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## SS1: Signal Processing for Big Data

Room: Cavaniglia

Chair: Nikolaos D Sidiropoulos (University of Minnesota, USA)

11:00 A Parallel Algorithm for Big Tensor Decomposition Using Randomly Compressed Cubes (PARACOMP)<sup>3</sup>

Nikolaos D Sidiropoulos (University of Minnesota, USA); Evangelos Papalexakis (Carnegie Mellon University, USA); Christos Faloutsos (Carnegie Mellon University, USA)

11:20 Fast and Robust Bootstrap method for testing hypotheses in the ICA model<sup>8</sup>

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Yao Cheng (TU Ilmenau, Germany); Peng Li (University of York, United Kingdom); Martin Haardt (Ilmenau University of Technology, Germany)

SPCOM-P1.14 Joint Precoding over a Master-slave Coordination Link""6: ;

Qianrui Li (Mitsubishi Electric Research Centre Europe, France); David Gesbert (Eurecom Institute, France); Nicolas Gresset (Mitsubishi Electric Research Centre Europe, France)

#### IVMSP-P1: Face Recognition

Room: Poster Area 6

Chair: Yu-hen Hu (University of Wisconsin-Madison, USA)

IVMSP-P1.1 Multiple-View Constrained Clustering For Unsupervised Face Identification In TV-Broadcast""6; 6

Meriem Bendris (Aix Marseille Université, France); Delphine Charlet (Orange Labs, France); Benoit Favre (Aix-Marseille Université, France); Geraldine Damnati (Orange Labs, France); Rémi Auguste (Université Lille 1, France)

IVMSP-P1.2 Face Recognition based on Sigma Sets of Image Features""6: ;

Ramya Srinivasan (University of California, Riverside, USA); Abhishek Nagar (Samsung Research, America, USA); Anshuman Tewari (Samsung Research, America, USA); Donato Mitrani (Samsung Research, America, USA); Amit Roy-Chowdhury (University of California, Riverside, USA)

IVMSP-P1.3 Log-domain polynomial filters for illumination-robust face recognition""726

Yinyan Jiang (Tsinghua University, P.R. China); Yong Wu (Tsinghua University, P.R. China); Weifeng Li (Tsinghua University, P.R. China); Longbiao Wang (Nagaoka University of Technology, Japan); Qingmin Liao (Tsinghua University, P.R. China)

IVMSP-P1.4 Probabilistic Linear Discriminant Analysis for intermodality face recognition""72;

Muhammad Shaikh (Northumbria University, United Kingdom); Muhammad Atif Tahir (Al Imam Mohammad Ibn Saud Islamic University & University of Northumbria, Saudi Arabia); Ahmed Bouridane (Northumbria University at Newcastle, United Kingdom)

IVMSP-P1.5 Regularized Shearlet Network For Face Recognition Using Single Sample Per Person""736

Mohamed Anouar Borgi (Research Group on Intelligent Machines, Tunisia); Demetrio Labate (University of Houston, USA); Maher El 'Arbi (University of Sfax, Tunisia); Chokri Ben Amar (University of Sfax, National School of Engineers & Research Groups on Intelligent Machines, Tunisia)

IVMSP-P1.6 Histogram of Log-Gabor Magnitude Patterns for Face Recognition""73;

Jun Yi (Beijing University of Posts and Telecommunications, P.R. China); Fei Su (Beijing university of posts and telecommunications, P.R. China)

IVMSP-P1.7 Facial Image De-identification using Identity Subspace Decomposition""746

Hehua Chi (Wuhan University & Wuhan University, USA); Yu-hen Hu (University of Wisconsin-Madison, USA)

IVMSP-P1.8 Polynomial based texture representation for facial expression recognition""74;

Cristina Bordei (Xlim Sic, Technicolor, University of Poitiers, France); Pascal Bourdon (Xlim Sic, France); Bertrand Augereau (Xlim Sic, France); Philippe Carré (University of Poitiers, France)

#### IVMSP-P2: Stereoscopic and 3D Processing

Room: Poster Area 7

Chair: Truong Nguyen (University of California, San Diego, USA)

IVMSP-P2.1 Analysis of the Effect of Calibration Error on Light Field Super-Resolution Rendering""756

Kuang-Tsu Shih (National Taiwan University, Taiwan); Chen-Yu Hsu (National Taiwan University, Taiwan); Cheng-Chieh Yang (National Taiwan University, Taiwan); Homer Chen (National Taiwan University & National Taiwan University, Taiwan)

IVMSP-P2.2 Efficient intra prediction scheme for light field image compression""75;

Yun Li (Mid Sweden University, Sweden); Mårten Sjöström (Mid Sweden University, Sweden); Roger Olsson (Mid Sweden University, Sweden); Ulf Jennehag (Mid Sweden University, Sweden)

- IVMSP-P2.3 Adaptive Block Truncation Filter for MVC Depth Image Enhancement<sup>766</sup>  
 Xuyuan Xu (City University of Hong Kong, Hong Kong); Lai Man Po (City University of Hong Kong, Hong Kong); Terence Cheung (City University of Hong Kong, Hong Kong); Litong Feng (City University of Hong Kong, Hong Kong); Kwok-Wai Cheung (City University of Hong Kong, Hong Kong); Chi-Wang Ting (City University of Hong Kong, Hong Kong); Ka-Ho Ng (City University of Hong Kong, Hong Kong)
- IVMSP-P2.4 Generic 2D/3D Smoothing via Regional Variation<sup>76</sup>;  
 Wenfei Jiang (Technicolor, P.R. China); Tao Luo (Technicolor, France); Fan Zhang (Technicolor, P.R. China); Jiang Tian (Technicolor, P.R. China); Pei Luo (Technicolor, P.R. China); Kangying Cai (Technicolor, France)
- IVMSP-P2.5 Temporally coherent stereo matching using kinematic constraints<sup>776</sup>  
 Rodrigo Schramm (UFRGS, Brazil); Claudio R Jung (Universidade Federal do Rio Grande do Sul, Brazil)
- IVMSP-P2.6 Performance Analysis in Lytro Camera: Empirical and Model Based Approaches to Assess Refocusing Quality<sup>77</sup>;  
 Mitra Damghanian (Mid Sweden University, Sweden); Roger Olsson (Mid Sweden University, Sweden); Mårten Sjöström (Mid Sweden University, Sweden)
- IVMSP-P2.7 An efficient algorithm for pothole detection using stereo vision<sup>786</sup>  
 Zhen Zhang (University of Bristol, United Kingdom); Xiao Ai (University of Bristol, United Kingdom); Chee Kin Chan (University of Bristol, United Kingdom); Naim Dahnoun (University of Bristol, United Kingdom)
- IVMSP-P2.8 Toward A One Shot Multi-Projector Profilometry System For Full Field Of View Object Measurement<sup>78</sup>;  
 Stuart Woolford (RMIT University, Australia); Ian Burnett (RMIT University, Australia)
- IVMSP-P2.9 Efficient 3-Dimensional Model Reconstruction Based on Marker Encoded Fringe Projection Profilometry<sup>796</sup>  
 Budianto Budianto (The Hong Kong Polytechnic University, Hong Kong); Daniel Pak Kong Lun (The Hong Kong Polytechnic University, Hong Kong)
- IVMSP-P2.10 Low-saliency Prior for Disocclusion Hole Filling in DIBR-synthesized Images<sup>79</sup>;  
 Bruno Macchiavello (Universidade de Brasilia, Brazil); Camilo Dorea (University of Brasilia, Brazil); Edson Hung (Universidade de Brasilia, Brazil); Gene Cheung (National Institute of Informatics, Japan); Ivan V. Bajic (Simon Fraser University, Canada)
- IVMSP-P2.11 Hierarchical Depth Processing with Adaptive Search Range and Fusion<sup>7</sup>: 6  
 Zucheul Lee (UC San Diego, USA); Truong Nguyen (University of California, San Diego, USA)
- IVMSP-P2.12 Using Monocular Depth Cues for Modeling Stereoscopic 3D Saliency<sup>7</sup>: ;  
 Iana Iatsun (University of Poitiers, France); Chaker Larabi (Université de Poitiers & XLIM-SIC, France); Christine Fernandez (XLIM, France)
- IVMSP-P2.13 An Improved Model of Binocular Energy Calculation For Full-Reference Stereoscopic Image Quality Assessment<sup>7</sup>: 6  
 Chathura Perera (University of Surrey, United Kingdom); Safak Dogan (University of Surrey, United Kingdom); Varuna De Silva (Apical Ltd, United Kingdom)
- IVMSP-P2.14 Label Propagation Through Edge-preserving Filters<sup>7</sup>: ;  
 Richard J Rzeszutek (Ryerson University, Canada); Dimitri Androutsos (Ryerson University, Canada)
- AASP-P1: Microphone Array Processing I, Music Analysis and Synthesis I**
- Room: Poster Area 8  
 Chair: Gaël Richard (Institut Mines-Télécom, Télécom ParisTech, CNRS-LTCl, France)
- AASP-P1.1 Close-talking spherical microphone array using sound pressure interpolation based on spherical harmonic expansion<sup>826</sup>  
 Yoichi Haneda (The University of Electro-Communications, Japan); Ken'ichi Furuya (Oita University, Japan); Shoichi Koyama (Nippon Telegraph and Telephone Corporation, Japan); Kenta Niwa (NTT Media Intelligence Laboratories, Japan)
- AASP-P1.2 Time-Delay Estimation for TOA-Based Localization of Multiple Sensors<sup>82</sup>;  
 Richard Heusdens (Delft University of Technology, The Netherlands); Nikolay D. Gaubitch (Delft University of Technology, The Netherlands)
- AASP-P1.3 Multi-Speaker Tracking using Multiple Distributed Microphone Arrays<sup>836</sup>  
 Axel Plinge (TU Dortmund University, Germany); Gernot Fink (TU Dortmund University, Germany)
- AASP-P1.4 Sound-Model-Based Acoustic Source Localization using Distributed Microphone Arrays<sup>83</sup>;  
 Rupayan Chakraborty (Universitat Politècnica de Catalunya, Spain); Climent Nadeu (UPC, Spain)
- AASP-P1.5 Cultivating Vocal Activity Detection for Music Audio Signals in a Circulation-type Crowdsourcing Ecosystem<sup>846</sup>  
 Kazuyoshi Yoshii (Kyoto University, Japan); Hiromasa Fujihara (National Institute of Advanced Industrial Science and Technology (AIST), Japan); Tomoyasu Nakano (National Institute of Advanced Industrial Science and Technology (AIST), Japan); Masataka Goto (National Institute of Advanced Industrial Science and Technology (AIST), Japan)
- AASP-P1.6 A Pairwise Approach to Simultaneous Onset/Offset Detection for Singing Voice using Correntropy<sup>84</sup>;  
 Sungyun Chang (Seoul National University, Korea); Kyogu Lee (Seoul National University, Korea)
- AASP-P1.7 Parametric model of spectral envelope to synthesize realistic intensity variations in singing voice<sup>856</sup>  
 Emilio Molina (Universidad de Málaga, Spain); Isabel Barbancho (Universidad de Málaga, Spain); Ana M. Barbancho (Universidad de Málaga, Spain); Lorenzo J. Tardón (ETSI Telecomunicación, Universidad de Málaga, Spain)
- AASP-P1.8 Exploiting global features for tempo octave correction<sup>85</sup>;  
 Hendrik Schreiber (Tagtraum Industries Incorporated, USA); Meinard Mueller (International Audio Laboratories Erlangen, Germany)



AASP-P1.9 An Audio Fingerprinting System for Live Version Identification using Image Processing Techniques<sup>86</sup>

Zafar Rafii (Northwestern University, USA); Bob Coover (Gracenote, USA); Jinyu Han (Gracenote, USA)

AASP-P1.10 Accounting for Phase Cancellations in Non-Negative Matrix Factorization Using Weighted Distances<sup>86</sup>

Sebastian Ewert (Queen Mary University of London, United Kingdom); Mark D. Plumbley (Queen Mary University of London, United Kingdom); Mark Sandler (Queen Mary University of London, United Kingdom)

AASP-P1.11 Estimating Timing and Channel Distortion Across Related Signals<sup>876</sup>

Colin Raffel (Columbia University in the City of New York, USA); Daniel P W Ellis (Columbia University, USA)

AASP-P1.12 PYIN: a Fundamental Frequency Estimator Using Probabilistic Threshold Distributions<sup>87</sup>

Matthias Mauch (Queen Mary, University of London, United Kingdom); Simon Dixon (Queen Mary University of London & Centre for Digital Music, United Kingdom)

AASP-P1.13 Music Segment Similarity Using 2D-Fourier Magnitude Coefficients<sup>886</sup>  
Oriol Nieto (New York University & Steinhardt School, USA); Juan Bello (New York University, USA)

#### MMSP-P1: Multimedia Communication and Interaction

Room: Poster Area 9

Chairs: Homer Chen (National Taiwan University & National Taiwan University, Taiwan), Frederic Dufaux (Telecom Paristech & CNRS, France)

MMSP-P1.1 Attention-Weighted Rate Allocation in Free-Viewpoint Television<sup>88</sup>  
Ricardo L de Queiroz (University of Brasíl, Brazil); Thacio Scandaroli (USC, USA); Dinei Florencio (Microsoft Research, USA)

MMSP-P1.2 Stereoscopic image retargeting based on 3D saliency detection<sup>88</sup>  
Junle Wang (University of Nantes, France); Yuming Fang (Jiangxi University of Finance and Economics, P.R. China); Manish Narwaria (Universite de Nantes, France); Weisi Lin (Nanyang Technological University, Singapore); Patrick Le Callet (IRCCYN, France)

MMSP-P1.3 Prediction-based Load Control and Balancing for Feature Extraction in Visual Sensor Networks<sup>896</sup>

Emil Eriksson (Royal Institute of Technology, Sweden); György Dán (KTH, Royal Institute of Technology, Sweden); Viktoria Fodor (KTH, Sweden)

MMSP-P1.4 MangaWall: Generating Manga Pages for Real-Time Applications<sup>89</sup>  
Zhipeng Wu (The University of Tokyo, Japan); Kiyoharu Aizawa (University of Tokyo, Japan)

MMSP-P1.5 Towards Optimal Resource Allocation for Differentiated Multimedia Services in Cloud Computing Environment<sup>8</sup>: 6

Xiaoming Nan (Ryerson University, Canada); Yifeng He (Ryerson University, Canada); Ling Guan (Ryerson University, Canada)

MMSP-P1.6 Source Localization on Solids Utilizing Time-frequency Analysis of Parameterized Warped Signals<sup>8</sup>;

Arun Kattukandy (Nanyang Technological University, Singapore); Vaninirappupthenpurayil Gopalan Reju (Nanyang Technological University, Singapore); Andy W. H. Khong (Nanyang Technological University, Singapore)

MMSP-P1.7 Analysis and Modeling of Next Speaking Start Timing based on Gaze Behavior in Multi-party Meetings<sup>8</sup>: 6

Ryo Ishii (NTT, Japan); Kazuhiro Otsuka (NTT, Japan); Shiro Kumano (NTT Corporation, Japan); Junji Yamato (NTT, Japan)

MMSP-P1.8 Analysis of Interaction Attitudes Using Data-driven Hand Gesture Phrases<sup>8</sup>;

Zhaojun Yang (University of Southern California, USA); Angeliki Metallinou (Pearson Knowledge Technologies, USA); Engin Erzin (Koc University, Turkey); Shrikanth Narayanan (University of Southern California, USA)

MMSP-P1.9 Bandit Framework for Systematic Learning in Wireless Video-based Face Recognition<sup>926</sup>

Onur Atan (University of California Los Angeles, USA); Yiannis Andreopoulos (University College London, United Kingdom); Cem Tekin (University of California, Los Angeles, USA); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)

MMSP-P1.10 Optimal Foresighted Packet Scheduling and Resource Allocation for Multi-user Video Transmission in 4G Cellular Networks<sup>92</sup>

Yuanzhang Xiao (University of California, Los Angeles, USA); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)

MMSP-P1.11 Quality-fair HTTP Adaptive Streaming over LTE Network<sup>936</sup>

Sergio Cicalò (University of Ferrara - Italy, Italy); Nesrine Changuel (Alcatel Lucent Bell Labs, France); Ray Miller (Bell Labs, USA); Bessem Sayadi (Alcatel-Lucent Bell-Labs, France); Velio Tralli (University of Ferrara - Italy, Italy)

MMSP-P1.12 Automatic Inference of Mental States from Spontaneous Facial Expressions<sup>93</sup>

Yanjia Sun (New Jersey Institute of Technology, USA); Ali Akansu (NJIT, USA)

MMSP-P1.13 Segmentation of music video streams in music pieces through audio-visual analysis<sup>946</sup>

Gabriel Sargent (LABRI, France); Pierre Hanna (University Bordeaux 1, France); Henri Nicolas (LaBRI, France)

**1:00 PM - 2:45 PM**

**Lunch Time**

**2:45 PM - 3:45 PM**

**PT1: Plenary Talk: Signal Processing in Computational Art History (Room Cavaniglia)**

**3:45 PM - 4:15 PM**

**Coffee break**

**4:15 PM - 6:15 PM**

**SLTC-L3: Speaker recognition I**

Room: Cavaniglia

Chairs: Anthony Larcher (Institute for Infocomm Research & A\*STAR, Singapore), Pedro Torres-Carrasquillo (MIT Lincoln Laboratory, USA)

- 4:15 Text-dependent GMM-JFA system for password based speaker verification<sup>94</sup>;  
Sergey Novoselov (Speech Technology Center, Russia); Timur Pekhovskiy (St. Petersburg National Research University of Information Technologies, Mechanics and Optics & Speech Technology Center Ltd., Russia); Andrey Shulipa (Speech Technology Center, Russia); Alexey Sholokhov (Saint-Petersburg National Research University of Information Technologies, Mechanics and Optics, Russia)
- 4:35 Modelling the Alternative Hypothesis for Text-Dependent Speaker Verification<sup>95</sup>  
Anthony Larcher (Institute for Infocomm Research & A\*STAR, Singapore); Kong-Aik Lee (Institute for Infocomm Research, Singapore); Bin Ma (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)
- 4:55 Imposture classification for Text-Dependent Speaker Verification<sup>95</sup>;  
Anthony Larcher (Institute for Infocomm Research & A\*STAR, Singapore); Kong-Aik Lee (Institute for Infocomm Research, Singapore); Bin Ma (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)
- 5:15 Unsupervised Adaptation of PLDA by Using Variational Bayes Methods<sup>96</sup>  
Jesus Villalba (Universidad de Zaragoza, Spain); Eduardo Lleida (University of Zaragoza, Spain)
- 5:35 Evasion and obfuscation in automatic speaker verification<sup>96</sup>;  
Federico Alegre (EURECOM, France); Giovanni Soldi (EURECOM, France); Nicholas Evans (EURECOM, France)
- 5:55 A Wrapped Kalman Filter for Azimuthal Speaker Tracking<sup>P IC</sup>  
Johannes Traa (UIUC, USA); Paris Smaragdus (University of Illinois at Urbana-Champaign, USA)

**SPTM-L2: Signal and System Modelling, and Estimation II**

Room: Basilica

Chairs: Yonina C. Eldar (Technion-Israel Institute of Technology, Israel), Antonio Napolitano (Universita di Napoli Parthenope, Italy)

- 4:15 An Algorithm for Exact Super-resolution and Phase Retrieval<sup>97</sup>  
Yuxin Chen (Stanford University, USA); Yonina C. Eldar (Technion-Israel Institute of Technology, Israel); Andrea Goldsmith (Stanford University, USA)
- 4:35 Estimation of phase synchrony using the synchrosqueezing transform<sup>97</sup>;

Alireza Ahrabian (Imperial College, United Kingdom); Danilo Mandic (Imperial College, London, United Kingdom)

- 4:55 Wide-Band Moving Source Passive Localization in Highly Corruptive Environments<sup>98</sup>  
Antonio Napolitano (Universita di Napoli Parthenope, Italy)
- 5:15 Compressive Nonparametric Graphical Model Selection for Time Series<sup>98</sup>;  
Alexander Jung (Vienna University of Technology & Institute of Telecommunications, Austria); Reinhard Heckel (ETH Zürich, Switzerland); Helmut Bölcskei (ETH Zurich, Switzerland); Franz Hlawatsch (Vienna University of Technology, Austria)
- 5:35 3D Rotation Estimation Using Discrete Spherical Harmonic Oscillator Transforms<sup>99</sup>  
Soo-Chang Pei (National Taiwan University, Taiwan); Chun-Lin Liu (California Institute of Technology, USA)
- 5:55 Smooth Time-Frequency Estimation using Covariance Fitting<sup>99</sup>;  
Johan Brynolfsson (Lund University, Sweden); Johan Svaerd (Lund University, Sweden); Andreas Jakobsson (Lund University, Sweden); Maria Sandsten (Lund University, Sweden)

**SS2: Enhanced Radar Sensing in Harsh Environments Phenomenology**

Room: Polveriera

Chair: Yuriy V. Shkvarko (Cinvestav Jalisco, Mexico)

- 4:15 Multilevel descriptive experiment design regularization framework for sparsity preserving enhancement of radar imagery in harsh sensing environments<sup>9</sup>: 6  
Yuriy V. Shkvarko (Cinvestav Jalisco, Mexico); Israel Yañez (Research Center and Advanced Studies of the National Polytechnic Institute, Mexico); Gustavo Martín del Campo (CINVESTAV del IPN, Mexico); Victor Espadas (Centro de Investigacion y de Estudios Avanzados del IPN, Mexico)
- 4:35 Multi-Band Radio-Frequency Integrated Circuits for Multiband and Multimode Wireless Communication, Radar and Sensing Systems in Harsh Environments<sup>9</sup> ;  
Cuong Huynh (Ho Chi Minh City University of Technology, Vietnam); Jaeyoung Lee (Texas A&M University, USA); Cam Nguyen (Texas A&M University, USA)
- 4:55 Detection, Parametric Imaging and Classification of Very Small Marine Targets Emerged in Heavy Sea Clutter Utilizing GPS-Based Forward Scattering Radar<sup>9</sup>; 5  
Hristo A. Kabakchiev (Sofia University "St. Kliment Ohridski", Bulgaria)
- 5:15 Radar tomography using noise waveform, antenna with beam synthesis and MIMO principle<sup>9</sup>; : "  
Konstantin Alexandrovich Lukin (IRE NASU National Academy of Sciences of Ukraine, Ukraine); Pavlo Vyplavin (IRE NASU National Academy of Sciences of Ukraine, Ukraine); Volodymyr Kudriashov (IRE NASU National Academy of Sciences of Ukraine, Ukraine); Sergiy Lukin (IRE NASU, National Academy of Sciences of Ukraine, Ukraine); Vladymir Palamarchuk (IRE NASU National Academy of Sciences of Ukraine, Ukraine); Piotr Suszenko (IRE NASU, National Academy of Sciences of Ukraine, Ukraine); Nikolai Zaets (IRE NASU, National

Academy of Sciences of Ukraine, Ukraine); Yuriy Shkvarko (CINVESTAV, Guadalajara, Ukraine)  
5:35 Over-the-Horizon Radar Potential Signal Parameter Estimation Accuracy in Harsh Sensing Environments<sup>""</sup>: 23  
Yuri Abramovich (W R Systems, Ltd, USA); Geoffrey San Antonio (US Naval Research Laboratory, USA)  
5:55 Polarimetric MIMO Radar Target Detection Based on Glowworm Swarm Optimization Algorithm<sup>""</sup>: 27  
Hong Jiang (Jilin University, P.R. China); Xiaohui Tang (Jilin University, P.R. China)

#### **AASP-L1: Microphone-Array Beamforming**

Room: Scherma  
Chairs: Jingdong Chen (Northwestern Polytechnical University, USA), Nobutaka Ono (National Institute of Informatics, Japan)  
4:15 Diffusion-Based Distributed MVDR Beamformer<sup>""</sup>: 32  
Matthew O'Connor (Victoria University of Wellington, New Zealand); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand)  
4:35 On the Noise Reduction Performance of the MVDR Beamformer in Noisy and Reverberant Environments<sup>""</sup>: 37  
Chao Pan (Northwestern Polytechnical University, P.R. China); Jingdong Chen (Northwestern Polytechnical University, USA); Jacob Benesty (INRS-EMT, University of Quebec, Canada)  
4:55 A New Generalized Sidelobe Canceller with a Compact Array of Microphones Suitable for Mobile Terminals<sup>""</sup>: 42  
Akihiko K. Sugiyama (NEC Corporation, Japan); Ryoji Miyahara (NEC Engineering Ltd., Japan)  
5:15 Multichannel Wiener Filter Performance Analysis in Presence of Mismatching<sup>""</sup>: 47  
Dani Cherkassky (Bar-Ilan University & Silentium, Israel); Sharon Gannot (Bar-Ilan University, Israel)  
5:35 Automatic spatial gain control for an informed spatial filter<sup>""</sup>: 52  
Sebastian Braun (International Audio Laboratories Erlangen, Germany); Oliver Thiergart (International Audio Laboratories Erlangen, Germany); Emanuel Habets (International Audio Laboratories Erlangen, Germany)  
5:55 An Analysis of Binaural Spectro-temporal Masking as Nonlinear Beamforming<sup>""</sup>: 57  
Amir R Moghimi (Carnegie Mellon University, USA); Richard M Stern (Carnegie Mellon University, USA)

#### **SPCOM-L1: Resource allocation**

Room: Teatrino  
4:15 Parallel and Distributed Methods for Nonconvex Optimization<sup>""</sup>: 62  
Gesualdo Scutari (State University of New York at Buffalo, USA); Francisco Facchinei (University of Rome, "La Sapienza", Italy); Lorenzo Lampariello (University of Rome, "La Sapienza", Italy); Peiran Song (Sunny Buffalo, USA)

4:35 Max-Min Network Flow and Resource Allocation for Backhaul Constrained Heterogeneous Wireless Networks<sup>""</sup>: 67  
Wei-Cheng Liao (University of Minnesota, USA); Mingyi Hong (University of Minnesota, USA); Zhi-Quan Luo (University of Minnesota, USA)  
4:55 Joint cell selection and radio resource allocation in MIMO small cell networks via successive convex approximation<sup>""</sup>: 72  
Stefania Sardellitti (University of Rome La Sapienza, Italy); Gesualdo Scutari (State University of New York at Buffalo, USA); Sergio Barbarossa (University of Rome, Italy)  
5:15 Near-Optimal Spectrum Allocation in Multi-tier Cellular Networks with Random Inelastic Traffic<sup>""</sup>: 77  
Wei Bao (University of Toronto, Canada); Ben Liang (University of Toronto, Canada)  
5:35 Queue Aware Precoder Design for Space Frequency Resource Allocation<sup>""</sup>: 82  
Ganesh Venkatraman (University of Oulu & CWC, University of Oulu, Finland); Antti Tölli (University of Oulu, Finland); Le-Nam Tran (University of Oulu & Centre for Wireless Communications, Finland); Markku Juntti (University of Oulu, Finland)  
5:55 Effectiveness of successive interference cancellation and association policies for heterogeneous wireless networks<sup>""</sup>: 87  
Mathias Wildemeersch (Singapore University of Technology and Design (SUTD), Singapore); Tony Q. S. Quek (Singapore University of Technology and Design (SUTD) & Institute for Infocomm Research, Singapore); Marios Kountouris (Supélec, France); Cornelis H Slump (University of Twente, The Netherlands)

#### **IVMSP-L2: Stereoscopic and 3D coding**

Room: Volta  
Chair: Gene Cheung (National Institute of Informatics, Japan)  
4:15 Quad-tree partitioned compressed sensing for depth map coding<sup>""</sup>: 92  
Ying Liu (Illinois Institute of Technology, USA); Krishna Rao Vijayanagar (Illinois Institute of Technology, USA); Joohee Kim (Illinois Institute of Technology, USA)  
4:35 Flexible depth map spatial resolution in depth-enhanced multiview video coding<sup>""</sup>: 97  
Payman Aflaki (Tampere University of Technology & Nokia Research Center, Finland); Miska Hannuksela (Nokia Research Center, Finland); Moncef Gabbouj (Tampere University of Technology & Tampere, Finland, Finland)  
4:55 Asymmetric Coding using Binocular Just Noticeable Difference and Depth Information for Stereoscopic 3D<sup>""</sup>: 2  
Sid Ahmed Fezza (University of Oran, Algeria); Chaker Larabi (Université de Poitiers & XLIM-SIC, France); Kamel Mohamed Faraoun (Djillali Liabes University, Algeria)  
5:15 A Graph-based Joint Bilateral Approach for Depth Enhancement<sup>""</sup>: 7

Yongzhe Wang (University of Southern California, USA); Antonio Ortega (USC, USA); Dong Tian (Mitsubishi Electric Research Labs, USA); Anthony Vetro (Mitsubishi Electric Research Laboratories, USA)

5:35 Synthesis Error Compensated Multiview Video Plus Depth For Representation of Multiview Video"; 2

Mehrdad Panahpour Tehrani (Nagoya University, Japan); Akio Ishikawa (NICT, Japan); Makoto Okui (NICT, Japan); Naomi Inoue (NICT, Japan); Keita Takahashi (Nagoya University, Japan); Toshiaki Fujii (Nagoya University, Japan)

5:55 A Low Complexity Mode Decision Approach for HEVC-based 3D Video Coding Using a Bayesian Method"; 7

Hamid Reza Tohidpour (University of British Columbia, Canada); Mahsa T. Pourazad (TELUS Communications Company, Canada); Panos Nasiopoulos (University of British Columbia, Canada)

### SLTC-P3: Speech Production and Perception

Room: Poster Area 1

Chair: Douglas O'Shaughnessy (INRS-Énergie-Matériaux-Télécommunications, Canada)

SLTC-P3.1 Robust and efficient environment detection for adaptive speech enhancement in cochlear implants"; 22

Oldooz Hazrati (The University of Texas at Dallas, USA); Seyed Omid Sadjadi (The University of Texas at Dallas & The Center for Robust Speech Systems (CRSS), USA); John Hansen (The University of Texas at Dallas, USA)

SLTC-P3.2 Improving Channel Selection of Sound Coding Algorithms in Cochlear Implants"; 27

Hussnain Ali (The University of Texas at Dallas, USA); Feng Hong (The University of Texas at Dallas, USA); John Hansen (The University of Texas at Dallas, USA); Emily Tobey (The University of Texas at Dallas, USA)

SLTC-P3.3 Speech Reinforcement in Noisy Reverberant Environments Using a Perceptual Distortion Measure"; 32

João Crespo (Delft University of Technology, The Netherlands); Richard Hendriks (Delft University of Technology, The Netherlands)

SLTC-P3.4 Modeling pathological speech perception from data with similarity labels"; 37

Visar Berisha (Arizona State University, USA); Julie Liss (ASU, USA); Steven Sandoval (ASU / SenSIP Center / School of ECEE, USA); Rene Utianski (ASU, USA); Andreas Spanias (ASU / SenSIP Center / School of ECEE, USA)

SLTC-P3.5 Closed Phase Estimation for Inverse Filtering the Oral Airflow Waveform"; 42

Jon Gudnason (Reykjavik University, Iceland); Daryush Mehta (Massachusetts General Hospital, USA); Thomas Quatieri (MIT, USA)

SLTC-P3.6 Perceived quality of resonance based decomposed speech components under diotic and dichotic listening"; 47

Chin-Tuan Tan (New York University School of Medicine, USA); Ivan Selesnick (Polytechnic University, USA); Kemal Avci (Abant Izzet Baysal University, Turkey)

SLTC-P3.7 Signal Processing Methods for Removing the Effects of Whole-Body Vibration Upon Speech"; 52

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Room: Poster Area 8

Chair: Israel Cohen (Technion, Israel)

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## MMSP-P2: Multimedia Systems, Databases, and Quality Assessment

Room: Poster Area 9

Chair: Homer Chen (National Taiwan University & National Taiwan University, Taiwan)

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Jinfeng Bai (Institute of Automation, P.R. China); Zhineng Chen (Institute of Automation, P.R. China); Bailan Feng (Institute of Automation, P.R. China); Bo Xu (Institute of Automation, Chinese Academy of Sciences, P.R. China)

MMSP-P2.9 Quality assessment of online videos using metadata""35: 7  
Chul-Hee Han (Yonsei University, Korea); Jong-Seok Lee (Yonsei University, Korea)

MMSP-P2.10 Auditory Attention Based Mobile Audio Quality Assessment""35: ;  
Yuhong Yang (National Engineering Research Center for Multimedia Software, Wuhan Univ., China Shenzhen Institute., P.R. China); Hongjiang Yu (Wuhan University, P.R. China); Ruimin Hu (National Engineering Research Center on Multimedia Software, Wuhan University, P.R. China); Li Gao (National Engineering Research Center for Multimedia Software, Computer School of Wuhan University, P.R. China); Song Wang (Wuhan University, P.R. China); Qing Zhai (Wuhan University, P.R. China); Songbo Xie (Wuhan University, P.R. China)

MMSP-P2.11 A Power Mask based Audio Fingerprint""35: 6  
Bob Coover (Gracenote, USA); Jinyu Han (Gracenote, USA)

MMSP-P2.12 A Monolithic Programmable Ultra-HD Video Codec Engine""35: ;  
Hetul Sanghvi (Texas Instruments Inc, India); Mihir N Mody (Texas Instruments, India); Mahesh Mehendale (Texas Instruments Inc., India); Subrangshu Das (Texas Instruments Inc., India); Dipan Kumar Mandal (Texas Instruments, India); Niraj Nandan (Texas Instruments, India); Vyagrheswarudu Nainala (Texas Instruments Inc., India); Vijayavardhan Baireddy (Texas Instruments Inc., India); Pavan Shastry (Texas Instruments India, India)

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Room: Poster Area 10

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Joel B. Harley (Carnegie Mellon University, USA); Jose Moura (Carnegie Mellon University, USA)

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Neda Adib (Southern Methodist University, USA); Scott Douglas (Southern Methodist University & LGT Corporation, USA)

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Huajie Shao (Zhejiang University, P.R. China); Xiao-Ping Zhang (Ryerson University, Canada); Zhi Wang (Zhejiang University & State Key Laboratory of Industrial Control Technology, Zhejiang University, P.R. China)

SAM-P1.4 Reaching Asymptotic Efficient Performance for Squared Processing of Range and Range Difference Localizations in the Presence of Sensor Position Errors""363;  
Shanjie Chen (University of Missouri, USA); Dominic K. C. Ho (University of Missouri, USA)

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Zhang Jie (Shenzhen Graduate School, Peking University, P.R. China)

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Afsaneh Asaei (Idiap Research Institute, Switzerland); Herve Bourlard (IDIAP, Switzerland); Mohammad J. Taghizadeh (Idiap Research Institute & EPFL, Switzerland); Volkan Cevher (Ecole Polytechnique Federale de Lausanne, Switzerland)

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Youssef Oualil (Saarland University, Germany); Dietrich Klakow (Saarland University, Germany)

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Ngoc Hung Nguyen (University of South Australia, Australia); Kutluyil Doğançay (University of South Australia, Australia); Linda M. Davis (University of South Australia, Australia)

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Saurav Subedi (Villanova University, USA); Yimin D. Zhang (Villanova University, USA); Moeness G. Amin (Villanova University, USA); Brahm Himed (AFRL, USA)

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Ryan Goldhahn (NATO STO Centre for Maritime Research and Experimentation, Italy); Paolo Braca (NATO STO Centre for Maritime Research and Experimentation, Italy); Kevin LePage (CMRE, Italy); Peter Willett (University of Connecticut, USA); Stefano Marano (University of Salerno, Italy); Vincenzo Matta (University of Salerno, Italy)

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Stiven Dias (Instituto Tecnológico de Aeronáutica (ITA) & Embraer Defense & Security (EDS), Brazil); Marcelo Bruno (ITA, Brazil)

## Wednesday, May 7

8:30 AM - 10:30 AM

### SLTC-L4: Fundamental Frequency Estimation

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Chairs: Malcolm Slaney (Microsoft Research & Stanford University, USA), DeLiang Wang (Ohio State University, USA)

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Frank Kurth (Fraunhofer FKIE, Germany); Alessia Cornaggia-Urrigshardt (Fraunhofer FKIE, Germany); Sebastian Urrigshardt (Fraunhofer FKIE, Germany)

8:50 Multi-pitch tracking using Gaussian mixture model with time varying parameters and Grating Compression Transform""3695

Abhijith Mundanad Narayanan (Indian Institute of Science, India); Prasanta Kumar Ghosh (Indian Institute of Science, India); Kasi Rajgopal (Indian Institute of Science, India)

9:10 A Computationally Efficient Refinement of the Fundamental Frequency Estimate for the Adaptive Harmonic Model""369;

Veronica Morfi (University of Crete / FORTH, Greece); Gilles Degottex (University of Crete / FORTH & FORTH, Greece); Athanasios Mouchtaris (Foundation for Research and Technology-Hellas, Greece)

9:30 A Robust Pitch Detector Based on Time Envelope and Individual Harmonic Information using Phase Locked Loops and Consensual Decisions""36: 5

Patricia Pelle (University of Buenos Aires, Argentina); Claudio Estienne (University of Buenos Aires, School of Engineering, Argentina)

9:50 Neural Networks For Supervised Pitch Tracking in Noise""36: :

Kun Han (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

10:10 Epoch Extraction from Allpass Residual of Speech Signals""36: 5

Karthika Vijayan (IIT Hyderabad, India); Sri Rama Murty Kodukula (Indian Institute of Technology Hyderabad, India)

### SS3: Optimization algorithms for high dimensional signal processing

Room: Basilica

Chairs: Volkan Cevher (Ecole Polytechnique Federale de Lausanne, Switzerland), Mário

A. T. Figueiredo (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal)

8:30 A preconditioned forward-backward approach with application to large-scale

nonconvex spectral unmixing problems""36; :

Audrey Repetti (Université Paris-Est Marne-la-Vallée, France); Emilie Chouzenoux (Université Paris-Est Marne-la-Vallée, France); Jean-Christophe Pesquet (University Paris-Est, France)

8:50 Iteration-Complexity of a Generalized Forward Backward Splitting Algorithm""P IC

Jingwei Liang (Greyc, ENSICAEN, France); Jalal Fadili (CNRS and Greyc, ENSICAEN, France); Gabriel Peyré (CNRS and Université Paris-Dauphine, France)

9:10 Barrier smoothing for nonsmooth convex minimization""3725

Quoc Tran Dinh (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland); Yen-Huan Li (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland); Volkan Cevher (Ecole Polytechnique Federale de Lausanne, Switzerland)

9:30 Distributed Nesterov Gradient Methods for Random Networks: Convergence in Probability and Convergence Rates""372:

Dusan Jakovetic (BioSense Center, University of Novi Sad, Serbia); João Xavier (I.S.T. - Technical U. Lisbon / I.S.R. Lisbon, Portugal); Jose Moura (Carnegie Mellon University, USA)

9:50 Teaching a new trick to an old dog: revisiting the quadratic programming

formulation of sparse recovery using ADMM""3734

Mário A. T. Figueiredo (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal)

10:10 Active set strategy for high-dimensional non-convex sparse optimization problems""3739

Aurélien Boisbunon (INRIA Sophia-Antipolis Méditerranée – AYIN Team, France); Rémi Flamary (Université de Nice Sophia-Antipolis & Laboratoire Lagrange, UMR CNRS, France); Alain Rakotomamonjy (INSA/Université de Rouen, France)

### MMSP-L1: Multimedia and Multimodal Signal Processing I

Room: Polveriera

Chairs: Peter Schelkens (Vrije Universiteit Brussel, Belgium), Vanessa Testoni (Samsung Research, Brazil)

8:30 Robust Canonical Correlation Analysis: Audio-visual Fusion for Learning Continuous Interest""3744

Mihalis Nicolaou (Imperial College London, United Kingdom); Yannis Panagakis (Imperial College London, United Kingdom); Stefanos Zafeiriou (Imperial College, United Kingdom); Maja Pantic (Imperial College, United Kingdom)

8:50 A new EM estimation of dynamic stream weights for coupled-HMM-based audio-visual ASR""3749

Ahmed Hussen Abdelaziz (Ruhr-Universität Bochum, Germany); Steffen Zeiler (Ruhr-Universität Bochum, Germany); Dorothea Kolossa (Ruhr-Universität Bochum, Germany)

9:10 Look Who's Talking: Detecting the Dominant Speaker in a Cluttered Scenario""3754

Eleonora D'Arca (Heriot Watt University, United Kingdom); Neil Robertson (Heriot-Watt University, United Kingdom); James R Hopgood (University of Edinburgh & Institute for Digital Communications, United Kingdom)

9:30 Motion history images for online speaker/signer diarization""3759

Binyam Gebrekidan Gebre (Max Planck Institute for Psycholinguistics, The Netherlands); Peter Wittenburg (MPI for Psycholinguistics, The Netherlands); Tom Heskes (Radboud University Nijmegen, The Netherlands); Sebastian Drude (Max Planck Institute for Psycholinguistics, The Netherlands)

9:50 Multimodal Voice Conversion using Non-Negative Matrix Factorization in Noisy Environments""3764

Kenta Masaka (Kobe University, Japan); Ryo Aihara (Kobe University, Japan); Tetsuya Takiguchi (Kobe University, Japan); Yasuo Ariki (Kobe University, Japan)

10:10 Bag of sub-graphs for video event recognition""3769

Najib Ben Aoun (REGIM-Lab:REsearch Groups on Intelligent Machines & University of Sfax, National Engineering School of Sfax, Tunisia); Mahmoud Mejdoub (REGIM-Lab: REsearch Groups on Intelligent Machines, Tunisia); Chokri Ben Amar (University of Sfax, National School of Engineers & Research Groups on Intelligent Machines, Tunisia)

### AASP-L2: Speech and Audio Enhancement

Room: Scherma

Chairs: Shoji Makino (University of Tsukuba, Japan), Jonathan Le Roux (Mitsubishi Electric Research Laboratories, USA)

8:30 Examples of Optimal Noise Reduction Filters Derived from the Squared Pearson Correlation Coefficient""3774

Jiaolong Yu (Northwestern Polytechnical University, P.R. China); Jacob Benesty (INRS-EMT, University of Quebec, Canada); Gongping Huang (Northwestern Polytechnical University, P.R. China); Jingdong Chen (Northwestern Polytechnical University, USA)

8:50 Fast segment search for corpus-based speech enhancement based on speech recognition technology""3779

Atsunori Ogawa (NTT Corporation, Japan); Keisuke Kinoshita (NTT Corporation, Japan); Takaaki Hori (NTT Corporation, Japan); Tomohiro Nakatani (NTT Corporation, Japan); Atsushi Nakamura (NTT Corporation, Japan)

9:10 Deep Learning for Monaural Speech Separation""3784

Po-Sen Huang (University of Illinois at Urbana-Champaign & Beckman Institute, USA); Minje Kim (University of Illinois at Urbana-Champaign, USA); Mark Hasegawa-Johnson (University of Illinois, USA); Paris Smaragdis (University of Illinois at Urbana-Champaign, USA)

9:30 An interactive audio source separation framework based on non-negative matrix factorization""3789

Ngoc Q. K. Duong (Technicolor, France); Alexey Ozerov (Technicolor Research & Innovation, France); Louis Chevallier (Technicolor, France); Joel Sirot (Technicolor, France)

9:50 Towards complex matrix decomposition of spectrograms based on the relative phase offsets of harmonic sounds""3794

Holger Kirchhoff (Queen Mary University of London, United Kingdom); Roland Badeau (Institut Mines Telecom, Telecom ParisTech, CNRS LTCI, France); Simon Dixon (Queen Mary University of London & Centre for Digital Music, United Kingdom)

10:10 Audio Declipping with Social Sparsity""3799

Kai Siedenburg (McGill University, Canada); Matthieu Kowalski (Univ Paris-Sud, France); Monika Doerfler (University of Vienna, Austria)

#### SS4: Signal Processing for Cyber-Security and Privacy

Room: Teatrino

Chairs: Holger Boche (Technical University Munich, Germany), Rafael F. Schaefer (Princeton University, USA)

8:30 On the Use of Secret Keys in Broadcast Channels with Receiver Side Information""37: 4

Rafael F. Schaefer (Princeton University, USA); Ashish Khisti (University of Toronto, Canada); Holger Boche (Technical University Munich, Germany)

8:50 Mobi-Cliques for Improving Ergodic Secrecy in Fading Wiretap Channels under Power Constraints""37: 9

Dionysios Kalogerias (Rutgers, The State University of New Jersey, USA); Athina Petropulu (Rutgers, The State University of New Jersey, USA)

9:10 Precoding for Secret Key Generation in Multiple Antenna Channels with Statistical Channel State Information""37: 4

Sabrina Engelmann (Dresden University of Technology, Germany); Anne Wolf (Dresden University of Technology, Germany); Eduard Jorswieck (TU Dresden, Germany)

9:30 Robust Artificial Noise-aided Transmit Optimization for Achieving Secrecy and Energy Harvesting""37: 8

Qiang Li (University of Electronic Science and Technology of China, P.R. China); Wing-Kin Ma (The Chinese University of Hong Kong, Hong Kong); Anthony Man-Cho So (The Chinese University of Hong Kong, Hong Kong)

9:50 Privacy-leakage codes for biometric authentication systems""3823

Tanya Ignatenko (Eindhoven University of Technology, The Netherlands); Frans MJ Willems (Technical University Eindhoven, The Netherlands)

10:10 Device-to-Device Communications:The Physical Layer Security Advantage""3828

Daohua Zhu (National Mobile Communications Research Laboratory, Southeast University, P.R. China); Lee Swindlehurst (University of California at Irvine, USA); Ali Fakoorian (University of California, Irvine, USA); Wei Xu (Southeast University, P.R. China); Chunming Zhao (National Mobile Communications Research Laboratory, Southeast University, P.R. China)

#### BISP-L1: Biomedical Informatics and Image Analysis I

Room: Volta

Chair: Scott Acton (University of Virginia, USA)

8:30 A Non-Homogeneous Poisson Process Model of Skin Conductance Responses Integrated with Observed Regulatory Behaviors for Autism Intervention""3833

Theodora Chaspari (University of Southern California, USA); Matthew Goodwin (Northeastern University, USA); Oliver Wilder-Smith (Northeastern University, USA); Amanda Gulrud (University of California, USA); Charlotte Mucchetti (University of California, USA); Connie Kasari (University of California, USA); Shrikanth Narayanan (University of Southern California, USA)

8:50 Joint Clustering of Protein Interaction Networks by Block Modeling""3838

Yijie Wang (Texas A&M University, USA); Xiaoning Qian (Texas A&M University, USA)

9:10 Using Density Invariant Graph Laplacian to Resolve Unobservable Parameters for Three-Dimensional Optical Bio-imaging""3843

Chien-Hung Lu (Department of Electrical Engineering, Princeton University, USA); Pei-Yuan Wu (Department of Electrical Engineering, Princeton University, USA)

9:30 Deep Learning of Feature Representation with Multiple Instance Learning for Medical Image Analysis""3848

Yan Xu (Beihang University, P.R. China); Tao Mo (Tsinghua University, P.R. China); Qiwei Feng (Tsinghua University, P.R. China); Peilin Zhong (Tsinghua University, P.R. China); Maode Lai (Zhejiang University, P.R. China); Eric Chang (Microsoft Research, P.R. China)

9:50 Exponential Hermite Splines for the Analysis of Biomedical Images""3853

Virginie Uhlmann (Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland); Ricard Delgado-Gonzalo (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Costanza Conti (University of Florence, Italy); Lucia Romani (University of Milano-Bicocca, Italy); Michael Unser (EPFL, Switzerland)

10:10 An Adaptive Distributed Resampling Algorithm with Non-Proportional Allocation""3857

Omer Demirel (The Max Planck Institute of Molecular Cell Biology and Genetics, Germany); Ihor Smal (Erasmus MC -- University Medical Center Rotterdam, ? Th); Wiro Niessen (Erasmus MC, Rotterdam, The Netherlands); Erik Meijering (Erasmus MC -- University Medical Center Rotterdam, The Netherlands); Ivo F. Sbalzarini (The Max Planck Institute of Molecular Cell Biology and Genetics, Germany)

