Han Huck, Georgia Institute of Technology, United States Siniscalchi, Marco, University of Enna, Italy Lee, Chin-Hui, Georgia Institute of Technology, United States

SPE-P17.4: TRUTH-TO-ESTIMATE RATIO MASK: A POST-PROCESSING METHOD FOR SPEECH ENHANCEMENT DIRECT AT LOW SIGNAL-TO-NOISE RATIOS

Chen, Bohan, Hong Kong University of Science and Technology Shenzhen Research Institute, China Wang, He, Hong Kong University of Science and Technology Shenzhen Research Institute, China Wei, Yue, Incus Company Limited, China So, Richard H.Y., Hong Kong University of Science and Technology, China

SPE-P17.5: GEOMETRY CONSTRAINED PROGRESSIVE LEARNING FOR LSTM-BASED SPEECH ENHANCEMENT

Tang, Xin, University of Science and Technology of China, China Du, Jun, University of Science and Technology of China, China Chai, Li, University of Science and Technology of China, China Wang, Yannan, Tencent Technology(Shenzhen) Company Limited, China Wang, Qing, Tencent Technology(Shenzhen) Company Limited, China Lee, Chin-Hui, Georgia Institute of Technology, United States
SPE-P17.6: USING SEPARATE LOSSES FOR SPEECH AND NOISE IN MASK-BASED SPEECH ENHANCEMENT
Xu, Ziyi, Technische Universität Braunschweig, Germany Elshamy, Samy, Technische Universität Braunschweig, Germany Fingscheidt, Tim, Technische Universität Braunschweig, Germany

SPE-P17.7: STABLE TRAINING OF DNN FOR SPEECH ENHANCEMENT BASED ON PERCEPTUALLY-MOTIVATED BLACK-BOX COST FUNCTION
Kawanaka, Masaki, National Institute of Technology, Tokuyama College, Japan Koizumi, Yuma, NTT Corporation, Japan Miyazaki, Ryoichi, National Institute of Technology, Tokuyama College, Japan Yatabe, Kohei, Waseda University, Japan

SPE-P17.8: A ROBUST AUDIO-VISUAL SPEECH ENHANCEMENT MODEL
Wang, Wupeng, Huawei Noah's Ark Lab, China Xing, Chao, Huawei Noah's Ark Lab, China Wang, Dong, Tsinghua University, China Chen, Xiao, Huawei Noah's Ark Lab, China Sun, Fengyu, Huawei Technologies CO. LTD, China

SPE-P17.9: ROBUST UNSUPERVISED AUDIO-VISUAL SPEECH ENHANCEMENT USING A MIXTURE OF VARIATIONAL AUTOENCODERS
Sadeghi, Mostafa, Inria, Grenoble Alpes, France Alameda-Pineda, Xavier, Inria, Grenoble Alpes, France

SPE-P17.10: AV(SE)²: AUDIO-VISUAL SQUEEZE-EXCITE SPEECH ENHANCEMENT
Iuzzolino, Michael, University of Colorado Boulder, United States Koishida, Kazuhito, Microsoft Corporation, United States

SPE-P17.11: SPECTROGRAMS FUSION WITH MINIMUM DIFFERENCE MASKS ESTIMATION FOR MONOAURAL SPEECH DEREVERBERATION
Shi, Hao, Tianjin University, China Wang, Longbiao, Tianjin University, China Ge, Meng, Tianjin University, China Li, Sheng, National Institute of Information and Communications Technology (NICT), Japan Dang, Jianwu, Tianjin University, China

SPE-P17.12: A RETURN TO DEREVERBERATION IN THE FREQUENCY DOMAIN USING A JOINT LEARNING APPROACH
Li, Yuying, Indiana University Bloomington, United States Williamson, Donald S., Indiana University, United States
Friday, 8 May, 08:00 - 10:00

**SPE-P18 - Speaker Recognition Systems, Data and Features**

**SPE-P18.1: IN-DOMAIN AND OUT-OF-DOMAIN DATA AUGMENTATION TO IMPROVE CHILDREN’S SPEAKER VERIFICATION SYSTEM IN LIMITED DATA SCENARIO**

Shahnawazuddin, Syed, National Institute of Technology Patna, India
Ahmad, Waquar, National Institute of Technology Calicut, India
Adiga, Nagaraj, University of Crete, Greece
Kumar, Avinash, National Institute of Technology Sikkim, India

**SPE-P18.2: JHU-HLTCOE SYSTEM FOR THE VOXSRC SPEAKER RECOGNITION CHALLENGE**

Garcia-Romero, Daniel, Johns Hopkins University, United States
McCree, Alan, Johns Hopkins University, United States
Snyder, David, Johns Hopkins University, United States
Sell, Gregory, Johns Hopkins University, United States

**SPE-P18.3: DETECTION OF SPEECH EVENTS AND SPEAKER CHARACTERISTICS THROUGH PHOTO-PLETHYSMOGRAPHIC SIGNAL NEURAL PROCESSING**

Cámbara, Guillermo, Telefónica, Spain
Luque, Jordi, Telefónica, Spain
Farrús, Mireia, Universitat Pompeu Fabra, Spain

**SPE-P18.4: XMU-TS SYSTEMS FOR NIST SRE19 CTS CHALLENGE**

Lu, Hao, Xiamen University, China
Zhou, Jianfeng, Xiamen University, China
Zhao, Miao, Xiamen University, China
Lei, Wendian, Xiamen Talentedsoft, China
Hong, Qingyang, Xiamen University, China
Li, Lin, Xiamen University, China

**SPE-P18.5: I-VECTOR TRANSFORMATION USING K-NEAREST NEIGHBORS FOR SPEAKER VERIFICATION**

Khan, Umair, Universitat Politecnica de Catalunya, Spain
India, Miquel, Universitat Politecnica de Catalunya, Spain
Hernando, Javier, Universitat Politecnica de Catalunya, Spain

**SPE-P18.6: H-VECTORS: UTTERANCE-LEVEL SPEAKER EMBEDDING USING A HIERARCHICAL ATTENTION MODEL**

Shi, Yanpei, University of Sheffield, United Kingdom
Huang, Qiang, University of Sheffield, United Kingdom
Hain, Thomas, University of Sheffield, United Kingdom

**SPE-P18.7: FEATURE ENHANCEMENT WITH DEEP FEATURE LOSSES FOR SPEAKER VERIFICATION**
Kataria, Saurabh, Johns Hopkins University, United States Nidadavolu, Phani Sankar, Johns Hopkins University, United States Villalba, Jesús, Johns Hopkins University, United States Chen, Nanxin, Johns Hopkins University, United States García-Perera, Paola, Johns Hopkins University, United States Dehak, Najim, Johns Hopkins University, United States

**SPE-P18.8: COMBINING DEEP EMBEDDINGS OF ACOUSTIC AND ARTICULATORY FEATURES FOR SPEAKER IDENTIFICATION**

Hong, Qian-Bei, National Cheng Kung University and Academia Sinica, Taiwan Wu, Chung-Hsien, National Cheng Kung University and Academia Sinica, Taiwan Wang, Hsin-Min, National Cheng Kung University and Academia Sinica, Taiwan Huang, Chien-Lin, Ping An Technology (Shenzhen) Co., Ltd., United States

**SPE-P18.9: BAYESIAN ESTIMATION OF PLDA WITH NOISY TRAINING LABELS, WITH APPLICATIONS TO SPEAKER VERIFICATION**

Borgstrom, Bengt, MIT Lincoln Laboratory, United States Torres-Carrasquillo, Pedro, MIT Lincoln Laboratory, United States

**SPE-P18.10: UNSUPERVISED FEATURE ENHANCEMENT FOR SPEAKER VERIFICATION**

Nidadavolu, Phani Sankar, Johns Hopkins University, United States Kataria, Saurabh, Johns Hopkins University, United States Villalba, Jesús, Johns Hopkins University, United States García-Perera, Paola, Johns Hopkins University, United States Dehak, Najim, Johns Hopkins University, United States

**SPE-P18.11: CN-CELEB: A CHALLENGING CHINESE SPEAKER RECOGNITION DATASET**

Fan, Yue, Tsinghua University, China Kang, Jiawen, Tsinghua University, China Li, Lantian, Tsinghua University, China Li, Kaicheng, Tsinghua University, China Chen, Haolin, Tsinghua University, China Cheng, Sitong, Tsinghua University, China Zhang, Pengyuan, Tsinghua University, China Zhou, Ziya, Tsinghua University, China Cai, Yunqi, Tsinghua University, China Wang, Dong, Tsinghua University, China

**SPE-P18.12: HI-MIA : A FAR-FIELD TEXT-DEPENDENT SPEAKER VERIFICATION DATABASE AND THE BASELINES**

Qin, Xiaoyi, Duke Kunshan University, China Bu, Hui, Beijing Shell Shell Technology Co. Ltd., China Li, Ming, Duke Kunshan University, China
Friday, 8 May, 11:45 - 13:45

SPE-P19 - Machine Learning for Speech Synthesis III

SPE-P19.1: END-TO-END CODE-SWITCHING TTS WITH CROSS-LINGUAL LANGUAGE MODEL
Zhou, Xuehao, National University of Singapore, Singapore
Tian, Xiaohai, National University of Singapore, Singapore
Lee, Grandee, National University of Singapore, Singapore
Das, Rohan Kumar, National University of Singapore, Singapore
Li, Haizhou, National University of Singapore, Singapore

SPE-P19.2: CODE-SWITCHED SPEECH SYNTHESIS USING BILINGUAL PHONETIC POSTERIORGRAM WITH ONLY MONOLINGUAL CORPORA
Cao, Yuewen, Chinese University of Hong Kong, China
Liu, Songxiang, Chinese University of Hong Kong, China
Wu, Xixin, Chinese University of Hong Kong, China
Kang, Shiyin, Tencent, China
Liu, Peng, Tencent, China
Wu, Zhiyong, Tsinghua University, China
Xiu, Xunying, Chinese University of Hong Kong, Hong Kong SAR of China
Su, Dan, Tencent, China
Yu, Dong, Tencent, China
Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China

SPE-P19.3: GENERATING MULTILINGUAL VOICES USING SPEAKER SPACE TRANSLATION BASED ON BILINGUAL SPEAKER DATA
Maiti, Soumi, City University of New York, United States
Marchi, Erik, Apple, United States
Conkie, Alistair, Apple, United States

SPE-P19.4: SPEAKER ADAPTATION OF A MULTILINGUAL ACOUSTIC MODEL FOR CROSS-LANGUAGE SYNTHESIS
Himawan, Ivan, ObEN, United States
Aryal, Sandesh, ObEN, United States
Ouyang, Iris, ObEN, United States
Kang, Sam, ObEN, United States
Lanchantin, Pierre, ObEN, United States
King, Simon, University of Edinburgh, United Kingdom

SPE-P19.5: SEMI-SUPERVISED SPEAKER ADAPTATION FOR END-TO-END SPEECH SYNTHESIS WITH PRETRAINED MODELS
Inoue, Katsuki, Okayama university, Japan
Hara, Sunao, Okayama university, Japan
Abe, Masanobu, Okayama university, Japan
Hayashi, Tomoki, Nagoya university, Japan
Yamamoto, Ryuichi, LINE Corporation, Japan
Watanabe, Shinji, Johns Hopkins university, United States

SPE-P19.6: BOFFIN TTS: FEW-SHOT SPEAKER ADAPTATION BY BAYESIAN OPTIMIZATION
Moss, Henry, Lancaster University, United Kingdom Aggarwal, Vatsal, Amazon, Inc., United Kingdom Prateek, Nishant, Amazon, Inc., United Kingdom Gonzalez, Javier, Amazon, Inc., United Kingdom Barra-Chicote, Roberto, Amazon, Inc., United Kingdom

SPE-P19.7: SEMI-SUPERVISED LEARNING BASED ON HIERARCHICAL GENERATIVE MODELS FOR END-TO-END SPEECH SYNTHESIS

Fujimoto, Takato, Nagoya Institute of Technology, Japan Takaki, Shinji, Nagoya Institute of Technology, Japan Hashimoto, Kei, Nagoya Institute of Technology, Japan Oura, Keiichiro, Nagoya Institute of Technology, Japan Nankaku, Yoshihiko, Nagoya Institute of Technology, Japan Tokuda, Keiichi, Nagoya Institute of Technology, Japan

SPE-P19.8: BREATHING AND SPEECH PLANNING IN SPONTANEOUS SPEECH SYNTHESIS

Székely, Éva, KTH Royal Institute of Technology, Sweden Henter, Gustav Eje, KTH Royal Institute of Technology, Sweden Beskow, Jonas, KTH Royal Institute of Technology, Sweden Gustafson, Joakim, KTH Royal Institute of Technology, Sweden

SPE-P19.9: ESPNET-TTS: UNIFIED, REPRODUCIBLE, AND INTEGRATABLE OPEN SOURCE END-TO-END TEXT-TO-SPEECH TOOLKIT

Hayashi, Tomoki, Nagoya University, Japan Yamamoto, Ryuichi, LINE Corporation, Japan Inoue, Katsuki, Okayama University, Japan Yoshimura, Takenori, Nagoya University, Japan Watanabe, Shinji, Johns Hopkins University, United States Toda, Tomoki, Nagoya University, Japan Takeda, Kazuya, Nagoya University, Japan Zhang, Yu, Google AI, United States Tan, Xu, Microsoft Research Asia, China

SPE-P19.10: EXTRACTING UNIT EMBEDDINGS USING SEQUENCE-TO-SEQUENCE ACOUSTIC MODELS FOR UNIT SELECTION SPEECH SYNTHESIS

Zhou, Xiao, University of Science and Technology of China, China Ling, Zhen-Hua, University of Science and Technology of China, China Dai, Li-Rong, University of Science and Technology of China, China

SPE-P19.11: AUDIO-ASSISTED IMAGE INPAINTING FOR TALKING FACES

Koumparoulis, Alexandros, University of Thessaly, Greece Potamianos, Gerasimos, University of Thessaly, Greece Thomas, Samuel, IBM, United States Morais, Edmilson da Silva, IBM, Brazil
SPE-P20 - Speech Recognition: Acoustic Modelling II

SPE-P20.1: LIBRI-LIGHT: A BENCHMARK FOR ASR WITH LIMITED OR NO SUPERVISION
Kahn, Jacob, Facebook, United States Rivière, Morgane, Facebook, United States Zheng, Weiyi, Facebook, United States Kharitonov, Eugene, Facebook, United States Xu, Qiantong, Facebook, United States Mazaré, Pierre-Emmanuel, Facebook, France Karadayi, Julien, ENS, France Liptchinsky, Vitaly, Facebook, United States Collobert, Ronan, Facebook, United States Fuegen, Christian, Facebook, United States Likhomanenko, Tatiana, Facebook, United States Synnaeve, Gabriel, Facebook, United States Mohamed, Abdelrahman, Facebook, United States Dupoux, Emmanuel, Facebook / EHESS, France

SPE-P20.2: A COMPREHENSIVE STUDY OF RESIDUAL CNNS FOR ACOUSTIC MODELING IN ASR
Bozheniuk, Vitalii, RWTH Aachen University, Germany Zeyer, Albert, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-P20.3: LAYER-NORMALIZED LSTM FOR HYBRID-HMM AND END-TO-END ASR
Zeineldeen, Mohammad, RWTH Aachen University, Germany Zeyer, Albert, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-P20.5: IMPROVING SEQUENCE-TO-SEQUENCE SPEECH RECOGNITION TRAINING WITH ON-THE-FLY DATA AUGMENTATION
Nguyen, Thai Son, Karlsruhe Institute of Technology, Germany Stueker, Sebastian, Karlsruhe Institute of Technology, Germany Niehues, Jan, Maastricht University, Netherlands Waibel, Alex, Karlsruhe Institute of Technology, Germany

SPE-P20.6: EFFECTIVENESS OF SELF-SUPERVISED PRE-TRAINING FOR ASR
Baevski, Alexei, Facebook, United States Mohamed, Abdelrahman, Facebook, United States

SPE-P20.7: HIGH-ACCURACY AND LOW-LATENCY SPEECH RECOGNITION WITH TWO-HEAD CONTEXTUAL LAYER TRAJECTORY LSTM MODEL
Li, Jinyu, Microsoft, United States Zhao, Rui, Microsoft, United States Sun, Eric, Microsoft, United States Wong, Jeremy, Microsoft, United States Das, Amit,
Microsoft, United States Meng, Zhong, Microsoft, United States Gong, Yifan, Microsoft, United States

SPE-P20.8: DFSMN-SAN WITH PERSISTENT MEMORY MODEL FOR AUTOMATIC SPEECH RECOGNITION
You, Zhao, Tencent, China Su, Dan, Tencent, China Chen, Jie, Tencent, China Weng, Chao, Tencent, United States Yu, Dong, Tencent, United States

SPE-P20.9: DYNAMIC TEMPORAL RESIDUAL LEARNING FOR SPEECH RECOGNITION
Xie, Jiaqi, Tsinghua University, China Yan, Ruijie, Tsinghua University, China Xiao, Shanyu, Tsinghua University, China Peng, Liangrui, Tsinghua University, China Johnson, Michael T., University of Kentucky, United States Zhang, Wei-Qiang, Tsinghua University, China

SPE-P20.10: E2E-SINCNET: TOWARD FULLY END-TO-END SPEECH RECOGNITION
Parcollet, Titouan, University of Oxford, United Kingdom Morchid, Mohamed, University of Avignon, France Linarès, Georges, University of Avignon, France

SPE-P20.11: SPEAKER AUGMENTATION FOR LOW RESOURCE SPEECH RECOGNITION
Du, Chennpeng, Shanghai Jiao Tong University, China Yu, Kai, Shanghai Jiao Tong University, China

SPE-P20.12: CGCNN: COMPLEX GABOR CONVOLUTIONAL NEURAL NETWORK ON RAW SPEECH
Noé, Paul-Gauthier, Avignon Université, France Parcollet, Titouan, University of Oxford, France Morchid, Mohamed, Avignon Université, France
SPE-P21 - Voice Conversion

**SPE-P21.1: ONE-SHOT VOICE CONVERSION USING STAR-GAN**
Wang, Ruobai, NetEase Inc., China Ding, Yu, NetEase Inc., China Li, Lincheng, NetEase Inc., China Fan, Changjie, NetEase Inc., China

**SPE-P21.2: ONE-SHOT VOICE CONVERSION BY VECTOR QUANTIZATION**
Wu, Da-Yi, National Taiwan University, Taiwan Lee, Hung-yi, National Taiwan University, Taiwan

