

**FORTY-EIGHTH
ASILOMAR CONFERENCE ON
SIGNALS, SYSTEMS AND
COMPUTERS**



Final Program

November 2–5, 2014
Asilomar Hotel and
Conference Grounds

Technical Co-sponsor

IEEE
Signal Processing Society  [®]

FORTY-EIGHTH ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS & COMPUTERS

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6100 Main Street, MS 380
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Welcome from the General Chairman

Prof. Roger Woods
Queen's University Belfast, UK

Welcome to the 48th Asilomar Conference on Signals, Systems, and Computers! I have had a long involvement with the Conference since my first publication in 1997 when I was immediately struck by the unique nature of the Asilomar conference environment. The picturesque sand dunes and warm sunshine provide a wonderful backdrop to a conference that allows easy access to, and interaction with key researchers. Understandably, over the years, I have needed little persuasion to attend. There will never be a better opportunity to capture the attention of a key researcher in your area of expertise than at Asilomar!

The technical program was crafted expertly by the Technical Program Chair, Geert Leus, and his team of Technical Area Chairs: Shengli Zhou, Zhengdao Wang, Bhaskar Rao, Michael Rabbat, Zhi Tian, Visa Koivunen, Selin Aviyente, Jorn Janneck, Mohsin Jamali, and Matt McKay. I would like to thank Geert and his team for assembling a high quality program with 437 accepted papers and 163 invited papers. The student paper contest this year has been chaired by Joe Cavallaro and he has selected a total of 11 submissions. The student finalists will present poster presentations to the judges on Sunday afternoon and, of course, everyone is welcome to attend. The awards for the top three papers will be made at the plenary session. A key innovation this year has been to inculcate two major themes, brain machine interface and neural networks, and processing of high dimensional large scale data.

This year's plenary talk will be given by Professor Georgios B. Giannakis, from the University of Minnesota. I am pleased to have such a high profile speaker with a strong background in signal processing across a wide range of applications. Georgios will describe signal processing techniques to handle massive datasets which are noisy, incomplete, vulnerable to cyber-attacks and have outliers. The growth of Big Data represents a major ongoing challenge for humanity. The derivation of suitable data processing techniques is a vital activity and I am especially looking forward to seeing what can be accomplished in this area. Georgios has had a long engagement with the conference having acted as part of the technical committee as early as 1993 and presented his first paper at Asilomar in 1988.

I am privileged to have served as this year's General Chair. I hope that you enjoy the 2014 Conference programme whilst taking some time out to encounter the very special environment and atmosphere that Asilomar has to offer.

Prof. Roger Woods
Queen's University Belfast, UK, June 2014

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and Technology

2014 Asilomar Conference Session Schedule

Sunday Afternoon, November 2, 2014

- 3:00–7:00 PM Registration — Merrill Hall
4:00–6:30 PM Student Paper Contest — Heather
7:00–9:00 PM Welcoming Dessert Reception — Merrill Hall

Monday Morning, November 3, 2014

- 7:30–9:00 AM Breakfast – Crocker Dining Hall
8:00 AM–6:00 PM Registration
8:15–9:45 AM MA1a — Conference Welcome and Plenary Session — Chapel
9:45–10:15 AM Coffee Social

10:15–11:55 AM MORNING SESSIONS

- MA1b Learning and Optimization for Big Data
MA2b EEG Based Brain Computer Interface
MA3b Underwater Wireless Networks
MA4b Physical Layer Security I
MA5b Image and Video Processing
MA6b Sparse Estimation and Learning in Multi-Channel and Array Systems
MA7b Architectures for Detection and Decoding
MA8b1 Synchronization and Channel Estimation (Poster)
MA8b2 Relaying (Poster)
MA8b3 Active Sensing and Target Recognition (Poster)
MA8b4 Physiological Signal Processing (Poster)

- 12:00–1:00 PM Lunch – Crocker Dining Hall

Monday Afternoon, November 3, 2014

1:30–5:10 PM AFTERNOON SESSIONS

- MP1a Big Data Analytics
MP1b Tensor-Based Signal Processing
MP2a Neural Engineering and Signal Processing
MP2b Brain Connectomics
MP3a Compressed Sensing I
MP3b Compressed Sensing II
MP4a Underwater Acoustic Communications and Networking
MP4b Massive MIMO I
MP5a Smart Grid: Learning and Optimization
MP5b Image and Video Quality
MP6a Array Calibration
MP6b Wireless Localization
MP7a Resource-aware and Domain-specific Computing
MP7b Detection and Estimation for Networked Data
MP8a1 Network Resource Allocation and Localization (Poster)
MP8a2 Bioinformatics and Medical Imaging (Poster)
MP8a3 Source Separation and Array Processing (Poster)
MP8a4 Digital Communications (Poster)
MP8a5 Image and Speech Processing (Poster)

Monday Evening, November 3, 2014

- 6:00–9:30 PM Conference Cocktail/Social — Merrill Hall
The Cocktail/Social takes the place of Monday's dinner. No charge for conference attendees and a guest.

2014 Asilomar Conference Session Schedule (continued)

Tuesday Morning, November 4, 2014

7:30–9:00 AM Breakfast — Crocker Dining Hall

8:00 AM–5:00 PM Registration

8:15–11:55 AM MORNING SESSIONS

TA1a High Dimensional and Large Volume Data

TA1b Big Data Signal Processing

TA2a Neural Spike Train Analysis

TA2b Dynamic Brain Functional Connectivity

TA3a Distributed Optimization over Networks

TA3b Latest Coding Advances

TA4a Enhanced MIMO for LTE-A and 5G Systems

TA4b Cognitive Radio I

TA5a Recent Advances in Speech Coding

TA5b Historic Photographic Paper Identification via Textural Similarity Assessment

TA6a Compressive Methods in Radar

TA6b Statistical Inference in Smart Grids

TA7a Computer Arithmetic I

TA7b MIMO Sensing

TA8a1 Channel Estimation and MIMO Feedback (Poster)

TA8a2 Image Processing I (Poster)

TA8a3 Signal Processing for Communications (Poster)

TA8a4 Adaptive Filtering (Poster)

TA8b1 Multiuser and Cellular Systems (Poster)

TA8b2 Computer Arithmetic II (Poster)

TA8b3 Array Processing Methods (Poster)

TA8b4 Compressed Sensing III (Poster)

12:00–1:00 PM Lunch – Crocker Dining Hall

Tuesday Afternoon, November 4, 2014

1:30–5:35 PM AFTERNOON SESSIONS

TP1a Covariance Mining

TP1b Large-Scale Learning and Optimization

TP2a Bioinformatics and DNA Computing

TP2b Echo Cancellation

TP3a Machine Learning

TP3b Sparse Signal Recovery

TP4a Optical Communications

TP4b Energy Harvesting Wireless Communications

TP5a Speech Enhancement

TP5b Full Duplex MIMO Radio

TP6a Passive and Multistatic Radars

TP6b Many-Core Platforms

TP7a Design Methodologies for Signal Processing

TP7b Optical Wireless Communications

TP8a1 Cognitive Radio II (Poster)

TP8a2 Signal Processing Methods (Poster)

TP8a3 Image Processing II (Poster)

TP8a4 Sensor and Wireless Networks (Poster)

TP8b1 Topics in Communication Systems (Poster)

TP8b2 Relays, Cognitive, Cooperative, and Heterogeneous Networks (Poster)

TP8b3 Signal Processing Architectures (Poster)

TP8b4 Signal Processing Theory and Applications (Poster)

Tuesday Evening Open Evening — Enjoy the Monterey Peninsula

2014 Asilomar Conference Session Schedule (continued)

Wednesday Morning, November 5, 2014

7:30–9:00 AM Breakfast — Crocker Dining Hall

8:00 AM–12:00 PM Registration — Copyright forms must be turned in before the registration closes at 12:00 noon.

8:15–11:55 AM MORNING SESSIONS

WA1a MIMO Design for mmWave Systems

WA1b Massive MIMO II

WA2a 5G and Energy Efficient Cellular Networks

WA2b Mobile Health

WA3a Sparse Learning and Estimation

WA3b Advances in Statistical Learning

WA4a Physical Layer Security II

WA4b Coding and Decoding

WA5a Information Processing for Social and Sensor Networks

WA5b Document Processing and Synchronization

WA6a Adaptive Signal Design and Analysis

WA6b Distributed Detection and Optimization

WA7a Implementation of Wireless Systems

WA7b Video Coding Architecture and Design

12:00–1:00 PM Lunch — Meal tickets may be purchased at registration desk. This meal is not included in the registration.

Student Paper Contest

Heather - Sunday, November 2, 2014, 4:00–6:30 PM

Track A

“Everlasting Secrecy in Disadvantaged Wireless Environments against Sophisticated Eavesdroppers”

Azadeh Sheikholeslami, Dennis Goeckel, Hossein Pishro-nik, UMASS-Amherst, United States

“On Physical Layer Secrecy of Collaborative Compressive Detection”

Bhavya Kaikhura, Thakshila Wimalajeewa, Pramod Varshney, Syracuse University, United States

Track B

“Max-Min Fairness in Compact MU-MIMO Systems: Can the Matching Network Play a Role?”

Yahia Hassan, Armin Wittneben, ETH Zurich, Switzerland

Track C

“On the Convergence Rate of Swap-collide Algorithm for Simple Task Assignment”

Sam Safavi, Usman A. Khan, Tufts University, United States

“Secrecy Outage Analysis of Cognitive Wireless Sensor Networks”

Satyanarayana Vuppala, Jacobs University Bremen, Germany; Weigang Liu, Tharmalingam Ratnarajah, University of Edinburgh, United Kingdom; Giuseppe Abreu, Jacobs University Bremen, Germany

Track D

“Subspace Learning from Extremely Compressed Measurements”

Martin Azizyan, Akshay Krishnamurthy, Aarti Singh, Carnegie Mellon University, United States

“Abstract Algebraic-Geometric Subspace Clustering”

Manolis Tsakiris, Rene Vidal, Johns Hopkins University, United States

Track E

“Calibrating Nested Sensor Arrays with Model Errors”

Keyong Han, Peng Yang, Arye Nehorai, Washington University in St. Louis, United States

Track F

“Whitening 1/f-type Noise in Electroencephalogram Signals for Steady-State Visual Evoked Potential Brain-Computer Interfaces”

Alan Paris, Azadeh Vosoughi, George Atia, University of Central Florida, United States

Track G

“Hybrid Floating-Point Modules with Low Area Overhead on a Fine-Grained Processing Core”

Jon Pimentel, Bevan Baas, University of California, Davis, United States

Track H

“Crowdsourced Study of Subjective Image Quality”

Deepti Ghadiyaram, Alan Bovik, University of Texas at Austin, United States

2014 Asilomar Conference Session Schedule

Coffee breaks will be at 9:55 AM and 3:10 PM. (except Monday morning when refreshments will be served outside Merrill Hall from 9:45–10:15 AM)

Monday, November 3, 2014

CONFERENCE WELCOME AND PLENARY SESSION 8:15–9:45 AM

1. Welcome from the General Chairperson

Prof. Roger Woods
Queen's University of Belfast

2. Session MA1a Distinguished Lecture for the 2014
Asilomar Conference

Learning Tools for Big Data Analytics

Georgios B. Giannakis
Univ. of Minnesota, USA

Abstract

We live in an era of data deluge. Pervasive sensors collect massive amounts of information on every bit of our lives, churning out enormous streams of raw data in various formats. Mining information from unprecedented volumes of data promises to limit the spread of epidemics and diseases, identify trends in financial markets, learn the dynamics of emergent social-computational systems, and also protect critical infrastructure including the smart grid and the Internet's backbone network. While Big Data can be definitely perceived as a big blessing, big challenges also arise with large-scale datasets. The sheer volume of data makes it often impossible to run analytics using a central processor and storage, and distributed processing with parallelized multi-processors is preferred while the data themselves are stored in the cloud. As many sources continuously generate data in real time, analytics must often be performed "on-the-fly" and without an opportunity to revisit past entries. Due to their disparate origins, massive datasets are noisy, incomplete, prone to outliers, and vulnerable to cyber-attacks. These effects are amplified if the acquisition and

transportation cost per datum is driven to a minimum. Overall, Big Data present challenges in which resources such as time, space, and energy, are intertwined in complex ways with data resources. Given these challenges, ample signal processing opportunities arise. This keynote lecture outlines ongoing research in novel models applicable to a wide range of Big Data analytics problems, as well as algorithms to handle the practical challenges, while revealing fundamental limits and insights on the mathematical trade-offs involved.

Biography

Georgios B. Giannakis received his Diploma in Electrical Engineering from the National Technical University of Athens, Greece, 1981. From 1982 to 1986 he was with the University of Southern California, where he received his MSc. in Electrical Engineering (1983), MSc. in Mathematics (1986), and Ph.D. in Electrical Engineering (1986). He became a Fellow of the IEEE in 1997. Since 1999, he has been a Professor with the University of Minnesota where he now holds an ADC Chair in Wireless Telecommunications in the ECE Department, and serves as director of the Digital Technology Center. His general interests span the areas of communications, networking and statistical signal processing – subjects on which he has published more than 370 journal papers, 630 conference papers, 20 book chapters, two edited books and two research monographs (h-index 108). Current research focuses on sparsity and big data analytics, wireless cognitive radios, mobile ad hoc networks, renewable energy, power grid, gene-regulatory, and social networks. He is the (co-) inventor of 22 patents issued, and the (co-) recipient of 8 best paper awards from the IEEE Signal Processing (SP) and Communications Societies, including the G. Marconi Prize Paper Award in Wireless Communications. He also received Technical Achievement Awards from the SP Society (2000), from EURASIP (2005), a Young Faculty Teaching Award, and the G. W. Taylor Award for Distinguished Research from the University of Minnesota. He is a Fellow of EURASIP, and has served the IEEE in a number of posts, including that of a Distinguished Lecturer for the IEEE-SP Society.

**Program of the
2014 Asilomar Conference on
Signals, Systems, and Computers**

**Technical Program Chairman
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Session MA1b Learning and Optimization for Big Data

Co-Chairs: *Konstantinos Slavakis, University of Minnesota and Nicholas D. Sidiropoulos, University of Minnesota*

- MA1b-1 FLEXA: A Fast Parallel Algorithm for Big-Data Optimization 10:15 AM
Francisco Facchinei, Simone Sagratella, University of Rome, Italy; Gesualdo Scutari, University of Buffalo, the State University of New York, United States
- MA1b-2 Fast and Robust Bootstrap in Analysing Large Multivariate Datasets 10:40 AM
Shahab Basiri, Esa Ollila, Visa Koivunen, Aalto University, Finland
- MA1b-3 Clustering High-Dimensional Dynamical Systems on Low-Rank Matrix Manifolds 11:05 AM
Konstantinos Slavakis, X. Wang, G. Lerman, University of Minnesota, United States
- MA1b-4 Adaptive Estimation from Big Data via Censored Stochastic Approximation 11:30 AM
Dimitrios Berberidis, University of Minnesota, Twin Cities, United States; Gang Wang, Beijing Institute of Technology, China; Georgios Giannakis, Vassilis Kekatos, University of Minnesota, Twin Cities, United States

Session MA2b EEG Based Brain Computer Interface

Chair: *Murat Akcakaya, Northeastern University*

- MA2b-1 Decoding the Focus of Auditory Attention from Single-Trial EEG Signals 10:15 AM
Lenny Varghese, Inyong Choi, Siddharth Rajaram, Courtney Pacheco, Barbara Shinn-Cunningham, Boston University, United States
- MA2b-2 Auditory Considerations for a Motor Imagery Brain-Computer Interface for Speech Synthesizer Control 10:40 AM
Jonathan Brumberg, Jeremy Burnison, University of Kansas, United States
- MA2b-3 Single-Trial Identification of Failed Memory Retrieval 11:05 AM
Eunho Noh, University of California, San Diego, United States; Matthew Mollison, Tim Curran, University of Colorado Boulder, United States; Virginia de Sa, University of California, San Diego, United States
- MA2b-4 Utilization of Temporal Trial Dependency in ERP based BCIs 11:30 AM
Umut Orhan, CorTech, LLC, United States; Delia Fernandez-Canellas, Universitat Politècnica de Catalunya, Spain; Murat Akcakaya, Dana H. Brooks, Deniz Erdogmus, Northeastern University, United States

Session MA3b Underwater Wireless Networks

Chair: *Milica Stojanovic, Northeastern University*

- MA3b-1 On the Feasibility of Fully Wireless Remote Control for ROVs 10:15 AM
Federico Favaro, Filippo Campagnaro, Paolo Casari, Michele Zorzi, University of Padova, Italy
- MA3b-2 Modeling Realistic Underwater Acoustic Networks using Experimental Data 10:40 AM
Mandar Chitre, Gabriel Chua, National University of Singapore, Singapore
- MA3b-3 Scalable Collision-Tolerant Localization in Underwater Acoustic Sensor Networks 11:05 AM
Hamid Ramezani, Geert Leus, Technical University of Delft, Netherlands; Milica Stojanovic, Northeastern University, United States
- MA3b-4 New Frontiers in Underwater Acoustic Communications 11:30 AM
Andrew Singer, Thomas Riedl, University of Illinois at Urbana Champaign, United States

Session MA4b Physical Layer Security I

Chair: *Pramod Varshney, Syracuse University*

- MA4b-1 On Physical Layer Secrecy of Collaborative Compressive Detection 10:15 AM
Bhavya Kailkhura, Thakshila Wimalajeewa, Pramod Varshney, Syracuse University, United States
- MA4b-2 Converse Results for Secrecy Generation over Channels 10:40 AM
Himanshu Tyagi, University of California, San Diego, United States; Shun Watanabe, University of Tokushima, Japan
- MA4b-3 Robust Transmission over Wiretap Channels with Secret Keys 11:05 AM
Rafael F. Schaefer, H. Vincent Poor, Princeton University, United States
- MA4b-4 Secret Key-Private Key Generation for Multiple Terminals 11:30 AM
Huishuai Zhang, Syracuse University, United States; Lifeng Lai, Worcester Polytechnic Institute, United States; Yingbin Liang, Huishuai Zhang, Syracuse University, United States

Session MA5b Image and Video Processing

Chair: *Marios S. Pattichis, University of New Mexico*

- MA5b-1 Robust Image Recognition by Multi-Kernel Dictionary Learning 10:15 AM
Rituparna Sarkar, Sedat Ozer, Scott Acton, Kevin Skadron, University of Virginia, United States

- MA5b-2 Robust Dual-Band MWIR/LWIR Infrared Target Tracking 10:40 AM
Chuong Nguyen, Joseph Havlicek, University of Oklahoma, United States; Guoliang Fan, Oklahoma State University, United States; John Caulfield, Cyan Systems, United States; Marios Pattichis, University of New Mexico, United States
- MA5b-3 Crowdsourced Study of Subjective Image Quality 11:05 AM
Deepti Ghadiyaram, Alan Bovik, University of Texas at Austin, United States
- MA5b-4 Detecting Coronal Holes for Solar Activity Modeling 11:30 AM
Marios Pattichis, University of New Mexico, United States; Rachel Hock, AFRL/RVBXS Space Vehicles Directorate, United States; Venkatesh Jatla, University of New Mexico, United States; Carl Henney, Charles Arge, AFRL/RVBXS Space Vehicles Directorate, United States

Session MA6b Sparse Estimation and Learning in Multi-Channel and Array Systems

Co-Chairs: *Palghat P. Vaidyanathan, California Institute of Technology and Piya Pal, University of Maryland*

- MA6b-1 Characterization of Orthogonal Subspaces for Alias-Free Reconstruction of Damped Complex Exponential Modes in Sparse Arrays 10:15 AM
Pooria Pakrooh, Ali Pezeshki, Louis L. Scharf, Colorado State University, United States
- MA6b-2 Exploiting Sparsity during the detection of High-Order QAM Signals in Large Dimension MIMO Systems 10:40 AM
Oleg Tanchuk, Bhaskar Rao, University of California, San Diego, United States
- MA6b-3 Structured Sparse Representation with Low-Rank Interference 11:05 AM
Minh Dao, Yuanming Suo, Sang (Peter) Chin, Trac Tran, Johns Hopkins University, United States
- MA6b-4 Grid-Less Algorithms for Identifying More Spectral Lines Than Sensors. 11:30 AM
Piya Pal, University of Maryland, College Park, United States; P. P. Vaidyanathan, California Institute of Technology, United States

Session MA7b Architectures for Detection and Decoding

Chair: *Joseph R. Cavallaro, Rice University*

- MA7b-1 A Reduced-Complexity Iterative Decoding Scheme for Quasi-Cyclic Low-Density Parity-Check Codes 10:15 AM
Shu Lin, Keke Liu, Juane Li, University of California, Davis, United States

- MA7b-2 Efficient Adaptive List Successive Cancellation Decoder for Polar Codes 10:40 AM
Chuan Zhang, National Mobile Communications Research Laboratory, China; Zhongfeng Wang, Broadcom Corporation, United States; Xiaohu You, National Mobile Communications Research Laboratory, China
- MA7b-3 Decoder Diversity Architectures for Finite Alphabet Iterative Decoders for LDPC Codes 11:05 AM
Bane Vasic, University of Arizona, United States; David Declercq, Universite de Cergy-Pontoise, France; Shiva Planjery, Codelucida, United States
- MA7b-4 Asynchronous Design for Precision-Scaleable Energy-Efficient LDPC Decoder 11:30 AM
Jingwei Xu, Tiben Che, Ehsan Rohani, Gwan Choi, Texas A&M university, United States

Session MA8b1 Synchronization and Channel Estimation

Chair: *Shengli Zhou, University of Connecticut*

10:15 AM–11:55 AM

- MA8b1-1 Frequency Tracking with Intermittent Wrapped Phase Measurement Using the Rao-Blackwellized Particle Filter
Maryam Eslami Rasekh, Upamanyu Madhow, University of California, Santa Barbara, United States; Raghuraman Mudumbai, University of Iowa, United States
- MA8b1-2 Improving IEEE 1588v2 Time Synchronization Performance with Phase Locked Loop
Rico Jahja, Suk-seung Hwang, Goo-Rak Kwon, Jae-young Pyun, Seokjoo Shin, Chosun University, Indonesia
- MA8b1-3 Superimposed Pilots based Secure Communications for Multiple Antenna System
Yejian Chen, Bell Laboratories, Alcatel-Lucent, Germany
- MA8b1-4 An Improved ESPRIT-Based Blind CFO Estimation Algorithm In OFDM Systems
Yen-Chang Pan, See-May Phoong, National Taiwan University, Taiwan; Yuan-Pei Lin, National Chiao Tung University, Taiwan
- MA8b1-5 Blind, Low Complexity Estimation of Time and Frequency Offsets in OFDM Systems
Rohan Ramlall, University of California, Irvine, United States
- MA8b1-6 Efficient NLOS Optical Wireless Channel Estimation based on Sparse Pulse
Xiaoke Zhang, Chen Gong, Zhengyuan Xu, University of Science and Technology of China, China
- MA8b1-7 Channel Estimation and Precoder Design for Millimeter-Wave Communications: The Sparse Way
Philip Schniter, Ohio State University, United States; Akbar Sayeed, Wisconsin, United States