## SLTC-P5: Speaker recognition II

Room: Poster Area 1

Chair: Nicholas Evans (EURECOM, France)

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Shanshan Zhang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Ce Zhang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Rong Zheng (Institute of Automation, Chinese Academy of Sciences, P.R. China); Bo Xu (Institute of Automation, Chinese Academy of Sciences, P.R. China)

SLTC-P5.2 Training pairwise Support Vector Machines with large scale datasets""3867

Sandro Cumani (Politecnico di Torino, Italy); Pietro Laface (Politecnico di Torino, Italy)

SLTC-P5.3 Large-scale speaker identification""3872

Ludwig Schmidt (MIT, USA); Matthew Sharifi (Google, USA); Ignacio Lopez Moreno (Google Inc., USA)

SLTC-P5.4 Spear: An Open Source Toolbox for Speaker Recognition Based on Bob""3877

Elie Khoury (Idiap Research Institute, Switzerland); Laurent El Shafey (Idiap Research Institute, Switzerland); Sébastien Marcel (IDIAP Research Institute, Switzerland)

SLTC-P5.5 Speaker Verification Using Kernel-Based Binary Classifiers with Binary Operation Derived Features""3882

Hung-Shin Lee (Institute of Information Science, Academia Sinica, Taiwan); Yu Tsao (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Yun-Fan Chang (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Hsin-Min Wang (Academia Sinica, Taiwan); Sk Jeng (National Taiwan University, Taiwan)

SLTC-P5.6 Improving PLDA speaker verification with limited development data""3887

Ahilan Kanagasundaram (Queensland University of Technology, Australia); David Dean (Queensland University of Technology, Australia); Sridha Sridharan (Queensland University of Technology, Australia)

SLTC-P5.7 Constrained discriminative PLDA training for speaker verification""3892

Johan Rohdin (Tokyo Institute of Technology, Japan); Sangeeta Biswas (Tokyo Institute of Technology, Japan); Koichi Shinoda (Tokyo Institute of Technology, Japan)

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Aren Jansen (Johns Hopkins University HLTCOE, USA); Daniel Garcia-Romero (Johns Hopkins University HLTCOE, USA); Pascal Clark (Johns Hopkins University HLTCOE, USA); Jaime Hernandez-Cordero (US Department of Defense, USA)

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Niko Brummer (AGNITIO, South Africa); Daniel Garcia-Romero (Johns Hopkins University HLTCOE, USA)

SLTC-P5.10 Bayesian vocal tract model estimates of nasal stops for speaker verification""38: 7

EwaldENZINGER (School of Elec. Eng. & Telecom., University of New South Wales, Sydney, Australia & Austrian Academy of Sciences, Austria); Christian Kasess (Acoustics Research Institute, Austrian Academy of Sciences, Austria)

SLTC-P5.11 Physiologically-motivated Feature Extraction for Speaker Identification""38: 2

Jianglin Wang (Marquette University, USA); Michael Johnson (Marquette University, USA)

SLTC-P5.12 A novel scheme for speaker recognition using a phonetically-aware deep neural network""38: 7

Yun Lei (SRI International, USA); Nicolas Scheffer (SRI International, USA); Luciana Ferrer (SRI International, USA); Mitchell McLaren (SRI International, USA)

SLTC-P5.13 Deep Belief Networks for i-vector Based Speaker Recognition""3922

Omid Ghahabi (Universitat Politècnica de Catalunya · BarcelonaTech, Spain); Javier Hernando (Technical University of Catalonia, Spain)

SLTC-P5.14 JFA-Based Front Ends for Speaker Recognition""3927

Patrick Kenny (CRIM, Canada); Themis Stafylakis (Ecole de Technologie Supérieure, Canada); Pierre Ouellet (Centre de Recherche Informatique de Montreal (CRIM), Canada); Jahangir Alam (CRIM, Canada)

## SLTC-P6: Robust Speech Recognition I

Room: Poster Area 2

Chair: Jinyu Li (Microsoft Corporation, USA)

SLTC-P6.1 Feature Enhancement using Sparse Reference and Estimated Soft-Mask Exemplar-Pairs for Noisy Speech Recognition""3932

Lee Tan (University of California, Los Angeles, USA); Abeer Alwan (UCLA, USA)

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Hitesh A Gupta (UCLA, USA); Anirudh Raju (UCLA, USA); Abeer Alwan (UCLA, USA)

SLTC-P6.3 Feature compensation using linear combination of speaker and environment dependent correction vectors""3942

Xiong Xiao (Nanyang Technological University, Singapore); Jinyu Li (Microsoft Corporation, USA); Eng-Siong Chng (Nanyang Technological University, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

SLTC-P6.4 Subspace Gaussian Mixture Model with State-dependent Subspace Dimensions""3947

Tom Ko (The Hong Kong University of Science and Technology, Hong Kong); Brian Mak (The Hong Kong University of Science and Technology, Hong Kong); Cheung-Chi Leung (Institute for Infocomm Research, A\*STAR, Singapore)

SLTC-P6.5 Generalization of Temporal Filter and Linear Transformation for Robust Speech Recognition""3952

Duc Hoang Ha Nguyen (Nanyang Technological University, Singapore); Xiong Xiao (Nanyang Technological University, Singapore); Eng-Siong Chng (Nanyang Technological University, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

SLTC-P6.6 Mean normalization of power function based cepstral coefficients for robust speech recognition in noisy environments""3957

Soonho Baek (School of Electrical and Electronic Engineering, Yonsei University, Korea); Hong-Goo Kang (Yonsei University, Korea)

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Shin Jae Kang (Seoul National University, Korea); Tae Gyoong Kang (Seoul National University, Korea); Kang Hyun Lee (Seoul National University, Korea); Kiho Cho (Seoul National University, Korea); Nam Soo Kim (Seoul National University, Korea)

SLTC-P6.8 Semi-supervised noise dictionary adaptation for exemplar-based noise robust speech recognition""3967

Yi Luan (The University of Tokyo, USA); Daisuke Saito (The University of Tokyo, Japan); Yosuke Kashiwagi (The University of Tokyo, Japan); Nobuaki Minematsu (The University of Tokyo, Japan); Keikichi Hirose (The University of Tokyo, Japan)

SLTC-P6.9 Medium-duration modulation cepstral feature for robust speech recognition""396;  
Vikramjit Mitra (SRI International, USA); Horacio Franco (SRI International, USA); Martin Graciarena (SRI lab, USA); Dimitra Vergyri (SRI International, USA)

SLTC-P6.10 Exploiting a 'gaze-Lombard effect' to improve ASR performance in acoustically noisy settings""3976

Neil Cooke (University of Birmingham, United Kingdom); Ao Shen (University of Birmingham, United Kingdom); Martin Russell (University of Birmingham, United Kingdom)

SLTC-P6.11 Speech Feature Denoising and Dereverberation via Deep Autoencoders for Noisy Reverberant speech recognition""397;

Xue Feng (Massachusetts Institute of Technology, USA); Yaodong Zhang (Massachusetts Institute of Technology, USA); James Glass (Massachusetts Institute of Technology, USA)

SLTC-P6.12 Synthesized Stereo Mapping via Deep Neural Networks for Noisy Speech Recognition""3986

Jun Du (University of Science and Technology of China, P.R. China); Li-Rong Dai (University of Science and Technology of China, P.R. China); Qiang Huo (Microsoft Research, P.R. China)

SLTC-P6.13 Second Order Vector Taylor Series based Robust Speech Recognition""398;  
Suliang Bu (Shanghai Jiao Tong University, P.R. China); Yanmin Qian (Shanghai Jiao Tong University, P.R. China); Khe Chai Sim (National University of Singapore, Singapore); Yongbin You (Shanghai Jiao Tong University, P.R. China); Kai Yu (Shanghai Jiao Tong University, P.R. China)

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Seyed Omid Sadjadi (The University of Texas at Dallas & The Center for Robust Speech Systems (CRSS), USA); Larry Heck (Microsoft Research, USA)

### SPTM-P5: Sampling Theory and Methods I

Room: Poster Area 3

Chair: Josef A. Nosssek (TU Munich, Germany)

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Arthur Redfern (Texas Instruments, USA); Kun Shi (FICO, USA)

SPTM-P5.2 Clock Jitter in Sampling and Reconstruction""39: 6  
Bede Liu (Princeton University, USA)

SPTM-P5.3 A Low-complexity Sub-Nyquist Sampling System for Wideband Radar ESM Receivers""39: :

Mehrdad Yaghoobi (University of Edinburgh, United Kingdom); Michael Lexa (GE Global Research, USA); Fabien Millioz (University Lyon 1, France); Mike Davies (University of Edinburgh, United Kingdom)

SPTM-P5.4 Cramér-Rao Bound for Sampling & Reconstruction of FRI Signals""39; 5  
Andre Angierski (University of Rostock, Germany); Volker Kuehn (University of Rostock, Germany)

SPTM-P5.5 Jittered Random Sampling with a Successive Approximation ADC""39: ;  
Chenchi Luo (Texas Instruments, USA); Lingchen Zhu (Georgia Institute of Technology, USA)

SPTM-P5.6 Universal Sampling of Signals with Finite Rate of Innovation""3: 25  
Xiaoyao Wei (Imperial College London, United Kingdom); Pier Luigi Dragotti (Imperial College London, United Kingdom)

SPTM-P5.7 Finite dimensional FRI""3: 2:

Jon Oñativia (Imperial College London, United Kingdom); Yue M. Lu (Harvard University, USA); Pier Luigi Dragotti (Imperial College London, United Kingdom)

SPTM-P5.8 Stable Recovery from the Magnitude of Symmetrized Fourier Measurements""3: 35  
Philipp Walk (Technische Universität München, Germany); Peter Jung (TU-Berlin, Heinrich-Hertz-Chair for Mobile Communication Technology & Fraunhofer German-Sino Lab for Mobile Communications - MCI, Germany)

SPTM-P5.9 Sampling 2-D Signals on a Union of Lattices that Intersect on a Lattice""3: 39  
Jayakrishnan Unnikrishnan (EPFL, Switzerland); Matthew A Prelee (University of Michigan, USA)

SPTM-P5.10 A Model-Based Framework for Fast Dynamic Image Sampling""3: 44  
G. M. Dilshan P Godaliyadda (Purdue University, USA); Gregory T Buzzard (Purdue University, USA); Charles Bouman (Purdue University, USA)

SPTM-P5.11 Optimum Analog Receive Filters for Detection and Inference under a Sampling Rate Constraint""3: 49  
Manuel Stein (Technische Universität München, Germany); Andreas Lenz (Technische Universität München, Germany); Amine Mezghani (TU Munich, Germany); Josef A. Nosssek (TU Munich, Germany)

SPTM-P5.12 Jitter Requirements for Bandpass Sampling Receivers utilizing Sample-and-Hold Circuits""3: 54

Bjoern Almeroth (Technische Universität Dresden, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

SPTM-P5.13 On the role of the Hilbert transform in boosting the performance of the annihilating filter""3: 58

Sudarshan Nagesh (Indian Institute of Science, India); Satish Mulleti (Indian Institute of Science, India); Chandra Sekhar Seelamantula (Indian Institute of Science, India)

SPTM-P5.14 On Conditions for Uniqueness in Sparse Phase Retrieval<sup>3</sup>: 63  
Henrik Ohlsson (Linköping University, Sweden); Yonina C. Eldar (Technion-Israel Institute of Technology, Israel)

#### SPTM-P6: Bayesian Techniques

Room: Poster Area 4

Chair: Monica F. Bugallo (Stony Brook University, USA)

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Céline Meillier (University of Grenoble, GIPSA-Lab, France); Florent Chatelain (GipSA-Lab, France); Olivier Michel (INPG, France); Hacheme Ayasso (GIPSA-LAB, France)

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Yanning Shen (University of Electronic Science and Technology of China, P.R. China); Huiping Duan (UESTC, P.R. China); Jun Fang (Stevens Institute of Technology, USA); Hongbin Li (Stevens Institute of Technology, USA)

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Chair: Andre Kaup (University of Erlangen-Nuremberg, Germany)
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Heinz Hofbauer (University of Salzburg, Austria); Andreas Unterweger (University of Salzburg, Austria); Andreas Uhl (Salzburg University, Austria)
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Tilo Strutz (Leipzig University of Telecommunications, Germany)
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Room: Poster Area 7

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Wojciech Samek (Berlin Institute for Technology (TU Berlin), Germany); Motoaki Kawanabe (ATR Institute International, Japan)

BISP-P1.2 Simple and Efficient Methods for Steady State Visual Evoked Potential Detection in BCI Embedded System""4266

Niccolo' Mora (University of Parma, Italy); Valentina Bianchi (University of Parma, Italy); Ilaria De Munari (University of Parma, Italy); Paolo Ciampolini (University of Parma, Italy)

BISP-P1.3 Optimizing spatial filter pairs for EEG classification based on phase synchronization""426;

Nicoletta Caramia (University of Pavia, Italy); Fabien Lotte (INRIA, France); Stefano Ramat (University of Pavia, Italy)

BISP-P1.4 Automatic Removal of EEG Artifacts Using Electrode-Scalp Impedance""4276

Yuan Zou (University of Texas at Dallas, USA); Omid Dehzangi (University of Texas at Dallas, USA); Viswam Nathan (University of Texas at Dallas, USA); Roozbeh Jafari (University of Texas at Dallas, USA)

BISP-P1.5 Performance estimation of a cooperative brain-computer interface based on the detection of steady-state visual evoked potentials""427;

Hubert Cecotti (University of Ulster, United Kingdom); Bertrand Rivet (GIPSA-Lab, Grenoble INP, France)

BISP-P1.6 Connectivity based Feature-Level Filtering for Single-Trial EEG BCIs""4286

Dominic Heger (Karlsruhe Institute of Technology (KIT), Germany); Emiliyana Terziyska (Karlsruhe Institute of Technology (KIT), Germany); Tanja Schultz (Karlsruher Institut für Technologie, Germany)

BISP-P1.7 Fingertip Force Estimation From Forearm Muscle Electrical Activity""428;

Pu Liu (Worcester Polytechnic Institute, USA); Francois Martel (University of Sherbrooke, Canada); Denis Rancourt (University of Sherbrooke, USA); Edward Clancy (Worcester Polytechnic Institute, USA); Donald R. Brown, III (Worcester Polytechnic Institute, USA)

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Aina Frau-Pascual (INRIA, France); Thomas Vincent (INRIA, France); Florence Forbes (INRIA, France); Philippe Ciuciu (CEA/NeuroSpin & INRIA Saclay, France)

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Wei Du (UMBC, USA); Sai Ma (UMBC, USA); Gengshen Fu (UMBC, USA); Vince Calhoun (University of New Mexico, USA); Tulay Adali (University of Maryland Baltimore County, USA)

BISP-P1.11 Time varying brain connectivity modeling using fMRI signals""42; ;

Aiping Liu (University of British Columbia, Canada); Xun Chen (University of British Columbia, Canada); Z. Jane Wang (University of British Columbia, Canada); Martin McKeown (University of British Columbia, Canada)

BISP-P1.12 Compensation of Recording Position Shifts for a Myoelectric Silent Speech Recognizer""42; 6

Michael Wand (Karlsruhe Institute of Technology, Germany); Christopher Schulte (Karlsruhe Institute of Technology, Germany); Matthias Janke (Karlsruhe Institute of Technology, Germany); Tanja Schultz (Karlsruher Institut für Technologie, Germany)

BISP-P1.13 Identification of Dynamic functional brain network states Through Tensor Decomposition""42; ;

Arash Golibagh Mahyari (Michigan State University, USA); Selin Aviyente (Electrical and Computer Engineering, Michigan State University, MI, USA)

#### **AASP-P3: Audio Source Separation I, Music Information Retrieval I**

Room: Poster Area 8

Chair: Laurent Daudet (Université Paris Diderot, France)

AASP-P3.1 An Alternating Least-squares Algorithm for Approximate Joint

Diagonalization and Its Application to Blind Source Separation""4326

Shinya Saito (Tokyo University of Science, Japan); Kunio Oishi (Tokyo University of Technology, Japan); Toshihiro Furukawa (Tokyo University of Science, Japan)

AASP-P3.2 Sparse Target Cancellation Filters with Application to Semi-Blind Noise Extraction""432;

Jiri Malek (Technical University of Liberec, Czech Republic); Zbynek Koldovsky (Technical University of Liberec, Czech Republic)

AASP-P3.3 On the use of contextual time-frequency information for full-band clustering-based convolutive blind source separation""4336

Matt Atcheson (The University of Western Australia, Australia); Ingrid Jafari (The University of Western Australia, Australia); Roberto Togneri (University of Western Australia, Australia); Nordholm Sven (Curtin University of Technology, Australia)

AASP-P3.4 Automatic Carrier Pitch Estimation for Coherent Demodulation<sup>433</sup>;  
 Gregory Sell (Johns Hopkins University, USA)

AASP-P3.5 Custom Sized Non-negative Matrix Factor Deconvolution for Sound Source Separation<sup>434</sup>  
 Julian M. Becker (RWTH Aachen University, Germany); Christian Rohlfing (RWTH Aachen University, Germany)

AASP-P3.6 Ultrasound-Coupled Semi-Supervised Nonnegative Matrix Factorisation for Speech Enhancement<sup>434</sup>;  
 Tom Barker (Tampere University of Technology, Finland); Olivier Delhomme (University of Strasbourg, France); Tuomas Virtanen (Tampere University of Technology, Finland)

AASP-P3.7 Speech/music discrimination in a large database of radio broadcasts from the wild<sup>435</sup>  
 Ewald Wieser (University of Applied Sciences St. Pölten, Austria); Matthias Husinsky (University of Applied Sciences St. Pölten Austria, Austria); Markus Seidl (University of Applied Sciences St. Pölten, Austria)

AASP-P3.8 Improving Music Auto-tagging by Intra-song Instance Bagging<sup>435</sup>;  
 Chin-Chia Michael Yeh (Academia Sinica, Taiwan); Ju-Chiang Wang (Institute of Information Science, Academia Sinica, Taiwan); Yi-Hsuan Yang (Academia Sinica, Taiwan); Hsin-Min Wang (Academia Sinica, Taiwan)

AASP-P3.9 Intra-note Segmentation via Sticky HMM with DP Emission<sup>436</sup>  
 Yuma Koizumi (Hosei University, Japan); Katunobu Itou (Hosei University, Japan)

AASP-P3.10 Linear regression-based adaptation of music emotion recognition models for personalization<sup>436</sup>;  
 Yu-An Chen (National Taiwan University, Taiwan); Ju-Chiang Wang (Institute of Information Science, Academia Sinica, Taiwan); Yi-Hsuan Yang (Academia Sinica, Taiwan); Homer Chen (National Taiwan University & National Taiwan University, Taiwan)

AASP-P3.11 Better beat tracking through robust onset aggregation<sup>437</sup>  
 Brian McFee (University of Columbia, USA); Daniel P W Ellis (Columbia University, USA)

AASP-P3.12 A Study of Instrument-wise Onset Detection in Beijing Opera Percussion Ensembles<sup>437</sup>;  
 Mi Tian (Queen Mary University of London, United Kingdom); Ajay Srinivasamurthy (Universitat Pompeu Fabra, Spain); Mark Sandler (Queen Mary University of London, United Kingdom); Xavier Serra (University Pompeu Fabra, Spain)

AASP-P3.13 Multi-resolution Linear Prediction Based Features for Audio Onset Detection with Bidirectional LSTM Neural Networks<sup>438</sup>  
 Erik Marchi (Technische Universität München, Germany); Giacomo Ferroni (Università Politecnica delle Marche, Italy); Florian Eyben (Technische Universität München, Germany); Leonardo Gabrielli (Università Politecnica delle Marche, Italy); Stefano Squartini (Università Politecnica delle Marche, Italy); Björn W Schuller (Imperial College London & Technische Universität München, Germany)

## **IDSP-P1: Emerging Industrial Signal Processing Applications and Education**

Room: Poster Area 9

Chair: Amir Said (LG Electronics Mobile Research, USA)

IDSP-P1.1 Orbit Refinement for Software Defined Radio For Space Applications<sup>438</sup>;

Jake Gunther (Utah State University, USA); Charles Swenson (Utah State University, USA); Todd Moon (Utah State University, USA); Chad Fish (Space Dynamics Laboratory, USA); Richard Parris (Air Force Research Lab, USA); Donald Thompson (Air Force Research Lab, USA); Todd Pedersen (Air Force Research Lab, USA)

IDSP-P1.2 Information maximizing DAC noise shaping<sup>439</sup>

Zhenhua Yu (Texas Instruments, USA); Arthur Redfern (Texas Instruments, USA); Lei Ding (Texas Instruments, USA)

IDSP-P1.3 Face Recognition using Distributed, Mobile Computing<sup>439</sup>;

Gregorio Hinojos (New Mexico State University, USA); Phillip L De Leon (New Mexico State University, USA)

IDSP-P1.4 Forecasting in wind energy applications with site-adaptive Weibull estimation<sup>43</sup>: 6

Matthew J Holland (Nara Institute of Science and Technology & Mathematical Informatics Lab, Japan); Kazushi Ikeda (Nara Institute of Science and Technology, Japan)

IDSP-P1.5 Estimating an Optimal Setpoint to Lessen Errors in Filling Weighing System Based on Kalman Filtering<sup>43</sup> ;

Sakkarin Sinchai (King Mongkut's Institute of Technology Ladkrabang, Thailand); Sukkharak Sae-chia (Phranakhon Si Ayutthaya Rajabhat University & King Mongkut's Institute of Technology Ladkrabang, Thailand); Tulaya Limpiti (KMITL, Thailand); Jeerasuda Koseeyaporn (KMITL, Thailand); Paramote Wardkein (KMITL, Algeria)

IDSP-P1.6 State-of-Charge Estimation for Supercapacitors: a Kalman Filtering Formulation<sup>43</sup>; 6

Andrew Nadeau (University of Rochester, USA); Gaurav Sharma (University of Rochester, USA); Tolga Soyata (University of Rochester, USA)

IDSP-P1.7 An Auto-Focusing Noise Suppressor for Cellphone Movies Based on Phase Randomization and Power Compensation<sup>43</sup> ;

Ryoji Miyahara (NEC Engineering Ltd., Japan); Akihiko K. Sugiyama (NEC Corporation, Japan)

IDSP-P1.8 TDA2X, A Soc Optimized For Advanced Driver Assistance Systems<sup>442</sup>  
 Jagadeesh Sankaran (Texas Instruments, USA)

IDSP-P1.9 Anchor Free Node Tracking Using Ranges, Odometry, and Multidimensional Scaling<sup>442</sup>;

Brian Beck (Georgia Institute of Technology, USA); Robert John Baxley (Georgia Tech Research Institute, USA)

IDSP-P1.10 A MATLAB-Based Magnitude Response Game for DSP Education<sup>443</sup>  
 Peter Casapicola (Graz University of Technology, Austria); Markus Poelzl (Graz University of Technology, Austria); Bernhard C. Geiger (Graz University of Technology, Austria)

IDSP-P1.11 Flipping Signals and Systems - Course Structure & Results<sup>443</sup>;

Mark Fowler (Binghamton University, USA)  
IDSP-P1.12 Hands-On Real-Time DSP Teaching using Inexpensive ARM Cortex M4 Development Systems""4446  
Donald Reay (Heriot-Watt University, United Kingdom)  
IDSP-P1.13 DSP See-Through: Going Beyond Talk-Through""444:  
Adrian Rothenbuhler (Hewlett-Packard, USA); Cameron Wright (University of Wyoming, USA); Thad B. Welch (Boise State University, USA); Michael Morrow (University of Wisconsin - Madison, USA)

### **SAM-P2: DOA Estimation**

Room: Poster Area 10

Chair: Ami Wiesel (Hebrew University in Jerusalem, Israel)

SAM-P2.1 Underdetermined DOA Estimation of Multi-path signals based on ICA and sparse reconstruction""4455

Xiong Kunlai (National University of Defense Technology, P.R. China); Zhang-Meng Liu (National University of Defense Technology, P.R. China); Zheng Liu (National University of Defense Technology, P.R. China); Daowang Feng (National University of Defense Technology, P.R. China); Wenli Jiang (National University of Defense Technology, P.R. China)

SAM-P2.2 Toeplitz rectification and DoA estimation with MUSIC""4459

Pascal Vallet (Institut Polytechnique de Bordeaux & IMS, France); Philippe Loubaton (Université de Marne La Vallée, France)

SAM-P2.3 High Resolution Direction Finding from Rectangular Higher Order Cumulant Matrices: The Rectangular 2q-MUSIC Algorithms""4464

Hanna Becker (I3S Laboratory, France); Pascal Chevalier (Thales Communication, France); Martin Haardt (Ilmenau University of Technology, Germany)

SAM-P2.4 DOA estimation performances of multi-parametric MUSIC in presence of modeling errors - case of coherent multi-paths""4469

Anne Ferréol (Thales Communications, France); Cyrille Delestre (ENS Cachan & Thales, France); Pascal Larzabal (ENS-Cachan, PARIS, France)

SAM-P2.5 Nonuniform Linear Antenna Arrays for Enhanced Near Field Source Localization""4474

Houcem Gazzah (University of Sharjah, UAE); Jean Pierre Delmas (UMR CNRS 5157 - CITI Department, France)

SAM-P2.6 A Computationally efficient source localization method for a mixture of Near-Field and Far-Field narrowband signals""4479

Weiliang Zuo (Xi'an Jiaotong University, P.R. China); Jingmin Xin (Xi'an Jiaotong University, P.R. China); Jiasong Wang (State Key Laboratory of Astronautic Dynamics, P.R. China); Nanning Zheng (Xi'an Jiaotong University, P.R. China); Akira Sano (Keio University, Japan)

SAM-P2.7 ML Estimation and CRB for Narrowband AR Signals on a Sensor Array""4484

Langford White (The University of Adelaide, Australia); Peter Sherman (Iowa State University, USA)

SAM-P2.8 DOA Estimation Exploiting Coprime Arrays with Sparse Sensor Spacing""4489

Yimin D. Zhang (Villanova University, USA); Si Qin (Villanova University, USA); Moeness G. Amin (Villanova University, USA)

SAM-P2.9 A Signal Adaptive Array Interpolation Approach with Reduced Transformation Bias for DOA estimation of Highly Correlated Signals""4494

Marco Marinho (University of Brasilia, Brazil); Felix Antreich (German Aerospace Center (DLR), Germany); João Paulo Carvalho Lustosa da Costa (Universidade de Brasilia (UnB), Brazil); Josef A. Nosske (TU Munich, Germany)

SAM-P2.10 Asymptotic Performance Analysis of ESPRIT-Type Algorithms for Circular and Strictly Non-circular Sources With Spatial Smoothing""4499

Jens Steinwandt (Ilmenau University of Technology, Germany); Florian Roemer (Ilmenau University of Technology, Germany); Martin Haardt (Ilmenau University of Technology, Germany)

SAM-P2.11 DOA Estimation of Speech Source in Noisy Environments with Weighted Spatial Bispectrum Correlation Matrix""44: 4

Wei Xue (Institute of Automation Chinese Academy of Sciences, P.R. China); Shan Liang (Institute of Automation Chinese Academy of Sciences, P.R. China); Wen-ju Liu (Institute of Automation, Chinese Academy of Sciences, P.R. China)

SAM-P2.12 Robust DOA Estimation of Multiple Speech Sources""44: 9

Nguyen Thi Ngoc Tho (Advanced Digital Sciences Center, Singapore); Zhao Shengkui (Advanced Digital Sciences Center, Singapore); Douglas L. Jones (University of Illinois at Urbana-Champaign, USA)

SAM-P2.13 Search-Free Decentralized Direction-of-Arrival Estimation Using Common Roots for Non-Coherent Partly Calibrated Arrays""44: 4

Wassim Suleiman (TU Darmstadt & LOEWE Schwerpunkt Cocoon, Germany); Pouyan Parvazi (TU Darmstadt, Germany)

SAM-P2.14 Single Snapshot DOA Estimation Using Compressed Sensing""44: 9

Stefano Fortunati (University of Pisa, Italy); Raffaele Grasso (CMRE, Italy); Fulvio Gini (University of Pisa, Italy); Maria S. Greco (University of Pisa, Italy)

**10:30 AM - 11:00 AM**

**Coffee break**

**11:00 AM - 1:00 PM**

### **SLTC-L5: Error Detection in Automatic Speech Recognition**

Room: Cavaniglia

Chairs: Michiel Bacchiani (Google Inc., USA), Elmar Nöth (Universität Erlangen Nürnberg, Germany)

11:00 Detecting Deletions in ASR Output""4524

Matthew Seigel (University of Cambridge, United Kingdom); Phil Woodland (University of Cambridge, United Kingdom)

11:20 Direct Sub-word Confidence Estimation with Hidden-state Conditional Random Fields""4529

Matthew Seigel (University of Cambridge, United Kingdom); Phil Woodland (University of Cambridge, United Kingdom)

11:40 ASR Error Detection using Recurrent Neural Network Language Model and Complementary ASR""4534

Yik-Cheung Tam (SRI International, USA); Yun Lei (SRI International, USA); Jing Zheng (Google, USA); Wen Wang (SRI International, USA)

12:00 A Phonetic Similarity Based Noisy Channel Approach to ASR Hypothesis Re-Ranking and Error Detection""4539

Martin Hacker (University of Erlangen-Nuremberg, Germany); Elmar Nöth (Universität Erlangen Nürnberg, Germany)

12:20 Exploiting un-transcribed foreign data for speech recognition in well-resourced languages""4544

David Imseng (Idiap Research Institute, Switzerland); Blaise Potard (IDIAP Research Institute, Switzerland); Petr Motlicek (IDIAP Research Institute, Switzerland); Alexandre Nanchen (Idiap Research Institute, Switzerland); Hervé Boulard (Idiap Research Institute, Switzerland)

12:40 Close/distant talker discrimination based on kurtosis of linear prediction residual signals""4549

Kohei Hayashida (Ritsumeikan University, Japan); Masato Nakayama (Ritsumeikan University, Japan); Takanobu Nishiura (Ritsumeikan University, Japan); Yoichi Yamashita (Ritsumeikan University, Japan); Toshiharu Horiuchi (KDDI R&D Laboratories Inc., Japan); Tsuneo Kato (KDDI R&D Laboratories Inc., Japan)

### **SPTM-L3: Compressed Sensing II**

Room: Basilica

Chairs: Mike Davies (University of Edinburgh, United Kingdom), Konstantinos Slavakis (University of Minnesota, USA)

11:00 Efficient Recovery of Principal Components from Compressive Measurements with Application to Gaussian Mixture Model Estimation""4554

Farhad Pourkamali Anaraki (University of Colorado at Boulder, USA); Shannon Hughes (University of Colorado at Boulder, USA)

11:20 Modulated Measurement Matrix Design for Compressed Sensing""4559

Chunli Guo (University of Edinburgh, United Kingdom); Mike Davies (University of Edinburgh, United Kingdom)

11:40 Lie Operators for Compressive Sensing""4564

Chinmay Hegde (MIT, USA); Aswin Sankaranarayanan (Carnegie Mellon University, USA); Richard Baraniuk (Rice University, USA)

12:00 Robust Primary User Identification using Compressive Sampling for Cognitive Radios""4569

Eva Lagunas (Universitat Politècnica de Catalunya, Spain); Montse Najar (UPC, Spain)

12:20 the Modulated E-spline with Multiple subbands and its application to sampling wavelet-sparse signals""4574

Yingsong Zhang (Imperial College London, United Kingdom); Pier Luigi Dragotti (Imperial College London, United Kingdom)

12:40 Maximum Entropy Hadamard Sensing of Sparse and Localized Signals""4579

Valerio Cambareri (University of Bologna, Italy); Riccardo Rovatti (ARCES, Italy); Gianluca Setti (University of Ferrara, Italy)

### **SS5: Seismic Signal Processing**

Room: Polveriera

Chairs: Daniela Donno (MINES ParisTech, France), Renato R Lopes (University of Campinas, Brazil)

11:00 Seismic Signal Processing: Some Recent Advances""4584

Leonardo T Duarte (University of Campinas, Brazil); Daniela Donno (MINES ParisTech, France); Renato R Lopes (University of Campinas, Brazil); João Romano (State University of Campinas, Brazil)

11:20 High-resolution imaging of seismic data: how to combine wave-theory with signal processing techniques""4589

Leiv-J. Gelius (University of Oslo, Norway)

11:40 Fault Detection in Seismic Datasets Using Hough Transform""4594

Zhen Wang (Georgia Institute of Technology, USA); Ghassan AlRegib (Georgia Institute of Technology, USA)

12:00 A constrained-based optimization approach for seismic data recovery problems""4599

Mai Quyen Pham (IFP Energies Nouvelles, France); Caroline Chau (Aix-Marseille Université & CNRS UMR 7353, France); Laurent Duval (IFP Energies Nouvelles, France); Jean-Christophe Pesquet (University Paris-Est, France)

12:20 Reconstruction of signals from highly aliased multichannel samples by Generalized Matching Pursuit""45: 4

Massimiliano Vassallo (Schlumberger London Technology Centre, United Kingdom); Ali Ozbek (Schlumberger Cambridge Research, United Kingdom); Yousef I. Kamil (Schlumberger London Technology Centre, United Kingdom); Dirk-Jan van Manen (Schlumberger Cambridge Research, United Kingdom); Kurt Eggenberger (Schlumberger, USA)

12:40 Sparse Inversion of the Radon coefficients in the presence of erratic noise with application to simultaneous seismic source processing""45: 8

Mauricio D. Sacchi (University of Alberta, Canada)

### **MLSP-L1: Bayesian Methods**

Room: Scherma

Chair: Cédric Févotte (CNRS & Laboratoire Lagrange (CNRS, Observatoire de la Côte d'Azur & Université de Nice Sophia Antipolis), France)

11:00 Probabilistic 3D Mapping based on GNSS SNR Measurements""45: 2

Andrew T. Irish (University of California, Santa Barbara, USA); Jason T. Isaacs (University of California, Santa Barbara, USA); François Quitin (Université Libre de Bruxelles (ULB), Belgium); Joao P. Hespanha (University of California, Santa Barbara, USA); Upamanyu Madhow (University of California, Santa Barbara, USA)

11:20 Learning to classify with possible sensor failures<sup>45</sup>; 7

Tianpei Xie (University of Michigan, Ann Arbor, USA); Nasser Nasrabadi (US Army Research Laboratory, USA); Alfred Hero III (University of Michigan, USA)

11:40 Speech Decoloration based on the Product-of-Filters Model<sup>462</sup>

Dawen Liang (Columbia University, USA); Daniel P W Ellis (Columbia University, USA); Matthew D Hoffman (Adobe Research, USA); Gautham J Mysore (Adobe Research, USA)

12:00 Mondrian hidden Markov model for music signal processing<sup>467</sup>

Masahiro Nakano (NTT Communication Science Laboratories, NTT Corporation, Japan); Yasunori Ohishi (NTT Communication Science Laboratories, NTT Corporation, Japan); Hirokazu Kameoka (The University of Tokyo, Japan); Ryo Mukai (NTT Communication Science Laboratories, NTT Corporation, Japan); Kunio Kashino (Nippon Telegraph and Telephone Corporation, Japan)

12:20 Physical Layer Authentication based on Channel Response Tracking using Gaussian Processes<sup>4632</sup>

Steven Van Vaerenbergh (University of Cantabria, Spain); Óscar González (University of Cantabria, Spain); Javier Via (University of Cantabria, Spain); Ignacio Santamaría (University of Cantabria, Spain)

12:40 Modeling Spatial Extremes via Ensemble-of-Trees of Pairwise Copulas<sup>4637</sup>

Hang Yu (Nanyang Technological University, Singapore); Wayne Uy (Nanyang Technological University, Singapore); Justin Dauwels (Nanyang Technological University, Singapore)

## SPCOM-L2: Interference management

Room: Teatrino

Chair: Wolfgang Utschick (Technische Universität München, Germany)

11:00 A Sparse MLE Approach for Joint Interference Mitigation and Data Recovery<sup>4642</sup>

An Liu (Hong Kong University of Science and Technology, Hong Kong); Vincent Lau (Hong Kong University of Science and Technology, Hong Kong); Xiangming Kong (Huawei Technologies CO., LTD, P.R. China)

11:20 Opportunistic Interference Alignment for MIMO Interfering Broadcast Channels<sup>4647</sup>

Hyun Jong Yang (UNIST, Korea); Won-Yong Shin (Dankook University, Korea); Bang Chul Jung (Gyeongsang National University, Korea); Changho Suh (KAIST, Korea)

11:40 The Design of Optimal Receiver for Opportunistic Interference Alignment<sup>4652</sup>

Hyun Jong Yang (UNIST, Korea); Bang Chul Jung (Gyeongsang National University, Korea); Won-Yong Shin (Dankook University, Korea); Arogyaswami Paulraj (Stanford University, USA)

12:00 Robust Optimization for Multi-cell Interfering MIMO-MAC under Limited Feedback<sup>4657</sup>

Pan Cao (Dresden University of Technology, Germany); Eduard Jorswieck (TU Dresden, Germany)

12:20 Partial CSI Feedback Design for Interference Alignment in MIMO Cellular Networks<sup>4662</sup>

Xiongbin Rao (the Hong Kong University of Science and Technology, Hong Kong); Vincent Lau (Hong Kong University of Science and Technology, Hong Kong)

12:40 Retrospective Interference Alignment for the 3-user MIMO Interference Channel with delayed CSIT<sup>4667</sup>

Marc Torrellas (Technical University of Catalonia, Spain); Adrian Agustin (Universitat Politècnica de Catalunya (UPC), Spain); Josep Vidal (Universitat Politècnica de Catalunya, Spain)

## IVMSP-L3: Image Enhancement

Room: Volta

Chair: Gaurav Sharma (University of Rochester, USA)

11:00 Image Denoising by Targeted External Databases<sup>4672</sup>

Enming Luo (University of California San Diego, USA); Stanley H Chan (Harvard University, USA); Truong Nguyen (University of California, San Diego, USA)

11:20 Selectively Detail-enhanced Exposure Fusion via a Gradient Domain Content Adaptive Bilateral Filter<sup>4677</sup>

Zhengguo Li (Institute for Infocomm Research, Singapore); Jinghong Zheng (Institute for Infocomm Research, Singapore)

11:40 A New Image Filtering Method: Nonlocal Image Guided Averaging<sup>4682</sup>

Jing Zhang (University of Science and Technology of China, P.R. China); Yang Cao (University of Science and Technology of China, P.R. China); Zengfu Wang (University of Science and Technology of China, P.R. China)

12:00 Collaborative Noise Reduction using Color-Line Model<sup>4687</sup>

Wei-Chih Tu (National Taiwan University, Taiwan); Chia-Liang Tsai (National Taiwan University, Taiwan); Shao-Yi Chien (National Taiwan University, Taiwan)

12:20 Epitomic Image Colorization<sup>4692</sup>

Yingzhen Yang (University of Illinois at Urbana-Champaign, USA); Xinqi Chu (University of Illinois at Urbana-Champaign, USA); Tian Tsong Ng (Institute for Infocomm Research, A\*STAR, Singapore); Alex Yong-Sang Chia (Institute for Infocomm Research, Singapore); Jianchao Yang (Adobe Research, USA); Hailin Jin (Adobe Research, USA); Thomas S Huang (University of Illinois at Urbana-Champaign, USA)

12:40 A statistical derivation of an automatic tone mapping algorithm for wide dynamic range display<sup>4697</sup>

Alain Horé (University of Calgary, Canada); Orly Yadid-Pecht (University of Calgary, Canada)

## SLTC-P7: Features in Speech Recognition

Room: Poster Area 1

Chair: Torbjorn Svendsen (Norwegian University of Science and Technology, Norway)

SLTC-P7.1 MATLAB Exercises in Support of Teaching Digital Speech Processing<sup>46</sup>: 2  
Lawrence Rabiner (Rutgers University, USA)

SLTC-P7.2 Subband Hybrid Feature for Multi-stream Speech Recognition<sup>46</sup>: 6  
Feipeng Li (Johns Hopkins University & Center for Language and Speech Processing, USA)

SLTC-P7.3 Music Tonality Features for Speech/Music Discrimination<sup>46</sup>: ;  
Gregory Sell (Johns Hopkins University, USA); Pascal Clark (Johns Hopkins University HLTCOE, USA)

SLTC-P7.4 A Pitch Extraction Algorithm Tuned For Automatic Speech Recognition<sup>46</sup>: 6  
Pegah Ghahremani (Johns Hopkins University, USA); Bagher BabaAli (University of Tehran, Iran); Daniel Povey (Johns Hopkins University, USA); Korbinian Riedhammer (ICSI, Berkeley, USA); Jan Trmal (Johns Hopkins University, USA); Sanjeev Khudanpur (Johns Hopkins University, USA)

SLTC-P7.5 Multi-view learning with supervision for transformed bottleneck features<sup>46</sup>: ;  
Raman Arora (Johns Hopkins University, USA); Karen Livescu (Toyota Technological Institute at Chicago, USA)

SLTC-P7.6 Joint noise adaptive training for robust automatic speech recognition<sup>4726</sup>  
Arun Narayanan (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

SLTC-P7.7 Analysis-by-synthesis feature estimation for robust automatic speech recognition using spectral masks<sup>472</sup>:  
Michael Mandel (The Ohio State University, USA); Arun Narayanan (The Ohio State University, USA)

SLTC-P7.8 A Discriminatively Trained Hough Transform for Frame-Level Phoneme Recognition<sup>4736</sup>  
Jonathan Dennis (Institute for Infocomm Research & Nanyang Technological University, Singapore); Eng-Siong Chng (Nanyang Technological University, Singapore); Tran Huy Dat (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

SLTC-P7.9 Analyzing Convolutional Neural Networks for Speech Activity Detection in Mismatched Acoustic Conditions<sup>473</sup>:  
Samuel Thomas (IBM Research & IBM TJ Watson Research Center, USA); Sriram Ganapathy (IBM Research & IBM TJ Watson, USA); George Saon (IBM T. J. Watson Research Center, USA); Hagen Soltau (IBM, USA)

SLTC-P7.10 Learning Dynamic Features with Neural Networks for Phoneme Recognition<sup>4746</sup>  
Xin Zheng (Tsinghua University, P.R. China); Zhiyong Wu (Graduate School at Shenzhen, Tsinghua University, P.R. China); Helen Meng (, Hong Kong); Lianhong Cai (Tsinghua University, P.R. China)

SLTC-P7.11 Contrastive Auto-encoder for Phoneme Recognition<sup>474</sup>:

Xin Zheng (Tsinghua University, P.R. China); Zhiyong Wu (Graduate School at Shenzhen, Tsinghua University, P.R. China); Helen Meng (, Hong Kong); Lianhong Cai (Tsinghua University, P.R. China)

SLTC-P7.12 Transductive Nonnegative Matrix Factorization for Semi-Supervised High-Performance Speech Separation<sup>4756</sup>

Naiyang Guan (National University of Defense Technology, P.R. China); Long Lan (National University of Defense Technology, P.R. China); Dacheng Tao (University of Technology, Sydney, Australia); Zhigang Luo (National University of Defense Technology, P.R. China); Xuejun Yang (National University of Defense Technology, P.R. China)

SLTC-P7.13 Automatic phonetic segmentation in Mandarin Chinese: boundary models, glottal features and tone<sup>475</sup>:

Jiahong Yuan (University of Pennsylvania, USA); Neville Ryant (University of Pennsylvania, USA); Mark Liberman (University of Pennsylvania, USA)

SLTC-P7.14 UT-VOCAL EFFORT II: Analysis and Constrained-Lexicon Recognition of Whispered Speech<sup>4766</sup>

Shabnam Ghaffarzagdegan (University of Texas at Dallas, USA); Hynek Boril (University of Texas at Dallas, USA); John Hansen (University of Texas at Dallas, USA)

## SLTC-P8: Statistical speech synthesis

Room: Poster Area 2

Chair: Tomoki Toda (NAIST, Japan)

SLTC-P8.1 Tongue shape conversion with non-parallel training data<sup>476</sup>:

Hao Li (National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, P.R. China); Minghao Yang (The National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, P.R. China); Jianhua Tao (Institute of Automation, Chinese Academy of Sciences, P.R. China)

SLTC-P8.2 Dialogue Context Sensitive HMM-Based Speech Synthesis<sup>4776</sup>

Pirros Tsiakoulis (University of Cambridge, United Kingdom); Catherine Breslin (University of Cambridge, United Kingdom); Milica Gasic (University of Cambridge, United Kingdom); Matthew Henderson (University of Cambridge, United Kingdom); Dongho Kim (University of Cambridge, United Kingdom); Martin Szummer (University of Cambridge, United Kingdom); Blaise Thomson (Cambridge University, United Kingdom); Steve Young (United Kingdom & Cambridge University, United Kingdom)

SLTC-P8.3 Integration of speaker and pitch adaptive training for HMM-based singing voice synthesis<sup>477</sup>:

Kanako Shirota (Nagoya Institute of Technology, Japan); Kazuhiro Nakamura (Nagoya Institute of Technology, Japan); Kei Hashimoto (Nagoya Institute of Technology, Japan); Keiichiro Oura (Nagoya Institute of Technology, Japan); Yoshihiko Nankaku (Nagoya Institute of Technology, Japan); Keiichi Tokuda (Nitech, Japan)

SLTC-P8.4 Parametric Representation for Singing Voice Synthesis: A Comparative Evaluation""4786

Onur Babacan (University of Mons, Belgium); Thomas Drugman (UMONS, Belgium); Tuomo Raitio (Aalto University, Finland); Daniel Erro (University of the Basque Country - Ikerbasque, Spain); Thierry Dutoit (FPMS, Belgium)

SLTC-P8.5 Very Fast Unit Selection Using Viterbi Search with Zero-Concatenation-Cost Chains""478;

Jiri Kala (University of West Bohemia, Czech Republic); Jindrich Matousek (University of West Bohemia, Czech Republic)

SLTC-P8.6 Speaker dependent expression predictor from text: expressiveness and transplantation""4796

Langzhou Chen (Toshiba Research Europe Ltd., United Kingdom); Norbert Braunschweiler (Toshiba Research Europe Ltd., United Kingdom); Mark Gales (University of Cambridge, United Kingdom)

SLTC-P8.7 Fundamental Frequency Generation for Whisper-to-Audible Speech Conversion""479;

Matthias Janke (Karlsruhe Institute of Technology, Germany); Kishore Prahallad (IIIT Hyderabad, India); Michael Wand (Karlsruhe Institute of Technology, Germany); Till Heistermann (Karlsruhe Institute of Technology, Germany); Tanja Schultz (Karlsruher Institut für Technologie, Germany)

SLTC-P8.8 A novel pitch decomposition method for the Generalized Linear Alignment Model""47: 6

Mahsa Sadat Elyasi Langarani (OHSU, USA); Esther Klabbers (OHSU, USA); Jan van Santen (OHSU, USA)

SLTC-P8.9 Narrow Adaptive Regularization of Weights for Grapheme-to-Phoneme Conversion""47: ;

Keigo Kubo (Nara Institute of Science and Technology, Japan); Sakriani Sakti (NAIST, Japan); Graham Neubig (Graduate School of Information Science, Nara Institute of Science and Technology, Japan); Tomoki Toda (NAIST, Japan); Satoshi Nakamura (Nara Institute of Science and Technology, Japan)

SLTC-P8.10 Automatic Discovery of a Phonetic Inventory for unwritten languages for statistical speech synthesis""47; 6

Prasanna Kumar Muthukumar (Carnegie Mellon University, USA); Alan Black (CMU, USA)

SLTC-P8.11 Neural net word representations for phrase-break prediction without a part of speech tagger""47: ;

