

**FIFTIETH
ASILOMAR CONFERENCE ON
SIGNALS, SYSTEMS AND
COMPUTERS**



November 6–9, 2016
Asilomar Hotel and
Conference Grounds

Technical Co-sponsor



FIFTIETH ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS AND COMPUTERS

Technical Co-Sponsor

IEEE SIGNAL PROCESSING SOCIETY

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Welcome from the General Chairman

Prof. Phil Schniter
The Ohio State University, USA

Welcome the 50th Asilomar Conference on Signals, Systems, and Computers! I am honored to serve as the general chair for this special "50th anniversary" edition of the Conference. I first attended in 1997 and have returned almost every year since then. What keeps me coming back are the high-quality technical program, the relaxed and friendly atmosphere, and the natural beauty of Asilomar State Park.

This year, we come together to celebrate the remarkable impact that Asilomar has made, over the last 50 years, on the fields of signal processing, communications, circuits, and control. As we know, these fields are key to many of the core technologies that we use in our day-to-day lives.

For 50 years now, Asilomar has brought together top researchers from academia, industry, and government laboratories to advance the frontier of knowledge. As our lives become ever more enriched by technology, the importance of Asilomar will only grow in the years to come.

I am very excited by this year's technical program, which was brilliantly crafted by the Technical Program Chair, Gerald Matz, and his team: Jeff Andrews, Andreas Burg, Romain Couillet, Joakim Jaldén, Marco Lops, Antonia Papandreou-Suppapola, Marios Pattichis, Alejandro Ribeiro, and Wei Yu.

This year's program consists of 392 accepted papers, of which 208 were invited. Among these papers, 81 were submitted to the student paper contest, from which a list of 7 finalists were selected. On Sunday afternoon before the Welcome Reception, these finalists will present their work before a panel of judges organized by Scott Acton. We encourage everyone to attend this special session. The top 3 finishers will be announced before Tuesday's plenary lecture.

This year we are honored to have two plenary talks. The first plenary will be given on Sunday evening by Dr. John Treichler of Raytheon, Inc. John, who has been attending Asilomar since 1978, is famous for many contributions to signal processing and communications. I am very much looking forward to his lecture on "Fifty years of the Asilomar conference and its role in the flowering of DSP technology."

The second plenary will be given on Tuesday morning by Prof. Thomas Strohmer of the University of California at Davis. Thomas is an eminent researcher on the mathematics of signal processing, where he has made many lasting contributions. I am very excited about his lecture, entitled "You can have it all: Rapid, robust, and reliable solution of bilinear problems in signal processing."

I am thrilled and honored to serve as the General Chair of the 50th Asilomar Conference. I hope that you all enjoy the conference this year and discover everything that it has to offer.

Phil Schniter, Columbus, OH, June 2016.

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TRACK D: SIGNAL PROCESSING AND ADAPTIVE SYSTEMS

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Andreas Burg
EPFL, Switzerland

TRACK H: SPEECH IMAGE AND VIDEO PROCESSING

Marios Pattichis
University of New Mexico, USA

VICE TRACK CHAIR

Wei Yu
University of Toronto, Canada

2016 Asilomar Conference Session Schedule

Sunday Afternoon, November 6, 2016

- 3:00–7:00 PM Registration — Merrill Hall
3:00–5:15 PM Student Paper Contest — Heather Hall
5:30–6:30 PM 50th Anniversary Address, John Treichler —Nautilus Hall
6:30–9:00 PM Welcoming Reception — Merrill Hall

Monday Morning, November 7, 2016

- 7:30–9:00 AM Breakfast – Crocker Dining Hall
8:00 AM–6:00 PM Registration
9:45–10:15 AM Coffee Social

8:15–11:55 AM MORNING SESSIONS

- MA1 Towards 5G (Invited)
MA2a Spectrum Sharing Between Communication and Radar Systems (Invited)
MA2b Hybrid Analog/Digital Precoding (Invited)
MA3a Topology of Networks (Invited)
MA3b Smart Grid (Invited)
MA4a High Dimensional Inference, Random Matrices, and Applications (Invited)
MA4b Information Theory and Statistical Learning (Invited)
MA5a Sequential Signal Processing (Invited)
MA5b Multisensor Systems and Statistical Inference (Invited)
MA6 Signals and Systems in Visual Cultural Heritage (Invited)
MA7a Computer Arithmetic I
MA7b Neural Signal Processing
MA8a1 Efficient Hardware Implementation (Poster)
MA8a2 Error Correction and Network Coding (Poster)
MA8a3 Massive MIMO (Poster)
MA8a4 Neural Imaging (Poster)
MA8b1 Design Methodologies for Signal Processing Systems (Poster)
MA8b2 Sparse Methods and Compressive Sensing (Poster)
MA8b3 Speech and Image Analysis (Poster)

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

Monday Afternoon, November 7, 2016

1:30–5:10 PM AFTERNOON SESSIONS

- MP1a Algorithm and Hardware Aspects for 5G Wireless Systems (Invited)
MP1b Wireless Networks (Invited)
MP2a Interference Limited Next Generation Satellite Communications (SatnexIV) (Invited)
MP2b Signal Processing for Low-Resolution Sampling (Invited)
MP3a Communication and Coding for Distributed Computing (Invited)
MP3b Distributed Optimization (Invited)
MP4a Sparse Sampling for Data Analytics (Invited)
MP4b High-dimensional Inference (Invited)
MP5a Recent Advances in Nonstationary Signal Processing (Invited)
MP5b Recent Advances in Covariance Matrix Estimation for Array Processing (Invited)
MP6a Emerging Models and Methods in Image and Video Processing (Invited)
MP6b Speech Signal Processing and Health Applications (Invited)
MP7a Advances in Neuronal Modeling (Invited)
MP7b Advances in Neural Array Processing (Invited)
MP8a1 Beamforming and Array-based Estimation I (Poster)
MP8a2 Communication Networks (Poster)
MP8a3 Estimation and Learning Theory for Communications (Poster)
MP8a4 Model Selection, Source Separation and Classification (Poster)
MP8b1 Beamforming and Array-based Estimation II (Poster)
MP8b2 Communication Theory (Poster)
MP8b3 Implementations of DSP Kernels (Poster)

2016 Asilomar Conference Session Schedule (continued)

Monday Evening, November 7, 2016

6:30–9:30 PM 50th Anniversary Conference Banquet at the Monterey Bay Aquarium. Buses leave Asilomar grounds at 5:40 pm and 6:00 pm. See registration materials for details and fees.