Session MA8b2 Relaying

Chair: *Giuseppe Caire, TU Berlin*

10:15 AM–11:55 AM

- MA8b2-1 Performance Analysis of Fixed Gain MIMO AF Relaying with Co-Channel Interferences
Min Lin, Min Li, PLA University of Science and Technology, China; Wei-Ping Zhu, Concordia University, Canada; Kang An, PLA University of Science and Technology, China
- MA8b2-2 On Carrier-Cooperation in Parallel Gaussian MIMO Relay Channels with Partial Decode-and-Forward
Christoph Hellings, Wolfgang Utschick, Technische Universität München, Germany
- MA8b2-3 Enhanced Relay Cooperation via Rate Splitting
Ivana Maric, Dennis Hui, Ericsson, United States
- MA8b2-4 Alternate versus Simultaneous Relaying in MIMO Cellular Relay Networks: A Degrees of Freedom Study
Aya Salah, Amr El-Keyi, Nile University, Egypt; Mohammed Nafie, Cairo University, Egypt
- MA8b2-5 Low-Complexity Two-Way AF MIMO Relay Strategy for Wireless Relay Networks
Kanghee Lee, Republic of Korea Air Force, Republic of Korea; Visvakumar Aravinthan, Sunghoon Moon, Wichita State University, United States; Jongbum Ryou, Sungo Kim, Changki Moon, Inha Hyun, Republic of Korea Air Force, Republic of Korea
- MA8b2-6 Blind Self-Interference Cancellation for Full-Duplex Relays
Gustavo Gonzalez, Fernando Gregorio, Juan Cousseau, CONICET - Universidad Nacional del Sur, Argentina

Session MA8b3 Active Sensing and Target Recognition

Chair: *Mark R. Bell, Purdue University*

10:15 AM–11:55 AM

- MA8b3-1 Proximal Constrained Waveform Design Algorithms for Cognitive Radar STAP
Pawan Setlur, Wright State Research Institute, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States
- MA8b3-2 The Generalized Sinusoidal Frequency Modulated Waveform for High Duty Cycle Active Sonar
David Hague, John Buck, University of Massachusetts Dartmouth, United States
- MA8b3-3 Concurrent Exploration of Orthogonal Waveform and Co-Prime Array for Quick and High Resolution Scanning
Shuo Yang, Xin Wang, Xuehong Lin, Stony Brook University, United States

- MA8b3-4 On Bayesian Transmit Signal Design using Information Theory
Mir H. Mahmood, NextNav LLC, United States; Mark R. Bell, Purdue University, United States
- MA8b3-5 Improved Distributed Automatic Target Recognition Performance by Exploiting Dominant Scatterer Spatial Diversity
John Wilcher, William Melvin, Georgia Tech Research Institute, United States; Aaron Lanterman, Georgia Institute of Technology, United States
- MA8b3-6 Semi-Supervised Classification of Terrain Features in Polarimetric SAR Images using H/A/ α and the General Four-Component Scattering Power Decompositions
Stephen Dauphin, Sandia National Laboratories, United States; Margaret Cheney, Colorado State University, United States; Derek West, Robert Riley, Sandia National Laboratories, United States
- MA8b3-7 A Super-Resolving Near-Field Holographic Method for Underwater EM Signature Modeling
Hatim Alqadah, Naval Research Laboratory, United States; Nicolas Valdivia, US Naval Research Laboratory, United States
- MA8b3-8 Limitations and Capabilities of the Fractional Spectrogram Analysis Tool for SAR-Based Detection of Multiple Vibrating Targets
Adebello Jelili, Balu Santhanam, Majeed Hayat, University of New Mexico, United States

Session MA8b4 Physiological Signal Processing

Chair: *Alessio Medda, Georgia Tech*

10:15 AM–11:55 AM

- MA8b4-1 Sample-Based Cross-Frequency Coupling Analysis with CFAR Detection
Charles Creusere, Nathan McRae, Mark Norman, Philip Davis, New Mexico State University, United States
- MA8b4-2 Classification of Human Viewers using SVM
Philip Davis, Charles Creusere, Jim Kroger, New Mexico State University, United States
- MA8b4-3 Activity Recognition using Statistical Gait Parameters from a Single Accelerometer
Andrew Vaughan, Alessio Medda, Brian Liu, Shean Phelps, Georgia Tech Research Institute, United States
- MA8b4-4 Intra-Patient and Inter-Patient Seizure Prediction from Spatial-Temporal EEG Features
Shuoxin Ma, Daniel Bliss, Arizona State University, United States
- MA8b4-5 Effective Connectivity in fMRI from Mutual Prediction Approach
Marisel Villafaña-Delgado, Selin Aviyente, Michigan State University, United States

- MA8b4-6 Whitening 1/f-type Noise in Electroencephalogram Signals for Steady-State Visual Evoked Potential Brain-Computer Interfaces
Alan Paris, Azadeh Vosoughi, George Atia, University of Central Florida, United States
- MA8b4-7 Adaptive Learning of Behavioral Tasks for Patients with Parkinson's Disease Using Signals from Deep Brain Stimulation
Nazanin Zaker, University of Denver, United States; Arindam Dutta, Alexander Maurer, Arizona State University, United States; Jun Zhang, University of Denver, United States; Sara Hanrahan, Adam Hebb, Colorado Neurological Institute, United States; Narayan Kovvali, Antonia Papandreou-Suppappola, Arizona State University, United States

Session MP1a Big Data Analytics

Chair: *Ali Tajer, Rensselaer Polytechnic Institute*

- MP1a-1 Universal Sequential Outlier Hypothesis Testing 1:30 PM
Yun Li, Sirin Nitinawarat, Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States
- MP1a-2 Parsimonious Models for Random Variables and Stochastic Processes 1:55 PM
Weiyu Xu, University of Iowa, United States
- MP1a-3 Fundamental Limits on Information-Friction Energy of Big-Data Computing 2:20 PM
Majid Mahzoon, Pulkit Grover, Carnegie Mellon University, India
- MP1a-4 Quickest Search Over Correlated Sequences 2:45 PM
Ali Tajer, Wayne State University, United States

Session MP1b Tensor-Based Signal Processing

Chair: *Eric Moreau, University of Toulon*

- MP1b-1 Memory-Efficient Parallel Computation of Tensor and Matrix Products for Big Tensor Decomposition 3:30 PM
Niranjay Ravindran, Nicholas Sidiropoulos, Shaden Smith, George Karypis, University of Minnesota, United States
- MP1b-2 Recent Advances on Tensor Models and their Relevance for Multidimensional Data Processing 3:55 PM
Salah Bourennane, Julien Marot, Ecole Centrale Marseille - Institut Fresnel, France
- MP1b-3 Tensor-Based Channel Estimation for Non-Regenerative Two-Way Relaying Networks with Multiple Relays 4:20 PM
Jianshu Zhang, Kristina Naskovska, Martin Haardt, Ilmenau University of Technology, Germany
- MP1b-4 Fast Non-Unitary Simultaneous Diagonalization of Third-Order Tensors 4:45 PM
Victor Maurandi, Eric Moreau, University of Toulon, France

Session MP2a Neural Engineering and Signal Processing

Chair: *Ervin Sejdic, University of Pittsburgh*

- MP2a-1 Electroencephalography-based Alzheimer's Disease Diagnosis: Where we are at Now and Where we are Heading 1:30 PM
Tiago Falk, Institut National de la Recherche Scientifique, Canada
- MP2a-2 EEG Event Detection Using Big Data 1:55 PM
Iyad Obeid, Amir Harati, Joseph Picone, Temple University, United States
- MP2a-3 A Source Localization Approach to Creating a Neural Interface with the Peripheral Nervous System 2:20 PM
Jose Zariffa, Toronto Rehabilitation Institute - University Health Network, Canada
- MP2a-4 A Picture is Worth a Thousand Words: Some Examples of the Utility of Biomedical Image Processing in Brain Research 2:45 PM
Negar Memarian, University of California, Los Angeles, United States

Session MP2b Brain Connectomics

Chair: *Dimitri Van De Ville, EPFL*

- MP2b-1 Brain-Network Continua Revealed with Multivariate Performance Metrics. 3:30 PM
Stephen Strother, Baycrest and University of Toronto, Canada
- MP2b-2 Learning with Multi-Site fMRI Graph Data 3:55 PM
Gabriel Castrillon, Seyed-Ahmad Ahmadi, Nassir Navab, Technische Universität München, Germany; Jonas Richiardi, Stanford University, United States
- MP2b-3 Using Computer Vision to Understand Biological Vision 4:20 PM
Dmitri Chklovskii, Simons Center for Data Analysis, United States
- MP2b-4 Dynamic Functional Connectivity: Probing Spontaneous Network Reorganization 4:45 PM
Dimitri Van De Ville, Nora Leonardi, École Polytechnique Fédérale de Lausanne / University of Geneva, Switzerland

Session MP3a Compressed Sensing I

Chair: *Aleksandar Dogandzic, Iowa State University*

- MP3a-1 Robust Line Spectral Estimation 1:30 PM
Gongguo Tang, Colorado School of Mines, United States; Parikshit Shah, Badri Bhaskar, University of Wisconsin-Madison, United States; Benjamin Recht, University of California, Berkeley, United States
- MP3a-2 On the Applicability of Matrix Completion on MIMO Radars 1:55 PM
Shunqiao Sun, Athina Petropulu, Rutgers University, United States

- MP3a-3 Subspace Learning from Extremely Compressed Measurements 2:20 PM
Martin Azizyan, Akshay Krishnamurthy, Aarti Singh, Carnegie Mellon University, United States
- MP3a-4 Analysis of Misfocus Effects in Compressive Optical Imaging 2:45 PM
Wenbing Dang, Ali Pezeshki, Randy Bartels, Colorado State University, United States

Session MP3b Compressed Sensing II

Chair: *George Atia, University of Central Florida*

- MP3b-1 Filter Design for a Compressive Sensing Delay Estimation Framework 3:30 PM
Misagh Khayambashi, Lee Swindlehurst, University of California, Irvine, United States
- MP3b-2 Adaptive Sequential Compressive Detection 3:55 PM
Davood Mardani, George Atia, University of Central Florida, United States
- MP3b-3 A Recursive Way for Sparse Reconstruction of Parametric Spaces 4:20 PM
Oguzhan Teke, Bilkent University, Turkey; Ali Cafer Gurbuz, TOBB University of Economics and Technology, Turkey; Orhan Arıkan, Bilkent University, Turkey
- MP3b-4 Subspace Methods for Recovery of Low Rank & Joint Sparse Matrices 4:45 PM
Sampurna Biswas, Mathews Jacob, Soura Dasgupta, University of Iowa, United States

Session MP4a Underwater Acoustic Communications and Networking

Chair: *Zhaohui Wang, Michigan Technological University*

- MP4a-1 Experimental Study of Secret Key Generation in Underwater Acoustic Channels 1:30 PM
Yi Huang, University of Connecticut, United States; Lifeng Lai, Worcester Polytechnic Institute, United States; Shengli Zhou, Zhijie Shi, University of Connecticut, United States
- MP4a-2 Random Linear Packet Coding for Fading Channels: Joint Power and Rate Control 1:55 PM
Rameez Ahmed, Milica Stojanovic, Northeastern University, United States
- MP4a-3 Underwater Acoustic Communications in Great Lakes and in Oceans: What is the Difference? 2:20 PM
Wensheng Sun, Mohsen Jamalabdollahi, Zhaohui Wang, Seyed Zekavat, Michigan Technological University, United States
- MP4a-4 Information-Guided Pilot Insertion for Capacity Improvement in OFDM Underwater Acoustic Communications 2:45 PM
Xilin Cheng, Colorado State University, United States; Miaowen Wen, Xiang Cheng, Peking University, China; Liuqing Yang, Colorado State University, United States

Session MP4b Massive MIMO I

Chair: *Erik Larsson, Linköping University*

- MP4b-1 Jsdm and Multi-Cell Networks: Handling 3:30 PM
Inter-Cell Interference Through Long-Term Antenna
Statistics
*Ansuman Adhikary, University of Southern California,
United States; Giuseppe Caire, Technical University
Berlin, Germany*
- MP4b-2 Enabling Massive MIMO Systems in the 3:55 PM
FDD Mode thanks to D2D Communications
*Haifan Yin, Laura Cottatellucci, David Gesbert, Eurecom,
France*
- MP4b-3 Massive MIMO As a Cyber-Weapon 4:20 PM
*Erik G. Larsson, Linköping University, Sweden; Marcus
Karlsson, Linköping University, Sweden*
- MP4b-4 Large Antenna Array and Propagation 4:45 PM
Environment Interaction
*Xiang Gao, Meifang Zhu, Fredrik Rusek, Fredrik
Tufvesson, Ove Edfors, Lund University, Sweden*

Session MP5a Smart Grid: Learning and Optimization

Chair: *Gonzalo Mateos, University of Minnesota*

- MP5a-1 Dynamic Attacks on Power Systems 1:30 PM
Economic Dispatch
*Jinsub Kim, Lang Tong, Robert Thomas, Cornell
University, United States*
- MP5a-2 Line Outage Detection in Power Transmission 1:55 PM
Networks Via Message Passing Algorithms
*Jianshu Chen, University of California, Los Angeles,
United States; Yue Zhao, Andrea Goldsmith, Stanford
University, United States; H. Vincent Poor, Princeton
University, United States*
- MP5a-3 Online Learning Approaches for Dynamic 2:20 PM
Optimal Power Flow
*Seung-Jun Kim, Georgios Giannakis, University of
Minnesota, United States*
- MP5a-4 Decentralized Primary Frequency Control in 2:45 PM
Power Networks
*Changhong Zhao, Steven Low, California Institute of
Technology, United States*

Session MP5b Image and Video Quality

Chair: *Pamela C. Cosman, University of California, San Diego*

- MP5b-1 Real-Time 3D Rotation Smoothing for Video 3:30 PM
Stabilization
*Chao Jia, Zeina Sinno, Brian Evans, University of Texas at
Austin, United States*

- MP5b-2 Joint Source-Channel Rate-Distortion Optimization with Motion Information Sharing for H.264/AVC Video-Plus-Depth Coding 3:55 PM
Yueh-Lun Chang, University of California, San Diego, United States; Yuan Zhang, Communication University of China, China; Pamela Cosman, University of California, San Diego, United States
- MP5b-3 Image Assisted Upsampling of Depth Map via Nonlocal Similarity 4:20 PM
Wentian Zhou, Xin Li, Daryl Reynolds, West Virginia University, United States
- MP5b-4 Video De-Interlacing Using Asymmetric Nonlocal-Means Filtering 4:45 PM
Roozbeh Dehghannasiri, Texas A&M University, United States

Session MP6a Array Calibration

Chair: *Visa Koivunen, Aalto University*

- MP6a-1 Bilinear Compressed Sensing for Array Self-Calibration 1:30 PM
Benjamin Friedlander, University of California, Santa Cruz, United States; Thomas Strohmer, University of California, Davis, United States
- MP6a-2 Calibrating Nested Sensor Arrays with Model Errors 1:55 PM
Keyong Han, Peng Yang, Arye Nehorai, Washington University in St. Louis, United States
- MP6a-3 A New Method for DOA Estimation in the Presence of Unknown Mutual Coupling of an Antenna Array 2:20 PM
Eric Wei-Jhong Ding, Borching Su, National Taiwan University, Taiwan
- MP6a-4 An Angular Sampling Theorem for the Usable Frequency Range of Antenna Array Calibration Measurements 2:45 PM
Chung-Cheng Ho, Scott Douglas, Southern Methodist University, United States

Session MP6b Wireless Localization

Chair: *Petar M. Djuric, Stony Brook University*

- MP6b-1 Direct Localization of Emitters Using Widely Spaced Sensors in Multipath Environments 3:30 PM
Nil Garcia, New Jersey Institute of Technology, United States; Marco Lops, Universita degli Studi di Cassino, Italy; Martial Coulon, University of Toulouse, France; Alexander Haimovich, New Jersey Institute of Technology, United States; Jason Dabin, Space and Naval Warfare Systems Command - Systems Center Pacific, United States
- MP6b-2 Millimeter-Wave Personal Radars for 3D Environment Mapping 3:55 PM
Anna Guerra, Francesco Guidi, Davide Dardari, University of Bologna, Italy

- MP6b-3 Simultaneous Tracking and RSS Model Calibration by Robust Filtering 4:20 PM
Juan Manuel Castro-Arvizu, Universitat Politècnica de Catalunya, Spain; Jordi Vilà-Valls, Pau Closas, Centre Tecnològic de Telecomunicacions de Catalunya, Spain; Juan Fernández-Rubio, Universitat Politècnica de Catalunya, Spain
- MP6b-4 Proximity Detection with RFID in the Internet of Things 4:45 PM
Miodrag Bolic, Majed Rostamian, University of Ottawa, United States; Petar Djuric, Stony Brook University, United States

Session MP7a Resource-aware and Domain-specific Computing

Chair: *Frank Hannig, Friedrich-Alexander University Erlangen-Nurnberg*

- MP7a-1 Partial Expansion of Dataflow Graphs for Resource-Aware Scheduling of Multicore Signal Processing Systems 1:30 PM
George Zaki, IGI Technologies, United States; William Plishker, Shuvra Bhattacharyya, University of Maryland, College Park, United States; Frank Fruth, Texas Instruments, United States
- MP7a-2 Performance Analysis of Weakly-Consistent Scenario-Aware Dataflow Graphs 1:55 PM
Marc Geilen, TU Eindhoven, Netherlands; Joachim Falk, University of Erlangen-Nuremberg, Germany; Christian Haubelt, Universität Rostock, Germany; Twan Basten, TU Eindhoven, Netherlands; Bart Theelen, TNO-ESI, Netherlands; Sander Stuijk, TU Eindhoven, Netherlands
- MP7a-3 Application-driven Reconfiguration of Shared Resources for Timing Predictability of MPSoC Platforms 2:20 PM
Deepak Gangadharan, Ericles Sousa, Vahid Lari, Frank Hannig, Juergen Teich, University of Erlangen-Nuremberg, Germany
- MP7a-4 Accelerating the Dynamic Time Warping Distance Measure using Logarithmic Arithmetic 2:45 PM
Joseph Tarango, University of California, Riverside / Intel, United States; Eamonn Keogh, Philip Brisk, University of California, Riverside, United States

Session MP7b Detection and Estimation for Networked Data

Chair: *Yue Lu, Harvard University*

- MP7b-1 Detecting Convoys in Networks of Short-Range Sensors 3:30 PM
Sean Lawlor, Michael Rabbat, McGill University, Canada
- MP7b-2 Distributed SPRT for Gaussian Binary Hypothesis Testing: Performance Analysis and Fundamental Trade-offs 3:55 PM
Anit Sahu, Soumya Kar, Carnegie Mellon University, United States

- MP7b-3 Denoising of Network Graphs using Topology Diffusion 4:20 PM
Mohammad Aghagolzadeh, Hayder Radha, Michigan State University, United States
- MP7b-4 Optimal Hypothesis Testing with Combinatorial Structure: Applications in Graph Detection 4:45 PM
Yue M. Lu, Harvard University, United States

Session MP8a1 Network Resource Allocation and Localization

Chair: *Michael Rabbat, McGill University*

1:30 PM–3:10 PM

- MP8a1-1 Optimal Scheduling Policies and the Performance of the CDF Scheduling
PhuongBang Nguyen, Bhaskar Rao, University of California, San Diego, United States
- MP8a1-2 Joint Interference and User Association Optimization in Cellular Wireless Networks
Changkyu Kim, Russell Ford, Sundeep Rangan, New York University, Polytechnic School of Engineering, United States
- MP8a1-3 Throughput Maximization in Wireless Powered Communication Networks with Energy Saving
Rui Wang, Donald Brown, Worcester Polytechnic Institute, United States
- MP8a1-4 Optimal Flow Bifurcation in Networks with Dual Base Station Connectivity and Non-ideal Backhaul
Amitav Mukherjee, Hitachi America, Ltd., United States
- MP8a1-5 Joint Sequential Target State Estimation and Clock Synchronization in Wireless Sensor Networks
Jichuan Li, Arye Nehorai, Washington University in St. Louis, United States
- MP8a1-6 High-Accuracy Vehicle Position Estimation Using a Cooperative Algorithm with Anchors and Probe Vehicles
Ramez L. Gerges, First Responder System Testbed (FiRST), United States; John J. Shynk, University of California, Santa Barbara, United States
- MP8a1-7 Statistical Scheduling of Economic Dispatch and Energy Reserves of Hybrid Power Systems with High Renewable Energy Penetration
Yi Gu, Huaiguang Jiang, University of Denver, United States; Yingchen Zhang, National Renewable Energy Laboratory, United States; David Wenzhong Gao, University of Denver, United States

Session MP8a2 Bioinformatics and Medical Imaging

Chair: *George Atia, University of Central Florida*

1:30 PM–3:10 PM

- MP8a2-1 Comparison and Integration of Genomic Profiles Predict Brain Cancer Survival and Drug Targets
Katherine Aiello, Orly Alter, University of Utah, United States
- MP8a2-2 Tensor GSVD for Comparison of Two Large-Scale Multidimensional Datasets
Theodore Schomay, Preethi Sankaranarayanan, Katherine Aiello, Orly Alter, University of Utah, United States
- MP8a2-3 An Efficient ADMM-based Sparse Reconstruction Strategy for Multi-Level Sampled MRI
Joshua Trzasko, Eric Borisch, Paul Weavers, Armando Manduca, Phillip Young, Stephen Riederer, Mayo Clinic, United States
- MP8a2-4 Multiscale Functional Networks in Human Resting State Functional MRI
Jacob Billings, Emory University, United States; Alessio Medda, Georgia Tech Research Institute, United States; Shella Keilholz, Georgia Institute of Technology / Emory University, United States
- MP8a2-5 Piecewise Linear Slope Estimation
Atul Ingle, William Sethares, Tomy Varghese, James Bucklew, University of Wisconsin-Madison, United States
- MP8a2-6 Fast Magnetic Resonance Parametric Imaging via Model-Based Low-Rank Matrix Factorization
Parisa Amiri Eliasi, New York University, Polytechnic School of Engineering, United States; Li Feng, Ricardo Otazo, New York University, School of Medicine, United States; Sundeep Rangan, New York University, Polytechnic School of Engineering, United States
- MP8a2-7 A Signal Model for Forensic DNA Mixtures
Ullrich Mönich, Massachusetts Institute of Technology, United States; Catherine Grgicak, Boston University, United States; Viveck Cadambe, Yonglin Wu, Massachusetts Institute of Technology, United States; Genevieve Wellner, Boston University, United States; Ken Duffy, National University of Ireland Maynooth, Ireland; Muriel Médard, Massachusetts Institute of Technology, United States

Session MP8a3 Source Separation and Array Processing

Chair: *Douglas Cochran, Arizona State University*

1:30 PM–3:10 PM

- MP8a3-1 Forward - Backward Greedy Algorithms for Signal Demixing
Nikhil Rao, Parikshit Shah, Stephen Wright, University of Wisconsin, United States