**SPE-P21.3: NEUTRAL TO LOMBARD SPEECH CONVERSION WITH DEEP LEARNING**
Gentet, Enguerrand, Groupe PSA, France David, Bertrand, LTCI, Télécom Paris, Institut Polytechnique de Paris, France Denjean, Sébastien, Groupe PSA, France Richard, Gaël, LTCI, Télécom Paris, Institut Polytechnique de Paris, France Roussarie, Vincent, Groupe PSA, France

**SPE-P21.4: END-TO-END VOICE CONVERSION VIA CROSS-MODAL KNOWLEDGE DISTILLATION FOR DYSARTHRIC SPEECH RECONSTRUCTION**
Wang, Disong, Chinese University of Hong Kong, Hong Kong SAR of China Yu, Jianwei, Chinese University of Hong Kong, Hong Kong SAR of China Wu, Xixin, Chinese University of Hong Kong, Hong Kong SAR of China Liu, Songxiang, Chinese University of Hong Kong, Hong Kong SAR of China Sun, Lifa, SpeechX Limited, China Liu, Xunying, Chinese University of Hong Kong, Hong Kong SAR of China Meng, Helen, Chinese University of Hong Kong, Hong Kong SAR of China

**SPE-P21.5: PITCHNET: UNSUPERVISED SINGING VOICE CONVERSION WITH PITCH ADVERSARIAL NETWORK**
Deng, Chengqi, Zhejiang University, China Yu, Chengzhu, Tencent, United States Lu, Heng, Tencent, United States Weng, Chao, Tencent, United States Yu, Dong, Tencent, United States

**SPE-P21.6: AN IMPROVED FRAME-UNIT-SELECTION BASED VOICE CONVERSION SYSTEM WITHOUT PARALLEL TRAINING DATA**
Xie, Feng-Long, Tencent, China Li, Xin-Hui, Tencent, China Liu, Bo, Tencent, China Zheng, Yi-Bin, Tencent, China Meng, Li, Tencent, China Lu, Li, Tencent, China Soong, Frank K., Microsoft Research Asia, China

**SPE-P21.7: VOICE CONVERSION WITH TRANSFORMER NETWORK**
Liu, Ruolan, Samsung Research China-Beijing, China Chen, Xiao, Samsung Research China-Beijing, China Wen, Xue, Samsung Research China-Beijing, China

**SPE-P21.8: MSPEC-NET: MULTI-DOMAIN SPEECH CONVERSION NETWORK**

Malaviya, Harshit, Dhirubhai Ambani Institute of Information and Communication Technology, India Shah, Jui, Dhirubhai Ambani Institute of Information and Communication Technology, India Patel, Maitreya, Dhirubhai Ambani Institute of Information and Communication Technology, India Munshi, Jalansh, Dhirubhai Ambani Institute of Information and Communication Technology, India Patil, Hemant, Dhirubhai Ambani Institute of Information and Communication Technology, India

**SPE-P21.9: MULTI-SPEAKER AND MULTI-DOMAIN EMOTIONAL VOICE CONVERSION USING FACTORIZED HIERARCHICAL VARIATIONAL AUTOENCODER**

Elgaar, Mohamed, Humelo Inc. and Korea Advanced Institute of Science and Technology, Korea (South) Park, Jung Bae, Humelo Inc. and Korea Advanced Institute of Science and Technology, Korea (South) Lee, Sang Wan, Humelo Inc. and Korea Advanced Institute of Science and Technology, KAIST Institute for Artificial Intelligence, KAIST Center for Neuroscience-inspired Artificial Intelligence, Korea (South)

**SPE-P21.10: EMOTIONAL VOICE CONVERSION USING MULTITASK LEARNING WITH TEXT-TO-SPEECH**

Kim, Tae-Ho, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Cho, Sungjae, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Choi, Shinkook, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Park, Sejik, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Lee, Soo-Young, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

**SPE-P21.11: EFFECTIVE WAVENET ADAPTATION FOR VOICE CONVERSION WITH LIMITED DATA**

Du, Hongqiang, Northwestern Polytechnical University, Singapore Tian, Xiaohai, National University of Singapore, Singapore Xie, Lei, Northwestern Polytechnical University, China Li, Haizhou, National University of Singapore, Singapore

**SPE-P21.12: LIFTER TRAINING AND SUB-BAND MODELING FOR COMPUTATIONALLY EFFICIENT AND HIGH-QUALITY VOICE CONVERSION USING SPECTRAL DIFFERENTIALS**
Saeki, Takaaki, University of Tokyo, Japan Saito, Yuki, University of Tokyo, Japan Takamichi, Shinnosuke, University of Tokyo, Japan Saruwatari, Hiroshi, University of Tokyo, Japan
SPE-P22 - Large Vocabulary Continuous Speech Recognition and Search

SPE-P22.1: IMPROVING PROPER NOUN RECOGNITION IN END-TO-END ASR BY CUSTOMIZATION OF THE MWER LOSS CRITERION

SPE-P22.2: NEURAL LATTICE SEARCH FOR SPEECH RECOGNITION
Ma, Rao, Shanghai Jiao Tong University, China Li, Hao, Shanghai Jiao Tong University, China Liu, Qi, Shanghai Jiao Tong University, China Chen, Lu, Shanghai Jiao Tong University, China Yu, Kai, Shanghai Jiao Tong University, China

SPE-P22.3: DELIBERATION MODEL BASED TWO-PASS END-TO-END SPEECH RECOGNITION

SPE-P22.4: ALIGNMENT-LENGTH SYNCHRONOUS DECODING FOR RNN TRANSDUCER
Saon, George, IBM Research AI, United States Tuske, Zoltan, IBM Research AI, United States Audhkhasi, Kartik, IBM Research AI, United States

SPE-P22.5: INCORPORATING WRITTEN DOMAIN NUMERIC GRAMMARS INTO END-TO-END CONTEXTUAL SPEECH RECOGNITION SYSTEMS FOR IMPROVED RECOGNITION OF NUMERIC SEQUENCES
Haynor, Ben, Google, Inc., United States Aleksic, Petar, Google, Inc., United States

SPE-P22.6: LSTM-BASED ONE-PASS DECODER FOR LOW-LATENCY STREAMING
Jorge, Javier, Universitat Politècnica de València, Spain Giménez, Adrià, Universitat Politècnica de València, Spain Iranzo-Sánchez, Javier, Universitat Politècnica de València, Spain Silvestre-Cerdà, Joan Albert, Universitat Politècnica de València, Spain Civera, Jorge, Universitat Politècnica de València, Spain Sanchis, Albert, Universitat Politècnica de València, Spain Juan, Alfons, Universitat Politècnica de València, Spain
SPE-P22.7: MULTISTATE ENCODING WITH END-TO-END SPEECH RNN TRANSDUCER NETWORK
Wu, Zelin, Google LLC, United States Li, Bo, Google LLC, United States Zhang, Yu, Google LLC, United States Aleksic, Petar, Google LLC, United States Sainath, Tara, Google LLC, United States

SPE-P22.8: NEURAL ORACLE SEARCH ON N-BEST HYPOTHESES
Variani, Ehsan, Google, United States Chen, Tongzhou, Google, United States Apfel, James, Google, United States Ramabhadran, Bhuvana, Google, United States Lee, Seungji, Google, United States Moreno, Pedro, Google, United States

SPE-P22.10: TRANSFORMER TRANSDUCER: A STREAMABLE SPEECH RECOGNITION MODEL WITH TRANSFORMER ENCODERS AND RNN-T LOSS
Zhang, Qian, Google, United States Lu, Han, Google, United States Sak, Hasim, Google, United States Tripathi, Anshuman, Google, United States McDermott, Erik, Google, United States Koo, Stephen, Google, United States Kumar, Shankar, Google, United States

SPE-P22.11: FULL-SUM DECODING FOR HYBRID HMM BASED SPEECH RECOGNITION USING LSTM LANGUAGE MODEL
Zhou, Wei, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-P22.12: THE RWTH ASR SYSTEM FOR TED-LIUM RELEASE 2: IMPROVING HYBRID HMM WITH SPECAUGMENT
Zhou, Wei, RWTH Aachen University, Germany Michel, Wilfried, RWTH Aachen University, Germany Irie, Kazuki, RWTH Aachen University, Germany Kitza, Markus, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany
SPE-P23 - Speech Recognition: General Topics

SPE-P23.1: META LEARNING FOR END-TO-END LOW-RESOURCE SPEECH RECOGNITION
Hsu, Jui-Yang, National Taiwan University, Taiwan Chen, Yuan-Jui, National Taiwan University, Taiwan Lee, Hung-yi, National Taiwan University, Taiwan

SPE-P23.2: CROSS-SPEAKER SILENT-SPEECH COMMAND WORD RECOGNITION USING ELECTRO-OPTICAL STOMATOGRAPHY
Stone, Simon, Technische Universität Dresden, Germany Birkholz, Peter, Technische Universität Dresden, Germany

SPE-P23.3: EXPLORING A ZERO-ORDER DIRECT HMM BASED ON LATENT ATTENTION FOR AUTOMATIC SPEECH RECOGNITION
Bahar, Parnia, RWTH Aachen University, Germany Makarov, Nikita, RWTH Aachen University, Germany Zeyer, Albert, RWTH Aachen University, Germany Schlüter, Ralf, RWTH Aachen University, Germany Ney, Hermann, RWTH Aachen University, Germany

SPE-P23.4: IMPROVING DEVICE DIRECTEDNESS CLASSIFICATION OF UTERANCES WITH SEMANTIC LEXICAL FEATURES

SPE-P23.5: TRAINING ASR MODELS BY GENERATION OF CONTEXTUAL INFORMATION
Singh, Kritika, Facebook AI, United States Okhonko, Dmytro, Facebook AI, United States Liu, Jun, Facebook AI, United States Wang, Yongqiang, Facebook AI, United States Zhang, Frank, Facebook AI, United States Girshick, Ross, Facebook AI, United States Edunov, Sergey, Facebook AI, United States Peng, Fuchun, Facebook AI, United States Saraf, Yatharth, Facebook AI, United States Zweig, Geoffrey, Facebook AI, United States Mohamed, Abdelrahman, Facebook AI, United States

SPE-P23.6: SPEECH RECOGNITION MODEL COMPRESSION
Sakthi, Madhumitha, University of Texas at Austin, United States Tewfik, Ahmed, University of Texas at Austin, United States Pawate, Raj, Cadence Design Systems Inc., United States
SPE-P23.7: GPU-ACCELERATED VITERBI EXACT LATTICE DECODER FOR BATCHED ONLINE AND OFFLINE SPEECH RECOGNITION
Braun, Hugo, NVIDIA, United States Luitjens, Justin, NVIDIA, United States Leary, Ryan, NVIDIA, United States Kaldewey, Tim, NVIDIA, United States Povey, Daniel, Self, United States

SPE-P23.8: SEQUENCE-TO-SEQUENCE AUTOMATIC SPEECH RECOGNITION WITH WORD EMBEDDING REGULARIZATION AND FUSED DECODING
Liu, Alexander H., National Taiwan University, Taiwan Sung, Tzu-Wei, University of California, San Diego, Taiwan Chuang, Shun-Po, National Taiwan University, Taiwan Lee, Hung-yi, National Taiwan University, Taiwan Lee, Lin-shan, National Taiwan University, Taiwan

SPE-P23.9: SYNCHRONOUS TRANSFORMERS FOR END-TO-END SPEECH RECOGNITION
Tian, Zhengkun, Institute of Automation, Chinese Academy of Sciences, China Yi, Jiangyan, Institute of Automation, Chinese Academy of Sciences, China Bai, Ye, Institute of Automation, Chinese Academy of Sciences, China Tao, Jianhua, Institute of Automation, Chinese Academy of Sciences, China Zhang, Shuai, Institute of Automation, Chinese Academy of Sciences, China Wen, Zhengqi, Institute of Automation, Chinese Academy of Sciences, China

SPE-P23.10: INVESTIGATION OF METHODS TO IMPROVE THE RECOGNITION PERFORMANCE OF TAMIL-ENGLISH CODE-SWITCHED DATA IN TRANSFORMER FRAMEWORK
Sagaya Mary N J, Metilda, Indian Institute of Technology Madras, India M. Shetty, Vishwas, Indian Institute of Technology Madras, India Umesh, Srinivasan, Indian Institute of Technology Madras, India

SPE-P23.11: BANGLA VOICE COMMAND RECOGNITION IN END-TO-END SYSTEM USING TOPIC MODELING BASED CONTEXTUAL RESCORING
Sadeq, Nafis, Bangladesh University of Engineering and Technology, Bangladesh Ahmed, Shafayat, Bangladesh University of Engineering and Technology, Bangladesh Saha Shubha, Sudipta, Bangladesh University of Engineering and Technology, Bangladesh Islam, Md. Nahidul, Bangladesh University of Engineering and Technology, Bangladesh Adnan, Muhammad Abdullah, Bangladesh University of Engineering and Technology, Bangladesh

SPE-P23.12: LEARNING TO DETECT KEYWORD PARTS AND WHOLE BY SMOOTHED MAX POOLING
SPTM-L1 - Estimation Theory and Methods I

SPTM-L1.1: STATE-SPACE GAUSSIAN PROCESS FOR DRIFT ESTIMATION IN STOCHASTIC DIFFERENTIAL EQUATIONS
Zhao, Zheng, Aalto University, Finland Tronarp, Filip, Aalto University, Finland Hostettler, Roland, Uppsala University, Sweden Särkkä, Simo, Aalto University, Finland

SPTM-L1.2: COMPUTING HILBERT TRANSFORM AND SPECTRAL FACTORIZATION FOR SIGNAL SPACES OF SMOOTH FUNCTIONS
Boche, Holger, Technische Universität München, Germany Pohl, Volker, Technische Universität München, Germany

SPTM-L1.3: M-ESTIMATORS OF SCATTER WITH EIGENVALUE SHRINKAGE
Ollila, Esa, Aalto University, Finland Palomar, Daniel, Hong Kong University of Science and Technology, Hong Kong SAR of China Pascal, Frédéric, CentraleSupelec, France

SPTM-L1.4: A MULTITAPER REASSIGNED SPECTROGRAM FOR INCREASED TIME-FREQUENCY LOCALIZATION PRECISION
Sandsten, Maria, Lund University, Sweden Reinhold, Isabella, Lund University, Sweden Anderson, Rachele, Lund University, Sweden

SPTM-L1.5: STOCHASTIC ML ESTIMATION FOR HYPERSPECTRAL UNMIXING UNDER ENDMEMBER VARIABILITY AND NONLINEAR MODELS
Li, Yuening, Chinese University of Hong Kong, Hong Kong SAR of China Wu, Ruiyuan, Chinese University of Hong Kong, Hong Kong SAR of China Ma, Wing-Kin, Chinese University of Hong Kong, Hong Kong SAR of China

SPTM-L1.6: ROBUST PHASE RETRIEVAL WITH OUTLIERS
Jiang, Xue, Shanghai Jiao Tong University, China So, Hing Cheung, City University of Hong Kong, Hong Kong SAR of China Liu, Xingzhao, Shanghai Jiao Tong University, China
Tuesday, 5 May, 11:30 - 13:30

SPTM-L2 - Graph Representations and Analysis

SPTM-L2.1: NODE-ASYNCHRONOUS SPECTRAL CLUSTERING ON DIRECTED GRAPHS
Teke, Oguzhan, California Institute of Technology, United States Vaidyanathan, P. P., California Institute of Technology, United States

SPTM-L2.2: ESTIMATING CENTRALITY BLINDLY FROM LOW-PASS FILTERED GRAPH SIGNALS
He, Yiran, Chinese University of Hong Kong, Hong Kong SAR of China Wai, Hoi To, Chinese University of Hong Kong, Hong Kong SAR of China

SPTM-L2.3: BLIND INFERENCE OF CENTRALITY RANKINGS FROM GRAPH SIGNALS
Roddenberry, T. Mitchell, Rice University, United States Segarra, Santiago, Rice University, United States

SPTM-L2.4: A LOW-DIMENSIONALITY METHOD FOR DATA-DRIVEN GRAPH LEARNING
Stankovic, Ljubisa, University of Montenegro, Montenegro Dakovic, Milos, University of Montenegro, Montenegro Mandic, Danilo P., Imperial College London, United Kingdom Brajovic, Milos, University of Montenegro, Montenegro Scalzo-Dees, Bruno, Imperial College London, United Kingdom Constantinides, Anthony G., Imperial College London, United Kingdom

SPTM-L2.5: METRIC REPRESENTATIONS OF NETWORKS: A UNIQUENESS RESULT
Segarra, Santiago, Rice University, United States Roddenberry, T. Mitchell, Rice University, United States Memoli, Facundo, Ohio State University, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SPTM-L2.6: ON THE STABILITY OF POLYNOMIAL SPECTRAL GRAPH FILTERS
Kenlay, Henry, University of Oxford, United Kingdom Thanou, Dorina, Swiss Data Science Center, United Kingdom Dong, Xiaowen, University of Oxford, United Kingdom
SPTM-L3 - Estimation and Detection

SPTM-L3.1: ON CRAMÉR-RAO LOWER BOUNDS WITH RANDOM EQUALITY CONSTRAINTS
Prévost, Clémence, Université de Lorraine, France Chaumette, Eric, Université de Toulouse, France Usevich, Konstantin, Université de Lorraine, France Brie, David, Université de Lorraine, France Comon, Pierre, Univ. Grenoble Alpes, France

SPTM-L3.2: ON HARMONIC APPROXIMATIONS OF INHARMONIC SIGNALS
Elvander, Filip, Lund University, Sweden Ding, Jie, Harbin Engineering University, China Jakobsson, Andreas, Lund University, Sweden

SPTM-L3.3: A GENERAL TEST FOR THE LINEAR STRUCTURE OF COVARIANCE MATRICES OF GAUSSIAN POPULATIONS
Xiao, Yu-Hang, Paderborn University, Germany Ramírez, David, University Carlos III of Madrid, Spain Schreier, Peter, Paderborn University, Germany

SPTM-L3.4: SEQUENTIAL JOINT DETECTION AND ESTIMATION WITH AN APPLICATION TO JOINT SYMBOL DECODING AND NOISE POWER ESTIMATION
Reinhard, Dominik, Technische Universität Darmstadt, Germany Fauß, Michael, Princeton University, United States Zoubir, Abdelhak M., Technische Universität Darmstadt, Germany

SPTM-L3.5: A LINEAR TIME PARTITIONING ALGORITHM FOR FREQUENCY WEIGHTED IMPURITY FUNCTIONS
Nguyen, Thuan, Oregon State University, United States Nguyen, Thinh, Oregon State University, United States

SPTM-L3.6: FINITE SAMPLE DEVIATION AND VARIANCE BOUNDS FOR FIRST ORDER AUTOREGRESSIVE PROCESSES
González, Rodrigo, KTH Royal Institute of Technology, Sweden Rojas, Cristian R., KTH Royal Institute of Technology, Sweden
Wednesday, 6 May, 09:00 - 11:00