Tuesday Morning, November 8, 2016

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

8:00 AM–5:00 PM Registration

8:15–9:45 AM TA1a — Conference Welcome and Plenary Session — Chapel

10:15–11:55 AM MORNING SESSIONS

TA1b Biological Communications (Invited)

TA2b Recent Advances in Massive MIMO (Invited)

TA3b Distributed Signal Processing

TA4b Sketching and Optimizing for Big Data (Invited)

TA5b Hardware Aspects for Compressive Sensing and Analog-to-Information Conversion (Invited)

TA6b Phase Retrieval for Imaging: Theory and Methods (Invited)

TA7b Biological Neural Systems (Invited)

TA8b1 Array Processing and Wireless Communications (Poster)

TA8b2 Communication System Theory (Poster)

TA8b3 MIMO and Multistatic Radars (Poster)

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

Tuesday Afternoon, November 8, 2016

1:30–5:35 PM AFTERNOON SESSIONS

TP1a Millimeter Wave Cellular Systems (Invited)

TP1b 5G Cellular Theory

TP2a Implementation of Decoders for Polar Codes (Invited)

TP2b Beamforming and Linear Processing

TP3a Multiagent Systems and Game Theory (Invited)

TP3b Graph Signal Processing (Invited)

TP4a Bilinear Inverse Problems (Invited)

TP4b Five Puzzles and Euclid's Bag of Tricks (Invited)

TP5a Detection over Very Large Datasets (Invited)

TP5b Source Localization and Sparse Array Design

TP6a Big Data Analytics for Image and Video Processing (Invited)

TP6b Optimization and Adaptive Methods

TP7a Signal Processing for Dynamic Functional Brain Network Analysis (Invited)

TP7b Implementation of Full-Duplex Radio Transceivers (Invited)

TP8a1 Network Data Analysis (Poster)

TP8a2 Relaying and Full Duplex Communications (Poster)

TP8a3 Subspaces, Covariances and Tensors (Poster)

TP8b1 Computer Arithmetic II (Poster)

TP8b2 Image and Video Sensor Processing and Communications (Poster)

TP8b3 Processing of Physiological Signals (Poster)

Tuesday Evening Open Evening — Enjoy the Monterey Peninsula

2016 Asilomar Conference Session Schedule (continued)

Wednesday Morning, November 9, 2016

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 AM–11:30 PM MORNING SESSIONS

WA1a Approximate Computing and Fault Tolerance (Invited)

WA1b Communication System Development

WA2a Physical Layer Security (Invited)

WA2b Massive MIMO in the Field

WA3a Cognitive Networking (Invited)

WA3b Signal Processing with Lattices (Invited)

WA4a Decentralized Optimization and Learning (Invited)

WA4b Modelling and Inference with Graphs

WA5 Tensor Signal Processing (Invited)

WA6a Emerging Sensing Technologies for Assisted Living (Invited)

WA6b Image and Video Quality Assessment

WA7 Cognitive Radar (Invited)

12:00–1:00 PM Lunch — This meal is not included in the registration.

Student Paper Contest

Heather - Sunday, November 6, 2016, 3:00–5:15 PM

Track A

“On the Impact of Blockage on the Throughput of Multi-tier Millimeter-Wave Networks”

Shuqiao Jia, David Ramirez, Rice University, United States; Lei Huang, Yi Wang, Huawei Technologies Co. Ltd., China; Behnaam Aazhang, Rice University, United States

“Fundamental Limits of Secure Device-to-Device Coded Caching”

Ahmed A. Zewail, Aylin Yener, Pennsylvania State University, United States

Track B

“Robust Precoding Design for Massive MISO Downlink”

Mostafa Medra, Timothy Davidson, McMaster University, Canada

Track C

“A Distributed Range-based Algorithm for Localization in Mobile Networks”

Sam Safavi, Usman Khan, Tufts University, United States

Track D

“Parallel Asynchronous Lock-free Algorithms for Nonconvex Big-Data Optimization”

Loris Cannelli, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, La Sapienza, Italy; Vyacheslav Kungurtsev, Czech Technical University in Prague, Czech Republic

Track E

“Two-Dimensional Sparse Arrays with Hole-Free Coarray and Reduced Mutual Coupling”

Chun-Lin Liu, Palghat Vaidyanathan, California Institute of Technology, United States

Track G

“Memristor Based Adder Circuit Design”

Nagaraja Revanna, Earl Swartzlander, University of Texas at Austin, United States

2016 Asilomar Conference Session Schedule

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

Sunday, November 6, 2016

PLENARY SESSION 5:30–6:30 PM

50th Anniversary Asilomar Distinguished Lecture

**Fifty years of the Asilomar conference, and its role in the
flowering of DSP technology**

John Treichler

Raytheon Applied Signal Technology, USA

Abstract

When this conference was first held at Asilomar in 1967, computers were rare beasts, control systems were mostly analog, digital signals processing was mostly theory, and Silicon Valley hadn't even been named yet [That happened in 1971]. This talk chronicles the incredible evolution of those technologies over the past 50 years and highlights many of the points where the research and practice brought together at this annual conference proved highly influential in the progress of the tightly related fields of communications, control, estimation, coding, and signal processing algorithm design. Little did the founders of this conference understand the impact that it, and the technology it helped develop, would have on the world.

Biography

John Treichler received his BA and MEE degrees from Rice University, Houston, TX in 1970 and his PhDEE from Stanford in 1977. He served as a line officer aboard destroyers in the US Navy from 1970 to 1974. In 1977 he joined ARGO Systems in Sunnyvale, CA and then helped found Applied Signal Technology, Inc. in 1984 after serving for a year as an Associate Professor of Electrical Engineering at Cornell University. Applied Signal Technology, now a mission area within the Space and Airborne Systems (SAS) business unit of Raytheon, Inc, designs and builds advanced signal processing equipment used by the United States government and its allies for foreign intelligence collection. For three years he was the president

of the Raytheon Applied Signal Technology business unit and continues as the unit's Chief Technical Officer. He was elected a Fellow in the Institute of Electrical and Electronics Engineers (IEEE) in 1991. He was awarded the IEEE Signal Processing Society's Technical Achievement Award in 2000 and its first Industrial Leader Award in 2016. He recently completed a three-year tour as the IEEE Signal Processing Society's Vice President for Membership and Awards and is on the board of directors of the IEEE Foundation. In 2016 he was elected a member of the National Academy of Engineering.