- MP8a3-2 An Extended Family of Bounded Component Analysis Algorithms
Huseyin Atahan Inan, Alper Tunga Erdogan, Koc University, Turkey
- MP8a3-3 Source Separation in Noisy and Reverberant Environment using Miniature Microphone Array
Shuo Li, Milutin Stanacevic, Stony Brook University, United States
- MP8a3-4 Competitive Algorithm Blending for Enhanced Source Separation
Keith Gilbert, Karen Payton, University of Massachusetts Dartmouth, United States
- MP8a3-5 Design of Coprime DFT Arrays and Filter Banks
Chun-Lin Liu, P. P. Vaidyanathan, California Institute of Technology, United States
- MP8a3-6 The Differential Geometry of Asymptotically Efficient Subspace Estimation
Thomas Palka, Raytheon, United States; Richard Vaccaro, University of Rhode Island, United States
- MP8a3-7 Effects of Network Topology on the Conditional Distributions of Surrogated Generalized Coherence Estimates
Lauren Crider, Douglas Cochran, Arizona State University, United States
- MP8a3-8 Maximum Energy Sequential Matrix Diagonalisation for Parahermitian Matrices
Jamie Corr, Keith Thompson, Stephan Weiss, University of Strathclyde, United Kingdom; John McWhirter, Cardiff University, United Kingdom; Ian Proudler, Loughborough University, United Kingdom

Session MP8a4 Digital Communications

Chair: *James Glenn-Anderson, Supercomputer Systems Inc.*

1:30 PM–3:10 PM

- MP8a4-1 High-throughput DOCSIS Upstream QC-LDPC Decoder
Bei Yin, Michael Wu, Rice University, United States; Christopher Dick, Xilinx Incorporated, United States; Joseph R. Cavallaro, Rice University, United States
- MP8a4-2 On the Performance of LDPC and Turbo Decoder Architectures with Unreliable Memories
Joao Andrade, Instituto de Telecomunicações, Universidade de Coimbra, Portugal; Aida Vosoughi, Guohui Wang, Rice University, United States; Georgios Karakonstantis, Andreas Burg, Telecommunication Circuits Lab, EPFL, Switzerland; Gabriel Falcao, Vitor Silva, Instituto de Telecomunicações, Universidade de Coimbra, Portugal; Joseph R. Cavallaro, Rice University, United States
- MP8a4-3 Successive Cancellation List Polar Decoder using Log-likelihood Ratios
Bo Yuan, Keshab K. Parhi, University of Minnesota, Twin Cities, United States

- MP8a4-4 60 GHz Synthetic Aperture Radar for Short-Range Imaging: Theory and Experiments
Babak Mamandipoor, University of California, Santa Barbara, United States; Greg Malysa, Amin Arbabian, Stanford University, United States; Upamanyu Madhow, University of California, Santa Barbara, United States; Karam Noujeim, Anritsu Co., United States
- MP8a4-5 A Systematic Procedure for Deriving Block-Parallel, Power Efficient, Digital Filter Architectures for High-Speed Data Conversion
Paraskevas Argyropoulos, Hanoach Lev-Ari, Northeastern University, United States
- MP8a4-6 Distributed Synchronization of a Testbed Network with USRP N200 Radio Boards
Gilberto Berardinelli, Jakob L. Buthler, Fernando M. L. Tavares, Oscar Tonelli, Dereje A. Wassie, Farhood Hakhamaneshi, Troels B. Sørensen, Preben Mogensen, Aalborg University, Denmark
- MP8a4-7 Design Study of a Short-Range Airborne UAV Radar for Human Monitoring
Sevgi Zubeyde Gurbuz, TOBB University of Economics and Technology, Turkey; Muhsin Alperen Bolucek, Tunahan Kirilmaz, TUALCOM Communication and RF Technologies, Turkey; Unver Kaynak, TOBB University of Economics and Technology, Turkey
- MP8a4-8 Max-Min Fairness in Compact MU-MIMO Systems: Can the Matching Network Play a Role?
Yahia Hassan, Armin Wittneben, ETH Zurich, Switzerland

Session MP8a5 Image and Speech Processing

Chair: *Linda S. DeBrunner, Florida State University*

1:30 PM–3:10 PM

- MP8a5-1 Acoustic Echo and Noise Cancellation using Kalman Filter in a Modified GSC Framework
Subhash Tanan, Karan Nathwani, Ayush Jain, Rajesh M Hegde, Indian Institute of Technology Kanpur, India; Ruchi Rani, Abhijit Tripathy, Samsung R&D Institute India Delhi, India
- MP8a5-2 Paper Texture Classification via Multi-Scale Restricted Boltzman Machines
Arash Sangari, William Sethares, University of Wisconsin-Madison, United States
- MP8a5-3 Regularized Logistic Regression Based classification for Infrared Images
Golrokh Mirzaei, Mohsin M. Jamali, University of Toledo, United States; Jeremy Ross, Peter Gorsevski, Verner Bingman, Bowling Green State University, United States
- MP8a5-4 Localizing Near and Far Field Acoustic Sources with Distributed Microphone Arrays
Martin Weiss Hansen, Jesper Rindom Jensen, Mads Græsbøll Christensen, Aalborg University, Denmark

- MP8a5-5 Graph Wavelet Transform: Application to Image Segmentation
Alp Ozdemir, Selin Aviyente, Michigan State University, United States
- MP8a5-6 Histogram Transform Model Using MFCC Features for Text-Independent Speaker Identification
Hong Yu, Zhanyu Ma, Beijing University of Posts and Telecommunications, China; Minyue Li, Jun Guo, Google, Inc., Sweden

Session TA1a High Dimensional and Large Volume Data

Chair: *Sergiy Vorobyov, Aalto University*

- TA1a-1 Tensor Restricted Isometry Property for Multilinear Sparse System of Genomic Interactions 8:15 AM
Alexandra Fry, Carmeliza Navasca, University of Alabama at Birmingham, United States
- TA1a-2 Analysis of a Separable STAP Algorithm for Very Large Arrays 8:40 AM
Jie Chen, Feng Jiang, A. Lee Swindlehurst, University of California, Irvine, United States
- TA1a-3 Spatial-Temporal Characterization of Synchrophasor Measurement Systems - A Big Data Approach for Smart Grid System Situational Awareness 9:05 AM
Huaiguang Jiang, University of Denver, United States; Lei Huang, Electric Power Research Institute, China Southern Power Grid, China; Jun Zhang, University of Denver, United States; Yingchen Zhang, National Renewable Energy Laboratory, United States; David Wenzhong Gao, University of Denver, United States
- TA1a-4 Performance Analysis of the Tucker HOSVD for Extracting Low-Rank Structure from Multiple Signal-Plus-Noise Matrices 9:30 AM
Himanshu Nayar, Rajesh Nadakuditi, University of Michigan, Ann Arbor, United States

Session TA1b Big Data Signal Processing

Chair: *Georgios B. Giannakis, University of Minnesota*

- TA1b-1 A Comparison of Clustering and Missing Data Methods for Health Sciences 10:15 AM
Ran Zhao, Claremont Graduate University, United States; Deanna Needell, Claremont McKenna College, United States; Christopher Johansen, Jerry Grenard, Claremont Graduate University, United States
- TA1b-2 Discovery of Principles of Nature from Matrix and Tensor Modeling of Large-Scale Molecular Biological Data 10:40 AM
Orly Alter, University of Utah, United States
- TA1b-3 Big Data Clustering Using Random Sampling and Consensus 11:05 AM
Panagiotis Traganitis, Konstantinos Slavakis, Georgios Giannakis, University of Minnesota, United States

- TA1b-4 Classification of Streaming Big Data with Misses 11:30 AM
Fatemeh Sheikholeslami, Morteza Mardani, Georgios Giannakis, University of Minnesota, United States

Session TA2a Neural Spike Train Analysis

Chair: *Rebecca Willett, University of Wisconsin-Madison*

- TA2a-1 Neural Spike Train Denoising by Point Process Re-weighted Iterative Smoothing 8:15 AM
Demba Ba, Massachusetts Institute of Technology, United States; Behtash Babadi, University of Maryland, College Park, United States; Emery Brown, Massachusetts Institute of Technology / Harvard University, United States
- TA2a-2 Neurally Inspired Objective Function for Subspace Tracking and Online Feature Learning 8:40 AM
Dmitri Chklovskii, Simons Center for Data Analysis, United States
- TA2a-3 Tracking Influence in Dynamic Neural Networks 9:05 AM
Rebecca Willett, University of Wisconsin-Madison, United States; Eric Hall, Duke University, United States
- TA2a-4 A Design and Implementation Framework for Unsupervised High-resolution Recursive Filters in Neuromotor Prosthesis Applications 9:30 AM
Islam Badreldin, Karim Oweiss, University of Florida, United States

Session TA2b Dynamic Brain Functional Connectivity

Chair: *Laleh Najafizadeh, Rutgers University*

- TA2b-1 Functional Connectivity Differences in Brain Networks: Contributions of Shared and Unshared Variance 10:15 AM
Michael Cole, Rutgers University, United States; Grega Repovs?, University of Ljubljana, United States; Alan Anticevic, Yale University, United States
- TA2b-2 Beyond Brain Maps: Functional Connectivity versus Task-Based Activations in Mental State Prediction 10:40 AM
Irina Rish, IBM T. J. Watson Research Center, United States
- TA2b-3 Approaches for Capturing Dynamic Connectivity States in fMRI data 11:05 AM
Vince Calhoun, University of New Mexico, United States
- TA2b-4 Characterizing whole Brain Modulatory Interactions in Resting-State 11:30 AM
Bharat Biswal, New Jersey Institute of Technology, United States

Session TA3a Distributed Optimization over Networks

Chair: *Philippe Ciblat, TELECOM ParisTech*

- TA3a-1 The ADMM Algorithm for Distributed Averaging: Convergence Rates and Optimal Parameter Selection 8:15 AM
Euhanna Ghadimi, Andr'e Teixeira, Royal Institute of Technology-KTH, Sweden; Michael Rabbat, McGill University, Canada; Mikael Johansson, Royal Institute of Technology-KTH, Sweden
- TA3a-2 Performance Analysis of Multitask Diffusion Adaptation Over Asynchronous Networks 8:40 AM
Roula Nassif, Cédric Richard, André Ferrari, Université de Nice Sophia-Antipolis, France; Ali H. Sayed, University of California, Los Angeles, France
- TA3a-3 On the Convergence of an Alternating Direction Penalty Method for Nonconvex Problems 9:05 AM
Sindri Magnússon, P. Chathuranga Weeraddana, KTH Royal Institute of Technology, Sweden; Michael Rabbat, McGill University, Canada; Carlo Fischione, KTH Royal Institute of Technology, Sweden
- TA3a-4 Decentralized Regression with Asynchronous Sub-Nyquist Sampling 9:30 AM
Hoi To Wai, Anna Scaglione, University of California, Davis, United States

Session TA3b Latest Coding Advances

Chair: *Hamid Jafarkhani, University of California, Irvine*

- TA3b-1 Joint Space-Time Code Designs for Multiple Access Channels 10:15 AM
Tianyi Xu, InterDigital Communications, Inc., United States; Xiang-Gen Xia, University of Delaware, United States
- TA3b-2 Quantized Distributed Reception Techniques for MIMO Wireless Systems 10:40 AM
Junil Choi, David Love, Purdue University, United States
- TA3b-3 Generalized Spatial Modulation for Large-Scale MIMO Systems: Analysis and Detection 11:05 AM
Theagarajan Lakshmi Narasimhan, Patchava Raviteja, Ananthanarayanan Chockalingam, Indian Institute of Science, India
- TA3b-4 Bandwidth Analysis of Low-Complexity Decoupling Networks for Multiple Coupled Antennas 11:30 AM
Ding Nie, Bertrand Hochwald, University of Notre Dame, United States

Session TA4a Enhanced MIMO for LTE-A and 5G Systems

Chair: *Fred Vook, Nokia Siemens Networks*

- TA4a-1 3D Channel Models for Elevation 8:15 AM
Beamforming and FD-MIMO in LTE-A and 5G
Jianzhong (Charlie) Zhang, Yang Li, Young-Han Nam, Samsung, United States
- TA4a-2 Advanced Antenna Solutions for 5G Wireless 8:40 AM
Access
Erik Dahlman, Stefan Parkvall, David Astely, Hugo Tullberg, Ericsson, Sweden
- TA4a-3 Multi-Layer Precoding for Full-Dimensional 9:05 AM
MIMO Systems
Ahmed Alkhateeb, University of Texas at Austin, United States; Geert Leus, Delft University of Technology, Netherlands; Robert W. Heath Jr., University of Texas at Austin, United States
- TA4a-4 Massive MIMO for mmWave systems 9:30 AM
Frederick Vook, Timothy Thomas, Nokia Solutions and Networks, United States

Session TA4b Cognitive Radio I

Chair: *Paul de Kerret, Eurecom*

- TA4b-1 Statistically Coordinated Precoding for the 10:15 AM
MISO Cognitive Radio Channel
Paul de Kerret, Miltiades Filippou, David Gesbert, Eurecom, France
- TA4b-2 Simultaneous Detection and Estimation based 10:40 AM
Spectrum Sharing in Cognitive Radio Networks
Jyoti Mansukhani, Priyadip Ray, Indian Institute of Technology Kharagpur, India; Pramod Varshney, Syracuse University, United States
- TA4b-3 Interference-Temperature Limit for Cognitive 11:05 AM
Radio Networks with MIMO Primary Users
Cristian Lameiro, University of Cantabria, Spain; Wolfgang Utschick, Technische Universität München, Germany; Ignacio Santamaria, University of Cantabria, Spain
- TA4b-4 Competitive Dynamic Pricing under Demand 11:30 AM
Uncertainty
Yixuan Zhai, Qing Zhao, University of California, Davis, United States

Session TA5a Recent Advances in Speech Coding

Chair: *Tokunbo Ogunfunmi, Santa Clara University*

- TA5a-1 Large Margin Nearest Neighborhood Metric 8:15 AM
Learning for I-Vector Based Speaker Verification
Waqar Ahmad, Harish Karnick, Rajesh M Hegde, Indian Institute of Technology Kanpur, India

- TA5a-2 Performance Enhanced Scalable Wideband Speech Coding for IP Networks 8:40 AM
Tokunbo Ogunfunmi, Koji Seto, Santa Clara University, United States
- TA5a-3 Adaptive Control of Applying Band-Width for Post Filter of Speech Coder Depending on Pitch Frequency 9:05 AM
Hironobu Chiba, Univ. of Tsukuba, Japan; Yutaka Kamamoto, Takehiro Moriya, Noboru Harada, Nippon Telegraph and Telephone Corp., Japan; Shigeki Miyabe, Takeshi Yamada, Shoji Makino, Univ. of Tsukuba, Japan
- TA5a-4 Classification of Sonorant Consonants Utilizing Empirical Mode Decomposition 9:30 AM
Ashkan Ashrafi, San Diego State University, United States; Stanley Wenndt, Air Force Research Laboratory, United States

Session TA5b Historic Photographic Paper Identification via Textural Similarity Assessment

Co-Chairs: *Andrew G. Klein, Worcester Polytechnic Institute and Patrice Abry, Ecole Supérieure de Lyon (CNRS)*

- TA5b-1 Automated Surface Texture Classification of Photographic Print Media 10:15 AM
Paul Messier, Paul Messier LLC, United States; Richard Johnson, Cornell University, United States
- TA5b-2 Eigentextures: An SVD Approach to Automated Paper Classification 10:40 AM
William Sethares, Atul Ingle, Tomas Krc, University of Wisconsin, United States; Sally Wood, Santa Clara University, United States
- TA5b-3 Texture Classification via Area-Scale Analysis of Raking Light Images 11:05 AM
Andrew G. Klein, Western Washington University, United States; Anh Do, Christopher Brown, Worcester Polytechnic Institute, United States; Philip Klausmeyer, WAM, United States
- TA5b-4 Hyperbolic Wavelet Transform for Historic Photographic Paper Classification Challenge 11:30 AM
Stephane Roux, Patrice Abry, ENS Lyon, France; Herwig Wendt, ENSHEIT-IRIT, France; Stephane Jaffard, Paris Est University, France

Session TA6a Compressive Methods in Radar

Chair: *Athina Petropulu, Rutgers University*

- TA6a-1 Sparse Arrays, MIMO, and Compressive Sensing for GMTI Radar 8:15 AM
Haley Kim, Alexander Haimovich, New Jersey Institute of Technology, United States

- TA6a-2 Efficient Linear Time-Varying System 8:40 AM
 Identification Using Chirp Waveforms
Andrew Harms, Duke University, United States; Waheed Bajwa, Rutgers University, United States; Robert Calderbank, Duke University, United States
- TA6a-3 Robust Multipath Exploitation Radar Imaging 9:05 AM
 in Urban Sensing Based on Bayesian Compressive Sensing
Qisong Wu, Yimin Zhang, Moeness Amin, Fauzia Ahmad, Villanova University, United States
- TA6a-4 Joint Sparse and Low-rank Model for 9:30 AM
 Radio-Frequency Interference Suppression in Ultra-wideband Radar Applications
Lam Nguyen, Army Research Laboratory, United States; Minh Dao, Trac Tran, Johns Hopkins University, United States

Session TA6b Statistical Inference in Smart Grids

Co-Chairs: *H. Vincent Poor, Princeton University and Yue Zhao, Stanford University*

- TA6b-1 Revisiting Cyclo-Stationary Random Signal 10:15 AM
 Analysis for Modeling Renewable Power
Masood Parvania, University of California, Davis, United States; Francesco Verde, Universita' Federico II di Napoli, Italy; Anna Scaglione, University of California, Davis, United States; Donatella Darsena, Giacinto Gelli, Universita' Federico II di Napoli, Italy
- TA6b-2 Integrating PMU-data-driven and 10:40 AM
 Physics-based Analytics for Power Systems Operations
Yang Chen, Le Xie, P. R. Kumar, Texas A&M University, United States
- TA6b-3 Sensor Placement for Real-Time Dynamic 11:05 AM
 State Estimation in Power Systems: A Structural Systems Approach
Pedro Rocha, University of Porto, Portugal; Sergio Pequito, Carnegie Mellon University, United States; Pedro Aguiar, Paula Rocha, University of Porto, Portugal; Soumya Kar, Carnegie Mellon University, United States
- TA6b-4 Dynamic Joint Outage Identification and 11:30 AM
 State Estimation in Power Systems
Yue Zhao, Stanford University, United States; Jianshu Chen, University of California, Los Angeles, United States; Andrea Goldsmith, Stanford University, United States; H. Vincent Poor, Princeton University, United States

Session TA7a Computer Arithmetic I

Chair: *Neil Burgess, ARM Inc.*

- TA7a-1 Ultra-Light Weight Hardware Accelerator 8:15 AM
 Circuits for Data Encryption in Wearable Systems
Sanu Mathew, Sudhir Satpathy, Vikram Suresh, Ram Krishnamurthy, Intel Corporation, United States

- TA7a-2 Arithmetic Operations in the Heterogeneous System Architecture 8:40 AM
Michael Schulte, AMD Research, United States
- TA7a-3 Low Latency is Low Energy 9:05 AM
David Lutz, Neil Burgess, ARM, United States
- TA7a-4 Optimizing DSP Circuits by a New Family of Arithmetic Operators 9:30 AM
Javier Hormigo, Julio Villalba, Universidad de Malaga, Spain

Session TA7b MIMO Sensing

Chair: *Jian Li, University of Florida*

- TA7b-1 Bi-Static MIMO Radar Operations for Range-Folded Clutter Mitigation 10:15 AM
Yuri Abramovich, WR Systems Ltd., United States; Gordon Frazer, DSTO, Australia; Geoffrey San Antonio, Naval Research Laboratory, United States; Ben Johnson, Colorado School of Mines, United States
- TA7b-2 Large Phased Array Antenna Calibration Using Radar Clutter and MIMO 10:40 AM
Matthew Brown, Mitch Mirkin, Dan Rabideau, MIT Lincoln Laboratory, United States
- TA7b-3 High Resolution Imaging for MIMO Forward Looking Ground Penetrating Radar 11:05 AM
Jian Li, Ode Ojowu, Luzhou Xu, University of Florida, United States; John Anderson, Howard University, United States; Lam Nguyen, Army Research Laboratory, United States
- TA7b-4 Structure Health Monitoring Exploiting Mimo Ultrasonic Sensing and Group Sparse Bayesian Learning 11:30 AM
Qisong Wu, Yimin Zhang, Moeness Amin, Andrew Golato, Sridhar Santhanam, Fauzia Ahmad, Villanova University, United States

Session TA8a1 Channel Estimation and MIMO Feedback

Chair: *Ananthanarayanan Chockalingam, Indian Institute of Science*

8:15 AM–9:55 AM

- TA8a1-1 Channel Estimation in Millimeter Wave MIMO Systems with One-Bit Quantization
Jianhua Mo, University of Texas at Austin, United States; Philip Schniter, Ohio State University, United States; Robert W. Heath Jr., University of Texas at Austin, United States
- TA8a1-2 Maximum-Likelihood Joint Channel Estimation and Data Detection for Space Time Block Coded MIMO Systems
Haider Alshamary, Weiyu Xu, University of Iowa, United States

- TA8a1-3 Cramer-Rao Bound for Blind Channel Estimation in Cyclic Prefixed MIMO-OFDM Systems With Few Received Symbols
Borching Su, Kai-Han Tseng, National Taiwan University, Taiwan
- TA8a1-4 Efficient MIMO Sparse Channel Estimation Using LTE Sounding Reference Signal
Jeng-Kuang Hwang, Jen-Hao Liu, Chien-Min Chen, Chuan-Shun Lin, Yuan Ze University, Taiwan
- TA8a1-5 Impact of Received Signal on Self-interference Channel Estimation and Achievable Rates in In-band Full-duplex Transceivers
Dani Korpi, Lauri Anttila, Mikko Valkama, Tampere University of Technology, Finland
- TA8a1-6 MIMO Nullforming with RVQ Limited Feedback and Channel Estimation Errors
D. Richard Brown III, Worcester Polytechnic Institute, United States; David Love, Purdue University, United States
- TA8a1-7 Limited Feedback in OFDM Systems for Combating ISI/ICI Caused by Insufficient Cyclic Prefix Length
Erich Zoechmann, Stefan Pratschner, Stefan Schwarz, Markus Rupp, Vienna University of Technology, Austria
- TA8a1-8 Frugal Channel Tracking for Transmit Beamforming
Omar Mehanna, Nicholas Sidiropoulos, University of Minnesota, United States