SPTM-L4 - Optimization Techniques I

SPTM-L4.1: BALANCING RATES AND VARIANCE VIA ADAPTIVE BATCH-SIZES IN FIRST-ORDER STOCHASTIC OPTIMIZATION
Gao, Zhan, University of Pennsylvania, United States Koppel, Alec, U.S. Army Research Laboratory, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SPTM-L4.2: A GREEDY SPARSE APPROXIMATION ALGORITHM BASED ON L1-NORM SELECTION RULES
Ben mhenni, Ramzi, Ecole Centrale de Nantes, France Bourguignon, Sébastien, Ecole Centrale de Nantes, France Idier, Jérome, Ecole Centrale de Nantes, France

SPTM-L4.3: EXACT SPARSE NONNEGATIVE LEAST SQUARES
Nadisic, Nicolas, University of Mons, Belgium Vandaele, Arnaud, University of Mons, Belgium Gillis, Nicolas, University of Mons, Belgium Cohen, Jeremy, CNRS, Université de Rennes, Inria, IRISA., France

SPTM-L4.4: EPIGRAPHICAL REFORMULATION FOR NON-PROXIMABLE MIXED NORMS
Kyochi, Seisuke, University of Kitakyushu, Japan Ono, Shunsuke, Tokyo Institute of Technology, Japan Selesnick, Ivan, New York University, United States

SPTM-L4.5: FORWARD-BACKWARD SPLITTING FOR OPTIMAL TRANSPORT BASED PROBLEMS

SPTM-L4.6: SSGD: SPARSITY-PROMOTING STOCHASTIC GRADIENT DESCENT ALGORITHM FOR UNBIASED DNN PRUNING
Lee, Ching-Hua, University of California, San Diego, United States Fedorov, Igor, ARM, United States Rao, Bhaskar D., University of California, San Diego, United States Garudadri, Harinath, University of California, San Diego, United States
Thursday, 7 May, 09:00 - 11:00

SPTM-L5 - Signal Processing Emerging Topics

**SPTM-L5.1: LOW-RANK TENSOR RING MODEL FOR COMPLETING MISSING VISUAL DATA**
Asif, M. Salman, University of California, Riverside, United States Prater-Bennette, Ashley, Air Force Research Laboratory, United States

**SPTM-L5.2: SEQUENTIAL SEMI-ORTHOGONAL MULTI-LEVEL NMF WITH NEGATIVE RESIDUAL REDUCTION FOR NETWORK EMBEDDING**
Hashimoto, Riku, University of Electro-Communications, Japan Kasai, Hiroyuki, Waseda University, Japan

**SPTM-L5.3: A FAST PROXIMAL POINT ALGORITHM FOR GENERALIZED GRAPH LAPLACIAN LEARNING**
Deng, Zengde, Chinese University of Hong Kong, Hong Kong SAR of China So, Anthony Man-Cho, Chinese University of Hong Kong, Hong Kong SAR of China

**SPTM-L5.4: RECONSTRUCTION OF FRI SIGNALS USING DEEP NEURAL NETWORK APPROACHES**
Leung, Vincent C. H., Imperial College London, United Kingdom Huang, Jun-Jie, Imperial College London, United Kingdom Dragotti, Pier Luigi, Imperial College London, United Kingdom

**SPTM-L5.5: ADAPTIVE PREDICTION OF FINANCIAL TIME-SERIES FOR DECISION-MAKING USING A TENSORIAL AGGREGATION APPROACH**
Campello, Betania, University of Campinas, Brazil Duarte, Leonardo, University of Campinas, Brazil Romano, João, University of Campinas, Brazil
Thursday, 7 May, 09:00 - 11:00

SPTM-L6 - Tracking and Adaptive Signal Processing

SPTM-L6.1: DATA SELECTION KERNEL CONJUGATE GRADIENT ALGORITHM

Diniz, Paulo, Federal University of Rio de Janeiro, Brazil Ferreira, Jonathas, Federal University of Rio de Janeiro, Brazil Kuhfuss, Marcele, Federal University of Rio de Janeiro, Brazil Ferreira, Tadeu, Fluminense Federal University, Brazil

SPTM-L6.2: NORMALIZED LEAST-MEAN-SQUARE ALGORITHMS WITH MINIMAX CONCAVE PENALTY

Kaneko, Hiroyuki, Keio University, Japan Yukawa, Masahiro, Keio University, Japan

SPTM-L6.3: STEEPENING SQUARED ERROR FUNCTION FACILITATES ONLINE ADAPTATION OF GAUSSIAN SCALES

Takizawa, Masa-aki, Keio University, Japan Yukawa, Masahiro, Keio University, Japan

SPTM-L6.4: INDOOR ALTITUDE ESTIMATION OF UNMANNED AERIAL VEHICLES USING A BANK OF KALMAN FILTERS

Yang, Liu, Stony Brook University, United States Wang, Hechuan, Stony Brook University, United States El-Laham, Yousef, Stony Brook University, United States Ignacio Lamas Fonte, José, Avansig S. L., Spain Trillo Pérez, David, Avansig S. L., Spain Bugallo, Mónica F., Stony Brook University, United States

SPTM-L6.5: UNDERWATER TRACKING BASED ON THE SUM-PRODUCT ALGORITHM ENHANCED BY A NEURAL NETWORK DETECTIONS CLASSIFIER

Soldi, Giovanni, NATO STO Centre for Maritime Research and Experimentation, Italy Gaglione, Domenico, NATO STO Centre for Maritime Research and Experimentation, Italy De Magistris, Giovanni, NATO STO Centre for Maritime Research and Experimentation, Italy Braca, Paolo, NATO STO Centre for Maritime Research and Experimentation, Italy Stinco, Pietro, NATO STO Centre for Maritime Research and Experimentation, Italy Ferri, Gabriele, NATO STO Centre for Maritime Research and Experimentation, Italy Tesei, Alessandra, NATO STO Centre for Maritime Research and Experimentation, Italy Le Page, Kevin, NATO STO Centre for Maritime Research and Experimentation, Italy

SPTM-L6.6: FEATURE AFFINE PROJECTION ALGORITHMS

Yazdanpanah, Hamed, University of São Paulo, Brazil
SPTM-L7 - Bayesian Signal Processing II

SPTM-L7.1: APPROXIMATE BAYESIAN COMPUTATION WITH THE SLICED-WASSERSTEIN DISTANCE


SPTM-L7.2: ENHANCED MIXTURE POPULATION MONTE CARLO VIA STOCHASTIC OPTIMIZATION AND MARKOV CHAIN MONTE CARLO SAMPLING

El-Laham, Yousef, Stony Brook University, United States Djuric, Petar, Stony Brook University, United States Bugallo, Mónica F., Stony Brook University, United States

SPTM-L7.3: BETTER SAFE THAN SORRY: RISK-AWARE NONLINEAR BAYESIAN ESTIMATION

Kalogerias, Dionysios, University of Pennsylvania, United States Chamon, Luiz, University of Pennsylvania, United States Pappas, George, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SPTM-L7.4: PARTICLE FILTERING ON THE COMPLEX STIEFEL MANIFOLD WITH APPLICATION TO SUBSPACE TRACKING

Bordin, Claudio, Universidade Federal do ABC, Brazil Bruno, Marcelo, Instituto Tecnológico de Aeronáutica, Brazil

SPTM-L7.5: BAYESIAN MULTIPLE CHANGE-POINT DETECTION WITH LIMITED COMMUNICATION

Halme, Topi, Aalto University, Finland Nitzan, Eyal, Aalto University, Finland Poor, H. Vincent, Princeton University, United States Koivunen, Visa, Aalto University, Finland

SPTM-L7.6: WHAT DID YOUR ADVERSARY BELIEVE? OPTIMAL FILTERING AND SMOOTHING IN COUNTER-ADVERSARIAL AUTONOMOUS SYSTEMS

Mattila, Robert, KTH Royal Institute of Technology, Sweden Lourenço, Inês, KTH Royal Institute of Technology, Sweden Krishnamurthy, Vikram, Cornell University, United States Rojas, Cristian R., KTH Royal Institute of Technology, Sweden Wahlberg, Bo, KTH Royal Institute of Technology, Sweden
SPTM-L8 - Sparsity-Aware Processing II

SPTM-L8.1: ROBUST PARAMETER ESTIMATION OF CONTAMINATED DAMPED EXPONENTIALS
Xie, Youye, Colorado School of Mines, United States
Liu, Dehong, Mitsubishi Electric Research Laboratories (MERL), United States
Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States
Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States

SPTM-L8.2: COMPUTATION OF "BEST" INTERPOLANTS IN THE LP SENSE
Bohra, Pakshal, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Unser, Michael, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SPTM-L8.3: PRECISE PERFORMANCE ANALYSIS OF THE BOX-ELASTIC NET UNDER MATRIX UNCERTAINTIES
Alrashdi, Ayed, King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Ben Atitallah, Ismail, Harvard University, United States
Al-Naffouri, Tareq, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

SPTM-L8.4: FAST BLOCK-SPARSE ESTIMATION FOR VECTOR NETWORKS
Yue, Zuogong, University of New South Wales, Australia
Sundaram, Padmavathi, Harvard Medical School, United States
Solo, Victor, University of New South Wales, Australia

SPTM-L8.5: RELATIVE COST BASED MODEL SELECTION FOR SPARSE HIGH-DIMENSIONAL LINEAR REGRESSION MODELS
B. Gohain, Prakash, KTH Royal Institute of Technology, Sweden
Jansson, Magnus, KTH Royal Institute of Technology, Sweden

SPTM-L8.6: CUMULANT SLICE RECONSTRUCTION FROM COMPRESSIVE MEASUREMENTS AND ITS APPLICATION TO LINE SPECTRUM ESTIMATION
Wang, Yanbo, George Mason University, United States
Tian, Zhi, George Mason University, United States
Tuesday, 5 May, 16:30 - 18:30

SPTM-P1 - Adaptation and Learning over Graphs

SPTM-P1.1: ADAPTATION AND LEARNING IN MULTI-TASK DECISION SYSTEMS
Marano, Stefano, University of Salerno, Italy Sayed, Ali H., Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SPTM-P1.2: GRAPH METRIC LEARNING VIA GERSHGORIN DISC ALIGNMENT
Yang, Cheng, York University, Canada Cheung, Gene, York University, Canada Hu, Wei, Peking University, China

SPTM-P1.3: LEARNING GRAPH INFLUENCE FROM SOCIAL INTERACTIONS
Matta, Vincenzo, University of Salerno, Italy Bordignon, Virginia, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland Santos, Augusto, Portugal Sayed, Ali H., Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SPTM-P1.4: SOCIAL LEARNING WITH PARTIAL INFORMATION SHARING
Bordignon, Virginia, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland Matta, Vincenzo, University of Salerno, Italy Sayed, Ali H., Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SPTM-P1.5: NON-PARAMETRIC COMMUNITY CHANGE-POINTS DETECTION IN STREAMING GRAPH SIGNALS
Ferrari, André, Université Côte d’Azur, France Richard, Cédric, Université Côte d’Azur, France

SPTM-P1.6: SPATIAL GATING STRATEGIES FOR GRAPH RECURRENT NEURAL NETWORKS
Ruiz, Luana, University of Pennsylvania, United States Gama, Fernando, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SPTM-P1.7: LEARNING CONNECTIVITY AND HIGHER-ORDER INTERACTIONS IN RADIAL DISTRIBUTION GRIDS
Yang, Qiuling, Beijing Institute of Technology, China Coutino, Mario, Delft University of Technology, Netherlands Wang, Gang, University of Minnesota, United States Giannakis, Georgios B., University of Minnesota, United States Leus, Geert, Delft University of Technology, Netherlands
SPTM-P1.8: SEMI-SUPERVISED LEARNING OF PROCESSES OVER MULTI-RELATIONAL GRAPHS

Lu, Qin, University of Minnesota, United States Ioannidis, Vassilis N., University of Minnesota, United States Giannakis, Georgios B., University of Minnesota, United States

SPTM-P1.9: RECURSIVE PREDICTION OF GRAPH SIGNALS WITH INCOMING NODES

Venkitaraman, Arun, KTH Royal Institute of Technology, Sweden Chatterjee, Saikat, KTH Royal Institute of Technology, Sweden Wahlberg, Bo, KTH Royal Institute of Technology, Sweden

SPTM-P1.10: LEARNING SIGNED GRAPHS FROM DATA

Matz, Gerald, Technische Universität Wien, Austria Dittrich, Thomas, Technische Universität Wien, Austria

SPTM-P1.11: FORECASTING MULTI-DIMENSIONAL PROCESSES OVER GRAPHS

Natali, Alberto, Delft University of Technology, Netherlands Isufi, Elvin, Delft University of Technology, Netherlands Leus, Geert, Delft University of Technology, Netherlands

SPTM-P1.12: A REGULARIZATION FRAMEWORK FOR LEARNING OVER MULTITASK GRAPHS

SPTM-P2 - Sampling Theory, Analysis and Methods

SPTM-P2.1: DISTRIBUTED QUANTIZATION FOR SPARSE TIME SEQUENCES
Cohen, Alejandro, Massachusetts Institute of Technology, United States
Shlezinger, Nir, Weizmann Institute of Science, Israel
Salamatian, Salman, Massachusetts Institute of Technology, United States
Eldar, Yonina, Weizmann Institute of Science, Israel
Medard, Muriel, Massachusetts Institute of Technology, United States

SPTM-P2.2: A TIME-BASED SAMPLING FRAMEWORK FOR FINITE-RATE-OF-INNOVATION SIGNALS
Rudresh, Sunil, Indian Institute of Science, India
Kamath, Abijith Jagannath, Indian Institute of Science, India
Seelamantula, Chandra Sekhar, Indian Institute of Science, India

SPTM-P2.3: EFFECTIVE APPROXIMATION OF BANDBLIMITED SIGNALS AND THEIR SAMPLES
Boche, Holger, Technische Universität München, Germany
Mönich, Ullrich, Technische Universität München, Germany

SPTM-P2.4: RECEIVER DESIGN AND AGC OPTIMIZATION WITH SELF INTERFERENCE INDUCED SATURATION
Sheemar, Chandan, EURECOM, France
Slock, Dirk, EURECOM, France

SPTM-P2.5: D-SLAM: DIFFUSION SOURCE LOCALIZATION AND TRAJECTORY MAPPING
Alexandru, Roxana, Imperial College London, United Kingdom
Blu, Thierry, Chinese University of Hong Kong, Hong Kong SAR of China
Dragotti, Pier Luigi, Imperial College London, United Kingdom

SPTM-P2.6: TRIGGERLESS RANDOM INTERLEAVED SAMPLING
Rupniewski, Marek, Warsaw University of Technology, Poland

SPTM-P2.7: THE FRACTIONAL QUATERNION FOURIER NUMBER TRANSFORM
da Silva Jr., Luiz, Federal University of Pernambuco, Brazil
de Oliveira Neto, José, Federal University of Pernambuco, Brazil
Lima, Juliano, Federal University of Pernambuco, Brazil

SPTM-P2.8: SHORT AND SQUEEZED: ACCELERATING THE COMPUTATION OF ANTISPARSE REPRESENTATIONS WITH SAFE SQUEEZING
Elvira, Clément, Univ Rennes, Inria, CNRS, IRISA, France Herzet, Cédric, Univ Rennes, Inria, CNRS, IRISA, France

**SPTM-P2.9: DECENTRALIZED EXPECTED CONSISTENT SIGNAL RECOVERY FOR QUANTIZATION MEASUREMENTS**

Wang, Chang-Jen, National Chiao Tung University, Taiwan Wen, Chao-Kai, National Sun Yat-sen University, Taiwan Tsai, Shang-Ho, National Chiao Tung University, Taiwan Jin, Shi, Southeast University, China

**SPTM-P2.11: LIE GROUP STATE ESTIMATION VIA OPTIMAL TRANSPORT**

Wang, Zhichao, University of New South Wales, Australia Solo, Victor, University of New South Wales, Australia
SPTM-P3 - Signal and Information Processing over Graphs

SPTM-P3.1: SMOOTHING GRAPH SIGNALS VIA RANDOM SPANNING FORESTS
Pilavci, Yusuf Yigit, University Grenoble-Alpes, Grenoble-INP, France Amblard, Pierre-Olivier, CNRS, France Barthelmé, Simon, CNRS, France Tremblay, Nicolas, CNRS, France

SPTM-P3.2: DIAGONALIZABLE SHIFT AND FILTERS FOR DIRECTED GRAPHS BASED ON THE JORDAN-CHEVALLEY DECOMPOSITION
Misiakos, Panagiotis, National Technical University of Athens, Greece Wendler, Chris, ETH Zurich, Switzerland Püschel, Markus, ETH Zurich, Switzerland

SPTM-P3.3: GAUSSIAN PROCESSES OVER GRAPHS
Venkitaraman, Arun, KTH Royal Institute of Technology, Sweden Chatterjee, Saikat, KTH Royal Institute of Technology, Sweden Handel, Peter, KTH Royal Institute of Technology, Sweden

SPTM-P3.4: BLIND SOURCE SEPARATION OF GRAPH SIGNALS
Miettinen, Jari, Aalto University, Finland Vorobyov, Sergiy A., Aalto University, Finland Ollila, Esa, Aalto University, Finland

SPTM-P3.5: GRAPHICAL EVOLUTIONARY GAME THEORETIC ANALYSIS OF SUPER USERS IN INFORMATION DIFFUSION
Li, Yuejiang, Tsinghua University, China Li, Yaxin, Michigan State University, United States Hu, Hong, Tsinghua University, China Zhao, H. Vicky, Tsinghua University, China Chen, Yan, University of Electronic Science and Technology of China, China

SPTM-P3.6: GRADIENT-BASED ALGORITHM WITH SPATIAL REGULARIZATION FOR OPTIMAL SENSOR PLACEMENT
Ghayem, Fateme, University of Grenoble, France Rivet, Bertrand, University of Grenoble, France Cabral Farias, Rodrigo, Univ. Cote dAzur, France Jutten, Christian, University of Grenoble, France

SPTM-P3.7: THE GRAPHON FOURIER TRANSFORM
Ruiz, Luana, University of Pennsylvania, United States F. O. Chamon, Luiz, University of Pennsylvania, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SPTM-P3.8: LEARNING PRODUCT GRAPHS FROM MULTIDOMAIN SIGNALS

Wednesday, 6 May, 09:00 - 11:00
Kadambari, Sai Kiran, Indian Institute of Science, India
Chepuri, Sundeep Prabhakar, Indian Institute of Science, India