Tuesday, November 8, 2016

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

1. Welcome from the General Chair

Prof. Philip Schniter
The Ohio State University, USA

2. Session TA1a Distinguished Lecture for the 2016
Asilomar Conference

**You can have it all: Rapid, robust, and reliable solution of
bilinear problems in signal processing**

Thomas Strohmer
University of California, Davis, USA

Abstract

I will first describe how I once failed to catch a murderer (dubbed the “graveyard murderer” by the media), because I failed in solving a blind deconvolution problem. Here, blind deconvolution refers to the following problem: Assume we are given a function y which arises as the convolution of two unknown functions g and h . When and how is it possible to recover g and h from the knowledge of y ? Blind deconvolution pervades many areas of science and technology, including astronomy, medical imaging, optics, and communications engineering. Blind deconvolution is obviously ill-posed and even under additional assumptions this is a very difficult non-convex problem full of undesirable local minima. I will present the first numerically efficient blind deconvolution algorithm that comes with rigorous convergence guarantees. We will also

consider more general bilinear problems, such as the case where we are given a mixture of blind deconvolution problems. Here we need to correctly blindly deconvolve and separate (demix) multiple functions at the same time from just a single measured function. I will describe a powerful convex framework for the solution of this problem and discuss its importance for the future Internet-of-Things.

Biography

Thomas Strohmer is Professor of Mathematics at the University of California, Davis. His research interests are in applied harmonic analysis, numerical analysis, signal- and image processing, high-dimensional data analysis, and mathematics of information. He got his M.S. and Ph.D. in Mathematics in 1991 and 1994 respectively from the University of Vienna, Austria. He spent one year as Erwin-Schrodinger fellow at the Department of Statistics at Stanford University in 1997 before joining the University of California, Davis in 1998. His recent awards include the 2013 IEEE Signal Processing Society Best Paper Award and the 2014 SIAM Outstanding Paper Prize. Dr. Strohmer is on the editorial board of several journals. He also serves as consultant to industry in the areas of telecommunications, bioengineering, and signal- and image processing.

**Program of the
2016 Asilomar Conference on
Signals, Systems, and Computers**

**Technical Program Chairman
Prof. Gerald Matz
Vienna University of Technology**

Session MA1 Towards 5G (invited)

Co-Chairs: *Angel Lozano, UPF, Barcelona, Spain and Maxime Guillaud, Huawei Research, Paris, France*

- MA1-1 A Novel Alternative to Cloud-RAN for Throughput Densification: Coded Pilots and Fast User-Packet Scheduling at Remote Radio Heads 8:15 AM
Ozgun Y. Bursalioglu, Chenwei Wang, Haralabos Papadopoulos, DOCOMO Innovations Inc, United States; Giuseppe Caire, Technische Universität Berlin, Germany
- MA1-2 Integer-Forcing Analog-To-Digital Conversion for Massive MIMO Systems 8:40 AM
Luis G. Ordóñez, Iñaki Estella, Maxime Guillaud, Huawei Technologies, France
- MA1-3 Analytical Handle for ZF Reception in Distributed Massive MIMO 9:05 AM
Rajitha Senanayake, University of Melbourne, Australia; Angel Lozano, Universitat Pompeu Fabra, Spain; Peter Smith, Victoria University of Wellington, New Zealand; Jamie Evans, University of Melbourne, Australia
- MA1-4 The Impact of Beamforming and Coordination on Spectrum Pooling in MmWave Cellular Networks 9:30 AM
Hossein Shokri, KTH Royal Institute of Technology, Sweden; Federico Boccardi, Ofcom, United Kingdom; Elza Erkip, New York University, United States; Carlo Fischione, KTH Royal Institute of Technology, Sweden; Gabor Fodor, Ericsson, Sweden; Marios Kountouris, Huawei Technologies Co. Ltd., France; Petar Popovski, Aalborg University, Denmark; Michele Zorzi, University of Padova, Italy
- BREAK 9:55 AM
- MA1-5 Limited Feedback Based Double-Sided Full-Dimension MIMO for Mobile Backhauling 10:15 AM
Stefan Schwarz, Markus Rupp, Technische Universität Wien, Austria
- MA1-6 Downlink Massive MIMO Capacity Bound with Blind Gain Estimation at the Terminal 10:40 AM
Hien Quoc Ngo, Erik G. Larsson, Linköping University, Sweden
- MA1-7 Overloaded MU-MISO Transmission with Imperfect CSIT 11:05 AM
Enrico Piovano, Hamdi Joudeh, Bruno Clerckx, Imperial College London, United Kingdom
- MA1-8 Enforcing Coordination in Network MIMO with Unequal CSIT 11:30 AM
Paul de Kerret, Antonio Bazco, David Gesbert, EURECOM, France

Session MA2a Spectrum Sharing Between Communication and Radar Systems (invited)

Chair: *Athina Petropulu, Rutgers University*

- MA2a-1 Bargaining over Fair Performing Dual Radar 8:15 AM
and Communication Task
*Andrey Garnaev, Wade Trappe, Rutgers University,
WINLAB, United States; Athina Petropulu, Rutgers
University, United States*
- MA2a-2 Spectrum Sharing Between MIMO-MC 8:40 AM
Radars and Communication Systems
Bo Li, Athina Petropulu, Rutgers University, United States
- MA2a-3 Spectrum Sharing with Radars: Impact of 9:05 AM
Radars on Wi-Fi
*Hossein-Ali Safavi-Naeini, Sumit Roy, University of
Washington, United States*
- MA2a-4 Spectrum Maps for Cognition and 9:30 AM
Co-Existence of Communication and Radar
Systems
*Maarit Melvasalo, Visa Koivunen, Jarmo Lunden, Aalto
University, Finland*

Session MA2b Hybrid Analog/Digital Precoding (invited)

Co-Chairs: *Mats Bengtsson, KTH Royal Institute of Technology; Hadi
Ghauch, KTH Royal Institute of Technology and Taejoon Kim, City
University of Hong Kong*