Session TA8a2 Image Processing I

Chair: *Kenneth Jenkins, Pennsylvania State University*

8:15 AM–9:55 AM

- TA8a2-1 Second Order Model Deviations of Local Gabor Features for Texture Classification
David Picard, Inbar Fijalkow, ETIS - UMR 8051 / ENSEA, Université Cergy-Pontoise, CNRS, France
- TA8a2-2 Weighted Boundary Matching Error Concealment for HEVC Using Block Partition Decisions
Yan-Tsung Peng, Pamela Cosman, University of California, San Diego, United States
- TA8a2-3 Reducing the Latency and Improving the Resolution of Vector Quantization with Anamorphic Stretch Transform
Haochen Yuan, Mohammad H. Asghari, Bahram Jalali, University of California, Los Angeles, United States
- TA8a2-4 Supervised Facial Recognition based on Multiresolution Analysis with Radon Transform
Ahmed Aldhahab, George Atia, Wasfy Mikhael, University of Central Florida, United States
- TA8a2-5 On Compensating Unknown Pixel Behaviors for Image Sensors with Embedded Processing
William Guicquero, Michele Benetti, Arnaud Peizerat, Antoine Dupret, Commissariat à l'énergie atomique et aux énergies alternatives, France; Pierre Vanderghenst, École Polytechnique Fédérale de Lausanne, Switzerland

- TA8a2-6 Representative Selection for Big Data via Sparse Graph and Geodesic Grassmann Manifold Distance
Chinh Dang, Hayder Radha, Michigan State University, United States
- TA8a2-7 A Generic Particle Filtering Approach for Multiple Polyhedral Object Tracking in a Distributed Active Sensor Network
Benoit Fortin, Regis Lherbier, Jea-Charles Noyer, Univ. Littoral Cote d'Opale, France
- TA8a2-8 Spatial Domain Synthetic Scene Statistics
Debarati Kundu, Brian Evans, University of Texas at Austin, United States

Session TA8a3 Signal Processing for Communications

Chair: *Bhavya Kailkhura, Syracuse University*

8:15 AM–9:55 AM

- TA8a3-1 Energy-Efficient Secure Communications in MISO-SE Systems
Alessio Zappone, Pin-Hsun Lin, Eduard A. Jorswieck, TU Dresden, Germany
- TA8a3-2 Distinguishing BFSK from QAM and PSK by Sampling Once per Symbol
Mohammad Bari, Milos Doroslovacki, George Washington University, United States
- TA8a3-3 Quadratic Program Solution of Communication Links Under Jamming
Koorosh Firouzbakht, Guevara Noubir, Masoud Salehi, Northeastern University, United States
- TA8a3-4 An Iterative Soft Decision Based Adaptive K-best Decoder Without SNR Estimation
Mehnaz Rahman, Ehsan Rohani, Gwan Choi, Texas A&M University, United States
- TA8a3-5 MMSE Scaling Enhances Performance in Practical Lattice Codes
Nuwan Ferdinand, University of Oulu, Finland; Matthew Nokleby, Duke University, United States; Brian Kurkoski, Japan Advanced Institute of Science and Technology, Japan; Behnaam Aazhang, Rice University, United States
- TA8a3-6 RLS-Based Frequency-domain DFE for Uplink SC-FDMA
Naveed Iqbal, Azzedine Zerguine, King Fahd University of Petroleum and Minerals, Saudi Arabia; Naofal Al-Dhahir, University of Texas at Dallas, United States
- TA8a3-7 Reduced-State Cyclic Viterbi Receiver for Localized SC-FDMA Uplink System
Jeng-Kuang Hwang, Jeng-Da Li, Yu-Chang Hsu, Chuan-Shun Lin, Yuan-Ze University, Taiwan
- TA8a3-8 Energy Detection Using Very Large Antenna Array Receivers
Alex Oliveras Martinez, Elisabeth De Carvalho, Petar Popovski, Gert Frølund Pedersen, Aalborg University, Denmark

Session TA8a4 Adaptive Filtering

Chair: *Milos Doroslovacki, George Washington University*

8:15 AM–9:55 AM

- TA8a4-1 On Component-Wise Conditionally Unbiased Linear Bayesian Estimation
Mario Huemer, Oliver Lang, Johannes Kepler University Linz, Austria
- TA8a4-2 Performance of Proportionate-type NLMS Algorithm with Gain Allocation Proportional to the Mean Square Weight Deviation
Kevin Wagner, Naval Research Laboratory, United States; Milos Doroslovacki, George Washington University, United States
- TA8a4-4 An Efficient Least Mean Squares Algorithm based on q-Gradient
Ubaid Al-Saggaf, Mohammad Moinuddin, King Abdulaziz University, Saudi Arabia; Azzedine Zerguine, King Fahd University of Petroleum and Minerals, Saudi Arabia
- TA8a4-5 Optimal Step Size Control for Acoustic Echo Cancellation
Khosrow Lashkari, Seth Suppappola, Cirrus Logic, United States
- TA8a4-6 Stochastic Gradient Algorithm Based on an Improved Higher Order Exponentiated Error Cost Function
Umair bin Mansoor, Syed Asad, Azzedine Zerguine, King Fahd University of Petroleum and Minerals, Saudi Arabia
- TA8a4-7 Spectral Multiscale Coverage with the Feature Aided CPHD Tracker
Ramona Georgescu, Shuo Zhang, Amit Surana, Alberto Speranzon, Ozgur Erdinc, United Technologies Research Center, United States
- TA8a4-8 Adaptive Sampling with Sensor Selection for Target Tracking in Wireless Sensor Networks
Abdulkadir Kose, Engin Masazade, Yeditepe University, Turkey

Session TA8b1 Multiuser and Cellular Systems

Chair: *Rafael F. Schaefer, Princeton University*

10:15 AM–11:55 AM

- TA8b1-1 Average Sum MSE Minimization in the Multi-User Downlink With Multiple Power Constraints
Andreas Gründinger, Michael Joham, Technische Universität München, Germany; Jose Pablo Gonzalez Coma, Luis Castedo, University of A Coruna, Spain; Wolfgang Utschick, Technische Universität München, Germany
- TA8b1-2 Hierarchical Precoding for Ultra-Dense Heterogeneous Networks
Lars Thiele, Martin Kurras, Fraunhofer Institute for Telecommunications Heinrich Hertz Institute, Germany

- TA8b1-3 Detection using Block QR Decomposition for MIMO HetNets
Robin Thomas, Raymond Knopp, Eurecom, France; Sunil (B.T.) Maharaj, University of Pretoria, South Africa
- TA8b1-4 On Performance Prediction for Multiuser Detection Enabled Systems in Packet Based Asynchronous Gaussian Multiple Access Channels
Prabahan Basu, MIT Lincoln Laboratory, United States
- TA8b1-5 Decentralized Target Rate Optimization for MU-MIMO Leakage Based Precoding
Tim Ruegg, Marc Kuhn, Armin Wittneben, ETH Zurich, Switzerland
- TA8b1-6 Leveraging Interference for Increasing Throughput and Reliability of Commercial Wireless Small Cells
Rachel Learned, Michael Pitaro, Matthew Ho, Massachusetts Institute of Technology, United States
- TA8b1-7 Throughput Analysis of LTE and WiFi in Unlicensed Band
Abhijeet Bhorkar, Christian Ibars Casas, Pingping Zong, Intel Corporation, United States
- TA8b1-8 Multi-User Detection for xDSL with Partial Cooperation Among Multiple Operators
Syed Hassan Raza Naqvi, Umberto Spagnolini, Politecnico di Milano, Italy

Session TA8b2 Computer Arithmetic II

Chair: *Sardar Muhammad Sulaman, Lund University*

10:15 AM–11:55 AM

- TA8b2-1 Improved Non-restoring Square Root Algorithm with Dual Path Calculation
Kihwan Jun, Earl Swartzlander, University of Texas at Austin, Republic of Korea
- TA8b2-2 Merged Residue Number System Generation
Michael Sullivan, Earl Swartzlander, University of Texas at Austin, United States
- TA8b2-3 Partial Product Generation and Addition for Multiplication in FPGAs With 6-Input LUTs
George Walters, Penn State Erie, The Behrend College, United States
- TA8b2-4 Low-Power Radix-4 Quotient Generator
Milos Ercegovac, University of California, Los Angeles, United States
- TA8b2-5 Memristor Based Adders
Divya Mahajan, Matheen Musaddiq, Earl Swartzlander, University of Texas at Austin, United States
- TA8b2-6 Canonic Real-Valued FFT Structures
Megha Parhi, Yingjie Lao, Keshab K. Parhi, University of Minnesota, Twin Cities, United States
- TA8b2-7 A High Throughput and Low Power Radix-4 FFT Architecture
Soumak Mookherjee, Linda S. DeBrunner, Victor DeBrunner, Florida State University, United States

TA8b2-8 A Domain Splitting Algorithm for the Mathematical Functions Code Generator
Olga Kupriianova, Christoph Lauter, UPMC, LIP6, PEQUAN team, France

Session TA8b3 Array Processing Methods

Chair: *Piya Pal, University of Maryland*

10:15 AM–11:55 AM

- TA8b3-1 Array Self Calibration with Large Initial Errors
Benjamin Friedlander, University of California, Santa Cruz, United States
- TA8b3-2 Maximum Likelihood Estimation for Geolocation in the Presence of Multipath
Benjamin Friedlander, University of California, Santa Cruz, United States
- TA8b3-3 Enhanced Location Detection Algorithms Based on Time of Arrival Trilateration
Sajina Pradhan, Jae-young Pyun, Goo-Rak Kwon, Seokjoo Shin, Suk-seung Hwang, Chosun University, Republic of Korea
- TA8b3-4 Designing Radio Interferometric Positioning Systems for Indoor Localizations in Millimeter Wave Bands
Marie Shinotsuka, Georgia Institute of Technology, United States; Yiyin Wang, Shanghai Jiao Tong University, China; Xiaoli Ma, G. Tong Zhou, Georgia Institute of Technology, United States
- TA8b3-5 Indoor Sound Source Localization and Number Estimation Using Infinite Gaussian Mixture Model
Longji Sun, Qi Cheng, Oklahoma State University, United States
- TA8b3-6 On the Structural Nature of Cooperation in Distributed Network Localization
Alireza Ghods, Stefano Severi, Giuseppe Abreu, Jacobs University Bremen, Germany; Samuel Van de Velde, Ghent University, Belgium
- TA8b3-7 Enabling Distributed Detection with Dependent Sensors
Brian Proulx, Junshan Zhang, Douglas Cochran, Arizona State University, United States
- TA8b3-8 Active Sonar Transmission Strategies in the Presence of Strong Direct Blast
Luzhou Xu, Jian Li, Akshay Jain, University of Florida, United States

Session TA8b4 Compressed Sensing III

Chair: *Victor DeBrunner, Florida State University*

10:15 AM–11:55 AM

- TA8b4-1 Super-resolution Line Spectrum Estimation with Block Priors
Kumar Vijay Mishra, Myung Cho, Anton Kruger, Weiyu Xu, University of Iowa, United States

- TA8b4-3 Complexity Reduction in Compressive Sensing using Hirschman Uncertainty Structured Random Matrices
Peng Xi, Victor DeBrunner, Florida State University, United States
- TA8b4-4 A Sparse Approach for Estimation of Amplitude Modulated Sinusoids
Stefan Ingi Adalbjörnsson, Johan Swärd, Andreas Jakobsson, Ted Kronvall, Lund University, Sweden
- TA8b4-5 Sparsity Order Estimation for Single Snapshot Compressed Sensing
Florian Roemer, Anastasia Lavrenko, Giovanni Del Galdo, Thomas Hotz, Technische Universitaet Ilmenau, Germany; Orhan Arikan, Bilkent University, Turkey; Reiner Thoma, Technische Universitaet Ilmenau, Germany
- TA8b4-6 Streaming Signal Recovery Using Sparse Bayesian Learning
Uditha Wijewardhana, Marian Codreanu, Centre for Wireless Communications, Finland
- TA8b4-7 Compressed Change Detection for Structural Health Monitoring
Omid Sarayanibafghi, George Atia, Masoud Malekzadeh, Necati Catbas, University of Central Florida, United States
- TA8b4-8 A Sparse Semi-Parametric Chirp Estimator
Johan Swärd, Johan Brynolfsson, Andreas Jakobsson, Maria Hansson-Sandsten, Lund University, Sweden

Session TP1a Covariance Mining

Chair: *Pradeep Ravikumar, University of Texas at Austin*

- TP1a-1 Abstract Algebraic-Geometric Subspace Clustering 1:30 PM
Manolis Tsakiris, Rene Vidal, Johns Hopkins University, United States
- TP1a-2 Minimum Variance Portfolio Optimization with Robust Shrinkage Covariance Estimation 1:55 PM
Liusha Yang, Hong Kong University of Science and Technology, Hong Kong SAR of China; Romain Couillet, Supelec, France; Matthew McKay, Hong Kong University of Science and Technology, Hong Kong SAR of China
- TP1a-3 Greedy Algorithms in Convex Optimization on Banach Spaces 2:20 PM
Vladimir Temlyakov, University of South Carolina, United States
- TP1a-4 Greedy Algorithms for Learning Graphical Models 2:45 PM
Ali Jalali, Christopher Johnson, Pradeep Ravikumar, University of Texas at Austin, United States

Session TP1b Large-Scale Learning and Optimization

Chair: *Alejandro Ribeiro, University of Pennsylvania*

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| TP1b-1 | Distributed Adaptive Sparsity-Imposing Canonical Correlations
<i>Jia Chen, Ioannis Schizas, University of Texas at Arlington, United States</i> | 3:30 PM |
| TP1b-2 | Game-Theoretic Learning In A Distributed-Information Setting: Distributed Convergence To Mean-Centric Equilibria
<i>Brian Swenson, Soumya Kar, Carnegie Mellon University, United States; Joao Xavier, Instituto Superior Tecnico, Portugal</i> | 3:55 PM |
| TP1b-3 | Network Newton
<i>Aryan Mokhtari, Alejandro Ribeiro, University of Pennsylvania, United States</i> | 4:20 PM |
| TP1b-4 | Communication-Computation Tradeoffs in Decentralized Stochastic Optimization
<i>Konstantinos Tsianos, Michael Rabbat, McGill University, Canada</i> | 4:45 PM |

Session TP2a Bioinformatics and DNA Computing

Co-Chairs: *Olgica Milenkovic, University of Illinois at Urbana-Champaign and Farzad Farnoud, California Institute of Technology*

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| TP2a-1 | On the Capacity of String-Duplication Systems and Genomic Duplication
<i>Farzad Farnoud, California Institute of Technology, United States; Moshe Schwartz, Ben-Gurion University of the Negev, Israel; Jehoshua Bruck, California Institute of Technology, United States</i> | 1:30 PM |
| TP2a-2 | Intrinsic Universality and the Computational Power of Self-Assembly
<i>Damien Woods, California Institute of Technology, United States</i> | 1:55 PM |
| TP2a-3 | Hybrid Rank Aggregation for Gene Prioritization
<i>Minji Kim, Farzad Farnoud, Olgica Milenkovic, University of Illinois at Urbana-Champaign, United States</i> | 2:20 PM |
| TP2a-4 | Rate-Independent Computation in Chemical Reaction Networks
<i>David Doty, California Institute of Technology, United States</i> | 2:45 PM |

Session TP2b Echo Cancellation

Chair: *Steven Grant, Missouri University of Science and Technology*

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| TP2b-1 | Echo Cancellation for Bone Conduction Transducers
<i>Mohammad Behgam, Steven L. Grant, Missouri University of Science and Technology, United States</i> | 3:30 PM |
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- TP2b-2 Uncertainty Modeling in Acoustic Echo Control 3:55 PM
Gerald Enzner, Rainer Martin, Ruhr-University Bochum, Germany; Peter Vary, RWTH Aachen University, Germany
- TP2b-3 A Kalman Filter for Stereophonic Acoustic Echo Cancellation 4:20 PM
Constantin Paleologu, University Politehnica of Bucharest, Romania; Jacob Benesty, University of Quebec, Canada; Steven L. Grant, Missouri University of Science and Technology, United States; Silviu Ciochina, University Politehnica of Bucharest, Romania
- TP2b-4 Study and Design of Differential Microphone Array Beamforming 4:45 PM
Jingdong Chen, Northwestern Polytechnical University, China; Jacob Benesty, INRS-EMT, University of Quebec, Canada

Session TP3a Machine Learning

Chair: *Vassilis Kekatos, University of Minnesota*

- TP3a-1 Consensus Inference with Multilayer Graphs for Multi-modal Data 1:30 PM
Karthikeyan Natesan Ramamurthy, IBM T. J. Watson Research Center, United States; Jayaraman J. Thiagarajan, Lawrence Livermore National Laboratory, United States; Rahul Sridhar, Premnisanth Kothandaraman, Ramanathan Nachiappan, SSN College of Engineering, India
- TP3a-2 Energy Price Matrix Factorization 1:55 PM
Vassilis Kekatos, University of Minnesota, United States
- TP3a-3 A New Reduction Scheme for Gaussian Sum Filters 2:20 PM
Leila Pishdad, Fabrice Labeau, McGill University, Canada
- TP3a-4 Exploring Upper Bounds on the Number of Distinguishable Classes 2:45 PM
Catherine Keller, MIT Lincoln Laboratory, United States; Gary Whipple, Laboratory for Telecommunication Sciences, United States

Session TP3b Sparse Signal Recovery

Co-Chairs: *Daniel Palomar, Hong Kong University of Science and Technology and Gonzalo Mateos, University of Rochester*

- TP3b-1 Compression Schemes for Time-Varying Sparse Signals 3:30 PM
Sundeep Prabhakar Chepuri, Geert Leus, Delft University of Technology, Netherlands
- TP3b-2 A Fast Algorithm for Sparse Generalized Eigenvalue Problem 3:55 PM
Junxiao Song, Prabhu Babu, Daniel Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China

- TP3b-3 Bootstrapped Sparse Bayesian Learning for Sparse Signal Recovery 4:20 PM
Ritwik Giri, Bhaskar Rao, University of California, San Diego, United States
- TP3b-4 A Fast Proximal Gradient Algorithm for Reconstructing Nonnegative Signals with Sparse Transform Coefficients 4:45 PM
Renliang Gu, Aleksandar Dogandžic, Iowa State University, United States

Session TP4a Optical Communications

Chair: *Philippe Ciblat, TELECOM ParisTech*

- TP4a-1 Fifth-Order Volterra Series Based Nonlinear Equalizer for Long-Haul High Data Rate Optical Fiber Communications 1:30 PM
Abdelkerim Amari, Philippe Ciblat, Yves Jaouen, Telecom ParisTech, France
- TP4a-2 Improving the Ultraviolet Scattering Channel Via Beam Reshaping 1:55 PM
Difan Zou, Shang-Bin Li, Zhengyuan Xu, School of Information Science and Technology, and Optical Wireless Communication and Network Center, China
- TP4a-3 Correlation Study on the SIMO Channel Output of NLOS Optical Wireless Communications 2:20 PM
Boyang Huang, Chen Gong, Zhengyuan Xu, University of Science and Technology of China, China
- TP4a-4 An Improved Performance Decoding Technique for Asymmetrically and Symmetrically Clipped Optical (ASCO)-OFDM 2:45 PM
Nan Wu, Yeheskel Bar-Ness, New Jersey Institute of Technology, United States

Session TP4b Energy Harvesting Wireless Communications

Chair: *Sennur Ulukus, University of Maryland*

- TP4b-1 On the Capacity of the Energy Harvesting Channel with Energy Transfer 3:30 PM
Aylin Yener, Pennsylvania State University, United States
- TP4b-2 Sum-rate Analysis for Systems with Wireless Energy Transfer 3:55 PM
Rania Morsi, Derrick Wing Kwan Ng, Robert Schober, Friedrich-Alexander University of Erlangen-Nuremberg, Germany
- TP4b-3 Optimal Energy Routing in Networks with Energy Cooperation 4:20 PM
B. Gurakan, O. Ozel, Sennur Ulukus, University of Maryland, United States
- TP4b-4 Renewables Powered Mobile Cloud Offloading 4:45 PM
Kaibin Huang, University of Hong Kong, Hong Kong SAR of China

Session TP5a Speech Enhancement

Chair: *Dalei Wu, Nanjing University of Posts and Telecommunications*

- TP5a-1 Noise Power Spectral Density Matrix 1:30 PM
Estimation Based on Improved IMCRA
Qipeng Gong, Benoit Champagne, Peter Kabal, McGill University, Canada
- TP5a-2 BI-CosampSE: Block Identification based 1:55 PM
Compressive Sampling Matching Pursuit for Speech Enhancement
Dalei Wu, Nanjing University of Posts and Telecommunications, China; Wei-Ping Zhu, M.N.S. Swamy, Concordia university, Canada
- TP5a-3 Pitch Estimation for Non-Stationary Speech 2:20 PM
Mads Græsbøll Christensen, Jesper Rindom Jensen, Aalborg University, Denmark
- TP5a-4 Estimating the Noncircularity of Latent 2:45 PM
Components within Complex-Valued Subband Mixtures with Applications to Speech Processing
Greg Okopal, Scott Wisdom, Les Atlas, University of Washington, United States

Session TP5b Full Duplex MIMO Radio

Chair: *Yingbo Hua, University of California, Riverside*

- TP5b-1 Non-Linear Distortion Cancellation in Full 3:30 PM
Digital Domain for Full Duplex Radios
Yang-Seok Choi, Feng Xue, Roya Doostnejad, Shilpa Talwar, Intel Corporation, United States
- TP5b-2 Blind Digital Tuning for Interference 3:55 PM
Cancellation in Full-Duplex Radio
Yingbo Hua, University of California, Riverside, United States
- TP5b-3 On In-Band Full-Duplex MIMO Radios with 4:20 PM
Transmit and Receive Antenna Reuse
Daniel Bliss, Yu Rong, Arizona State University, United States
- TP5b-4 MIMO Broadcast Channel with Continuous 4:45 PM
Feedback using Full-duplex Radios
Xu Du, Rice University, United States; Christopher Dick, Xilinx Incorporated, United States; Ashutosh Sabharwal, Rice University, United States

Session TP6a Passive and Multistatic Radars

Chair: *Muralidhar Rangaswamy, Air Force Research Labs*

- TP6a-1 Passive Multistatic Radar Based on 1:30 PM
Long-term Evolution Signals
Sandeep Gogineni, Wright State Research Institute, United States; Muralidhar Rangaswamy, Wright Patterson Air Force Base - AFRL, United States; Arye Nehorai, Washington University in St. Louis, United States

- TP6a-2 A Correlation-Based Signal Detection 1:55 PM
 Algorithm in Passive Radar with DVB-T2 Emitter
Guolong Cui, Hongbin Li, Stevens Institute of Technology, United States; Braham Himed, Air Force Research Laboratory, United States
- TP6a-3 Improving Multistatic MIMO Radar 2:20 PM
 Performance in Data-Limited Scenarios
Tariq Qureshi, Muralidhar Rangaswamy, Air Force Research Laboratory, United States; Kristine Bell, Metron Inc., United States
- TP6a-4 Market based Sensor Mobility Management 2:45 PM
 for Target Localization
Nianxia Cao, Swastik Brahma, Pramod Varshney, Syracuse University, United States