**SPTM-P3.9: GRAPH VERTEX SAMPLING WITH ARBITRARY GRAPH SIGNAL HILBERT SPACES**

Girault, Benjamin, University of Southern California, United States
Ortega, Antonio, University of Southern California, United States
Narayanan, Shrikanth, University of Southern California, United States

**SPTM-P3.10: ESTIMATION OF INFORMATION IN PARALLEL GAUSSIAN CHANNELS VIA MODEL ORDER SELECTION**

Lopez, Carlos Alejandro, Technical University of Catalonia, Spain
de Cabrera, Ferran, Technical University of Catalonia, Spain
Riba, Jaume, Technical University of Catalonia, Spain

**SPTM-P3.11: GENERALIZED GRAPH SPECTRAL SAMPLING WITH STOCHASTIC PRIORS**

Hara, Junya, Tokyo University of Agriculture and Technology, Japan
Tanaka, Yuichi, Tokyo University of Agriculture and Technology, Japan
Eldar, Yonina, Weizmann Institute of Science, Israel
**SPTM-P4 - Sparsity-Aware Processing I**

**SPTM-P4.1: ANOMALYDAE: DUAL AUTOENCODER FOR ANOMALY DETECTION ON ATTRIBUTED NETWORKS**

Fan, Haoyi, Harbin University of Science and Technology, China
Zhang, Fengbin, Harbin University of Science and Technology, China
Li, Zuoyong, Minjiang University, China

**SPTM-P4.2: ON THE DEGREES OF FREEDOM IN TOTAL VARIATION MINIMIZATION**

Xue, Feng, National Key Laboratory of Science and Technology on Test Physics and Numerical Mathematics, China
Blu, Thierry, Chinese University of Hong Kong, Hong Kong SAR of China

**SPTM-P4.3: ATOMIC NORM DENOISING IN BLIND TWO-DIMENSIONAL SUPER-RESOLUTION**

Suliman, Mohamed A., Imperial College London, United Kingdom
Dai, Wei, Imperial College London, United Kingdom

**SPTM-P4.4: DYNAMIC CHANNEL PRUNING FOR CORRELATION FILTER BASED OBJECT TRACKING**

Yelluru Gopal, Goutam, Concordia University, Canada
Amer, Maria A., Concordia University, Canada

**SPTM-P4.5: POSITIVE SEMIDEFINITE MATRIX FACTORIZATION: A LINK TO PHASE RETRIEVAL AND A BLOCK GRADIENT ALGORITHM**

Lahat, Dana, IRIT, Université de Toulouse, CNRS, France
Févotte, Cédric, IRIT, Université de Toulouse, CNRS, France

**SPTM-P4.6: REALIZABILITY OF PLANAR POINT EMBEDDINGS FROM ANGLE MEASUREMENTS**

Dümbgen, Frederike, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
El Helou, Majed, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Scholefield, Adam, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

**SPTM-P4.7: SPARSE RECOVERY WITH NON-LINEAR FOURIER FEATURES**

Ozcelikkale, Ayca, Uppsala University, Sweden
SPTM-P4.8: EFFICIENT SUPER-RESOLUTION TWO-DIMENSIONAL HARMONIC RETRIEVAL VIA ENHANCED LOW-RANK STRUCTURED COVARIANCE RECONSTRUCTION
Wang, Yue, George Mason University, United States Zhang, Yu, Nanjing University of Aeronautics and Astronautics, China Tian, Zhi, George Mason University, United States Leus, Geert, Delft University of Technology, Netherlands Zhang, Gong, Nanjing University of Aeronautics and Astronautics, China

SPTM-P4.9: EFFECT OF UNDERSAMPLING ON NON-NEGATIVE BLIND DECONVOLUTION WITH AUTOREGRESSIVE FILTERS
Sarangi, Pulak, University of California, San Diego, United States Hucumenoglu, Mehmet Can, University of California, San Diego, United States Pal, Piya, University of California, San Diego, United States

SPTM-P4.10: MANIFOLD GRADIENT DESCENT SOLVES MULTI-CHANNEL SPARSE BLIND DECONVOLUTION PROVABLY AND EFFICIENTLY
Shi, Laixi, Carnegie Mellon University, United States Chi, Yuejie, Carnegie Mellon University, United States

SPTM-P4.11: SELF-TUNING ALGORITHMS FOR MULTISENSOR-MULTITARGET TRACKING USING BELIEF PROPAGATION
Soldi, Giovanni, Centre for Maritime Research and Experimentation (CMRE), Italy Meyer, Florian, University of California, San Diego, United States Braca, Paolo, Centre for Maritime Research and Experimentation (CMRE), Italy Hlawatsch, Franz, Technische Universität Wien, Austria
Wednesday, 6 May, 11:30 - 13:30

**SPTM-P5 - Optimization Techniques II**

**SPTM-P5.1: SPARSE BRANCH AND BOUND FOR EXACT OPTIMIZATION OF L0-NORM PENALIZED LEAST SQUARES**

Ben Mhenni, Ramzi, Ecole Centrale de Nantes, France Bourguignon, Sébastien, Ecole Centrale de Nantes, France Mongeau, Marcel, Ecole Nationale de l'Aviation Civile, Université de Toulouse, France Ninin, Jordan, École nationale supérieure de techniques avancées Bretagne, France Hervé, Carfantan, Université Toulouse III Paul Sabatier, France

**SPTM-P5.2: A PROXIMAL DUAL CONSENSUS METHOD FOR LINEARLY COUPLED MULTI-AGENT NON-CONVEX OPTIMIZATION**

Zhang, Jiawei, Chinese University of Hong Kong, Shenzhen, China Ge, Songyang, Chinese University of Hong Kong, Shenzhen, China Chang, Tsung-Hui, Chinese University of Hong Kong, Shenzhen, China Luo, Zhi-Quan, Chinese University of Hong Kong, Shenzhen, China

**SPTM-P5.3: A PENALTY ALTERNATING DIRECTION METHOD OF MULTIPLIERS FOR DECENTRALIZED COMPOSITE OPTIMIZATION**

Zhang, Jiaojiao, Chinese University of Hong Kong, China So, Anthony Man-Cho, Chinese University of Hong Kong, China Ling, Qing, Sun Yat-Sen University, China

**SPTM-P5.4: WIRTINGER FLOW ALGORITHMS FOR PHASE RETRIEVAL FROM BINARY MEASUREMENTS**

Kishore, Vinith, Indian Institute of Science, Bangalore, India Seelamantula, Chandra Sekhar, Indian Institute of Science, Bangalore, India

**SPTM-P5.5: DECENTRALIZED MIN-MAX OPTIMIZATION: FORMULATIONS, ALGORITHMS AND APPLICATIONS IN NETWORK POISONING ATTACK**

Tsaknakis, Ioannis, University of Minnesota Twin Cities, United States Hong, Mingyi, University of Minnesota Twin Cities, United States Liu, Sijia, IBM Research, United States

**SPTM-P5.6: AN EFFICIENT AUGMENTED LAGRANGIAN-BASED METHOD FOR LINEAR EQUALITY-CONSTRAINED LASSO**

Deng, Zengde, Chinese University of Hong Kong, Hong Kong SAR of China Yue, Man-Chung, Hong Kong Polytechnic University, Hong Kong SAR of China So, Anthony Man-Cho, Chinese University of Hong Kong, Hong Kong SAR of China
SPTM-P5.7: CONTROL OF LINEAR DYNAMICAL SYSTEMS USING SPARSE INPUTS
Sriram, Chandrasekhar, Indian Institute of Science, India Joseph, Geethu, Indian Institute of Science, India Murthy, Chandra R., Indian Institute of Science, India

SPTM-P5.8: DECENTRALIZED STOCHASTIC NON-CONVEX OPTIMIZATION OVER WEAKLY CONNECTED TIME-VARYING DIGRAPHS
Lu, Songtao, IBM, United States Wu, Chai Wah, IBM, United States

SPTM-P5.10: RECOVERY OF BINARY SPARSE SIGNALS FROM COMPRESSED LINEAR MEASUREMENTS VIA POLYNOMIAL OPTIMIZATION
Fosson, Sophie M., Politecnico di Torino, Italy Abuabiah, Mohammad, Politecnico di Torino, Italy
SPTM-P6 - Sampling, Multirate Signal Processing and Digital Signal Processing

SPTM-P6.1: PACO AND PACO-DCT: PATCH CONSENSUS AND ITS APPLICATION TO INPAINTING
Ramírez, Ignacio, Universidad de la República, Uruguay Hounie, Ignacio, Universidad de la República, Uruguay

SPTM-P6.2: IMAGE RECOVERY FROM ROTATIONAL AND TRANSLATIONAL INVARIANTS
Marshall, Nicholas, Princeton University, United States Lan, Ti-Yen, Princeton University, United States Bendory, Tamir, Tel Aviv University, Israel Singer, Amit, Princeton University, United States

SPTM-P6.3: OPTIMAL WINDOW DESIGN FOR JOINT SPATIAL-SPECTRAL DOMAIN FILTERING OF SIGNALS ON THE SPHERE
Aslam, Adeem, Lahore University of Management Sciences, Pakistan Khalid, Zubair, Lahore University of Management Sciences, Pakistan

SPTM-P6.4: FILTERING OUT TIME-FREQUENCY AREAS USING GABOR MULTIPLIERS
Kreme, Ama Marina, Aix-Marseille Université, France Emiya, Valentin, Aix-Marseille Université, France Chaux, Caroline, Aix-Marseille Université, France Torrésani, Bruno, Aix-Marseille Université, France

SPTM-P6.5: $\beta$-NMF AND SPARSITY PROMOTING REGULARIZATIONS FOR COMPLEX MIXTURE UNMIXING. APPLICATION TO 2D HSQC NMR.
Cherni, Afef, Aix-Marseille Univ, CNRS, Centrale Marseille, I2M, France Anthoine, Sandrine, Aix-Marseille Univ, CNRS, Centrale Marseille, I2M, France Chaux, Caroline, Aix-Marseille Univ, CNRS, Centrale Marseille, I2M, France

SPTM-P6.6: FIR FILTERING OF DISCONTINUOUS SIGNALS: A RANDOM-STRATIFIED SAMPLING APPROACH
Darawsheh, Hikmat, University of Westminster, United Kingdom Tarczynski, Andrzej, University of Westminster, United Kingdom

SPTM-P6.7: MESSAGE TRANSMISSION THROUGH UNDERSPREAD TIME-VARYING LINEAR CHANNELS
SPTM-P6.8: THE DISCRETE STOCKWELL TRANSFORMS FOR INFINITE-LENGTH SIGNALS AND THEIR REAL-TIME IMPLEMENTATIONS

Yan, Yusong, Beijing Institute of Technology, China Zhu, Hongmei, York University, Canada

SPTM-P6.9: LOW-RANK APPROXIMATION OF MATRICES VIA A RANK-REVEALING FACTORIZATION WITH RANDOMIZATION

Kaloorazi, Maboud, Northwestern Polytechnical University, China Chen, Jie, Northwestern Polytechnical University, China

SPTM-P6.10: TIME-SCALE SYNTHESIS FOR LOCALLY STATIONARY SIGNALS

Meynard, Adrien, Duke University, United States Torrésani, Bruno, Aix-Marseille Université, France

SPTM-P6.11: MAXIMALLY ENERGY-CONCENTRATED DIFFERENTIAL WINDOW FOR PHASE-AWARE SIGNAL PROCESSING USING INSTANTANEOUS FREQUENCY

Kusano, Tsubasa, Waseda University, Japan Yatabe, Kohei, Waseda University, Japan Oikawa, Yasuhiro, Waseda University, Japan

SPTM-P6.12: ON THE USE OF RÉNYI ENTROPY FOR OPTIMAL WINDOW SIZE COMPUTATION IN THE SHORT-TIME FOURIER TRANSFORM

Meignen, Sylvain, University Grenoble Alpes, France Colominas, Marcelo A., CONICET, Argentina Pham, Duong-Hung, University of Toulouse, France
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SPTM-P7 - Bayesian Signal Processing I

SPTM-P7.1: DATA-DRIVEN MODEL SET DESIGN FOR MODEL AVERAGED PARTICLE FILTER
Liu, Bin, Nanjing University of Posts and Telecommunications, China

SPTM-P7.2: GRAPHEM: EM ALGORITHM FOR BLIND KALMAN FILTERING UNDER GRAPHICAL SPARSITY CONSTRAINTS
Chouzenoux, Emilie, CVN, CentraleSupélec, INRIA Saclay, France Elvira, Víctor, University of Edinburgh, United Kingdom

SPTM-P7.3: ON DESIGN OF OPTIMAL SMART METER PRIVACY CONTROL STRATEGY AGAINST ADVERSARIAL MAP DETECTION
Avula, Ramana Reddy, KTH Royal Institute of Technology, Sweden Oechtering, Tobias, KTH Royal Institute of Technology, Sweden

SPTM-P7.4: APPROXIMATE INFEERENCE BY KULLBACK-LEIBLER TENSOR BELIEF PROPAGATION
Wijnings, Patrick W.A., Eindhoven University of Technology, Netherlands Stuijk, Sander, Eindhoven University of Technology, Netherlands de Vries, Bert, Eindhoven University of Technology, Netherlands Corporaal, Henk, Eindhoven University of Technology, Netherlands

SPTM-P7.5: A PARTICLE GIBBS SAMPLING APPROACH TO TOPOLOGY INFERENC EN IN GENE REGULATORY NETWORKS
Iloska, Marija, Stony Brook University, United States El-Laham, Yousef, Stony Brook University, United States Bugallo, Mónica F., Stony Brook University, United States

SPTM-P7.6: PARTICLE FILTER WITH REJECTION CONTROL AND UNBIASED ESTIMATOR OF THE MARGINAL LIKELIHOOD
Kudlicka, Jan, Uppsala University, Sweden Murray, Lawrence M., Uber AI, United States Schön, Thomas B., Uppsala University, Sweden Lindsten, Fredrik, Linköping University, Sweden

SPTM-P7.7: PARTICLE GROUP METROPOLIS METHODS FOR TRACKING THE LEAF AREA INDEX
Martino, Luca, Universidad Rey Juan Carlos, Spain Elvira, Víctor, University of Edinburgh, United Kingdom Camps-Valls, Gustau, Universitat de Valencia, Spain
SPTM-P7.8: UNSUPERVISED VARIATIONAL BAYESIAN KALMAN FILTERING FOR LARGE-DIMENSIONAL GAUSSIAN SYSTEMS
Ait-El-Fquih, Boujemaa, King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Rodet, Thomas, Ecole Normale Supérieure de Cachan, France
Hoteit, Ibrahim, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

SPTM-P7.9: LEVENBERG-MARQUARDT AND LINE-SEARCH EXTENDED KALMAN SMOOTHERS
Särkkä, Simo, Aalto University, Finland
Svensson, Lennart, Chalmers University of Technology, Sweden

SPTM-P7.10: LAPLACE STATE SPACE FILTER WITH EXACT INFERENVE AND MOMENT MATCHING
Neri, Julian, McGill University, Canada
Depalle, Philippe, McGill University, Canada
Badeau, Roland, Telecom Paris, France

SPTM-P7.11: PROBABILISTIC FILTER AND SMOOTHER FOR VARIATIONAL INFERENCE OF BAYESIAN LINEAR DYNAMICAL SYSTEMS
Neri, Julian, McGill University, Canada
Badeau, Roland, Telecom Paris, France
Depalle, Philippe, McGill University, Canada

SPTM-P7.12: OPTIMUM KERNEL PARTICLE FILTER FOR ASYMMETRIC LAPLACE NOISE
Andersson, Ulrika, University of Cambridge, United Kingdom
Godsill, Simon, University of Cambridge, United Kingdom
Thursday, 7 May, 11:30 - 13:30

**SPTM-P8 - Signal Processing over Networks**

**SPTM-P8.2: CONVEX OPTIMISATION-BASED PRIVACY-PRESERVING DISTRIBUTED AVERAGE CONSENSUS IN WIRELESS SENSOR NETWORKS**

Li, Qiongxiu, Aalborg university, Denmark
Heusdens, Richard, Delft University of Technology, Netherlands
Christensen, Mads Græsbøll, Aalborg university, Denmark

**SPTM-P8.3: PROXIMAL MULTITASK LEARNING OVER DISTRIBUTED NETWORKS WITH JOINTLY SPARSE STRUCTURE**

Jin, Danqi, Northwestern Polytechnical University, China
Chen, Jie, Northwestern Polytechnical University, China
Richard, Cédric, Université de la Cote d’Azur, France
Chen, Jingdong, Northwestern Polytechnical University, China

**SPTM-P8.4: OPTIMAL SAMPLING RATE AND BANDWIDTH OF BANDLIMITED SIGNALS - AN ALGORITHMIC PERSPECTIVE**

Boche, Holger, Technische Universität München, Germany
Mönich, Ullrich, Technische Universität München, Germany

**SPTM-P8.5: RESILIENT TO BYZANTINE ATTACKS FINITE-SUM OPTIMIZATION OVER NETWORKS**

Wu, Zhaoxian, Sun Yat-Sen University, China
Ling, Qing, Sun Yat-Sen University, China
Chen, Tianyi, Rensselaer Polytechnic Institute, United States
Giannakis, Georgios B., University of Minnesota, United States

**SPTM-P8.6: EXPLOITING SPARSITY FOR ROBUST SENSOR NETWORK LOCALIZATION IN MIXED LOS/NLOS ENVIRONMENTS**

Jin, Di, Technische Universität Darmstadt, Germany
Yin, Feng, Chinese University of Hong Kong, China
Fauß, Michael, Princeton University, United States
Muma, Michael, Technische Universität Darmstadt, Germany
Zoubir, Abdelhak M., Technische Universität Darmstadt, Germany

**SPTM-P8.7: A LOW-COMPLEXITY MAP DETECTOR FOR DISTRIBUTED NETWORKS**

Feitosa, Allan, Universidade de São Paulo, Brazil
Nascimento, Vítor, Universidade de São Paulo, Brazil
Lopes, Cássio, Universidade de São Paulo, Brazil

**SPTM-P8.8: QUICKEST CHANGE DETECTION IN ANONYMOUS HETEROGENEOUS SENSOR NETWORKS**
Sun, Zhongchang, University at Buffalo, State University of New York, United States
Zou, Shaofeng, University at Buffalo, State University of New York, United States
Li, Qunwei, Ant Financial Services Group, China

**SPTM-P8.9: OPTIMAL POWER FLOW USING GRAPH NEURAL NETWORKS**

Owerko, Damian, University of Pennsylvania, United States
Gama, Fernando, University of Pennsylvania, United States
Ribeiro, Alejandro, University of Pennsylvania, United States