Oliver Watts (University of Edinburgh, United Kingdom); Siva Reddy Gangireddy (University of Edinburgh, United Kingdom); Junichi Yamagishi (Univ of Edinburgh, United Kingdom); Simon King (University of Edinburgh, United Kingdom); Steve Renals (University of Edinburgh, United Kingdom); Adriana Stan (Technical University of Cluj-Napoca, Romania); Mircea Giurgiu (Technical University of Cluj-Napoca, Romania)

### SPTM-P7: Digital and Multirate Signal Processing

Room: Poster Area 3

Chair: P. p. Vaidyanathan (Cal Tech., USA)

SPTM-P7.1 M-Channel Oversampled Perfect Reconstruction Filter Banks for Graph Signals""4826

Yuichi Tanaka (Tokyo University of Agriculture and Technology, Japan); Akie Sakiyama (Tokyo University of Agriculture and Technology, Japan)

SPTM-P7.2 Mixer sequence design for N-path filters""482;

Guolong Su (Massachusetts Institute of Technology, USA); Arthur Redfern (Texas Instruments, USA)

SPTM-P7.3 Fractional Number-Theoretic Transforms Based on Matrix Functions""4836

Juliano Lima (Federal University of Pernambuco, Brazil); Ricardo Campello de Souza (Federal University of Pernambuco, Brazil); Paulo Hugo Lima (Federal University of Pernambuco, Brazil)

SPTM-P7.4 Lifting Wavelet Design by Block Wavelet Transform Inversion""483;

Mehmet Cemil Kale (Anadolu University, Turkey); Omer Nezh Gerek (Anadolu University, Turkey)

SPTM-P7.5 Structured Dictionary Learning with 2-D Non-separable Oversampled Lapped Transform""4846

Shogo Muramatsu (Niigata University, Japan)

SPTM-P7.6 FFT based solution for multivariable l2 equations using KKT system via FFT and efficient pixel-wise inverse calculation""484;

Keiichiro Shirai (Shinshu University Japan, Japan); Masahiro Okuda (The University of Kitakyushu, Japan)

SPTM-P7.7 Frequency domain linear prediction based on temporal analysis""4856

Ravi R Shenoy (Indian Institute of Science & Nokia, India); Chandra Sekhar Seelamantula (Indian Institute of Science, India)

SPTM-P7.8 An efficient 18-band quasi-ANSI 1/3-octave filter bank using re-sampling method for digital hearing aids""485;

Cheng-Yen Yang (National Chiao Tung University, Taiwan); Chih-Wei Liu (National Chiao Tung University, Taiwan); Shyh-Jye Jou (National Chiao Tung University, Taiwan)

SPTM-P7.9 On the Choice of Window for Spatial Smoothing of Spherical Data""4866

Zubair Khalid (The Australian National University, Australia); Rodney Andrew Kennedy (The Australian National University, Australia); Salman Durrani (The Australian National University, Australia)

SPTM-P7.10 Multi-wavelet coherence for point processes on the real line""486;

Edward Cohen (Imperial College London, United Kingdom)

### IFS-P1: Multimedia Forensics

Room: Poster Area 4

Chair: Marco Tagliasacchi (Politecnico di Milano, Italy)

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Khosro Bahrami (Nanyang Technological University, Singapore); Alex Kot (Nanyang Technological University, Singapore)

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- IFS-P1.3 Exploiting perceptual quality issues in countering sift-based forensic methods<sup>488</sup>  
Irene Amerini (University of Florence, Italy); Federica Battisti (University of Roma TRE, Italy); Roberto Caldelli (University of Florence & Interuniversity Consortium for Telecommunications - CNIT, Italy); Marco Carli (University of Roma TRE, Italy); Andrea Costanzo (University of Siena, Italy)
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Da Luo (Sun Yat-sen University, P.R. China); Rui Yang (Sun Yat-sen University, P.R. China); Jiwu Huang (Shenzhen University, P.R. China)
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Yuxing Wu (Shanghai Jiaotong University, P.R. China); Xinghao Jiang (Shanghai Jiao Tong University, P.R. China); Tanfeng Sun (Shanghai Jiaotong University of , P.R. China); Wan Wang (Shanghai Jiaotong University, P.R. China)
- IFS-P1.6 Wireless Device Identification Based on RF Oscillator Imperfections<sup>489</sup>;  
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- IFS-P1.7 High Dimensional Changeoint Detection with a Dynamic Graphical Lasso<sup>48</sup>: 6  
Alexander Gibberd (University College London, United Kingdom); James D B Nelson (University College London, United Kingdom)
- IFS-P1.8 Information Theoretical Limit of Compression Forensics<sup>48</sup>: ;  
Xiaoyu Chu (University of Maryland, USA); Yan Chen (University of Maryland, College Park, USA); Matthew Stamm (Drexel University, USA); K. J. Ray Liu (University of Maryland, USA)
- IFS-P1.9 SOFIR: Securely Outsourced Forensic Image Recognition<sup>48</sup>: 6  
Christoph Bösch (University of Twente, The Netherlands); Andreas Peter (University of Twente, The Netherlands); Pieter H. Hartel (University of Twente, The Netherlands); Willem Jonker (University of Twente, The Netherlands)
- IFS-P1.10 Transportation-theoretic image counterforensics to first significant digit histogram forensics<sup>48</sup>: ;  
Cecilia Pasquini (DISI, University of Trento, Italy); Pedro Comesaña (Universidad de Vigo, Spain); Fernando Pérez-González (University of Vigo, Spain); Giulia Boato (University of Trento, Italy)
- IFS-P1.11 Countering Anti-Forensics of Median Filtering<sup>4926</sup>  
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- IFS-P1.12 Antiforensic synthesis of motion vectors using template algorithms<sup>492</sup>;  
Simone Milani (Politecnico di Milano & University of Padova, Italy); Paolo Bestagini (Politecnico di Milano, Italy); Marco Tagliasacchi (Politecnico di Milano, Italy); Stefano Tubaro (Politecnico di Milano, Italy)
- Chair: Antti Tölli (University of Oulu, Finland)
- SPCOM-P4.1 Multi-Group Multi-way Relaying with Reduced Number of Relay Antennas<sup>4936</sup>  
Rakash SivaSiva Ganesan (TU Darmstadt, Germany); Hussein A Al-Shatri (University of Rostock, Germany); Xiang Li (University of Rostock, Germany); Tobias Weber (Uni Rostock, Germany); Anja Klein (TU Darmstadt, Germany)
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- SPCOM-P4.3 An amplify-and-forward scheme for cognitive radios<sup>4946</sup>  
Francesco Verde (University of Napoli Federico II & National Laboratory for Multimedia Communications of National Inter-University Consortium for Teleco, Italy); Anna Scaglione (University of California, Davis, USA); Donatella Darsena (University of Napoli Parthenope, Italy); Giacinto Gelli (University of Napoli - Federico II, Italy)
- SPCOM-P4.4 Geometric Monitoring for CSI Reduction in Amplify-and-Forward Relay Networks<sup>494</sup>;  
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- SPCOM-P4.6 Simplified MIMO Relay Design for Multicasting from Multiple-Sources<sup>495</sup>;  
Muhammad R. A. Khandaker (University College London, United Kingdom); Yue Rong (Curtin University, Australia)
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- SPCOM-P4.9 Joint parallel interference cancellation and relay selection algorithms based on greedy techniques for cooperative DS-CDMA systems<sup>4976</sup>  
Jiaqi Gu (University of York, United Kingdom); Rodrigo C. de Lamare (University of York, United Kingdom)
- SPCOM-P4.10 Effect of Phase Noise on Digital Self-Interference Cancellation in Wireless Full Duplex<sup>497</sup>;

#### SPCOM-P4: Relaying

Room: Poster Area 5



Shihai Shao (University of Electronic Science and Technology of China, P.R. China); Xin Quan (University of Electronic Science and Technology of China, P.R. China); Ying Shen (University of Electronic Science and Technology of China, P.R. China); Youxi Tang (University of Electronic Science and Technology of China, P.R. China)

SPCOM-P4.11 Sampling Jitter in Full-Duplex Radio Transceivers: Estimation and Mitigation<sup>4</sup>986

Ville Syrjälä (Kyoto University, Japan); Koji Yamamoto (Kyoto University, Japan)

SPCOM-P4.12 Feasibility Study on Full-Duplex Wireless Millimeter-Wave Systems<sup>4</sup>98;

Liangbin Li (University of California, Irvine, USA); Kaushik Josiam (Samsung Telecommunications America, USA); Rakesh Taori (Samsung Research America, USA)

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Room: Poster Area 6

Chair: Kenneth Lam (Hong Kong Polytechnic University, Hong Kong)

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Ye Ai (Tsinghua University, P.R. China); Weifeng Li (Tsinghua University, P.R. China); Tsung-Han Chan (National Tsing Hua University & Advanced Digital Sciences Center, Taiwan); Qingmin Liao (Tsinghua University, P.R. China)

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Sos Ağaian (, USA); Mehdi Roopaei (University of Texas at San Antonio, USA); David Akopian (The University of Texas at San Antonio, USA)

IVMSP-P6.3 A Perceptual Blind Blur Image Quality Metric<sup>4</sup>99: 6

Fatma Kerouh (USTHB, Algeria); Amina Serir (USTHB, Algeria)

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Manasa Priya K (Indian Institute of Technology Hyderabad, India); Manasa K (Indian Institute of Technology Hyderabad, India); Sumohana Channappayya (Indian Institute of Technology Hyderabad, India)

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Yuanhao Zhai (University of Michigan, USA); David L Neuhoff (University of Michigan, USA)

IVMSP-P6.6 Saliency Detection based on Extended Boundary Prior with Foci of attention<sup>4</sup>99; ;

Yijun Li (Shanghai Jiao Tong University, P.R. China); Keren Fu (Shanghai Jiao Tong University, P.R. China); Zhou Lei (Shanghai Jiao Tong University, P.R. China); Yu Qiao (Shanghai Jiao Tong University, P.R. China); Jie Yang (Inst. of Image Processing & Pattern Recognition, Jiaotong University, Shanghai, P.R. China); Li Bai (University of Nottingham, United Kingdom)

IVMSP-P6.7 Segmentation-enhanced Saliency Detection Model Based on Distance Transform and Center Bias<sup>4</sup>: 25

Hong-Yun Gao (The Hong Kong Polytechnic University, Hong Kong); Kenneth Lam (Hong Kong Polytechnic University, Hong Kong)

IVMSP-P6.8 From Quaternion to Octonion: Feature-based Image Saliency Detection<sup>4</sup>: 2:

Hong-Yun Gao (The Hong Kong Polytechnic University, Hong Kong); Kenneth Lam (Hong Kong Polytechnic University, Hong Kong)

IVMSP-P6.9 Co-Saliency Detection Based on Hierarchical Segmentation<sup>4</sup>P 1C

Zhi Liu (Shanghai University, P.R. China); Wenbin Zou (INSA, France); Lina Li (Shanghai University, P.R. China); Liqun Shen (Shanghai University, P.R. China); Olivier Le Meur (University of Rennes 1, France)

IVMSP-P6.10 Retargeting Pyramid Using Direct Decimation<sup>4</sup>: 35

Ryosuke Morita (Tokyo University of Agriculture and Technology, Japan); Keiichiro Shirai (Shinshu University Japan, Japan); Yuichi Tanaka (Tokyo University of Agriculture and Technology, Japan)

IVMSP-P6.11 A computing method of double linear correlation for mirror image matching<sup>4</sup>: 3:

Izumi Ito (Tokyo Institute of Technology, Japan)

IVMSP-P6.12 Multiscale Anomaly Detection Using Diffusion Maps and Saliency Score<sup>4</sup>: 45

Gal Mishne (Technion - Israel Institute of Technology, Israel); Israel Cohen (Technion, Israel)

#### BISP-P2: Biomedical Informatics and Image Analysis II

Room: Poster Area 7

Chair: Jean-Christophe Olivo-Marin (Institut Pasteur, France)

BISP-P2.1 Structured sparse PCA to identify miRNA co-regulatory modules<sup>4</sup>: 4:

Shaogang Ren (Texas A&M University, USA); Xiaoning Qian (Texas A&M University, USA)

BISP-P2.2 Variable selection for noisy data applied in proteomics<sup>4</sup>: 55

Noura Dridi (IMS Bordeaux 1, France); Audrey Giremus (Université Bordeaux 1, France); Jean-François Giovannelli (IMS, UMR CNRS 52 18, Université Bordeaux 1, France); Caroline Truntzer (CLIPP, France); Pascal Roy (Service de Biostatistique des HCL, France); Laurent Gerfault (Cea, France); Jean-philippe Charrier (Biomerieux, France); Patrick Ducoroy (Clipproteomic, France); Catherine Mercier (Service de Biostatistique des HCL, France); Pierre Grangeat (CEA/LETI/DRT/STD/DTBS/LE2S, France)

BISP-P2.3 Fast Spatially Variant Deconvolution for Optical Microscopy via Iterative Shrinkage Thresholding<sup>4</sup>: 5:

Nikhil Chacko (University of California, Santa Barbara, USA); Michael Liebling (University of California, Santa Barbara, USA)

BISP-P2.4 A Comparison of x-lets in Denoising cDNA Microarray Images<sup>4</sup>: 65

Roozbeh Shams (Isfahan University of Technology, Iran); Hossein Rabbani (Isfahan University of Medical Sciences & The University of Iowa, Iran); Saeed Gazor (Queens University, Canada)

BISP-P2.5 Generalized Extreme Value Distributions, Information Geometry and Sharpness Functions for Microscopy Images<sup>4</sup>: 6:

Reiner Lenz (Linköping University, Sweden)

BISP-P2.6 Classification of Temporal Gene Expression Data Using Wavelet Domain Feature in Kernel SVM<sup>4</sup>P 1C

Shaikh Anowarul Fattah (Bangladesh University of Engineering and Technology, Bangladesh); Mahjabin Maksud (BUET, Bangladesh); Ayan Kumar Biswas (BUET, Bangladesh); Nazia Zannat (BUET, Bangladesh); Yuhui Luo (Princeton University, USA); S. y. Kung (Princeton University, USA)

BISP-P2.7 Quantitative control of the error bounds of a fast super-resolution technique for microscopy and astronomy<sup>4</sup>: 75

Pierre Chainais (INRIA Lille-Nord Europe & Clermont University, France); Pierre Pfennig (Ecoel Centrale Lille, France); Aymeric Leray (IRI CNRS USR 3078 - University Lille 1, France)

#### **AASP-P4: Spatial Audio I, Signal Enhancement I**

Room: Poster Area 8

Chair: John Hershey (MERL, USA)

AASP-P4.1 Gaussian Process Models for HRTF based 3D Sound Localization<sup>4</sup>: 7: Yuancheng Luo (University of Maryland, USA); Dmitry Zotkin (University of Maryland, College Park, USA); Ramani Duraiswami (University of Maryland, USA)

AASP-P4.2 Beyond Virtual Loudspeakers: HRTF Optimization for Multichannel Binaural Synthesis<sup>4</sup>: 10

Charles Verron (Black Sound, France); Rozenn Nicol (Orange Labs, France); Marc Emerit (Orange Labs, USA)

AASP-P4.3 Large Deformation Diffeomorphic Metric Mapping and Fast-Multipole Boundary Element Method provide new insights for Binaural Acoustics<sup>4</sup>: 85

Reza Zolfaghari (University of Sydney, Australia); Nicolas Epain (University of Sydney, Australia); Craig Jin (University of Sydney, Australia); Joan Glaunes (University Paris Descartes, Australia); Anthony Tew (University of York, Australia)

AASP-P4.4 A Study on the Frequency-Domain Primary-Ambient Extraction for Stereo Audio Signals<sup>4</sup>: 8:

Jianjun HE (Nanyang Technological University, Singapore); Woon Seng Gan (Nanyang Technological University, Singapore); Ee Leng Tan (Nanyang Technological University, Singapore)

AASP-P4.5 The Influence of Low Order Reflections on the Interaural Time Differences in Crosstalk Cancellation Systems<sup>4</sup>: 95

Dimitrios Kosmidis (Fraunhofer IIS, Germany); Yesenia Lacouture-Parodi (HUAWEI European Research Center, Germany); Emanuel Habets (International Audio Laboratories Erlangen, Germany)

AASP-P4.6 Down-Mixing Using Coherence Suppression<sup>4</sup>: 9:

Alexander Adami (International Audio Laboratories Erlangen, Germany); Emanuel Habets (International Audio Laboratories Erlangen, Germany); Juergen Herre (International Audio Laboratories Erlangen, Germany)

AASP-P4.7 Coupled Dictionary Training for Exemplar-based Speech Enhancement<sup>4</sup>: 5

Deepak Baby (KU Leuven, Belgium); Tuomas Virtanen (Tampere University of Technology, Finland); Tom Barker (Tampere University of Technology, Finland); Hugo Van hamme (KU Leuven, Belgium)

AASP-P4.8 Localization of Impulsive Disturbances in Archive Audio Signals Using Predictive Matched Filtering<sup>4</sup>: 10

Maciej Niedźwiecki (Gdansk University of Technology, Poland); Marcin Ciolek (Gdansk University of Technology, Poland)

AASP-P4.9 Employing Phase Information for Audio Denoising<sup>4</sup>: 5

Ilker Bayram (Istanbul Technical University, Turkey)

AASP-P4.10 Sparse Denoising of Audio by Greedy Time-Frequency Shrinkage<sup>4</sup>: 10

Gautam Bhattacharya (McGill University, Canada); Philippe Depalle (McGill University, Canada)

AASP-P4.11 Single-channel speech presence probability estimation using inter-frame and inter-band correlations<sup>4</sup>: 25

Hajar Momeni (Yazd University, Iran); Emanuël Habets (International Audio Laboratories Erlangen, Germany); Hamid Reza Abutalebi (Yazd University, Iran)

#### **MLSP-P1: Pattern Recognition and Classification**

Room: Poster Area 9

Chair: Konstantinos Diamantaras (TEI of Thessaloniki, Greece)

MLSP-P1.1 A network of cooperative learners for data-driven stream mining<sup>4</sup>: 2:

Luca Canzian (University of California, Los Angeles, USA); Mihaela van der

Schaar (University of California, Los Angeles (UCLA), USA)

MLSP-P1.2 Parsimonious Gaussian process models for the classification of multivariate remote sensing images<sup>4</sup>: 35

Mathieu Fauvel (University of Toulouse, France); Charles Bouveyron (Université Paris Descartes, France); Stéphane Girard (INRIA, France)

MLSP-P1.3 Real-Time Action Recognition Based on Cumulative Motion Shapes<sup>4</sup>: 39

Marlon Alcantara (University of Campinas, Brazil); Thierry Moreira (University of Campinas, Brazil); Helio Pedrini (Institute of Computing, University of

Campinas, Brazil)

MLSP-P1.4 Conformal Predictors for Online Track Classification<sup>4</sup>: 44

Michael Pekala (Johns Hopkins University Applied Physics Laboratory, USA); I-

Jeng Wang (Johns Hopkins University Applied Physics Lab., USA); Ashley J

Llorens (JHU/APL, USA)

MLSP-P1.5 Training ensemble of diverse classifiers on feature subsets<sup>4</sup>: 49

Rahul Gupta (University of Southern California, USA); Kartik Audhkhasi

(University of Southern California, USA); Shrikanth Narayanan (University of

Southern California, USA)

MLSP-P1.6 Splitting-While-Merging Framework for Clustering High-Dimension Data with Component-Wise Expectation Conditional Maximisation<sup>4</sup>: 54

Rui Fa (Brunel University, United Kingdom); Basel Abu-Jamous (Brunel

University, United Kingdom); David Roberts (The University of Oxford, United

Kingdom); Asoke Nandi (Brunel University, United Kingdom)

MLSP-P1.7 K-mappings and regression trees<sup>4</sup>: 59

Yi Wang (Duke University & SAMSI, USA); Arthur Szlam (City College of New

York, USA)

MLSP-P1.8 Semi-Supervised Learning Using a Graph-based Phase Field Model for Imbalanced Data Set Classification<sup>4</sup>; 64  
 Aymen El Ghouli (Telecom ParisTech, France); Hichem Sahbi (Telecom ParisTech, France)

MLSP-P1.9 Sensing-aware kernel SVM<sup>4</sup>; 69  
 Weicong Ding (Boston University, USA); Prakash Ishwar (Boston University, USA); Venkatesh Saligrama (Boston University, USA); William Karl (Boston University, USA)

MLSP-P1.10 Fast Margin-based Cost-Sensitive Classification<sup>4</sup>; 74  
 Feng Nan (Boston University, USA); Joe Wang (Boston University, USA); Kirill Trapeznikov (Boston University, USA); Venkatesh Saligrama (Boston University, USA)

MLSP-P1.11 Recycled Linear Classifiers for Multiclass Classification<sup>4</sup>; 79  
 Akshay Soni (University of Minnesota, USA); Jarvis D. Haupt (University of Minnesota, USA); Fatih Porikli (Australian National University, Australia)

### **SAM-P3: Detection and Estimation**

Room: Poster Area 10

Chair: Jean Pierre Delmas (UMR CNRS 5157 - CITI Department, France)

SAM-P3.1 Bayesian Cramer-Rao Type Bound for Risk-Unbiased Estimation With Deterministic Nuisance Parameters<sup>4</sup>; 84  
 Shahar Bar (Ben-Gurion University of the Negev, Israel); Joseph Tabrikian (Ben-Gurion University of the Negev, Israel)

SAM-P3.2 Estimating the number of signals in the presence of nonuniform noise<sup>4</sup>; 89  
 Roberto Diversi (DEIS – University of Bologna, Italy); Roberto Guidorzi (DEIS – University of Bologna, Italy); Umberto Soverini (University of Bologna, Italy)

SAM-P3.3 Joint Angle and Frequency Estimation Using Structured Least Squares<sup>4</sup>; 94  
 Cheng Qian (Harbin Institute of Technology Shenzhen Graduate School, P.R. China); Lei Huang (Beijing Institute of Technology, P.R. China); Yunmei Shi (Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, P.R. China); Hing Cheung So (City University of Hong Kong, Hong Kong)

SAM-P3.4 Time delay estimation in the presence of clock frequency error<sup>4</sup>; 99  
 Sen Zhong (University of Electronic Science and Technology of China, P.R. China); Wei Xia (University of Electronic Science and Technology of China, P.R. China); Zi-Shu He (University of Electronics Science and Technology of China, P.R. China); Jinfeng Hu (UESTC, P.R. China); Jun Li (Uestc, P.R. China)

SAM-P3.5 Joint Frequency and Phasor Estimation in Unbalanced Three-Phase Power Systems<sup>4</sup>; 4  
 Tirza Rountenberg (Cornell University, USA); Lang Tong (Cornell University, USA)

SAM-P3.6 Multichannel Detection of an Unknown Rank-One Signal with Uncalibrated Receivers<sup>4</sup>; 9  
 Daniel E Hack (Matrix Research, USA); Lee K Patton (Matrix Research, USA); Braham Himed (AFRL, USA)

SAM-P3.7 Fourth-Order Tensor Method for Blind Spatial Signature Estimation<sup>4</sup>; 4

Paulo Gomes (Universidade Federal do Ceará, Brazil); André Almeida (Federal University of Ceará & Wireless Telecom Research Group - GTEL, Brazil); João Paulo Carvalho Lustosa da Costa (Universidade de Brasília (UnB), Brazil)

SAM-P3.8 Conditional Cramér-Rao Lower Bounds for DOA Estimation and Array Calibration<sup>4</sup> IC  
 Zhang-Meng Liu (National University of Defense Technology, P.R. China)

SAM-P3.9 Sparse Array-Based Room Transfer Function Estimation for Echo Cancellation<sup>4</sup> IC  
 Atulya Yellepeddi (Massachusetts Institute of Technology & Woods Hole Oceanographic Institution, USA); Dinei Florencio (Microsoft Research, USA)

SAM-P3.10 Random Distributed Detection with an application to Cognitive Radio Byzantine Attack<sup>4</sup>; 9  
 Uri Rogers (Boise State University, USA); Jun Guo (Boise State University, USA); Xia Li (Boise State University, USA); Hao Chen (Boise State University, USA)

SAM-P3.11 Detection of Correlated Time Series in a Network of Sensor Arrays<sup>4</sup>5224  
 Nicholas Klausner (Colorado State University, USA); M. r. Azimi-Sadjadi (Colorado State University, USA); Louis Scharf (Colorado State, USA)

SAM-P3.12 A Low Power Self-capacitive Touch Sensing Analog Front End with Sparse Multi-touch Detection<sup>4</sup>5229  
 Chenchi Luo (Texas Instruments, USA)

SAM-P3.13 Blind Beamforming Techniques for Automatic Identification System using GSVD and Tracking<sup>4</sup>5234  
 Mu Zhou (Delft University of Technology, The Netherlands); Alle Jan van der Veen (Delft University, The Netherlands)

**1:00 PM - 2:30 PM**

**Lunch Time**

**2:30 PM - 2:45 PM**

**Opportunities for International Research Support through the US Office of Naval Research-Global (ONRG)**

**2:45 PM - 3:45 PM**

**PT2: Plenary Talk: Model-Based Signal Processing (Room Cavaniglia)**

**3:45 PM - 4:15 PM**

**Coffee break**

**4:15 PM - 6:15 PM**

#### SLTC-L6: Articulatory features in speech processing

Room: Cavaniglia

Chairs: John Hansen (University of Texas at Dallas, USA), Sabato M Siniscalchi (University of Enna Kore, Italy)

4:15 Articulatory features from deep neural networks and their role in speech recognition""5239

Vikramjit Mitra (SRI International, USA); Ganesh Sivaraman (University of Maryland, College Park, MD, USA); Hosung Nam (Haskins Laboratories, New Haven, CT, USA); Carol Espy-Wilson (University of Maryland, USA); Elliot Saltzman (Boston University, Boston, MA, USA)

4:35 Refinements of Regression-based Context-Dependent Modelling of Deep Neural Networks for Automatic Speech Recognition""5244

Guangsen Wang (National University of Singapore, Singapore); Khe Chai Sim (National University of Singapore, Singapore)

4:55 Normalization of articulatory data through Procrustes transformations and analysis-by-synthesis""5249

Daniel Felps (Texas A&M University, USA); Sandesh Aryal (Texas A&M University, USA); Ricardo Gutierrez-Osuna (Texas A&M University, USA)

5:15 A sparse smoothing approach for Gaussian mixture model based acoustic-to-articulatory inversion""5254

Prasad Sudhakar (Universite Catholique de Louvain, Belgium); Laurent Jacques (University of Louvain, Belgium); Prasanta Kumar Ghosh (Indian Institute of Science, India)

5:35 The Effect of Speaking Rate on Audio and Visual Speech""5259

Sarah Taylor (Disney Research, USA); Barry-John Theobald (University of East Anglia, United Kingdom); Iain Matthews (Disney Research, USA)

5:55 Trajectory Analysis of Speech using Continuous State Hidden Markov Models""5264

Philip Weber (University of Birmingham, United Kingdom); Steve Houghton (University of Birmingham, United Kingdom); Colin Champion (The University of Birmingham, United Kingdom); Martin Russell (University of Birmingham, United Kingdom); Peter Jancovic (University of Birmingham, United Kingdom)

#### SPTM-L4: Classification and Pattern Recognition

Room: Basilica

Chairs: Prakash Ishwar (Boston University, USA), Todd Moon (Utah State University, USA)

4:15 Improvement of utterance clustering by using employees' sound and area data""5269

Tetsuya Kawase (Gifu University, Japan); Masanori Takehara (Gifu University, Japan); Satoshi Tamura (Gifu University, Japan); Satoru Hayamizu (Gifu University, Japan); Ryuhei Tenmoku (AIST, Japan); Takeshi Kurata (AIST, Japan)

4:35 Acoustic Feature Extraction By Statistics Based Local Binary Pattern For Environmental Sound Classification""5274

Takumi Kobayashi (National Institute of Advanced Industrial Science and Technology, Japan); Jiaxing Ye (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

4:55 Spectral Clustering with Imbalanced Data""5279

Jing Qian (Boston University, USA); Venkatesh Saligrama (Boston University, USA)

5:15 Subspace Learning in Minimax Detection""5284

Raja Fazliza Raja Suleiman (Université de Nice Sophia Antipolis, France); David Mary (Université de Nice Sophia-Antipolis, France); André Ferrari (Université de Nice Sophia-Antipolis, France)

5:35 Information-Theoretic Criteria for the Design of Compressive Subspace Classifiers""5289

Matthew Nokleby (Duke University, USA); Miguel Rodrigues (University College London, United Kingdom); Robert Calderbank (Duke University, USA)

5:55 Sparse Adaptive Possibilistic Clustering""5294

Spyridoula Xenaki (National Observatory of Athens, Greece); Konstantinos Koutroumbas (National Observatory of Athens, Greece); Athanasios A. Rontogiannis (National Observatory of Athens, Greece)

#### SS6: Dictionary-based processing of single- and multi-channel audio

Room: Polveriera

Chairs: Peter Balazs (Austrian Academy of Sciences, Austria), Marco Liuni (IRCAM, France)

4:15 A General Framework For Dictionary Based Audio Fingerprinting""5299

Manuel Moussallam (Institut Langevin - ESPCI ParisTech, France); Laurent Daudet (Université Paris Diderot, France)

4:35 Online Non-negative Tensor Deconvolution for Source Detection in 3DTV Audio""52: 4

Yuki Mitsufuji (Sony Corporation, Japan); Marco Liuni (IRCAM, France); Alex Baker (IRCAM, United Kingdom); Axel Roebel (IRCAM, France)

4:55 Hearing behind walls: localizing sources in the room next door with cosparsity""52: 9

Srdan Kitić (INRIA, France); Nancy Bertin (IRISA - CNRS UMR6074 & Inria, France); Rémi Gribonval (INRIA, France)

5:15 Active-set Newton algorithm for non-negative sparse coding of audio""52: 4

Tuomas Virtanen (Tampere University of Technology, Finland); Bhiksha Raj (Carnegie Mellon University, USA); Jort Gemmeke (KU Leuven, Belgium); Hugo Van hamme (KU Leuven, Belgium)

5:35 Adaptive Gabor Frames by Projection onto Time-Frequency Subspaces""52: 9

Monika Doerfler (University of Vienna, Austria); Gino Velasco (University of the Philippines Diliman, Philippines)

5:55 Perceptual Matching Pursuit with Gabor dictionaries and time-frequency masking""5324

Gilles Chardon (Austrian Academy of Sciences, Austria); Thibaud Necciari (Austrian Academy of Sciences, Austria); Peter Balazs (Austrian Academy of Sciences, Austria)

#### AASP-L3: Music Transcription

Room: Scherma

Chairs: Bryan Pardo (Northwestern University, USA), Emmanuel Vincent (Inria Nancy - Grand Est, France)

4:15 Automatic transcription of pitched and unpitched sounds from polyphonic music""5329  
Emmanouil Benetos (City University London, United Kingdom); Sebastian Ewert (Queen Mary University of London, United Kingdom); Tillman Weyde (City University, United Kingdom)

4:35 Polyphonic Piano Transcription using Non-negative matrix factorisation and group sparsity""5334

Ken O'Hanlon (Queen Mary University of London, United Kingdom); Mark D. Plumbley (Queen Mary University of London, United Kingdom)

4:55 Leveraging Repetition for Improved Automatic Lyric Transcription in popular music""5339

Matt McVicar (National Institute of Advanced Industrial Science and Technology, Japan); Daniel P W Ellis (Columbia University, USA); Masataka Goto (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

5:15 Automatic Transcription of Guitar Tablature from Audio Signals in Accordance with Player's Proficiency""5344

Kazuki Yazawa (Kyoto University, Japan); Katsutoshi Itoyama (Kyoto University & Graduate School of Informatics, Japan); Hiroshi Okuno (Kyoto University, Japan)

5:35 Transcribing Vocal Expression from Polyphonic Music""5349

Yukara Ikemiya (Kyoto University, Japan); Katsutoshi Itoyama (Kyoto University & Graduate School of Informatics, Japan); Hiroshi Okuno (Kyoto University, Japan)

5:55 Enhancing downbeat estimation when facing different music styles""5354

Simon Durand (Telecom ParisTech & CNRS-LTCl, France); Bertrand David (Telecom ParisTech, France); Gaël Richard (Institut Mines-Télécom, Télécom ParisTech, CNRS-LTCl, France)

### SPCOM-L3: Massive MIMO

Room: Teatrino

4:15 Antenna Subset Selection Optimization for Large-scale MISO Constant Envelope Precoding""5359

Jiaxian Pan (The Chinese University of Hong Kong, Hong Kong); Wing-Kin Ma (The Chinese University of Hong Kong, Hong Kong)

4:35 Massive MIMO Systems with Hardware-Constrained Base Stations""5364

Emil Björnson (Supélec & KTH, Sweden); Michail Matthaiou (Queen's University Belfast, United Kingdom); Mérouane Debbah (Supelec, France)

4:55 Constant Envelope Signal Space Diversity""5369

Tumula V. K. Chaitanya (McGill University, Canada); Danyo Danev (Linköping University, Sweden); Erik G. Larsson (Linköping University, Sweden)

5:15 Multi-Stream Iterative SVD for Massive MIMO Communication Systems under Time Varying Channels""5374

Junting Chen (HKUST, Hong Kong); Vincent Lau (Hong Kong University of Science and Technology, Hong Kong)

5:35 CSIT Estimation and Feedback for FDD Multi-user Massive MIMO Systems""5379

Xiongbiao Rao (the Hong Kong University of Science and Technology, Hong Kong); Vincent Lau (Hong Kong University of Science and Technology, Hong Kong); Xiangming Kong (Huawei Technologies CO., LTD, P.R. China)

5:55 Uplink Performance of Massive MIMO Subject to Delayed CSIT and Anticipated Channel Prediction""5384

Anastasios Papazafeiropoulos (University of Edinburgh, United Kingdom); Tharmalingam Ratnarajah (The University of Edinburgh, United Kingdom)

### SAM-L2: Hyperspectral Processing and Source Separation

Room: Volta

Chairs: Chong-Yung Chi (National Tsing Hua University, Taiwan), Dominic K. C. Ho (University of Missouri, USA)

4:15 Residual Component Analysis of Hyperspectral Images for Joint Nonlinear Unmixing and Nonlinearity Detection""5388

Yoann Altmann (University of Toulouse, France); Nicolas Dobigeon (University of Toulouse, France); Steve McLaughlin (Heriot Watt University, United Kingdom); Jean-Yves Tourneret (University of Toulouse & IRIT/ENSEEIH/TéSA, France)

4:35 Blind spatial unmixing of multispectral images: an approach based on two-source sparsity and geometrical properties""5393

Djaouad Benachir (University of Toulouse, France); Yannick Deville (University of Toulouse, France); Shahram Hosseini (University of Toulouse / CNRS / IRAP, France)

4:55 Bayesian fusion of hyperspectral and multispectral images""5398

Qi Wei (University of Toulouse, France); Nicolas Dobigeon (University of Toulouse, France); Jean-Yves Tourneret (University of Toulouse & IRIT/ENSEEIH/TéSA, France)

5:15 Synthetic Coded Apertures in Compressive Spectral Imaging""53: 3

Laura Galvis (University of Delaware, USA); Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia); Gonzalo Arce (University of Delaware, USA)

5:35 Error Analysis of Low-Rank Three-Way Tensor Factorization Approach to Blind Source Separation""53: 8

Ivica Kopriva (Rudjer Boskovic Institute, Zagreb, Croatia); Jean-Philip Royer (Institut des Sciences de l'ingénieur de Toulon et du Var, France); Nadège Thirion (Institut des Sciences de l'ingénieur de Toulon et du Var & LSEET, France); Pierre Comon (CNRS UMR5216, France)

5:55 Underdetermined blind separation and tracking of moving sources based on DOA-HMM""53: 3

Takuya Higuchi (University of Tokyo, Japan); Norihiro Takamune (University of Tokyo, Japan); Tomohiko Nakamura (The University of Tokyo, Japan); Hirokazu Kameoka (The University of Tokyo, Japan)

## SLTC-P9: Spoken Language Processing

Room: Poster Area 1

Chair: Florian Metze (Carnegie Mellon University, USA)

SLTC-P9.1 Sensorimotor adaptation of speech using real-time articulatory resynthesis""53; 8  
Jeffrey Berry (Marquette, USA); Cassandra North (Marquette University, USA);  
Michael Johnson (Marquette University, USA)

SLTC-P9.2 Learning a semantic parser from spoken utterances""5423

Judith Gaspers (Bielefeld University, Germany); Philipp Cimiano (Bielefeld  
University, Germany)

SLTC-P9.3 A DNN-based Acoustic Modeling of Tonal Language and Its Application to  
Mandarin Pronunciation Training""5428

Wenping Hu (University of Science and Technology of China, P.R. China); Yao  
Qian (Microsoft Research Asia, P.R. China); Frank Soong (Microsoft Research  
Asia, USA)

SLTC-P9.4 Spoken Dialogue Grammar Induction from Crowdsourced Data""5433

Elisavet Palogiannidi (Technical University of Crete, Greece); Ioannis Klasinas  
(Technical University of Crete, Greece); Alexandros Potamianos (Technical  
University of Crete, Greece); Elias Iosif (Technical University of Crete, Greece)

SLTC-P9.5 Improved and robust prediction of pronunciation distance for individual-basis  
clustering of World Englishes pronunciation""5438

Shun Kasahara (The University of Tokyo, Japan); Shun Kitahara (The University  
of Tokyo, Japan); Nobuaki Minematsu (The University of Tokyo, Japan); Han-  
Ping Shen (National Cheng Kung University, Taiwan); Takehiko Makino (Chuo  
University, Japan); Daisuke Saito (The University of Tokyo, Japan); Keikichi  
Hirose (The University of Tokyo, Japan)

SLTC-P9.6 Ordinal Regression for Interaction Quality Prediction""5443

Layla El Asri (Orange Labs / UMI 2958 (CNRS - GeorgiaTech), France); Hatim  
Khouzaimi (Orange Labs / Laboratoire d'Informatique d'Avignon-CERI, France);  
Romain Laroche (Orange labs, Canada); Olivier Pietquin (University Lille 1 -  
LIFL (UMR 8022 CNRS / Lille 1), France)

SLTC-P9.7 Effective Pseudo-relevance Feedback for Language Modeling in Extractive  
Speech Summarization""5448

Shih-Hung Liu (National Taiwan University, Taiwan); Kuan-Yu Chen (National  
Taiwan University, Taiwan); Yu-Lun Hsieh (Academia Sinica, Taiwan); Berlin  
Chen (National Taiwan Normal University, Taiwan); Hsin-Min Wang (Academia  
Sinica, Taiwan); Hsu-Chun Yen (National Taiwan University, Taiwan); Wen-  
Lian Hsu (Academia Sinica, Taiwan)

SLTC-P9.8 Some Insights from Translating Conversational Telephone Speech""5453

Gaurav Kumar (Johns Hopkins University, USA); Matt Post (Johns Hopkins  
University, USA); Daniel Povey (Johns Hopkins University, USA); Sanjeev  
Khudanpur (Johns Hopkins University, USA)

SLTC-P9.9 Gaze-enhanced speech recognition""5458

Malcolm Slaney (Microsoft Research & Stanford University, USA); Rahul Rajan  
(Carnegie Mellon University, USA); Andreas Stolcke (Microsoft & ICSI, USA);  
Sarangarajan Parthasarathy (Microsoft, USA)

SLTC-P9.10 Computationally-efficient endpointing features for natural spoken  
interaction with personal-assistant systems""5463

Harish Arsikere (University of California, Los Angeles, USA); Elizabeth Shriberg  
(International Computer Science Institute/Speech Technology & Research  
Laboratory, USA); Umut Ozertem (Microsoft, USA)

SLTC-P9.11 Task specific continuous word representations for mono and multi-lingual  
Spoken Language Understanding""5468

Tasos Anastasakos (Microsoft, USA); Young-Bum Kim (University of Wisconsin  
Madison, USA); Anoop Deoras (Microsoft Corporation, USA)

SLTC-P9.12 Factored Adaptation of Speaker and Environment Using Orthogonal  
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Room: Poster Area 7

Chair: Gloria Menegaz (University of Verona, Italy)

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Room: Poster Area 8

Chair: Tao Zhang (Starkey Hearing Technologies, USA)

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MLSP-P2.9 Kernel-Based Identification of Hammerstein Systems for Nonlinear Acoustic Echo-Cancellation""595;  
Steven Van Vaerenbergh (University of Cantabria, Spain); Luis A Azpicueta-Ruiz (Universidad Carlos III de Madrid, Spain)

MLSP-P2.10 Intelligibility Detection of Pathological Speech Using Asymmetric Sparse Kernel Partial Least Squares Classifier""5966

Dong-Yan Huang (Institute for Infocomm Research, Singapore); Minghui Dong (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)  
MLSP-P2.11 Discriminative Non-Negative Matrix Factorization for Single-Channel Speech Separation<sup>596</sup>;  
Zi Wang (Tsinghua University, P.R. China); Fei Sha (USC, USA)  
MLSP-P2.12 Block Sparse Excitation Based All-Pole Modeling of Speech<sup>5976</sup>  
Ritwik Giri (University of California, San Diego, USA); Bhaskar Rao (University of California, San Diego, USA)

### IFS-P2: Biometrics and Content Fingerprinting

Room: Poster Area 10

Chair: Patrizio Campisi (University of ROMA TRE, Italy)

IFS-P2.1 Iris Template Protection Using a Digital Modulation Paradigm<sup>597</sup>;  
Emanuele Maiorana (University of ROMA TRE, Italy); Patrizio Campisi (University of ROMA TRE, Italy); Alessandro Neri (University of ROMA TRE, Italy)

IFS-P2.2 Heterogeneous Iris Recognition using Heterogeneous Eigeniris and Sparse Representation<sup>5986</sup>

Bo-Ren Zheng (Feng Chia University, Taiwan); Dai-Yan Ji (Advanced Analog Technology, Inc., Taiwan); Yung-hui Li (National Central University, Taiwan)

IFS-P2.3 Verification based ECG biometrics with cardiac irregular conditions using heartbeat level and segment level information fusion<sup>598</sup>;  
Ming Li (Sun Yat-sen University, P.R. China); Xin Li (Carnegie Mellon University, USA)

IFS-P2.4 On Establishing Evaluation Standards for ECG Biometrics<sup>5996</sup>  
Shahzad Pourayeyvali (University of Toronto, Canada); Saeid Wahabi (University of Toronto, Canada); Siddarth Hari (University of Toronto, Canada); Dimitrios Hatzinakos (University of Toronto, Canada)

IFS-P2.5 Performance of i-Vector Speaker Verification and the Detection of Synthetic Speech<sup>599</sup>;

Richard McClanahan (Sandia National Laboratories, USA); Bryan Stewart (New Mexico State University, USA); Phillip L De Leon (New Mexico State University, USA)

IFS-P2.6 Human Acoustic Fingerprints: A Novel Biometric Modality for Mobile Security<sup>59</sup>: 6  
Yuxi Liu (University of Toronto, Canada); Dimitrios Hatzinakos (University of Toronto, Canada)

IFS-P2.7 An HMM-based Behavior Modeling Approach for Continuous Mobile Authentication<sup>59</sup>: ;  
Aditi Roy (New York University, Polytechnic School of Engineering, USA); Tzipora Halevi (Polytechnic Institute of New York University, USA); Nasir Memon (Polytech University, USA)

IFS-P2.8 Robust Perceptual Color Image Hashing Using Quaternion Singular Value Decomposition<sup>59</sup>: 6  
Lahouari Ghouti (King Fahd University of Petroleum & Minerals, Saudi Arabia)

IFS-P2.9 Performance analysis of bag-of-features based content identification systems<sup>59</sup>; ;  
Sviatoslav Voloshynovskiy (University of Geneva, Switzerland); Maurits Diephuis (University of Geneva, Switzerland); Taras Holotyak (University of Geneva, Switzerland)

IFS-P2.10 Fast and Accurate Nearest Neighbor Search in the Manifolds of Symmetric Positive Definite Matrices<sup>5</sup>: 26

Ligang Zheng (Guangzhou University, P.R. China); Guoping Qiu (University of Nottingham, United Kingdom); Jiwu Huang (Shenzhen University, P.R. China)

IFS-P2.11 Fingerprint Information Maximization for Content Identification<sup>5</sup>: 2;  
Rohit Naini (University of Illinois, USA); Pierre Moulin (University of Illinois at Urbana-Champaign, USA)

IFS-P2.12 Efficient two stage decoding scheme to achieve content identification capacity<sup>5</sup>: 36  
Farzad Farhadzadeh (University of Geneva, Switzerland); Ke Sun (University of Geneva, Switzerland); Sohrab Ferdowsi (University of Geneva, Switzerland)

## Thursday, May 8

8:30 AM - 10:30 AM

### SLTC-L7: Parametric Speech Synthesis

Room: Cavaniglia

Chairs: Alan Black (CMU, USA), Zhen-Hua Ling (University of Science and Technology of China, P.R. China)

8:30 Decision Tree Usage for Incremental Parametric Speech Synthesis<sup>5</sup>: 3;  
Timo Baumann (Universität Hamburg, Germany)

8:50 Spectral Modeling Using Neural Autoregressive Distribution Estimators for Statistical Parametric Speech Synthesis<sup>5</sup>: 46

Xiang Yin (University of Science and Technology of China, P.R. China); Zhen-Hua Ling (University of Science and Technology of China, P.R. China); Li-Rong Dai (University of Science and Technology of China, P.R. China)

9:10 On the Training Aspects of Deep Neural Network (DNN) for Parametric TTS Synthesis<sup>5</sup>: 4;

Yao Qian (Microsoft Research Asia, P.R. China); Yuchen Fan (Microsoft Research Asia, P.R. China); Wenping Hu (University of Science and Technology of China, P.R. China); Frank Soong (Microsoft Research Asia, USA)

9:30 Parametric Speech Synthesis Based on Gaussian Process Regression Using Global Variance and Hyperparameter Optimization<sup>5</sup>: 56

Tomoki Koriyama (Tokyo Institute of Technology, Japan); Takashi Nose (Tohoku University, Japan); Takao Kobayashi (Tokyo Institute of Technology, Japan)

9:50 Complex cepstrum factorization for statistical parametric synthesis<sup>5</sup>: 5;  
Ranniery Maia (Toshiba Cambridge Research Lab, United Kingdom); Yannis Stylianou (University of Crete, Greece)

10:10 Deep Mixture Density Networks for Acoustic Modeling in Statistical Parametric Speech Synthesis<sup>5</sup>: 66  
Heiga Zen (Google, United Kingdom); Andrew Senior (Google Inc., USA)

#### **SPTM-L5: Signal Processing over Graphs II**

Room: Basilica

Chairs: Alfred Hero III (University of Michigan, USA), Ali H. Sayed (University of California, Los Angeles, USA)

8:30 On lq Estimation of Sparse Inverse Covariance<sup>5</sup>: 6;

Goran Marjanovic (University of Michigan, USA); Alfred Hero III (University of Michigan, USA)

8:50 Anomalous Cluster Detection<sup>5</sup>: 76

Jing Qian (Boston University, USA); Venkatesh Saligrama (Boston University, USA); Yuting Chen (Boston University, USA)

9:10 A Stable Betweenness Centrality Measure in Networks<sup>5</sup>: 7;

Santiago Segarra (University of Pennsylvania, USA); Alejandro Ribeiro (University of Pennsylvania, USA)

9:30 Towards a sampling theorem for signals on arbitrary graphs<sup>5</sup>: 86

Aamir Anis (University of Southern California, USA); Akshay Gadde (University of Southern California, USA); Antonio Ortega (USC, USA)

9:50 On the Convergence Rate of the Bi-Alternating Direction Method of Multipliers<sup>5</sup>: 8;

Guoqiang Zhang (Delft University of Technology, The Netherlands); Richard Heusdens (Delft University of Technology, The Netherlands); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand)