- MA2b-1 Alternating Minimization for Hybrid 10:15 AM
Precoding in Multiuser OFDM mmWave Systems
*Xianghao Yu, Jun Zhang, Hong Kong University of
Science and Technology, Hong Kong SAR of China;
Khaled B. Letaief, Hong Kong University of Science
and Technology, Hong Kong and Hamad bin Khalifa
University, Qatar*
- MA2b-2 Subspace Estimation and Hybrid Precoding 10:40 AM
for Wideband Millimeter-Wave MIMO System
*Wai Ming Chan, Taejoon Kim, City University of Hong
Kong, Hong Kong SAR of China; Hadi Ghauch, Mats
Bengtsson, KTH Royal Institute of Technology, Sweden*
- MA2b-3 Multiuser Hybrid Precoding for Frequency 11:05 AM
Selective Millimeter Wave Systems
*Nuria Gonzalez-Prelcic, University of Vigo, Spain; Robert
W. Heath, University of Texas at Austin, United States*
- MA2b-4 Hybrid Precoding for Millimeter Wave 11:30 AM
Systems with a Constraint on User Electromagnetic
Radiation Exposure
*David Love, Miguel Castellanos, Purdue University,
United States; Bertrand Hochwald, University of Notre
Dame, United States*

Session MA3a Topology of Networks (invited)

Co-Chairs: *Harish Chintakunta, Florida Polytechnic University and Hamid Krim, North Carolina State University*

- MA3a-1 Influence of Topology in Information Flow in Social Networks 8:15 AM
Harish Chintakunta, Athanasios Gentimis, Florida Polytechnic University, United States
- MA3a-2 Persistent Homology Lower Bounds on Distances in the Space of Networks 8:40 AM
Weiyu Huang, Alejandro Ribeiro, University of Pennsylvania, United States
- MA3a-3 Node Dominance: Discovering Hypernym-Hyponym Relations for Building Taxonomies 9:05 AM
Hui Guan, North Carolina State University, United States; Harish Chintakunta, Florida Polytechnic University, United States; Hamid Krim, North Carolina State University, United States
- MA3a-4 Persistent Homology of Directed Networks 9:30 AM
Samir Chowdhury, Facundo Memoli, The Ohio State University, United States

Session MA3b Smart Grid (invited)

Chair: *Hao Zhu, University of Illinois at Urbana Champaign*

- MA3b-1 A Learning Based Method for Real Time Prediction of Cascading Failures 10:15 AM
Yue Zhao, Stony Brook University, United States; Jianshu Chen, Microsoft Research, United States
- MA3b-2 On the Solution of the Three-Phase Load Flow in Distribution Networks 10:40 AM
Mohammadhafez Bazrafshan, Nikolaos Gatsis, University of Texas at San Antonio, Iran
- MA3b-3 A Compressive Sensing Framework for the Analysis of Solar Photo-Voltaic Power 11:05 AM
Raksha Ramakrishna, Anna Scaglione, Bitu Analui, Arizona State University, United States
- MA3b-4 Power Network Topology Control for Mitigating the Effects of Geomagnetically Induced Currents 11:30 AM
Cecilia Klauber, Hao Zhu, University of Illinois, United States

Session MA4a High Dimensional Inference, Random Matrices, and Applications (invited)

Chair: *Matthew McKay, Hong Kong University of Science and Technology*

- MA4a-1 Free Component Analysis 8:15 AM
Raj Rao Nadakuditi, University of Michigan, United States

- MA4a-2 Random Matrix Improved Subspace Clustering 8:40 AM
Romain Couillet, CentraleSupélec, France; Abba Kammoun, King Abdullah University of Science and Technology, France
- MA4a-3 Inference of Principal Components of Noisy Correlation Matrices with Prior Information: from Statistical Physics to Applications to Proteins 9:05 AM
Remi Monasson, CNRS & Ecole Normale Supérieure, France
- MA4a-4 A Tailored Sparse PCA Method for Finding Vaccine Targets Against Hepatitis C 9:30 AM
Ahmed Abdul Quadeer, David Morales-Jimenez, Matthew McKay, Hong Kong University of Science and Technology, Hong Kong SAR of China

Session MA4b Information Theory and Statistical Learning (invited)

Chair: *Pablo Piantanida, CentraleSupélec*

- MA4b-1 Information-Theoretic Analysis of Stability and Bias of Learning Algorithms 10:15 AM
Maxim Raginsky, University of Illinois at Urbana-Champaign, United States
- MA4b-2 Estimation from Pairwise Comparisons: Statistical and Computational Aspects 10:40 AM
Nihar Shah, University of California, Berkeley, United States; Sivaraman Balakrishnan, Carnegie Mellon University, United States; Martin Wainwright, University of California, Berkeley, United States
- MA4b-3 Beyond Maximum Likelihood: Boosting the Chow-Liu Algorithm for Large Alphabets 11:05 AM
Jiantao Jiao, Yanjun Han, Tsachy Weissman, Stanford University, United States
- MA4b-4 Adaptive Sequential Learning 11:30 AM
Craig Wilson, Google, Inc., United States; Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States

Session MA5a Sequential Signal Processing (invited)

Co-Chairs: *Venugopal Veeravalli, University of Illinois at Urbana-Champaign and George Moustakides, University of Patras*

- MA5a-1 On Parallel Sequential Change Detection Controlling False Discovery Rate 8:15 AM
Jie Chen, Wenyi Zhang, H. Vincent Poor, University of Science and Technology of China, China
- MA5a-2 Distributed Quickest Detection with Optional Observations at the Fusion Center 8:40 AM
Bo Jiang, Lifeng Lai, Worcester Polytechnic Institute, United States

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| MA5a-3 | How to Quickly Detect a Change While Sleeping (almost) All the Time
<i>Venkat Chandar, D.E. Shaw, United States; Aslan Tchamkerten, Télécom Paristech, France</i> | 9:05 AM |
| MA5a-4 | Dynamic Change-Point Detection using Correlation Networks
<i>Shanshan Cao, Yao Xie, Georgia Institute of Technology, United States; Yuxin Chen, Stanford University, United States</i> | 9:30 AM |

Session MA5b Multisensor Systems and Statistical Inference (invited)