**SPTM-P8.10: BYZANTINE-ROBUST DECENTRALIZED STOCHASTIC OPTIMIZATION**

Peng, Jie, Sun Yat-Sen University, China
Ling, Qing, Sun Yat-Sen University, China

**SPTM-P8.11: FEDERATED TRUTH INFERENCE OVER DISTRIBUTED CROWDSOURCING PLATFORMS**

Yang, Ming-Hsun, National Chiao Tung University, Taiwan
Liu, Gin-Hao, National Tsing Hua University, Taiwan
Hong, Y.-W. Peter, National Tsing Hua University, Taiwan

**SPTM-P8.12: CLOCK SYNCHRONIZATION OVER NETWORKS USING SAWTOOTH MODELS**

del Aguila Pla, Pol, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Pellaco, Lissy, KTH Royal Institute of Technology, Sweden
Dwivedi, Satyam, Ericsson Research, Sweden
Handel, Peter, KTH Royal Institute of Technology, Sweden
Jaldén, Joakim, KTH Royal Institute of Technology, Sweden
Thursday, 7 May, 11:30 - 13:30

SPTM-P9 - Estimation Theory and Methods II

SPTM-P9.1: AN ANALYTICAL SOLUTION TO JACOBSEN ESTIMATOR FOR WINDOWED SIGNALS
Murakami, Takahiro, Meiji University, Japan Wang, Wenwu, University of Surrey, United Kingdom

SPTM-P9.2: REGULARIZED PARTIAL PHASE SYNCHRONY INDEX APPLIED TO DYNAMICAL FUNCTIONAL CONNECTIVITY ESTIMATION
Frusque, Gaëtan, Ecole Normal Supérieur de Lyon, France Jung, Julien, Hospice Civil de lyon, Neuroscience Hospital & INSERM, France Borgnat, Pierre, CNRS, France Gonçalves, Paulo, Inria, France

SPTM-P9.3: THE MATCHED REASSIGNED CROSS-SPECTROGRAM FOR PHASE ESTIMATION
Sandsten, Maria, Lund University, Sweden Anderson, Rachele, Lund University, Sweden Reinhold, Isabella, Lund University, Sweden Brynolfsson, Johan, Lund University, Sweden

SPTM-P9.4: LINE SPECTRAL ESTIMATION WITH PALINDROMIC KERNELS
Verbeke, Dieter, Vrije Universiteit Brussel, Belgium Markovsky, Ivan, Vrije Universiteit Brussel, Belgium

SPTM-P9.5: LATENT FUSED LASSO
Feng, Yining, New York University, United States Selesnick, Ivan, New York University, United States

SPTM-P9.6: ADVERSARIAL ATTACKS ON DEEP UNFOLDED NETWORKS FOR SPARSE CODING
Wang, Yulu, Tsinghua University, China Wu, Kailun, Tsinghua University, China Zhang, Changshui, Tsinghua University, China

SPTM-P9.7: RIEMANNIAN FRAMEWORK FOR ROBUST COVARIANCE MATRIX ESTIMATION IN SPIKED MODELS
Bouchard, Florent, Univ. Savoie Mont Blanc, France Breloy, Arnaud, Univ. Paris Nanterre, France Ginolhac, Guillaume, Univ. Savoie Mont Blanc, France Pascal, Frédéric, CentraleSupélec, Univ. Paris-Saclay, France

SPTM-P9.8: ROBUST MATRIX COMPLETION VIA LP-GREEDY PURSUITS
Jiang, Xue, Shanghai Jiao Tong University, China  
Zoubir, Abdelhak M., Technische Universität Darmstadt, Germany  
Liu, Xingzhao, Shanghai Jiao Tong University, China

**SPTM-P9.9: MAXIMUM LIKELIHOOD ESTIMATION OF A LOW-RANK PROBABILITY MASS TENSOR FROM PARTIAL OBSERVATIONS**  
Yeredor, Arie, Tel Aviv University, Israel  
Haardt, Martin, Ilmenau University of Technology, Germany

**SPTM-P9.10: SEPARABLE OPTIMIZATION FOR JOINT BLIND DECONVOLUTION AND DEMIXING**  
Weitzner, Dana, Tel Aviv University, Israel  
Giryes, Raja, Tel Aviv University, Israel

**SPTM-P9.11: MISSPECIFIED CRAMER-RAO BOUND FOR DELAY ESTIMATION WITH A MISMATCHED WAVEFORM: A CASE STUDY**  
Roemer, Florian, Fraunhofer Institute for Nondestructive Testing IZFP, Germany
**SPTM-P10 - Detection and Classification**

**SPTM-P10.1: PRIVACY-AWARE QUICKEST CHANGE DETECTION**

Lau, Tze Siong, Nanyang Technological University, Singapore
Tay, Wee Peng, Nanyang Technological University, Singapore

**SPTM-P10.2: SOURCE ENUMERATION VIA TOEPLITZ MATRIX COMPLETION**

Garg, Vaibhav, University of Cantabria, Spain
Giménez-Febrer, Pere, University of Cantabria, Spain
Pagès-Zamora, Alba, Universitat Politècnica de Catalunya, Spain
Santamaría, Ignacio, University of Cantabria, Spain

**SPTM-P10.3: SEQUENTIAL METHODS FOR DETECTING A CHANGE IN THE DISTRIBUTION OF AN EPISODIC PROCESS**

Banerjee, Taposh, University of Texas at San Antonio, United States
Adib, Edmond, University of Texas at San Antonio, United States
Taha, Ahmad, University of Texas at San Antonio, United States
John, Eugene, University of Texas at San Antonio, United States

**SPTM-P10.4: DISTRIBUTION OF THE PRODUCT OF A COMPLEX GAUSSIAN MATRIX AND VECTOR AND ITS SUM WITH A COMPLEX GAUSSIAN VECTOR**

Shi, Wanxin, University of Electronic Science and Technology of China, China
Li, Yang, University of Electronic Science and Technology of China, China
He, Qian, University of Electronic Science and Technology of China, China

**SPTM-P10.5: PRINCIPAL ANGLE DETECTOR FOR SUBSPACE SIGNAL WITH STRUCTURED UNKNOWN INTERFERENCE**

Xu, Xingyu, Tsinghua University, China
Jiao, Yuchen, Tsinghua University, China
Gu, Yuantao, Tsinghua University, China

**SPTM-P10.6: A ROBUST SPEAKER CLUSTERING METHOD BASED ON DISCRETE TIED VARIATIONAL AUTOENCODER**

Feng, Chen, Ping An Technology (Shenzhen) Co., Ltd., China
Wang, Jianzong, Ping An Technology (Shenzhen) Co., Ltd., China
Li, Tongxu, Ping An Technology (Shenzhen) Co., Ltd., China
Peng, Junqing, Ping An Technology (Shenzhen) Co., Ltd., China
Xiao, Jing, Ping An Technology (Shenzhen) Co., Ltd., China

**SPTM-P10.7: TRACK-BEFORE-DETECT FOR SUB-NYQUIST RADAR**

Na, Siqi, Tsinghua University, China
Huang, Tianyao, Tsinghua University, China
Liu, Yimin, Tsinghua University, China
Wang, Xi Qin, Tsinghua University, China
SPTM-P10.8: OPTIMAL TRANSPORT BASED CHANGE POINT DETECTION AND TIME SERIES SEGMENT CLUSTERING
Cheng, Kevin, Tufts University, United States Aeron, Shuchin, Tufts University, United States Hughes, Michael, Tufts University, United States Hussey, Erika, CCDC-Soldier Center, United States Miller, Eric, Tufts University, United States

SPTM-P10.9: MULTI-VIEW WASSERSTEIN DISCRIMINANT ANALYSIS WITH ENTROPIC REGULARIZED WASSERSTEIN DISTANCE
Kasai, Hiroyuki, Waseda University, Japan

SPTM-P10.10: LARGE-SCALE TIME SERIES CLUSTERING WITH K-ARS
Yue, Zuogong, University of New South Wales, Australia Solo, Victor, University of New South Wales, Australia

SPTM-P10.11: DETERMINISTIC FEATURE DECOUPLING BY SURFING INVARIANCE MANIFOLDS
Martinez-Enriquez, Eduardo, Consejo Superior de Investigaciones Cientificas, Spain Portilla, Javier, Consejo Superior de Investigaciones Cientificas, Spain

SPTM-P10.12: UNSUPERVISED AUTO-ENCODING MULTIPLE-OBJECT TRACKER FOR CONSTRAINT-CONSISTENT COMBINATORIAL PROBLEM
Kawachi, Yuta, DENSO IT Laboratory, Inc., Japan Suzuki, Teppei, DENSO IT Laboratory, Inc., Japan
SS-L1 - Active Control of Acoustic Noise over Spatial Regions

**SS-L1.1: SPATIAL ACTIVE NOISE CONTROL BASED ON KERNEL INTERPOLATION WITH DIRECTIONAL WEIGHTING**
Ito, Hayato, University of Tokyo, Japan Koyama, Shoichi, University of Tokyo, Japan Ueno, Natsuki, University of Tokyo, Japan Saruwatari, Hiroshi, University of Tokyo, Japan

**SS-L1.2: ACTIVE NOISE CONTROL OVER MULTIPLE REGIONS: PERFORMANCE ANALYSIS**
Zhang, Jihui, Australian National University, Australia Sun, Huiyuan, Australian National University, Australia Samarasinghe, Prasanga N., Australian National University, Australia Abhayapala, Thushara D., Australian National University, Australia

**SS-L1.3: ARRAY-GEOMETRY-AWARE SPATIAL ACTIVE NOISE CONTROL BASED ON DIRECTION-OF-ARRIVAL WEIGHTING**
Maeno, Yu, Sony Corporation, Japan Takida, Yuhta, Sony Corporation, Japan Murata, Naoki, Sony Corporation, Japan Mitsufuji, Yuki, Sony Corporation, Japan

**SS-L1.4: MULTICHANNEL ACTIVE NOISE CONTROL WITH SPATIAL DERIVATIVE CONSTRAINTS TO ENLARGE THE QUIET ZONE**
Shi, Dongyuan, Nanyang Technological University, Singapore Lam, Bhan, Nanyang Technological University, Singapore Wen, Shulin, Nanyang Technological University, Singapore Gan, Woon-Seng, Nanyang Technological University, Singapore

**SS-L1.5: AN ACOUSTIC MODELLING BASED REMOTE ERROR SENSING APPROACH FOR QUIET ZONE GENERATION IN A NOISY ENVIRONMENT**
Zhu, Qiaoxi, University of Technology Sydney, Australia Qiu, Xiaojun, University of Technology Sydney, Australia Burnett, Ian, University of Technology Sydney, Australia

**SS-L1.6: DISTRIBUTED WAVE-DOMAIN ACTIVE NOISE CONTROL BASED ON THE DIFFUSION STRATEGY**
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<td>Scalzo-Dees, Bruno, Imperial College London, United Kingdom Stankovic, Ljubisa, University of Montenegro, Montenegro Constantinides, Anthony G., Imperial College London, United Kingdom Mandic, Danilo P., Imperial College London, United Kingdom</td>
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SS-L3.1: GRAPH NEURAL NET USING ANALYTICAL GRAPH FILTERS AND TOPOLOGY OPTIMIZATION FOR IMAGE DENOISING
Su, Wengtai, National Tsing Hua University, Taiwan Cheung, Gene, York University, Taiwan Wildes, Richard P., York University, Taiwan Lin, Chia-Wen, National Tsing Hua University, Taiwan

SS-L3.2: DEFENDING GRAPH CONVOLUTIONAL NETWORKS AGAINST ADVERSARIAL ATTACKS
Ioannidis, Vassilis N., University of Minnesota, United States Giannakis, Georgios B., University of Minnesota, United States

SS-L3.3: CONSTRAINED SPECTRAL CLUSTERING FOR DYNAMIC COMMUNITY DETECTION
Karaaslanli, Abdullah, Michigan State University, United States Aviyente, Selin, Michigan State University, United States

SS-L3.4: TOWARDS AN EFFICIENT AND GENERAL FRAMEWORK OF ROBUST TRAINING FOR GRAPH NEURAL NETWORKS
Xu, Kaidi, Northeastern University, United States Liu, Sijia, IBM Research, United States Chen, Pin-Yu, IBM Research, United States Sun, Mengshu, Northeastern University, United States Ding, Caiwen, University of Connecticut, United States Kailkhura, Bhavya, Lawrence Livermore National Laboratory, United States Lin, Xue, Northeastern University, United States

SS-L3.5: DEEP GEOMETRIC KNOWLEDGE DISTILLATION WITH GRAPHS
Lassance, Carlos, IMT Atlantique, France Bontonou, Myriam, IMT Atlantique, France Boukli Hacene, Ghouthi, IMT Atlantique, France Gripon, Vincent, IMT Atlantique, France Tang, Jian, HEC Montreal/Mila, Canada Ortega, Antonio, University of Southern California, France

SS-L3.6: ON THE CHOICE OF GRAPH NEURAL NETWORK ARCHITECTURES
SS-L4 - End-to-End Approaches for Spoken Language Understanding

SS-L4.1: MULTITASK LEARNING WITH CAPSULE NETWORKS FOR SPEECH-TO-INTENT APPLICATIONS
Poncelet, Jakob, Katholieke Universiteit Leuven, Belgium Van hamme, Hugo, Katholieke Universiteit Leuven, Belgium

SS-L4.2: USING SPEECH SYNTHESIS TO TRAIN END-TO-END SPOKEN LANGUAGE UNDERSTANDING MODELS
Lugosch, Loren, McGill University / Mila, Canada Meyer, Brett H., McGill University, Canada Nowrouzezahrai, Derek, McGill University / Mila, Canada Ravanelli, Mirco, Université de Montréal / Mila, Canada

SS-L4.3: IMPROVED END-TO-END SPOKEN UTTERANCE CLASSIFICATION WITH A SELF-ATTENTION ACOUSTIC CLASSIFIER
Price, Ryan, Interactions, LLC., United States Mehrabani, Mahnoosh, Interactions, LLC., United States Bangalore, Srinivas, Interactions, LLC., United States

SS-L4.4: DIALOGUE HISTORY INTEGRATION INTO END-TO-END SIGNAL-TO-CONCEPT SPOKEN LANGUAGE UNDERSTANDING SYSTEMS
Tomashenko, Natalia, University of Avignon, France Raymond, Christian, Rennes/IRISA, France Caubrière, Antoine, Le Mans Université, France De Mori, Renato, McGill University, France Estève, Yannick, Avignon Université, France

SS-L4.5: ERROR ANALYSIS APPLIED TO END-TO-END SPOKEN LANGUAGE UNDERSTANDING
Caubrière, Antoine, Le Mans Université, France Ghannay, Sahar, LIMSI, CNRS, Univ. Paris-Sud, Univ. Paris-Saclay, France Tomashenko, Natalia, Avignon Université, France De Mori, Renato, Avignon Université, France Laurent, Antoine, Le Mans Université, France Morin, Emmanuel, Nantes Université, France Estève, Yannick, Avignon Université, France

SS-L4.6: A DATA EFFICIENT END-TO-END SPOKEN LANGUAGE UNDERSTANDING ARCHITECTURE
Dinarelli, Marco, LIG, France Kapoor, Nikita, LIG, India Jabaian, Bassam, LIA, France Besacier, Laurent, LIG, France
Tuesday, 5 May, 16:30 - 18:30

**SS-L5 - Spike-based Neuromorphic Information Representation, Processing and Learning**

**SS-L5.1: FEDERATED NEUROMORPHIC LEARNING OF SPIKING NEURAL NETWORKS FOR LOW-POWER EDGE INTELLIGENCE**

Skatchkovsky, Nicolas, King’s College London, United Kingdom
Jang, Hyeryung, King's College London, United Kingdom
Simeone, Osvaldo, King's College London, United Kingdom

**SS-L5.2: TEMPORAL CODING IN SPIKING NEURAL NETWORKS WITH ALPHA SYNAPTIC FUNCTION**

Comsa, Iulia M., Google Research, Switzerland
Potempa, Krzysztof, Google Research, Switzerland
Versari, Luca, Google Research, Switzerland
Fischbacher, Thomas, Google Research, Switzerland
Gesmundo, Andrea, Google Research, Switzerland
Alakuijala, Jyrki, Google Research, Switzerland

**SS-L5.3: EVENT-DRIVEN SIGNAL PROCESSING WITH NEUROMORPHIC COMPUTING SYSTEMS**

Blouw, Peter, Applied Brain Research Inc., Canada
Eliasmith, Chris, Applied Brain Research Inc., Canada

**SS-L5.4: CHALLENGES AND PERSPECTIVES IN NEUROMORPHIC-BASED VISUAL IOT SYSTEMS AND NETWORKS**

Martini, Maria G., Kingston University, United Kingdom
Khan, Nabeel, Kingston University, United Kingdom
Bi, Yin, University College London, United Kingdom
Andreopoulos, Yiannis, University College London, United Kingdom
Saki, Hadi, King's College London, United Kingdom
Shikh-Bahaei, Mohammad, King’s College London, United Kingdom

**SS-L5.5: SPIKING NEURAL NETWORKS TRAINED WITH BACKPROPAGATION FOR LOW POWER NEUROMORPHIC IMPLEMENTATION OF VOICE ACTIVITY DETECTION**

Martinelli, Flavio, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Dellaferera, Giorgia, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Mainar, Pablo, Logitech Europe, Switzerland
Cernak, Milos, Logitech Europe, Switzerland

**SS-L5.6: TRAINING DEEP SPIKING NEURAL NETWORKS FOR ENERGY-EFFICIENT NEUROMORPHIC COMPUTING**
Srinivasan, Gopalakrishnan, Purdue University, United States Lee, Chankyu, Purdue University, United States Sengupta, Abhronil, Pennsylvania State University, United States Panda, Priyadarshini, Yale University, United States Sarwar, Syed Shakib, Purdue University, United States Roy, Kaushik, Purdue University, United States
Tuesday, 5 May, 16:30 - 18:30

SS-L6 - Machine Learning for Communications II

**SS-L6.1: DEEP LEARNING FOR ROBUST POWER CONTROL FOR WIRELESS NETWORKS**

Cui, Wei, University of Toronto, Canada
Shen, Kaiming, University of Toronto, Canada
Yu, Wei, University of Toronto, Canada

**SS-L6.2: FEEDBACK TURBO AUTOENCODER**

Jiang, Yihan, University of Washington, United States
Kim, Hyeji, Samsung AI Research Cambridge, United Kingdom
Asnani, Himanshu, Tata Institute of Fundamental Research, India
Oh, Sewoong, University of Washington, United States
Kannan, Sriram, University of Washington, United States
Viswanath, Pramod, University of Illinois at Urbana Champaign, United States