10:10 Online Dictionary Learning over Distributed Models<sup>5</sup>: 96

Jianshu Chen (University of California, Los Angeles, USA); Zaid J. Towfic (University of California, Los Angeles, USA); Ali H. Sayed (University of California, Los Angeles, USA)

#### **DISPS-L1: Algorithm and Architecture Co-Optimization**

Room: Polveriera

Chairs: Magdy Bayoumi (University of Louisiana, USA), Warren Gross (McGill University, Canada)

8:30 A 3.8 Gb/s Large-scale MIMO Detector for 3GPP LTE-Advanced<sup>5</sup>: 9;

Bei Yin (Rice University, USA); Michael Wu (Rice University, USA); Guohui Wang (Rice University, USA); Chris Dick (Xilinx, USA); Joseph R. Cavallaro (Rice University, USA); Christoph Studer (Cornell University, USA)

8:50 Error-Adaptive Classifier Boosting (EACB): Exploiting Data-driven Training for Highly Fault-tolerant Hardware<sup>5</sup>: 6

Zhuo Wang (Princeton University, USA); Robert Schapire (Princeton University, USA); Naveen Verma (Massachusetts Institute of Technology, USA)

9:10 Design and Implementation of a Low Power Spike Detection Processor for 128-Channel Spike Sorting Microsystem<sup>5</sup>: ;

Tsung-Chuan Ma (National Taiwan University, Taiwan); Tung-Chuan Chen (National Taiwan University, Taiwan); Liang-Gee Chen (DSP/IC Design Lab., National Taiwan University, Taiwan)

9:30 Towards Approaching near-Optimal MIMO detection performance on a C-programmable baseband processor<sup>5</sup>: ; 5

Ubaid Ahmad (Katholieke University of Leuven & IMEC, Belgium); Min Li (IMEC, Belgium); Amir Amin (IMEC, Belgium); Meng Li (IMEC, Belgium); Liesbet Van der Perre (IMEC, Belgium); Rudy Lauwereins (IMEC, Leuven, Belgium); Sofie Pollin (KU Leuven, USA)

9:50 FFTs with Near-Optimal Memory Access Through Block Data Layouts<sup>5</sup>: ;

Berkin Akin (Carnegie Mellon University, USA); Franz Franchetti (Carnegie Mellon University, USA); James C. Hoe (Carnegie Mellon University, USA)

10:10 LLR-Based Successive Cancellation List Decoding of Polar Codes<sup>5</sup>: 25

Alexios Balatsoukas-Stimming (EPFL, Switzerland); Mani Bastani Parizi (EPFL, Switzerland); Andreas Burg (EPFL, Switzerland)

#### **SS7: Joint Optimization of RF devices and Resource Allocation in Wireless**

##### **Networks**

Room: Scherma

Chairs: Erik G. Larsson (Linköping University, Sweden), Jarmo Takala (Tampere University of Technology, Finland)

8:30 Reduced-Complexity Power Amplifier Linearization for Carrier Aggregation Mobile Transceivers<sup>5</sup>: 2;

Mahmoud Abdelaziz (Tampere University of Technology, Finland); Lauri Anttila (Tampere University of Technology, Finland); Abbas Mohammadi (Amirkabir University of Technology, Iran); Fadhel Ghannouchi (University of Calgary, Canada); Mikko Valkama (Tampere University of Technology, Finland)

8:50 Multiuser Frequency Allocation with Wideband Power Amplifier Models<sup>5</sup>: 35

Xiaojia Lu (University of Oulu, Finland); Antti Tölli (University of Oulu, Finland); Lauri Anttila (Tampere University of Technology, Finland); Markku Juntti (University of Oulu, Finland); Mikko Valkama (Tampere University of Technology, Finland)

9:10 Digital predistortion of concurrent multiband communication systems<sup>5</sup>: 3;

Thomas Eriksson (Chalmers University of Technology, Sweden); Christian Fager (Chalmers University of Technology, Sweden)

9:30 Iterative Blind Estimation of Nonlinear Channels<sup>5</sup>: 45

Jan Dohl (Technische Universität Dresden, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

9:50 Cross Layer Energy-Efficiency Optimization for Cognitive Radio Transceivers<sup>5</sup>: 4;

Christian Senning (EPFL, Switzerland); Mikel Mendikute (Mondragon University, Spain); Andreas Burg (EPFL, Switzerland)

10:10 Efficient Architecture Mapping of FFT/IFFT for Cognitive Radio Networks<sup>5</sup>: 55

Guohui Wang (Rice University, USA); Bei Yin (Rice University, USA); Inkeun Cho (University of Maryland, USA); Joseph R. Cavallaro (Rice University,

USA); Shuvra Bhattacharyya (University of Maryland, USA); Jarmo Takala (Tampere University of Technology, Finland)

### **SAM-L3: Sparsity Structures**

Room: Teatrino

Chairs: Yonina C. Eldar (Technion-Israel Institute of Technology, Israel), Geert Leus (Delft University of Technology, The Netherlands)

8:30 Joint Sparsity Recovery for Spectral Compressed Sensing<sup>5</sup>; 5:  
Yuejie Chi (Ohio State University, USA)

8:50 Sparse Reconstruction Of Equivalence Classes Of Moving Targets Using Single-Channel Synthetic Aperture Radar<sup>5</sup>; 65

Jake Gunther (Utah State University, USA); Josh Hunsaker (Utah State University, USA); Hyrum Anderson (Sandia National Laboratories, USA); Todd Moon (Utah State University, USA)

9:10 Sparsity-Aware Field Estimation via Ordinary Kriging<sup>5</sup>; 6:

Sijia Liu (Syracuse University, USA); Engin Masazade (Yeditepe University, Turkey); Makan Fardad (Syracuse University, USA); Pramod Varshney (Syracuse University, USA)

9:30 A block-sparse MUSIC algorithm for the localization and the identification of directive sources<sup>5</sup>; 75

Gilles Chardon (Austrian Academy of Sciences, Austria)

9:50 Joint DOA and Multi-pitch estimation using Block Sparsity<sup>5</sup>; 7:

Ted Kronvall (Lund University, Sweden); Stefan I Adalbjörnsson (Lund University, Sweden); Andreas Jakobsson (Lund University, Sweden)

10:10 Tensor-Based Algorithms for Learning Multidimensional Separable Dictionaries<sup>5</sup>; 85

Florian Roemer (Ilmenau University of Technology, Germany); Giovanni Del Galdo (Fraunhofer Institute for Integrated Circuits IIS, Germany); Martin Haardt (Ilmenau University of Technology, Germany)

### **IFS-L1: Secret Communications, Fingerprinting, and Security**

Room: Volta

Chairs: Oscar C. Au (HKUST, Hong Kong), Yao-Win Peter Hong (National Tsing Hua University, Taiwan)

8:30 Artificial-Noise-Aided Secure Multi-Antenna Transmission in Slow Fading Channels with Limited Feedback<sup>5</sup>; 8:

Xi Zhang (Hong Kong University of Science and Technology, Hong Kong); Xiangyun Zhou (The Australian National University, Australia); Matthew R McKay (Hong Kong University of Science and Technology, Hong Kong); Robert Heath (The University of Texas at Austin, USA)

8:50 Strong Secrecy and Decoding Performance Analysis for Robust Broadcasting Under Channel Uncertainty<sup>5</sup>; 95

Rafael F. Schaefer (Princeton University, USA); Holger Boche (Technical University Munich, Germany)

9:10 On the Performance of Full-Duplex Relaying under PHY Security Constraints<sup>5</sup>; 9:

Hirley Alves (University of Oulu & Federal University of Technology of Parana - Brazil, Finland); Glauber Brante (Federal University of Technology - Parana (UTFPR), Brazil); Richard Demo Souza (Federal University of Technology - Parana (UTFPR), Brazil); Daniel Benevides da Costa (Federal University of Ceara (UFC) & Area: Telecommunications, Brazil); Matti Latva-aho (UoOulu, Finland)

9:30 Steganalysis in Technicolor: Boosting WS Detection of Stego Images from CFA-Interpolated Covers<sup>5</sup>; : 4

Matthias Kirchner (University of Muenster, Germany); Rainer Boehme (WWU Münster, Germany)

9:50 TTP-Free Asymmetric Fingerprinting Protocol based on Client Side Embedding<sup>5</sup>; : 9

Tiziano Bianchi (Politecnico di Torino, Italy); Alessandro Piva (University of Florence, Italy)

10:10 On the Security of Random Linear Measurements<sup>5</sup>; : 4

Tiziano Bianchi (Politecnico di Torino, Italy); Valerio Bioglio (Università di Torino, Italy); Enrico Magli (Politecnico di Torino, Italy)

### **SLTC-P11: Features for Speaker Recognition**

Room: Poster Area 1

Chair: Panayiotis Georgiou (University of Southern California, USA)

SLTC-P11.1 Robust speaker identification in noisy and reverberant conditions<sup>5</sup>; : 9

Xiaoqia Zhao (The Ohio State University, USA); Yuxuan Wang (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

SLTC-P11.2 Inter Dataset Variability Compensation for Speaker Recognition<sup>5</sup>; 6224

Hagai Aronowitz (IBM Research - Haifa, Israel)

SLTC-P11.3 Minimum Divergence Estimation of Speaker Prior in Multi-Session PLDA Scoring<sup>5</sup>; 6229

Liping Chen (University of Science and Technology of China & Institute for Infocomm Research, Agency for Science, Technology and Research, P.R. China); Kong-Aik Lee (Institute for Infocomm Research, Singapore); Bin Ma (Institute for Infocomm Research, Singapore); Wu Guo (University of Science and Technology of China, P.R. China); Haizhou Li (Institute for Infocomm Research, Singapore); Li-Rong Dai (University of Science and Technology of China, P.R. China)

SLTC-P11.4 Construction of Discriminative Kernels from Known and Unknown Non-targets for PLDA-SVM Scoring<sup>5</sup>; 6234

Wei Rao (The Hong Kong Polytechnic University, Hong Kong); Man-wai Mak (Hong Kong Polytechnic University, Hong Kong)

SLTC-P11.5 Uncertainty Propagation in Front End Factor Analysis For Noise Robust Speaker Recognition<sup>5</sup>; 6239

Chengzhu Yu (University of Texas at Dallas, USA); Gang Liu (University of Texas at Dallas, USA); Seongjun Hahn (University of Texas at Dallas, USA); John Hansen (University of Texas at Dallas, USA)

SLTC-P11.6 Frequency offset correction in single sideband speech for speaker verification<sup>5</sup>; 6244

Hua Xing (University of Texas at Dallas, USA); John Hansen (University of Texas at Dallas, USA)

SLTC-P11.7 Effective Use of DCTs for Contextualizing Features for Speaker Recognition""6249  
 Mitchell McLaren (SRI International, USA); Nicolas Scheffer (SRI International, USA); Luciana Ferrer (SRI International, USA); Yun Lei (SRI International, USA)

SLTC-P11.8 Domain Adaptation via Within-Class Covariance Correction in i-vector Based Speaker Recognition Systems""6254  
 Ondrej Glembek (Raytheon BBN Technologies, USA); Jeff Ma (Raytheon BBN Technologies, USA); Pavel Matejka (Raytheon BBN Technologies, USA); Bing Zhang (Raytheon BBN Technologies, USA); Oldrich Plchot (Brno University of Technology, Czech Republic); Lukáš Burget (Brno University of Technology, Czech Republic); Spyros Matsoukas (Amazon, USA)

SLTC-P11.9 Simplified VTS-based i-vector Extraction in Noise-robust Speaker Recognition""6259  
 Yun Lei (SRI International, USA); Mitchell McLaren (SRI International, USA); Luciana Ferrer (SRI International, USA); Nicolas Scheffer (SRI International, USA)

SLTC-P11.10 Unscented Transform for iVector-Based Noisy Speaker Recognition""6264  
 David Martínez González (University of Zaragoza, Spain); Lukáš Burget (Brno University of Technology, Czech Republic); Themos Stafylakis (Ecole de Technologie Supérieure, Canada); Yun Lei (SRI International, USA); Patrick Kenny (CRIM, Canada); Eduardo Lleida (University of Zaragoza, Spain)

SLTC-P11.11 Supervised Domain Adaptation for i-vector based Speaker Recognition""6269  
 Daniel Garcia-Romero (Johns Hopkins University HLTCOE, USA); Alan McCree (Johns Hopkins University, USA)

SLTC-P11.12 Deep Neural Networks for Small Footprint Text-Dependent Speaker Verification""6274  
 Ehsan Variani (Johns Hopkins University, USA); Xin Lei (Google Inc., USA); Erik McDermott (Google Inc., USA); Ignacio Lopez Moreno (Google Inc., USA); Javier Gonzalez-Dominguez (Universidad Autónoma de Madrid, Spain)

SLTC-P11.13 Iterative Bayesian Word Segmentation for Unsupervised Vocabulary Discovery from Phoneme Lattices""6279  
 Jahn Heymann (University of Paderborn, Germany); Oliver Walter (University of Paderborn, Germany); Reinhold Haeb-Umbach (University of Paderborn, Germany); Bhiksha Raj (Carnegie Mellon University, USA)

## SLTC-P12: Spoken Language Understanding II

Room: Poster Area 2

Chair: Larry Heck (Microsoft Research, USA)

SLTC-P12.1 unsupervised broadcast news story segmentation using distance dependent Chinese restaurant processes""6284

Chao Yang (Northwestern Polytechnical University, P.R. China); Lei Xie (Northwestern Polytechnical University, P.R. China); Xiangzeng Zhou (Northwestern Polytechnical University, P.R. China)

SLTC-P12.2 Extending Domain Coverage of Language Understanding Systems via Intent Transfer Between Domains Using Knowledge Graphs and Search Query Click Logs""6289  
 Ali El-Kahky (Columbia University, USA); Xiaohu Liu (Microsoft, USA); Ruhi Sarikaya (Microsoft, USA); Gokhan Tur (Microsoft, USA); Dilek Hakkani-Tur (Microsoft Research, USA); Larry Heck (Microsoft, USA)

SLTC-P12.3 A Variational Bayesian Model for User Intent Detection""6294  
 Yangfeng Ji (Georgia Institute of Technology, USA); Dilek Hakkani-Tur (Microsoft Research, USA); Asli Celikyilmaz (Microsoft, USA); Gokhan Tur (Microsoft Research, USA); Larry Heck (Microsoft Research, USA)

SLTC-P12.4 Recurrent Conditional Random Field for Language Understanding""6299  
 Kaisheng Yao (Microsoft Research, USA); Baolin Peng (Beihang University, P.R. China); Geoffery Zweig (Microsoft Research, USA); Dong Yu (Microsoft Research, USA); Xiaolong Li (Microsoft, USA); Feng Gao (Microsoft, P.R. China)

SLTC-P12.5 Leveraging Semantic Web Search and Browse Sessions for Multi-Turn Spoken Dialog Systems""62: 4  
 Lu Wang (Cornell University, USA); Larry Heck (Microsoft Research, USA); Dilek Hakkani-Tur (Microsoft Research, USA)

SLTC-P12.6 Small-Footprint Keyword Spotting Using Deep Neural Networks""62: 9  
 Guoguo Chen (Johns Hopkins University, USA); Carolina Parada (Google Inc., USA); Georg Heigold (Google, USA)

SLTC-P12.7 Log-Linear Dialog Manager""62: 4  
 Hao Tang (TTIC, USA); Shinji Watanabe (Mitsubishi Electric Research Laboratories, USA); Tim K. Marks (MERL, USA); John Hershey (MERL, USA)

SLTC-P12.8 Retrieving the syntactic structure of erroneous ASR transcriptions for open-domain Spoken Language Understanding""62: 9  
 Frederic Bechet (Aix Marseille Université & LIF-CNRS, France); Benoit Favre (Aix-Marseille Université, France); Alexis Nasr (Aix Marseille Université, France); Mathieu Morey (Aix Marseille Université, France)

SLTC-P12.9 Language Model Adaptation For Automatic Call Transcription""6324  
 Ali Haznedaroglu (Sestek & Bogaici University, Turkey); Levent Arslan (Bogazici University, Turkey)

SLTC-P12.10 Unsupervised Submodular Subset Selection for Speech Data""6329  
 Kai Wei (University of Washington, USA); Yuzong Liu (University of Washington, USA); Katrin Kirchhoff (University of Washington, USA); Jeff Bilmes (, USA)

SLTC-P12.11 A Submodular Optimization Approach to Sentence Set Selection""6334  
 Yusuke Shinohara (Toshiba Corporation, Japan)

SLTC-P12.12 Semantic Context Inference for Spoken Document Retrieval using Term Association Matrices""6338  
 Chien-Lin Huang (National Institute of Information and Communications Technology, Japan); Chiori Hori (NICT, Japan)

SLTC-P12.13 Strategies For Vietnamese Keyword Search""6343  
Nancy F. Chen (Institute for Infocomm Research, Singapore); Sunil Sivadas (Institute for Infocomm Research, Singapore); Boon Pang Lim (Institute for Infocomm Research, Singapore); Hoang Gia Ngo (National University of Singapore, Singapore); Haihua Xu (Nanyang Technological University, Singapore); Van Tung Pham (Nanyang Technological University, Singapore); Bin Ma (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

### SPTM-P10: Signal Sampling, Sensing and Reconstruction I

Room: Poster Area 3

Chair: Geert Leus (Delft University of Technology, The Netherlands)

SPTM-P10.1 A Sub-Band Based Reconstructor for M-Channel Time-Interleaved ADCs with Missing Samples""6348

Anu Kalidas M Pillai (Linköping University, Sweden); Hakan Johansson (University of Linköping, Sweden)

SPTM-P10.2 Minimum Fourier Measurements for Stable Recovery of Block Sparse Signal""6353

Junjie Pan (Zhejiang University, P.R. China); Feifei Gao (Tsinghua University, P.R. China)

SPTM-P10.3 Modified Adaptive Basis Pursuits for Recovery of Correlated Sparse Signals""6358

Sathya Narayanan (Nanyang Technological University, Singapore); Sujit Kumar Sahoo (Nanyang Technological University, Singapore); Anamitra Makur (Nanyang Technological University, Singapore)

SPTM-P10.4 Band-Limited Extrapolation on the Sphere for Signal Reconstruction in the Presence of Noise""6363

Yibeltal Fantahun Alem (The Australian National University, Australia); Zubair Khalid (The Australian National University, Australia); Rodney Andrew Kennedy (The Australian National University, Australia)

SPTM-P10.5 combining Spread Spectrum Compressive sensing with Rakeness for low frequency modulation in RMPI architecture""6368

Mauro Mangia (University of Bologna, Italy); Riccardo Rovatti (ARCES, Italy); Gianluca Setti (University of Ferrara, Italy); Pierre Vandergheynst (EPFL, Switzerland)

SPTM-P10.6 A Homotopy Recursive-in-Model-Order Algorithm for Weighted Lasso""6373

Zbynek Koldovsky (Technical University of Liberec, Czech Republic); Petr Tichavsky (Academy of Sciences of the Czech Republic, Czech Republic)

SPTM-P10.7 Fused Lasso with a Non-Convex Sparsity Inducing Penalty""6378

Ilker Bayram (Istanbul Technical University, Turkey); Po-Yu Chen (Polytechnic Institute of New York University, USA); Ivan Selesnick (Polytechnic University, USA)

SPTM-P10.8 Practical ReProCS for Separating Sparse and Low-dimensional Signal Sequences from their Sum -- Part 1""6383

Han Guo (Iowa State University, USA); Chenlu Qiu (Traffic Management Research Institute of the Ministry of Public Security, P.R. China); Namrata Vaswani (Iowa State University, USA)

SPTM-P10.9 Compressed Sensing for Block-Sparse Smooth Signals""6388

Shahzad Gishkori (Delft University of Technology, The Netherlands); Geert Leus (Delft University of Technology, The Netherlands)

SPTM-P10.10 Compressive Circulant Matrix Based Analog to Information Conversion""P 10

Jingchao Zhang (Harbin Institute of Technology, P.R. China); Ning Fu (Harbin Institute of Technology, P.R. China); Xiyuan Peng (Harbin Institute of Technology, P.R. China)

SPTM-P10.11 Time-Varying Filtering and Separation of Nonstationary FM Signals in Strong Noise Environments""6393

Haijian Zhang (Nanyang Technological University, Singapore); Guoan Bi (Nanyang Technological University, Singapore); Lifan Zhao (Nanyang Technological University, Singapore); Sirajudeen Gulam Razul (Nanyang Technological University, Singapore); Chong Meng Samson See (TL@NTU, Singapore)

SPTM-P10.12 The natural scale of signals: pulse duration and superoscillations""6398

Paulo Ferreira (University of Aveiro, Portugal); Armando J Pinho (University of Aveiro, Portugal)

SPTM-P10.13 System Approximation with General Measurement Functionals""63: 2

Holger Boche (Technical University Munich, Germany); Ullrich J Mönich (Massachusetts Institute of Technology, USA)

SPTM-P10.14 Active Target Detection with Mobile Agents""63: 7

Sunav Choudhary (University of Southern California, USA); Naveen Kumar (University of Southern California, USA); Shrikanth Narayanan (University of Southern California, USA); Urbashi Mitra (University of Southern California, USA)

### SPTM-P11: Estimation

Room: Poster Area 4

Chair: Alle-Jan van der Veen (TU Delft, The Netherlands)

SPTM-P11.1 Robust Measure Transformed MUSIC for DOA Estimation""63: 2

Koby Todros (Ben Gurion University of the Negev, Israel); Alfred Hero III (University of Michigan, USA)

SPTM-P11.2 Monte-Carlo estimation from observation on Stiefel manifold""63: 7

Jérémie Boulanger (Gipsa-Lab, France); Nicolas Le Bihan (GIPSA-Lab, CNRS, France); Salem Said (The University of Melbourne, Australia); Jonathan H. Manton (School of Engineering, The University of Melbourne, Australia)

SPTM-P11.3 Quasi-maximum likelihood estimator of multiple polynomial-phase signals""6422

Marko Simeunović (University of Montenegro, Montenegro); Slobodan Djukanović (University of Montenegro, Montenegro); Igor Djurović (University of Montenegro, Montenegro)

SPTM-P11.4 Distance Estimation Based on Phase Detection with Robust Chinese Remainder Theorem""6426



Xiaoping Li (Xi'an Jiaotong University, P.R. China); Wenjie Wang (Xi'an Jiaotong University, P.R. China); Bin Yang (Xi'an Jiaotong University, P.R. China); Qinye Yin (Xi'an Jiaotong University, P.R. China)

SPTM-P11.5 A Hybrid Data Association Model for Efficient Multi-Target Maximum Likelihood Estimation<sup>642</sup>;  
 Marcus Baum (University of Connecticut, USA); Peter Willett (University of Connecticut, USA)

SPTM-P11.6 RSS-based Localization in Non-homogeneous Environments<sup>6436</sup>  
 Francesco Bandiera (University of Salento, Italy); Angelo Coluccia (University of Salento, Italy); Giuseppe Ricci (University of Salento, Lecce, Italy); Andrea Toma (University of Salento, Italy)

SPTM-P11.7 A New Importance-Sampling ML Estimator of Time Delays and Angles of Arrival in Multipath Environments<sup>643</sup>;  
 Faouzi Bellili (Institut national de la recherche scientifique, Canada); Souheib Ben Amor (INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Abdelazize Samet (INRS-EMT, Canada)

SPTM-P11.8 Sparse Gaussian Noisy Independent Component Analysis<sup>6446</sup>  
 Frosti Pálsson (University of Iceland, Iceland); Magnus Ulfarsson (University of Iceland, Iceland); Johannes Sveinsson (University of Iceland, Iceland)

SPTM-P11.9 Vector l0 Latent-Space Principal Component Analysis<sup>644</sup>;  
 Martin Luessi (MGH Martinos Center for Biomedical Imaging, Harvard Medical School, USA); Matti S Hämäläinen (MGH Hospital, USA); Victor Solo (University of New South Wales, Australia)

SPTM-P11.10 Sparse Component Analysis via dyadic Cyclic Descent<sup>6456</sup>  
 Magnus Ulfarsson (University of Iceland, Iceland); Victor Solo (University of New South Wales, Australia)

SPTM-P11.11 Blind Separation of Dependent Sources With a Bounded Component Analysis Deflationary Algorithm<sup>P IC</sup>  
 Pablo Aguilera Bonet (University of Seville, Spain); Sergio Cruces (University of Seville, Spain); Ivan Duran Diaz (University of Seville, Spain); Auxiliadora Sarmiento Vega (University of Seville, Spain); Danilo Mandic (Imperial College, London, United Kingdom)

SPTM-P11.12 On Blind Channel Identification and Equalization Over Galois Fields<sup>645</sup>;  
 Arie Yeredor (Tel-Aviv University, Israel)

SPTM-P11.13 Robust Blind Calibration via Total Least Squares<sup>6466</sup>  
 John Lipor (University of Michigan, USA); Laura Balzano (University of Michigan, USA)

SPTM-P11.14 An Optimum Shrinkage Estimator Based on Minimum Probability of Error Criterion and Application to Signal Denoising<sup>646</sup>;  
 Jishnu Sadasivan (Indian Institute of Science, India); Subhadip Mukherjee (Indian Institute of Science, India); Chandra Sekhar Seelamantula (Indian Institute of Science, India)

**SPCOM-P6: Channel models, and source, channel and network coding**

Room: Poster Area 5

Chair: Philippe Ciblat (Telecom ParisTech, France)

SPCOM-P6.1 Analog Joint Source Channel Coding for Block Fading Multiple Access Channels<sup>6476</sup>  
 Óscar Fresnedo (University of A Coruña, Spain); Mohamed Hassanin (University of Delaware, USA); Luis Castedo (University of A Coruña, Spain); Javier Garcia-Frias (University of Delaware, USA)

SPCOM-P6.2 Optimization of zero-delay mappings for distributed coding by deterministic annealing<sup>647</sup>;  
 Mustafa Mehmetoglu (University of California, Santa Barbara, USA); Emrah Akyol (University of Southern California, USA); Kenneth Rose (University of California, Santa Barbara, USA)

SPCOM-P6.3 Analog Joint Source Channel Coding For Gaussian Broadcast Channels<sup>6486</sup>  
 Mohamed Hassanin (University of Delaware, USA); Javier Garcia-Frias (University of Delaware, USA); Luis Castedo (University of A Coruña, Spain)

SPCOM-P6.4 Variable-Length Versus Fixed-Length Coding: On Tradeoffs for Soft-Decision Decoding<sup>648</sup>;  
 Sai Han (Technische Universität Braunschweig, Germany); Tim Fingscheidt (Technische Universität Braunschweig, Germany)

SPCOM-P6.5 Asymptotic Analysis and Design of LDPC Codes for Laurent-based Optimal and Suboptimal CPM Receivers<sup>6496</sup>  
 Tarik Benaddi (IRIT & CNES, France); Charly Poulliat (INP - ENSEEIHT Toulouse, France); Marie-Laure Boucheret (University of Toulouse IRIT Enseeiht, France); Benjamin Gadat (Thales Alenia Space, France); Guy Lesthievant (CNES, France)

SPCOM-P6.6 Achieving Full-Diversity And Fast Maximum Likelihood Decoding In Asynchronous Analog Network Coding<sup>649</sup>;  
 Yun Liu (The Chinese University of Hong Kong, Hong Kong); Wei Zhang (The University of New South Wales, Australia); Soung Chang Liew (The Chinese University of Hong Kong, Hong Kong); Pc Ching (The Chinese University of Hong Kong, Hong Kong)

SPCOM-P6.7 A Study on the Statistical Modeling of Fading and its Effects on System Performance Using SIRP and SDP Methods<sup>64: 6</sup>  
 Cheng-An Yang (University of California, Los Angeles, USA); Kung Yao (UCLA, USA); Ezio Biglieri (Universitat Pompeu Fabra, Barcelona, Spain)

SPCOM-P6.8 Geometry-Based Stochastic Modeling and Estimation of Vehicle to Vehicle Channels<sup>64: ;</sup>  
 Sajjad Beygi (University of Southern California, USA); Erik G Ström (Chalmers University of Technology, Sweden); Urbashi Mitra (University of Southern California, USA)

SPCOM-P6.9 A Grey-Box Modelling Approach for the Nonlinear Parametric Channel<sup>64: 6</sup>  
 Karsten Wiedmann (University of Rostock, Germany); Tobias Weber (Uni Rostock, Germany)

SPCOM-P6.10 Multi-scale Multi-lag Channel Estimation using Low rank Structure of Received Signal<sup>64: ;</sup>  
 Sajjad Beygi (University of Southern California, USA); Urbashi Mitra (University of Southern California, USA)

## IVMSP-P8: Image Feature Extraction

Room: Poster Area 6

Chair: Lina Karam (Arizona State University, USA)

IVMSP-P8.1 Multi-image aggregation for better visual object retrieval""6526

Cai-Zhi Zhu (National Institute of Informatics, Japan); Yu-Hui Huang (RWTH Aachen University, Germany); Shin'ichi Satoh (National Institute of Informatics, Japan)

IVMSP-P8.2 Investigating and Predicting Social and Visual Image Interestingness on Social Media by Crowdsourcing""652;

Liang-Chi Hsieh (National Taiwan University, Taiwan); Winston Hsu (National Taiwan University, Taiwan); Hao-Chuan Wang (National Tsing Hua University, Taiwan)

IVMSP-P8.3 Sparse Moving Factorization for Subspace Video Stabilization""6536

Chengzhou Tang (Peking University, P.R. China); Ronggang Wang (Peking University, P.R. China)

IVMSP-P8.4 A Scale-Adaptive Extension to Methods based on LBP using Scale-

Normalized Laplacian of Gaussian Extrema in Scale-Space""653;

Sebastian Hegenbart (University of Salzburg, Austria); Andreas Uhl (Salzburg University, Austria)

IVMSP-P8.5 Individualized Matching Based On Logo Density For Scalable Logo Recognition""6546

Yuan Zhang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Shuwu Zhang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Wei Liang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Qin-Zhen Guo (Institute of Automation, Chinese Academy of Sciences, P.R. China)

IVMSP-P8.6 Finger detection and Hand Posture Recognition Based on Depth Information""654;

Stergios Poularakis (University of Thessaly, Greece); Ioannis Katsavounidis (University of Thessaly, Greece)

IVMSP-P8.7 Change detection based on features invariant to monotonic transforms and spatial constrained matching""6556

Marco Rodrigues (Federal University of Minas Gerais, Brazil); Luciano Milen (UFMG, Brazil); Erickson Nascimento (Universidade Federal de Minas Gerais (UFMG), Brazil); William Robson Schwartz (Federal University of Minas Gerais, Brazil)

IVMSP-P8.8 Change Detection on SAR Images Using Divisive Normalization-based Image Representation""655;

Qian Xu (Arizona State University, USA); Lina Karam (Arizona State University, USA)

IVMSP-P8.9 Motion detection with spatiotemporal sequences""6566

Tong Zhang (Southeast University, P.R. China); Haixian Wang (Southeast University, P.R. China)

IVMSP-P8.10 A Vanishing Point-Based Global Descriptor for Manhattan Scenes""656;

Rohit Naini (University of Illinois, USA); Shantanu Rane (Mitsubishi Electric Research Laboratories, USA); Srikumar Ramalingam (Mitsubishi Electric Research Laboratories, USA)

IVMSP-P8.11 People Counting With Image Retrieval Using Compressed Sensing""6576

Homa Foroughi (University of Alberta, Canada); Nilanjan Ray (University of Alberta, Canada); Hong Zhang (University of Alberta, Canada)

IVMSP-P8.12 Intrinsic prior for Bayesian classification of texture images""657;

Aurélien Jean Schutz (University of Bordeaux & IMS Laboratory, France); Lionel Bombrun (IMS Laboratory - University Bordeaux & Groupe Signal, France); Yannick Berthoumiou (Institut Polytechnique de Bordeaux & IMS Laboratory - Signal and Image Group, France)

IVMSP-P8.13 Information bottleneck-based relevant knowledge representation in large-scale video surveillance systems""6586

Simone Chiappino (University of Genoa, Italy); Lucio Marcenaro (Università degli Studi di Genova, Italy); Carlo S Regazzoni (University Of Genova, Italy)

IVMSP-P8.14 Functional Relevant Multichannel Kernel Adaptive Filter for Human Activity Analysis""658;

Andres Alvarez-Meza (Universidad Nacional de Colombia - Signal Processing and Recognition Group, Colombia); German Castellanos-Dominguez (, Colombia); Jose Principe (University of Florida, USA)

## BISP-P4: Signal detection in biomedical applications

Room: Poster Area 7

BISP-P4.1 Physiological Parameter Monitoring of Drivers based on Video Data and Independent Vector Analysis""6596

Zhenyu Guo (University of British Columbia, Canada); Z. Jane Wang (University of British Columbia, Canada); Zhiqi Shen (Nanyang Technological University, Singapore)

BISP-P4.2 Non-Invasive Monitoring Of Fetal Movements Using Time-Frequency Features Of Accelerometry""659;

Siamak Layeghy (The University of Queensland, Australia); Ghasem Azemi (UQ, Brisbane, Australia); Paul B Colditz (University of Queensland, Australia); Boualem Boashash (Qatar University, Doha & University of Queensland, Brisbane, Australia)

BISP-P4.3 Real-Time Swallowing Detection Based on Tracheal Acoustics""65: 6

Temiloluwa Olubanjo (Georgia Institute of Technology, USA); Maysam Ghovanloo (Georgia Institute of Technology, USA)

BISP-P4.4 Fuzzy Logic Based Emotion Classification""65: ;

Joseph W Matiko (University of Southampton, United Kingdom); Stephen Beeby (University of Southampton, United Kingdom); John Tudor (University of Southampton, United Kingdom)

BISP-P4.5 Mobile real-time arousal detection""65; 6

Vasileios Alexandratos (Technical University of Delft, The Netherlands); Murtaza Bulut (Philips Research, The Netherlands); Radu Jasinschi (Philips Research, The Netherlands)

BISP-P4.6 Design of a reliable processing pipeline for the non-intrusive measurement of feet trajectories with lasers<sup>65</sup>;

Sébastien Piérard (University of Liège, Belgium); Samir Azroul (University of Liège, Belgium); Marc Van Droogenbroeck (Université de Liège & Intelsig, Belgium)

BISP-P4.7 PhotoECG: Photoplethysmography to Estimate ECG Parameters<sup>662</sup>

Rohan Banerjee (Tata Consultancy Services Limited, India); Aniruddha Sinha (Tata Consultancy Services, India); Anirban Dutta Choudhury (Tata Consultancy Services, India); Aishwarya Visvanathan (Tata Consultancy Services, India)

BISP-P4.8 Power-Efficient Joint Compressed Sensing of Multi-Lead ECG Signals<sup>662</sup>;

Hossein Mamaghanian (EPFL, Switzerland); Giovanni Ansaloni (EPFL, Switzerland); David Atienza (EPFL, Switzerland); Pierre Vanderghelynst (EPFL, Switzerland)

BISP-P4.9 A weighted  $l_1$  minimization algorithm for compressed sensing ECG<sup>663</sup>

Luisa Polania (University of Delaware, USA); Kenneth Barner (University of Delaware, USA)

BISP-P4.10 Robust classification between normal and abnormal lung sounds using adventitious-sound and heart-sound models<sup>663</sup>;

Masaru Yamashita (Nagasaki University, Japan); Masataka Himeshima (Nagasaki University, Japan); Shoichi Matsunaga (Nagasaki University, Japan)

BISP-P4.11 Compressive Sensing of ECG Signals Based on Mixed Pseudonorm of the First- and Second-Order Differences<sup>664</sup>

Jeevan Pant (Ryerson University, Canada); Sri Krishnan (Ryerson University, Canada)

BISP-P4.12 Online Bayesian Apnea-Bradycardia Detection using Auto-Regressive Models<sup>664</sup>;

Di GE (University of Rennes 1, France); Alfredo Hernández (INSERM, France); Guy Carrault (Université de Rennes, France)

BISP-P4.13 Learning-based Heart Rate Detection from Remote Photoplethysmography Features<sup>665</sup>

YungChien Hsu (National Taiwan University, Taiwan); Yen-Liang Lin (National Taiwan University, Taiwan); Winston Hsu (National Taiwan University, Taiwan)

BISP-P4.14 Fetal Heart Rate Detection Using VPW-FRI<sup>665</sup>;

Amrith Nair (Nanyang Technological University, Singapore); Pina Marziliano (Nanyang Technological University, Singapore)

## AASP-P6: Spatial Audio II, Signal Enhancement II

Room: Poster Area 8

Chair: Dorothea Kolossa (Ruhr-Universität Bochum, Germany)

AASP-P6.1 Sparse Sound Field Representation in Recording and Reproduction for Reducing Spatial Aliasing Artifacts<sup>666</sup>

Shoichi Koyama (Nippon Telegraph and Telephone Corporation, Japan); Suehiro Shimauchi (NTT Media Intelligence Laboratories, NTT Corporation, Japan); Hitoshi Ohmuro (NTT, Japan)

AASP-P6.2 Robust beamforming under uncertainties in the loudspeakers directivity pattern<sup>666</sup>;

Lucio Bianchi (Politecnico di Milano, Italy); Roberto Magalotti (B&C Speakers, Italy); Fabio Antonacci (Politecnico di Milano, Italy); Augusto Sarti (Politecnico di Milano, Italy); Stefano Tubaro (Politecnico di Milano, Italy)

AASP-P6.3 The Design of Ambisonic Reproduction System based on Dynamic Gain Parameters<sup>667</sup>

Bing Bu (Beijing University of Technology, P.R. China); Changchun Bao (Beijing University of Technology, P.R. China); Mao-shen Jia (Beijing University of Technology, P.R. China); Rong Zhu (Beijing University of Technology, P.R. China)

AASP-P6.4 Fast Modelling of Pinna Spectral Notches from HRTFs using Linear Prediction Residual Cepstrum<sup>667</sup>;

Chaitanya Ahuja (Indian Institute of Technology Kanpur, India); Rajesh M Hegde (Indian Institute of Technology Kanpur, India)

AASP-P6.5 Enhancing Vertical Localization with Image-guided Selection of Non-individual Head-Related Transfer Functions<sup>668</sup>

Michele Geronazzo (University of Padova, Italy); Simone Spagnol (University of Padova, Italy); Alberto Bedin (University of Padova, Italy); Federico Avanzini (University of Padova, Italy)

AASP-P6.6 HRTF Magnitude Synthesis via Sparse Representation of Anthropometric Features<sup>668</sup>;

Piotr Bilinski (INRIA, France); Jens Ahrens (University of Technology Berlin, Germany); Mark R. P. Thomas (Microsoft Research, USA); Ivan J. Tashev (Microsoft Research, USA); John Platt (Microsoft, USA)

AASP-P6.7 Anthropometric-based customization of Head-Related Transfer Functions using Isomap in the horizontal plane<sup>669</sup>

Felipe Grijalva (University of Campinas, Brazil); Luiz Martini (University of Campinas, Brazil); Siome Goldenstein (State University of Campinas, Brazil); Dinei Florencio (Microsoft Research, USA)

AASP-P6.8 MMSE-Optimal Enhancement of Complex Speech Coefficients With Uncertain Prior Knowledge of the Clean Speech Phase<sup>669</sup>;

Timo Gerkmann (University of Oldenburg, Germany)

AASP-P6.9 Speech Enhancement using Segmental Nonnegative Matrix Factorization<sup>66</sup>;

Hao-teng Fan (National Chi Nan University, Taiwan); Jehi-weih Hung (National Chi Nan University, Taiwan); Xugang Lu (NICT, Japan); Syu-Siang Wang (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Yu Tsao (Research Center for Information Technology Innovation, Academia Sinica, Taiwan)

AASP-P6.10 An Evaluation of Excitation Feature Prediction in A Hybrid Approach to Electrolaryngeal Speech Enhancement<sup>66</sup> :

Kou Tanaka (Graduate School of Information Science, Nara Institute of Science and Technology, Japan); Tomoki Toda (NAIST, Japan); Graham Neubig (Graduate School of Information Science, Nara Institute of Science and Technology, Japan); Sakriani Sakti (NAIST, Japan); Satoshi Nakamura (Nara Institute of Science and Technology, Japan)

AASP-P6.11 ML Estimation of Memoryless Nonlinear Distortions in Audio Signals<sup>66</sup>; 5  
Flavio Avila (UERJ, Brazil); Luiz W. P. Biscainho (UFRJ, Brazil)

### MLSP-P3: Learning theory I

Room: Poster Area 9

Chair: Cédric Richard (Université de Nice Sophia-Antipolis, France)

MLSP-P3.1 Network Inference and Change Point Detection for Piecewise-Stationary Time Series<sup>66</sup>; :

Hang Yu (Nanyang Technological University, Singapore); Chenyang Li (Nanyang Technological University, Singapore); Justin Dauwels (Nanyang Technological University, Singapore)

MLSP-P3.2 A Maximal Figure-of-Merit Learning Approach to Maximizing Mean Average Precision with Deep Neural Network Based Classifiers<sup>6725</sup>

Kehuang Li (Georgia Institute of Technology, USA); Zhen Huang (Georgia Institute of Technology, USA); You-Chi Cheng (Georgia Institute of Technology, USA); Chin-Hui Lee (Georgia Institute of Technology, USA)

MLSP-P3.3 An Efficient Sparse Kernel Adaptive Filtering Algorithm Based on Isomorphism Between Functional Subspace and Euclidean Space<sup>672</sup>:

Masa-aki Takizawa (Keio University, Japan); Masahiro Yukawa (Keio University, Japan)

MLSP-P3.4 Improved Convergence Performance of Adaptive Algorithms Through Logarithmic Cost<sup>6735</sup>

Muhammed Sayin (Bilkent University, Turkey); Nuri Denizcan Vanli (Bilkent University, Turkey); Suleyman Serdar Kozat (Bilkent University, Turkey)

MLSP-P3.5 Mixed Maps for Learning a Kolmogoroff-Nagumo-Type Average Element on the Compact Stiefel Manifold<sup>673</sup>:

Simone Fiori (Università Politecnica delle Marche, Italy); Tetsuya Kaneko (Tokyo University of Agriculture and Technology, Japan); Toshihisa Tanaka (Tokyo University of Agriculture and Technology, Japan)

MLSP-P3.6 Estimators for Unnormalized Statistical Models Based On Self Density Ratio<sup>6745</sup>

Kazuyuki Hiraoka (Wakayama National College of Technology, Japan); Toshihiko Hamada (Wakayama National College of Technology, Japan); Gen Hori (Asia University & RIKEN, Japan)

MLSP-P3.7 Clustering Based Online Learning in Recommender Systems: A Bandit Approach<sup>674</sup>:

Linqi Song (University of California, Los Angeles, USA); Cem Tekin (University of California, Los Angeles, USA); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)

MLSP-P3.8 Looking for the Same Needle in Multiple Haystacks: Performance Bounds<sup>6755</sup>

Raviv Raich (Oregon State University, USA); Zeyu You (Oregon State University, USA)

MLSP-P3.9 Projentropy: Using entropy to optimize spatial projections<sup>675</sup>:

Austin Brockmeier (University of Florida, USA); Eder Santana (University of Florida, USA); Luis Sanchez Giraldo (University of Florida, USA); Jose Principe (University of Florida, USA)

MLSP-P3.10 Improving The Tracking Ability of KRLS Using Kernel Subspace Pursuit<sup>6765</sup>  
Jad Kabbara (McGill University, Canada); Ioannis Psaromiligkos (McGill University, Canada)

MLSP-P3.11 Non-uniform Feature Sampling for Decision Tree Ensembles<sup>676</sup>:  
Anastasios Kyrillidis (IBM Research & IBM Research Lab Zurich, Switzerland); Anastasios Zouzias (IBM Research, Switzerland)

MLSP-P3.12 Extreme-Value Graphical models with Multiple Covariates<sup>6775</sup>

Hang Yu (Nanyang Technological University, Singapore); Jingjing Cheng (Nanyang Technological University, Singapore); Justin Dauwels (Nanyang Technological University, Singapore)

MLSP-P3.13 Learning Multiple Concepts with Incremental Diverse Density<sup>677</sup>:

James Gibson (University of Southern California, USA); Shrikanth Narayanan (University of Southern California, USA)

### MMSP-P3: Multimedia and Multimodal Signal Processing II

Room: Poster Area 10

Chair: Stefano Tubaro (Politecnico di Milano, Italy)

MMSP-P3.1 Audio Tampering Detection Using Multimodal Features<sup>6785</sup>

Simone Milani (Politecnico di Milano & University of Padova, Italy); Pier Francesco Piazza (Politecnico di Milano, Italy); Paolo Bestagini (Politecnico di Milano, Italy); Stefano Tubaro (Politecnico di Milano, Italy)

MMSP-P3.2 Synthesizing Real-time Speech-Driven Facial Animation<sup>678</sup>:

Changwei Luo (University of Science and Technology of China, P.R. China); Jun Yu (University of Science and Technology of China, P.R. China); Zengfu Wang (University of Science and Technology of China, P.R. China)

MMSP-P3.3 Speech driven talking head from estimated articulatory features<sup>6795</sup>

Atef Ben Youssef (University of Edinburgh & Centre for Speech Technology Research, United Kingdom); Hiroshi Shimodaira (University of Edinburgh, United Kingdom); David Braude (University of Edinburgh, United Kingdom)

MMSP-P3.4 Evaluation of HMM-based visual laughter synthesis<sup>679</sup>:

Huseyin Cakmak (University of Mons, Belgium); Jerome Urbain (University of Mons, Belgium); Joelle Tilmann (University of Mons, Belgium); Thierry Dutoit (FPMS, Belgium)

MMSP-P3.5 Sentiment retrieval on web reviews using spontaneous natural speech<sup>67</sup>: 5

Jose Costa Pereira (University of California, San Diego, USA); Jordi Luque (Telefonica I+D, Spain); Xavier Anguera (Telefonica Research, Spain)

MMSP-P3.6 Detecting Planar Surface Using a Light-Field Camera with Application to Distinguishing Real Scenes From Printed Photos<sup>67</sup>: :

Alireza Ghasemi (EPFL, Switzerland); Martin Vetterli (EPFL, Switzerland)

MMSP-P3.7 Power-Spectral Analysis of Head Motion Signal for Behavioral Modeling in Human Interaction<sup>67</sup>; 5

Bo Xiao (University of Southern California, USA); Panayiotis Georgiou (University of Southern California, USA); Brian Baucom (University of Utah, USA); Shrikanth Narayanan (University of Southern California, USA)

MMSP-P3.8 Late Fusion and Calibration for Multimedia Event Detection Using Few Examples<sup>67</sup>;

Julien van Hout (SRI International, USA); Eric Yeh (SRI International, USA); Dennis Koelma (University of Amsterdam, The Netherlands); Cees GM Snoek (University of Amsterdam, The Netherlands); Chen Sun (University of Southern California, USA); Ramakant Nevatia (USC, USA); Julie Wong (SRI International, USA); Gregory Myers (SRI International, USA)

MMSP-P3.9 Temporal Synchronization of Multiple Audio Signals<sup>6825</sup>

Julius Kammerl (Google Inc., USA); Neil Birkbeck (Google Inc., USA); Sasi Inguva (Google Inc., USA); Damien Kelly (Google Inc., USA); Andy Crawford (Google Inc., USA); Hugh Denman (Google Inc., USA); Anil Kokaram (Google Inc., USA); Caroline Pantofaru (Google Inc., USA)

MMSP-P3.10 Human Action Recognition using Associated Depth and Skeleton Information<sup>682</sup>:

Nick C. Tang (Academia Sinica, Taiwan); Yen-Yu Lin (Academia Sinica, Taiwan); Ju-Hsuan Hua (Academia Sinica, Taiwan); Ming-Fang Weng (Institute for Information Industry, Taiwan); Mark Liao (Academia Sinica, Taiwan)

MMSP-P3.11 Exploring the use of ENF for multimedia synchronization<sup>6835</sup>

Hui Su (University of Maryland, USA); Adi Hajj-Ahmad (University of Maryland, College Park, USA); M Wu (University of Maryland, USA); Douglas Oard (University of Maryland, USA)