Chair: *Visa Koivunen, Aalto University*

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| MA5b-1 | How to Capture a Stopping Time: the Independent Case
<i>George Moustakides, University of Patras, Greece</i> | 10:15 AM |
| MA5b-2 | Wideband Capon Beamforming with Pre-Steering
<i>Richard Kozick, Bucknell University, United States; Christian Coviello, University of Oxford, United Kingdom</i> | 10:40 AM |
| MA5b-3 | Sparsity-Promoting Bootstrap Method for Large-Scale Data
<i>Visa Koivunen, Emad Mozafari, Aalto University, Finland</i> | 11:05 AM |
| MA5b-4 | New Contributions to Estimation Theory with Applications in Wave Energy, IEEE 1588, Cybersecurity, MIMO Radar and the Internet of Things
<i>Qian He, University of Electronic Science and Technology, China; Jiangfan Zhang, Anand Guruswamy, Basel Alnajjab, Rick S. Blum, Lehigh University, United States</i> | 11:30 AM |

Session MA6 Signals and Systems in Visual Cultural Heritage (invited)

Co-Chairs: *Andy Klein, Department of Engineering and Design, and Rick Johnson, Department of Electrical and Computer Engineering, Cornell NYC Tech*

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| MA6-1 | Automated Classification of Pen Strokes in Van Gogh's Drawings
<i>Rosaleena Mohanty, University of Wisconsin-Madison, United States; William Sethares, University of Wisconsin-Madison and Rijksmuseum, United States; Teio Meedendorp, Louis van Tilborgh, Van Gogh Museum, Netherlands</i> | 8:15 AM |
| MA6-2 | Non-Negative Dictionary Learning for Paper Watermark Similarity
<i>David Picard, Thomas Henn, ETIS ENSEA/Université de Cergy-Pontoise/CNRS, France; Georg Dietz, papierstruktur.de, France</i> | 8:40 AM |

- MA6-3 Automated Chain Line Marking and Pattern Matching in Radiographs of Rembrandt's Prints 9:05 AM
Xuelie Xi, Cornell University, United States; Devin Conathan, University of Wisconsin, United States; Amanda House, Cornell University, United States; William Sethares, University of Wisconsin-Madison and Rijksmuseum, United States; C. Richard Johnson, Jr., Cornell University, United States
- MA6-4 Deep Learning Classification of Photographic Paper Based on Clustering by Domain Experts 9:30 AM
Andrea Frost, Western Washington University, United States; Sally Wood, Santa Clara University, United States; Paul Messier, Yale University, United States; David Palzer, Andrew G. Klein, Western Washington University, United States
- BREAK 9:55 AM
- MA6-5 Applying Measures of Texture Similarity to Wove Paper 10:15 AM
Patrice Abry, CNRS / ENS Lyon, France; Andrew G. Klein, Western Washington University, United States; Paul Messier, Yale University, United States; Margaret H. Ellis, Morgan Library & Museum, United States; William A. Sethares, University of Wisconsin, United States; David Picard, ENSEA, France; Yuanhao Zhai, David L. Neuhoff, University of Michigan, United States; Stephane Roux, ENS Lyon, France; Stephane Jaffard, Université Paris-Est - Créteil Val-de-Marne, France; Herwig Wendt, CNRS / University of Toulouse, France; C. Richard Johnson, Jr., Cornell University, United States
- MA6-6 Multispectral Imaging at the Interface of Cultural Heritage Research and Undergraduate Education 10:40 AM
Erich Uffelmann, Mallory Stephenson, Washington and Lee University, United States; John Delaney, Kathryn Dooley, National Gallery of Art (Washington, DC), United States
- MA6-7 Spatial-Spectral Representation for X-Ray Fluorescence Image Super-Resolution 11:05 AM
Qiqin Dai, Northwestern University, United States; Emeline Pouyet, Northwestern University / Art Institute of Chicago Center for Scientific Studies in the Arts, United States; Oliver Cossairt, Marc Walton, Aggelos Katsaggelos, Northwestern University, United States
- MA6-8 Automatic Registration and Mosaicking of Color, Infrared, and X-Radiograph Images of Old Master Paintings Along with Automated Thread Counting 11:30 AM
Damon Conover, John Delaney, National Gallery of Art; George Washington University, United States; Murray Loew, George Washington University, United States

Session MA7a Computer Arithmetic I

Chair: TBD

- MA7a-1 A Theoretical Analysis of Square versus Rectangular Component Multipliers in Recursive Multiplication 8:15 AM
Behrooz Parhami, University of California, Santa Barbara, United States
- MA7a-2 Memristor Based Adder Circuit Design 8:40 AM
Nagaraja Revanna, Earl Swartzlander, University of Texas at Austin, United States
- MA7a-3 Synthesis of Correlated Bit Streams for Stochastic Computing 9:05 AM
Megha Parhi, Yin Liu, Marc D. Riedel, Keshab K. Parhi, University of Minnesota, United States
- MA7a-4 A Fully Serial-In Parallel-Out Digit-Level Finite Field Multiplier in F_2^m using Redundant Representation 9:30 AM
Parham Hosseinzadeh Namin, Roberto Muscedere, Majid Ahmadi, University of Windsor, Canada

Session MA7b Neural Signal Processing

Chair: TBD

- MA7b-1 Efficiency of Estimators in Fluorescence Microscopy 10:15 AM
Amir Tahmasbi, Texas A&M University, United States; E. Sally Ward, Texas A&M Health Science Center, United States; Raimund Ober, Texas A&M University, United States
- MA7b-2 Detection of Protein Repeats using the Ramanujan Filter Bank 10:40 AM
Srikanth V. Tenneti, Vaidyanathan P.P., California Institute of Technology, United States
- MA7b-3 On Inferring Functional Connectivity with Directed Information in Neuronal Networks 11:05 AM
Zhiting Cai, Rice University, United States; Curtis Neveu, John Byrne, University of Texas Health Science Center at Houston, United States; Behnaam Aazhang, Rice University, United States
- MA7b-4 Seizure Prediction using Long-Term Fragmented Intracranial Canine and Human EEG Recordings 11:30 AM
Zisheng Zhang, Keshab Parhi, University of Minnesota, United States

Session MA8a1 Efficient Hardware Implementation

Chair: TBD

8:15 AM–9:55 AM

- MA8a1-1 Cost-Performance Tradeoffs in Unreliable Computation Architectures
Mehmet Donmez, Maxim Raginsky, Andrew Singer, Lav Varshney, University of Illinois at Urbana Champaign, United States