**SS-L6.3: EXPLOITING CHANNEL LOCALITY FOR ADAPTIVE MASSIVE MIMO SIGNAL DETECTION**

Khani, Mehrdad, Massachusetts Institute of Technology, United States
Alizadeh, Mohammad, Massachusetts Institute of Technology, United States
Hoydis, Jakob, Nokia Bell Labs, France
Fleming, Phil, Independent Consultant, United States

**SS-L6.4: DEEP LEARNING-BASED BEAM ALIGNMENT IN MMWAVE VEHICULAR NETWORKS**

Myers, Nitin Jonathan, University of Texas at Austin, United States
Wang, Yuyang, University of Texas at Austin, United States
González-Prelcic, Nuria, University of Texas at Austin, United States
Heath Jr., Robert W., University of Texas at Austin, United States

**SS-L6.5: JOINT SOURCE-CHANNEL CODING AND BAYESIAN MESSAGE PASSING DETECTION FOR GRANT-FREE RADIO ACCESS IN IOT**

Dommel, Johannes, Fraunhofer Heinrich Hertz Institute, Germany
Utovski, Zoran, Fraunhofer Heinrich Hertz Institute, Germany
Stanczak, Slawomir, Fraunhofer Heinrich Hertz Institute, Germany
Simeone, Osvaldo, King’s College London, United Kingdom

**SS-L6.6: CNN-BASED ANALOG CSI FEEDBACK IN FDD MIMO-OFDM SYSTEMS**

Boloursaz Mashhadi, Mahdi, Imperial College London, United Kingdom
Yang, Qianqian, Imperial College London, United Kingdom
Gündüz, Deniz, Imperial College London, United Kingdom
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**SS-L7 - Learning and Optimization in Non-Convex Environments**

**SS-L7.1: SCALABLE LEARNING-BASED SAMPLING OPTIMIZATION FOR COMPRESSIVE DYNAMIC MRI**

**SS-L7.2: LINEAR SPEEDUP IN SADDLE-POINT ESCAPE FOR DECENTRALIZED NON-CONVEX OPTIMIZATION**

**SS-L7.3: ON DISTRIBUTED STOCHASTIC GRADIENT ALGORITHMS FOR GLOBAL OPTIMIZATION**
Swenson, Brian, Princeton University, United States Sridhar, Anirudh, Princeton University, United States Poor, H. Vincent, Princeton University, United States

**SS-L7.4: DISTRIBUTED TENSOR COMPLETION OVER NETWORKS**
Battiloro, Claudio, Sapienza University of Rome, Italy Di Lorenzo, Paolo, Sapienza University of Rome, Italy

**SS-L7.5: LOOKAHEAD CONVERGES TO STATIONARY POINTS OF SMOOTH NON-CONVEX FUNCTIONS**
Wang, Jianyu, Carnegie Mellon University, United States Tantia, Vinayak, Facebook AI Research, Canada Ballas, Nicolas, Facebook AI Research, Canada Rabbat, Michael, Facebook AI Research, Canada

**SS-L7.6: COMMUNICATION CONSTRAINED LEARNING WITH UNCERTAIN MODELS**
Hare, James, U.S. Army Research Laboratory, United States Uribe, Cesar, Massachusetts Institute of Technology, United States Kaplan, Lance, U.S. Army Research Laboratory, United States Jadbabaie, Ali, Massachusetts Institute of Technology, United States
**Wednesday, 6 May, 09:00 - 11:00**

**SS-L8 - Recent Advances in Automotive Radar Systems**

**SS-L8.1: A SPARSE LINEAR ARRAY APPROACH IN AUTOMOTIVE RADARS USING MATRIX COMPLETION**
Sun, Shunqiao, University of Alabama, United States
Petropulu, Athina, Rutgers University, United States

**SS-L8.2: A LOW-RESOLUTION ADC PROOF-OF-CONCEPT DEVELOPMENT FOR A FULLY-DIGITAL MILLIMETER-WAVE JOINT COMMUNICATION-RADAR**
Kumari, Preeti, University of Texas at Austin, United States
Mezghani, Amine, University of Manitoba, Canada
W. Heath Jr., Robert, University of Texas at Austin, United States

**SS-L8.3: PERFORMANCE BOUNDS FOR DISPLACED SENSOR AUTOMOTIVE RADAR IMAGING**
Wang, Guohua, Hertzwell Pte Ltd, Singapore
Mishra, Kumar Vijay, Hertzwell Pte Ltd, Singapore

**SS-L8.4: SPATIAL AND TEMPORAL SMOOTHING FOR COVARIANCE ESTIMATION IN SUPER-RESOLUTION ANGLE ESTIMATION IN AUTOMOTIVE RADARS**
Ertan, Ali Erdem, Uhnder Inc., United States
Ali, Murtaza, Uhnder Inc., United States

**SS-L8.5: SLOW-TIME MIMO-FMCW AUTOMOTIVE RADAR DETECTION WITH IMPERFECT WAVEFORM SEPARATION**
Wang, Pu, Mitsubishi Electric Research Laboratories (MERL), United States
Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States
Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States
Orlik, Philip V., Mitsubishi Electric Research Laboratories (MERL), United States

**SS-L8.6: ON BINARY SEQUENCE SET DESIGN WITH APPLICATIONS TO AUTOMOTIVE RADAR**
Lin, Ronghao, University of Science and Technology of China, China
Li, Jian, University of Science and Technology of China, China
**SS-L9 - Learning Based Inversion**

**SS-L9.1: OPTIMAL TRANSPORT STRUCTURE OF CYCLEGAN FOR UNSUPERVISED LEARNING FOR INVERSE PROBLEMS**
Sim, Byeongsu, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Oh, Gyutaek, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Ye, Jong Chul, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

**SS-L9.2: LIGHT-FIELD RECONSTRUCTION AND DEPTH ESTIMATION FROM FOCAL STACK IMAGES USING CONVOLUTIONAL NEURAL NETWORKS**
Huang, Zhengyu, University of Michigan, United States Fessler, Jeffrey, University of Michigan, United States Norris, Theodore, University of Michigan, United States Chun, Il Yong, University of Hawai‘i at Mānoa, United States

**SS-L9.3: JOINT LEARNING OF CARTESIAN UNDERSAMPLING AND RECONSTRUCTION FOR ACCELERATED MRI**
Weiss, Tomer, Technion - Israel Institute of Technology, Israel Vedula, Sanketh, Technion - Israel Institute of Technology, Israel Senouf, Ortal, Technion - Israel Institute of Technology, Israel Michailovich, Oleg, University of Waterloo, Canada Zibulevsky, Michael, Technion - Israel Institute of Technology, Israel Bronstein, Alex, Technion - Israel Institute of Technology, Israel

**SS-L9.4: BUILDING FIRMLY NONEXPANSIVE CONVOLUTIONAL NEURAL NETWORKS**
Terris, Matthieu, Heriot-Watt University, United Kingdom Repetti, Audrey, Heriot-Watt University, United Kingdom Pesquet, Jean-Christophe, Université Paris-Saclay, CentraleSupélec, Inria, France Wiaux, Yves, Heriot-Watt University, United Kingdom

**SS-L9.5: CONFIRMNET: CONVOLUTIONAL FIRMNET AND APPLICATION TO IMAGE DENOISING AND INPAINTING**
Pokala, Praveen Kumar, Indian Institute of Science, India Uttam, Prakash Kumar, Indian Institute of Science, India Seelamantula, Chandra Sekhar, Indian Institute of Science, India

**SS-L9.6: LEARNING DIFFERENTIABLE SPARSE AND LOW RANK NETWORKS FOR AUDIO-VISUAL OBJECT LOCALIZATION**
Pu, Jie, Imperial College London, United Kingdom Panagakis, Yannis, University of Athens, Greece Pantic, Maja, Imperial College London, United Kingdom
Wednesday, 6 May, 11:30 - 13:30

SS-L10 - Signal Processing for Emerging Wireless Hardware Architectures

SS-L10.1: SPHERICAL LARGE INTELLIGENT SURFACES
Hu, Sha, Huawei Sweden, Sweden Rusek, Fredrik, Lund University, Sweden

SS-L10.2: PATHLOSS PREDICTION USING DEEP LEARNING WITH APPLICATIONS TO CELLULAR OPTIMIZATION AND EFFICIENT D2D LINK SCHEDULING
Levie, Ron, Technische Universität Berlin, Germany Yapar, Cagkan, Technische Universität Berlin, Germany Kutyniok, Gitta, Technische Universität Berlin, Germany Caire, Giuseppe, Technische Universität Berlin, Germany

SS-L10.3: BEAMFORMING IN INTELLIGENT ENVIRONMENTS BASED ON ULTRA-MASSIVE MIMO PLATFORMS IN MILLIMETER WAVE AND TERAHERTZ BANDS
Nie, Shuai, Georgia Institute of Technology, United States Akyildiz, Ian, Georgia Institute of Technology, United States

SS-L10.4: A SINGLE-RF ARCHITECTURE FOR MULTIUSER MASSIVE MIMO VIA REFLECTING SURFACES

SS-L10.5: HYBRID PRECODING FOR SECURE TRANSMISSION IN REFLECT-ARRAY-ASSISTED MASSIVE MIMO SYSTEMS
Asaad, Saba, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany Schaefer, Rafael F., Technische Universität Berlin, Germany Poor, H. Vincent, Princeton University, United States

SS-L10.6: WIDEBAND CHANNEL TRACKING FOR MILLIMETER WAVE MASSIVE MIMO SYSTEMS WITH HYBRID BEAMFORMING RECEPTION
Alexandropoulos, George, National and Kapodistrian University of Athens, Greece Vlachos, Evangelos, University of Edinburgh, United Kingdom Thompson, John, University of Edinburgh, United Kingdom
**Wednesday, 6 May, 11:30 - 13:30**

### SS-L11 - Neural and Audio Signal Processing for Hearing Devices

#### SS-L11.1: IMPROVING AUDITORY ATTENTION DECODING PERFORMANCE OF LINEAR AND NON-LINEAR METHODS USING STATE-SPACE MODEL

Aroudi, Ali, University of Oldenburg, Germany de Taillez, Tobias, University of Oldenburg, Germany Doclo, Simon, University of Oldenburg, Germany

#### SS-L11.2: TOWARDS DECODING SELECTIVE ATTENTION FROM SINGLE-TRIAL EEG DATA IN COCHLEAR IMPLANT USERS BASED ON DEEP NEURAL NETWORKS

Nogueira, Waldo, Medical University Hannover, Germany Dolhopiatenko, Hanna, Medical University Hannover, Germany

#### SS-L11.3: HARMONIC/PERCUSSIVE SOUND SEPARATION AND SPECTRAL COMPLEXITY REDUCTION OF MUSIC SIGNALS FOR COCHLEAR IMPLANT LISTENERS

Lentz, Benjamin, Ruhr-Universität Bochum, Germany Nagathil, Anil, Ruhr-Universität Bochum, Germany Gauer, Johannes, Ruhr-Universität Bochum, Germany Martin, Rainer, Ruhr-Universität Bochum, Germany

#### SS-L11.4: BIO-MIMETIC ATTENTIONAL FEEDBACK IN MUSIC SOURCE SEPARATION

Bellur, Ashwin, LCAP, Johns Hopkins University, United States Elhilali, Mounya, LCAP, Johns Hopkins University, United States

#### SS-L11.5: TALKER-INDEPENDENT SPEAKER SEPARATION IN REVERBERANT CONDITIONS

Delfarah, Masood, Ohio State University, United States Liu, Yuzhou, Ohio State University, United States Wang, DeLiang, Ohio State University, United States

#### SS-L11.6: EVALUATION OF JOINT AUDITORY ATTENTION DECODING AND ADAPTIVE BINAURAL BEAMFORMING APPROACH FOR HEARING DEVICES WITH ATTENTION SWITCHING

Pu, Wenqiang, Shenzhen Research Institute of Big Data, Chinese University of Hong Kong, Shenzhen, China Zan, Peng, University of Maryland, United States Xiao, Jinjun, Starkey Hearing Technologies, United States Zhang, Tao, Starkey Hearing Technologies, United States Luo, Zhi-Quan, Shenzhen Research Institute of Big Data, Chinese University of Hong Kong, Shenzhen, China
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<td>ROBUST PRICING MECHANISM FOR RESOURCE SUSTAINABILITY UNDER PRIVACY CONSTRAINT IN COMPETITIVE ONLINE LEARNING MULTI-AGENT SYSTEMS</td>
<td>Tampubolon, Ezra, Technische Universität München, Germany Boche, Holger, Technische Universität München, Germany</td>
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<td>SS-L12</td>
<td>NEURAL NETWORK WIRETAP CODE DESIGN FOR MULTI-MODE FIBER OPTICAL CHANNELS</td>
<td>Besser, Karl-Ludwig, Technische Universität Braunschweig, Germany Lonnstrom, Andrew, Technische Universität Braunschweig, Germany Jorswieck, Eduard A., Technische Universität Braunschweig, Germany</td>
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<td>SS-L12</td>
<td>AGE-BASED SCHEDULING POLICY FOR FEDERATED LEARNING IN MOBILE EDGE NETWORKS</td>
<td>Yang, Howard, Singapore University of Technology and Design, Singapore Arafa, Ahmed, University of North Carolina - Charlotte, United States Quek, Tony, Singapore University of Technology and Design, Singapore Poor, H. Vincent, Princeton University, United States</td>
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<td>SS-L12</td>
<td>ADVERSARIAL NETWORKS FOR SECURE WIRELESS COMMUNICATIONS</td>
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<td>LATENCY-MINIMIZED DESIGN OF SECURE TRANSMISSIONS IN UAV-AIDED COMMUNICATIONS</td>
<td>Wu, Xiongwei, Chinese University of Hong Kong, Hong Kong SAR of China Li, Qiang, University of Electronic Science and Technology of China, China Lu, Yawei, Tsinghua University, China Poor, H. Vincent, Princeton University, United States Leung, Victor C. M., Shenzhen University, China Ching, P. C., Chinese University of Hong Kong, Hong Kong SAR of China</td>
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<td>SS-L12</td>
<td>DETECT INSIDER ATTACKS USING CNN IN DECENTRALIZED OPTIMIZATION</td>
<td>Li, Gangqiang, College of Electronic and Information Engineering, Shenzhen University, China Wu, Sissi Xiaoxiao, College of Electronic and Information Engineering, Shenzhen University, China Zhang, Shengli, College of Electronic and Information Engineering, Shenzhen University, China Li, Qiang, School of</td>
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SS-L13 - Random Matrix Theory and High-Dimensional Statistical Signal Processing

SS-L13.1: RISK CONVERGENCE OF CENTERED KERNEL RIDGE REGRESSION WITH LARGE DIMENSIONAL DATA
Elkhalil, Khalil, Duke university, United States Kammoun, Abla, King Abdullah University of Science and Technology (KAUST), Saudi Arabia Zhang, Xiangliang, King Abdullah University of Science and Technology (KAUST), Saudi Arabia Alouini, Mohamed-Slim, King Abdullah University of Science and Technology (KAUST), Saudi Arabia Al-Naffouri, Tareq, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

SS-L13.2: A WHITENESS TEST BASED ON THE SPECTRAL MEASURE OF LARGE NON-HERMITIAN RANDOM MATRICES
Bose, Arup, Indian Statistical Institute, India Hachem, Walid, CNRS / Université Paris-Est Marne-la-Vallée, France

Tieplova, Daria, Université Paris-Est/Marne la Vallée, France Loubaton, Philippe, Université Paris-Est/Marne la Vallée, France Pastur, Leonid, Institute of Low Temperature Physics and Engineering, Ukraine

SS-L13.4: POSITIVE SOLUTIONS FOR LARGE RANDOM LINEAR SYSTEMS
Bizeul, Pierre, Sorbonne Université, France Clenet, Maxime, Université Paris Est Marne-La-Vallée, France Najim, Jamal, Université Paris Est Marne-La-Vallée et Centre National de la Recherche Scientifique, France

SS-L13.5: ON THE FREQUENCY DOMAIN DETECTION OF HIGH DIMENSIONAL TIME SERIES
Rosuel, Alexis, Université Paris-Est Marne-la-Vallée, France Vallet, Pascal, Université de Bordeaux, France Loubaton, Philippe, Université Paris-Est Marne-la-Vallée, France Mestre, Xavier, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain

SS-L13.6: LARGE DIMENSIONAL ASYMPTOTICS OF MULTI-TASK LEARNING
Tiomoko, Malik, Université Paris Sud/ Gipsa Lab, France Louart, Cosme, Gipsa Lab / CEA LIST, France Couillet, Romain, Gipsa-Lab / Centrale-Supélec, France
Wednesday, 6 May, 16:30 - 18:30

**SS-L14 - Signal Processing and Machine Learning for Satellite and Space Communications**

**SS-L14.1: ROBUST HYBRID BEAMFORMING FOR SATELLITE-TERRESTRIAL INTEGRATED NETWORKS**

Lin, Zhi, Army Engineering University, China Lin, Min, Nanjing University of Posts and Telecommunications, China Champagne, Benoit, McGill University, Canada Zhu, Wei-Ping, Concordia University, Canada Al-Dhahir, Naofal, University of Texas at Austin, United States

**SS-L14.2: IN-NETWORK CACHING FOR HYBRID SATELLITE-TERRESTRIAL NETWORKS USING DEEP REINFORCEMENT LEARNING**

Garg, Navneet, Heriot-Watt University, United Kingdom Sellathurai, Mathini, Heriot-Watt University, United Kingdom Ratnarajah, Tharmalingam, University of Edinburgh, United Kingdom

**SS-L14.3: MULTIGRAPH SPECTRAL CLUSTERING FOR JOINT CONTENT DELIVERY AND SCHEDULING IN BEAM-FREE SATELLITE COMMUNICATIONS**

Vázquez, Miguel Ángel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain Pérez-Neira, Ana Isabel, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Universitat Politecnica de Catalunya (UPC), Spain

**SS-L14.4: CONSTANT-ENVELOPE PRECODING FOR SATELLITE SYSTEMS**

Tsinos, Christos, University of Luxembourg, Luxembourg Arora, Aakash, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SS-L14.5: RESOURCE MANAGEMENT IN THE MULTIBEAM NOMA-BASED SATELLITE DOWNLINK**

Ramírez, Tomás, University of Vigo, Spain Mosquera, Carlos, University of Vigo, Spain

**SS-L14.6: GENETIC ALGORITHM OPTIMIZED SUPPORT VECTOR MACHINE IN NOMA-BASED SATELLITE NETWORKS WITH IMPERFECT CSI**

Yan, Xiaojuan, Beibu Gulf University, China An, Kang, National University of Defense Technology, China Wang, Cheng-Xiang, Southeast University, China Zhu, Wei-Ping, Concordia University, Canada Li, Yusheng, National University of Defense Technology, China Feng, Zhiqiang, Beibu Gulf University, China
SS-L15 - Signal Processing and Coding for Macromolecular Storage and Computing