MMSP-P3.12 Continuous Visual Speech Recognition for Multimodal Fusion<sup>683</sup>:

Eric Benhaim (Télécom ParisTech, France); Hichem Sahbi (Telecom ParisTech, France); Guillaume Vitte (Parrot SA, France)

**10:30 AM - 11:00 AM**

**Coffee break**

**11:00 AM - 1:00 PM**

**SLTC-L8: Speech Intelligibility Enhancement**

Room: Cavaniglia

Chairs: Rainer Martin (Ruhr-University Bochum, Germany), Yannis Stylianou (University of Crete, Greece)

11:00 Deep Recurrent De-Noising Auto-Encoder and blind de-reverberation for reverberated speech recognition<sup>6845</sup>

Felix J Weninger (Mitsubishi Electric Research Laboratories, Germany); Shinji Watanabe (Mitsubishi Electric Research Laboratories, USA); Yuuki Tachioka (Mitsubishi Electric Corporation, Japan); Björn W Schuller (Imperial College London & Technische Universität München, Germany)

11:20 Learning Spectral Mapping for Speech Dereverberation<sup>684</sup>:

Kun Han (The Ohio State University, USA); Yuxuan Wang (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

11:40 Restoration of Instantaneous Amplitude and Phase using Kalman filter for Speech Enhancement<sup>6855</sup>

Naushin Nower (JAIST, Japan); Yang Liu (JAIST, Japan); Unoki Masashi (Japan Advanced Institute of Science and Technology, Japan)

12:00 On the use of Early-to-Late Reverberation Ratio for ASR in reverberant environments<sup>685</sup>:

Alessio Brutti (Fondazione Bruno Kessler, Italy); Marco Matassoni (Fondazione Bruno Kessler, Italy)

12:20 Comparison of post-processing methods for intelligibility enhancement of narrowband speech in a mobile phone framework<sup>6865</sup>

Emma Jokinen (Aalto University, Finland); Marko Takanen (Aalto University, Finland); Paavo Alku (Aalto University, Finland)

12:40 Simple and artefact-free spectral modifications for enhancing the intelligibility of casual speech<sup>686</sup>:

Maria Koutsogiannaki (University of Crete & FORTH, Greece); Yannis Stylianou (University of Crete, Greece)

**SPTM-L6: Performance Analysis and Bounds**

Room: Basilica

Chairs: Kutluyıl Doğançay (University of South Australia, Australia), K. v. s. Hari (Indian Institute of Science, India)

11:00 Performance Bounds for Joint Estimation of Ionospheric and Target Parameters in MIMO-OTH Radar<sup>6875</sup>

Mao Li (University of Electronic Science and Technology of China, P.R. China); Qian He (University of Electronic Science and Technology of China, P.R. China); Zi-Shu He (University of Electronics Science and Technology of China, P.R. China); Rick Blum (Lehigh University, USA)

11:20 Waveform Selection for Range and Doppler Estimation via Barankin Bound Signal-to-Noise Ratio Threshold<sup>687</sup>:

John Kota (Arizona State University, USA); Narayan Kovvali (Arizona State University, USA); Daniel W. Bliss (Arizona State University, USA); Antonia Papandreou-Suppappola (Arizona State University, USA)

11:40 A Ziv-Zakai type bound for hybrid parameter estimation<sup>6885</sup>

Chengfang Ren (Université Paris-Sud/LSS, France); Jérôme Galy (LIRMM Montpellier, France); Eric Chaumette (ONERA, France); Pascal Larzabal (ENS-Cachan, PARIS, France); Alexandre Renaux (Université Paris 11, France)

12:00 Fundamental Localization Accuracy in Narrowband Array-based Systems<sup>688</sup>:

Yanjun Han (Tsinghua University, P.R. China); Huadong Meng (Tsinghua University, P.R. China); Yuan Shen (Massachusetts Institute of Technology, USA); Yimin Liu (Tsinghua University, P.R. China)

12:20 Ziv-Zakai Bound for Time Delay Estimation of Unknown Deterministic Signals<sup>6895</sup>

Nicolò Decarli (University of Bologna, Italy); Davide Dardari (University of Bologna, Italy)

12:40 Approximate Least Squares<sup>689</sup>:

Michael Lunglmayr (University of Klagenfurt, Austria); Christoph Unterrieder (University of Klagenfurt, Austria); Mario Huemer (Johannes Kepler University Linz, Austria)

### **BISP-L2: EEG data processing I**

Room: Polveriera

Chair: Ahmed Tewfik (University of Texas, Austin, USA)

11:00 Neural Decoding Using a Nonlinear Generative Model for Brain-Computer Interface""68: 5

Henrique Dantas (Universidade Federal de Pernambuco, USA); Spencer Kellis (California Institute of Technology, USA); V. John Mathews (University of Utah, USA); Bradley Greger (Arizona State University, USA)

11:20 Subspace Denoising of EEG Artefacts Via Multivariate EMD""68: :

David Looney (Imperial College London, United Kingdom); Valentin Goverdovsky (Imperial College London, United Kingdom); Preben Kidmose (Aarhus University, Denmark); Danilo Mandic (Imperial College, London, United Kingdom)

11:40 Bayesian detection of single-trial event-related potentials""68: 5

Maria Rosario Mestre (University of Cambridge, United Kingdom); Simon Godsill (University of Cambridge, United Kingdom); William Fitzgerald (University of Cambridge, United Kingdom)

12:00 Assessment of new spectral features for EEG-based emotion recognition""68: : Anne-Claire Conneau (Institut Mines-Telecom/Telecom ParisTech & CNRS-LTCL, France); Slim ESSID (Telecom ParisTech & CNRS/LTCL, France)

12:20 Synchrony Analysis of Paroxysmal Gamma Waves in Meditation EEG""6925

Jin Jing (Nanyang Technological University & School of Electrical and Electronic Engineering, Singapore); Justin Dauwels (Nanyang Technological University, Singapore); Francois-Benois Vialatte (Laboratoire SIGMA, France); Andrzej S Cichocki (RIKEN BSI, Laboratory for Advanced Brain Signal Processing, Japan)

12:40 Reduced-rank neural activity index for EEG/MEG multi-source localization""692:

Tomasz Piotrowski (Nicolaus Copernicus University, Poland); Dania Gutierrez (Center for Research and Advanced Studies & Monterrey's Unit, Mexico); Isao Yamada (Tokyo Institute of Technology, Japan); Jarosław Żygierewicz (University of Warsaw, Poland)

### **AASP-L4: Sound Field Analysis and Reproduction**

Room: Scherma

Chairs: Jean-Marc Jot (DTS, Inc., USA), Boaz Rafaely (Ben-Gurion University of the Negev, Israel)

11:00 Room Statistics and Direct-to-reverberant Ratio Estimation from Dual-channel Signals""6935

Eleftheria Georganti (University Hospital of Zurich, Switzerland); John Mourjopoulos (University of Patras, Greece); Steven van de Par (University of Oldenburg, Germany)

11:20 Non-intrusive estimation of the level of reverberation in speech""693:

Pablo Peso Parada (Nuance Communications, United Kingdom); Dushyant Sharma (Nuance Communications, United Kingdom); Patrick A Naylor (Imperial College London, United Kingdom)

11:40 A Method for Converting Between Cylindrical and Spherical Harmonic Representations of Sound Fields""6945

Mark R. P. Thomas (Microsoft Research, USA); Jens Ahrens (University of Technology Berlin, Germany); Ivan J. Tashev (Microsoft Research, USA)

12:00 Multizone Soundfield Reproduction In Reverberant Rooms Using Compressed Sensing Techniques""694:

Wenyu Jin (Victoria University of Wellington, New Zealand); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand)

12:20 Generation of multiple sound zones by spatial filtering in wavenumber domain using a linear array of loudspeakers""6955

Takuma Okamoto (National Institute of Information and Communications Technology, Japan)

12:40 PDE-based Interpolation Method for Optically Visualized Sound Field""695:

Kohei Yatabe (Waseda University, Japan); Yasuhiro Oikawa (Waseda University, Japan)

### **SPCOM-L4: Energy harvesting and management**

Room: Teatrino

Chair: Rui Zhang (National University of Singapore, Singapore)

11:00 Energy Consumption in multi-user MIMO systems: Impact of user mobility""6965

Luca Sanguinetti (University of Pisa, Italy); Aris Moustakas (University of Athens, Greece); Emil Björnson (Supélec & KTH, Sweden); Mérouane Debbah (Supélec, France)

11:20 Robust Transmit Designs for an Energy Harvesting Multicast System""696:

Xiaoxiao Wu (The Chinese University of Hong Kong, Hong Kong); Qiang Li (University of Electronic Science and Technology of China, P.R. China); Wing-Kin Ma (The Chinese University of Hong Kong, Hong Kong); Anthony Man-Cho So (The Chinese University of Hong Kong, Hong Kong)

11:40 Joint Transceiver design for MISO SWIPT interference channel""6975

Qingjiang Shi (Zhejiang Sci-Tech University, P.R. China); Cheng Peng (Zhejiang Sci-Tech University, P.R. China); Weiqiang Xu (Zhejiang Sci-Tech University, P.R. China); Yongchao Wang (Xidian University, P.R. China)

12:00 Energy-constrained Throughput Maximization for Point-to-Point Communications""697:

Qing Bai (Technische Universität München, Germany); Jingrui Li (Technische Universität München, Germany); Josef A. Nossek (TU Munich, Germany)

12:20 Energy Harvesting for Relay-Assisted Communications""6985

Arin Minasian (University of Toronto, Canada); Raviraj Adve (University of Toronto, Canada); Shahram ShabbazPanahi (University of Ontario Institute of Technology, Canada)

12:40 Interference Power Recycling in Two-Scale Ad Hoc Wireless Networks""698:

Javier Villares (Technical University of Catalonia, Spain); Josep Sala (Technical University of Catalonia, Spain); Francesc Rey (Universitat Politècnica de Catalunya, Spain)

### SS8: Social Nets: Learning and Optimization

Room: Volta

Chairs: Georgios B. Giannakis (University of Minnesota, USA), Gonzalo Mateos (University of Minnesota, USA)

11:00 State-Dependent Opinion Dynamics""6995

Daron Acemoglu (Massachusetts Institute of Technology, USA); Mohamed Mostagir (University of Michigan, USA); Asuman Ozdaglar (Massachusetts Institute of Technology, USA)

11:20 A Proximal Gradient Algorithm for Tracking Cascades Over Networks""699:

Brian Baingana (University of Minnesota, USA); Gonzalo Mateos (University of Minnesota, USA); Georgios B. Giannakis (University of Minnesota, USA)

11:40 Information aggregation in a beauty contest game""69: 5

Ceyhun Eksin (University of Pennsylvania, USA); Pooya Molavi (University of Pennsylvania, USA); Alejandro Ribeiro (University of Pennsylvania, USA); Ali Jadbabaie (University of Pennsylvania, USA)

12:00 Online ratings: convergence towards a positive perspective?""69: :

Yaonan Zhang (Boston University, USA); Theodoros Lappas (Boston University, USA); Mark Crovella (Boston University, USA); Eric Kolaczyk (Boston University, USA)

12:20 Towards a Spectral Characterization of Signals Supported on Small-World Networks""69: 5

Michael Rabbat (McGill University, Canada); Vincent Gripon (Telecom Bretagne, France)

12:40 Unsupervised Social Media Events Clustering using User-centric Parallel SPLIT-N-MERGE Algorithms""69: :

Minh-Son Dao (University of Information Technology, Vietnam, Japan); Anh Duc Duong (University of Information Technology-VNUHCM, Vietnam); Francesco De Natale G.B. De Natale (University of Trento, Italy)

### SLTC-P13: Paralinguistic Speech Recognition

Room: Poster Area 1

Chair: Nick Campbell (Trinity College Dublin, Canada)

SLTC-P13.1 Emotions Are A Personal Thing: Towards Speaker-Adaptive Emotion Recognition""6: 25

Maxim Sidorov (Ulm University, Germany); Stefan Ultes (Ulm University, Germany); Alexander Schmitt (University of Ulm & Dialogue Systems Group, Germany)

SLTC-P13.2 A Feature Selection and Feature Fusion Combination Method for Speaker-Independent Speech Emotion Recognition""6: 2:

Yun Jin (Southeast University, P.R. China); Peng Song (Southeast University, P.R. China); Wenming Zheng (Southeast University Nanjing, P.R. China); Li Zhao (Southeast University, P.R. China)

SLTC-P13.3 Automatic detection of expressed emotion in Parkinson's disease""6: 35  
Shunan Zhao (University of Toronto, Canada); Frank Rudzicz (University of Toronto, Canada); Leonardo Carvalho (University of Toronto, Canada); Cesar Márquez-Chin (Rehabilitation Engineering Laboratory, University of Toronto, Canada); Steven Livingstone (Ryerson University, Canada)

SLTC-P13.4 Introducing Shared-Hidden-Layer Autoencoders for Transfer Learning and their Application in Acoustic Emotion Recognition""6: 3:

Jun Deng (Technische Universität München, Germany); Rui Xia (The University of Texas at Dallas, USA); Zixing Zhang (Technische Universität München, Germany); Yang Liu (UT Dallas, USA); Björn W Schuller (Imperial College London & Technische Universität München, Germany)

SLTC-P13.5 Social Signal Classification Using Deep BLSTM Recurrent Neural Networks""6: 45

Raymond Brueckner (Technische Universität München & Nuance Communications Deutschland GmbH, Germany); Björn W Schuller (Imperial College London & Technische Universität München, Germany)

SLTC-P13.6 Visual-Only Discrimination between Native and Non-Native Speech""6: 4:  
Christos Georgakis (Imperial College London, United Kingdom); Stavros Petridis (Imperial College London, United Kingdom); Maja Pantic (Imperial College London, United Kingdom)

SLTC-P13.7 Simplified and Supervised i-vector Modeling for Speaker Age Regression""6: 55

Prashanth Gurusankar Shivakumar (University of Southern California & Signal Analysis and Interpretation Lab, USA); Ming Li (Sun Yat-sen University, P.R. China); Vedant Dhandhanian (University of Southern California, USA); Shrikanth Narayanan (University of Southern California, USA)

SLTC-P13.8 Affective language model adaptation via corpus selection""6: 5:

Nikolaos Malandrakis (University of Southern California, USA); Alexandros Potamianos (Technical University of Crete, Greece); Kean J Hsu (University of Southern California, USA); Kalina N Babeva (University of Southern California, USA); Michelle C Feng (University of Southern California, USA); Gerald C Davison (University of Southern California, USA); Shrikanth Narayanan (University of Southern California, USA)

SLTC-P13.9 Inferring social relationships in a phone call from a single party's speech""6: 65

Sree Harsha Yella (Idiap Research Institute, Switzerland); Xavier Anguera (Telefonica Research, Spain); Jordi Luque (Telefonica I+D, Spain)

SLTC-P13.10 Automatic Characterization of Speaking Styles in Educational Videos""6: 6:

Soroosh Mairioryad (The University of Texas at Dallas, USA); Anitha Kannan (Microsoft Research, USA); Dilek Hakkani-Tur (Microsoft Research, USA); Elizabeth Shriberg (International Computer Science Institute/Speech Technology & Research Laboratory, USA)

SLTC-P13.11 Automatic Analysis of Speech Quality for Aphasia Treatment""6: 75

Duc Le (University of Michigan, USA); Keli Licata (University of Michigan, USA); Elizabeth Mercado (University of Michigan, USA); Carol Persad

(University of Michigan, USA); Emily Mower Provost (University of Michigan, Ann Arbor, USA)

SLTC-P13.12 Ecologically Valid Long-term Mood Monitoring of Individuals with Bipolar Disorder Using Speech<sup>6</sup>: 7:  
 Zahi N Karam (University of Michigan, USA); Emily Mower Provost (University of Michigan, Ann Arbor, USA); Satinder Singh (University of Michigan, USA); Jennifer Montgomery (University of Michigan, USA); Christopher Archer (University of Michigan, USA); Gloria Harrington (University of Michigan, USA); Melvin Mcinnis (University of Michigan, USA)

SLTC-P13.13 Automatic Detection of Psychological Distress Indicators and Severity Assessment in Crisis Hotline Conversations<sup>6</sup>: 85  
 Maciej Pacula (Raytheon BBN Technologies, USA); Talya Meltzer (Raytheon BBN Technologies, USA); Michael R Crystal (Raytheon BBN Technologies, USA); Amit Srivastava (Raytheon BBN Technologies, USA); Brian Marx (National Center for PTSD at VA Boston Healthcare System, USA)

SLTC-P13.14 Mandarin tone classification without pitch tracking<sup>6</sup>: 8:  
 Neville Ryant (University of Pennsylvania, USA); Jiahong Yuan (University of Pennsylvania, USA); Mark Liberman (University of Pennsylvania, USA)

#### SLTC-P14: Language Models

Room: Poster Area 2

Chair: Shinji Watanabe (Mitsubishi Electric Research Laboratories, USA)

SLTC-P14.1 Role Play Dialogue Topic Model for Language Model Adaptation in Multi-Party Conversation Speech Recognition<sup>6</sup>: 95

Ryo Masumura (NTT Corporation, Japan); Takanobu Oba (NTT Communication Science Laboratories, Japan); Hirokazu Masataki (NTT Corporation, Japan); Osamu Yoshioka (NTT Corporation, Japan); Satoshi Takahashi (NTT Corporation, Japan)

SLTC-P14.2 Static interpolation of exponential n-gram models using features of features<sup>6</sup>: 9:  
 Abhinav Sethy (IBM T. J. Watson Research Center, USA); Stanley Chen (IBM, USA); Bhuvana Ramabhadran (IBM T. J. Watson Research Center, USA)

SLTC-P14.3 Improving Language Modeling by Using Distance and Co-Occurrence Information of Word-Pairs and its Application to LVCSR<sup>6</sup>: : 5

Tze Yuang Chong (Nanyang Technological University, Singapore); Rafael E. Banchs (Institute for Infocomm Research, Singapore); Eng-Siong Chng (Nanyang Technological University, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

SLTC-P14.4 Optimization of Neural Network Language Models for Keyword Search<sup>6</sup>: : :

Ankur Gandhe (Carnegie Mellon University, USA); Florian Metzger (Carnegie Mellon University, USA); Alex Waibel (Karlsruhe Institute of Technology, Germany); Ian Lane (Carnegie Mellon University, USA)

SLTC-P14.5 Paraphrastic Neural Network Language Models<sup>6</sup>: 25

Xunying Liu (University of Cambridge, United Kingdom); Mark Gales (University of Cambridge, United Kingdom); Phil Woodland (University of Cambridge, United Kingdom)

SLTC-P14.6 Variance Regularization of RNNLM for Speech Recognition<sup>6</sup>: : 5  
 Yongzhe Shi (Tsinghua University, P.R. China); Wei-Qiang Zhang (Tsinghua University, P.R. China); Meng Cai (Tsinghua National Laboratory for Information Science and Technology, P.R. China); Jia Liu (Tsinghua University, P.R. China)

SLTC-P14.7 Query-based Composition for Large-scale Language Model in LVCSR<sup>6</sup>: ; :  
 Yang Han (Peking University, P.R. China); Chenwei Zhang (Peking University, P.R. China); Xiangang Li (Peking University, P.R. China); Yi Liu (Peking University, P.R. China); Xihong Wu (Peking University, P.R. China)

SLTC-P14.8 Efficient Lattice Rescoring Using Recurrent Neural Network Language Models<sup>6</sup>: 2:

Xunying Liu (University of Cambridge, United Kingdom); Yongqiang Wang (Cambridge University, United Kingdom); Xie Chen (University of Cambridge, United Kingdom); Mark Gales (University of Cambridge, United Kingdom); Phil Woodland (University of Cambridge, United Kingdom)

SLTC-P14.9 Code Switch Language Modeling With Functional Head Constraint<sup>6</sup>: 35  
 Ying Li (The Hong Kong University of Science and Technology, Hong Kong); Pascale Fung (University of Science & Technology (HKUST), Hong Kong)

SLTC-P14.10 A Bin-Based Ontological Framework for Low-Resource N-Gram Smoothing in Language Modelling<sup>6</sup>: 3:

Yacine Benahmed (INRS-Énergie-Matériaux-Télécommunications & Université de Moncton, Campus de Shippagan, Canada); Sid-Ahmed Selouani (Université de Moncton, Campus de Shippagan, Canada); Douglas O'Shaughnessy (INRS-Énergie-Matériaux-Télécommunications, Canada)

#### SPTM-P12: Signal Sampling, Sensing and Reconstruction II

Room: Poster Area 3

Chair: Isao Yamada (Tokyo Institute of Technology, Japan)

SPTM-P12.1 Frames from Generalized Group Fourier Transforms and SL4(Hq)<sup>6</sup>: 45  
 Matthew Thill (California Institute of Technology, USA); Vidya Muthukumar (IIT Chennai, USA); Babak Hassibi (California Institute of Technology, USA)

SPTM-P12.2 Block Processing with Iterative Correction Filters for Time-Interleaved ADCs<sup>6</sup>: 4:

Matthias Hotz (FTW Telecommunications Research Center, Austria); Christian Vogel (FTW Telecommunications Research Center Vienna & Graz University of Technology, Austria)

SPTM-P12.3 Ramanujan-sum expansions for finite duration (FIR) sequences<sup>6</sup>: 55  
 P. p. Vaidyanathan (Cal Tech., USA)

SPTM-P12.4 Second-Order Total Generalized Variation Constraint<sup>6</sup>: 5:

Shunsuke Ono (Tokyo Institute of Technology, Japan); Isao Yamada (Tokyo Institute of Technology, Japan)

SPTM-P12.5 Magnitude-constrained sequence design with application in MRI<sup>6</sup>: 65  
 Marcus Björk (Uppsala University, Sweden); Petre Stoica (Uppsala University, Sweden)



SPTM-P12.6 Sparsity Fine Tuning in Wavelet Domain with Application to Compressive Image Reconstruction""6; 6:

Weisheng Dong (Xidian University, P.R. China); Xiaolin Wu (McMaster University, Canada); Guangming Shi (Xidian University, P.R. China)

SPTM-P12.7 Sparse Signal Recovery under Poisson Statistics for Online Marketing Applications""6; 75

Delaram Motamedvaziri (Boston University, USA); Mohammad Hossein Rohban (Boston University, USA); Venkatesh Saligrama (Boston University, USA)

SPTM-P12.8 Iterative Soft-Thresholding for Time-Varying Signal Recovery""6; 7: Aurele Balavoine (Georgia Institute of Technology, USA); Christopher Rozell (Georgia Tech, USA); Justin K Romberg (Georgia Tech, USA)

SPTM-P12.9 Algebraic Phase Unwrapping over Collection of Triangles Based on Two-dimensional Spline Smoothing""6; 85

Daichi Kitahara (Tokyo Institute of Technology, Japan); Isao Yamada (Tokyo Institute of Technology, Japan)

SPTM-P12.10 Information-Maximizing Prefilters for Quantization""6; 8:

Bernhard C. Geiger (Graz University of Technology, Austria); Gernot Kubin (Graz University of Technology, Austria)

SPTM-P12.11 Matrix Recovery From Quantized and Corrupted Measurements""6; 95 Andrew Lan (Rice University, USA); Christoph Studer (Cornell University, USA); Richard Baraniuk (Rice University, USA)

SPTM-P12.12 Selective analytic signal construction from a non-uniformly sampled bandpass signal""6; 9:

Jean-Adrien Vernhes (INP-ENSEEIH/IRIT/T&SA, France); Marie Chabert (Irit/Enseeiht, France); Bernard Lacaze (TESA Lab, France); Guy Lesthievant (CNES, France); Roland Baudin (Thales Alenia Space, France)

SPTM-P12.13 Denoising using multi-stage randomized Orthogonal Matching Pursuit""6; : 5 Stefanos Koskinas (McGill University, Canada); Ioannis Psaromiligkos (McGill University, Canada)

#### DISPS-P1: Design Methods and Optimization for DSP

Room: Poster Area 4

Chair: Marco Mattavelli (EPFL, Switzerland)

DISPS-P1.1 Efficient Software Synthesis of Dynamic Dataflow Programs""6; : :

Hervé Yviquel (INSA of Rennes, France); Alexandre Sanchez (INSA of Rennes, France); Pekka Jääskeläinen (Tampere University of Technology, Finland); Jarmo Takala (Tampere University of Technology, Finland); Mickael Raulet (IETR-INSA Rennes, France); Emmanuel Casseau (IRISA Laboratory, France)

DISPS-P1.2 Cooperative CPU+GPU Deblocking Filter Parallelization for High Performance HEVC Video Codecs""6; ; 5

Diego F. de Souza (INESC-ID, IST, University of Lisbon & INESC-ID, Portugal); Nuno Roma (INESC-ID, IST, University of Lisbon, Portugal); Leonel A Sousa (INESC-ID / IST, Technical University of Lisbon, Portugal)

DISPS-P1.3 Efficient duty-cycle mismatch compensation in digital transmitter""6; : :

Chunshu Li (IMEC, Belgium); Min Li (IMEC, Belgium); Mark Ingels (Imec, Belgium); Marian Verhelst (KULeuven, Belgium); Xiaoqiang Zhang (IMEC, Belgium); Joris Van Driessche (IMEC, Belgium); Andre Bourdoux (IMEC, Belgium); Liesbet Van der Perre (IMEC, Belgium); Sofie Pollin (KU Leuven, USA)

DISPS-P1.4 A Methodology for Optimizing Buffer Sizes of Dynamic Dataflow FPGAs Implementations""7225

Ab Al-Hadi Ab Rahman (Universiti Teknologi Malaysia, Malaysia); Simone Casale Brunet (EPFL & SCI STI MM, Switzerland); Claudio Alberti (EPFL, Switzerland); Marco Mattavelli (EPFL, Switzerland)

DISPS-P1.5 Design of Sparse-Signal Processing in Radar Systems""722:

Radmila Pribic (Thales Nederland Delft, The Netherlands); Ioannis Kyriakides (University of Nicosia, Cyprus)

DISPS-P1.6 3-D Stacked Memory System Architecture Exploration by ESL Virtual Platform and Reconfigurable Stacking Memory Architecture in 3D-DSP SoC System""7234

Hsien-Chung Hsieh (Industrial Technology Research Institute, Taiwan); Sum Yi-Fa (Industrial Technology Research Institute, Taiwan); Jen-Chieh Yeh (Industrial Technology Research Institute, Taiwan); Po-Han Huang (Industrial Technology Research Institute, Taiwan)

DISPS-P1.7 Computing Resource Minimization with Content-aware Workload Estimation in Cloud-based Surveillance Systems""7239

Peng-Jung Wu (Industrial Technology Research Institute, Taiwan); Yung-Cheng Kao (Industrial Technology Research Institute, Taiwan)

DISPS-P1.8 Low Complexity Subband Analysis using Quadrature Mirror Filters""7243 Aditya Chopra (National Instruments, USA); William Reid (National Instruments, USA); Brian L Evans (The University of Texas at Austin, USA)

DISPS-P1.9 Leakage-Aware Scratch-Pad Memory Banking for Embedded Multidimensional Signal Processing""7248

Florin Balasa (American University in Cairo, Egypt); Noha Abuash (American University in Cairo, Egypt); Cristian Gingu (Fermilab, USA); Doru Nasui (American International Radio, Inc., USA)

DISPS-P1.10 Fault Tolerance Analysis of Digital Feed-Forward Deep Neural Networks""7253

Minjae Lee (Seoul National University, Korea); Kyuyeon Hwang (Seoul National University, Korea); Wonyong Sung (Seoul National University, Korea)

DISPS-P1.11 Embedding Polynomial Time Memory Mapping and Routing Algorithms on-chip to Design Configurable Decoder Architectures""7258

Saeed ur Rehman (Université de Bretagne-Sud & Lab-STICC, France); Awais Sani (Ouest-Valorisation, France); Cyrille Chavet (Université de Bretagne Sud & Lab-STICC, France); Philippe Coussy (Université de Bretagne-Sud / Lab-STICC, France)

DISPS-P1.12 Robust Decision Feedback Equalizer Scheme by Using Sphere-Decoding Detector""7263

Hung-Yi Cheng (National Taiwan University, Taiwan); Chun-Yuan Chu (National Taiwan University, Taiwan); Yen-Liang Chen (NTU, Taiwan); An-Yeu Wu (National Taiwan University, Taiwan)

## SPCOM-P7: Sensing and learning networks

Room: Poster Area 5

Chair: Milica Stojanovic (Northeastern University, USA)

SPCOM-P7.1 Single Bit and Reduced Dimension Diffusion Strategies Over Distributed Networks""P IC

Muhammed Sayin (Bilkent University, Turkey); Suleyman Serdar Kozat (Bilkent University, Turkey)

SPCOM-P7.2 Sigma Point Belief Propagation""P IC

Florian Meyer (Vienna University of Technology, Austria); Ondrej Hlinka (Vienna University of Technology, Austria); Franz Hlawatsch (Vienna University of Technology, Austria)

SPCOM-P7.3 On the Stochastic Modeling of Desynchronization Convergence in Wireless Sensor Networks""7267

Dujdow Buranapanichkit (University College London & Torrington Place, United Kingdom); Nikos Deligiannis (University College London, United Kingdom); Yiannis Andreopoulos (University College London, United Kingdom)

SPCOM-P7.4 Distributed Bayesian estimation of arrival rates in asynchronous monitoring networks""7272

Angelo Coluccia (University of Salento, Italy); Giuseppe Notarstefano (University of Salento, Italy)

SPCOM-P7.5 Distributed detection with censoring sensors under dependent observations""7277

Hao He (Syracuse University, USA); Pramod Varshney (Syracuse University, USA)

SPCOM-P7.6 Energy-saving gossip algorithm for compressed sensing in multi-agent systems""7282

Chiara Ravazzi (Politecnico di Torino, Italy); Sophie Fosson (Politecnico di Torino, Italy); Enrico Magli (Politecnico di Torino, Italy)

SPCOM-P7.7 Distributed blind system identification in sensor networks""7287

Chengpu YU (Nanyang Technological University, Singapore); Lihua Xie (University of Nanyang Technological University, Singapore); YengChai Soh (School of EEE, Nanyang Technological University, Singapore)

SPCOM-P7.8 Decentralized vs. Centralized Scheduling in Wireless Sensor Networks For Data Fusion""7292

Mihaela Mitici (University of Twente, The Netherlands); Jasper Goseling (University of Twente, The Netherlands); Maurits de Graaf (University of Twente, The Netherlands); Richard Boucherie (University of Twente, The Netherlands)

SPCOM-P7.9 Probabilistic sensor management for target tracking via compressive sensing""7297

Yujiao Zheng (Syracuse University, USA); Thakshila Wimalajeewa (Syracuse University, USA); Pramod Varshney (Syracuse University, USA)

SPCOM-P7.10 Sparsity-Promoting Adaptive Sensor Selection for Non-Linear Filtering""72: 2

Sundeep Prabhakar Chepuri (Delft University of Technology, The Netherlands); Geert Leus (Delft University of Technology, The Netherlands)

SPCOM-P7.11 Topology Optimization for Energy-efficient Communications in Consensus Wireless Networks""72: 7

Benjamin Béjar (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland); Martin Vetterli (EPFL, Switzerland)

## IVMSP-P9: Image Segmentation

Room: Poster Area 6

Chair: Mark Liao (Academia Sinica, Taiwan)

IVMSP-P9.1 First Maudor 2013 Evaluation Campaign in Scanned Document Image Processing""72: 2

Ilya Oparin (LNE, Laboratoire National de Métrologie et d'Essais, France); Juliette Kahn (LNE, Laboratoire National de Métrologie et d'Essais, France); Olivier Galibert (LNE, Laboratoire National de Métrologie et d'Essais, France)

IVMSP-P9.2 GPU-accelerated joint 1D and 2D barcode localization on smartphones""72: 7

Gábor Sörös (ETH Zurich, Switzerland)

IVMSP-P9.3 Joint Learning of Foreground Region Labeling and Depth Ordering""7322

Youngjoo Seo (KAIST, Korea); Jongmin Kim (KAIST, Korea); Hoyong Jang (KAIST, Korea); Tae-Ho Kim (Korea Advanced Institute of Science and Technology, Korea); Chang D Yoo (KAIST, Korea)

IVMSP-P9.4 Multi-Scale Crest Line Extration based on Half Gaussian Kernels""7327

Baptiste Magnier (Ales School of Mines, France); Arezki Aberkane (LGI2P de l'Ecole des Mines d'Ales, France); Philippe Borianne (Umr Amap & CIRAD, France); Philippe Montesinos (Ecole des Mines d'Alès, France); Jourdan Christophe (CIRAD de Montpellier, France)

IVMSP-P9.5 Hierarchical Image Content Analysis with an Embedded Marked Point Process Framework""7332

Csaba Benedek (MTA SZTAKI & Dept. of Electronic Technology, Budapest University of Technology and Economics, Hungary)

IVMSP-P9.6 Combination of Graph Theoretic Grouping and Time-Frequency Analysis for Image Segmentation""7337

Rahele Kafieh (Isfahan University of Medicine, Iran); Hossein Rabbani (Isfahan University of Medical Sciences & The University of Iowa, Iran); Saeed Gazor (Queens University, Canada)

IVMSP-P9.7 Automatic initialization for naval application of graph segmentation techniques: a comparative study""7342

Irene Camino (Helmut Schmidt University, Germany); Udo Zölzer (Helmut-Schmidt-University Hamburg, Germany)

## BISP-P5: Processing and applications in Ultrasound

Room: Poster Area 7

Chair: François Varray (CREATIS, Université de Lyon, France)

BISP-P5.1 A new method for 2D-vector blood flow imaging based on unconventional beamforming techniques""7347

- Matteo Lenge (University of Florence, Italy); Alessandro Ramalli (University of Florence, Italy); Andrea Cellai (University of Florence, Italy); Piero Tortoli (University of Florence, Italy); Christian Cachard (CREATIS Lyon, France); Hervé Liebgott (CREATIS Lyon, France)
- BISP-P5.2 Dynamic Receive Aperture Downsampling for Ultrasound Imaging""7352  
Mohammed Albulayli (University of Victoria, Canada); Daler Rakhmatov (University of Victoria, Canada)
- BISP-P5.3 Segmentation of Ultrasound Images for Phlebotomy Applications""7357  
Dipti Prasad Mukherjee (Indian Statistical Institute, India); Scott Acton (University of Virginia, USA)
- BISP-P5.4 A Nonlinear Ultrasound Propagation Simulator using the Slowly Varying Envelope Approximation""7362""  
Clément Marti (Creatis, Université de Lyon, France); François Varray (Creatis, Université de Lyon, France); Christian Cachard (CREATIS Lyon, France)
- BISP-P5.5 An Integrated System For The Evaluation of Flow Mediated Dilation""7367  
Alessandro Ramalli (University of Florence, Italy); Luca Bassi (University of Florence, Italy); Matteo Lenge (University of Florence, Italy); Carlo Palombo (University of Pisa, Italy); Kunihiro Aizawa (University of Exeter Medical School, United Kingdom); Piero Tortoli (University of Florence, Italy)
- BISP-P5.6 Amplitude and Phase Estimator for Real-Time Biomedical Spectral Doppler Applications""736;  
Stefano Ricci (University of Florence, Italy); Riccardo Matera (University of Florence, Italy); Alessandro Dallai (University of Florence, Italy)
- BISP-P5.7 High Frame Rate Compounding for Nonlinear B/A Parameter Ultrasound Imaging in Echo Mode - Simulation Results""7375  
Matthieu Toulemonde (CREATIS & Université de Lyon, France); François Varray (CREATIS, Université de Lyon, France); Olivier Basset (CREATIS, Université de Lyon, France); Piero Tortoli (University of Florence, Italy); Christian Cachard (CREATIS Lyon, France)
- BISP-P5.8 Real-time Implementation of a Novel Algorithm For Ultrasound Freehand Elastography of Breast Lesions""737:  
Alessandro Ramalli (University of Florence, Italy); Luca Bassi (University of Florence, Italy); Enrico Boni (University of Florence, Italy); Stefano Ricci (University of Florence, Italy); Elisabetta Giannotti (AOU Careggi, Italy); Dalmar Abdulcadir (AOU Careggi, Italy); Jacopo Nori (AOU Careggi, Italy); Piero Tortoli (University of Florence, Italy)
- AASP-P7: Reverberation Reduction, Music Information Retrieval II**
- Room: Poster Area 8  
Chair: Sharon Gannot (Bar-Ilan University, Israel)
- AASP-P7.1 Adaptive Multichannel Equalization Applied To Room Acoustics Exploiting the Sparsity of Target Response""7384  
Rajan Sobhana Rashobh (Nanyang Technological University, Singapore); Andy W. H. Khong (Nanyang Technological University, Singapore)
- AASP-P7.2 Probabilistic Integration of Diffuse Noise Suppression and Dereverberation""7389  
Ito Nobutaka (NTT, Japan); Shoko Araki (NTT Communication Science Laboratories, Japan); Tomohiro Nakatani (NTT Corporation, Japan)
- AASP-P7.3 Speech dereverberation using weighted prediction error with Laplacian model of the desired signal""7394  
Ante Jukić (University of Oldenburg, Germany); Simon Doclo (University of Oldenburg, Germany)
- AASP-P7.4 Frequency-Domain Single-Channel Inverse Filtering for Speech Dereverberation: Theory and Practice""7399  
Ina Kodrasi (University of Oldenburg, Germany); Timo Gerkmann (University of Oldenburg, Germany); Simon Doclo (University of Oldenburg, Germany)
- AASP-P7.5 Single channel reverberation suppression based on sparse linear prediction""73: 4  
Nicolás López (Institut Mines-Télécom, Télécom ParisTech, CNRS-LTCl & Arkamys, France); Yves Grenier (Institut Mines-Télécom, Télécom ParisTech, CNRS LTCl, France); Gaël Richard (Institut Mines-Télécom, Télécom ParisTech, CNRS-LTCl, France); Ivan Bourmeyster (Arkamys, France)
- AASP-P7.6 Blind RT60 estimation robust across room sizes and source distances""73: 9  
Baldwin Dumortier (Inria Nancy - Grand Est, France); Emmanuel Vincent (Inria Nancy - Grand Est, France)
- AASP-P7.7 Towards Efficient Audio Thumbnailing""73: 4  
Nanzhu Jiang (International Audio Laboratories Erlangen, Germany); Meinard Mueller (International Audio Laboratories Erlangen, Germany)
- AASP-P7.8 Learning to segment songs with ordinal linear discriminant analysis""73: 9  
Brian McFee (University of Columbia, USA); Daniel P W Ellis (Columbia University, USA)
- AASP-P7.9 Vocal Timbre Analysis Using Latent Dirichlet Allocation and Cross-Gender Vocal Timbre Similarity""7424  
Tomoyasu Nakano (National Institute of Advanced Industrial Science and Technology (AIST), Japan); Kazuyoshi Yoshii (Kyoto University, Japan); Masataka Goto (National Institute of Advanced Industrial Science and Technology (AIST), Japan)
- AASP-P7.10 Modified LASSO Screening for Audio Word-based Music Classification Using Large-scale Dictionary""7429  
Ping-Keng Jao (Academia Sinica, Taiwan); Chin-Chia Michael Yeh (Academia Sinica, Taiwan); Yi-Hsuan Yang (Academia Sinica, Taiwan)
- AASP-P7.11 Audio Part Mixture Alignment Based on Hierarchical Nonparametric Bayesian Model of Musical Audio Sequence Collection""7434  
Akira Maezawa (Kyoto University & Yamaha Corporation, Japan); Hiroshi Okuno (Kyoto University, Japan)
- AASP-P7.12 A Supervised Approach to Hierarchical Metrical Cycle Tracking from Audio Music Recordings""7439  
Ajay Srinivasamurthy (Universitat Pompeu Fabra, Spain); Xavier Serra (University Pompeu Fabra, Spain)
- AASP-P7.13 Improving Instrument Recognition in Polyphonic Music Through System Integration""7444  
Dimitrios Giannoulis (Queen Mary University of London, United Kingdom); Emmanouil Benetos (City University London, United Kingdom); Anssi Klapuri

(Ovelin, Helsinki, Finland); Mark D. Plumbley (Queen Mary University of London, United Kingdom)

#### MLSP-P4: Sparsity

Room: Poster Area 9

Chair: Volkan Cevher (Ecole Polytechnique Federale de Lausanne, Switzerland)

MLSP-P4.1 Collaborative Representation, Sparsity or Nonlinearity: What Is Key to Dictionary Based Classification?""7449

Xu Chen (Princeton University, USA); Peter J Ramadge (Princeton University, USA)

MLSP-P4.2 Learning high-dimensional nonlinear mapping via compressed sensing""7454  
Tomoya Sakai (Nagasaki University, Japan); Daisuke Miyata (Nagasaki University, Japan)

MLSP-P4.3 Scalable Sparse Approximation of a Sample Mean""7459

Efren Cruz Cortes (University of Michigan, USA); Clayton Scott (University of Michigan, USA)

MLSP-P4.4 A Fast Variational Approach for Bayesian Compressive Sensing with Informative Priors""7464

Evrpidis Karseras (Imperial College London, United Kingdom); Wei Dai (Imperial College, United Kingdom)

MLSP-P4.5 Dictionary Learning for Sparse Representation: Complexity and Algorithms""7469

Meisam Razaviyayn (University of Minnesota, USA); Hung-Wei Tseng (University of Minnesota, USA); Zhi-Quan Luo (University of Minnesota, USA)

MLSP-P4.6 Change Detection in Streams of Signals with Sparse Representations""7474

Cesare Alippi (Politecnico di Milano, Italy); Giacomo Boracchi (Politecnico di Milano, Italy); Brendt Wohlberg (Los Alamos National Laboratory, USA)

MLSP-P4.7 Sparse kernel recursive least squares using  $l_1$  regularization and a fixed-point sub-iteration""7479

Badong Chen (Xi'an Jiaotong University, USA); Nanning Zheng (Xi'an Jiaotong University, P.R. China); Jose Principe (University of Florida, USA)

MLSP-P4.8 Doubly Sparse Transform Learning With Convergence Guarantees""7484

Saiprasad Ravishankar (University of Illinois, USA); Yoram Bresler (University of Illinois, Urbana-Champaign, USA, USA)

MLSP-P4.9 An Improved Auto-Calibration Algorithm Based on Sparse Bayesian Learning Framework""P IC

Lifan Zhao (Nanyang Technological University, Singapore); Guoan Bi (Nanyang Technological University, Singapore); Lu Wang (Nanyang Technological University, Singapore); Haijian Zhang (Nanyang Technological University, Singapore)

MLSP-P4.10 Dictionary Training for Sparse Representation as Generalization of K-means Clustering""P IC

Sujit Kumar Sahoo (Nanyang Technological University, Singapore); Anamitra Makur (Nanyang Technological University, Singapore)

MLSP-P4.11 Blockwise Coordinate Descent Schemes for Sparse Representation""7489

Baodi Liu (China University of Petroleum, P.R. China); Yu-Xiong Wang (Carnegie Mellon University, USA); Bin Shen (Purdue University, USA); Yu-Jin Zhang (Tsinghua University, P.R. China); Yanjiang Wang (China University of Petroleum, P.R. China)

#### SAM-P4: MIMO Radar

Room: Poster Area 10

Chair: Athina Petropulu (Rutgers, The State University of New Jersey, USA)

SAM-P4.1 Closed Form Fourier-Based Transmit Beamforming for MIMO Radar""7494

John Lipor (University of Michigan, USA); Sajid Ahmed (King Abdullah University of Science and Technology, Thuwal, KSA, Saudi Arabia); Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

SAM-P4.2 MIMO Radar Capability on Powerful Jammers Suppression""7499

Yongzhe Li (University of Electronic Science and Technology of China & Aalto University, Finland); Sergiy A. Vorobyov (Aalto University & University of Alberta on leave, Finland); Aboulnasr Hassanien (University of Alberta, Canada)

SAM-P4.3 Unimodular Code Design for MIMO Radar Using Bhattacharyya Distance""74: 4

Mohammad Mahdi Naghsh (Isfahan University of Technology & Uppsala University, Iran); Mahmood Modarres-Hashemi (Isfahan University of Technology, Iran); Abbas Sheikh (Shiraz University, Iran); Mojtaba Soltanalian (Uppsala University, Sweden); Petre Stoica (Uppsala University, Sweden)

SAM-P4.4 MIMO Radar Performance Analysis under  $K$ -distributed Clutter""74: 9

Xin Zhang (Darmstadt University of Technology, Germany); Mohammed Nabil El Korso (Paris 10 University & LEME-EA 4416, France); Marius Pesavento (Technische Universität Darmstadt, Germany)

SAM-P4.5 MIMO Radar Demystified and Where it Makes Sense to Use""74: 4

Eli Brookner (Raytheon, USA)

SAM-P4.6 MIMO Radar Filterbank Design for Interference Mitigation""74: 9

Tuomas Aittomäki (Aalto University, Finland); Visa Koivunen (Aalto University, Finland)

SAM-P4.7 Generalized Ambiguity Function for the MIMO Radar With Correlated Waveforms""7524

Yongzhe Li (University of Electronic Science and Technology of China & Aalto University, Finland); Sergiy A. Vorobyov (Aalto University & University of Alberta on leave, Finland); Visa Koivunen (Aalto University, Finland)

SAM-P4.8 Signal Model and Detection Performance for MIMO-OTH Radar with Multipath Ionospheric Propagation and Non-Point Target""7529

Qian He (University of Electronic Science and Technology of China, P.R. China); Xiaodong Li (University of Electronic Science and Technology of China, P.R. China); Zi-Shu He (University of Electronics Science and Technology of China, P.R. China); Rick Blum (Lehigh University, USA)

SAM-P4.9 Minimum sidelobe beam pattern design for MIMO radar systems: A Robust Approach""7534

Nafiseh Shariati (KTH Royal Institute of Technology, Sweden); Dave Zachariah (Uppsala University, Sweden); Mats Bengtsson (KTH Royal Institute of Technology, Sweden)

SAM-P4.10 Approaching Peak Correlation Bounds Via Alternating Projections""7539  
Mojtaba Soltanalian (Uppsala University, Sweden); Mohammad Mahdi Naghsh (Isfahan University of Technology & Uppsala University, Iran); Petre Stoica (Uppsala University, Sweden)

SAM-P4.11 The Significant Gains from Optimally Processed Multiple Signals of Opportunity and Multiple Receive Stations in Passive Radar""P IC  
Qian He (University of Electronic Science and Technology of China, P.R. China); Rick Blum (Lehigh University, USA)

**1:00 PM - 2:30 PM**

**Lunch Time**

**2:30 PM - 2:45 PM**

**Shaping the future: the innovative dimension of Research & Technology**

**2:45 PM - 3:45 PM**

**PT3: Plenary Talk: Green radar state of art: theory, practice and way ahead (Room Cavaniglia)**

**3:45 PM - 4:15 PM**

**Coffee break ☕**

**4:15 PM - 6:15 PM**

**SLTC-L9: Language Identification**

Room: Cavaniglia

Chairs: Najim Dehak (Massachusetts Institute of Technology, USA), Haizhou Li (Institute for Infocomm Research, Singapore)

4:15 Improved Phonotactic Language Recognition Based on RNN Feature Reconstruction""7544

Wei-Wei Liu (Tsinghua National Laboratory for Information Science and Technology, P.R. China); Wei-Qiang Zhang (Tsinghua University, P.R. China); Yongzhe Shi (Tsinghua University, P.R. China); An Ji (Marquette University, USA); Jiaming Xu (Tsinghua University, P.R. China); Jia Liu (Tsinghua National Laboratory for Information Science and Technology, P.R. China)

4:35 Language Recognition System Using Language Branch Discriminative Information""7549