Session TP6b Many-Core Platforms

Chair: *Mats Brorsson, KTH*

- TP6b-1 Towards Modeling and Analyzing 3:30 PM
 Performance of LTE Base Station Software
Konstantin Popov, SICS, Sweden; Mats Brorsson, KTH Royal Institute of Technology, Sweden
- TP6b-2 REPLICA T7-16-128 - A 2048-threaded 3:55 PM
 16-core 7-FU Chained VLIW Chip Multiprocessor
Martti Forsell, Jussi Roivainen, VTT, Finland
- TP6b-3 Improving Image Quality by SSIM Based 4:20 PM
 Increase of Run-Length Zeros in GPGPU JPEG
 Encoding
Stefan Petersson, Håkan Grahn, Blekinge Institute of Technology, Sweden
- TP6b-4 Kickstarting High-Performing 4:45 PM
 Energy-Efficient Manycore Architectures with
 Epiphany
Tomas Nordström, Zain ul-Abdin, Halmstad University, Sweden; Andreas Olofsson, Adapteva, United States

Session TP7a Design Methodologies for Signal Processing

Chair: *Chris Lee, NCKU*

- TP7a-1 Finding Fast Action Selectors for Dataflow 1:30 PM
 Actors
Gustav Cedersjö, Jörn W. Janneck, Jonas Skeppstedt, Lund University, Sweden
- TP7a-2 Automatic Generation of Application Specific 1:55 PM
 FPGA Multicore Accelerators
Pascal Schleuniger, Andreas Hindborg, Nicklas Bo Jensen, Maxwell Walter, Laust Brock-Nannestad, Lars Bonnichsen, Christian W. Probst, Sven Karlsson, Technical University of Denmark, Denmark
- TP7a-3 Dataflow Toolset for Soft-Core Processors on 2:20 PM
 FPGA for Image Processing Applications
Burak Bardak, Fahad Manzoor Siddiqui, Roger Woods, Queen's University Belfast, United Kingdom

- TP7a-4 An Enhanced and Embedded GNU Radio Flow 2:45 PM
Ryan Marlow, Peter Athanas, Virginia Polytechnic Institute and State University, United States

Session TP7b Optical Wireless Communications

Chair: *Zhengyuan (Daniel) Xu, University of Science and Technology of China*

- TP7b-1 Multiuser MISO Indoor Visible Light Communications 3:30 PM
Jie Lian, Mohammad Noshad, Maite Brandt-Pearce, University of Virginia, United States
- TP7b-2 Optical Spatial Modulation OFDM using Micro LEDs 3:55 PM
Muhammad Ijaz, Dobroslav Tsonev, Abdelhamid Younis, University of Edinburgh, United Kingdom; Jonathan J. D. McKendry, Erdan Gu, Martin Dawson, University of Strathclyde, United Kingdom; Harald Haas, University of Edinburgh, United Kingdom
- TP7b-3 Adaptation of OFDM under Visible Light Communications and Illumination Constraints 4:20 PM
Thomas Little, Hany Elgala, Boston University, United States
- TP7b-4 Hybrid Dimmable Visible Light -with Infra-Red Optical Wireless Communications 4:45 PM
Andrew Burton, Z Ghassemlooy, Edward Bently, Hoa LeMinh, Northumbria University, United Kingdom; S K Laiw, National Taiwan University of Science and Technology, Taiwan; Chung Ghiu Lee, Chosun University, Republic of Korea

Session TP8a1 Cognitive Radio II

Chair: *Priyadip Ray, IIT Kharagpur*

1:30 PM–3:10 PM

- TP8a1-1 Characterization of Outage Performance for Cognitive Relay Networks with Mixed Fading
Efthymios Stathakis, Lars K. Rasmussen, Mikael Skoglund, Royal Institute of Technology (KTH), Sweden
- TP8a1-2 Restless Multi-Armed Bandits under Time-Varying Activation Constraints
Kobi Cohen, Qing Zhao, Anna Scaglione, University of California, Davis, United States
- TP8a1-3 On the Optimal Relay Design for Multi-Antenna Cognitive Two-Way AF Relay Networks
Maksym Girnyk, KTH Royal Institute of Technology, Sweden; Mikko Vehkaperä, Sergiy Vorobyov, Aalto University, Finland
- TP8a1-4 Network Aware Spectrum Efficiency Metric for Heterogeneous and Dynamic Radio Environments
Aditya Padaki, Ravi Tandon, Jeffrey Reed, Virginia Polytechnic Institute and State University, United States

- TP8a1-5 A Unified Framework for Robust Cooperative Spectrum Sensing
Qi Cheng, Eric Chan-Tin, Oklahoma State University, United States
- TP8a1-6 Receiver Configuration and Testbed Development for Underwater Cognitive Channelization
George Sklivanitis, Emre Can Demirors, Stella N. Batalama, Tommaso Melodia, Dimitris A. Pados, State University of New York at Buffalo, United States
- TP8a1-7 Estimation of Subspace Occupancy
Kaitlyn Beaudet, Douglas Cochran, Arizona State University, United States
- TP8a1-8 Performance Analysis: DF Cognitive Network with Transceiver Imperfections
Dang Khoa Nguyen, Kyushu Institute of Technology, Japan; Tu Thanh Lam, Post and Telecommunications Institute of Technology, Viet Nam; Hiroshi Ochi, Kyushu Institute of Technology, Japan

Session TP8a2 Signal Processing Methods

Chair: *Seung Jun Kim, University of Maryland, Baltimore County*

1:30 PM–3:10 PM

- TP8a2-1 Blind Equalization Based On Blind Separation with Toeplitz Constraint
Zhengwei Wu, Saleem Kassam, University of Pennsylvania, United States
- TP8a2-2 Piecewise-Constant Recovery via Spike-and-Slab Approximate Message-Passing using a Scalarwise Denoiser
Jaewook Kang, Heung-No Lee, Kiseon Kim, Gwangju Institute of Science and Technology (GIST), Republic of Korea
- TP8a2-3 Resource Allocation Optimization for Distributed Vector Estimation with Digital Transmission
Alireza Sani, Azadeh Vosoughi, University of Central Florida, United States
- TP8a2-4 Exploiting the Cramér-Rao Bound for Optimised Sampling and Quantisation of FRI Signals
Andre Angierski, Volker Kuehn, University of Rostock, Germany
- TP8a2-5 Adaptive Waveform for Integrated Detection and Identification of Moving Extended Target
Jo-Yen Nieh, Ric Romero, Naval Postgraduate School, United States
- TP8a2-6 Channel Gain Cartography Via Low Rank and Sparsity
Donghoon Lee, Seung-Jun Kim, University of Minnesota, United States
- TP8a2-7 Bayesian Cramér-Rao Bound for Distributed Estimation of Correlated Data with Non-linear Observation Model
Mojtaba Shirazi, Azadeh Vosoughi, University of Central Florida, United States
- TP8a2-8 Multirate Processing Using Nested Sampling
Peter Vouras, Naval Research Laboratory, United States

Session TP8a3 Image Processing II

Chair: *Ashkan Ashrafi, San Diego State University*

1:30 PM–3:10 PM

- TP8a3-1 Smoothed Rank Approximation Algorithms for Matrix Completion
Mohammed Al-Qizwini, Hayder Radha, Michigan State University, United States
- TP8a3-2 Visibility Prediction of Flicker Distortions on Naturalistic Videos
Lark Kwon Choi, Lawrence Cormack, Alan Bovik, University of Texas at Austin, United States
- TP8a3-3 Image Compression via Wavelets and Row Compression
Mary HudachekBuswell, Georgia Institute of Technology, United States; Michael Stewart, Saied Belkasim, Georgia State University, United States
- TP8a3-4 Low Complexity Dimensionality Reduction for Hyperspectral Images
Seda Senay, Hector Erives, New Mexico Institute of Mining and Technology, United States
- TP8a3-5 Improving Image Clustering using Sparse Text and the Wisdom of the Crowds
Anna Ma, Claremont Graduate University, United States; Arjuna Flenner, Naval Air Warfare Center, United States; Deanna Needell, Claremont McKenna College, United States; Allon Percus, Claremont Graduate University, United States
- TP8a3-6 Color Image Watermarking Using Quaternion Wavelets
Lahouari Ghouti, King Fahd University of Petroleum and Minerals, Saudi Arabia
- TP8a3-7 Immersion Ultrasonic Array Imaging Using a New Array Spatial Signature in Different Imaging Algorithms
Nasim Moallemi, Shahram Shahbazpanahi, University of Ontario Institute of technology, Canada
- TP8a3-8 A Proof on the Invariance of the Hirschman Uncertainty to the Rényi Entropy Parameter and an Observation on its Relevance in the Image Texture Classification Problem
Kirandeep Ghuman, Victor DeBrunner, Florida State University, United States

Session TP8a4 Sensor and Wireless Networks

Chair: *Usman Khan, Tufts University*

1:30 PM–3:10 PM

- TP8a4-1 Design of Orthogonal Golomb Rulers with Applications in Wireless Localization.
Omotayo Oshiga, Giuseppe Abreu, Jacobs University Bremen, Germany

- TP8a4-2 **Secrecy Outage Analysis of Cognitive Wireless Sensor Networks**
Satyantarayana Vuppala, Jacobs University Bremen, Germany; Weigang Liu, Tharmalingam Ratnarajah, University of Edinburgh, United Kingdom; Giuseppe Abreu, Jacobs University Bremen, Germany
- TP8a4-3 **On the Convergence Rate of Swap-Collide Algorithm for Simple Task Assignment**
Sam Safavi, Usman A. Khan, Tufts University, United States
- TP8a4-4 **On the Impact of Low-Rank Interference on Distributed Multi-Agent Optimization**
Chenguang Xi, Usman A. Khan, Tufts University, United States
- TP8a4-5 **Multipath-Aided Cooperative Network Localization Using Convex Optimization**
Hassan Naseri, Mario Pereira da Costa, Visa Koivunen, Aalto University, Finland
- TP8a4-6 **Mobile Sensor Mapping via Semi-Definite Programming**
Giuseppe Destino, Davide Macagnano, University of Oulu, Finland
- TP8a4-7 **Indoor Node Localization using Geometric Dilution of Precision in Ad-Hoc Sensor Networks**
Sudhir Kumar, Rajesh M. Hegde, Indian Institute of Technology Kanpur, India
- TP8a4-8 **Efficient Consensus Synchronization via Implicit Acknowledgment**
Andrew G. Klein, Western Washington University, United States; D. Richard Brown III, Worcester Polytechnic Institute, United States

Session TP8b1 Topics in Communication Systems

Chair: *Alexios Balatsoukas-Stimming, EPFL*

3:30 PM–5:10 PM

- TP8b1-1 **Performance Analysis of a MMSE Turbo Equalizer with LDPC in a FTN Channel with Application to Digital Video Broadcast**
Ghassan Maalouli, Brian A. Banister, Comtech EF Data, United States
- TP8b1-2 **Characteristics of Optical Scattering and Turbulence Communication Channels**
Weihao Liu, Zhengyuan Xu, University of Science and Technology of China, China
- TP8b1-3 **Comparison of SNR and Peak-SNR (PSNR) Performance Measures and Signals for Peak-limited Two-Dimensional (2D) Pixelated Optical Wireless Communication**
Eyal Katz, Yeheskel Bar-Ness, New Jersey Institute of Technology, United States
- TP8b1-4 **I.I.D. Stochastic Analysis of PWM Signals**
Noyan Sevuhtekin, Andrew Singer, University of Illinois at Urbana-Champaign, United States

- TP8b1-5 Statistical Data Correction for Unreliable Memories
Christoph Roth, ETH-Zurich, Switzerland; Christoph Struder, Cornell University, United States; Georgios Karakonstantis, Andreas Burg, École Polytechnique Fédérale de Lausanne, Switzerland
- TP8b1-6 Sonar Data Compression using Non-Uniform Quantization and Noise Shaping
Lok Wong, Gregory Allen, Brian Evans, University of Texas at Austin, United States
- TP8b1-7 Multilevel Coding for Non-Orthogonal Broadcast
Stephan Pfletschinger, Monica Navarro, Centre Tecnologic de Telecomunicacions de Catalunya, Spain; Christian Ibars, Intel Corporation, United States
- TP8b1-8 Dynamic Target Identification and Classification Based on Resonance Topography Grouping
Ananya Sen Gupta, Daniel Schupp, University of Iowa, United States; Ivars Kirsteins, Naval Undersea Warfare Center, United States

Session TP8b2 Relays, Cognitive, Cooperative, and Heterogeneous Networks

Chair: *Andrew G. Klein, Worcester Polytechnic Institute*

3:30 PM–5:10 PM

- TP8b2-1 A Distributed Algorithm for Energy Saving in Nomadic Relaying Networks
Zhe Ren, BMW Group Research and Technology, Germany; Mahdy Shabeeb, Munich University of Technology, Germany; Slawomir Stanczak, Fraunhofer Institute for Telecommunications Heinrich Hertz Institute, Germany; Peter Fertl, BMW Group Research and Technology, Germany
- TP8b2-2 Instantaneous Relaying for the 3-Way Relay Channel with Circular Message Exchanges
Bho Matthiesen, Eduard A. Jorswieck, Technische Universität Dresden, Germany
- TP8b2-3 On the Performance of Hybrid Satellite-Terrestrial Cooperative Networks with Interferences
Min Lin, PLA University of Science and Technology, China; Jian Ouyang, Nanjing University of Posts and Telecommunications, China; Zhu Wei-Ping, Concordia University, Canada
- TP8b2-4 An Online Parallel Algorithm for Spectrum Sensing in Cognitive Radio Networks
Yang Yang, Technische Universität Darmstadt, Germany; Mengyi Zhang, Chinese University of Hong Kong, Hong Kong SAR of China; Marius Pesavento, Technische Universität Darmstadt, Germany; Daniel Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China

- TP8b2-5 On the Spatial Spectral Efficiency of ITLinQ
Ratheesh Mungara, Universitat Pompeu Fabra, Spain; Xinchun Zhang, University of Texas at Austin, United States; Angel Lozano, Universitat Pompeu Fabra, Spain; Robert W. Heath Jr., University of Texas at Austin, United States
- TP8b2-6 Time and Frequency Self-Synchronization in Dense Cooperative Networks
Maria Antonietta Alvarez, Bahar Azari, Umberto Spagnolini, Politecnico di Milano, Italy
- TP8b2-7 Effect of Cluster Rotation Speed in Coordinated Heterogeneous MIMO Cellular Networks with Proportionally Fair User Scheduling
Hakimeh Purmehdi, Robert Elliott, Witold Krzymien, University of Alberta, Canada; Jordan Melzer, TELUS Communications, Canada
- TP8b2-8 Relay Selection for AF Wireless Relay Networks in Adverse Communication Environments
Kanghee Lee, Republic of Korea Air Force, Republic of Korea; Visvakumar Aravinthan, Sunghoon Moon, Wichita State University, United States; Jongbum Ryou, Changki Moon, Inha Hyun, Republic of Korea Air Force, Republic of Korea; Sun Jo, Defense Acquisition Program Administration of ROK, Republic of Korea

Session TP8b3 Signal Processing Architectures

Chair: *Zain Ul-Abdin, Halmstad University*

3:30 PM–5:10 PM

- TP8b3-1 Hybrid Floating-Point Modules with Low Area Overhead on a Fine-Grained Processing Core
Jon Pimentel, Bevan Baas, University of California, Davis, United States
- TP8b3-2 Scalable Hardware-Based Power Management for Many-Core Systems
Bin Liu, Brent Bohnenstiehl, Bevan Baas, University of California, Davis, United States
- TP8b3-3 Optimized FPGA Based Implementation of Discrete Wavelet Transform
Amin Jarrah, Mohsin M. Jamali, University of Toledo, United States
- TP8b3-4 Mapping and Scheduling of Dataflow Graphs - A Systematic Map
Usman Mazhar Mirza, Mehmet Ali Arslan, Gustav Cedersjö, Sardar Muhammad Sulaman, Jörn W. Janneck, Lund University, Sweden
- TP8b3-5 Dataflow Machines
Jörn W. Janneck, Gustav Cedersjö, Lund University, Sweden; Endri Bezati, Simone Casale Brunet, École Polytechnique Fédérale de Lausanne, Switzerland
- TP8b3-6 Replacement Techniques for Improving Performance in Sub-Block Caches
Oluleye Olorode, Mehrdad Nourani, University of Texas at Dallas, United States

- TP8b3-7 Dynamic Reconfiguration of FPGA-based Multi-Processor Arrays
James Glenn-Anderson, Supercomputer Systems, Inc., United States
- TP8b3-8 Coprime Processing for the Elba Island Sonar Data Set
Vaibhav Chavali, Kathleen Wage, George Mason University, United States; John Buck, University of Massachusetts Dartmouth, United States

Session TP8b4 Signal Processing Theory and Applications

Chair: *Yue Lu, Harvard University*

3:30 PM–5:10 PM

- TP8b4-1 Prediction of a Bed-Exit Motion: Multi-Modal Sensing Approach and Incorporation of Biomechanical Knowledge
Jun Hao, Xiaoxiao Dai, Amy Stroder, Jun Zhang, Bradley Davidson, Mohammad Mahoor, University of Denver, United States; Neil McClure, OKT Enterprises, United States
- TP8b4-2 Ultra-Wideband Radar based Human Body Landmark Detection and Tracking with Biomedical Constraints for Human Motion Measuring
Xiaoxiao Dai, Zhichong Zhou, Jun Zhang, Bradley Davidson, University of Denver, United States
- TP8b4-3 Separation of Interleaved Markov Chains
Ariana Minot, Yue Lu, Harvard University, United States
- TP8b4-4 Ramanujan Subspaces and Digital Signal Processing
P. P. Vaidyanathan, California Institute of Technology, United States
- TP8b4-5 Asynchronous Discrete-time Signal Processing with Molecular Reactions
Sayed Ahmad Salehi, Marc Riedel, Keshab K. Parhi, University of Minnesota, United States
- TP8b4-6 Sequential Prediction of Individual Sequences in the Presence of Computational Errors
Mehmet Donmez, Andrew Singer, University of Illinois at Urbana Champaign, United States
- TP8b4-7 A Scalable Feature Learning and Tag Prediction Framework for Natural Environment Sounds
Prasanna Sattigeri, Arizona State University, United States; Jayaraman Thiagarajan, Lawrence Livermore National Laboratory, United States; Mohit Shah, Arizona State University, United States; Karthikeyan Ramamurthy, IBM Research, United States; Andreas Spanias, Arizona State University, United States
- TP8b4-8 Extending Coherence for Optimal Detection of Nonstationary Harmonic Signals
Scott Wisdom, University of Washington, United States; James Pitton, Applied Physics Laboratory and University of Washington, United States; Les Atlas, University of Washington, United States

Session WA1a MIMO Design for mmWave Systems

Chair: *Zhouyue Pi, Samsung*

- WA1a-1 A Tractable Model for Rate in Noise Limited mmWave Cellular Networks 8:15 AM
Sarabjot Singh, Mandar Kulkarni, Jeffrey Andrews, University of Texas at Austin, United States
- WA1a-2 MIMO Designs for mmWave Wireless LAN Systems 8:40 AM
Sridhar Rajagopal, Shadi Abu-Surra, Sudhir Ramakrishna, Rakesh Taori, Samsung Research America, United States
- WA1a-3 Analysis of Millimeter Wave Cellular Networks with Overlaid Microwave Base Stations 9:05 AM
Tianyang Bai, Robert W. Heath Jr., University of Texas at Austin, United States
- WA1a-4 Initial Beamforming for mmWave Communications 9:30 AM
Vip Desai, Philippe Sartori, Weimin Xiao, Anthony Soong, Lukasz Krzymien, Huawei Technologies Co., Ltd., United States; Ahmed Alkhateeb, University of Texas at Austin, United States

Session WA1b Massive MIMO II

Chair: *David J. Love, Purdue University*

- WA1b-1 A Multistage Linear Receiver Approach for MMSE Detection in Massive MIMO 10:15 AM
Ting Li, Sujeet Patole, Murat Torlak, University of Texas at Dallas, United States
- WA1b-2 Beamforming-Based Spatial Precoding in FDD Massive MIMO Systems 10:40 AM
Ming-Fu Tang, Meng-Ying Lee, Borching Su, National Taiwan University, Taiwan; Chia-Pang Yen, Industrial Technology Research Institute, Taiwan
- WA1b-3 Asymmetric Distributed Space Frequency Coded Cooperative Network for Large Scale MIMO 11:05 AM
Bhagyashri Honrao, Chirag Warty, Shikha Nema, SNDT University, India

Session WA2a 5G and Energy Efficient Cellular Networks

Chair: *Jinkang Zhu, University of Science and Technology of China*

- WA2a-1 Traffic Aware Offloading for BS Sleeping in Heterogeneous Networks 8:15 AM
Shan Zhang, Sheng Zhou, Zhisheng Niu, Tsinghua University, China
- WA2a-2 A Survey on 5G New Waveform: From Energy Efficiency Aspects 8:40 AM
Shunqing Zhang, Xiuqiang Xu, Yiqun Wu, Lei Lu, Yan Chen, Huawei Technologies Co., Ltd., China

- WA2a-3 Evolution of LTE and new Radio Access Technologies for FRA (Future Radio Access) 9:05 AM
Hidetoshi Kayama, Huiling Jiang, DOCOMO Beijing Communications Laboratories Co. Ltd., China
- WA2a-4 A Novel Cell-Interference Model and Performance Analysis of the Future Wireless Networks 9:30 AM
Jinkang Zhu, Haibao Ren, University of Science and Technology of China, China

Session WA2b Mobile Health

Chair: *Mi Zhang, Cornell University*

- WA2b-1 On Outlier Detection in R-R Intervals from ECG Data Collected in the Natural Field Environment 10:15 AM
Rummana Bari, Santosh Kumar, University of Memphis, United States
- WA2b-2 Patient-Centric On-Body Sensor Localization in Smart Health Systems 10:40 AM
Ramyar Saeedi, Hassan Ghasemzadeh, Washington State University, United States
- WA2b-3 Making Sense of Personal Data in Clinical Settings 11:05 AM
Harinath Garudadri, University of California, San Diego, United States

Session WA3a Sparse Learning and Estimation

Chair: *Ali Pezeshki, Colorado State University*

- WA3a-1 Sparse Bayesian Learning Using Approximate Message Passing 8:15 AM
Maher Al-Shoukairi, Bhaskar Rao, University of California, San Diego, United States
- WA3a-2 Hierarchical Bayesian Approach for Jointly-Sparse Solution of Multiple-Measurement Vectors 8:40 AM
Mohammad Shekaramiz, Todd K. Moon, Jacob H. Gunther, Information Dynamics Laboratory / Utah State University, United States
- WA3a-3 Dictionary Approaches For Identifying Periodicities in Data 9:05 AM
Srikanth Venkata Tenneti, P. P Vaidyanathan, California Institute of Technology, United States
- WA3a-4 An Asymptotic Maximum Likelihood Estimator for the Period of a Cyclostationary Process 9:30 AM
David Ramírez, Peter J. Schreier, University of Paderborn, Germany; Javier Via, Ignacio Santamaría, University of Cantabria, Spain; Louis L. Scharf, Colorado State University, United States