- MA8a1-2 Baseband Volterra Filters with Even-Order Terms: Theoretical Foundation and Practical Implications
Harald Enzinger, Karl Freiberger, Gernot Kubin, Graz University of Technology, Austria; Christian Vogel, FH Joanneum - University of Applied Sciences, Austria
- MA8a1-3 Fast Time-Domain Volterra Filtering
Harald Enzinger, Karl Freiberger, Gernot Kubin, Graz University of Technology, Austria; Christian Vogel, FH Joanneum - University of Applied Sciences, Austria
- MA8a1-4 Hardware Implementation of a Series of Transform Matrices Based on Discrete Hirschman Transform
Peng Xi, Victor Debrunner, Florida State University, United States

Session MA8a2 Error Correction and Network Coding

Chair: *TBD*

8:15 AM–9:55 AM

- MA8a2-1 Performance Analysis of LP Decoding for LDPC Codes in AWGN Channel
Hassan Tavakoli, Guilan University, Iran
- MA8a2-2 Spatially-Coupled LDPC Codes Optimized for 1-D Magnetic Recording Channels
Homa Esfahanizadeh, Ahmed Hareedy, Lara Dolecek, University of California, Los Angeles, United States
- MA8a2-3 On the Catastrophic Puncturing Patterns for Finite-Length Polar Codes
Song-Nam Hong, Ajou University, ; Dennis Hui, Ivana Maric, Ericsson Research, United States
- MA8a2-4 On Error Correction for Asynchronous Communication
Chen Yi, Joerg Kliever, New Jersey Institute of Technology, United States
- MA8a2-5 Linear Superposition Coding for the Asymmetric Gaussian MAC with Quantized Feedback
Stefan Farthofer, Gerald Matz, Vienna University of Technology, Austria
- MA8a2-6 Physical-Layer Network Coded QAM with Trellis Shaping for the Two-Way Relay Channel
Daniela Donati, Mark Flanagan, University College Dublin, Ireland
- MA8a2-7 Construction of Minimal Sets for Capacity- Approaching Variable-Length Constrained Sequence Codes
Congzhe Cao, Ivan Fair, University of Alberta, Canada

Session MA8a3 Massive MIMO

Chair: *TBD*

8:15 AM–9:55 AM

- MA8a3-1 Massive MIMO via Cooperative Users
Sha Hu, Fredrik Rusek, Ove Edfors, Lund University, Sweden

- MA8a3-2 Robust Precoding Design for Massive MISO Downlink
Mostafa Medra, Timothy Davidson, McMaster University, Canada
- MA8a3-3 Analysis of One-Bit Quantized ZF Precoding for Downlink Multiuser Massive MIMO
Amodh Kant Saxena, University of California, Irvine, United States; Inbar Fijalkow, ETIS / ENSEA - University Cergy-Pontoise - CNRS, France; Amine Mezghani, Lee Swindlehurst, University of California, Irvine, France
- MA8a3-4 Analysis and Evaluation of a Practical Downlink Multiuser MIMO Scheduler over LTE Advanced Massive MIMO Systems
Rob Arnott, NEC Telecom Modus, United States; Kengo Oketani, NEC Corporation, United States; Narayan Prasad, Sampath Rangarajan, NEC Laboratories America, United States; Patricia Wells, NEC Telecom Modus, United States
- MA8a3-5 Grassmannian Training for Massive MIMO Cellular Networks
Yonghee Han, Jungwoo Lee, Seoul National University, Republic of Korea
- MA8a3-6 Power Allocation for Downlink Path-Based Precoding in Multiuser FDD Massive MIMO Systems Without CSI Feedback
Chin-Wei Hsu, Ming-Fu Tang, Borching Su, National Taiwan University, Taiwan
- MA8a3-7 Performance of Cell-Free Massive MIMO Systems with MMSE and PCP Receivers
Elina Nayebi, University of California, San Diego, United States; Alexei Ashikhmin, Thomas L. Marzetta, Bell Laboratories, United States; Bhaskar D. Rao, University of California, San Diego, United States
- MA8a3-8 A Path Selection Algorithm for Sparse Massive MIMO Channels
Maliheh Soleimani, Mahmood Mazrouei-Sebdani, Witold A. Krzymien, University of Alberta, Canada; Jordan Melzer, TELUS Communications, Canada

Session MA8a4 Neural Imaging

Chair: *TBD*

8:15 AM–9:55 AM

- MA8a4-1 Detection of Diabetic Peripheral Neuropathy using Spatial-Temporal Analysis in Infrared Videos
Peter Soliz, Carla Agurto, Ana Edwards, Zyden Jarry, VisionQuest Biomedical LLC, United States; Janet Simon, Foot & Ankle Associates of New Mexico, United States; Mark Burge, University of New Mexico Health Sciences Center, United States

- MA8a4-2 Clustering Brain-Network-Connectivity States using Kernel Partial Correlations
Konstantinos Slavakis, Shiva Salsabilian, David Wack, Sarah Muldoon, Henry Baidoo-Williams, University at Buffalo, United States; Jean Vettel, US Army Research Laboratory, United States; Matt Cieslak, Scott Grafton, University of California, Santa Barbara, United States
- MA8a4-3 Automated Selection of Uniform Regions for CT Image Quality Detection
Maitham Naeemi, University of Washington - Bothell, United States; Adam Alessio, University of Washington, United States; Sohini Roychowdhury, University of Washington - Bothell, United States
- MA8a4-4 Big Data Spark Solution for Functional Magnetic Resonance Imaging
Saman Sarraf, Rotman Research Institute at Baycrest, University of Toronto, United States; Mehdi Ostadhashem, Rogers, United States