Xianliang Wang (Institute of Acoustics, Chinese Academy of Sciences, P.R. China); Yulong Wan (Institute of Acoustics, Chinese Academy of Sciences, P.R. China); Lin Yang (Institute of Acoustics, Chinese Academy of Sciences, P.R. China); Ruohua Zhou (Institute of Acoustics, Chinese Academy of Sciences, P.R. China); Yonghong Yan (Institute of Acoustics, Chinese Academy of Sciences, P.R. China)

4:55 Introducing Attribute Features to Foreign Accent Recognition""7554

Hamid Behravan (School of Computing, University of Eastern Finland, Finland); Ville Hautamäki (University of Eastern Finland, Finland); Sabato M Siniscalchi (University of Enna Kore, Italy); Tomi H. Kinnunen (University of Eastern Finland, Finland); Chin-Hui Lee (Georgia Institute of Technology, USA)

5:15 Automatic Language Identification using Deep Neural Networks""7559

Ignacio Lopez Moreno (Google Inc., USA); Javier Gonzalez-Dominguez (Universidad Autónoma de Madrid, Spain); Oldrich Plchot (Brno University of Technology, Czech Republic); David Martínez González (University of Zaragoza, Spain); Joaquin Gonzalez-Rodriguez (Universidad Autonoma de Madrid, Spain); Pedro J Moreno (Google, Inc., USA)

5:35 Extended Phone Log-Likelihood Ratio Features and Acoustic-based I-Vectors for Language Recognition""7564

Luis Fernando D'Haro (Technical University of Madrid & Speech Technology Group, Spain); Ricardo Cordoba (Speech Technology Group, Spain); Christian Salamea (Speech Technology Group, Spain); Julián David Echeverry (Speech Technology Group, Spain)

5:55 Subspace Gaussian Mixture Model for Computer-Assisted Language Learning""7569

Rong Tong (Institute for Infocomm Research, Singapore); Boon Pang Lim (Institute for Infocomm Research, Singapore); Nancy F. Chen (Institute for Infocomm Research, Singapore); Bin Ma (Institute for Infocomm Research, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

**IVMSP-L4: Image Analysis II**

Room: Basilica

Chair: Alessandro Foi (Tampere University of Technology, Finland)

4:15 Regularizing inverse problems in image processing with a manifold-based model of overlapping patches""7574

Yevgen Matviychuk (University of Colorado at Boulder, USA); Shannon Hughes (University of Colorado at Boulder, USA)

4:35 Gaussian-Cauchy mixture modeling for robust signal-dependent noise estimation""7579

Lucio Azzari (Tampere University of Technology, Finland); Alessandro Foi (Tampere University of Technology, Finland)

4:55 New Bivariate Statistical Model of Natural Image Correlations""7584

Che-Chun Su (The University of Texas at Austin, USA); Lawrence Cormack (The University of Texas at Austin, USA); Alan C Bovik (University of Texas at Austin, USA)

5:15 A multivariate statistical model for multiple images acquired by homogeneous or heterogeneous sensors""7589

Jorge Prendes (Supélec & TêSA Laboratory, France); Marie Chabert (Irit/Enseeiht, France); Frederic Pascal (Supélec, France); Alain Giros (CNES, France); Jean-Yves Tournet (University of Toulouse & IRIT/ENSEEIH/TêSA, France)

5:35 Saliency Driven Clustering for Salient Object Detection""7594  
Zhou Lei (Shang Hai Jiao Tong University, P.R. China); Yijun Li (Shanghai Jiao Tong University, P.R. China); Yipeng Song (Shanghai Jiaotong University, P.R. China); Yu Qiao (Shanghai Jiao Tong University, P.R. China); Jie Yang (Inst. of Image Processing & Pattern Recognition, Jiaotong University, Shanghai, P.R. China)

5:55 2D Hilbert-Huang Transform""7599  
Jérémy Schmitt (Laboratoire de Physique ENS Lyon, France); Nelly Pustelnik (ENS Lyon & Laboratoire de Physique, France); Pierre Borgnat (ENS Lyon, CNRS, France); Patrick Flandrin (CNRS-ENS de Lyon, France)

#### SS9: Array signal processing for radio astronomy: the SKA is the future

Room: Polveriera

Chairs: Stefan J. Wijnholds (ASTRON, The Netherlands), Alfonso Farina (SELEX-SI, Italy)

4:15 Signal Processing Challenges for Radio Astronomical Arrays""75: 4  
Stefan J. Wijnholds (ASTRON, The Netherlands); Alle Jan van der Veen (Delft University, The Netherlands); Filippo De Stefani (SELEX - Sistemi Integrati, Italy); Emanuele La Rosa (Selex ES, Italy); Alfonso Farina (SELEX-SI, Italy)

4:35 RFI Spatial Processing at Nançay Observatory: Approaches and Experiments""75: 9  
Gregory Hellbourg (Observatoire de Paris, France); Rodolphe Weber (University of Orleans & Laboratoire PRISME, France); Karim Abed-Meraim (Polytech'Orléans & University of Sharjah, UAE, France); Albert Jan Boonstra (ASTRON, The Netherlands)

4:55 Robust Radio Interferometric Calibration""75: 4  
Sarod Yatawatta (ASTRON, The Netherlands); Sanaz Kazemi (University of Groningen, The Netherlands)

5:15 Holistic Power Analysis of Implementation Alternatives for a Very Large Scale Synthesis Array with Phased Array Stations""75: 9  
Andreea Anghel (IBM Research - Zurich & Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland); Rik Jongerius (IBM Research, The Netherlands); Gero Dittmann (IBM Research, Zurich Research Laboratory, Switzerland); Jonas Weiss (IBM Research GmbH, Zurich Research Laboratory, Switzerland); Ronald P. Luitjen (IBM Zurich research Laboratory, Switzerland)

5:35 A Computationally Efficient Self-Calibration Algorithm for the LOFAR Radio Astronomical Array""7624  
Yuntao Wu (Wuhan Institute of Technology, P.R. China); Amir Leshem (Bar-Ilan University, Israel); Stefan J. Wijnholds (ASTRON, The Netherlands)

5:55 PURIFY: a new algorithmic framework for next-generation radio-interferometric imaging""7629

Rafael Carrillo (EPFL, Switzerland); Jason McEwen (University College London, United Kingdom); Yves Wiaux (Heriot Watt University, United Kingdom)

#### MLSP-L2: Neural Network Methods

Room: Scherma

Chairs: Li Deng (Microsoft Research, USA), Konstantinos Diamantaras (TEI of Thessaloniki, Greece)

4:15 On-Line Continuous-Time Music Mood Regression with Deep Recurrent Neural Networks""7634

Felix J Weninger (Technische Universität München, Germany); Florian Eyben (Technische Universität München, Germany); Björn W Schuller (Imperial College London & Technische Universität München, Germany)

4:35 Phone sequence modeling with recurrent neural networks""7639  
Nicolas Boulanger-Lewandowski (University of Montreal, Canada); Jasha Droppo (Microsoft Research, USA); Mike Seltzer (Microsoft Research, USA); Dong Yu (Microsoft Research, USA)

4:55 Deep Learning of Split Temporal Context for Automatic Speech Recognition""7644  
Moez Baccouche (Orange Labs, France); Benoît Besset (Orange Labs, France); Patrice Collen (Orange Labs, France); Olivier Le Blouch (Orange Labs, France)

5:15 Minimum Variance Extreme Learning Machine for Human Action Recognition""7649  
Alexandros Iosifidis (Aristotle University of Thessaloniki, Greece); Anastasios Tefas (Aristotle University of Thessaloniki, Greece); Ioannis Pitas (Aristotle University of Thessaloniki, Greece)

5:35 3D gesture classification with convolutional neural networks""7654  
Stefan Duffner (LIRIS, INSA de Lyon, France); Samuel Berlemont (Orange Labs, France); Grégoire Lefebvre (Orange Labs, France); Christophe Garcia (INSA Lyon, France)

5:55 Deep Hybrid Networks with good out-of-sample object recognition""7659  
Muhammad Ghifary (Victoria University of Wellington, New Zealand); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand); Mengjie Zhang (VUW, New Zealand)

#### SPCOM-L5: Consensus and distributed estimation

Room: Teatrino

Chair: Amir Leshem (Bar-Ilan University, Israel)

4:15 On The Convergence of Average Consensus With Generalized Metropolis-Hasting Weights""7664""

Valentin Schwarz (Vienna University of Technology, Austria); Gabor Hannak (Vienna University of Technology, Austria); Gerald Matz (Vienna University of Technology, Austria)

4:35 Decentralized Linearized Alternating Direction Method of Multipliers""7669  
Qing Ling (University of Science and Technology of China, P.R. China); Alejandro Ribeiro (University of Pennsylvania, USA)

- 4:55 Optimal Power Allocation for Distributed BLUE Estimation with Linear Spatial Collaboration""7674  
 Mohammad Fanaei (West Virginia University, USA); Matthew Valenti (West Virginia University, USA); Abbas Jamalipour (University of Sydney, Australia); Natalia A. Schmid (West Virginia University, USA)
- 5:15 Robust Detection and Social Learning in Tandem Networks""7679  
 Jun Feng Jack Ho (Nanyang Technological University, Singapore); Wee Peng Tay (Nanyang Technological University, Singapore); Tony Q. S. Quek (Singapore University of Technology and Design (SUTD) & Institute for Infocomm Research, Singapore)
- 5:35 Consensus algorithms with state-dependent weights""7684  
 Ondrej Slučiak (Vienna University of Technology, Austria); Markus Rupp (Vienna University of Technology, Austria)
- 5:55 Incentivizing Information Sharing in Networks""7689  
 Jie Xu (University of California, Los Angeles, USA); Yangbo Song (University of California, Los Angeles, USA); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)

#### SPTM-L7: Advances in Adaptive Filtering

- Room: Volta  
 Chairs: Kostas Berberidis (University of Patras, Greece), Sergios Theodoridis (University of Athens, Greece)
- 4:15 Distributed Least Mean Squares Strategies for Sparsity-Aware Estimation over Gaussian Markov Random Fields""7694  
 Paolo Di Lorenzo (University of Rome La Sapienza, Italy); Sergio Barbarossa (University of Rome, Italy)
- 4:35 Shrinkage Tuning Based on An Unbiased MSE Estimate for Sparsity-aware Adaptive Filtering""7699  
 Masao Yamagishi (Tokyo Institute of Technology, Japan); Masahiro Yukawa (Keio University, Japan); Isao Yamada (Tokyo Institute of Technology, Japan)
- 4:55 Distributed Bayesian learning with a Bernoulli model""76: 4  
 Zhe Shen (Stony Brook University, USA); Petar M. Djurić (Stony Brook University, USA)
- 5:15 Diffusion LMS for clustered multitask networks""76: 9  
 Cédric Richard (Université de Nice Sophia-Antipolis, France); Jie Chen (Université de Nice Sophia-Antipolis, France); Ali H. Sayed (University of California, Los Angeles, USA)
- 5:35 An Adaptive Line Enhancer Based On The Convex Combination of Two IIR Filters""76: 4  
 Walter Kozack (Santa Clara University, USA); Tokunbo Ogunfunmi (Santa Clara University, USA)
- 5:55 An Adaptive Projected Subgradient based Algorithm for Robust Subspace Tracking""76: 9  
 Symeon Chouvardas (University of Athens, Greece); Yannis Kopsinis (University of Athens, Greece); Sergios Theodoridis (University of Athens, Greece)

#### SLTC-P15: Robust Speech Recognition II

- Room: Poster Area 1  
 Chair: Geoffery Zweig (Microsoft Research, USA)
- SLTC-P15.1 Noise-robust Speech Recognition with Exemplar-based Sparse Representations Using Alpha-Beta Divergence""7724  
 Emre Yilmaz (KU Leuven, Belgium); Jort Gemmeke (KU Leuven, Belgium); Hugo Van hamme (KU Leuven, Belgium)
- SLTC-P15.2 Extension of uncertainty propagation to dynamic MFCCs for noise robust ASR""7729  
 Dung Tran (INRIA/LORIA, France); Emmanuel Vincent (Inria Nancy - Grand Est, France); Denis Juvet (INRIA & LORIA, France)
- SLTC-P15.3 Fusion of multiple uncertainty estimators and propagators for noise robust ASR""7734  
 Dung Tran (INRIA/LORIA, France); Emmanuel Vincent (Inria Nancy - Grand Est, France); Denis Juvet (INRIA & LORIA, France)
- SLTC-P15.4 A Compact Formulation of Turbo Audio-Visual Speech Recognition""7739  
 Simon Receveur (Institute for Communications Technology, Technische Universität Braunschweig, Germany); Patrick Meyer (Technische Universität Braunschweig, Institute for Communications Technology, Germany); Tim Fingscheidt (Technische Universität Braunschweig, Germany)
- SLTC-P15.5 Estimating Room Acoustic Parameters for Speech Recognizer Adaptation and Combination in Reverberant Environments""7744  
 Feifei Xiong (Fraunhofer IDMT-HSA, Germany); Stefan Goetze (Fraunhofer IDMT-HSA, Germany); Bernd Meyer (University of Oldenburg, Germany)
- SLTC-P15.6 Noise-Adaptive LDA: A New Approach for Speech Recognition Under Observation Uncertainty""P IC  
 Dorothea Kolossa (Ruhr-Universität Bochum, Germany); Steffen Zeiler (Ruhr-Universität Bochum, Germany); Rahim Saeidi (University of Eastern Finland, Finland); Ramon Fernandez Astudillo (INESC-ID-Lisboa, Portugal)
- SLTC-P15.7 Impact of single-microphone dereverberation on DNN-based meeting transcription systems""7749  
 Takuya Yoshioka (University of Cambridge, United Kingdom); Xie Chen (University of Cambridge, United Kingdom); Mark Gales (University of Cambridge, United Kingdom)
- SLTC-P15.8 Recurrent Deep Neural Networks for Robust Speech Recognition""7754  
 Chao Weng (Georgia Institute of Technology, USA); Dong Yu (Microsoft Research, USA); Shinji Watanabe (Mitsubishi Electric Research Laboratories, USA); Fred Juang (Georgia Institute of Technology, USA)
- SLTC-P15.9 Factorized adaptation for deep neural network""7759  
 Jinyu Li (Microsoft Corporation, USA); Jui-Ting Huang (Microsoft Corporation, USA); Yifan Gong (Microsoft, USA)
- SLTC-P15.10 Using neural network front-ends on far field multiple microphones based speech recognition""7764

Yulan Liu (University of Sheffield, United Kingdom); Pengyuan Zhang (Key Laboratory of Speech Acoustics and Content Understanding, Chinese Academy of Sciences, P.R. China); Thomas Hain (University of Sheffield, United Kingdom)

SLTC-P15.11 Robust far-field spoken command recognition for home automation combining adaptation and multichannel processing""7769  
Athanasios Katsamanis (National Technical University of Athens, Greece); Isidoros Rodomagoulakis (National Technical University of Athens, Greece); Gerasimos Potamianos (University of Thessaly, Greece); Petros Maragos (National Technical University of Athens, Greece); Antigoni Tsiami (National Technical University of Athens + ATHENA-RC, Greece)

SLTC-P15.12 Highly Accurate Phonetic Segmentation Using Boundary Correction Models and System Fusion""7774  
Andreas Stolcke (Microsoft & ICSI, USA); Neville Ryant (University of Pennsylvania, USA); Vikramjit Mitra (SRI International, USA); Jiahong Yuan (University of Pennsylvania, USA); Wen Wang (SRI International, USA); Mark Liberman (University of Pennsylvania, USA)

SLTC-P15.13 Fusion of Diverse denoising systems for Robust Automatic Speech Recognition""7779  
Naveen Kumar (University of Southern California, USA); Maarten Van Segbroeck (University of Southern California, USA); Kartik Audhkhasi (University of Southern California, USA); Peter Drotar (Brno University of Technology, Czech Republic); Shrikanth Narayanan (University of Southern California, USA)

SLTC-P15.14 Unsupervised non-parametric Bayesian modeling of non-stationary noise for model-based noise suppression""7784  
Masakiyo Fujimoto (NTT Corporation, Japan); Yotaro Kubo (NTT Corporation, Japan); Tomohiro Nakatani (NTT Corporation, Japan)

## SLTC-P16: Deep Neural Networks in Speech Recognition II

Room: Poster Area 2

Chair: Patrick Nguyen (Big Data Startup, USA)

SLTC-P16.1 A Comparison of Two Optimization Techniques for Sequence Discriminative Training of Deep Neural Networks""7789

George Saon (IBM T. J. Watson Research Center, USA); Hagen Soltau (IBM, USA)

SLTC-P16.2 Joint Training of convolutional and non-convolutional Neural Networks""7794  
Hagen Soltau (IBM, USA); George Saon (IBM T. J. Watson Research Center, USA); Tara Sainath (IBM TJ Watson Research Center, USA)

SLTC-P16.3 Reduction of Acoustic Model Training Time and Required Data Passes via Stochastic Approaches to Maximum Likelihood and Discriminative Training""7799

Petr Novak (IBM, Czech Republic); Roman Otec (IBM, Czech Republic); Antonio Lee (IBM T. J. Watson Research Center, USA); Vaibhava Goel (IBM T. J. Watson Research Center, USA)

SLTC-P16.4 Data Augmentation for Deep Neural Network Acoustic Modeling""77: 4

Xiaodong Cui (IBM T. J. Watson Research Center, USA); Vaibhava Goel (IBM T. J. Watson Research Center, USA); Brian Kingsbury (IBM T. J. Watson Research Center, USA)

SLTC-P16.5 Asynchronous Stochastic Optimization for Sequence Training of Deep Neural Networks""77: 9

Georg Heigold (Google Inc., USA); Erik McDermott (Google Inc., USA); Vincent Vanhoucke (Google Inc., USA); Andrew Senior (Google Inc., USA); Michiel Bacchiani (Google Inc., USA)

SLTC-P16.6 Joint Acoustic Modeling of Triphones and Trigraphemes by Multi-Task Learning Deep Neural Networks for Low-Resource Speech Recognition""77: 4

Dongpeng Chen (The Hong Kong University of Science and Technology, Hong Kong); Brian Mak (The Hong Kong University of Science and Technology, Hong Kong); Cheung-Chi Leung (Institute for Infocomm Research, A\*STAR, Singapore); Sunil Sivadas (Institute for Infocomm Research, Singapore)

SLTC-P16.7 Standalone Training of Context-Dependent Deep Neural Network Acoustic Models""77: 9

Chao Zhang (University of Cambridge, United Kingdom); Phil Woodland (University of Cambridge, United Kingdom)

SLTC-P16.8 GMM-free DNN training""7824

Andrew Senior (Google Inc., USA); Georg Heigold (Google, USA); Michiel Bacchiani (Google Inc., USA); Hank Liao (Google, United Kingdom)

SLTC-P16.9 Multilingual Shifting Deep Bottleneck Features for low-resource ASR""7829

Bao Quoc Nguyen (Karlsruhe Institute of Technology (KIT), Germany); Markus Müller (Karlsruhe Institute of Technology, Germany); Sebastian Stüker (Karlsruhe Institute of Technology, Germany); Alex Waibel (Karlsruhe Institute of Technology, Germany); Jonas Gehring (Facebook, Germany)

SLTC-P16.10 A Family of Discriminative Training Criteria based on the f-Divergence for Deep Neural Networks""7834

Markus Nussbaum-Thom (RWTH Aachen University, Germany); Xiaodong Cui (IBM T. J. Watson Research Center, Germany); Ralf Schlüter (RWTH Aachen University, Germany); Vaibhava Goel (IBM T. J. Watson Research Center, USA); Hermann Ney (RWTH Aachen, Germany)

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Diyuan Liu (University of Science and Technology of China, P.R. China); Si Wei (Anhui USTC iFLYTEK Co., Ltd., P.R. China); Wu Guo (University of Science and Technology of China, P.R. China); Yebo Bao (University of Science and Technology of China, P.R. China); Shifu Xiong (University of Science and Technology of China, P.R. China); Li-Rong Dai (University of Science and Technology of China, P.R. China)

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Mahdi Esfahanian (Florida Atlantic University, USA); Hanqi Zhuang (Florida Atlantic University, USA); Nurgun Erdol (Florida Atlantic University, USA)

#### SAM-P5: Beamforming and Sensor Array Processing

Room: Poster Area 10

Chair: Xavier Mestre (CTTC, Spain)

SAM-P5.1 Robust Adaptive Beamforming Based on Response Vector Optimization<sup>7</sup>; 8265

Jingwei Xu (Xidian University, P.R. China); Guisheng Liao (Xidian University, P.R. China); Shengqi Zhu (Xidian University, P.R. China)

SAM-P5.2 MIMO RF Probe For Wide-area Indoor Human Motion Monitoring<sup>7</sup>; 8269

Chi Xu (Duke University, USA); Jeffrey Krolik (Duke University, USA)

SAM-P5.3 Optimization of transmit signals to interfere eavesdropping in a wireless LAN<sup>7</sup>; 8274

Shuichi Ohno (Hiroshima University, Japan); Yuji Wakasa (Yamaguchi University, Japan); Shui Yan (Valeo Interior Control Co., Ltd., P.R. China); Emmanuel Chifuel Manasseh (Hiroshima University, Japan)

SAM-P5.4 Optimal power Allocation and network beamforming for OFDM-based relay networks""8279  
 Ruhallah AliHemmati (TMU, Iran); Shahram ShahbazPanahi (University of Ontario Institute of Technology, Canada); Min Dong (University of Ontario Institute of Technology, Canada)

SAM-P5.5 A Conic Quadratic Programming Approach to Physical Layer Multicasting for Large-Scale Antenna Arrays""P IC  
 Le-Nam Tran (University of Oulu & Centre for Wireless Communications, Finland); Muhammad Fainan Hanif (University of Oulu, Finland); Markku Juntti (University of Oulu, Finland)

SAM-P5.6 A Generalized Theorem on the Average Array Directivity Factor""P IC  
 Dovid Y. Levin (Bar-Ilan University, Israel); Emanuël Habets (International Audio Laboratories Erlangen, Germany); Sharon Gannot (Bar-Ilan University, Israel)

SAM-P5.7 Time-Varying STAP for Nonstationary Hot Clutter Cancellation""8284  
 Giuseppe Fabrizio (Defence Science and Technology Organisation, Australia); Alfonso Farina (SELEX-SI, Italy)

SAM-P5.8 Knowledge-Aided Parametric Adaptive Matched Filter with Automatic Combining for Covariance Estimation""8289  
 Pu Wang (Schlumberger-Doll Research, USA); Hongbin Li (Stevens Institute of Technology, USA); Zhe Wang (Stevens Institute of Technology, USA); Braham Himed (AFRL, USA)

SAM-P5.9 ISAR Imaging by Exploiting the Continuity of Target Scene""8294  
 Lu Wang (Nanyang Technological University, Singapore); Lifan Zhao (Nanyang Technological University, Singapore); Guoan Bi (Nanyang Technological University, Singapore); Liren Zhang (United Arab Emirates University, UAE)

SAM-P5.10 A network of HF surface wave radars for maritime surveillance: preliminary results in the German Bight""8299  
 Salvatore Maresca (NATO Science and Technology Organization Centre for Maritime Research and Experimentation, Italy); Paolo Braca (NATO STO Centre for Maritime Research and Experimentation, Italy); Jochen Horstmann (NURC, Italy); Raffaele Grasso (CMRE, Italy)

## Friday, May 9

8:30 AM - 10:30 AM

### SLTC-L10: Speech Enhancement

Room: Cavaniglia  
 Chairs: Tim Fingscheidt (Technische Universität Braunschweig, Germany), Frank Soong (Microsoft Research Asia, USA)  
 8:30 On Speech Quality Assessment of Artificial Bandwidth Extension""82: 4

Patrick Bauer (Technische Universität Braunschweig & Institute for Communications Technology, Germany); Cyril Guillaumé (NXP Software, Leuven, Belgium); Wouter Tirry (NXP Software, Leuven, Belgium); Tim Fingscheidt (Technische Universität Braunschweig, Germany)

8:50 A Maximum A Posterior-based Reconstruction Approach to Speech Bandwidth Expansion in Noise""82: 9  
 Hyunson Seo (Yonsei University, Korea); Frank Soong (Microsoft Research Asia, USA); Hong-Goo Kang (Yonsei University, Korea)

9:10 Exploiting The Baseband Phase Structure Of The Voiced Speech For Speech Enhancement""82: 4  
 Sanjay Patil (Clemson University, USA); John Gowdy (Clemson University, USA)

9:30 Non-linear Soft-sounds Enhancement for near-end Speech Intelligibility Improvement""82: 9  
 Rajyalakshmi Dokku (Ruhr-Universität Bochum, Germany)

9:50 Binaural Noise Suppression Based on an Unbiased Estimator of Target PSD in Complex Noise Environments""8324  
 Youna Ji (Yonsei University, Korea); Young-cheol Park (Yonsei University, Korea); Dae Hee Youn (Yonsei University, Korea)

10:10 A Structure-Preserving Training Target For Supervised Speech Separation""8329  
 Yuxuan Wang (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

### SPTM-L8: Signal Processing on Networks

Room: Basilica  
 Chairs: Sergio Barbarossa (University of Rome La Sapienza", Italy), Franz Hlawatsch (Vienna University of Technology, Austria)

8:30 Large Deviations Analysis of Adaptive Distributed Detection""8334  
 Paolo Braca (NATO STO Centre for Maritime Research and Experimentation, Italy); Stefano Marano (University of Salerno, Italy); Vincenzo Matta (University of Salerno, Italy); Ali H. Sayed (University of California, Los Angeles, USA)

8:50 Distributed Decorrelation in Sensor Networks with Application to Distributed Particle Filtering""8339  
 Michael Moldaschl (University of Vienna, Austria); Wilfried Gansterer (University of Vienna, Austria); Ondrej Hlinka (Vienna University of Technology, Austria); Florian Meyer (Vienna University of Technology, Austria); Franz Hlawatsch (Vienna University of Technology, Austria)

9:10 Ordinal Potential Functions for Network Selection in Heterogeneous Wireless Networks""8344  
 Liang Ze Wong (Institute for Infocomm Research, Singapore); Tony Q. S. Quek (Singapore University of Technology and Design (SUTD) & Institute for Infocomm Research, Singapore); Michael Padilla (Singapore University of Technology and Design (SUTD), Singapore)

9:30 Crawford-Sobel meet Lloyd-Max on the grid""8349

Benjamin Larrousse (University Paris 11, France); Olivier Beaudé (Laboratory of Signals and Systems, France); Samson E. LaSaulce (CNRS - Supelec, France)  
9:50 Probabilistic ranking of multi-attribute items using indifference curve<sup>8354</sup>  
Xiaohui Gong (University of Alberta, Canada); H. Vicky Zhao (University of Alberta, Canada); Yan Sun (University of Rhode Island, USA)  
10:10 Multi-Agent Distributed Large-Scale Optimization by Inexact Consensus Alternating Direction Method of Multipliers<sup>8359</sup>  
Tsung-Hui Chang (National Taiwan University of Science and Technology, Taiwan); Mingyi Hong (University of Minnesota, USA); Xiangfeng Wang (Nanjing University, P.R. China)

### SS10: Dynamic Geometry Compression

Room: Polveriera

Chair: Dinei Florencio (Microsoft Research, USA)

8:30 Hybrid compression of dynamic 3D mesh data<sup>8364</sup>

Cheong-Hoon Kwak (Simon Fraser University, Canada); Ivan V. Bajic (Simon Fraser University, Canada)

8:50 On Human Time-Varying Mesh Compression Exploiting Activity-Related Characteristics<sup>8369</sup>

Alexandros Dumanoglou (Information Technologies Institute, Greece); Dimitrios Alexiadis (Informatics & Telematics Institute, Greece); Stylianos Asteriadis (Information Technologies Institute, Greece); Dimitrios Zarpalas (Informatics and Telematics Institute, Greece); Petros Daras (Centre for Research and Technology Hellas, Greece)

9:10 Compression of Human Body Sequences Using Graph Wavelet Filter Banks<sup>8374</sup>

Ha Q. Nguyen (University of Illinois at Urbana-Champaign, USA); Philip A. Chou (Microsoft Research, USA); Yinpeng Chen (Microsoft Research, USA)

9:30 3D Geometry Representation using Multiview Coding of Image Tiles<sup>8379</sup>

Yu Gao (Simon Fraser University, Canada); Gene Cheung (National Institute of Informatics, Japan); Thomas Maugey (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Pascal Frossard (EPFL, Switzerland); Jie Liang (Simon Fraser University, Canada)

9:50 Low Complexity Connectivity Driven Dynamic Geometry Compression for 3D Tele-Immersion<sup>8384</sup>

Rufael Mekuria (Centrum Wiskunde Informatica, The Netherlands); Pablo Cesar (CWI, The Netherlands); Dick Bulterman (CWI, The Netherlands)

### SS11: Signal Processing Techniques for Interference Alignment

Room: Scherma

Chair: Tharmalingam Ratnarajah (The University of Edinburgh, United Kingdom)

8:30 Link Adaptation for Interference Alignment with Imperfect CSIT<sup>8389</sup>

Mohsen Rezaee (Vienna University of Technology, Austria); Mehrdad Taki (Tehran University of Iran, Iran); Maxime Guillaud (Vienna University of Technology, Austria)

8:50 Ergodic Interference Alignment for the SIMO/MIMO Interference Channel<sup>8394</sup>  
Yohan Lejosne (EURECOM, France); Dirk Stock (EURECOM, France); Yi Yuan-Wu (Orange Labs, France)

9:10 Interference Alignment (IA) and Coordinated Multi-Point (CoMP) with IEEE802.11ac feedback compression: testbed results<sup>8398</sup>

Per Zetterberg (KTH Royal Institute of Technology, Sweden)

9:30 Performance Analysis of Distributed Cooperation under Uncoordinated Network Interference<sup>83</sup>

Nikolaos Pappas (Linköping University, Sweden); Marios Kountouris (Supélec, France)

9:50 Pilot-assisted ergodic interference alignment for wireless networks<sup>83</sup>

Hamed Farhadi (KTH Royal Institute of Technology, Sweden); Majid Nasiri Khormuji (Huawei Technologies Sweden, Sweden); Mikael Skoglund (KTH Royal Institute of Technology, Sweden)

10:10 Homotopy Continuation for Vector Space Interference Alignment in MIMO X Networks<sup>83</sup>

Óscar González (University of Cantabria, Spain); Jacobo Fanjul (University of Cantabria, Spain); Ignacio Santamaría (University of Cantabria, Spain)

### MLSP-L3: Source Separation

Room: Teatrino

Chair: Tulay Adali (University of Maryland Baltimore County, USA)

8:30 Jacobi Like Algorithm for Non-Orthogonal Joint Diagonalization of Hermitian Matrices<sup>83</sup>

Victor Maurandi (Université de Toulon, France); Eric Moreau (University of Toulon & LSIS UMR CNRS 7296, France); Christophe De Luigi (Université du Sud Toulon-Var, LSEET UMR, France)

8:50 Alternating Direction Method of Multipliers for Non-Negative Matrix Factorization with the Beta-Divergence<sup>8423</sup>

Dennis Sun (Stanford University, USA); Cédric Févotte (CNRS & Laboratoire Lagrange (CNRS, Observatoire de la Côte d'Azur & Université de Nice Sophia Antipolis), France)

9:10 Non-negative Source-Filter Dynamical System for Speech Enhancement<sup>8428</sup>

Umut Şimşekli (Bogazici University, Turkey); Jonathan Le Roux (Mitsubishi Electric Research Laboratories, USA); John Hershey (MERL, USA)

9:30 Analyzing Data into Quantized Components<sup>8433</sup>

Konstantinos Diamantaras (TEI of Thessaloniki, Greece); Theophilos Papadimitriou (Democritus University of Thrace, Greece); Konstantinos Goulianas (TEI of Thessaloniki, Greece)

9:50 An efficient entropy rate estimator for complex-valued signal processing: Application to ICA<sup>8438</sup>

Gengshen Fu (UMBC, USA); Ronald Phlypo (INRIA & CEA Neurospin, France); Matthew Anderson (UBMC, USA); Xi-Lin Li (Fortemedia, USA); Tulay Adali (University of Maryland Baltimore County, USA)

10:10 Blind qubit state disentanglement with quantum processing: principle, criterion and algorithm using measurements along two directions""8443

Yannick Deville (University of Toulouse, France); Alain Deville (Aix-Marseille Univ, France)

## IFS-L2: Forensics, Biometrics, and Privacy

Room: Volta

Chairs: Pedro Comesaña (Universidad de Vigo, Spain), Anthony T S Ho (University of Surrey, United Kingdom)

8:30 A Video Forensic Technique for Detecting Frame Deletion and Insertion""8448

Alessandra Gironi (Università di Firenze, Italy); Marco Fontani (University of Siena & University of Florence, Italy); Tiziano Bianchi (Politecnico di Torino, Italy); Alessandro Piva (University of Florence, Italy); Mauro Barni (University of Siena, Italy)

8:50 Guided filtering for PRNU-based localization of small-size image forgeries""8453

Giovanni Chierchia (Institut Mines-Télécom, Télécom ParisTech, CNRS LTCI, France); Davide Cozzolino (University Federico II of Naples, Italy); Giovanni Poggi (Università Federico II di Napoli, Italy); Carlo Sansone (Università degli Studi di Napoli Federico II, Italy); Luisa Verdoliva (University of Napoli, Italy)

9:10 Printer Identification from Micro-metric Scale Printing""8458

Quoc Thong Nguyen (LAGIS UMR CNRS 8146, France); Yves Delignon (Institut TELECOM/TELECOM Lille1 & Lagis UMR CNRS 8146, France); Lionel Chagas (LGP2 UMR CNRS 5518, France); François Septier (Institut Mines-Telecom/Telecom Lille/LAGIS UMR CNRS 8219, France)

9:30 The Role of Permutation Coding in Minimum-distortion Perfect Counterforensics""8462

Félix Balado (University College Dublin, Ireland)

9:50 Joint kernel collaborative representation on tensor manifold for face recognition""8467

Yeong Khang Lee (Yonsei University, Korea); Andrew Teoh Beng Jin (Yonsei University, Korea); Kar-Ann Toh (Yonsei University, Korea)

10:10 Privacy-Preserving Function Computation by Exploitation of Friendships in Social Networks""8472

Farid Movahedi Naini (EPFL, Switzerland); Jayakrishnan Unnikrishnan (EPFL, Switzerland); Patrick Thiran (EPFL, Switzerland); Martin Vetterli (EPFL, Switzerland)

## SLTC-P17: Speech Analysis and Coding

Room: Poster Area 1

Chair: Tom Bäckström (Friedrich-Alexander University Erlangen-Nürnberg & Fraunhofer IIS, Germany)

SLTC-P17.1 Sparse Representation Based on a Bag of Spectral Exemplars for Acoustic Event Detection""8477

Xugang Lu (NICT, Japan); Yu Tsao (Research Center for Information Technology Innovation, Academia Sinica, Taiwan); Shigeki Matsuda (NICT, Japan); Chiori Hori (NICT, Japan)

SLTC-P17.2 Robust Full-band Adaptive Sinusoidal Analysis and Synthesis of Speech""8482

George Kafentzis (Orange Labs, France); Olivier Rosec (Voxygen S.A., France); Yannis Stylianou (University of Crete, Greece)

SLTC-P17.3 An Adaptive Time-Frequency Analysis Scheme for Improved Real-Time Speech Enhancement""8487

Kristian Timm Andersen (KU Leuven & Widex A/S, Denmark); Marc Moonen (KU Leuven, Belgium)

SLTC-P17.4 A Fixed Dimension and Perceptually based Dynamic Sinusoidal Model of Speech""8492

Qiong HU (University of Edinburgh & Toshiba Cambridge, United Kingdom); Yannis Stylianou (University of Crete, Greece); Korin Richmond (The University of Edinburgh, United Kingdom); Ranniery Maia (Toshiba Cambridge Research Lab, United Kingdom); Junichi Yamagishi (Univ of Edinburgh, United Kingdom); Javier Latorre (Toshiba, United Kingdom)

SLTC-P17.5 Energy-Constrained Minimum Variance Response Filter for Robust Vowel Spectral Estimation""8497

Colin Vaz (University of Southern California, USA); Andreas Tsiartas (USC, USA); Shrikanth Narayanan (University of Southern California, USA)

SLTC-P17.6 Long audio alignment for automatic subtitling using different phone-relatedness measures""84: 2

Aitor Alvarez (Vicomtech-IK4, Spain); Haritz Arzelus (Vicomtech-IK4, Spain); Pablo Ruiz (Vicomtech-IK4, Spain)

SLTC-P17.7 Gaussian mixture linear prediction""84: 7

Jouni Pohjalainen (Aalto University, Finland); Paavo Alku (Aalto University, Finland)

SLTC-P17.8 Time Varying Linear Prediction using sparsity constraints""84: 2

Srikanth Raj Chetupalli (Indian Institute of Science, India); Thippur V. Sreenivas (Indian Institute of Science, India)

SLTC-P17.9 Design of Optimal Wavelets for Detecting Impulse Noise in Speech""84: 6

Rajeev Nongpiur (University of Victoria, Canada); Dale Shpak (University of Victoria, Canada); Pan Agathoklis (University of Victoria, Canada)

SLTC-P17.10 Pitch Enhancement Motivated by Rate-Distortion Theory""84: ;

Obada Alhaj Moussa (KTH EE, Sweden); Minyue Li (Google Inc., P.R. China); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand)

SLTC-P17.11 Intra-Predictive Switched Split Vector Quantization of Speech Spectra""P IC Miguel Arjona Ramirez (University of São Paulo, Brazil)

SLTC-P17.12 Estimating Speaker Height and Subglottal Resonances Using MFCCs and GMMs""P IC

Harish Arsikere (University of California, Los Angeles, USA); Steven Lulich (Indiana University, Bloomington, USA); Abeer Alwan (UCLA, USA)

SLTC-P17.13 Frequency warping using subglottal resonances: complementarity with VTLN and robustness to additive noise""8526

Harish Arsikere (University of California, Los Angeles, USA); Abeer Alwan (UCLA, USA)

SLTC-P17.14 Shift-Invariant Features for Speech Activity Detection in Adverse Radio-Frequency Channel Conditions""852;



Mohamed Kamal Omar (IBM, USA); Sriram Ganapathy (IBM Research & IBM TJ Watson, USA)

### SLTC-P18: Adaptation in Speech Recognition

Room: Poster Area 2

Chair: Mike Seltzer (Microsoft Research, USA)

SLTC-P18.1 Using contextual information in Joint Factor Eigenspace MLLR for speech recognition in diverse scenarios""8536

Oscar Saz (University of Sheffield, United Kingdom); Thomas Hain (University of Sheffield, United Kingdom)

SLTC-P18.2 Regularized Constrained Maximum Likelihood Linear Regression for Speech Recognition""853;

Sina Hamidi Ghalehjehg (McGill University, Canada); Richard Rose (McGill University, Canada)

SLTC-P18.3 Two-Stage Speaker Adaptation in Subspace Gaussian Mixture Models""8546

Sina Hamidi Ghalehjehg (McGill University, Canada); Richard Rose (McGill University, Canada)

SLTC-P18.4 Deep Neural Network Trained with Speaker Representation for Speaker Normalization""854;

Aanchan Mohan (McGill University, Canada); Yun Tang (Nuance Communications, Canada); Richard Rose (McGill University, Canada); Chengyuan Ma (Nuance Communications, USA)

SLTC-P18.5 I-vector-based Speaker Adaptation of Deep Neural Networks for French Broadcast Audio Transcription""8556

Vishwa Gupta (CRIM, Canada); Patrick Kenny (CRIM, Canada); Pierre Ouellet (Centre de Recherche Informatique de Montreal (CRIM), Canada); Themis Stafylakis (Ecole de Technologie Superieure, Canada)

SLTC-P18.6 Direct Adaptation of Hybrid DNN/HMM Model for Fast Speaker Adaptation in LVCSR Based on Speaker Code""855;

Shaofei Xue (University of Science and Technology of China, P.R. China); Ossama Abdel-Hamid (York University, Canada); Hui Jiang (York University, Canada); Li-Rong Dai (University of Science and Technology of China, P.R. China)

SLTC-P18.7 Investigation of unsupervised adaptation of DNN acoustic models with filter bank input""8566

Takuya Yoshioka (University of Cambridge, United Kingdom); Anton Ragni (University of Cambridge, United Kingdom); Mark Gales (University of Cambridge, United Kingdom)

SLTC-P18.8 Speaker Adaptive Training using Deep Neural Networks""856;

Tsubasa Ochiai (Doshisha University, Japan); Shigeki Matsuda (NICT, Japan); Xugang Lu (NICT, Japan); Chiori Hori (NICT, Japan); Shigeru Katagiri (Doshisha University, Japan)

SLTC-P18.9 Cache based Recurrent Neural Network Language Model Inference for First Pass Speech Recognition""8576

Zhiheng Huang (Microsoft, USA); Geoffery Zweig (Microsoft Research, USA); Benoit Dumoulin (Microsoft, USA)

SLTC-P18.10 Singular Value Decomposition Based Low-footprint Speaker Adaptation and Personalization for Deep Neural Network""857;

Jian Xue (Microsoft Corporation, USA); Jinyu Li (Microsoft Corporation, USA); Dong Yu (Microsoft Research, USA); Mike Seltzer (Microsoft Research, USA); Yifan Gong (Microsoft, USA)

SLTC-P18.11 Real-time one-pass decoding with recurrent neural network language model for speech recognition""8586

Takaaki Hori (NTT Corporation, Japan); Yotaro Kubo (NTT Corporation, Japan); Atsushi Nakamura (NTT Corporation, Japan)

SLTC-P18.12 Constrained MLE-based speaker adaptation with L1 regularization""858;

Younggwon Kim (Korea Advanced Institute of Science and Technology, Korea);

Hoirin Kim (Korea Advanced Institute of Science and Technology, Korea)

SLTC-P18.13 Training Time Reduction and Performance Improvements from Multilingual Techniques on the Babel ASR Task""8596

Sebastian Stüker (Karlsruhe Institute of Technology, Germany); Markus Müller (Karlsruhe Institute of Technology, Germany); Bao Quoc Nguyen (Karlsruhe Institute of Technology (KIT), Germany); Alex Waibel (Karlsruhe Institute of Technology, Germany)

SLTC-P18.14 Domain Adaptation for Parsing in Automatic Speech Recognition""859;

Alex Marin (University of Washington, USA); Mari Ostendorf (University of Washington, USA)

### SPTM-P14: Adaptive Systems - Algorithms, Analyses and Applications

Room: Poster Area 3

Chair: Paulo Diniz (Universidade Federal do Rio de Janeiro, Brazil)

SPTM-P14.1 Mean-square performance of the hyperslab-based adaptive projected subgradient method""85: 6

Werner Wee (Tokyo Institute of Technology, Japan); Masao Yamagishi (Tokyo Institute of Technology, Japan); Isao Yamada (Tokyo Institute of Technology, Japan)

SPTM-P14.2 Set-Membership Adaptive Constrained Constant Modulus Reduced-Rank Algorithm for Beamforming""85: ;

Yunlong Cai (Zhejiang University, P.R. China); Rodrigo C. de Lamare (University of York, United Kingdom); Boya Qin (Zhejiang University, P.R. China); Minjian Zhao (Zhejiang University, P.R. China)

SPTM-P14.3 Statistical Analysis of Jointly-Optimized GSC Implementations of Beamformer-Assisted Acoustic Echo Cancelers""85: 6

Marcos H Maruo (Federal University of Santa Catarina, Brazil); Jose Carlos Moreira Bermudez (Federal University of Santa Catarina, Brazil); Leonardo Resende (Universidade Federal de Santa Catarina, Brazil)

SPTM-P14.4 Stability and MSE Analyses of Affine Projection Algorithms for Sparse System Identification""85: ;

- Markus V.S. Lima (Universidade Federal do Rio de Janeiro - UFRJ, Brazil); Iker Sobron (University of The Basque Country & Federal University of Rio de Janeiro, Spain); Wallace A. Martins (Federal University of Rio de Janeiro, Brazil); Paulo Diniz (Universidade Federal do Rio de Janeiro, Brazil)
- SPTM-P14.5 Sequential Bayesian learning in linear networks with random decision making""8626  
Yunlong Wang (Stony Brook University, USA); Petar M. Djurić (Stony Brook University, USA)
- SPTM-P14.6 Adjustment of Combination Weights Over Adaptive Diffusion Networks""862; Jesus Fernandez-Bes (Universidad Carlos III de Madrid, Spain); Jerónimo Arenas-García (Universidad Carlos III de Madrid, Spain); Ali H. Sayed (University of California, Los Angeles, USA)
- SPTM-P14.7 On the Gradient Descent Localization of Radioactive Sources""P IC Henry E Baidoo-Williams (University of Iowa, USA); Soura Dasgupta (The University of Iowa, USA); Raghuraman Mudumbai (University of Iowa, USA); Erwei Bai (University of Iowa, USA)
- SPTM-P14.8 Tracking Complex-Valued Multicomponent Chirp Signals Using a Complex Notch Filter with Adaptive Bandwidth and Frequency Parameters""8636 Paul T Wheeler (Loughborough University, United Kingdom); Jonathon A Chambers (Loughborough University, United Kingdom)
- SPTM-P14.9 Sparsity-Aware Adaptive Algorithms Based on Alternating Optimization and Shrinkage""P IC Rodrigo C. de Lamare (University of York, United Kingdom); Raimundo Sampaio-Neto (Cetuc-Puc-Rio, Brazil)
- SPTM-P14.10 A Quaternion Least Mean Phase Estimator""863; Sayed Pouria Talebi (Imperial College London, United Kingdom); Dongpo Xu (Imperial College London, United Kingdom); Anthony Kuh (Univ of Hawaii, Manoa, USA); Danilo Mandic (Imperial College, London, United Kingdom)
- SPTM-P14.11 Adaptive Widely Linear Reduced-Rank Beamforming based on Joint Iterative Optimization""P IC Nuan Song (Ilmenau University of Technology, Germany); Waheed Ullah Alokozai (Ilmenau University of Technology, Germany); Rodrigo C. de Lamare (University of York, United Kingdom); Martin Haardt (Ilmenau University of Technology, Germany)

#### SPCOM-P10: Distributed and sparse signal processing with applications

Room: Poster Area 4

- SPCOM-P10.1 Sparse adaptive multipath tracking for low bandwidth ranging applications""8646  
Nicolas Schneckenburger (German Aerospace Center (DLR), Germany); Dmitriy Shutin (German Aerospace Center (DLR), Germany)
- SPCOM-P10.2 Robust Sparse Channel Estimation for OFDM System using an Iterative Algorithm Based on Complex Median""864;

- Jesús Lacruz (Universidad de Los Andes, Venezuela); Juan Ramirez (Universidad de Los Andes, Venezuela); Jose L. Paredes (University of Los Andes & University of Delaware, USA)
- SPCOM-P10.3 Distributed support detection of jointly sparse signals""8656 Sophie Fosson (Politecnico di Torino, Italy); Javier Matamoros (Centre Tecnologic de Telecomunicacions de Catalunya, Spain); Carles Antón-Haro (Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Spain); Enrico Magli (Politecnico di Torino, Italy)
- SPCOM-P10.4 Distributed Quantization for Compressed Sensing""865; Amirpasha Shirazinia (KTH Royal Institute of Technology, Sweden); Saikat Chatterjee (KTH - Royal Institute of Technology & Communication Theory Lab, Sweden); Mikael Skoglund (KTH Royal Institute of Technology, Sweden)
- SPCOM-P10.5 Adaptive Distributed Compressed Sensing for Dynamic High-Dimensional Hypothesis testing""8666 Nicolò Michelusi (University of Southern California, USA); Urbashi Mitra (University of Southern California, USA)
- SPCOM-P10.6 Compressed Acquisition and Progressive Reconstruction of Multi-Dimensional Correlated Data in Wireless Sensor Networks""866; Markus Leinonen (University of Oulu & Centre for Wireless Communications (CWC), Finland); Marian Codreanu (University of Oulu, Finland); Markku Juntti (University of Oulu, Finland)
- SPCOM-P10.7 Recovering Signals with Variable Sparsity Levels from the Noisy 1-Bit Compressive Measurements""8676 Amin Movahed (University of New South Wales, Australia); Ashkan Panahi (Chalmers University of Technology, Sweden); Mark C Reed (University of New South Wales, Australia)
- SPCOM-P10.8 Estimation Models for Nonuniformly Sampled Signals - Application to Multiple Delay Estimation ""P IC Jesus Selva (University of Alicante (SPAIN), Spain)
- SPCOM-P10.9 Asymptotic Analysis of Failed Recovery Probability in a Distributed Wireless Storage System with Limited Sum Storage Capacity""867; Bi Hong (KAIST, Korea); Wan Choi (KAIST, Korea)
- SPCOM-P10.10 A stochastic approximation approach to load shedding in power networks""8686 Nikolaos Gatsis (The University of Texas at San Antonio, USA); Antonio G. Marques (Universidad Rey Juan Carlos, Spain)
- SPCOM-P10.11 Sparsity-Aware Channel Estimation with Contaminated Pilot Sequence""868; Giuseppe Destino (CWC, University of Oulu, Finland); Davide Macagnano (Centre for Wireless Communications, University of Oulu, Finland); Markku Juntti (University of Oulu, Finland); Shirish Nagaraj (Nokia Siemens Networks, USA)