Session WA3b Advances in Statistical Learning

Chair: *Kobi Cohen, University of Illinois at Urbana-Champaign*

- WA3b-1 Quasicontinuous State Hidden Markov Models Incorporating State Histories 10:15 AM
Todd K. Moon, Jacob H. Gunther, Utah State University, United States
- WA3b-2 A Classification Centric Quantizer for Efficient Encoding of Predictive Feature Errors 10:40 AM
Scott Deeann Chen, Pierre Moulin, University of Illinois at Urbana-Champaign, United States
- WA3b-3 Time-Varying Stochastic Multi-Armed Bandit 11:05 AM
Sattar Vakili, Qing Zhao, Yuan Zhou, University of California, Davis, United States

Session WA4a Physical Layer Security II

Chair: *Pin-Hsun Lin, TU Dresden*

- WA4a-1 Investigation of Secure Wireless Regions Using Configurable Beamforming on WARP platform 8:15 AM
Yuanrui Zhang, Queen's University Belfast, United Kingdom; Bei Yin, Rice University, United States; Roger Woods, Queen's University Belfast, United Kingdom; Joseph R. Cavallaro, Rice University, United States; Alan Marshall, University of Liverpool, United Kingdom; Youngwook Ko, Queen's University Belfast, United Kingdom
- WA4a-2 Wiretap-Channels with Constrained Active Attacks 8:40 AM
Carsten Rudolf Janda, Christian Scheunert, Eduard A. Jorswieck, Dresden University of Technology, Germany
- WA4a-3 Secrecy Rate Maximization for Information and Energy Transfer in MIMO Beamforming Networks 9:05 AM
Jens Steinwandt, Ilmenau University of Technology, Germany; Sergiy Vorobyov, Aalto University, Finland; Martin Haardt, Ilmenau University of Technology, Germany
- WA4a-4 Everlasting Secrecy in Disadvantaged Wireless Environments against Sophisticated Eavesdroppers 9:30 AM
Azadeh Sheikholeslami, Dennis Goeckel, Hossein Pishro-nik, UMASS-Amherst, United States

Session WA4b Coding and Decoding

Chair: *James A. Ritcey, University of Washington*

- WA4b-1 Noisy Belief Propagation Decoder 10:15 AM
Chu-Hsiang Huang, Yao Li, Lara Dolecek, University of California, Los Angeles, United States
- WA4b-2 A Low-Complexity Improved Successive Cancellation Decoder for Polar Codes 10:40 AM
Orion Afisiadis, Alexios Balatsoukas-Stimming, Andreas Burg, École Polytechnique Fédérale de Lausanne, Switzerland

WA4b-3 Differential Trellis Coded Modulation with State Dependent Mappings 11:05 AM
Ruey-Yi Wei, National Central University, Taiwan; James Ritcey, University of Washington, United States

Session WA5a Information Processing for Social and Sensor Networks

Chair: *Michael Rabbat, McGill University*

WA5a-1 Fourier Transform for Signals on Dynamic Graphs 8:15 AM
Arash Golibagh Mahyari, Selin Aviyente, Michigan State University, United States

WA5a-2 Anomalous Subgraph Detection in Publication Networks: Leveraging Truth 8:40 AM
Nadya Bliss, Manfred Laubichler, Arizona State University, United States

WA5a-3 Identifying Congestion in Software-Defined Networks 9:05 AM
Thomas Parker, Jamie Johnson, Murali Tummala, John McEachen, James Scrofani, Naval Postgraduate School, United States

WA5a-4 Vulnerability of CPS inference to DoS attacks 9:30 AM
Mohammadreza Doostmohammadian, Usman A. Khan, Tufts University, United States

Session WA5b Document Processing and Synchronization

Chair: *Olgica Milenkovic, University of Illinois at Urbana-Champaign*

WA5b-1 Synchronizing Ordinal Data over Noisy Channels 10:15 AM
Han Mao Kiah, Lili Su, Olgica Milenkovic, University of Illinois at Urbana-Champaign, United States

WA5b-2 Efficient Synchronization of Files in Distributed Storage Systems 10:40 AM
Salim El Rouayheb, Illinois Institute of Technology, United States; Sreechakra Goparaju, Princeton University, United States; Han Mao Kiah, Olgica Milenkovic, University of Illinois at Urbana-Champaign, United States

WA5b-3 Efficient File Synchronization: Extensions and Simulations 11:05 AM
Clayton Schoeny, Nicolas Bitouze, Frederic Sala, Lara Dolecek, University of California, Los Angeles, United States

Session WA6a Adaptive Signal Design and Analysis

Chair: *Antonia Papandreou-Suppappola, Arizona State University*

- WA6a-1 Eigen-Basis Analysis of Expected Cumulative Modulus for Constrained Signal Design 8:15 AM
Aaron Jones, Air Force Research Laboratory, United States; Brian Rigling, Wright State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States
- WA6a-2 Characterization of Information in Phase of Radar Range Profiles 8:40 AM
Linda Moore, Air Force Research Laboratory / University of Dayton, United States; Brian Rigling, Wright State University, United States; Robert Penno, University of Dayton, United States
- WA6a-3 Radar Tracking Waveform Design in Continuous Space and Optimization Selection Using Differential Evolution 9:05 AM
Antonia Papandreou-Suppappola, Bryan Paul, Daniel Bliss, Arizona State University, United States
- WA6a-4 Reduced Rank Adaptive Filtering in Impulsive Noise Environments 9:30 AM
Hanza Soury, King Abdullah University of Science and Technology (KAUST), Saudi Arabia; Karim Abed-Meraim, Polytech Orleans, France; Mohamed-Slim Alouini, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Session WA6b Distributed Detection and Optimization

Chair: *Andrea Simonetto, Delft University of Technology*

- WA6b-1 Distributed Detection for Wireless Sensor Networks with Fusion Center under Correlated Noise 10:15 AM
Alireza S. Behbahani, Ahmed M. Eltawil, Hamid Jafarkhani, University of California, Irvine, United States
- WA6b-2 Distributed Asynchronous Time-Varying Constrained Optimization 10:40 AM
Andrea Simonetto, Geert Leus, Delft University of Technology, Netherlands
- WA6b-3 M-ary Distributed Detection in the Presence of Channel Estimation Error 11:05 AM
Zahra Hajibabaei, Azadeh Vosoughi, University of Central Florida, United States

Session WA7a Implementation of Wireless Systems

Chair: *Roger Woods, Queens University*

- WA7a-1 Field-Order Based Hardware Cost Analysis of Non-Binary LDPC Decoders 8:15 AM
Yuta Toriyama, Behzad Amiri, Lara Dolecek, Dejan Markovic, University of California, Los Angeles, United States

- WA7a-2 Algorithm and Architecture for Hybrid 8:40 AM
 Decoding of Polar Codes
 *Bo Yuan, Keshab K. Parhi, University of Minnesota, Twin
 Cities, United States*
- WA7a-3 A Signal Processing Approach Towards 9:05 AM
 Ultra-Low Power Transceiver Design
 *Vijay Venkateswaran, Pawel Rulikowski, Howard Huang,
 Bell Labs, Ireland*
- WA7a-4 A High Performance GPU-based 9:30 AM
 Software-defined Basestation
 *Kaipeng Li, Michael Wu, Guohui Wang, Joseph R.
 Cavallaro, Rice University, United States*

Session WA7b Video Coding Architecture and Design

Chair: *Jorn Janneck, Lund University*

- WA7b-1 Development and Optimization of High Level 10:15 AM
 Dataflow Programs: the HEVC Decoder Design
 Case
 *Khaled Jerbi, INSA of Rennes / IETR, France; Daniele
 Renzi, Damien De Saint-Jorre, École Polytechnique
 Fédérale de Lausanne, Switzerland; Hervé Yviquel,
 INSA of Rennes / IETR, France; Claudio Alberti, École
 Polytechnique Fédérale de Lausanne, Switzerland;
 Mickaël Raulet, INSA of Rennes / IETR, France; Marco
 Mattavelli, École Polytechnique Fédérale de Lausanne,
 Switzerland*
- WA7b-2 A Low-Power Hybrid Video Recording 10:40 AM
 System with H.264/AVC and Light-Weight
 Compression
 *Hyun Kim, Seoul National University, Republic of Korea;
 Chae Eun Rhee, Inha University, Republic of Korea;
 Hyuk-Jae Lee, Seoul National University, Republic of
 Korea*
- WA7b-3 Design of View Synthesis Prediction in 11:05 AM
 3D-HEVC via Algorithmic Complexity Analysis
 *Gwo Giun (Chris) Lee, Bo-Syun Li, Chun-Fu Chen,
 National Cheng Kung University, Taiwan*

Author List

NAME	SESSION	NAME	SESSION
Aazhang, Behnaam	TA8a3-5	Aravinthan, Visvakumar	TP8b2-8
Abed-Meraim, Karim	WA6a-4	Arbajian, Amin	MP8a4-4
Abramovich, Yuri	TA7b-1	Arge, Charles	MA5b-4
Abreu, Giuseppe	TA8b3-6	Argyropoulos, Paraskevas	MP8a4-5
Abreu, Giuseppe	TP8a4-1	Arikan, Orhan	MP3b-3
Abreu, Giuseppe	TP8a4-2	Arikan, Orhan	TA8b4-5
Abry, Patrice	TA5b-4	Arslan, Mehmet Ali	TP8b3-4
Abu-Surra, Shadi	WA1a-2	Asad, Syed	TA8a4-6
Acton, Scott	MA5b-1	Asghari, Mohammad H	TA8a2-3
Adalbjörnsson, Stefan Ingi	TA8b4-4	Ashrafi, Ashkan	TA5a-4
Adhikary, Ansuman	MP4b-1	Astely, David	TA4a-2
Afisiadis, Orion	WA4b-2	Athanas, Peter	TP7a-4
Aghagolzadeh, Mohammad	MP7b-3	Atia, George	MA8b4-6
Aguiar, Pedro	TA6b-3	Atia, George	MP3b-2
Ahmad, Fauzia	TA6a-3	Atia, George	TA8a2-4
Ahmad, Fauzia	TA7b-4	Atia, George	TA8b4-7
Ahmad, Waquar	TA5a-1	Atlas, Les	TP5a-4
Ahmadi, Seyed-Ahmad	MP2b-2	Atlas, Les	TP8b4-8
Ahmed, Rameez	MP4a-2	Aviyente, Selin	MA8b4-5
Aiello, Katherine	MP8a2-1	Aviyente, Selin	MP8a5-5
Aiello, Katherine	MP8a2-2	Aviyente, Selin	WA5a-1
Akcakaya, Murat	MA2b-4	Azari, Bahar	TP8b2-6
Alberti, Claudio	WA7b-1	Azizyan, Martin	MP3a-3
Aldhahab, Ahmed	TA8a2-4	Ba, Demba	TA2a-1
Al-Dhahir, Naofal	TA8a3-6	Baas, Bevan	TP8b3-1
Alkhateeb, Ahmed	TA4a-3	Baas, Bevan	TP8b3-2
Alkhateeb, Ahmed	WA1a-4	Babadi, Behtash	TA2a-1
Allen, Gregory	TP8b1-6	Babu, Prabhu	TP3b-2
Alouini, Mohamed-Slim	WA6a-4	Badreldin, Islam	TA2a-4
Alqadah, Hatim	MA8b3-7	Bai, Tianyang	WA1a-3
Al-Qizwini, Mohammed	TP8a3-1	Bajwa, Waheed	TA6a-2
Al-Saggaf, Ubaid	TA8a4-4	Balatsoukas-Stimming, Alexios ...	WA4b-2
Alshamary, Haider	TA8a1-2	Banister, Brian A.	TP8b1-1
Al-Shoukairi, Maher	WA3a-1	Bardak, Burak	TP7a-3
Alter, Orly	MP8a2-1	Bari, Mohammad	TA8a3-2
Alter, Orly	MP8a2-2	Bari, Rummana	WA2b-1
Alter, Orly	TA1b-2	Bar-Ness, Yeheskel	TP4a-4
Alvarez, Maria Antonieta	TP8b2-6	Bar-Ness, Yeheskel	TP8b1-3
Amari, Abdelkerim	TP4a-1	Bartels, Randy	MP3a-4
Amin, Moeness	TA6a-3	Basiri, Shahab	MA1b-2
Amin, Moeness	TA7b-4	Basten, Twan	MP7a-2
Amiri, Behzad	WA7a-1	Basu, Prabahan	TA8b1-4
Amiri Eliasi, Parisa	MP8a2-6	Batalama, Stella N	TP8a1-6
An, Kang	MA8b2-1	Beaudet, Kaitlyn	TP8a1-7
Anderson, John	TA7b-3	Behbahani, Alireza S.	WA6b-1
Andrade, Joao	MP8a4-2	Behgam, Mohammad	TP2b-1
Andrews, Jeffrey	WA1a-1	Belkasim, Saied	TP8a3-3
Angierski, Andre	TP8a2-4	Bell, Kristine	TP6a-3
Anticevic, Alan	TA2b-1	Bell, Mark R.	MA8b3-4
Anttila, Lauri	TA8a1-5	Benesty, Jacob	TP2b-3
Aravinthan, Visvakumar	MA8b2-5	Benesty, Jacob	TP2b-4

NAME	SESSION	NAME	SESSION
Benetti, Michele	TA8a2-5	Calderbank, Robert	TA6a-2
Bently, Edward	TP7b-4	Calhoun, Vince	TA2b-3
Berardinelli, Gilberto	MP8a4-6	Campagnaro, Filippo	MA3b-1
Berberidis, Dimitrios	MA1b-4	Cao, Nianxia	TP6a-4
Bezati, Endri	TP8b3-5	Casale Brunet, Simone	TP8b3-5
Bhaskar, Badri	MP3a-1	Casari, Paolo	MA3b-1
Bhattacharyya, Shuvra	MP7a-1	Casas, Christian Ibars	TA8b1-7
Bhorkar, Abhijeet	TA8b1-7	Castedo, Luis	TA8b1-1
Billings, Jacob	MP8a2-4	Castrillon, Gabriel	MP2b-2
bin Mansoor, Umair	TA8a4-6	Castro-Arvizu, Juan Manuel	MP6b-3
Bingman, Verner	MP8a5-3	Catbas, Necati	TA8b4-7
Biswal, Bharat	TA2b-4	Caulfield, John	MA5b-2
Biswas, Sampurna	MP3b-4	Cavallaro, Joseph R.	MP8a4-1
Bitouze, Nicolas	WA5b-3	Cavallaro, Joseph R.	MP8a4-2
Bliss, Daniel	MA8b4-4	Cavallaro, Joseph R.	WA4a-1
Bliss, Daniel	TP5b-3	Cavallaro, Joseph R.	WA7a-4
Bliss, Daniel	WA6a-3	Cedersjö, Gustav	TP7a-1
Bliss, Nadya	WA5a-2	Cedersjö, Gustav	TP8b3-4
Bo Jensen, Nicklas	TP7a-2	Cedersjö, Gustav	TP8b3-5
Bohnenstiehl, Brent	TP8b3-2	Champagne, Benoit	TP5a-1
Bolic, Miodrag	MP6b-4	Chang, Yueh-Lun	MP5b-2
Bolucek, Muhsin Alperen	MP8a4-7	Chan-Tin, Eric	TP8a1-5
Bonnichsen, Lars	TP7a-2	Chavali, Vaibhav	TP8b3-8
Borisch, Eric	MP8a2-3	Che, Tiben	MA7b-4
Bourennane, Salah	MP1b-2	Chen, Chien-Min	TA8a1-4
Bovik, Alan	MA5b-3	Chen, Chun-Fu	WA7b-3
Bovik, Alan	TP8a3-2	Chen, Jia	TP1b-1
Brahma, Swastik	TP6a-4	Chen, Jianshu	MP5a-2
Brandt-Pearce, Maite	TP7b-1	Chen, Jianshu	TA6b-4
Brisk, Philip	MP7a-4	Chen, Jie	TA1a-2
Brock-Nannestad, Laust	TP7a-2	Chen, Jingdong	TP2b-4
Brooks, Dana H.	MA2b-4	Chen, Scott Deeann	WA3b-2
Brorsson, Mats	TP6b-1	Chen, Yan	WA2a-2
Brown, Christopher	TA5b-3	Chen, Yang	TA6b-2
Brown, Donald	MP8a1-3	Chen, Yejian	MA8b1-3
Brown, Emery	TA2a-1	Cheney, Margaret	MA8b3-6
Brown, Matthew	TA7b-2	Cheng, Qi	TA8b3-5
Brown III, D. Richard	TA8a1-6	Cheng, Qi	TP8a1-5
Brown III, D. Richard	TP8a4-8	Cheng, Xiang	MP4a-4
Bruck, Jehoshua	TP2a-1	Cheng, Xilin	MP4a-4
Brumberg, Jonathan	MA2b-2	Chepuri, Sundeep Prabhakar	TP3b-1
Brynolfsson, Johan	TA8b4-8	Chiba, Hironobu	TA5a-3
Buck, John	MA8b3-2	Chin, Sang (Peter)	MA6b-3
Buck, John	TP8b3-8	Chitre, Mandar	MA3b-2
Bucklew, James	MP8a2-5	Chklovskii, Dmitri	MP2b-3
Burg, Andreas	MP8a4-2	Chklovskii, Dmitri	TA2a-2
Burg, Andreas	TP8b1-5	Cho, Myung	TA8b4-1
Burg, Andreas	WA4b-2	Chockalingam, Ananthanarayanan	TA3b-3
Burgess, Neil	TA7a-3	Choi, Gwan	MA7b-4
Burnison, Jeremy	MA2b-2	Choi, Gwan	TA8a3-4
Burton, Andrew	TP7b-4	Choi, Inyong	MA2b-1
Buthler, Jakob L.	MP8a4-6	Choi, Junil	TA3b-2
Cadambe, Viveck	MP8a2-7	Choi, Lark Kwon	TP8a3-2
Caire, Giuseppe	MP4b-1	Choi, Yang-Seok	TP5b-1

NAME	SESSION	NAME	SESSION
Christensen, Mads Græsbøll	MP8a5-4	Desai, Vip	WA1a-4
Christensen, Mads Græsbøll	TP5a-3	Destino, Giuseppe	TP8a4-6
Chua, Gabriel	MA3b-2	Dick, Christopher	MP8a4-1
Ciblat, Philippe	TP4a-1	Dick, Christopher	TP5b-4
Ciochina, Silviu	TP2b-3	Ding, Eric Wei-Jhong	MP6a-3
Closas, Pau	MP6b-3	Djuric, Petar	MP6b-4
Cochran, Douglas	MP8a3-7	Do, Anh	TA5b-3
Cochran, Douglas	TA8b3-7	Dogandžić, Aleksandar	TP3b-4
Cochran, Douglas	TP8a1-7	Dolecek, Lara	WA4b-1
Codreanu, Marian	TA8b4-6	Dolecek, Lara	WA5b-3
Cohen, Kobi	TP8a1-2	Dolecek, Lara	WA7a-1
Cole, Michael	TA2b-1	Donmez, Mehmet	TP8b4-6
Cormack, Lawrence	TP8a3-2	Doostmohammadian, Mohammadreza	WA5a-4
Corr, Jamie	MP8a3-8	Doostnejad, Roya	TP5b-1
Cosman, Pamela	MP5b-2	Doroslovacki, Milos	TA8a3-2
Cosman, Pamela	TA8a2-2	Doroslovacki, Milos	TA8a4-2
Cottatellucci, Laura	MP4b-2	Doty, David	TP2a-4
Couillet, Romain	TP1a-2	Douglas, Scott	MP6a-4
Coulon, Martial	MP6b-1	Du, Xu	TP5b-4
Cousseau, Juan	MA8b2-6	Duffy, Ken	MP8a2-7
Creusere, Charles	MA8b4-1	Dupret, Antoine	TA8a2-5
Creusere, Charles	MA8b4-2	Dutta, Arindam	MA8b4-7
Crider, Lauren	MP8a3-7	Edfors, Ove	MP4b-4
Cui, Guolong	TP6a-2	El Rouayheb, Salim	WA5b-2
Curran, Tim	MA2b-3	Elgala, Hany	TP7b-3
Dabin, Jason	MP6b-1	El-Keyi, Amr	MA8b2-4
Dahlman, Erik	TA4a-2	Elliott, Robert	TP8b2-7
Dai, Xiaoxiao	TP8b4-1	Eltawil, Ahmed M.	WA6b-1
Dai, Xiaoxiao	TP8b4-2	Enzner, Gerald	TP2b-2
Dang, Chinh	TA8a2-6	Ercegovac, Milos	TA8b2-4
Dang, Wenbing	MP3a-4	Erdinc, Ozgur	TA8a4-7
Dao, Minh	MA6b-3	Erdogan, Alper Tunga	MP8a3-2
Dao, Minh	TA6a-4	Erdogmus, Deniz	MA2b-4
Dardari, Davide	MP6b-2	Erives, Hector	TP8a3-4
Darsena, Donatella	TA6b-1	Eslami Rasekh, Maryam	MA8b1-1
Dasgupta, Soura	MP3b-4	Evans, Brian	MP5b-1
Dauphin, Stephen	MA8b3-6	Evans, Brian	TA8a2-8
Davidson, Bradley	TP8b4-1	Evans, Brian	TP8b1-6
Davidson, Bradley	TP8b4-2	Facchinei, Francisco	MA1b-1
Davis, Philip	MA8b4-1	Falcao, Gabriel	MP8a4-2
Davis, Philip	MA8b4-2	Falk, Joachim	MP7a-2
Dawson, Martin	TP7b-2	Falk, Tiago	MP2a-1
De Carvalho, Elisabeth	TA8a3-8	Fan, Guoliang	MA5b-2
de Kerret, Paul	TA4b-1	Farnoud, Farzad	TP2a-1
de Sa, Virginia	MA2b-3	Farnoud, Farzad	TP2a-3
De Saint-Jorre, Damien	WA7b-1	Favaro, Federico	MA3b-1
DeBrunner, Linda S.	TA8b2-7	Feng, Li	MP8a2-6
DeBrunner, Victor	TA8b2-7	Ferdinand, Nuwan	TA8a3-5
DeBrunner, Victor	TA8b4-3	Fernandez-Canellas, Delia	MA2b-4
DeBrunner, Victor	TP8a3-8	Fernández-Rubio, Juan	MP6b-3
Declercq, David	MA7b-3	Ferrari, André	TA3a-2
Dehghannasiri, Roozbeh	MP5b-4	Fertl, Peter	TP8b2-1
Del Galdo, Giovanni	TA8b4-5	Fijalkow, Inbar	TA8a2-1
Demirors, Emrecan	TP8a1-6		