Session MA8b1 Design Methodologies for Signal Processing Systems

Chair: *TBD*

10:15 AM–11:55 AM

- MA8b1-1 A New Open-Source SIMDVector libm Fully Implemented with High-Level Scalar C
Christoph Lauter, Sorbonne Universités, UPMC Univ Paris 6, UMR 7606, LIP6, France
- MA8b1-2 Fast Digital Design Space Exploration with High-Level Synthesis: A Case Study with Approximate Conjugate Gradient Pursuit
Benjamin Knoop, Karthik Vinod, Sebastian Schmale, Dagmar Peters-Drolshagen, Steffen Paul, University of Bremen, Germany
- MA8b1-3 High-Level System Synthesis of Dataflow Programs for MPSoCs
Simone Casale Brunet, Endri Bezati, Marco Mattavelli, École polytechnique fédérale de Lausanne, Switzerland; Jorn Janneck, Lund University, Sweden
- MA8b1-4 Analyzing Streaming Application Performance on Processor Arrays
Jorn Janneck, Lund University, Sweden
- MA8b1-5 Trace-Based Manycore Partitioning of Stream-Processing Applications
Jorn Janneck, Lund University, Sweden; Michalska Malgorzata, Simone Casale-Brunet, Endri Bezati, Marco Mattavelli, École polytechnique fédérale de Lausanne, Switzerland

Session MA8b2 Sparse Methods and Compressive Sensing

Chair: *TBD*

10:15 AM–11:55 AM

- MA8b2-1 Time-Recursive Multi-Pitch Estimation using Group Sparse Recursive Least Squares
Filip Elvander, Johan Sward, Andreas Jakobsson, Lund University, Sweden
- MA8b2-2 Quantized Low-Rank Matrix Recovery with Erroneous Measurements: Application to Data Privacy in Power Grids
Meng Wang, Rensselaer Polytechnic Institute, United States
- MA8b2-3 Bayesian Method for Image Recovery from Block Compressive Sensing
Uditha Wijewardhana, Marian Codreanu, Matti Latva-aho, University of Oulu, Finland
- MA8b2-4 Stable Compressive Low Rank Toeplitz Covariance Estimation Without Regularization
Heng Qiao, Piya Pal, University of Maryland, United States
- MA8b2-5 Sparse Bayesian Learning Boosted by Partial Erroneous Support Knowledge
Mohammad Shekaramiz, Todd K. Moon, Jacob H. Gunther, Utah State University, United States
- MA8b2-6 Hyperparameter-Free Sparse Linear Regression of Grouped Variables
Ted Kronvall, Stefan Ingi Adalbjörnsson, Santhosh Nadig, Andreas Jakobsson, Lund University, Sweden
- MA8b2-7 One-Bit Compressive Sampling with Time-Varying Thresholds: Maximum Likelihood and the Cramer-Rao Bound
Christopher Gianelli, Luzhou Xu, Jian Li, University of Florida, United States; Petre Stoica, Uppsala University, Sweden

Session MA8b3 Speech and Image Analysis

Chair: *TBD*

10:15 AM–11:55 AM

- MA8b3-1 A Joint EMD and Teager-Kaiser Energy Approach Towards Normal and Nasal Speech Analysis
Chris De La Cruz, Balu Santhanam, University of New Mexico, United States
- MA8b3-2 Iris Recognition using Cross-Spectral Comparison
Patrick Brannen, Jennifer Webb, Delores Etter, Southern Methodist University, United States
- MA8b3-3 Efficient Facial Recognition using Vector Quantization of 2D DWT Features
Ahmed Aldhahab, Taif Al Obaidi, Wasfy B. Mikhael, University of Central Florida, United States

- MA8b3-4 An Efficient DCT template-based Object Detection Method using Phase Correlation
Markus Hörhan, Horst Eidenberger, Vienna University of Technology, Austria
- MA8b3-5 Transfer of Multimodal Emotion Features in Deep Belief Networks
Hiranmayi Ranganathan, Shayok Chakraborty, Panchanathan Sethuraman, Arizona State University, United States
- MA8b3-6 Direct Classification from Compressively Sensed Images via Deep Boltzmann Machine
Henry Braun, Pavan Turaga, Cihan Tepedelenlioglu, Andreas Spanias, Arizona State University, United States

Session MP1a Algorithm and Hardware Aspects for 5G Wireless Systems (invited)

Chair: *Christoph Studer, Cornell University*

- MP1a-1 Many-Antenna MU-MIMO Channel Measurements 1:30 PM
Clayton Shepard, Abeer Javed, Ryan Guerra, Jian Ding, Lin Zhong, Rice University, United States
- MP1a-2 Decentralized Data Detection for Massive MU-MIMO on a GPU Cluster 1:55 PM
Kaipeng Li, Rice University, United States; Rishi Sharan, Cornell University, United States; Yujun Chen, Joseph Cavallaro, Rice University, United States; Christoph Studer, Cornell University, United States
- MP1a-3 An Energy Efficiency Perspective on Massive MIMO Quantization 2:20 PM
Muris Sarajlic, Liang Liu, Ove Edfors, Lund University, Sweden
- MP1a-4 Limited Feedback in Multi-User MIMO System with Low Resolution ADCs 2:45 PM
Jianhua Mo, Robert Heath, University of Texas at Austin, United States

Session MP1b Wireless Networks (invited)

Chair: *Andrea Goldsmith, Stanford University, California*

- MP1b-1 From Niche to Renaissance: Why 5G will be the last G 3:30 PM
Mischa Dohler, Kings College London, United Kingdom; Ali Hossaini, Cinema Arts Network, United Kingdom; Prokar Dasgupta, NHS, United Kingdom; Peter Marshall, Ericsson, United Kingdom; Toktam Mahmoodi, Maria Lema, Kings College London, United Kingdom
- MP1b-2 CEAL: Research Challenges in Fog Networking 3:55 PM
Mung Chiang, Princeton University, United States
- MP1b-3 The Beam Alignment Problem in mmWave Wireless Networks 4:20 PM
Saeid Haghighatshoar, Giuseppe Caire, Technische Universität Berlin, Germany

MP1b-4 Staying Alive - Network Coding for Data Persistence in Volatile Networks 4:45 PM
Vitaly Abdrashitov, Muriel Medard, Massachusetts Institute of Technology, United States

Session MP2a Interference Limited Next Generation Satellite Communications (SatnexIV) (invited)

Chair: *Ana Perez-Neira, Universitat Politecnica de Catalunya - Centre Tecnologic de Telecomunicacions de Catalunya*

MP2a-1 User Selection for Multibeam Satellite Systems: A Stochastic Geometry Perspective. 1:30 PM
Mathini Sellathurai, Heriot Watt University, United Kingdom; Satyanarayana Vuppala, Tharm Ratnarajah, University of Edinburgh, United Kingdom