#### SPCOM-P11: Estimation in communication systems

Room: Poster Area 5

Chair: Chong-Yung Chi (National Tsing Hua University, Taiwan)

SPCOM-P11.1 Fast Time-Varying Channel Estimation Method for LTE SC-FDMA Systems<sup>8696</sup>

Dan Li (Shaoguan university, P.R. China); Feng Ke (South China University of Technology, P.R. China)

SPCOM-P11.2 Flat Fading Channel Estimation Based On Dirty Paper Coding<sup>869</sup>; Gabriel Dominguez-Conde (University of Vigo, Spain); Pedro Comesaña (Universidad de Vigo, Spain); Fernando Pérez-González (University of Vigo, Spain)

SPCOM-P11.3 Channel Estimation for LTE and LTE-A MU-MIMO Uplink with A Narrow Transmission Band<sup>86</sup>: 6

Chih-Ying Chen (National Chiao Tung University, Taiwan); David Lin (National Chiao Tung University, Taiwan)

SPCOM-P11.4 New Subspace-Based Blind Channel Estimation for Orthogonally Coded MIMO-OFDM Systems<sup>86</sup>: ;

Jian-Da Jiang (National Taiwan University, Taiwan); Tzu-Chiao Lin (National Taiwan University, Taiwan); See-May Phoong (National Taiwan University, Taiwan)

SPCOM-P11.5 Robust Joint CFO and Fast Time-Varying Channel Tracking for MIMO-OFDM Systems<sup>86</sup>: 6

Meng Chuan Mah (Multimedia University, Malaysia); Heng Siong Lim (Multimedia University, Malaysia); Alan Tan (Multimedia University, Malaysia)

SPCOM-P11.6 Training Signal Design for Channel Estimation in Massive MIMO Systems<sup>86</sup>: ;

Song Noh (Purdue University, USA); Michael Zoltowski (Purdue University, USA); Youngchul Sung (KAIST, Korea); David Love (Purdue University, USA)

SPCOM-P11.7 Ziv-Zakai Lower Bound for UWB based TOA Estimation with Unknown Interference<sup>8726</sup>

Adrià Gusi Amigó (Université Catholique de Louvain, Belgium); Pau Closas (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Achraf Hassan Mallat (Université catholique de Louvain, Belgium); Luc Vandendorpe (University of Louvain, Belgium)

SPCOM-P11.8 A Decentralized Framework for Linear Coherent Estimation with Spatial Collaboration<sup>872</sup>;

Swarnendu Kar (Intel Corporation, USA); Pramod Varshney (Syracuse University, USA)

SPCOM-P11.9 One-Shot Blind CFO Estimation for OFDM with Multi-Antenna Receiver<sup>8736</sup>

Weile Zhang (Xi'an Jiaotong University, P.R. China); Qinye Yin (Xi'an Jiaotong University, P.R. China); Wenjie Wang (Xi'an Jiaotong University, P.R. China)

SPCOM-P11.10 TDOA/AOD/AOA Localization in NLOS Environments<sup>873</sup>:

Behailu Yohannes Shikur (University of Rostock, Germany); Tobias Weber (Uni Rostock, Germany)

SPCOM-P11.11 Maximum Likelihood SNR Estimation over Time-Varying Flat-Fading SIMO Channels<sup>8745</sup>

Faouzi Bellili (Institut national de la recherche scientifique, Canada); Rabii Meftehi (INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphanne (Huawei & INRS-EMT, Canada)

## IVMSP-P11: Video Segmentation and Tracking

Room: Poster Area 6

Chair: Andrea Cavallaro (Queen Mary, University of London, United Kingdom)

IVMSP-P11.1 Video background subtraction using semi-supervised robust matrix completion<sup>874</sup>:

Hassan Mansour (Mitsubishi Electric Research Laboratories, USA); Anthony Vetro (Mitsubishi Electric Research Laboratories, USA)

IVMSP-P11.2 Visual Object Tracking Via Random Ferns based Classification<sup>8755</sup>

Aniruddha Acharya (Indian Institute of Science, India); Venkatesh Babu Radhakrishnan (Indian Institute of Science, India)

IVMSP-P11.3 A Clustering Approach for Detecting Moving Objects Captured by a Moving Aerial Camera<sup>875</sup>:

Joseph DeGol (University of Illinois, USA); Myra Nam (MIT, USA)

IVMSP-P11.4 Multiple Hypotheses Data Association Propagation for Robust Monocular-based SLAM Algorithms<sup>8765</sup>

Mauricio Soto Alvarez (Italian Institute of Technology, Italy); Petri Honkamaa (VTT, Italy)

IVMSP-P11.5 Visual Tracking Using Blind Source Separation for Mixed Images<sup>876</sup>:

Hsiao-Tzu Chen (National Central University, Taiwan); Chih-Wei Tang (National Central University, Taiwan)

IVMSP-P11.6 Automatic Foreground Extraction in Video<sup>8775</sup>

Haoqian Wang (Tsinghua University, P.R. China); Bowen Deng (Tsinghua University, P.R. China); Kai Li (Tsinghua University, P.R. China); Yongbing Zhang (Tsinghua University, P.R. China); Lei Zhang (Tsinghua University, P.R. China)

IVMSP-P11.7 An Integrated System for Object Tracking, Detection, and Online Learning with Real-Time RGB-D Video<sup>877</sup>:

I-Kuei Chen (National Taiwan University, Taiwan); Chung-Yu Chi (National Taiwan University, Taiwan); Szu-Lu Hsu (National Taiwan University, Taiwan); Liang-Gee Chen (DSP/IC Design Lab., National Taiwan University, Taiwan)

IVMSP-P11.8 Vehicle Speed Estimation by License Plate Detection and Tracking<sup>8785</sup>

Diogo Luvizon (Federal University of Technology - Paraná, Brazil); Bogdan Nassu (Universidade Tecnológica Federal do Paraná, Brazil); Rodrigo Minetto (University of Campinas & University Pierre and Marie Curie, Brazil)

IVMSP-P11.9 Online co-training ranking SVM for visual tracking<sup>878</sup>:

Pingyang Dai (Xiamen University, P.R. China); Kai Liu (Xiamen University, P.R. China); Yi Xie (Xiamen University, P.R. China); Cuihua Li (Xiamen University, P.R. China)

IVMSP-P11.10 Optical Flow Estimation Using Approximate Nearest Neighbor Field Fusion<sup>8795</sup>

Nirmal Jith O U (Indian Institute of Science, India); Avinash S Ramakanth (Indian Institute of Science, India); Venkatesh Babu Radhakrishnan (Indian Institute of Science, India)

IVMSP-P11.11 Parallel Particle-PHD filter<sup>879</sup>:

Marco Del Coco (University of Salento, Italy); Andrea Cavallaro (Queen Mary, University of London, United Kingdom)

IVMSP-P11.12 Fast Shot Segmentation Combining Global and Local Visual Descriptors<sup>87: 5</sup>  
Evlampios Apostolidis (Information Technologies Institute - Centre for Research and Technology Hellas, Greece); Vasileios Mezaris (Information Technologies Institute / CERTH, Greece)

IVMSP-P11.13 A robust, precise and flexible tracking algorithm based on IMS and SWAD<sup>87: :</sup>  
Gaetano Di Caterina (University of Strathclyde, United Kingdom); John J Soraghan (University of Strathclyde, United Kingdom)

IVMSP-P11.14 An I-Vector Based Descriptor for Alphabetical Gesture Recognition<sup>87: ;</sup>  
You-Chi Cheng (Georgia Institute of Technology, USA); Ville Hautamäki (University of Eastern Finland, Finland); Zhen Huang (Georgia Institute of Technology, USA); Kehuang Li (Georgia Institute of Technology, USA); Chin-Hui Lee (Georgia Institute of Technology, USA)

#### **BISP-P7: Medical image reconstruction I**

Room: Poster Area 7  
Chair: Yoram Bresler (University of Illinois, Urbana-Champaign, USA, USA)

BISP-P7.1 Compressed Sensing for Magnetic Resonance Images with Phase Variations<sup>87: ;</sup>  
Satoshi Ito (Utsunomiya University, Japan); Yoshifumi Yamada (Utsunomiya University, Japan)

BISP-P7.2 X-Ray Image Contrast Enhancement Based On Tissue Attenuation<sup>8824</sup>  
Chingchun Huang (National Chung Cheng University, Taiwan); Nguyen Hung (University of Technical Education, Vietnam); Chen-Yu Tseng (National Chiao Tung University, Taiwan)

BISP-P7.3 Volume Visualization Using Sparse Nonparametric Support Vector Machines and Harmonic Colors<sup>8829</sup>  
Naimul M Khan (Ryerson University, Canada); Riadh Ksantini (University of Windsor, Canada); Ling Guan (Ryerson University, Canada)

BISP-P7.4 BM3D MRI denoising equipped with Noise Invalidation technique<sup>8834</sup>  
Pegah Elahi (Ryerson University, Canada); Soosan Beheshti (Ryerson University, Canada); SayedMasoud Hashemi (University of Toronto, Canada)

BISP-P7.5 Hull Detection Based On Largest Empty Sector Angle with application to analysis of real time MR images<sup>8839</sup>  
Naveen Kumar (University of Southern California, USA); Shrikanth Narayanan (University of Southern California, USA)

BISP-P7.6 Lossless Compression of Medical Images based on HEVC Intra Coding<sup>8844</sup>  
Victor Sanchez (University of Warwick, United Kingdom); Joan Bartrina-Rapesta (Universitat Autònoma de Barcelona, Spain)

BISP-P7.7 A multi-view approach to Consensus Clustering in multi-modal MRI<sup>8849</sup>  
Carlos A. Mendez (University of Verona, Italy); Paul Summers (European Institute of Oncology, Italy); Gloria Menegaz (University of Verona, Italy)

BISP-P7.8 Enhanced Retinal Image Registration Accuracy using Expectation Maximisation and Variable Bin-sized Mutual Information<sup>8854</sup>

Parminder Singh Reel (The Open University, United Kingdom); Laurence Dooley (The Open University, United Kingdom); Patrick K C Wong (Open University, United Kingdom); Anko Börner (German Aerospace Center (DLR), Germany)

BISP-P7.9 Data Adaptive Estimation of Transversal Blood Flow Velocities<sup>8859</sup>  
Elham Pirnia (Lund University, Sweden); Andreas Jakobsson (Lund University, Sweden); Erik Gudmundson (Lund University, Sweden); Joergen Arendt Jensen (Technical University of Denmark, Denmark)

#### **AASP-P9: Noise and Room Acoustics Control, Audio Source Separation II, Audio Systems**

Room: Poster Area 8  
Chair: Nordholm Sven (Curtin University of Technology, Australia)

AASP-P9.1 Joint Time-Domain Reshaping and Frequency-Domain Equalization of Room Impulse Responses<sup>8864</sup>  
Jan Ole Jungmann (University of Luebeck, Germany); Radoslaw Mazur (University of Luebeck, Germany); Alfred Mertins (Institute for Signal and Image Processing, University of Luebeck, Germany)

AASP-P9.2 Steady-state Analysis of Biased Filtered-x Algorithms for Adaptive Room Equalization<sup>8869</sup>  
Laura Fuster (Universidad Politecnica de Valencia, Spain); María de Diego (Universitat Politècnica De València, Spain); Miguel Ferrer (Universidad Politecnica de Valencia, Spain); Alberto Gonzalez (Universidad Politecnica de Valencia, Spain)

AASP-P9.3 A Novel Decorrelation Approach for Multichannel System Identification<sup>8874</sup>  
Laura Romoli (Università Politecnica delle Marche, Italy); Stefania Cecchi (Università Politecnica delle Marche, Italy); Francesco Piazza (Università Politecnica delle Marche, Italy)

AASP-P9.4 Sparsity-Inducing Modified Filtered-X Affine Projection Algorithms for Active Noise Control<sup>8879</sup>  
Amelia Gully (University of York, United Kingdom); Rodrigo C. de Lamare (University of York, United Kingdom)

AASP-P9.5 New Feedback Active Noise Control System with Improved Performance<sup>8884</sup>  
Tongwei Wang (Nanyang Technological University, Singapore); Woon Seng Gan (Nanyang Technological University, Singapore); Sen Kuo (Northern Illinois University, USA)

AASP-P9.6 Deep Stacking Networks with Time Series for Speech Separation<sup>8889</sup>  
Shuai Nie (Institute of Automation, Chinese Academy of Sciences, Beijing, P.R. China); Hui Zhang (Inner Mongolia University, P.R. China); XueLiang Zhang (Inner Mongolia University, P.R. China); Wen-ju Liu (Institute of Automation, Chinese Academy of Sciences, P.R. China)

AASP-P9.7 Speech-guided source separation using a pitch-adaptive guide signal model<sup>8894</sup>  
Romain Hennequin (Audionamix R&D, France); Juan José Burred (Audionamix, France); Simon Maller (Audionamix, France); Pierre Leveau (Audionamix, France)

AASP-P9.8 Multichannel Audio Separation by Direction of Arrival Based Spatial Covariance Model and Non-Negative Matrix Factorization""8899

Joonas Nikunen (Tampere University of Technology, Finland); Tuomas Virtanen (Tampere University of Technology, Finland)

AASP-P9.9 Hybrid Model and Structured Sparsity for Under-Determined Convolutional Audio Source Separation""88: 4

Fangchen Feng (Univ Paris-Sud, France); Matthieu Kowalski (Univ Paris-Sud, France)

AASP-P9.10 Phase and level difference fusion for robust multichannel source separation""88: 9

Johannes Traa (University of Illinois at Urbana-Champaign, USA); Minje Kim (University of Illinois at Urbana-Champaign, USA); Paris Smaragdis (University of Illinois at Urbana-Champaign, USA)

AASP-P9.11 Multi-channel IIR filtering of audio signals using a GPU""88: 4

Jose A. Belloch (Universidad Politecnica de Valencia, Spain); Balázs Bank (Budapest University of Technology and Economics, Hungary); Lauri Savioja (Aalto University, Finland); Alberto Gonzalez (Universidad Politecnica de Valencia, Spain); Vesa Valimäki (Aalto University, Finland)

AASP-P9.12 Equalization of excursion and current-dependent nonlinearities in loudspeakers""88: 9

Shreyas Srikanth Payal (University of Utah, USA); V. John Mathews (University of Utah, USA); Ajay Iyer (Harman International Industries, USA); Russ Lambert (Harman International Industries, USA); Jeffrey Hutchings (Harman International Industries, USA)

AASP-P9.13 Hardware and algorithms for ultrasonic depth imaging""8924

Ivan Dokmanić (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Ivan J. Tashev (Microsoft Research, USA)

AASP-P9.14 Audio Packet Loss Concealment Using Spectral Motion""8929

Seyed Kamran Pedram (Brunel University, United Kingdom); Saeed Vaseghi (Brunel University, United Kingdom); Bahareh Langari (Brunel University, United Kingdom)

## MLSP-P6: Clustering, Factorizations & Feature Selection

Room: Poster Area 9

Chair: Raviv Raich (Oregon State University, USA)

MLSP-P6.1 Feature selection based on Survival Cauchy-Schwartz mutual information""8933

Badong Chen (Xi'an Jiaotong University, USA); Xiaohan Yang (Xi'an Jiaotong University, P.R. China); Hua Qu (Xi'an Jiaotong University, P.R. China); Jihong Zhao (Xi'an Jiaotong University, P.R. China); Nanning Zheng (Xi'an Jiaotong University, P.R. China); Jose Principe (University of Florida, USA)

MLSP-P6.2 Robust Feature Learning by Stacked Autoencoder with Maximum Correntropy Criterion""8938

Yu Qi (Zhejiang University, P.R. China); Yueming Wang (Zhejiang University, P.R. China); Xiaoxiang Zheng (Zhejiang University, P.R. China); Zhaohui Wu (Zhejiang University, P.R. China)

MLSP-P6.3 Piecewise constant Nonnegative matrix factorization""8943

Nicolas Seichepine (Télécom ParisTech, France); Slim ESSID (Telecom ParisTech & CNRS/LTCl, France); Cédric Févotte (CNRS & Laboratoire Lagrange (CNRS, Observatoire de la Côte d'Azur & Université de Nice Sophia Antipolis), France); Olivier Cappé (LTCl, Telecom Paris Tech, CNRS, France)

MLSP-P6.4 M-N scatter plots technique for evaluating varying-size clusters and setting the parameters of Bi-CoPaM and UNCLES methods""8948

Basel Abu-Jamous (Brunel University, United Kingdom); Rui Fa (Brunel University, United Kingdom); David Roberts (The University of Oxford, United Kingdom); Asoke Nandi (Brunel University, United Kingdom)

MLSP-P6.5 An initialization strategy for the dictionary learning problem""8953

Cristian Rusu (IMT Institute for Advanced Studies Lucca, Italy); Bogdan Dumitrescu (Tampere University of Technology, Finland)

MLSP-P6.6 Deflation Method for CANDECOMP/PARAFAC Tensor Decomposition""8958

Anh Huy Phan (RIKEN & Brain Science Institute, RIKEN, Japan); Petr Tichavsky (Academy of Sciences of the Czech Republic, Czech Republic); Andrzej S Cichocki (RIKEN BSI, Laboratory for Advanced Brain Signal Processing, Japan)

MLSP-P6.7 Clustering of Time Series Using a Hierarchical Linear Dynamical System""8963

Goktug Cinar (University of Florida, USA); Jose Principe (University of Florida, USA)

MLSP-P6.8 First Order Methods for Robust Non-negative Matrix Factorization for Large Scale Noisy Data""8968

Gejie Liu (Tufts University, USA); Shuchin Aeron (Tufts University, USA)

MLSP-P6.9 Multiple Kernel Interpolation for Inverting Non-Linear Dimensionality Reduction and Dimension Estimation""8973

Jayaraman J. Thiagarajan (Lawrence Livermore National Laboratory, USA); Karthikeyan Natesan Ramamurthy (IBM Thomas J. Watson Research Center, USA); Peer-Timo Bremer (Lawrence Livermore National Laboratory, USA)

MLSP-P6.10 Feature Reduction Based on Sum-of-SNR (SOSNR) Optimization""8978

Yinan Yu (Chalmers University of Technology, Sweden); Tomas McKelvey (Chalmers University of Technology, Sweden); S. y. Kung (Princeton University, USA)

MLSP-P6.11 Neighborhood selection for thresholding based subspace clustering""8983

Reinhard Heckel (ETH Zürich, Switzerland); Eirikur Agustsson (ETH Zurich, Switzerland); Helmut Bölcskei (ETH Zurich, Switzerland)

MLSP-P6.12 On Fast Algorithms for Orthogonal Tucker Decomposition""8988

Anh Huy Phan (RIKEN & Brain Science Institute, RIKEN, Japan); Andrzej S Cichocki (RIKEN BSI, Laboratory for Advanced Brain Signal Processing, Japan); Petr Tichavsky (Academy of Sciences of the Czech Republic, Czech Republic)

MLSP-P6.13 Discriminative Exemplar Clustering""8993

Yingzhen Yang (University of Illinois at Urbana-Champaign, USA); Feng Liang (University of Illinois, Urbana-Champaign, USA); Thomas S Huang (University of Illinois at Urbana-Champaign, USA)

## SAM-P6: Compressive and Physics-Based Methods

Room: Poster Area 10

Chair: Lee Swindlehurst (University of California at Irvine, USA)

SAM-P6.1 On the estimation of Grid Offsets in CS-based Direction-of-Arrival Estimation""8: 9

Mohamed Ibrahim (Technische Universität Ilmenau, Germany); Florian Roemer (Ilmenau University of Technology, Germany); Roman Alieiev (Ilmenau University of Technology, Germany); Giovanni Del Galdo (Fraunhofer Institute for Integrated Circuits IIS, Germany); Reiner S. Thomä (Ilmenau University of Technology, Germany)

SAM-P6.2 An efficient sub-nyquist receiver architecture for spectrum blind reconstruction and direction of arrival estimation""8: 3

Achanna Anil Kumar (Temasek Laboratories@NTU, Singapore); Sirajudeen Gulam Razul (Nanyang Technological University, Singapore); Chong Meng Samson See (TL@NTU, Singapore)

SAM-P6.3 Accurate Reconstruction Of Rain Field Maps From Commercial Microwave Networks Using Sparse Field Modeling""8: 8

Yoav Liberman (Tel-Aviv University, Israel); Hagit Messer (Tel-Aviv University, Israel)

SAM-P6.4 Fast and Stable Recovery of Approximately Low Multilinear Rank Tensors From Multi-Way Compressive Measurements""8: 2

Cesar Federico Caiafa (Instituto Argentino de Radioastronomia - CONICET & University of Buenos Aires, Argentina); Andrzej S Cichocki (RIKEN BSI, Laboratory for Advanced Brain Signal Processing, Japan)

SAM-P6.5 Improved Compressed Sensing Radar by Fusion with Matched Filtering""8: 7

Justin Dauwels (Nanyang Technological University, Singapore); Srinivasan Kannan (Nanyang Technological University, Singapore)

SAM-P6.6 Optimal Trajectory Design For a DToA Based Multi-Robot Angle of Arrival Estimation System for Rescue Operations""8: 22

Daniel Bonilla Licea (University of Leeds, United Kingdom); Desmond McLernon (The University of Leeds, United Kingdom); Mounir Ghoghho (University of Leeds, United Kingdom)

SAM-P6.7 Wavenumber tracking in a low resolution frequency-wavenumber representation using particle filtering""8: 27

Florent Le Courtois (ENSTA Bretagne & LAB STICC, France); Julien Bonnel (ENSTA Bretagne, France)

SAM-P6.8 Design of a robust open spherical microphone array""8: 32

Gilles Chardon (Austrian Academy of Sciences, Austria); Wolfgang Kreuzer (Austrian Academy of Sciences, Austria); Markus Noisternig (IRCAM & University of Music and Performing Arts Graz, France)

SAM-P6.9 Tactile Tomographic Fluid-Flow Imaging with a Robotic Whisker Array""8: 37

Cagdas Tuna (University of Illinois at Urbana-Champaign, USA); Douglas L. Jones (University of Illinois at Urbana-Champaign, USA); Farzad Kamalabadi (University of Illinois at Urbana-Champaign, USA)

SAM-P6.10 Outlier removal for improved source estimation in atmospheric inverse problems""8: 42

Marta Martinez-Camara (Ecole Polytechnique Federal de Lausanne, Switzerland); Andreas Stohl (Norwegian Institute for Air Research, Norway); Martin Vetterli (EPFL, Switzerland)

SAM-P6.11 Near-Optimal Source Placement For Linear Physical Fields""8: 47

Juri Ranieri (EPFL, Switzerland); Martin Vetterli (EPFL, Switzerland)

SAM-P6.12 Physics-Based Sea Clutter Model for Improved Detection of Low Radar Cross-Section Targets""8: 52

Brian O'Donnell (Arizona State University, USA); Richard LeBaron (Arizona State University, USA); Rodolfo Diaz (Arizona State University, USA); Antonia Papandreou-Suppappola (Arizona State University, USA)

SAM-P6.13 Source counting in speech mixtures using a variational EM approach for complex Watson mixture models""8: 56

Lukas Drude (Universität Paderborn, Germany); Aleksey Chinaev (University of Paderborn, Germany); Dang Hai Tran Vu (University of Paderborn, Germany); Reinhold Haeb-Umbach (University of Paderborn, Germany)

SAM-P6.14 Sparsity-Aware Sensor Selection: Centralized and Distributed Algorithms""P IC

Hadi Jamali-Rad (Delft University of Technology (TU Delft), The Netherlands); Andrea Simonetto (Delft University of Technology, The Netherlands); Geert Leus (Delft University of Technology, The Netherlands)

**10:30 AM - 11:00 AM**

**Coffee break**

**11:00 AM - 1:00 PM**

**SLTC-L11: Deep Learning in Speech Recognition**

Room: Cavaniglia

Chairs: Li Deng (Microsoft Research, USA), Tara Sainath (IBM TJ Watson Research Center, USA)

Improvements to Filterbank and Delta Learning Within A Deep Neural Network Framework""8: 5;

Tara Sainath (IBM TJ Watson Research Center, USA); Brian Kingsbury (IBM T. J. Watson Research Center, USA); Abdel-rahman Mohamed (University of Toronto, Canada); George Saon (IBM T. J. Watson Research Center, USA); Bhuvana Ramabhadran (IBM T. J. Watson Research Center, USA)

Sequence Classification Using the High-Level Features Extracted from Deep Neural Networks""8: 66

Li Deng (Microsoft Research, USA); Jianshu Chen (University of California, Los Angeles, USA)

Improving deep neural networks for LVCSR using dropout and shrinking structure""8: 6;

Shiliang Zhang (University of Science and Technology of China, P.R. China); Yebo Bao (University of Science and Technology of China, P.R. China); Pan Zhou (University of Science and Technology of China, P.R. China); Hui Jiang

(York University, Canada); Li-Rong Dai (University of Science and Technology of China, P.R. China)  
 Exploring One Pass Learning For Deep Neural Network Training With Averaged Stochastic Gradient Descent<sup>8</sup>: 76  
 Zhao You (Institute of Automation, Chinese Academy of Sciences, P.R. China); Xiaorui Wang (Institute of Automation, Chinese Academy of Sciences, P.R. China); Bo Xu (Institute of Automation, Chinese Academy of Sciences, P.R. China)  
 Accounting for the Residual Uncertainty of Multi-Layer Perceptron based Features<sup>8</sup>: 7  
 Ramon Fernandez Astudillo (INESC-ID-Lisboa, Portugal); Alberto Abad (INESC-ID/IST, Portugal); Isabel Trancoso (I.S.T. - Technical U. Lisbon / I.N.E.S.C. - I.D., Portugal)  
 Unsupervised Domain Adaptation for Deep Neural Network Based Voice Activity Detection<sup>8</sup>: 86  
 Zhang Xiao-Lei (Tsinghua University, P.R. China)

#### IVMSP-L5: Image Indexing and Retrieval

Room: Basilica  
 Chair: Constantine Kotropoulos (Aristotle University of Thessaloniki, Greece)  
 11:00 Low-cost multi-camera object matching<sup>8</sup>: 8;  
 Syed Fahad Tahir (Queen Mary University of London, United Kingdom); Andrea Cavallaro (Queen Mary, University of London, United Kingdom)  
 11:20 Extended-Bag-of-Features for Translation, Rotation, and Scale-Invariant Image Retrieval<sup>8</sup>: 96  
 Chia-Yin Tsai (Carnegie Mellon University, USA); Ting-Chu Lin (Columbia University, USA); Chia-Po Wei (Academia Sinica, Taiwan); Yu-Chiang Frank Wang (Academia Sinica, Taiwan)  
 11:40 Image Retrieval Based on Spatial Context with Relaxed Gabriel Graph Pyramid<sup>8</sup>: 9;  
 Xiaomeng Wu (NTT Communication Science Laboratories, Japan); Kunio Kashino (Nippon Telegraph and Telephone Corporation, Japan)  
 12:00 Beyond "Project and Sign" for Cosine Estimation with Binary Codes<sup>8</sup>: 6  
 Raghavendran Balu (INRIA, France); Teddy Furon (INRIA Rennes - Bretagne Atlantique, France); Hervé Jégou (INRIA, France)  
 12:20 Visual Reranking with improved image graph<sup>8</sup>: ;  
 Ziqiong Liu (Tsinghua University, P.R. China); Shengjin Wang (Tsinghua University, P.R. China); Liang Zheng (Tsinghua University, P.R. China); Qi Tian (University of Texas at San Antonio, USA)  
 12:40 Simultaneous image tagging and geo-location prediction within hypergraph ranking framework<sup>8</sup>: 6  
 Konstantinos Pliakos (Aristotle University of Thessaloniki, Greece); Constantine Kotropoulos (Aristotle University of Thessaloniki, Greece)

#### BISP-L3: Medical image reconstruction II

Room: Polveriera  
 Chairs: Mathews Jacob (University of Iowa, USA), Yves Wiaux (Heriot Watt University, United Kingdom)  
 11:00 Compressed Quantitative MRI: Bloch Response Recovery through Iterated Projection<sup>8</sup>: ;  
 Mike Davies (University of Edinburgh, United Kingdom); Gilles Puy (INRIA, Switzerland); Pierre Vandergheynst (EPFL, Switzerland); Yves Wiaux (Heriot Watt University, United Kingdom)  
 11:20 Joint recovery of under sampled signals on a manifold: application to free breathing cardiac MRI<sup>8</sup>: 26  
 Sunrita Poddar (University of Iowa, USA); Sajan Lingala (University of Iowa, USA); Mathews Jacob (University of Iowa, USA)  
 11:40 Model-Based Iterative Reconstruction for Synchrotron X-Ray Tomography<sup>8</sup>: 2;  
 Kadri Aditya Mohan (Purdue University, USA); Singanallur Vaidyanathan Venkatakrishnan (Purdue University, USA); Lawrence Drummy (Air Force Research Laboratory, USA); Jeff Simmons (AFRL, Wright-Patterson Air Force Base, USA); Dilworth Parkinson (Lawrence Berkeley National Laboratory, USA); Charles Bouman (Purdue University, USA)  
 12:00 Tomographic Reconstruction with Adaptive Sparsifying Transforms<sup>8</sup>: 36  
 Luke Pfister (University of Illinois, USA); Yoram Bresler (University of Illinois, Urbana-Champaign, USA, USA)  
 12:20 Compressed 3D Ultrasound Imaging with 2D Arrays<sup>8</sup>: 3;  
 Michael Birk (Technion, Israel); Amir Burshtein (Technion - Israel Institute of Technology, Israel); Tanya Chernyakova (The Technion, IIT, Israel); Alon Eilam (Technion - Israel Institute of Technology, Israel); Jung Woo Choe (Stanford University, USA); Amin Nikoozadeh (Stanford University, USA); Butrus T. Pierre Khuri-Yakub (Stanford University, USA); Yonina C. Eldar (Technion-Israel Institute of Technology, Israel)  
 12:40 Improved MRI Reconstruction via Non-Convex Elastic Net<sup>8</sup>: 46  
 Angshul Majumdar (Indraprastha Institute Of Information Technology-Delhi & University of British Columbia, India); Rabab Ward (University of British Columbia, Canada)

#### AASP-L5: Recent Topics on Audio Coding

Room: Scherma  
 Chairs: Akihiko K. Sugiyama (NEC Corporation, Japan), Vinay Melkote (Dolby Laboratories, USA)  
 11:00 Nonlinear Estimation of Missing  $\Delta$ LSF Parameters by a Mixture of Dirichlet Distributions<sup>8</sup>: 4;  
 Zhanyu Ma (BUPT-Beijing University of Posts and Telecommunications, P.R. China); Rainer Martin (Ruhr-University Bochum, Germany); Jun Guo (BUPT, P.R. China); Honggang Zhang (Beijing University of Posts and Telecommunications, P.R. China)  
 11:20 Lossless Audio Compression in the New IEEE Standard for Advanced Audio Coding<sup>8</sup>: 56

Huang Haibin (Institute for Infocomm Research, Singapore); Haiyan Shu (Institute for Infocomm Research, Singapore); Rongshan Yu (Institute for Infocomm Research, Singapore)

11:40 Sinusoidal Substitution - An Integrated Parametric Tool for Enhancement of Transform-Based Perceptual Audio Coders''''8; 5;

Sascha Disch (Fraunhofer IIS, Germany); Benjamin Schubert (Fraunhofer IIS, Germany)

12:00 A posteriori voiced / unvoiced probability estimation based on a sinusoidal model''''8; 66  
Robert Rehr (University of Oldenburg, Germany); Martin Krawczyk (Carl von Ossietzky Universität Oldenburg, Germany); Timo Gerkmann (University of Oldenburg, Germany)

12:20 Transform-domain Decorrelation in Dolby Digital Plus''''8; 6;  
Vinay Melkote (Dolby Laboratories, USA); Kuan-Chieh Yen (Dolby Laboratories, USA); Matt Fellers (Dolby Labs, USA); Grant Davidson (Dolby Laboratories, USA); Vivek Kumar (Dolby Laboratories, USA)

12:40 Improved Low-Delay MDCT-Based Coding of Both Stationary and Transient Audio Signals''''8; 76

Christian Helmrich (International Audio Laboratories Erlangen, Germany); Goran Markovic (Fraunhofer Institut für Integrierte Schaltungen (IIS), Germany); Bernd Edler (International Audio Laboratories Erlangen, Germany)

## SS12: Deep Learning for Music

Room: Teatrino

11:00 Improved Music Feature Learning With Deep Neural Networks''''8; 7;

Siddharth Sigtia (Queen Mary University of London, United Kingdom); Simon Dixon (Queen Mary University of London & Centre for Digital Music, United Kingdom)

11:20 End-to-end learning for music audio''''8; 86

Sander Dieleman (Ghent University, Belgium); Benjamin Schrauwen (Ghent University, Belgium)

11:40 Exploiting long-term temporal dependencies in NMF using recurrent neural networks with application to source separation''''8; 8;

Nicolas Boulanger-Lewandowski (University of Montreal, Canada); Gautham J Mysore (Adobe Research, USA); Matthew D Hoffman (Adobe Research, USA)

12:00 From Music Audio to Chord Tablature: Teaching Deep Convolutional Networks to Play Guitar''''8; 96

Eric Humphrey (New York University, USA); Juan Bello (New York University, USA)

12:20 Improved Musical Onset Detection with Convolutional Neural Networks''''8; 9;  
Jan Schlüter (Austrian Research Institute for Artificial Intelligence (OFAI), Austria); Sebastian Böck (Johannes Kepler University, Austria)

12:40 A Deep Representation for Invariance And Music Classification''''8; : 6

Chiyuan Zhang (MIT, USA); Georgios Evangelopoulos (MIT, USA); Stephen Voinea (MIT, USA); Lorenzo Rosasco (DIBRIS, Unige and LCSL - MIT, IIT, USA); Tomaso Poggio (MIT, USA)

## SPCOM-L6: Network Perspectives

Room: Volta

Chair: Timothy N. Davidson (McMaster University, Canada)

11:00 Performance of Partial Zero-forcing Beamforming in Large Random Spectrum Sharing Networks''''8; : ;

Ran Cai (The Chinese University of Hong Kong, Hong Kong); Wei Zhang (The University of New South Wales, Australia); Pe Ching (The Chinese University of Hong Kong, Hong Kong); Timothy N. Davidson (McMaster University, Canada); Jian-Kang Zhang (McMaster University, Canada)

11:20 An Accurate and Efficient Analysis of a MBSFN Network''''8; : 6

Salvatore Talarico (West Virginia University, USA); Matthew Valenti (West Virginia University, USA)

11:40 A Statistical Approach to Interference Reduction in Distributed Large-scale Antenna Systems''''8; : ;

Haifan Yin (EURECOM, France); David Gesbert (Eurecom Institute, France); Laura Cottatellucci (EURECOM, France)

12:00 Analysis of RF Energy Harvesting in Large-Scale Networks Using Absorption Function''''9226

Koji Ishibashi (The University of Electro-Communications, Japan); Giuseppe Abreu (Jacobs University Bremen, Germany)

12:20 Transmission Mode Selection for Network-Assisted Device to Device

Communication: A Levy-Bandit Approach''''922;

Setareh Maghsudi (Technische Universität Berlin, Germany); Slawomir Stanczak (Fraunhofer Heinrich Hertz Institute & Technische Universität Berlin, Germany)

12:40 Distributed energy-efficient power optimization in cellular relay networks with minimum rate constraints''''9236

Giacomo Bacci (University of Pisa & Wireless Systems Engineering and Research (Wiser) Srl, Italy); Elena Veronica Belmega (ENSEA/UCP/CNRS, France); Luca Sanguinetti (University of Pisa, Italy)

## SLTC-P19: Reduction of Noise in Speech

Room: Poster Area 1

Chair: Israel Cohen (Technion, Israel)

SLTC-P19.1 Noise-robust detection of peak-clipping in decoded speech''''923;

James Eaton (Imperial College London, United Kingdom); Patrick A Naylor (Imperial College London, United Kingdom)

SLTC-P19.2 Speech Enhancement Using a Modulation Domain Kalman Filter Post-processor With a Gaussian Mixture Noise Model''''9246

Yu Wang (Imperial College London, United Kingdom); Mike Brookes (Imperial College London, United Kingdom)

SLTC-P19.3 Mask-based Enhancement for Very Low Quality Speech''''924;

Sira Gonzalez (Imperial College London, United Kingdom); Mike Brookes (Imperial College London, United Kingdom)



SLTC-P19.4 A Two-Stage Approach for Improving the Perceptual Quality of Separated Speech""9256

Donald S Williamson (The Ohio State University, USA); Yuxuan Wang (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

SLTC-P19.5 A Feature Study for Classification-based Speech Separation at Very Low Signal-to-noise Ratio""925;

Jitong Chen (The Ohio State University, USA); Yuxuan Wang (The Ohio State University, USA); DeLiang Wang (Ohio State University, USA)

SLTC-P19.6 On the EM Algorithm for the Estimation of Speech AR Parameters in Noise""9266

Marcin Kuropatwinski (VOICE LAB, Poland); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand)

SLTC-P19.7 Parametric Multichannel Noise Reduction Algorithm Utilizing Temporal Correlations in Reverberant Environment""926;

Yu Gwang Jin (Seoul National University, Korea); Jong Won Shin (Gwangju Institute of Science and Technology, Korea); Chul Min Lee (Seoul National University, Korea); Soo Hyun Bae (Seoul National University, Korea); Nam Soo Kim (Seoul National University, Korea)

SLTC-P19.8 Speech Enhancement Combining Statistical Models and NMF with Update of Speech and Noise Bases""9275

Kisoo Kwon (Seoul National University, Korea); Jong Won Shin (Gwangju Institute of Science and Technology, Korea); Sukanya Sonowal (Seoul National University, Korea); InKyu Choi (Seoul National University, Korea); Nam Soo Kim (Seoul National University, Korea)

SLTC-P19.9 Noise Reduction in the Time Domain using Joint Diagonalization""927:

Sidsel Marie Nørholm (Aalborg University, Denmark); Jacob Benesty (INRS-EMT, University of Quebec, Canada); Jesper Rindom Jensen (Aalborg University, Denmark); Mads Græsbøll Christensen (Aalborg University, Denmark)

SLTC-P19.10 Single Microphone Wind Noise PSD Estimation Using Signal Centroids""9285

Christoph M. Nelke (RWTH Aachen University & Institute of Communication Systems and Data Processing, Germany); Navin Chatlani (Intel Corporation, USA); Christophe Beaugant (Intel, France); Peter Vary (RWTH Aachen, Germany)

SLTC-P19.11 Binaural Noise PSD Estimation for Binaural Speech Enhancement""928:

Masoumeh Azarpour (Institute of Communication Acoustics, Ruhr-Universität Bochum, Germany); Gerald Enzner (Ruhr-Universität Bochum, Germany); Rainer Martin (Ruhr-Universität Bochum, Germany)

SLTC-P19.12 A negentropy based adaptive line enhancer for single-channel noise reduction at low SNR conditions""9295

Jalal Taghia (Ruhr-Universität Bochum, Germany); Rainer Martin (Ruhr-Universität Bochum, Germany)

SLTC-P19.13 Iterative Closed-Loop Phase-Aware Single-Channel Speech Enhancement""P IC

Pejman Mowlaei (Graz University of Technology (TU Graz) & Signal Processing and Speech Communication Laboratory, Austria); Rahim Saeidi (University of Eastern Finland, Finland)

## SLTC-P20: Spoken Term Detection I

Room: Poster Area 2

Chair: Satoshi Nakamura (Nara Institute of Science and Technology, Japan)

SLTC-P20.1 Discriminative score normalization for keyword search decision""929:

Van Tung Pham (Nanyang Technological University, Singapore); Haihua Xu (Nanyang Technological University, Singapore); Nancy F. Chen (Institute for Infocomm Research, Singapore); Sunil Sivasdas (Institute for Infocomm Research, Singapore); Boon Pang Lim (Institute for Infocomm Research, Singapore); Eng-Siong Chng (Nanyang Technological University, Singapore); Haizhou Li (Institute for Infocomm Research, Singapore)

SLTC-P20.2 I-vector Based Language Modeling for Spoken Document Retrieval""92: 5

Kuan-Yu Chen (Academia Sinica, Taiwan); Hung-Shin Lee (Academia Sinica, Taiwan); Hsin-Min Wang (Academia Sinica, Taiwan); Berlin Chen (National Taiwan Normal University, Taiwan); Hsin-Hsi Chen (National Taiwan University, Taiwan)

SLTC-P20.3 Rescoring Confusion Networks For Keyword Search""92: :

Victor Soto (Columbia University in the City of New York, USA); Erica Cooper (Columbia University in the City of New York, USA); Lidia Mangu (IBM, USA); Andrew Rosenberg (Queens College/CUNY, USA); Julia Hirschberg (Columbia University in the City of New York, USA)

SLTC-P20.4 Zero-resource spoken term detection using hierarchical graph-based similarity search""92: 5

Kazuo Aoyama (NTT Corporation, Japan); Atsunori Ogawa (NTT Corporation, Japan); Takashi Hattori (NTT Communication Science Laboratories, Japan); Takaaki Hori (NTT Corporation, Japan); Atsushi Nakamura (NTT Corporation, Japan)

SLTC-P20.5 Translating TED Speeches by Recurrent Neural Network based Translation Model""92: :

Youzheng Wu (National Institute of Information and Communications Technology, Japan); Hu Xinhui (National Institute of Information and Communications Technology, Japan); Chiori Hori (NICT, Japan)

SLTC-P20.6 An autoencoder with bilingual sparse features for improved statistical machine translation""9325

Bing Zhao (SRI International, USA); Yik-Cheung Tam (SRI International, USA); Jing Zheng (Google, USA)

SLTC-P20.7 Out-of-Vocabulary Word Detection in a Speech-to-Speech Translation System""932:

Hong-Kwang Kuo (IBM TJ Watson Research Center, USA); Ellen Kislal (IBM TJ Watson Research Center, USA); Lidia Mangu (IBM, USA); Hagen Soltan (IBM, USA); Tomas Beran (IBM TJ Watson Research Center, USA)

SLTC-P20.8 Intra-content term weighting for Topic Segmentation""9335

Abdessalam Boucekif (Orange Labs, France); Geraldine Dammati (Orange Labs, France); Delphine Charlet (Orange Labs, France)

SLTC-P20.9 Limited Resource Term Detection for Effective Topic Identification of Speech""933:

Jonathan Wintrode (Johns Hopkins University, USA); Sanjeev Khudanpur (Johns Hopkins University, USA)

SLTC-P20.10 Effective Representations for Leveraging Language Content in Multimedia Event Detection<sup>9345</sup>  
 Shuang Wu (Raytheon BBN Technologies, USA); Xiaodan Zhuang (Raytheon BBN Technologies, USA); Pradeep Natarajan (Raytheon BBN Technologies, USA)

SLTC-P20.11 Use of Articulatory Bottle-Neck Features for Query-by-Example Spoken Term Detection in Low Resource Scenarios<sup>934</sup>:  
 Gautam Mantena (IIIT Hyderabad, India); Kishore Prahallad (IIIT Hyderabad, India)

SLTC-P20.12 Unsupervised Query-by-Example Spoken Term Detection using Segment-based Bag of Acoustic Words<sup>9355</sup>  
 Basil George (International Institute of Information Technology, India); Yegnanarayana B. (International Institute of Information Technology, Hyderabad, India)

SLTC-P20.13 Calibration and multiple system fusion for spoken term detection using linear logistic regression<sup>935</sup>:  
 Julien van Hout (SRI International, USA); Luciana Ferrer (SRI International, USA); Dimitra Vergyri (SRI International, USA); Nicolas Scheffer (SRI International, USA); Yun Lei (SRI International, USA); Vikramjit Mitra (SRI International, USA); Steven Wegmann (ICSI, USA)

SLTC-P20.14 Feature Fusion for High-Accuracy Keyword Spotting<sup>9365</sup>  
 Vikramjit Mitra (SRI International, USA); Julien van Hout (SRI International, USA); Horacio Franco (SRI International, USA); Dimitra Vergyri (SRI International, USA); Yun Lei (SRI International, USA); Martin Graciarena (SRI lab, USA); Yik-Cheung Tam (SRI International, USA); Jing Zheng (Google, USA)

#### SPTM-P15: Sparsity-Aware Learning and Reconstruction

Room: Poster Area 3  
 Chair: Bhaskar Rao (University of California, San Diego, USA)

SPTM-P15.1 Projection onto the Cospase Set is NP-hard<sup>936</sup>:  
 Andreas M Tillmann (TU Darmstadt, Germany); Rémi Gribonval (INRIA, France); Marc Pfetsch (Technische Universität Darmstadt, Germany)

SPTM-P15.2 Group-sparse Matrix Recovery<sup>9375</sup>  
 Xiangrong Zeng (Instituto de Telecomunicações, Instituto Superior Técnico, Portugal); Mario A. T. Figueiredo (Instituto Superior Técnico, Portugal)

SPTM-P15.3 Overcomplete Sparsifying Transform Learning Algorithm using a Constrained Least Squares Approach<sup>937</sup>:  
 Ender M Ekşioğlu (Istanbul Technical University, Turkey); Ozden Bayir (Istanbul Technical University, Turkey)

SPTM-P15.4 On Recovery of Block Sparse Signals from Multiple Measurements<sup>9385</sup>  
 Amrutraj Joshi (Indian Institute of Technology Madras, India); Arun Pachai Kannu (IIT Madras, India)

SPTM-P15.5 Information alignment for consensus with interference<sup>938</sup>:  
 Usman Khan (Tufts University, USA); Shuchin Aeron (Tufts University, USA)

SPTM-P15.6 Efficient Convolutional Sparse Coding<sup>9395</sup>  
 Brendt Wohlberg (Los Alamos National Laboratory, USA)

SPTM-P15.7 Subspace metrics for multivariate dictionaries and application to EEG<sup>939</sup>:  
 Sylvain Chevallier (University of Versailles-Saint Quentin & Laboratoire d'Ingénierie des Systèmes de Versailles (LISV), France); Quentin Barthélemy (Mensia Technologies, France); Jamal Atif (Université Paris Sud Orsay - LRI, TAO, INRIA, France)

SPTM-P15.8 Nested Sparse Bayesian Learning for Block-Sparse Signals with Intra-Block Correlation<sup>93</sup>: 5  
 Ranjitha Prasad (Indian Institute of Science, India); Chandra R Murthy (Indian Institute of Science, India); Bhaskar Rao (University of California, San Diego, USA)

SPTM-P15.9 Dynamic Sparse Coding with Smoothing Proximal Gradient Method<sup>93</sup>: :  
 Rakesh Chalasani (University of Florida, USA); Jose Principe (University of Florida, USA)