NAME	SESSION	NAME	SESSION
Filippou, Miltiades.....	TA4b-1	Grahn, Håkan.....	TP6b-3
Firouzbakht, Koorosh.....	TA8a3-3	Grant, Steven L.....	TP2b-1
Fischione, Carlo.....	TA3a-3	Grant, Steven L.....	TP2b-3
Flenner, Arjuna.....	TP8a3-5	Gregorio, Fernando.....	MA8b2-6
Ford, Russell.....	MP8a1-2	Grenard, Jerry.....	TA1b-1
Forsell, Martti.....	TP6b-2	Grgicak, Catherine.....	MP8a2-7
Fortin, Benoit.....	TA8a2-7	Grover, Pulkit.....	MP1a-3
Frazer, Gordon.....	TA7b-1	Gründinger, Andreas.....	TA8b1-1
Friedlander, Benjamin.....	MP6a-1	Gu, Erdan.....	TP7b-2
Friedlander, Benjamin.....	TA8b3-1	Gu, Renliang.....	TP3b-4
Friedlander, Benjamin.....	TA8b3-2	Gu, Yi.....	MP8a1-7
Frølund Pedersen, Gert.....	TA8a3-8	Guerra, Anna.....	MP6b-2
Fruth, Frank.....	MP7a-1	Guicquero, William.....	TA8a2-5
Fry, Alexandra.....	TA1a-1	Guidi, Francesco.....	MP6b-2
Gangadharan, Deepak.....	MP7a-3	Gunther, Jacob H.....	WA3a-2
Gao, David Wenzhong.....	MP8a1-7	Gunther, Jacob H.....	WA3b-1
Gao, David Wenzhong.....	TA1a-3	Guo, Jun.....	MP8a5-6
Gao, Xiang.....	MP4b-4	Gurakan, B.....	TP4b-3
Garcia, Nil.....	MP6b-1	Gurbuz, Ali Cafer.....	MP3b-3
Garudatri, Harinath.....	WA2b-3	Gurbuz, Sevgi Zubeyde.....	MP8a4-7
Geilen, Marc.....	MP7a-2	Haardt, Martin.....	MP1b-3
Gelli, Giacinto.....	TA6b-1	Haardt, Martin.....	WA4a-3
Georgescu, Ramona.....	TA8a4-7	Haas, Harald.....	TP7b-2
Gerges, Ramez L.....	MP8a1-6	Hague, David.....	MA8b3-2
Gesbert, David.....	MP4b-2	Haimovich, Alexander.....	MP6b-1
Gesbert, David.....	TA4b-1	Haimovich, Alexander.....	TA6a-1
Ghadimi, Euhanna.....	TA3a-1	Hajibabaei, Zahra.....	WA6b-3
Ghadiyaram, Deepti.....	MA5b-3	Hakhamaneshi, Farhood.....	MP8a4-6
Ghasemzadeh, Hassan.....	WA2b-2	Hall, Eric.....	TA2a-3
Ghassemlooy, Z.....	TP7b-4	Han, Keyong.....	MP6a-2
Ghods, Alireza.....	TA8b3-6	Hannig, Frank.....	MP7a-3
Ghouti, Lahouari.....	TP8a3-6	Hanrahan, Sara.....	MA8b4-7
Ghuman, Kirandeep.....	TP8a3-8	Hansen, Martin Weiss.....	MP8a5-4
Giannakis, Georgios.....	MA1b-4	Hansson-Sandsten, Maria.....	TA8b4-8
Giannakis, Georgios.....	MP5a-3	Hao, Jun.....	TP8b4-1
Giannakis, Georgios.....	TA1b-3	Harada, Noboru.....	TA5a-3
Giannakis, Georgios.....	TA1b-4	Harati, Amir.....	MP2a-2
Gilbert, Keith.....	MP8a3-4	Harms, Andrew.....	TA6a-2
Giri, Ritwik.....	TP3b-3	Hassan, Yahia.....	MP8a4-8
Girnyk, Maksym.....	TP8a1-3	Haubelt, Christian.....	MP7a-2
Glenn-Anderson, James.....	TP8b3-7	Havlicek, Joseph.....	MA5b-2
Goeckel, Dennis.....	WA4a-4	Hayat, Majeed.....	MA8b3-8
Gogineni, Sandeep.....	TP6a-1	Heath Jr., Robert W.....	TA4a-3
Golato, Andrew.....	TA7b-4	Heath Jr., Robert W.....	TA8a1-1
Goldsmith, Andrea.....	MP5a-2	Heath Jr., Robert W.....	TP8b2-5
Goldsmith, Andrea.....	TA6b-4	Heath Jr., Robert W.....	WA1a-3
Golibagh Mahyari, Arash.....	WA5a-1	Hebb, Adam.....	MA8b4-7
Gong, Chen.....	MA8b1-6	Hegde, Rajesh M.....	MP8a5-1
Gong, Chen.....	TP4a-3	Hegde, Rajesh M.....	TA5a-1
Gong, Qipeng.....	TP5a-1	Hegde, Rajesh M.....	TP8a4-7
Gonzalez, Gustavo.....	MA8b2-6	Hellings, Christoph.....	MA8b2-2
Gonzalez Coma, Jose Pablo.....	TA8b1-1	Henney, Carl.....	MA5b-4
Goparaju, Sreechakra.....	WA5b-2	Himed, Braham.....	TP6a-2
Gorsevski, Peter.....	MP8a5-3	Hindborg, Andreas.....	TP7a-2

NAME	SESSION	NAME	SESSION
Ho, Chung-Cheng.....	MP6a-4	Jerbi, Khaled.....	WA7b-1
Ho, Matthew.....	TA8b1-6	Jia, Chao.....	MP5b-1
Hochwald, Bertrand.....	TA3b-4	Jiang, Feng.....	TA1a-2
Hock, Rachel.....	MA5b-4	Jiang, Huaiguang.....	MP8a1-7
Honrao, Bhagyashri.....	WA1b-3	Jiang, Huaiguang.....	TA1a-3
Hormigo, Javier.....	TA7a-4	Jiang, Huling.....	WA2a-3
Hotz, Thomas.....	TA8b4-5	Jo, Sun.....	TP8b2-8
Hsu, Yu-Chang.....	TA8a3-7	Joham, Michael.....	TA8b1-1
Hua, Yingbo.....	TP5b-2	Johansen, Christopher.....	TA1b-1
Huang, Boyang.....	TP4a-3	Johansson, Mikael.....	TA3a-1
Huang, Chu-Hsiang.....	WA4b-1	Johnson, Ben.....	TA7b-1
Huang, Howard.....	WA7a-3	Johnson, Christopher.....	TP1a-4
Huang, Kaibin.....	TP4b-4	Johnson, Jamie.....	WA5a-3
Huang, Lei.....	TA1a-3	Johnson, Richard.....	TA5b-1
Huang, Yi.....	MP4a-1	Jones, Aaron.....	WA6a-1
HudachekBuswell, Mary.....	TP8a3-3	Jorswieck, Eduard A.....	TA8a3-1
Huemer, Mario.....	TA8a4-1	Jorswieck, Eduard A.....	TP8b2-2
Hui, Dennis.....	MA8b2-3	Jorswieck, Eduard A.....	WA4a-2
Hwang, Jeng-Kuang.....	TA8a1-4	Jun, Kihwan.....	TA8b2-1
Hwang, Jeng-Kuang.....	TA8a3-7	Kabal, Peter.....	TP5a-1
Hwang, Suk-seung.....	MA8b1-2	Kaillkhura, Bhavya.....	MA4b-1
Hwang, Suk-seung.....	TA8b3-3	Kamamoto, Yutaka.....	TA5a-3
Hyun, Inha.....	MA8b2-5	Kang, Jaewook.....	TP8a2-2
Hyun, Inha.....	TP8b2-8	Kar, Soumya.....	MP7b-2
Ibars, Christian.....	TP8b1-7	Kar, Soumya.....	TA6b-3
Ijaz, Muhammad.....	TP7b-2	Kar, Soumya.....	TP1b-2
Inan, Huseyin Atahan.....	MP8a3-2	Karakonstantis, Georgios.....	MP8a4-2
Ingle, Atul.....	MP8a2-5	Karakonstantis, Georgios.....	TP8b1-5
Ingle, Atul.....	TA5b-2	Karlsson, Marcus.....	MP4b-3
Iqbal, Naveed.....	TA8a3-6	Karlsson, Sven.....	TP7a-2
J. Thiagarajan, Jayaraman.....	TP3a-1	Karnick, Harish.....	TA5a-1
Jacob, Mathews.....	MP3b-4	Karypis, George.....	MP1b-1
Jafarkhani, Hamid.....	WA6b-1	Kassam, Saleem.....	TP8a2-1
Jaffard, Stephane.....	TA5b-4	Katz, Eyal.....	TP8b1-3
Jahja, Rico.....	MA8b1-2	Kayama, Hidetoshi.....	WA2a-3
Jain, Akshay.....	TA8b3-8	Kaynak, Unver.....	MP8a4-7
Jain, Ayush.....	MP8a5-1	Keilholz, Shella.....	MP8a2-4
Jakobsson, Andreas.....	TA8b4-4	Kekatos, Vassilis.....	MA1b-4
Jakobsson, Andreas.....	TA8b4-8	Kekatos, Vassilis.....	TP3a-2
Jalali, Ali.....	TP1a-4	Keller, Catherine.....	TP3a-4
Jalali, Bahram.....	TA8a2-3	Keogh, Eamonn.....	MP7a-4
Jamalabdollahi, Mohsen.....	MP4a-3	Khan, Usman A.....	TP8a4-3
Jamali, Mohsin M.....	MP8a5-3	Khan, Usman A.....	TP8a4-4
Jamali, Mohsin M.....	TP8b3-3	Khan, Usman A.....	WA5a-4
Janda, Carsten Rudolf.....	WA4a-2	Khayambashi, Misagh.....	MP3b-1
Janneck, Jörn W.....	TP7a-1	Kiah, Han Mao.....	WA5b-1
Janneck, Jörn W.....	TP8b3-4	Kiah, Han Mao.....	WA5b-2
Janneck, Jörn W.....	TP8b3-5	Kim, Changkyu.....	MP8a1-2
Jaouen, Yves.....	TP4a-1	Kim, Haley.....	TA6a-1
Jarraah, Amin.....	TP8b3-3	Kim, Hyun.....	WA7b-2
Jatla, Venkatesh.....	MA5b-4	Kim, Jinsub.....	MP5a-1
Jelili, Adebello.....	MA8b3-8	Kim, Kiseon.....	TP8a2-2
Jensen, Jesper Rindom.....	MP8a5-4	Kim, Minji.....	TP2a-3
Jensen, Jesper Rindom.....	TP5a-3	Kim, Seung-Jun.....	MP5a-3

NAME	SESSION	NAME	SESSION
Kim, Seung-Jun	TP8a2-6	Lee, Chung Ghiu	TP7b-4
Kim, Sungo	MA8b2-5	Lee, Donghoon	TP8a2-6
Kirilmaz, Tunahan	MP8a4-7	Lee, Gwo Giun (Chris)	WA7b-3
Kirsteins, Ivars	TP8b1-8	Lee, Heung-No	TP8a2-2
Klausmeyer, Philip	TA5b-3	Lee, Hyuk-Jae	WA7b-2
Klein, Andrew G.	TA5b-3	Lee, Kanghee	MA8b2-5
Klein, Andrew G.	TP8a4-8	Lee, Kanghee	TP8b2-8
Knopp, Raymond	TA8b1-3	Lee, Meng-Ying	WA1b-2
Ko, Youngwook	WA4a-1	LeMinh, Hoa	TP7b-4
Koivunen, Visa	MA1b-2	Leonardi, Nora	MP2b-4
Koivunen, Visa	TP8a4-5	Lerman, G.	MA1b-3
Korpi, Dani	TA8a1-5	Leus, Geert	MA3b-3
Kose, Abdulkadir	TA8a4-8	Leus, Geert	TA4a-3
Kothandaraman, Premnisanth	TP3a-1	Leus, Geert	TP3b-1
Kovvali, Narayan	MA8b4-7	Leus, Geert	WA6b-2
Krc, Tomas	TA5b-2	Lev-Ari, Hanoch	MP8a4-5
Krishnamurthy, Akshay	MP3a-3	Lherbier, Regis	TA8a2-7
Krishnamurthy, Ram	TA7a-1	Li, Bo-Syun	WA7b-3
Kroger, Jim	MA8b4-2	Li, Hongbin	TP6a-2
Kronvall, Ted	TA8b4-4	Li, Jeng-Da	TA8a3-7
Kruger, Anton	TA8b4-1	Li, Jian	TA7b-3
Krzymien, Lukasz	WA1a-4	Li, Jian	TA8b3-8
Krzymien, Witold	TP8b2-7	Li, Jichuan	MP8a1-5
Kuehn, Volker	TP8a2-4	Li, Juane	MA7b-1
Kuhn, Marc	TA8b1-5	Li, Kaipeng	WA7a-4
Kulkarni, Mandar	WA1a-1	Li, Min	MA8b2-1
Kumar, P. R.	TA6b-2	Li, Minyue	MP8a5-6
Kumar, Santosh	WA2b-1	Li, Shang-Bin	TP4a-2
Kumar, Sudhir	TP8a4-7	Li, Shuo	MP8a3-3
Kundu, Debarati	TA8a2-8	Li, Ting	WA1b-1
Kupriianova, Olga	TA8b2-8	Li, Xin	MP5b-3
Kurkoski, Brian	TA8a3-5	Li, Yang	TA4a-1
Kurras, Martin	TA8b1-2	Li, Yao	WA4b-1
Kwon, Goo-Rak	MA8b1-2	Li, Yun	MP1a-1
Kwon, Goo-Rak	TA8b3-3	Lian, Jie	TP7b-1
Labeau, Fabrice	TP3a-3	Liang, Yingbin	MA4b-4
Lai, Lifeng	MA4b-4	Lin, Chuan-Shun	TA8a1-4
Lai, Lifeng	MP4a-1	Lin, Chuan-Shun	TA8a3-7
Laiw, S K.	TP7b-4	Lin, Min	MA8b2-1
Lakshmi Narasimhan, Theagarajan	TA3b-3	Lin, Min	TP8b2-3
Lam, Tu Thanh	TP8a1-8	Lin, Pin-Hsun	TA8a3-1
Lameiro, Cristian	TA4b-3	Lin, Shu	MA7b-1
Lang, Oliver	TA8a4-1	Lin, Xuehong	MA8b3-3
Lanterman, Aaron	MA8b3-5	Lin, Yuan-Pei	MA8b1-4
Lao, Yingjie	TA8b2-6	Little, Thomas	TP7b-3
Lari, Vahid	MP7a-3	Liu, Bin	TP8b3-2
Larsson, Erik G.	MP4b-3	Liu, Brian	MA8b4-3
Lashkari, Khosrow	TA8a4-5	Liu, Chun-Lin	MP8a3-5
Laubichler, Manfred	WA5a-2	Liu, Jen-Hao	TA8a1-4
Lauter, Christoph	TA8b2-8	Liu, Keke	MA7b-1
Lavrenko, Anastasia	TA8b4-5	Liu, Weigang	TP8a4-2
Lawlor, Sean	MP7b-1	Liu, Weihao	TP8b1-2
Learned, Rachel	TA8b1-6	Lops, Marco	MP6b-1
		Love, David	TA3b-2

NAME	SESSION	NAME	SESSION
Love, David.....	TA8a1-6	Melzer, Jordan.....	TP8b2-7
Low, Steven.....	MP5a-4	Memarian, Negar.....	MP2a-4
Lozano, Angel.....	TP8b2-5	Messier, Paul.....	TA5b-1
Lu, Lei.....	WA2a-2	Mikhael, Wasfy.....	TA8a2-4
Lu, Yue.....	TP8b4-3	Milenkovic, Olgica.....	TP2a-3
Lu, Yue M.....	MP7b-4	Milenkovic, Olgica.....	WA5b-1
Lutz, David.....	TA7a-3	Milenkovic, Olgica.....	WA5b-2
Ma, Anna.....	TP8a3-5	Minot, Ariana.....	TP8b4-3
Ma, Shuoxin.....	MA8b4-4	Mirkin, Mitch.....	TA7b-2
Ma, Xiaoli.....	TA8b3-4	Mirza, Usman Mazhar.....	TP8b3-4
Ma, Zhanyu.....	MP8a5-6	Mirzaei, Golrokh.....	MP8a5-3
Maalouli, Ghassan.....	TP8b1-1	Mishra, Kumar Vijay.....	TA8b4-1
Macagnano, Davide.....	TP8a4-6	Miyabe, Shigeki.....	TA5a-3
Madhow, Upamanyu.....	MA8b1-1	Mo, Jianhua.....	TA8a1-1
Madhow, Upamanyu.....	MP8a4-4	Moallemi, Nasim.....	TP8a3-7
Magnússon, Sindri.....	TA3a-3	Mogensen, Preben.....	MP8a4-6
Mahajan, Divya.....	TA8b2-5	Moinuddin, Mohammad.....	TA8a4-4
Maharaj, Sunil (B.T.).....	TA8b1-3	Mokhtari, Aryan.....	TP1b-3
Mahmood, Mir H.....	MA8b3-4	Mollison, Matthew.....	MA2b-3
Mahoor, Mohammad.....	TP8b4-1	Mönich, Ullrich.....	MP8a2-7
Mahzoon, Majid.....	MP1a-3	Mookherjee, Soumak.....	TA8b2-7
Makino, Shoji.....	TA5a-3	Moon, Changki.....	MA8b2-5
Malekzadeh, Masoud.....	TA8b4-7	Moon, Changki.....	TP8b2-8
Malysa, Greg.....	MP8a4-4	Moon, Sunghoon.....	MA8b2-5
Mamandipoor, Babak.....	MP8a4-4	Moon, Sunghoon.....	TP8b2-8
Manduca, Armando.....	MP8a2-3	Moon, Todd K.....	WA3a-2
Mansukhani, Jyoti.....	TA4b-2	Moon, Todd K.....	WA3b-1
Manzoor Siddiqui, Fahad.....	TP7a-3	Moore, Linda.....	WA6a-2
Mardani, Davood.....	MP3b-2	Moreau, Eric.....	MP1b-4
Mardani, Morteza.....	TA1b-4	Moriya, Takehiro.....	TA5a-3
Maric, Ivana.....	MA8b2-3	Morsi, Rania.....	TP4b-2
Markovic, Dejan.....	WA7a-1	Moulin, Pierre.....	WA3b-2
Marlow, Ryan.....	TP7a-4	Mudumbai, Raghuraman.....	MA8b1-1
Marot, Julien.....	MP1b-2	Mukherjee, Amitav.....	MP8a1-4
Marshall, Alan.....	WA4a-1	Mungara, Ratheesh.....	TP8b2-5
Martin, Rainer.....	TP2b-2	Musaddiq, Matheen.....	TA8b2-5
Masazade, Engin.....	TA8a4-8	Nachiappan, Ramanathan.....	TP3a-1
Mathew, Sanu.....	TA7a-1	Nadakuditi, Rajesh.....	TA1a-4
Mattavelli, Marco.....	WA7b-1	Nafie, Mohammed.....	MA8b2-4
Matthiesen, Bho.....	TP8b2-2	Nam, Young-Han.....	TA4a-1
Maurandi, Victor.....	MP1b-4	Naqvi, Syed Hassan Raza.....	TA8b1-8
Maurer, Alexander.....	MA8b4-7	Naseri, Hassan.....	TP8a4-5
McClure, Neil.....	TP8b4-1	Naskovska, Kristina.....	MP1b-3
McEachen, John.....	WA5a-3	Nassif, Roula.....	TA3a-2
McKay, Matthew.....	TP1a-2	Natesan Ramamurthy, Karthikeyan.....	TP3a-1
McKendry, Jonathan J. D.....	TP7b-2	Nathwani, Karan.....	MP8a5-1
McRae, Nathan.....	MA8b4-1	Navab, Nassir.....	MP2b-2
McWhirter, John.....	MP8a3-8	Navarro, Monica.....	TP8b1-7
Médard, Muriel.....	MP8a2-7	Navasca, Carmeliza.....	TA1a-1
Medda, Alessio.....	MA8b4-3	Nayar, Himanshu.....	TA1a-4
Medda, Alessio.....	MP8a2-4	Needell, Deanna.....	TA1b-1
Mehanna, Omar.....	TA8a1-8	Needell, Deanna.....	TP8a3-5
Melodia, Tommaso.....	TP8a1-6	Nehorai, Arye.....	MP6a-2
Melvin, William.....	MA8b3-5		

NAME	SESSION	NAME	SESSION
Nehorai, Arye.....	MP8a1-5	Parhi, Keshab K.....	TA8b2-6
Nehorai, Arye.....	TP6a-1	Parhi, Keshab K.....	TP8b4-5
Nema, Shikha.....	WA1b-3	Parhi, Keshab K.....	WA7a-2
Ng, Derrick Wing Kwan.....	TP4b-2	Parhi, Megha.....	TA8b2-6
Nguyen, Chuong.....	MA5b-2	Paris, Alan.....	MA8b4-6
Nguyen, Dang Khoa.....	TP8a1-8	Parker, Thomas.....	WA5a-3
Nguyen, Lam.....	TA6a-4	Parkvall, Stefan.....	TA4a-2
Nguyen, Lam.....	TA7b-3	Parvania, Masood.....	TA6b-1
Nguyen, PhuongBang.....	MP8a1-1	Patole, Sujeet.....	WA1b-1
Nie, Ding.....	TA3b-4	Pattichis, Marios.....	MA5b-2
Nieh, Jo-Yen.....	TP8a2-5	Pattichis, Marios.....	MA5b-4
Nitinawarat, Sirin.....	MP1a-1	Paul, Bryan.....	WA6a-3
Niu, Zhisheng.....	WA2a-1	Payton, Karen.....	MP8a3-4
Noh, Eunho.....	MA2b-3	Peizerat, Arnaud.....	TA8a2-5
Nokleby, Matthew.....	TA8a3-5	Peng, Yan-Tsung.....	TA8a2-2
Nordström, Tomas.....	TP6b-4	Penno, Robert.....	WA6a-2
Norman, Mark.....	MA8b4-1	Pequito, Sergio.....	TA6b-3
Noshad, Mohammad.....	TP7b-1	Percus, Allon.....	TP8a3-5
Noubir, Guevara.....	TA8a3-3	Pereira da Costa, Mario.....	TP8a4-5
Noujeim, Karam.....	MP8a4-4	Pesavento, Marius.....	TP8b2-4
Nourani, Mehrdad.....	TP8b3-6	Petersson, Stefan.....	TP6b-3
Noyer, Jea-Charles.....	TA8a2-7	Petropulu, Athina.....	MP3a-2
Obeid, Iyad.....	MP2a-2	Pezeshki, Ali.....	MA6b-1
Ochi, Hiroshi.....	TP8a1-8	Pezeshki, Ali.....	MP3a-4
Ogunfunmi, Tokunbo.....	TA5a-2	Pfetschinger, Stephan.....	TP8b1-7
Ojowu, Ode.....	TA7b-3	Phelps, Shean.....	MA8b4-3
Okopal, Greg.....	TP5a-4	Phoong, See-May.....	MA8b1-4
Oliveras Martinez, Alex.....	TA8a3-8	Picard, David.....	TA8a2-1
Ollila, Esa.....	MA1b-2	Picone, Joseph.....	MP2a-2
Olofsson, Andreas.....	TP6b-4	Pimentel, Jon.....	TP8b3-1
Olorode, Oluleye.....	TP8b3-6	Pishdad, Leila.....	TP3a-3
Orhan, Umut.....	MA2b-4	Pishro-nik, Hossein.....	WA4a-4
Oshiga, Omotayo.....	TP8a4-1	Pitaro, Michael.....	TA8b1-6
Otazo, Ricardo.....	MP8a2-6	Pitton, James.....	TP8b4-8
Ouyang, Jian.....	TP8b2-3	Planjery, Shiva.....	MA7b-3
Oweiss, Karim.....	TA2a-4	Plishker, William.....	MP7a-1
Ozdemir, Alp.....	MP8a5-5	Poor, H. Vincent.....	MA4b-3
Ozel, O.....	TP4b-3	Poor, H. Vincent.....	MP5a-2
Ozer, Sedat.....	MA5b-1	Poor, H. Vincent.....	TA6b-4
Pacheco, Courtney.....	MA2b-1	Popov, Konstantin.....	TP6b-1
Padaki, Aditya.....	TP8a1-4	Popovski, Petar.....	TA8a3-8
Pados, Dimitris A.....	TP8a1-6	Pradhan, Sajina.....	TA8b3-3
Pakrooh, Pooria.....	MA6b-1	Pratschner, Stefan.....	TA8a1-7
Pal, Piya.....	MA6b-4	Probst, Christian W.....	TP7a-2
Paleologu, Constantin.....	TP2b-3	Proudlar, Ian.....	MP8a3-8
Palka, Thomas.....	MP8a3-6	Proulx, Brian.....	TA8b3-7
Palomar, Daniel.....	TP3b-2	Purmehdi, Hakimeh.....	TP8b2-7
Palomar, Daniel.....	TP8b2-4	Pyun, Jae-young.....	MA8b1-2
Pan, Yen-Chang.....	MA8b1-4	Pyun, Jae-young.....	TA8b3-3
Papandreou-Suppappola, Antonia.....	MA8b4-7	Qureshi, Tariq.....	TP6a-3
Papandreou-Suppappola, Antonia.....	WA6a-3	Rabbat, Michael.....	MP7b-1
Parhi, Keshab K.....	MP8a4-3	Rabbat, Michael.....	TA3a-1
		Rabbat, Michael.....	TA3a-3
		Rabbat, Michael.....	TP1b-4