SS-L15.1: OVERCOMING HIGH NANOPORE BASECALLER ERROR RATES FOR DNA STORAGE VIA BASECALLER-DECODER INTEGRATION AND CONVOLUTIONAL CODES
Chandak, Shubham, Stanford University, United States Neu, Joachim, Stanford University, United States Tatwawadi, Kedar, Stanford University, United States Mardia, Jay, Stanford University, United States Lau, Billy, Stanford University, United States Kubit, Matthew, Berkeley Lights, Inc., United States Hulett, Reyna, Stanford University, United States Griffin, Peter, Stanford University, United States Wootters, Mary, Stanford University, United States Weissman, Tsachy, Stanford University, United States Ji, Hanlee, Stanford University, United States

SS-L15.2: EFFICIENT CONSTRAINED ENCODERS CORRECTING A SINGLE NUCLEOTIDE EDIT IN DNA STORAGE
Cai, Kui, Singapore University of Technology and Design, Singapore He, Xuan, Singapore University of Technology and Design, Singapore Kiah, Han Mao, Nanyang Technological University, Singapore Nguyen, Tuan Thanh, Singapore University of Technology and Design, Singapore

SS-L15.3: IMAGE PROCESSING IN DNA
Pan, Chao, University of Illinois at Urbana–Champaign, United States Tabatabaei Yazdi, S. M. Hossein, Dorna Robotics, United States Tabatabaei, S Kasra, University of Illinois at Urbana–Champaign, United States Hernandez, Alvaro G., University of Illinois at Urbana–Champaign, United States Schroeder, Charles, University of Illinois at Urbana–Champaign, United States Milenkovic, Olgica, University of Illinois at Urbana–Champaign, United States

SS-L15.4: CONCENTRATION-BASED POLYNOMIAL CALCULATIONS ON NICKED DNA
Chen, Tonglin, University of Minnesota, United States Riedel, Marc, University of Minnesota, United States

SS-L15.5: CAPACITY OF THE ERASURE SHUFFLING CHANNEL
Shin, Seiyun, University of Illinois at Urbana–Champaign, United States Heckel, Reinhard, Technische Universität München, Germany Shomorony, Ilan, University of Illinois at Urbana–Champaign, United States

SS-L15.6: ACHIEVING THE CAPACITY OF THE DNA STORAGE CHANNEL
Lenz, Andreas, Technische Universität München, Germany Siegel, Paul, University of California, San Diego, United States Wachter-Zeh, Antonia, Technische Universität München, Germany Yaakobi, Eitan, Technion - Israel Institute of Technology, Israel
Thursday, 7 May, 09:00 - 11:00

SS-L16 - Distributed Machine Learning on Wireless Networks

SS-L16.1: FEDERATED LEARNING WITH QUANTIZATION CONSTRAINTS
Shlezinger, Nir, Weizmann Institute of Science, Israel Chen, Mingzhe, Princeton University, United States Eldar, Yonina, Weizmann Institute of Science, Israel Poor, H. Vincent, Princeton University, United States Cui, Shuguang, Chinese University of Hong Kong, China

SS-L16.2: COOPERATIVE LEARNING VIA FEDERATED DISTILLATION OVER FADING CHANNELS
Ahn, Jin-Hyun, Korea Advanced Institute of Science and Technology (KAIST), Korea (South) Simeone, Osvaldo, King’s College London, United Kingdom Kang, Joonhyuk, Korea Advanced Institute of Science and Technology (KAIST), Korea (South)

SS-L16.3: ON THE BYZANTINE ROBUSTNESS OF CLUSTERED FEDERATED LEARNING
Sattler, Felix, Fraunhofer Heinrich Hertz Institute, Germany Müller, Klaus-Robert, Technische Universität Berlin, Germany Wiegand, Thomas, Fraunhofer Heinrich Hertz Institute, Germany Samek, Wojciech, Fraunhofer Heinrich Hertz Institute, Germany

SS-L16.4: HIERARCHICAL FEDERATED LEARNING ACROSS HETEROGENEOUS CELLULAR NETWORKS
Abad, Mehdi Salehi Haydar, Sabanci University, Turkey Ozfatura, Emre, Imperial College London, United Kingdom Gündüz, Deniz, Imperial College London, United Kingdom Erçetin, Ozgur, Sabanci University, Turkey

SS-L16.5: OVERLAP LOCAL-SGD: AN ALGORITHMIC APPROACH TO HIDE COMMUNICATION DELAYS IN DISTRIBUTED SGD
Wang, Jianyu, Carnegie Mellon University, United States Liang, Hao, Carnegie Mellon University, United States Joshi, Gauri, Carnegie Mellon University, United States

SS-L16.6: Q-GADMM: QUANTIZED GROUP ADMM FOR COMMUNICATION EFFICIENT DECENTRALIZED MACHINE LEARNING
Elgabli, Anis, University of Oulu, Finland Park, Jihong, University of Oulu, Finland Bedi, Amrit S., Indian Institute of Technology Kanpur, India Bennis, Mehdi, University of Oulu, Finland Aggarwal, Vaneet, Purdue University, United States
Thursday, 7 May, 11:30 - 13:30

SS-L17 - Model Based Deep Learning

SS-L17.1: DEEP SOFT INTERFERENCE CANCELLATION FOR MIMO DETECTION
Shlezinger, Nir, Weizmann Institute of Science, Israel Fu, Rong, Tsinghua University, China Eldar, Yonina, Weizmann Institute of Science, Israel

SS-L17.2: AN EMPIRICAL BAYES APPROACH TO PARTIALLY LABELED AND SHUFFLED DATA SETS
Dytso, Alex, Princeton University, United States Poor, H. Vincent, Princeton University, United States

SS-L17.3: REINFORCED DEPTH-AWARE DEEP LEARNING FOR SINGLE IMAGE DEHAZING
Guo, Tiantong, Pennsylvania State University, United States Monga, Vishal, Pennsylvania State University, United States

SS-L17.4: LEARNING PLUG-AND-PLAY PROXIMAL QUASI-NEWTON DENOISERS
Al-Shabili, Abdullah, New York University, United States Mansour, Hassan, Mitsubishi Electric Research Laboratories (MERL), United States Boufounos, Petros T., Mitsubishi Electric Research Laboratories (MERL), United States

SS-L17.5: JOINT OPTIMIZATION OF SAMPLING PATTERNS AND DEEP PRIORS FOR IMPROVED PARALLEL MRI
Aggarwal, Hemant Kumar, University of Iowa, United States Jacob, Mathews, University of Iowa, United States

SS-L17.6: LEARNING SAMPLING AND MODEL-BASED SIGNAL RECOVERY FOR COMPRESSED SENSING MRI
Huijben, Iris A.M., Eindhoven University of Technology, Netherlands Veeling, Bastiaan S., University of Amsterdam, Netherlands van Sloun, Ruud J.G., Eindhoven University of Technology, Netherlands
SS-L18 - Anomaly Detection and Intent Inference in Object Tracking

SS-L18.1: INFERRING DYNAMIC GROUP LEADERSHIP USING SEQUENTIAL BAYESIAN METHODS
Li, Qing, University of Cambridge, United Kingdom
Godsill, Simon, University of Cambridge, United Kingdom
Liang, Jiaming, University of Cambridge, United Kingdom
Ahmad, Bashar, University of Cambridge, United Kingdom

SS-L18.2: SCALABLE DETECTION AND TRACKING OF EXTENDED OBJECTS
Meyer, Florian, University of California, San Diego, United States
Williams, Jason L., Commonwealth Scientific and Industrial Research Organisation, Australia

SS-L18.3: ADVERSARIAL ANOMALY DETECTION FOR MARKED SPATIO-TEMPORAL STREAMING DATA
Zhu, Shixiang, Georgia Institute of Technology, United States
Yuchi, Henry Shaowu, Georgia Institute of Technology, United States
Xie, Yao, Georgia Institute of Technology, United States

SS-L18.4: QUICKEST DETECTION OF GROWING DYNAMIC ANOMALIES IN NETWORKS
Rovatsos, Georgios, University of Illinois at Urbana-Champaign, United States
Veeravalli, Venugopal, University of Illinois at Urbana-Champaign, United States
Towsley, Don, University of Massachusetts, Amherst, United States
Swami, Ananthram, Army Research Lab, United States

SS-L18.5: IMAGE SEGMENTATION BASED PRIVACY-PRESERVING HUMAN ACTION RECOGNITION FOR ANOMALY DETECTION
Yan, Jiawei, Newcastle University, United Kingdom
Angelini, Federico, Newcastle University, United Kingdom
Naqvi, Syed Mohsen, Newcastle University, United Kingdom

SS-L18.6: PREDICTION OF VESSEL TRAJECTORIES FROM AIS DATA VIA SEQUENCE-TO-SEQUENCE RECURRENT NEURAL NETWORKS
Forti, Nicola, NATO STO Centre for Maritime Research and Experimentation, Italy
Millefiori, Leonardo M., NATO STO Centre for Maritime Research and Experimentation, Italy
Braca, Paolo, NATO STO Centre for Maritime Research and Experimentation, Italy
Willett, Peter, University of Connecticut, United States
Thursday, 7 May, 16:30 - 18:30

**SS-L19 - Hardware-Efficient Large-Scale Antenna Arrays: The Stage for Symbol-Level Precoding**

**SS-L19.1: NEAR-OPTIMAL INTERFERENCE EXPLOITATION 1-BIT MASSIVE MIMO PRECODING VIA PARTIAL BRANCH-AND-BOUND**

Li, Ang, University of Sydney, Australia Liu, Fan, University College London, United Kingdom Masouros, Christos, University College London, United Kingdom Li, Yonghui, University of Sydney, Australia Vucetic, Branka, University of Sydney, Australia

**SS-L19.2: SECURE SYMBOL-LEVEL MISO PRECODING**

Xu, Qian, Xi’an Jiaotong University, China Ren, Pinyi, Xi’an Jiaotong University, China Swindlehurst, A. Lee, University of California, Irvine, United States

**SS-L19.3: ROBUST SYMBOL-LEVEL PRECODING VIA AUTOENCODER-BASED DEEP LEARNING**

Sohrabi, Foad, University of Toronto, Canada Cheng, Hei Victor, University of Toronto, Canada Yu, Wei, University of Toronto, Canada

**SS-L19.4: CONSTANT ENVELOPE MASSIVE MIMO-OFDM PRECODING: AN IMPROVED FORMULATION AND SOLUTION**

Domouchtsidis, Stavros, University of Luxembourg, Luxembourg Tsinos, Christos, University of Luxembourg, Luxembourg Chatzinotas, Symeon, University of Luxembourg, Luxembourg Ottersten, Björn, University of Luxembourg, Luxembourg

**SS-L19.5: PASSIVE INTELLIGENT SURFACE ASSISTED MIMO POWERED SUSTAINABLE IOT**

Mishra, Deepak, University of New South Wales, Australia Larsson, Erik G., Linköping University, Sweden

**SS-L19.6: MULTIUSER MASSIVE MIMO DOWNLINK PRECODING USING SECOND-ORDER SPATIAL SIGMA-DELTA MODULATION**

Shao, Mingjie, Chinese University of Hong Kong, China Ma, Wing-Kin, Chinese University of Hong Kong, China Swindlehurst, Lee, University of California, Irvine, United States
Thursday, 7 May, 16:30 - 18:30

SS-L20 - Sustainable Networking and Computing through Machine Learning

SS-L20.1: ALLOCATION OF COMPUTING TASKS IN DISTRIBUTED MEC SERVERS CO-POWERED BY RENEWABLE SOURCES AND THE POWER GRID

Cecchinato, Davide, University of Padova, Italy
Berno, Michele, University of Padova, Italy
Esposito, Flavio, Saint Louis University, United States
Rossi, Michele, University of Padova, Italy

SS-L20.2: MULTI-AGENT DEEP REINFORCEMENT LEARNING FOR DISTRIBUTED HANDOVER MANAGEMENT IN DENSE MMWAVE NETWORKS

Sana, Mohamed, Commissariat à l’énergie atomique et aux énergies alternatives - Laboratoire d’électronique et de technologie de l’information (CEA-Leti), France
Domenico, Antonio, Commissariat à l’énergie atomique et aux énergies alternatives - Laboratoire d’électronique et de technologie de l’information (CEA-Leti), France
Calvanese Strinati, Emilio, Commissariat à l’énergie atomique et aux énergies alternatives - Laboratoire d’électronique et de technologie de l’information (CEA-Leti), France
Clemente, Antonio, Commissariat à l’énergie atomique et aux énergies alternatives - Laboratoire d’électronique et de technologie de l’information (CEA-Leti), France

SS-L20.3: INTERPRETABLE MACHINE LEARNING IN SUSTAINABLE EDGE COMPUTING: A CASE STUDY OF SHORT-TERM PHOTOVOLTAIC POWER OUTPUT PREDICTION

Chang, Xiaomin, University of Sydney, Australia
Li, Wei, University of Sydney, Australia
Ma, Jin, University of Sydney, Australia
Yang, Ting, Tianjin University, China
Zomaya, Albert, University of Sydney, Australia

SS-L20.4: LOAD MANAGEMENT WITH PREDICTIONS OF SOLAR ENERGY PRODUCTION FOR CLOUD DATA CENTERS

Floridia, Maurizio, Politecnico di Torino, Italy
Laganà, Demetrio, Eco4Cloud, Italy
Mastroianni, Carlo, CNR, Italy
Meo, Michela, Politecnico di Torino, Italy
Renga, Daniela, Politecnico di Torino, Italy

SS-L20.5: SPECTRUM ALLOCATION IN WIRELESS NETWORKS FOR CROWD LABELLING

Li, Xiaoyang, University of Hong Kong, Hong Kong SAR of China
Zhu, Guangxu, Shenzhen Research Institute of Big Data, China
Shen, Kaiming, University of
SS-L20.6: MODELING THE ENVIRONMENT IN DEEP REINFORCEMENT LEARNING: THE CASE OF ENERGY HARVESTING BASE STATIONS

Toronto, Canada Gong, Yi, Southern University of Science and Technology, China Huang, Kaibin, University of Hong Kong, Hong Kong SAR of China

Piovesan, Nicola, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain Miozzo, Marco, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain Dini, Paolo, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Spain
### Thursday, 7 May, 16:30 - 18:30

**SS-L21 - Advances in Signal Processing for Environmental Studies**

#### SS-L21.1: A DIFFERENTIAL APPROACH FOR RAIN FIELD TOMOGRAPHIC RECONSTRUCTION USING MICROWAVE SIGNALS FROM LEO SATELLITES

Shen, Xi, University of Western Australia, Australia
Huang, Defeng (David), University of Western Australia, Australia
Vincent, Claire, University of Melbourne, Australia
Wang, Wenxiao, University of Western Australia, Australia
Togneri, Roberto, University of Western Australia, Australia

#### SS-L21.2: UNCERTAINTIES IN SHORT COMMERCIAL MICROWAVE LINKS FADING DUE TO RAIN

Habi, Hai Victor, Tel Aviv University, Israel
Messer, Hagit, Tel Aviv University, Israel

#### SS-L21.3: ON THE OPPORTUNISTIC USE OF COMMERCIAL KU AND KA BAND SATCOM NETWORKS FOR RAIN RATE ESTIMATION: POTENTIALS AND CRITICAL ISSUES

Giannetti, Filippo, Università di Pisa, Italy
Moretti, Marco, Università di Pisa, Italy
Reggiannini, Ruggero, Università di Pisa, Italy
Vaccaro, Attilio, MBI SRL, Italy
Scarfone, Simone, Università di Pisa, Italy
Ortolani, Alberto, LaMMA Consortium, Italy

#### SS-L21.4: PERFORMANCE ANALYSIS FOR PATH ATTENUATION ESTIMATION OF MICROWAVE SIGNALS DUE TO RAINFALL AND BEYOND

Song, Boming, University of Western Australia, Australia
Huang, Defeng (David), University of Western Australia, Australia
Shen, Xi, University of Western Australia, Australia
Togneri, Roberto, University of Western Australia, Australia

#### SS-L21.5: DEEP RAINRATE ESTIMATION FROM HIGHLY ATTENUATED DOWNLINK SIGNALS OF GROUND-BASED COMMUNICATIONS SATELLITE TERMINALS

Mishra, Kumar Vijay, University of Luxembourg, Luxembourg
Shankar M. R., Blvd, University of Luxembourg, Luxembourg
Ottersten, Björn, University of Luxembourg, Luxembourg

#### SS-L21.6: STATISTICAL SIGNAL PROCESSING APPROACH FOR RAIN ESTIMATION BASED ON MEASUREMENTS FROM NETWORK MANAGEMENT SYSTEMS

Ostrometzky, Jonatan, Columbia University, United States
Messer, Hagit, Tel Aviv University, United States
SS-L22 - Signal Processing for IoT

SS-L22.1: DYNAMIC OVERSAMPLING IN 1-BIT QUANTIZED ASYNCHRONOUS LARGE-SCALE MULTIPLE-ANTENNA SYSTEMS FOR SUSTAINABLE IOT NETWORKS

Shao, Zhichao, Pontifical Catholic University of Rio de Janeiro, Brazil
Landau, Lukas T. N., Pontifical Catholic University of Rio de Janeiro, Brazil
de Lamare, Rodrigo C., Pontifical Catholic University of Rio de Janeiro, Brazil

SS-L22.2: DYNAMIC RESOURCE ALLOCATION FOR WIRELESS EDGE MACHINE LEARNING WITH LATENCY AND ACCURACY GUARANTEES

Merluzzi, Mattia, Sapienza University of Rome, Italy
Di Lorenzo, Paolo, Sapienza University of Rome, Italy
Barbarossa, Sergio, Sapienza University of Rome, Italy

SS-L22.3: FEDERATING SOLAR, STORAGE AND COMMUNICATIONS IN THE ELECTRIC GRID AND INTERNET OF THINGS

Ramakrishna, Raksha, Arizona State University, United States
Karakoc, Nurullah, Arizona State University, United States
Hreinsson, Kari, Arizona State University, United States
Scaglione, Anna, Arizona State University, United States

SS-L22.4: NON-GAUSSIAN BLE-BASED INDOOR LOCALIZATION VIA GAUSSIAN SUM FILTERING COUPLED WITH WASSERSTEIN DISTANCE

Malekzadeh, Parvin, Concordia University, Canada
Mehryan, Shervin, University of Toronto, Canada
Spachos, Petros, University of Guelph, Canada
Plataniotis, Konstantinos N., University of Toronto, Canada
Mohammadi, Arash, Concordia University, Canada