SPTM-P15.10 Analysis SimCO: A New Algorithm for Analysis Dictionary Learning<sup>93</sup>: 5  
 Jing Dong (University of Surrey, United Kingdom); Wenwu Wang (University of Surrey, United Kingdom); Wei Dai (Imperial College, United Kingdom)

SPTM-P15.11 Iterative log thresholding<sup>93</sup>: :  
 Dmitry Malioutov (IBM Research, USA); Aleksandr Aravkin (IBM TJ Watson Research Center, Canada)

SPTM-P15.12 High Resolution Sparse Estimation of Exponentially Decaying Signals<sup>9425</sup>  
 Johan Svaerd (Lund University, Sweden); Stefan I Adalbjörnsson (Lund University, Sweden); Andreas Jakobsson (Lund University, Sweden)

SPTM-P15.13 Flexible Parallel Algorithms for Big Data Optimization<sup>942</sup>:  
 Francisco Facchinei (University of Rome, "La Sapienza", Italy); Simone Sagratella (University of Rome, "La Sapienza", Italy); Gesualdo Scutari (State University of New York at Buffalo, USA)

#### SPTM-P16: Topics in Adaptive Signal Processing

Room: Poster Area 4  
 Chair: Cassio Lopes (University of São Paulo, Brazil)

SPTM-P16.1 Sparse LMS via online linearized Bregman iteration<sup>9435</sup>  
 Tao Hu (Texas A&M University, USA); Dmitri Chklovskii (Howard Hughes Medical Institute, USA)

SPTM-P16.2 Combination Coefficients for Fastest Convergence of Distributed LMS Estimation<sup>943</sup>:  
 Kevin Wagner (Naval Research Laboratory, USA); Milos Doroslovacki (The George Washington University, USA)

SPTM-P16.3 Distributed Diffusion-based LMS for Node-Specific Parameter Estimation over Adaptive Networks<sup>9445</sup>

- Nikola Bogdanovic (University of Patras, Greece); Jorge Plata-Chaves (Katholieke Universiteit Leuven (KU Leuven), Belgium); Kostas Berberidis (University of Patras, Greece)
- SPTM-P16.4 Learning Distributed Jointly Sparse Systems by Collaborative LMS<sup>944</sup>: Yuantao Gu (Tsinghua University, P.R. China); Mengdi Wang (Princeton University, USA)
- SPTM-P16.5 Robust Distributed Detection Over Adaptive Diffusion Networks<sup>945</sup>: Sara Al-Sayed (TU Darmstadt, Germany); Abdelhak M Zoubir (Darmstadt University of Technology, Germany); Ali H. Sayed (University of California, Los Angeles, USA)
- SPTM-P16.6 Sparse Constraint Affine Projection Algorithm with Parallel Implementation and Application in Compressive Sensing<sup>945</sup>: Dong Yin (Tsinghua University, P.R. China); Hing Cheung So (City University of Hong Kong, Hong Kong); Yuantao Gu (Tsinghua University, P.R. China)
- SPTM-P16.7 Convergence analysis of kernel LMS algorithm with pre-tuned dictionary<sup>945</sup>: Jie Chen (Université de Nice Sophia-Antipolis, France); Wei Gao (Université de Nice Sophia-Antipolis, France); Cédric Richard (Université de Nice Sophia-Antipolis, France); Jose Carlos Moreira Bermudez (Federal University of Santa Catarina, Brazil)
- SPTM-P16.8 There's plenty of room at the bottom: Incremental combinations of sign-error LMS filters<sup>946</sup>: Luiz Chamon (University of São Paulo, Brazil); Cassio Lopes (University of São Paulo, Brazil)
- SPTM-P16.9 Efficient Learning by Consensus over Regular Networks<sup>947</sup>: Zhiyuan Weng (Stony Brook University, USA); Petar M. Djurić (Stony Brook University, USA)
- SPCOM-P12: Spectrum sensing and cognitive radio**
- Room: Poster Area 5
- SPCOM-P12.1 The Myopic Solution of the Multi-Armed Bandit Compressive Spectrum Sensing Problem<sup>947</sup>: Saeed Bagheri (University of California, Davis, USA); Anna Scaglione (University of California, Davis, USA)
- SPCOM-P12.2 Distributed Wideband Spectrum Sensing for Cognitive Radio Networks<sup>948</sup>: Rocio Arroyo Valles (Delft University of Technology, The Netherlands); Sina Maleki (University of Luxembourg & The Interdisciplinary Centre for Security, Reliability and Trust (SnT), Luxembourg); Geert Leus (Delft University of Technology, The Netherlands)
- SPCOM-P12.3 Maximum Eigenvalue Detection for Spectrum Sensing under Correlated Noise<sup>948</sup>: Shree Krishna Sharma (University of Luxembourg, Luxembourg); Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (KTH Royal Institute of Technology, Sweden)
- SPCOM-P12.4 Mobile Distributed Compressive Sensing for Spectrum Sensing<sup>945</sup>: Veria Havary-Nassab (University of Toronto, Canada); Shahrokh Valaee (University of Toronto, Canada); Shahram ShahbazPanahi (University of Ontario Institute of Technology, Canada)
- SPCOM-P12.5 Gerschgorin Disk-based Robust Spectrum Sensing for Cognitive Radio<sup>949</sup>: Rongxian Li (Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, P.R. China); Lei Huang (Beijing Institute of Technology, P.R. China); Yunmei Shi (Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, P.R. China); Hing Cheung So (City University of Hong Kong, Hong Kong)
- SPCOM-P12.6 Joint Sensing and Resource Allocation for Underlay Cognitive Radios<sup>94</sup>: 5 Luis M. Lopez-Ramos (Universidad Rey Juan Carlos, Spain); Antonio G. Marques (Universidad Rey Juan Carlos, Spain); F. Javier Ramos (Rey Juan Carlos University, Spain)
- SPCOM-P12.7 A Non-Periodic Sensing Strategy for Improved Throughput in Cognitive Radio Networks<sup>94</sup>: Michele Guerrini (University of Perugia, Italy); Luca Rugini (University of Perugia, Italy); Paolo Banelli (University of Perugia, Italy)
- SPCOM-P12.8 Cognitive Transmit Beamforming from Binary Link Quality Feedback for Point to Point MISO channels<sup>94</sup>: 5 Balasubramanian Gopalakrishnan (University of Minnesota, USA); Nikolaos D Sidiropoulos (University of Minnesota, USA)
- SPCOM-P12.9 Graph-Based Robust Resource Allocation for Cognitive Radio Networks<sup>94</sup>: Lu Lu (Georgia Institute of Technology, USA); Dawei He (Georgia Institute of Technology, USA); Xingxing Yu (Georgia Institute of Technology, USA); Geoffrey Li (Georgia Tech, USA)
- SPCOM-P12.10 Opportunistic User Scheduling in MIMO Cognitive Radio Networks<sup>952</sup>: Lu Yang (University of New South Wales, Australia); Wei Zhang (The University of New South Wales, Australia); Nengheng Zheng (Shenzhen University, P.R. China); Pe Ching (The Chinese University of Hong Kong, Hong Kong)
- SPCOM-P12.11 Robust Beamforming with Decentralized Interference Coordination in Cognitive Radio Networks<sup>952</sup>: Harri Pennanen (University of Oulu, Finland); Antti Tölli (University of Oulu, Finland); Matti Latva-aho (UoOulu, Finland)
- SPCOM-P12.12 Interference Shaping Constraints for Underlay MIMO Interference Channels<sup>953</sup>: Christian Lameiro (University of Cantabria, Spain); Ignacio Santamaría (University of Cantabria, Spain); Wolfgang Utschick (Technische Universität München, Germany)
- SPCOM-P12.13 Intervention Framework for Counteracting Collusion in Spectrum Leasing Systems<sup>953</sup>: Juan Jose Alcaraz (Universidad Politécnica de Cartagena, Spain); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)
- SPCOM-P12.14 Channel-Aware Distributed Dynamic Spectrum Access via Learning-Based Heterogeneous Multi-channel Auction<sup>954</sup>

Marjan Zandi (University of Ontario Institute of Technology, Canada); Min Dong (University of Ontario Institute of Technology, Canada); Ali Grami (University of Ontario Institute of Technology, Canada)

#### IVMSP-P12: Video coding

Room: Poster Area 6

Chair: Beatrice Pesquet-Popescu (Télécom ParisTech, France)

IVMSP-P12.1 A convex-optimization framework for frame-level optimal rate allocation in predictive video coding<sup>954</sup>:

Aniello Fiengo (Télécom ParisTech, France); Giovanni Chierchia (Institut Mines-Télécom, Télécom ParisTech, CNRS LTCI, France); Marco Cagnazzo (Institut Mines-Telecom, Telecom-ParisTech, France); Beatrice Pesquet-Popescu (Télécom ParisTech, France)

IVMSP-P12.2 Low-Delay Window-Based Rate Control Scheme for Video Quality Optimization in Video Encoder<sup>955</sup>

Yuan Li (Peking University, P.R. China); Huizhu Jia (Peking University, P.R. China); Chuang Zhu (Peking University, P.R. China); Meng Li (Peking University, P.R. China); Xiaodong Xie (Peking University, P.R. China); Wen Gao (Peking University, P.R. China)

IVMSP-P12.3 Region-of-interest Based Rate Control Scheme for High Efficiency Video Coding<sup>955</sup>:

Marwa Meddeb (Telecom ParisTech, France); Marco Cagnazzo (Institut Mines-Telecom, Telecom-ParisTech, France); Beatrice Pesquet-Popescu (Télécom ParisTech, France)

IVMSP-P12.4 SSIM-Based Rate-Distortion Optimization in H.264<sup>9565</sup>

Wei Dai (Hong Kong University of Science and Technology, Hong Kong); Oscar C. Au (HKUST, Hong Kong); Wenjing Zhu (Hong Kong University of Science and Technology, Hong Kong); Pengfei Wan (HKUST, Hong Kong); Wei Hu (Hong Kong University of Science and Technology, Hong Kong); Jiantao Zhou (University of Macau, Macao)

IVMSP-P12.5 Palette-based Compound Image Compression in HEVC By Exploiting Non-Local Spatial Correlation<sup>956</sup>:

Wenjing Zhu (Hong Kong University of Science and Technology, Hong Kong); Oscar C. Au (HKUST, Hong Kong); Wei Dai (Hong Kong University of Science and Technology, Hong Kong); Haitao Yang (Huawei Technologies Co., Ltd, P.R. China); Rui Ma (HKUST, Hong Kong); Luheng Jia (HKUST, Hong Kong); Jin Zeng (Hong Kong University of Science and Technology, Hong Kong); Pengfei Wan (HKUST, Hong Kong)

IVMSP-P12.6 HEVC Decoder Acceleration on Multi-core X86 Platform<sup>9575</sup>

Bingjie Han (Peking University, P.R. China); Ronggang Wang (Peking University, P.R. China); Zhenyu Wang (Peking University, P.R. China); Shengfu Dong (Peking University, P.R. China); Wenmin Wang (Peking University, P.R. China); Wen Gao (Peking University, P.R. China)

IVMSP-P12.7 A Low-Complexity and Lossless Reference Frame Encoder Algorithm for Video Coding<sup>957</sup>:

Dieison Silveira (Federal University of Pelotas, Brazil); Guilherme Povala (Federal University of Pelotas, Brazil); Livia Amaral (Federal University of Pelotas, Brazil); Bruno Zatt (Federal University of Rio Grande do Sul, Brazil); Luciano Agostini (Federal University of Pelotas, Brazil); Marcelo Porto (Federal University of Pelotas, Brazil)

IVMSP-P12.8 An Efficient Motion Vector Prediction Method for Avoiding AMVP Data Dependency for HEVC<sup>9585</sup>

Chuen-Ching Wang (Kao Yuan University & Department of Information Technology, Taiwan); Gwo-Long Li (Industrial Technology Research Institute, Taiwan); Kuang-Hung Chiang (National Central University, Taiwan)

IVMSP-P12.9 Adaptive Re-Quantization For High Dynamic Range Video Compression<sup>9589</sup>

Mikaël Le Pendu (INRIA, Université de Rennes 1 & Technicolor R&D France, France); Christine Guillemot (INRIA, France); Dominique Thoreau (Technicolor, France)

IVMSP-P12.10 Joint Inter-Intra Prediction Based on Mode-Variant and Edge-Directed Weighting Approaches in Video Coding<sup>9594</sup>

Yue Chen (University of California Santa Barbara, USA); Debargha Mukherjee (Google, Inc., USA); Jingning Han (Google, USA); Kenneth Rose (University of California, Santa Barbara, USA)

IVMSP-P12.11 Weighted-prediction-based color gamut scalability extension for the H.265/HEVC video codec<sup>9599</sup>

Alireza Aminlou (Tampere University of Technology, Finland); Kemal Ugur (Nokia Research Center, Finland); Miska Hannuksela (Nokia Research Center, Finland); Moncef Gabbouj (Tampere University of Technology & Tampere, Finland, Finland)

IVMSP-P12.12 Smart Decoder: A New Paradigm for Video Coding<sup>95</sup>: 4

Dang-Khoa Vo-Nguyen (Orange Labs & I3S Laboratory, France); Joel Jung (Orange Labs, France); Jean-Marc Thiesse (ATEME, France); Marc Antonini (I3S-CNRS-University of Nice Sophia Antipolis, France)

#### IFS-P3: Multimedia Encryption, Secure Computations, and Data Hiding

Room: Poster Area 7

Chair: Sen-ching Samson Cheung (University of Kentucky, USA)

IFS-P3.1 A new lossy compression scheme for encrypted gray-scale images<sup>95</sup>: 9

Ran Hu (Peking University, P.R. China); Xiaolong Li (Peking University, P.R. China); Bin Yang (Peking University, P.R. China)

IFS-P3.2 Formulation of visual secret sharing schemes encrypting multiple images<sup>95</sup>: 3

M Sasaki (University of Aizu, Japan); Yodai Watanabe (University of Aizu, Japan)

IFS-P3.3 Security of audio secret sharing scheme encrypting audio secrets with bounded shares<sup>95</sup>: 8

Shinya Washio (University of Aizu, Japan); Yodai Watanabe (University of Aizu, Japan)

IFS-P3.4 Efficient Multi-party Computation with Collusion-deterred Secret Sharing<sup>9623</sup>

- Zhaohong Wang (University of Kentucky, USA); Ying Luo (University of Kentucky, USA); Sen-ching Samson Cheung (University of Kentucky, USA)
- IFS-P3.5 Secure Multi-Party Consensus Gossip Algorithms<sup>9628</sup>  
Riccardo Lazeretti (University of Siena, Italy); Steven Horn (NATO STO Centre for Maritime Research and Experimentation, Italy); Paolo Braca (NATO STO Centre for Maritime Research and Experimentation, Italy); Peter Willett (University of Connecticut, USA)
- IFS-P3.6 On the Performance Analysis of Data Fusion Schemes with Byzantines<sup>9633</sup>  
Bhavya Kailkhura (Syracuse University, USA); Swastik Brahma (Syracuse University, USA); Pramod Varshney (Syracuse University, USA)
- IFS-P3.7 Adjusting Bit-stream Video Watermarking Systems to Cope with HTTP Adaptive Streaming Transmission<sup>9638</sup>  
Antoine Robert (Technicolor, France); Omar Alvarez (Technicolor, France); Gwenaël J Doërr (Technicolor R&D France, France)
- IFS-P3.8 Efficient reversible data hiding based on two-dimensional pixel-intensity-histogram modification<sup>9642</sup>  
Xinlu Gui (Peking University, P.R. China); Xiaolong Li (Peking University, P.R. China); Bin Yang (Peking University, P.R. China)
- IFS-P3.9 Improved Control for Low Bit-rate Reversible Watermarking<sup>9647</sup>  
Ion Caciula (Valahia University of Targoviste, Romania); Dinu Coltuc (Valahia University of Targoviste, Romania)
- IFS-P3.10 A New Method for Image Reconstruction Using Self-Embedding<sup>9652</sup>  
Hongliang Cai (Fraunhofer SIT, Germany); Huajian Liu (Fraunhofer SIT, Germany); Martin Steinebach (Fraunhofer SIT, Germany); Xiaojing Wang (Chengdu Institute of Computer Applications, CAS, P.R. China)
- IFS-P3.11 Source-Channel Coding Approach to Generate Tamper-Proof Images<sup>9657</sup>  
Saeed Sarreshtedari (Sharif University of Technology, Iran); Mohammad Ali Akhaee (School of Electrical & Computer Eng., College of Eng., University of Tehran, Iran); Aliazam Abbasfar (University of Tehran, Iran)

#### AASP-P10: Microphone Array Processing II, Music Analysis and Synthesis II

Room: Poster Area 8

Chair: Augusto Sarti (Politecnico di Milano, Italy)

- AASP-P10.1 Power-based Signal-to-Diffuse Ratio Estimation using Noisy Directional Microphones<sup>9662</sup>  
Oliver Thiergart (International Audio Laboratories Erlangen, Germany); Tobias Ascherl (International Audio Laboratories Erlangen, Germany); Emanuel Habets (International Audio Laboratories Erlangen, Germany)
- AASP-P10.2 Extended Kalman Filter with Probabilistic Data Association for Multiple Non-Concurrent Speaker Localization in Reverberant Environments<sup>9667</sup>  
Soumitro Chakrabarty (International Audio Laboratories Erlangen, Germany); Konrad Kowalczyk (Fraunhofer Institute for Integrated Circuits IIS, Germany); Maja Taseska (International Audio Laboratories Erlangen, Germany); Emanuel Habets (International Audio Laboratories Erlangen, Germany)

AASP-P10.3 Source number estimation in reverberant conditions via full-band weighted, adaptive fuzzy c-means clustering<sup>9672</sup>

Joshua Hollick (The University of Western Australia, Australia); Ingrid Jafari (The University of Western Australia, Australia); Roberto Togneri (University of Western Australia, Australia); Nordholm Sven (Curtin University of Technology, Australia)

AASP-P10.4 Calibration of distributed sound acquisition systems using TOA measurements from a moving acoustic source<sup>9677</sup>

Nikolay D. Gaubitch (Delft University of Technology, The Netherlands); W. Bastiaan Kleijn (Victoria University of Wellington, New Zealand); Richard Heusdens (Delft University of Technology, The Netherlands)

AASP-P10.5 Sparse Cepstral Codes and Power Scale for Instrument Identification<sup>9682</sup>

Li-Fan Yu (Academia Sinica, Taiwan); Li Su (Academia Sinica, Taiwan); Yi-Hsuan Yang (Academia Sinica, Taiwan)

AASP-P10.6 True Discrete Cepstrum: an accurate and smooth spectral envelope estimation for music processing<sup>9687</sup>

Remi Mignot (Aalto University, Finland); Vesa Valimaki (Aalto University, Finland)

AASP-P10.7 Timbre Replacement of Harmonic and Drum Components for Music Audio Signals<sup>9692</sup>

Tomohiko Nakamura (The University of Tokyo, Japan); Hirokazu Kameoka (The University of Tokyo, Japan); Kazuyoshi Yoshii (Kyoto University, Japan); Masataka Goto (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

AASP-P10.8 Phase Constrained Complex NMF: Separating Overlapping Partial in Mixtures of Harmonic Musical Sources<sup>9697</sup>

James Bronson (McGill University, Canada); Philippe Depalle (McGill University, Canada)

AASP-P10.9 On the Reduction of False Positives in Singing Voice Detection<sup>96: 2</sup>

Bernhard Lehner (Johannes Kepler University, Austria); Gerhard Widmer (Johannes Kepler University Linz, Austria); Reinhard Sonnleitner (Johannes Kepler University, Austria)

AASP-P10.10 A Nonlinear Second-Order Digital Oscillator For Virtual Acoustic Feedback<sup>96: 7</sup>

Leonardo Gabrielli (Università Politecnica delle Marche, Italy); Marco Giobbi (Università Politecnica delle Marche, Italy); Stefano Squartini (Università Politecnica delle Marche, Italy); Vesa Valimaki (Aalto University, Finland)

AASP-P10.11 Music Signal Separation Based on Bayesian Spectral Amplitude Estimator with Automatic Target Prior Adaptation<sup>96: 2</sup>

Yuki Murota (Nara Institute of Science and Technology, Japan); Daichi Kitamura (Nara Institute of Science and Technology, Japan); Shunsuke Nakai (Nara Institute of Science and Technology, Japan); Hiroshi Saruwatari (Graduate School of Information Science, Nara Institute of Science and Technology, Japan); Satoshi Nakamura (Nara Institute of Science and Technology, Japan); Yu Takahashi (Yamaha Corporation, Japan); Kazunobu Kondo (Yamaha Corporation, Japan)

AASP-P10.12 A Novel Cepstral Representation For Timbre Modeling Of Sound Sources In Polyphonic Mixtures""96; 7

Zhiyao Duan (University of Rochester, USA); Bryan Pardo (Northwestern University, USA); Laurent Daudet (Université Paris Diderot, France)

### DISPS-P2: Implementations of DSP Systems and Applications

Room: Poster Area 9

Chair: Woon Seng Gan (Nanyang Technological University, Singapore)

DISPS-P2.1 IEEE 802.11ac MIMO Transmitter Baseband Processing on Customized VLIW Processor""9722

Mona Aghababaeetafreshi (Tampere University of Technology, Finland); Lasse Lehtonen (Tampere University of Technology, Finland); Maliheh Soleimani (Tampere University of Technology, Finland); Mikko Valkama (Tampere University of Technology, Finland); Jarmo Takala (Tampere University of Technology, Finland)

DISPS-P2.2 Scalable, Efficient ASICs for the Square Kilometre Array: from A/D Conversion to Central Correlation""9727

Martin Schmatz (IBM Research - Zurich, Switzerland); Rik Jongerius (IBM Research, The Netherlands); Gero Dittmann (IBM Research, Zurich Research Laboratory, Switzerland); Andreea Anghel (IBM Research - Zurich & Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland); Ton Engbersen (IBM Zurich Research Laboratory, Switzerland); Jan van Lunteren (IBM Research, Switzerland); Peter Buchmann (IBM Research - Zurich, Switzerland)

DISPS-P2.3 x1000 Real-time Phoneme Recognition VLSI Using Feed-forward Deep Neural Networks""9732

Jonghong Kim (Seoul National University, Korea); Kyuyeon Hwang (Seoul National University, Korea); Wonyong Sung (Seoul National University, Korea)

DISPS-P2.4 A High Throughput LDPC Decoder using a Mid-range GPU""9737

Wen Xie (Beijing University of Posts and Telecommunications, P.R. China); XianJun Jiao (Nokia & China Academy of Space Technology, P.R. China); Pekka Jääskeläinen (Tampere University of Technology, Finland); Heikki Kultala (Tampere University of Technology, Finland); Canfeng Chen (Nokia Research Center, P.R. China); Heikki Berg (Nokia, Finland); Zhisong Bie (Beijing University of Posts and Telecommunications, P.R. China)

DISPS-P2.5 Using the GPU for fast symmetry-based dense stereo matching in high resolution images""9742

Vasco Mota (Institute of Systems and Robotics, Portugal); Gabriel Falcao (Instituto de Telecomunicações, University of Coimbra, Portugal); Michel Antunes (Institute of Systems and Robotics, Portugal); Joao Barreto (Institute of Systems and Robotics, University of Coimbra, Portugal); Urbano Nunes (University of Coimbra, Portugal)

DISPS-P2.6 Barometric and GPS Altitude Sensor Fusion""9747

Vadim Zaliva (Carnegie Mellon University, USA); Franz Franchetti (Carnegie Mellon University, USA)

DISPS-P2.7 Boosted Multi-class Object Detection with Parallel Hardware Implementation for Real-Time Applications""9752

Ching-Te Chiu (National Tsing Hua University, Taiwan); Yao-Tsung Yang (National Tsing Hua University, Taiwan)

DISPS-P2.8 GPU based implementation of multichannel adaptive room equalization""9757

Jorge Lorente (Universitat Politècnica de València, Spain); Miguel Ferrer (Universidad Politecnica de Valencia, Spain); María de Diego (Universitat Politècnica De València, Spain); Alberto Gonzalez (Universidad Politecnica de Valencia, Spain)

DISPS-P2.9 Australian SKA Pathfinder: Digital Signal Processing Implementation and Early Engineering Test Array Results""9762

John Tuthill (Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia); Timothy Bateman (CSIRO, Australia); Andrew Brown (CSIRO, Australia); John Bunton (CSIRO ICT Centre, Australia); Grant Hampson (CSIRO, Australia); Aidan Hotan (CSIRO, Australia); Stephan Neuhold (CSIRO, Australia); John Reynolds (CSIRO, Australia); Timothy Shimwell (CSIRO, Australia); Maxim Voronkov (CSIRO, Australia)

DISPS-P2.10 Multi-core software architecture for the scalable HEVC decoder""9767

Wassim Hamidouche (IETR/INSA de Rennes, France); Mickael Raulet (IETR- INSA Rennes, France); Olivier Deforges (IETR / INSA Rennes, France)

DISPS-P2.11 Fast And Efficient Real-Time GPU Based Implementation of Wave Field Synthesis""9772

Rishabh Ranjan (Nanyang Technological University & DSP LAB, Singapore); Woon Seng Gan (Nanyang Technological University, Singapore)

DISPS-P2.12 Fast Software Polar Decoders""9777

Pascal Giard (McGill University, Canada); Gabi Sarkis (McGill University, Canada); Claude Thibeault (Ecole de Technologie Supérieure, Canada); Warren Gross (McGill University, Canada)

DISPS-P2.13 DSP Implementation of SQRT(M)-Best Rotated QAM Soft-Demapper""9782

Peng Xue (Samsung Electronics, Korea); Kitaek Bae (Samsung Advanced Institute of Technology, Korea); Kyeongyeon Kim (Samsung Advanced Institute of Technology, Korea); Navneet Basutkar (Samsung Advanced Institute of Technology, Korea); Ho Yang (Samsung Electronics, Korea)

DISPS-P2.14 A fast architecture for finding maximum (or minimum) values in a set""9787

Andrea Biroli (Politecnico di Torino, Italy); Juanchi Wang (Politecnico di Torino, Italy)

### SAM-P7: Sensor and Relay Networks

Room: Poster Area 10

Chair: Shahram ShahbazPanahi (University of Ontario Institute of Technology, Canada)

SAM-P7.1 A Modified broadcast strategy for distributed signal estimation in a wireless sensor network with a tree topology""9792

Joseph Szurley (KU Leuven, Belgium); Alexander Bertrand (KU Leuven & iMinds Future Health Department, Belgium); Marc Moonen (KU Leuven, Belgium); Ingrid Moerman (Ghent University - IBBT, Belgium)

SAM-P7.2 A gossiping approach to sampling clock synchronization in wireless acoustic sensor networks""9797

Joerg Schmalenstroer (University of Paderborn, Germany); Patrick Jebramcik (University of Paderborn, Germany); Reinhold Haeb-Umbach (University of Paderborn, Germany)

SAM-P7.3 Distributed Total Least Squares Estimation over Networks""97: 2

Roberto López-Valcarce (Universidad de Vigo, Spain); Silvana Silva Pereira (Universitat Politècnica de Catalunya - Barcelona Tech, Spain); Alba Pagès-Zamora (Technical University of Catalonia & UPC, Spain)

SAM-P7.4 Performance-Energy Tradeoffs in Cutset Wireless Sensor Networks""97: 7

Matthew A Prelee (University of Michigan, USA); David L Neuhoff (University of Michigan, USA)

SAM-P7.5 Optimal Spectrum Leasing and Network Beamforming for Two-Way Relay Networks""97: 2

Adnan Gavili (University of Ontario Institute of Technology, Canada); Shahram ShahbazPanahi (University of Ontario Institute of Technology, Canada)

SAM-P7.6 Multi-antenna Relay Network Beamforming Design for Multiuser Peer-to-Peer Communications""97: 6

Jiangwei Chen (University of Ontario Institute of Technology, Canada); Min Dong (University of Ontario Institute of Technology, Canada)

SAM-P7.7 Filter-and-forward relay beamforming using output power minimization""97: ;

Tao Wang (Nanyang Technological University, Singapore); Meng Hwa Er (Nanyang Technological University, Singapore); Boon Poh Ng (Nanyang technological university, Singapore)

SAM-P7.8 SINR balancing for non-regenerative two-way relay networks with interference neutralization""9826

Jianshu Zhang (Ilmenau University of Technology, Germany); Zuleita Ka Ming Ho (Samsung Electronics, Korea); Eduard Jorswieck (TU Dresden, Germany); Martin Haardt (Ilmenau University of Technology, Germany)

SAM-P7.9 Reduced Order Distributed Particle Filter for Electric Power Grids""982;

Amir Asif (York University, Canada); Arash Mohammadi (York University, Canada); Shivam Saxena (York University, Canada)

SAM-P7.10 Sensor Fault Detection by Sparsity Optimization""9836

Li Bingxuan (Nanyang Technological University, Singapore); Hang Yu (Nanyang Technological University, Singapore); Justin Dauwels (Nanyang Technological University, Singapore); Kay Soon Low (Nanyang Technological University, Singapore)

SAM-P7.11 How Many Bits from How Many Sensors? A Trade-off in Distributed Nearest-Neighbor Learning""983;

Stefano Marano (University of Salerno, Italy); Vincenzo Matta (University of Salerno, Italy); Peter Willett (University of Connecticut, USA)

SAM-P7.12 Bayesian Design of Decentralized Hypothesis Testing Under Communication Constraints""9846

Alla Tarighati (KTH Royal Institute of Technology, Sweden); Joakim Jaldén (KTH Royal Institute of Technology, Sweden)

SAM-P7.13 Generalized Quadratically Constrained Quadratic Programming for Signal Processing""984;

Arash Khabbazi-basmenj (Western University, Canada); Sergiy A. Vorobyov (Aalto University & University of Alberta on leave, Finland)

**1:00 PM - 2:45 PM**

**Lunch Time**

**2:45 PM - 3:45 PM**

**PT4: Plenary Talk: Synchronization and detectability in nonlinear networks and biology (Room Cavaniglia)**

**3:45 PM - 4:15 PM**

**Coffee break**

**4:15 PM - 6:15 PM**

**SLTC-L12: Neural network ASR**

Room: Cavaniglia

Chairs: Daniel Povey (Johns Hopkins University, USA), Frank Seide (Microsoft Research Asia, P.R. China)

4:15 An auto-encoder based approach to unsupervised learning of subword units""9856

Leonardo Badino (Istituto Italiano di Tecnologia, Italy); Claudia Canevari (Istituto Italiano di Tecnologia, Italy); Luciano Fadiga (Istituto Italiano di Tecnologia, Italy); Giorgio Metta (Italian Institute of Technology (IIT), Italy)

4:35 Multilingual Deep Neural Network Based Acoustic Modeling For Rapid Language Adaptation""985;

Ngoc Thang Vu (Karlsruhe Institute of Technology, Germany); David Imseng (Idiap Research Institute, Switzerland); Daniel Povey (Johns Hopkins University, USA); Petr Motlicek (IDIAP Research Institute, Switzerland); Tanja Schultz (Karlsruher Institut für Technologie, Germany); Hervé Bourlard (Idiap Research Institute, Switzerland)

4:55 Fine context, low-rank, softplus deep neural networks for mobile speech recognition""9866

Andrew Senior (Google Inc., USA); Xin Lei (Google Inc., USA)

5:15 Investigation of Maxout Networks For Speech Recognition""986;

Pawel Swietojanski (The University of Edinburgh, United Kingdom); Jinyu Li (Microsoft Corporation, USA); Jui-Ting Huang (Microsoft Corporation, USA)

5:35 Adaptation of Multilingual Stacked Bottle-Neck Neural Network Structure for New Language""9876

František Grézl (Brno University of Technology, Faculty of Information Technology, Czech Republic); Martin Karafiat (BUT Speech@FIT, Czech Republic); Karel Vesely (Brno University of Technology, Faculty of Information Technology, Czech Republic)

5:55 On Modeling Context-dependent Clustered States: Comparing HMM/GMM, Hybrid HMM/ANN and KL-HMM Approaches""987;

Marzieh Razavi (EPFL & Idiap Research Institute, Switzerland); Ramya Rasipuram (EPFL, Switzerland); Mathew Magimai Doss (Idiap Research Institute, Switzerland)

#### **SPTM-L9: Sparsity-Aware Learning**

Room: Basilica

Chairs: Mario A. T. Figueiredo (Instituto Superior Técnico, Portugal), Georgios B. Giannakis (University of Minnesota, USA)

4:15 Sparse Dictionary Learning from 1-bit Data""9886

Jarvis D. Haupt (University of Minnesota, USA); Nikolaos D Sidiropoulos (University of Minnesota, USA); Georgios B. Giannakis (University of Minnesota, USA)

4:35 Estimation of Simultaneously Structured Covariance Matrices from Quadratic Measurements""988;

Yuxin Chen (Stanford University, USA); Yuejie Chi (Ohio State University, USA); Andrea Goldsmith (Stanford University, USA)

4:55 Robust Binary Fused Compressive Sensing using Adaptive Outlier Pursuit""9896

Xiangrong Zeng (Instituto de Telecomunicações, Instituto Superior Técnico, Portugal); Mario A. T. Figueiredo (Instituto Superior Técnico, Portugal)

5:15 Adaptive variational sparse Bayesian estimation""989;

Konstantinos E. Themelis (National Observatory of Athens, Greece); Athanasios A. Rontogiannis (National Observatory of Athens, Greece); Konstantinos Koutroumbas (National Observatory of Athens, Greece)

5:35 Kernel Selection for Power Market Inference via Block Successive Upper Bound Minimization""98: 6

Vassilis Kekatos (University of Minnesota & University of Patras, USA); Yu Zhang (University of Minnesota, USA); Georgios B. Giannakis (University of Minnesota, USA)

5:55 A block coordinate descent method of multipliers: Convergence Analysis and Applications""98: :

Mingyi Hong (University of Minnesota, USA); Tsung-Hui Chang (National Taiwan University of Science and Technology, Taiwan); Xiangfeng Wang (Nanjing University, P.R. China); Meisam Razaviyayn (University of Minnesota, USA); Shiqian Ma (The Chinese University of Hong Kong, Hong Kong); Zhi-Quan Luo (University of Minnesota, USA)

#### **SS13: Non-native Speech Processing**

Room: Polveriera

Chairs: Ricardo Gutierrez-Osuna (Texas A&M University, USA), Michael Johnson (Marquette University, USA)

4:15 Accent conversion through cross-speaker articulatory synthesis""98: 6

Sandesh Aryal (Texas A&M University, USA); Ricardo Gutierrez-Osuna (Texas A&M University, USA)

4:35 Accent Rating by Native and Non-native Listeners""98: ;

Mirjam Wester (University of Edinburgh, United Kingdom); Cassie Mayo (University of Edinburgh, United Kingdom)

4:55 Lexical Stress Classification for Language Learning Using Spectral and Segmental Features""9926

Luciana Ferrer (SRI International, USA); Harry Bratt (SRI International, USA); Colleen Richey (SRI International, USA); Horacio Franco (SRI International, USA); Victor Abrash (SRI, USA); Kristin Precoda (SRI International, USA)

5:15 Adaptive and Discriminative Modeling for Improved Mispronunciation Detection""992;

Horacio Franco (SRI International, USA); Luciana Ferrer (SRI International, USA); Harry Bratt (SRI International, USA)

5:35 Phonological Modeling of Mispronunciation Gradations in L2 English Speech of L1 Chinese Learners""9936

Hao Wang (The Chinese University of Hong Kong, P.R. China); Xiaojun Qian (The Chinese University of Hong Kong, P.R. China); Helen Meng (The Chinese University of Hong Kong, Hong Kong)

5:55 The Electromagnetic Articulography Mandarin Accented English (EMA-MAE) Corpus of Acoustic and 3D Articulatory Kinematic Data""993;

An Ji (Marquette University, USA); Jeffrey Berry (Marquette, USA); Michael Johnson (Marquette University, USA)

#### **SAM-L4: SAM for Wireless Communications**

Room: Scherma

Chairs: Martin Haardt (Ilmenau University of Technology, Germany), Sergiy A. Vorobyov (Aalto University & University of Alberta on leave, Finland)

SAM-L4.1 4:15 Multiuser downlink beamforming with interference cancellation using a SDP-Based Branch-and-Bound Algorithm""9946

Anne Philipp (Technische Universität Darmstadt, Germany); Stefan Ulbrich (Technische Universität Darmstadt, Germany); Yong Cheng (Technische Universität Darmstadt, Germany); Marius Pesavento (Technische Universität Darmstadt, Germany)

SAM-L4.2 4:35 Performance Analysis of Max-SINR Algorithm Under CSI Mismatch""994;

S. Morteza Razavi (The University of Edinburgh, United Kingdom);

Tharmalingam Ratnarajah (The University of Edinburgh, United Kingdom)

SAM-L4.3 4:55 Optimal Decision Threshold for Eigenvalue-Based Spectrum Sensing Techniques""9956

Yibo He (The University of Edinburgh, United Kingdom); Tharmalingam Ratnarajah (The University of Edinburgh, United Kingdom); Jiang Xue (The University of Edinburgh & IDCOM, United Kingdom); Ebtihal H. G. Yousif



(University of Edinburgh, United Kingdom); Mathini Sellathurai (Heriot-Watt University, United Kingdom)

SAM-L4.4 5:15 Optimal MIMO Broadcasting over Time-Varying Wireless Channels for Energy Harvesting Transmitter with Non-Ideal Circuit Power""995;

Zheng Nan (Fudan University, P.R. China); Tianyi Chen (Fudan University, P.R. China); Xin Wang (Fudan University, P.R. China)

SAM-L4.5 5:35 Optimum Discrete Single Group Multicast Beamforming""9966

Özlem Tuğfe Demir (Middle East Technical University, Turkey); T. Engin Tuncer (Middle East Technical University, Turkey)

SAM-L4.6 5:55 Blind Spectra Separation and Direction Finding for Cognitive Radio Using Temporal Correlation-domain ESPRIT""996;

Xiao Fu (The Chinese University of Hong Kong, Hong Kong); Nikolaos D Sidiropoulos (University of Minnesota, USA); Wing-Kin Ma (The Chinese University of Hong Kong, Hong Kong); John Tranter (University of Minnesota, USA)

#### **SPCOM-L7: Power Systems Management and Smart Grid**

Room: Teatrino

Chair: Timothy N. Davidson (McMaster University, Canada)

4:15 Joint Day-Ahead Power Procurement and Load Scheduling Using Stochastic Alternating Direction Method of Multipliers""9976

Xiangfeng Wang (Nanjing University, P.R. China); Mingyi Hong (University of Minnesota, USA); Tsung-Hui Chang (National Taiwan University of Science and Technology, Taiwan); Meisam Razaviyayn (University of Minnesota, USA); Zhi-Quan Luo (University of Minnesota, USA)

4:35 Non-stationary Demand Side Management Method for Smart Grids""997;

Linqi Song (University of California, Los Angeles, USA); Yuanzhang Xiao (University of California, Los Angeles, USA); Mihaela van der Schaar (University of California, Los Angeles (UCLA), USA)

4:55 Asynchronous Alternating Direction Method of Multipliers Applied to the Direct-Current Optimal Power Flow Problem""9986

Azary Abboud (Supelec, France); Romain Couillet (Supélec, France); Mérouane Debbah (Supelec, France); Houria Siguerdidjane (Supelec, France)

5:15 An Off-line Optimization Approach for Online Energy Storage Management in Microgrid System""998;

Katayoun Rahbar (National University of Singapore (NUS), Singapore); Jie Xu (National University of Singapore, Singapore); Rui Zhang (National University of Singapore, Singapore)

5:35 Intertemporal Trading Economy Model for Smart Grid Household Energy Consumption""9996

Jayaprakash Rajasekharan (Aalto University, Finland); Visa Koivunen (Aalto University, Finland)

5:55 Integrating Energy Storage into the Smart Grid: A Prospect Theoretic Approach""999;

Yunpeng Wang (University of Miami, USA); Walid Saad (University of Miami, USA); Narayan Mandayam (WINLAB, Rutgers University, USA); H. Vincent Poor (Princeton University, USA)

#### **IVMSP-L6: Image Formation**

Room: Volta

Chair: Enrico Magli (Politecnico di Torino, Italy)

4:15 Non-uniform sampling and Gaussian process regression in transport of intensity phase imaging""99: 6

Jingshan Zhong (Nanyang Technological University & University of California, Berkeley, Singapore); Rene Claus (University of California, Berkeley, USA); Justin Dauwels (Nanyang Technological University, Singapore); Lei Tian (University of California, Berkeley, USA); Laura Waller (University of California, Berkeley, USA)

4:35 Compressive spectral imaging with colored-patterned detectors""99: ;

Claudia Correa-Pugliese (University of Delaware, USA); Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia); Gonzalo Arce (University of Delaware, USA)

4:55 Compressive Hyperspectral Imaging Using Progressive Total Variation""99: 6

Kamdem (University of Siena, Italy); Giulio Coluccia (Politecnico di Torino, Italy); Alessandro Barducci (IFAC-CNR Firenze, Italy); Mauro Barni (University of Siena, Italy); Enrico Magli (Politecnico di Torino, Italy)

5:15 Compressive Spectral Imaging based on Colored Coded Apertures""99: ;

Hoover Rueda (University of Delaware, USA); Henry Arguello Fuentes (Universidad Industrial de Santander, Colombia); Gonzalo Arce (University of Delaware, USA)

5:35 Enhanced Wall Clutter Mitigation For Compressed Through-the-Wall Radar Imaging using Joint Bayesian Sparse Signal Recovery""9: 26

Van Ha Tang (University of Wollongong & School of Electrical, Computer and Telecommunications Engineering, Australia); Abdesselam Bouzerdoum (University of Wollongong, Australia); Son Lam Phung (University of Wollongong, Australia); Fok Hing Chi Tivive (University of Wollongong, Australia)

5:55 An unmixing-based method for the analysis of thermal hyperspectral images""9: 2;

Manuel Cubero-Castan (GIPSA-Lab & ONERA, France); Jocelyn Chanussot (Grenoble Institute of Technology, France); Xavier Briottet (ONERA, France); Michal Shimoni (Royal Military Academy, Belgium); Véronique Achard (ONERA, France)

#### **SLTC-P21: Spoken Term Detection II**

Room: Poster Area 1

Chair: Julia Hirschberg (Columbia University in the City of New York, USA)

SLTC-P21.1 Unsupervised Spoken Term Detection with Spoken Queries by Multi-level Acoustic Patterns with Varying Model Granularity""9: 36

- Cheng-Tao Chung (National Taiwan University, Taiwan); Chun-an Chan (National Taiwan University, Taiwan); Lin-Shan Lee (National Taiwan University, Taiwan)
- SLTC-P21.2 High-Performance Query-by-Example Spoken Term Detection on the SWS 2013 Evaluation<sup>9</sup>: 3;  
Luis Javier Rodriguez-Fuentes (University of the Basque Country UPV/EHU, Spain); Amparo Varona (University of the Basque Country UPV/EHU, Spain); Mikel Penagarikano (University of the Basque Country, Spain); German Bordel (University of the Basque Country, Spain); Mireia Diez (University of the Basque Country UPV/EHU, Spain)
- SLTC-P21.3 Using Word Burst Analysis to Rescore Keyword Search Candidates on Low-Resource Languages<sup>9</sup>: 46  
Justin Richards (CUNY Graduate Center, USA); Min Ma (City University of New York, USA); Andrew Rosenberg (Queens College/CUNY, USA)
- SLTC-P21.4 The 2013 BBN Vietnamese Telephone Speech Keyword Spotting System<sup>9</sup>: 4;  
Stavros Tsakalidis (BBN Technologies, USA); Roger Hsiao (BBN Technologies, USA); Damianos Karakos (Raytheon BBN Technologies, USA); Tim Ng (BBN Technologies, USA); Shivesh Ranjan (Raytheon BBN Technologies, USA); Guruprasad Saikumar (Raytheon BBN Technologies, USA); Le Zhang (Raytheon BBN Technologies, USA); Long Nguyen (BBN Technologies, USA); Richard Schwartz (BBN Technologies, USA); John Makhoul (BBN Technologies, USA)
- SLTC-P21.5 Normalization of Phonetic Keyword Search Scores<sup>9</sup>: 56  
Damianos Karakos (Raytheon BBN Technologies, USA); Ivan Bulyko (Raytheon BBN Technologies, USA); Richard Schwartz (BBN Technologies, USA); Stavros Tsakalidis (BBN Technologies, USA); Long Nguyen (BBN Technologies, USA); John Makhoul (BBN Technologies, USA)
- SLTC-P21.6 Automatic Keyword Selection for Keyword Search Development and Tuning<sup>9</sup>: 5;  
Jia Cui (IBM T. J. Watson Research Center, USA); Jonathan Mamou (IBM Haifa Research Lab, Israel); Brian Kingsbury (IBM T. J. Watson Research Center, USA); Bhuvana Ramabhadran (IBM T. J. Watson Research Center, USA)
- SLTC-P21.7 Efficient Spoken Term Detection using Confusion Networks<sup>9</sup>: 66  
Lidia Mangu (IBM, USA); Brian Kingsbury (IBM T. J. Watson Research Center, USA); Hagen Soltau (IBM, USA); Hong-Kwang Kuo (IBM TJ Watson Research Center, USA); Michael Picheny (IBM TJ Watson Research Center, USA)
- SLTC-P21.8 Calibration and Fusion of Query-by-Example systems - BUT SWS 2013<sup>9</sup>: 6;  
Igor Szoke (Brno University of Technology & BUT Speech@FIT, Czech Republic); Lukáš Burget (Brno University of Technology, Czech Republic); František Grézl (Brno University of Technology, Faculty of Information Technology, Czech Republic); Jan Cernocky (Brno University of Technology, Czech Republic); Lucas Ondel (Brno University of Technology, Czech Republic)
- SLTC-P21.9 Multilingual MRASTA Features for Low-resource Keyword Search and Speech Recognition Systems<sup>9</sup>: 76  
Zoltán Tüske (RWTH Aachen University, Germany); David Nolden (RWTH Aachen University, Germany); Ralf Schlüter (RWTH Aachen University, Germany); Hermann Ney (RWTH Aachen, Germany)
- SLTC-P21.10 Featherweight Phonetic Keyword Search for Conversational Speech<sup>9</sup>: 7;  
Keith Kintzley (United States Naval Academy & Johns Hopkins University, USA); Aren Jansen (Johns Hopkins University HLTCOE, USA); Hynek Hermansky (Johns Hopkins University, USA)
- SLTC-P21.11 Subword-based Modeling for Handling OOV Words in Keyword Spotting<sup>9</sup>: 86  
Yanzhang He (The Ohio State University, USA); Brian Hutchinson (Western Washington University, USA); Peter Baumann (Northwestern University, USA); Mari Ostendorf (University of Washington, USA); Eric Fosler-Lussier (Ohio State University, USA); Janet Pierrehumbert (Northwestern University, USA)
- SLTC-P21.12 Semi-supervised term-weighted value rescoring for keyword search<sup>9</sup>: 8;  
Kartik Audhkhasi (University of Southern California, USA); Abhinav Sethy (IBM T. J. Watson Research Center, USA); Bhuvana Ramabhadran (IBM T. J. Watson Research Center, USA); Shrikanth Narayanan (University of Southern California, USA)
- SLTC-P21.13 Recursive Neural Network based Word Topology Model for Hierarchical Phrase-based Speech Translation<sup>9</sup>: 96  
Shixiang Lu (Institute of Automation, Chinese Academy of Sciences, P.R. China); Wei Wei (Institute of Automation, Chinese Academy of Sciences, P.R. China); Xiaoyin Fu (Institute of Automation, Chinese Academy of Sciences, P.R. China); Bo Xu (Institute of Automation, Chinese Academy of Sciences, P.R. China)
- SLTC-P22: Voice Conversion**
- Room: Poster Area 2  
Chair: Alan Black (CMU, USA)
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##### **Analysis**

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