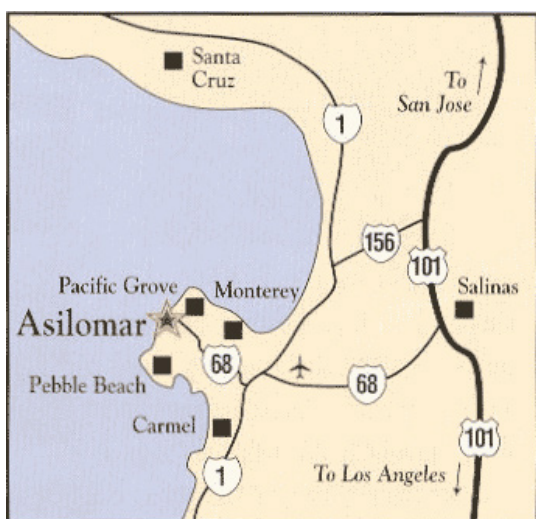
NAME	SESSION	NAME	SESSION
Rabideau, Dan.....	TA7b-2	Rohani, Ehsan.....	TA8a3-4
Radha, Hayder.....	MP7b-3	Roivainen, Jussi.....	TP6b-2
Radha, Hayder.....	TA8a2-6	Romero, Ric.....	TP8a2-5
Radha, Hayder.....	TP8a3-1	Rong, Yu.....	TP5b-3
Rahman, Mehnaz.....	TA8a3-4	Ross, Jeremy.....	MP8a5-3
Rajagopal, Sridhar.....	WA1a-2	Rostamian, Majed.....	MP6b-4
Rajaram, Siddharth.....	MA2b-1	Roth, Christoph.....	TP8b1-5
Ramakrishna, Sudhir.....	WA1a-2	Roux, Stephane.....	TA5b-4
Ramamurthy, Karthikeyan.....	TP8b4-7	Rüegg, Tim.....	TA8b1-5
Ramezani, Hamid.....	MA3b-3	Rulikowski, Pawel.....	WA7a-3
Ramírez, David.....	WA3a-4	Rupp, Markus.....	TA8a1-7
Ramlall, Rohan.....	MA8b1-5	Rusek, Fredrik.....	MP4b-4
Rangan, Sundeeep.....	MP8a1-2	Ryou, Jongbum.....	MA8b2-5
Rangan, Sundeeep.....	MP8a2-6	Ryou, Jongbum.....	TP8b2-8
Rangaswamy, Muralidhar.....	MA8b3-1	Sabharwal, Ashutosh.....	TP5b-4
Rangaswamy, Muralidhar.....	TP6a-1	Saeedi, Ramyar.....	WA2b-2
Rangaswamy, Muralidhar.....	TP6a-3	Safavi, Sam.....	TP8a4-3
Rangaswamy, Muralidhar.....	WA6a-1	Sagratella, Simone.....	MA1b-1
Rani, Ruchi.....	MP8a5-1	Sahu, Anit.....	MP7b-2
Rao, Bhaskar.....	MA6b-2	Sala, Frederic.....	WA5b-3
Rao, Bhaskar.....	MP8a1-1	Salah, Aya.....	MA8b2-4
Rao, Bhaskar.....	TP3b-3	Salehi, Masoud.....	TA8a3-3
Rao, Bhaskar.....	WA3a-1	Salehi, Sayed Ahmad.....	TP8b4-5
Rao, Nikhil.....	MP8a3-1	San Antonio, Geoffrey.....	TA7b-1
Rasmussen, Lars K.....	TP8a1-1	Sangari, Arash.....	MP8a5-2
Ratnarajah, Tharmalingam.....	TP8a4-2	Sani, Alireza.....	TP8a2-3
Raulet, Mickaël.....	WA7b-1	Sankaranarayanan, Preethi.....	MP8a2-2
Ravikumar, Pradeep.....	TP1a-4	Santamaria, Ignacio.....	TA4b-3
Ravindran, Niranjay.....	MP1b-1	Santamaria, Ignacio.....	WA3a-4
Raviteja, Patchava.....	TA3b-3	Santhanam, Balu.....	MA8b3-8
Ray, Priyadip.....	TA4b-2	Santhanam, Sridhar.....	TA7b-4
Recht, Benjamin.....	MP3a-1	Sarayanibafghi, Omid.....	TA8b4-7
Reed, Jeffrey.....	TP8a1-4	Sarkar, Rituparna.....	MA5b-1
Ren, Haibao.....	WA2a-4	Sartori, Philippe.....	WA1a-4
Ren, Zhe.....	TP8b2-1	Satpathy, Sudhir.....	TA7a-1
Renzi, Daniele.....	WA7b-1	Sattigeri, Prasanna.....	TP8b4-7
Repovš, Grega.....	TA2b-1	Sayed, Ali H.....	TA3a-2
Reynolds, Daryl.....	MP5b-3	Sayeed, Akbar.....	MA8b1-7
Rhee, Chae Eun.....	WA7b-2	Scaglione, Anna.....	TA3a-4
Ribeiro, Alejandro.....	TP1b-3	Scaglione, Anna.....	TA6b-1
Richard, Cédric.....	TA3a-2	Scaglione, Anna.....	TP8a1-2
Richiardi, Jonas.....	MP2b-2	Schaefer, Rafael F.....	MA4b-3
Riedel, Marc.....	TP8b4-5	Scharf, Louis L.....	MA6b-1
Riederer, Stephen.....	MP8a2-3	Scharf, Louis L.....	WA3a-4
Riedl, Thomas.....	MA3b-4	Scheunert, Christian.....	WA4a-2
Rigling, Brian.....	WA6a-1	Schizas, Ioannis.....	TP1b-1
Rigling, Brian.....	WA6a-2	Schleuniger, Pascal.....	TP7a-2
Riley, Robert.....	MA8b3-6	Schniter, Philip.....	MA8b1-7
Rish, Irina.....	TA2b-2	Schniter, Philip.....	TA8a1-1
Ritcey, James.....	WA4b-3	Schober, Robert.....	TP4b-2
Rocha, Paula.....	TA6b-3	Schoeny, Clayton.....	WA5b-3
Rocha, Pedro.....	TA6b-3	Schomay, Theodore.....	MP8a2-2
Roemer, Florian.....	TA8b4-5	Schreier, Peter J.....	WA3a-4
Rohani, Ehsan.....	MA7b-4	Schulte, Michael.....	TA7a-2

NAME	SESSION	NAME	SESSION
Schupp, Daniel	TP8b1-8	Speranzon, Alberto	TA8a4-7
Schwartz, Moshe	TP2a-1	Sridhar, Rahul	TP3a-1
Schwarz, Stefan	TA8a1-7	Stanacevic, Milutin	MP8a3-3
Scrofani, James	WA5a-3	Stanczak, Slawomir	TP8b2-1
Scutari, Gesualdo	MA1b-1	Stathakis, Efthymios	TP8a1-1
Sen Gupta, Ananya	TP8b1-8	Steinwandt, Jens	WA4a-3
Senay, Seda	TP8a3-4	Stewart, Michael	TP8a3-3
Sethares, William	MP8a2-5	Stojanovic, Milica	MA3b-3
Sethares, William	MP8a5-2	Stojanovic, Milica	MP4a-2
Sethares, William	TA5b-2	Stroder, Amy	TP8b4-1
Setlur, Pawan	MA8b3-1	Strohmer, Thomas	MP6a-1
Seto, Koji	TA5a-2	Strother, Stephen	MP2b-1
Severi, Stefano	TA8b3-6	Struder, Christoph	TP8b1-5
Sevuktekin, Noyan	TP8b1-4	Stuijk, Sander	MP7a-2
Shabeeb, Mahdy	TP8b2-1	Su, Borching	MP6a-3
Shah, Mohit	TP8b4-7	Su, Borching	TA8a1-3
Shah, Parikshit	MP3a-1	Su, Borching	WA1b-2
Shah, Parikshit	MP8a3-1	Su, Lili	WA5b-1
Shahbazpanahi, Shahram	TP8a3-7	Sulaman, Sardar Muhammad	TP8b3-4
Sheikholeslami, Azadeh	WA4a-4	Sullivan, Michael	TA8b2-2
Sheikholeslami, Fatemeh	TA1b-4	Sun, Longji	TA8b3-5
Shekaramiz, Mohammad	WA3a-2	Sun, Shunqiao	MP3a-2
Shi, Zhijie	MP4a-1	Sun, Wensheng	MP4a-3
Shin, Seokjoo	MA8b1-2	Suo, Yuanming	MA6b-3
Shin, Seokjoo	TA8b3-3	Suppappola, Seth	TA8a4-5
Shinn-Cunningham, Barbara	MA2b-1	Surana, Amit	TA8a4-7
Shinotsuka, Marie	TA8b3-4	Suresh, Vikram	TA7a-1
Shirazi, Mojtaba	TP8a2-7	Swamy, M.N.S.	TP5a-2
Shynk, John J.	MP8a1-6	Swärd, Johan	TA8b4-4
Sidiropoulos, Nicholas	MP1b-1	Swärd, Johan	TA8b4-8
Sidiropoulos, Nicholas	TA8a1-8	Swartzlander, Earl	TA8b2-1
Silva, Vitor	MP8a4-2	Swartzlander, Earl	TA8b2-2
Simonetto, Andrea	WA6b-2	Swartzlander, Earl	TA8b2-5
Singer, Andrew	MA3b-4	Swenson, Brian	TP1b-2
Singer, Andrew	TP8b1-4	Swindlehurst, A. Lee	TA1a-2
Singer, Andrew	TP8b4-6	Swindlehurst, Lee	MP3b-1
Singh, Aarti	MP3a-3	Tajer, Ali	MP1a-4
Singh, Sarabjot	WA1a-1	Talwar, Shilpa	TP5b-1
Sinno, Zeina	MP5b-1	Tanan, Subhash	MP8a5-1
Skadron, Kevin	MA5b-1	Tanchuk, Oleg	MA6b-2
Skeppstedt, Jonas	TP7a-1	Tandon, Ravi	TP8a1-4
Sklivanitis, George	TP8a1-6	Tang, Gongguo	MP3a-1
Skoglund, Mikael	TP8a1-1	Tang, Ming-Fu	WA1b-2
Slavakis, Konstantinos	MA1b-3	Taori, Rakesh	WA1a-2
Slavakis, Konstantinos	TA1b-3	Tarango, Joseph	MP7a-4
Smith, Shaden	MP1b-1	Tavares, Fernando M. L.	MP8a4-6
Song, Junxiao	TP3b-2	Teich, Juergen	MP7a-3
Soong, Anthony	WA1a-4	Teixeira, Andr'e	TA3a-1
Sørensen, Troels B.	MP8a4-6	Teke, Oguzhan	MP3b-3
Soury, Hamza	WA6a-4	Temlyakov, Vladimir	TP1a-3
Sousa, Ericles	MP7a-3	Tenneti, Srikanth Venkata	WA3a-3
Spagnolini, Umberto	TA8b1-8	Theelen, Bart	MP7a-2
Spagnolini, Umberto	TP8b2-6	Thiagarajan, Jayaraman	TP8b4-7
Spanias, Andreas	TP8b4-7	Thiele, Lars	TA8b1-2

NAME	SESSION	NAME	SESSION
Thomae, Reiner.....	TA8b4-5	Villalba, Julio.....	TA7a-4
Thomas, Robert.....	MP5a-1	Vook, Frederick.....	TA4a-4
Thomas, Robin.....	TA8b1-3	Vorobyov, Sergiy.....	TP8a1-3
Thomas, Timothy.....	TA4a-4	Vorobyov, Sergiy.....	WA4a-3
Thompson, Keith.....	MP8a3-8	Vosoughi, Aida.....	MP8a4-2
Tonelli, Oscar.....	MP8a4-6	Vosoughi, Azadeh.....	MA8b4-6
Tong, Lang.....	MP5a-1	Vosoughi, Azadeh.....	TP8a2-3
Toriyama, Yuta.....	WA7a-1	Vosoughi, Azadeh.....	TP8a2-7
Torlak, Murat.....	WA1b-1	Vosoughi, Azadeh.....	WA6b-3
Traganitis, Panagiotis.....	TA1b-3	Vouras, Peter.....	TP8a2-8
Tran, Trac.....	MA6b-3	Vuppala, Satyanarayana.....	TP8a4-2
Tran, Trac.....	TA6a-4	Wage, Kathleen.....	TP8b3-8
Tripathy, Abhijit.....	MP8a5-1	Wagner, Kevin.....	TA8a4-2
Trzasko, Joshua.....	MP8a2-3	Wai, Hoi To.....	TA3a-4
Tsakiris, Manolis.....	TP1a-1	Walter, Maxwell.....	TP7a-2
Tseng, Kai-Han.....	TA8a1-3	Walters, George.....	TA8b2-3
Tsianos, Konstantinos.....	TP1b-4	Wang, Gang.....	MA1b-4
Tsonev, Dobroslav.....	TP7b-2	Wang, Guohui.....	MP8a4-2
Tufvesson, Fredrik.....	MP4b-4	Wang, Guohui.....	WA7a-4
Tullberg, Hugo.....	TA4a-2	Wang, Rui.....	MP8a1-3
Tummala, Murali.....	WA5a-3	Wang, X.....	MA1b-3
Tyagi, Himanshu.....	MA4b-2	Wang, Xin.....	MA8b3-3
ul-Abdin, Zain.....	TP6b-4	Wang, Yiyin.....	TA8b3-4
Ulukus, Sennur.....	TP4b-3	Wang, Zhaohui.....	MP4a-3
Utschick, Wolfgang.....	MA8b2-2	Wang, Zhongfeng.....	MA7b-2
Utschick, Wolfgang.....	TA4b-3	Warty, Chirag.....	WA1b-3
Utschick, Wolfgang.....	TA8b1-1	Wassie, Dereje A.....	MP8a4-6
Vaccaro, Richard.....	MP8a3-6	Watanabe, Shun.....	MA4b-2
Vaidyanathan, P. P.....	WA3a-3	Weavers, Paul.....	MP8a2-3
Vaidyanathan, P. P.....	MA6b-4	Weeraddana, P. Chathuranga.....	TA3a-3
Vaidyanathan, P. P.....	MP8a3-5	Wei, Ruey-Yi.....	WA4b-3
Vaidyanathan, P. P.....	TP8b4-4	Wei-Ping, Zhu.....	TP8b2-3
Vakili, Sattar.....	WA3b-3	Weiss, Stephan.....	MP8a3-8
Valdivia, Nicolas.....	MA8b3-7	Wellner, Genevieve.....	MP8a2-7
Valkama, Mikko.....	TA8a1-5	Wen, Miaowen.....	MP4a-4
Van de Velde, Samuel.....	TA8b3-6	Wendt, Herwig.....	TA5b-4
Van De Ville, Dimitri.....	MP2b-4	Wenndt, Stanley.....	TA5a-4
Vandergheynst, Pierre.....	TA8a2-5	West, Derek.....	MA8b3-6
Varghese, Lenny.....	MA2b-1	Whipple, Gary.....	TP3a-4
Varghese, Tomy.....	MP8a2-5	Wijewardhana, Uditha.....	TA8b4-6
Varshney, Pramod.....	MA4b-1	Wilcher, John.....	MA8b3-5
Varshney, Pramod.....	TA4b-2	Willett, Rebecca.....	TA2a-3
Varshney, Pramod.....	TP6a-4	Wimalajeewa, Thakshila.....	MA4b-1
Vary, Peter.....	TP2b-2	Wisdom, Scott.....	TP5a-4
Vasic, Bane.....	MA7b-3	Wisdom, Scott.....	TP8b4-8
Vaughan, Andrew.....	MA8b4-3	Wittneben, Armin.....	MP8a4-8
Veeravalli, Venugopal.....	MP1a-1	Wittneben, Armin.....	TA8b1-5
Vehkaperä, Mikko.....	TP8a1-3	Wong, Lok.....	TP8b1-6
Venkateswaran, Vijay.....	WA7a-3	Wood, Sally.....	TA5b-2
Verde, Francesco.....	TA6b-1	Woods, Damien.....	TP2a-2
Vía, Javier.....	WA3a-4	Woods, Roger.....	TP7a-3
Vidal, Rene.....	TP1a-1	Woods, Roger.....	WA4a-1
Vilà-Valls, Jordi.....	MP6b-3	Wright, Stephen.....	MP8a3-1
Villafañe-Delgado, Marisel.....	MA8b4-5	Wu, Dalei.....	TP5a-2

NAME	SESSION	NAME	SESSION
Wu, Michael	MP8a4-1	Zekavat, Seyed	MP4a-3
Wu, Michael	WA7a-4	Zerguine, Azzedine	TA8a3-6
Wu, Nan	TP4a-4	Zerguine, Azzedine	TA8a4-4
Wu, Qisong	TA6a-3	Zerguine, Azzedine	TA8a4-6
Wu, Qisong	TA7b-4	Zhai, Yixuan	TA4b-4
Wu, Yiqun	WA2a-2	Zhang, Chuan	MA7b-2
Wu, Yonglin	MP8a2-7	Zhang, Huishuai	MA4b-4
Wu, Zhengwei	TP8a2-1	Zhang, Huishuai	MA4b-4
Xavier, Joao	TP1b-2	Zhang, Jianshu	MP1b-3
Xi, Chenguang	TP8a4-4	Zhang, Jianzhong (Charlie)	TA4a-1
Xi, Peng	TA8b4-3	Zhang, Jun	MA8b4-7
Xia, Xiang-Gen	TA3b-1	Zhang, Jun	TA1a-3
Xiao, Weimin	WA1a-4	Zhang, Jun	TP8b4-1
Xie, Le	TA6b-2	Zhang, Jun	TP8b4-2
Xu, Jingwei	MA7b-4	Zhang, Junshan	TA8b3-7
Xu, Luzhou	TA7b-3	Zhang, Mengyi	TP8b2-4
Xu, Luzhou	TA8b3-8	Zhang, Shan	WA2a-1
Xu, Tianyi	TA3b-1	Zhang, Shunqing	WA2a-2
Xu, Weiyu	MP1a-2	Zhang, Shuo	TA8a4-7
Xu, Weiyu	TA8a1-2	Zhang, Xiaoke	MA8b1-6
Xu, Weiyu	TA8b4-1	Zhang, Xinchen	TP8b2-5
Xu, Xiuqiang	WA2a-2	Zhang, Yimin	TA6a-3
Xu, Zhengyuan	MA8b1-6	Zhang, Yimin	TA7b-4
Xu, Zhengyuan	TP4a-2	Zhang, Yingchen	MP8a1-7
Xu, Zhengyuan	TP4a-3	Zhang, Yingchen	TA1a-3
Xu, Zhengyuan	TP8b1-2	Zhang, Yuan	MP5b-2
Xue, Feng	TP5b-1	Zhang, Yuanrui	WA4a-1
Yamada, Takeshi	TA5a-3	Zhao, Changhong	MP5a-4
Yang, Liuqing	MP4a-4	Zhao, Qing	TA4b-4
Yang, Liusha	TP1a-2	Zhao, Qing	TP8a1-2
Yang, Peng	MP6a-2	Zhao, Qing	WA3b-3
Yang, Shuo	MA8b3-3	Zhao, Ran	TA1b-1
Yang, Yang	TP8b2-4	Zhao, Yue	MP5a-2
Yen, Chia-Pang	WA1b-2	Zhao, Yue	TA6b-4
Yener, Aylin	TP4b-1	Zhou, G. Tong	TA8b3-4
Yin, Bei	MP8a4-1	Zhou, Sheng	WA2a-1
Yin, Bei	WA4a-1	Zhou, Shengli	MP4a-1
Yin, Haifan	MP4b-2	Zhou, Wentian	MP5b-3
You, Xiaohu	MA7b-2	Zhou, Yuan	WA3b-3
Young, Phillip	MP8a2-3	Zhou, Zhichong	TP8b4-2
Younis, Abdelhamid	TP7b-2	Zhu, Jinkang	WA2a-4
Yu, Hong	MP8a5-6	Zhu, Meifang	MP4b-4
Yuan, Bo	MP8a4-3	Zhu, Wei-Ping	MA8b2-1
Yuan, Bo	WA7a-2	Zhu, Wei-Ping	TP5a-2
Yuan, Haochen	TA8a2-3	Zoehmann, Erich	TA8a1-7
Yviquel, Hervé	WA7b-1	Zong, Pingping	TA8b1-7
Zaker, Nazanin	MA8b4-7	Zorzi, Michele	MA3b-1
Zaki, George	MP7a-1	Zou, Difan	TP4a-2
Zappone, Alessio	TA8a3-1		
Zariffa, Jose	MP2a-3		

Notes



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