SS-L22.5: OPTIMAL JOINT CHANNEL ESTIMATION AND DATA DETECTION BY L1-NORM PCA FOR STREETSCAPE IOT

Sklivanitis, George, Florida Atlantic University, United States
Tsagkarakis, Nicholas, Ericsson AB, Sweden
Pados, Dimitris, Florida Atlantic University, United States
Batalama, Stella, Florida Atlantic University, United States

SS-L22.6: ON MEASURING DOPPLER SHIFTS BETWEEN TAGS IN A BACKSCATTERING TAG-TO-TAG NETWORK WITH APPLICATIONS IN TRACKING

Ahmad, Abeer, Stony Brook University, United States
Huang, Yuanfei, Stony Brook University, United States
Sha, Xiao, Stony Brook University, United States
Athalye, Akshay, Stony Brook University, United States
Stanacevic, Milutin, Stony
SS-L23 - Deep Graph Learning

SS-L23.1: EFFICIENT BELIEF PROPAGATION FOR GRAPH MATCHING
Onaran, Efe, New York University, United States Villar, Soledad, New York University, United States

SS-L23.2: SUPERVISED GRAPH REPRESENTATION LEARNING FOR MODELING THE RELATIONSHIP BETWEEN STRUCTURAL AND FUNCTIONAL BRAIN CONNECTIVITY
Li, Yang, University of Rochester, United States Shafipour, Rasoul, University of Rochester, United States Mateos, Gonzalo, University of Rochester, United States Zhang, Zhengwu, University of Rochester, United States

SS-L23.3: STABILITY OF GRAPH NEURAL NETWORKS TO RELATIVE PERTURBATIONS
Gama, Fernando, University of Pennsylvania, United States Bruna, Joan, New York University, United States Ribeiro, Alejandro, University of Pennsylvania, United States

SS-L23.4: ACTIVE SEMI-SUPERVISED LEARNING FOR DIFFUSIONS ON GRAPHS
Das, Bishwadeep, Delft University of Technology, Netherlands Isufi, Elvin, Delft University of Technology, Netherlands Leus, Geert, Delft University of Technology, Netherlands

SS-L23.5: STOCHASTIC GRAPH NEURAL NETWORKS
Gao, Zhan, University of Pennsylvania, United States Isufi, Elvin, Delft University of Technology, Netherlands Ribeiro, Alejandro, University of Pennsylvania, United States

SS-L23.6: GENERATIVE ADVERSARIAL NETWORKS FOR GRAPH DATA IMPUTATION FROM SIGNED OBSERVATIONS
Madapu, Amarlingam, Indian Institute of Science, India Segarra, Santiago, Rice University, United States Chepuri, Sundeep Prabhakar, Indian Institute of Science, India Marques, Antonio, King Juan Carlos University, Spain
SS-L24 - AMP and other Approximate Bayesian Inference Techniques

**SS-L24.1: JOINT FREQUENCY DOMAIN CHANNEL ESTIMATION AND EQUALIZATION BASED ON EXPECTATION PROPAGATION FOR SINGLE CARRIER TRANSMISSIONS**

Şahin, Serdar, Thales, France Cipriano, Antonio Maria, Thales, France Poulliat, Charly, Toulouse INP - IRIT, France Boucheret, Marie-Laure, Toulouse INP - IRIT, France

**SS-L24.2: BP-VB-EP BASED STATIC AND DYNAMIC SPARSE BAYESIAN LEARNING WITH KRONECKER STRUCTURED DICTIONARIES**

Kurisummoottil Thomas, Christo, EURECOM, India Slock, Dirk, EURECOM, India

**SS-L24.3: ROBUSTNESS OF SPARSE BAYESIAN LEARNING IN CORRELATED ENVIRONMENTS**

Pote, Rohan R., University of California, San Diego, United States Rao, Bhaskar D., University of California, San Diego, United States

**SS-L24.4: A SIMPLE DERIVATION OF AMP AND ITS STATE EVOLUTION VIA FIRST-ORDER CANCELLATION**

Schniter, Philip, Ohio State University, United States

**SS-L24.5: VAMP WITH VECTOR-VALUED DIAGONALIZATION**

Fischer, Robert, Ulm University, Germany Sippel, Carmen, Ulm University, Germany Goertz, Norbert, Technische Universität Wien, Austria

**SS-L24.6: DISTRIBUTED VERIFICATION OF BELIEF PRECISIONS CONVERGENCE IN GAUSSIAN BELIEF PROPAGATION**

Li, Bin, Beijing Institute of Technology, China Wu, Nan, Beijing Institute of Technology, China Wu, Yik-Chung, University of Hong Kong, China
SS-L25 - Advances in Low-Resolution Sampling and Signal Processing

SS-L25.1: ADMM-BASED ONE-BIT QUANTIZED SIGNAL DETECTION FOR MASSIVE MIMO SYSTEMS WITH HARDWARE IMPAIRMENTS

Demir, Özlem Tugfe, Linköping University, Sweden
Björnson, Emil, Linköping University, Sweden

SS-L25.2: LEARNING TASK-BASED ANALOG-TO-DIGITAL CONVERSION FOR MIMO RECEIVERS

Shlezinger, Nir, Weizmann Institute of Science, Israel
van Sloun, Ruud J.G., Eindhoven University of Technology, Netherlands
Huijben, Iris A.M., Eindhoven University of Technology, Netherlands
Tsintsadze, Georgee, Weizmann Institute of Science, Israel
Eldar, Yonina, Weizmann Institute of Science, Israel

SS-L25.3: ONE-BIT NORMALIZED SCATTER MATRIX ESTIMATION FOR COMPLEX ELLIPTICALLY SYMMETRIC DISTRIBUTIONS

Liu, Chun-Lin, National Taiwan University, Taiwan
Vaidyanathan, P. P., California Institute of Technology, United States

SS-L25.4: ONE-BIT DOA ESTIMATION VIA SPARSE LINEAR ARRAYS

Sedighi, Saeid, University of Luxembourg, Luxembourg
Shankar M. R., Bhavani, University of Luxembourg, Luxembourg
Soltanalian, Mojtaba, University of Illinois at Chicago, United States
Ottersten, Björn, University of Luxembourg, Luxembourg

SS-L25.5: ONE-BIT SAMPLING IN FRACTIONAL FOURIER DOMAIN

Bhandari, Ayush, Imperial College London, United Kingdom
Graf, Olga, Technische Universität München, Germany
Krahmer, Felix, Technische Universität München, Germany
Zayed, Ahmed, DePaul University, United States

SS-L25.6: TARGET PARAMETER ESTIMATION VIA ONE-BIT PMCW RADAR

Zhu, Heng, University of Science and Technology of China, China
Shang, Xiaolei, University of Science and Technology of China, China
Li, Jian, University of Florida, United States
SS-L26 - Signal Processing for Beyond 5G Communications

SS-L26.1: MOBILITY-AWARE BEAM STEERING IN METASURFACE-BASED PROGRAMMABLE WIRELESS ENVIRONMENTS

Liaskos, Christos, Foundation for Research and Technology-Hellas (FORTH), Greece
Nie, Shuai, Georgia Institute of Technology, United States
Tsioliaridou, Ageliki, Foundation for Research and Technology-Hellas (FORTH), Greece
Pitsillides, Andreas, University of Cyprus, Cyprus
Ioannidis, Sotiris, Foundation for Research and Technology-Hellas (FORTH), Greece
Akyildiz, Ian, Georgia Institute of Technology, United States

SS-L26.2: DYNAMIC METASURFACE ANTENNAS FOR BIT-CONSTRAINED MIMO-OFDM RECEIVERS

Wang, Hanqing, Southeast University, China
Shlezinger, Nir, Weizmann Institute of Science, Israel
Jin, Shi, Southeast University, China
Eldar, Yonina, Weizmann Institute of Science, Israel
Yoo, Insang, Duke University, United States
Imani, Mohammadreza, Duke University, United States
Smith, David, Duke University, United States

SS-L26.3: USING INTELLIGENT REFLECTING SURFACES FOR RANK IMPROVEMENT IN MIMO COMMUNICATIONS

Özdogan, Özgecan, Linköping University, Sweden
Björnson, Emil, Linköping University, Sweden
Larsson, Erik G., Linköping University, Sweden

SS-L26.4: OPTIMIZING BACKSCATTERING COEFFICIENT DESIGN FOR MINIMIZING BER AT MONOSTATIC MIMO READER

Mishra, Deepak, University of New South Wales, Australia
Yuan, Jinhong, University of New South Wales, Australia

SS-L26.6: A HARDWARE ARCHITECTURE FOR RECONFIGURABLE INTELLIGENT SURFACES WITH MINIMAL ACTIVE ELEMENTS FOR EXPPLICIT CHANNEL ESTIMATION

Alexandropoulos, George, National and Kapodistrian University of Athens, Greece
Vlachos, Evangelos, University of Edinburgh, United Kingdom
Friday, 8 May, 15:15 - 17:15


**SS-L27.1: CONDITIONAL DENSITY DRIVEN GRID DESIGN IN POINT-MASS FILTER**
Dunik, Jindrich, University of West Bohemia, Czech Republic
Straka, Ondrej, University of West Bohemia, Czech Republic
Matousek, Jakub, University of West Bohemia, Czech Republic

**SS-L27.2: ENHANCED SAFETY OF AUTONOMOUS DRIVING BY INCORPORATING TERRESTRIAL SIGNALS OF OPPORTUNITY**
Maaref, Mahdi, University of California, Irvine, United States
Khalife, Joe, University of California, Irvine, United States
Kassas, Zaher, University of California, Irvine, United States

**SS-L27.3: OPPORTUNISTIC USE OF GNSS SIGNALS TO CHARACTERIZE THE ENVIRONMENT BY MEANS OF MACHINE LEARNING BASED PROCESSING**
Dovis, Fabio, Politecnico di Torino, Italy
Imam, Rayan, Politecnico di Torino, Italy
Qin, Wenjian, Politecnico di Torino, Italy
Savas, Caner, Politecnico di Torino, Italy
Visser, Hans, Fugro Innovation & Technology B.V., Netherlands

**SS-L27.4: AN OPTIMAL SYMMETRIC THRESHOLD STRATEGY FOR REMOTE ESTIMATION OVER THE COLLISION CHANNEL**
Zhang, Xu, Beijing Institute of Technology, China
Vasconcelos, Marcos, University of Southern California, United States
Cui, Wei, Beijing Institute of Technology, China
Mitra, Urbashi, University of Southern California, United States

**SS-L27.5: AUTOMOTIVE COLLISION RISK ESTIMATION UNDER COOPERATIVE SENSING**
Lachapelle, Daniel, University of Texas at Austin, United States
Humphreys, Todd, University of Texas at Austin, United States
Narula, Lakshay, University of Texas at Austin, United States
Iannucci, Peter, University of Texas at Austin, United States
Moradi-Pari, Ehsan, Honda R&D Americas, Inc., United States

**SS-L27.6: EXPLOITATION OF 3D CITY MAPS FOR HYBRID 5G RTT AND GNSS POSITIONING SIMULATIONS**
del Peral-Rosado, José A., IEEC-CERES, Universitat Autònoma de Barcelona (UAB), Spain
Gunnarsson, Fredrik, Ericsson Research, Sweden
Dwivedi, Satyam, Ericsson Research, Sweden
Razavi, Sara Modarres, Ericsson Research, Sweden
SS-P1 - Signal Processing Education: Trends and Innovations

SS-P1.1: A DATASET FOR MEASURING READING LEVELS IN INDIA AT SCALE
Agarwal, Dolly, Pratham Education Foundation, India Gupchup, Jayant, Microsoft Corporation, United States Baghel, Nishant, Pratham Education Foundation, United States

SS-P1.2: NOISE-ROBUST KEY-PHRASE DETECTORS FOR AUTOMATED CLASSROOM FEEDBACK
Zylich, Brian, Worcester Polytechnic Institute, United States Whitehill, Jacob, Worcester Polytechnic Institute, United States

SS-P1.3: EXPERIMENTS IN CREATING ONLINE COURSE CONTENT FOR SIGNAL PROCESSING EDUCATION
Jansson, Carl-Gustav, KTH Royal Institute of Technology, Sweden Thottappillil, Rajeev, KTH Royal Institute of Technology, Sweden Hillmann, Stefan, Technische Universität Berlin, Germany Möller, Sebastian, Technische Universität Berlin, Germany KVS, Hari, Indian Institute of Science, India Sundaresan, Rajesh, Indian Institute of Science, India

SS-P1.4: TEACHING SIGNALS AND SYSTEMS - A FIRST COURSE IN SIGNAL PROCESSING
Rakhashia, Nikhar, Indian Institute of Technology Bombay, India Bhurane, Ankit, Indian Institute of Information Technology Nagpur, India Gadre, Vikram, Indian Institute of Technology Bombay, India

SS-P1.5: COCHLEAR SIGNAL PROCESSING: A PLATFORM FOR LEARNING THE FUNDAMENTALS OF DIGITAL SIGNAL PROCESSING
Ambikairajah, Eliathamby, University of New South Wales, Australia Sethu, Vidhyasaharan, University of New South Wales, Australia

SS-P1.6: MULTIMODAL LEARNING FOR CLASSROOM ACTIVITY DETECTION
Li, Hang, TAL AI Lab, China Kang, Yu, TAL AI Lab, China Ding, Wenbiao, TAL AI Lab, China Yang, Song, TAL AI Lab, China Yang, Songfan, TAL AI Lab, China Huang, Gale Yan, TAL AI Lab, China Liu, Zitao, TAL AI Lab, China

SS-P1.7: AUTOMATIC FLUENCY EVALUATION OF SPONTANEOUS SPEECH USING DISFLUENCY-BASED FEATURES
Deng, Huaijin, University of Tsukuba, Japan
Lin, Youchao, University of Tsukuba, Japan
Utsuro, Takehito, University of Tsukuba, Japan
Kobayashi, Akio, Tsukuba University of Technology, Japan
Nishizaki, Hiromitsu, University of Yamanashi, Japan
Hoshino, Junichi, University of Tsukuba, Japan

SS-P1.8: INTELLIGENT STUDENT BEHAVIOR ANALYSIS SYSTEM FOR REAL CLASSROOMS

Zheng, Rui, Shanghai Jiao Tong University, China
Jiang, Fei, Shanghai Jiao Tong University, China
Shen, Ruimin, Shanghai Jiao Tong University, China
SS-P2 - Unconventional Sensing

SS-P2.1: CODED ILLUMINATION AND MULTIPLEXING FOR LENSLESS IMAGING

Zhang, Yucheng, University of California, Riverside, United States
Zheng, Rongjia, University of California, Riverside, United States
Asif, M. Salman, University of California, Riverside, United States

SS-P2.2: SPARSE CONVOLUTIONAL BEAMFORMING FOR WIRELESS ULTRASOUND

Mamistvalov, Alon, Weizmann Institute of Science, Israel
Eldar, Yonina, Weizmann Institute of Science, Israel

SS-P2.3: DIVERGENCE-BASED ADAPTIVE EXTREME VIDEO COMPLETION

El Helou, Majed, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Zhou, Ruofan, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Schmutz, Frank, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Guibert, Fabrice, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Süsstrunk, Sabine, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SS-P2.4: ENCODING AND DECODING MIXED BANDLIMITED SIGNALS USING SPIKING INTEGRATE-AND-FIRE NEURONS

Adam, Karen, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Scholefield, Adam, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Vetterli, Martin, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

SS-P2.5: ON THE EFFECT OF REFLECTANCE ON PHASOR FIELD NON-LINE-OF-SIGHT IMAGING

Guillén, Ibón, Universidad de Zaragoza, Spain
Liu, Xiaochun, University of Wisconsin-Madison, United States
Velten, Andreas, University of Wisconsin-Madison, United States
Gutierrez, Diego, Universidad de Zaragoza, Spain
Jarabo, Adrian, Universidad de Zaragoza, Spain

SS-P2.6: SIGNAL SENSING AND RECONSTRUCTION PARADIGMS FOR A NOVEL MULTI-SOURCE STATIC COMPUTED TOMOGRAPHY SYSTEM

Kotwal, Alankar, Carnegie Mellon University, United States
Cramer, Avilash, Massachusetts Institute of Technology, United States
Wu, Dufan, Massachusetts General Hospital, United States
Yang, Kai, Massachusetts General Hospital, United States
Krull, Wolfgang, Massachusetts General Hospital, United States
Gkioulekas, Ioannis, Carnegie Mellon University, United States
Gupta, Rajiv, Massachusetts General Hospital, United States

**SS-P2.7: SAMPLING CLASSES OF NON-BANDLIMITED SIGNALS USING INTEGRATE-AND-FIRE DEVICES: AVERAGE CASE ANALYSIS**
Alexandru, Roxana, Imperial College London, United Kingdom
Thao, Nguyen T., City College of New York, United States
Rzepka, Dominik, AGH University of Science and Technology, Poland
Dragotti, Pier Luigi, Imperial College London, United Kingdom

**SS-P2.8: TOWARDS AN INTELLIGENT MICROSCOPE: ADAPTIVELY LEARNED ILLUMINATION FOR OPTIMAL SAMPLE CLASSIFICATION**
Chaware, Amey, Duke University, United States
Cooke, Colin, Duke University, United States
Kim, Kanghyun, Duke University, United States
Horstmeyer, Roarke, Duke University, United States

**SS-P2.9: HIGH DYNAMIC RANGE IMAGING USING DEEP IMAGE PRIORS**
Jagatap, Gauri, Iowa State University, United States
Hegde, Chinmay, Iowa State University, United States

**SS-P2.10: KERNEL COMPUTATIONS FROM LARGE-SCALE RANDOM FEATURES OBTAINED BY OPTICAL PROCESSING UNITS**
Ohana, Ruben, Ecole Normale Supérieure, France
Wacker, Jonas, EURECOM, France
Dong, Jonathan, Ecole Normale Supérieure, France
Marmin, Sébastien, EURECOM, France
Krzakala, Florent, Ecole Normale Supérieure, France
Filippone, Maurizio, EURECOM, France
Daudet, Laurent, LightOn, France

**SS-P2.11: MULTI-DEPTH COMPUTATIONAL PERISCOPY WITH AN ORDINARY CAMERA**
Saunders, Charles, Boston University, United States
Bose, Rishabh, Stockdale High School, United States
Murray-Bruce, John, Boston University, United States
Goyal, Vivek, Boston University, United States

**SS-P2.12: SUPER-RESOLUTION WITH NOISY MEASUREMENTS: RECONCILING UPPER AND LOWER BOUNDS**
Qiao, Heng, University of California, San Diego, United States
Shahsavari, Sina, University of California, San Diego, United States
Pal, Piya, University of California, San Diego, United States