MP2a-2 Efficient Satellite Systems Based on Interference Management and Exploitation 1:55 PM
Alessandro Ugolini, University of Parma, Italy; Amina Piemontese, Chalmers University of Technology, Sweden; Alessandro Vanelli-Coralli, University of Bologna, Italy; Giulio Colavolpe, University of Parma, Italy

MP2a-3 Noma and Interference Limited Satellite Communications 2:20 PM
Ana Perez-Neira, Universitat Politecnica de Catalunya, Spain; Marius Caus, Miguel Angel Vazquez, Centre Tecnologic de Telecomunicacions de Catalunya, Spain

MP2a-4 Optimized Link Adaptation for DVB-S2x Precoded Waveforms Based on SNIR Estimation 2:45 PM
Stefano Andrenacci, Danilo Spano, University of Luxembourg, Luxembourg; Dimitrios Christopoulos, Newtec, Belgium; Symeon Chatzinotas, University of Luxembourg, Luxembourg; Jens Krause, SES, Luxembourg; Björn Ottersten, University of Luxembourg, Luxembourg

Session MP2b Signal Processing for Low-Resolution Sampling (invited)

Chair: *Robert Heath, The University of Texas at Austin*

MP2b-1 Spatial Coding Based on Minimum BER in 1-Bit Massive MIMO Systems 3:30 PM
Hela Jedda, Technische Universität München, Germany; Amine Mezghani, University of California, Irvine, United States; Jawad Munir, Fabian Steiner, Josef A. Nossek, Technische Universität München, Germany

MP2b-2 A Machine Learning Approach to Inverse Lithography 3:55 PM
Onkar Dabeer, Qualcomm Research, United States; Tapan Shah, GE Research, India

MP2b-3 Quantized Channel Estimation and Data Detection in Massive MU-MIMO-OFDM Systems 4:20 PM
Christoph Studer, Cornell University, Sweden; Giuseppe Durisi, Chalmers University, Sweden

- MP2b-4 Channel Estimation in Mixed Hybrid-Low Resolution MIMO Architectures for Millimeter Wave Communication 4:45 PM
Nuria Gonzalez-Prelcic, Universidade de Vigo, Spain; Cristian Rusu, University of Vigo, Spain; R Heath, University of Texas at Austin, United States

Session MP3a Communication and Coding for Distributed Computing (invited)

Chair: *Salman Avestimehr, USC, Los Angeles, California*

- MP3a-1 Coded Distributed Computing: Fundamental Limits and Practical Challenges 1:30 PM
Songze Li, Qian Yu, University of Southern California, United States; Mohammad-Ali Maddah-Ali, Bell Labs, Alcatel-Lucent, United States; Salman Avestimehr, University of Southern California, United States
- MP3a-2 Trade-Offs Between Asynchrony, Concurrency and Storage Cost in Consistent Distributed Storage Systems. 1:55 PM
Viveck Cadambe, Pennsylvania State University, United States
- MP3a-3 Codes Can Speed Up Large-Scale Distributed Computing 2:20 PM
Kangwook Lee, Maximilian Lam, Ramtin Pedarsani, Dimitris Papailiopoulos, Kannan Ramchandran, University of California, Berkeley, United States
- MP3a-4 Avoiding Coordination in Parallel Machine Learning 2:45 PM
Dimitris Papailiopoulos, University of California, Berkeley, United States

Session MP3b Distributed Optimization (invited)

Chair: *Qing Ling, University of Science and Technology China*

- MP3b-1 Distributed Proximal Gradient Methods for Constrained Consensus Optimization 3:30 PM
Necdet Serhat Aybat, Erfan Yazdandoost, Pennsylvania State University, United States
- MP3b-2 ESOM: Exact Second-Order Method for Consensus Optimization 3:55 PM
Aryan Mokhtari, University of Pennsylvania, United States; Wei Shi, University of Illinois at Urbana-Champaign, United States; Qing Ling, University of Science and Technology of China, China
- MP3b-3 Distributed Nonconvex Multiagent Optimization over Time-Varying Networks 4:20 PM
Ying Sun, Hong Kong University of Science and Technology, Hong Kong SAR of China; Gesualdo Scutari, Purdue University, United States; Daniel Palomar, Hong Kong University of Science and Technology, United States

- MP3b-4 Space-Time Scheduling for Green Data 4:45 PM
 Center Networks
Tianyi Chen, University of Minnesota, United States;
Antonio Marques, Rey Juan Carlos University, Spain;
Georgios Giannakis, University of Minnesota, United States

**Session MP4a Sparse Sampling for Data Analytics
 (invited)**

Chair: *Geert Leus, Delft University of Technology*

- MP4a-1 Solving Inverse Source Problems for Linear 1:30 PM
 PDEs using Sparse Sensor Measurements
*John Murray-Bruce, Pier Luigi Dragotti, Imperial College
 London, United Kingdom*
- MP4a-2 Rethinking Sketching as Sampling: Linear 1:55 PM
 Transforms of Graph Signals
*Fernando Gama, University of Pennsylvania, United
 States; Antonio García Marques, King Juan Carlos
 University, Spain; Gonzalo Mateos, University of
 Rochester, United States; Alejandro Ribeiro, University of
 Pennsylvania, United States*
- MP4a-3 Distributed Adaptive Learning of Signals 2:20 PM
 Defined over Graphs
*Paolo Di Lorenzo, Paolo Banelli, University of Perugia,
 Italy; Sergio Barbarossa, Stefania Sardellitti, Sapienza
 University of Rome, Italy*
- MP4a-4 Subsampling for Graph Signal Detection 2:45 PM
*Sundeep Prabhakar Chepuri, Geert Leus, Delft University
 of Technology, Netherlands*

**Session MP4b High-dimensional Inference
 (invited)**

Chair: *Galen Reeves, Duke University*

- MP4b-1 Dynamics of Stochastic Gradient Method for 3:30 PM
 Online Estimation
Chuang Wang, Yue Lu, Harvard University, United States
- MP4b-2 Fast and Robust Learning for Mixture of 3:55 PM
 Sparse Linear Models Using Codes
*Dong Yin, Ramtin Pedarsani, University of California,
 Berkeley, United States; Yudong Chen, Cornell University,
 United States; Kannan Ramchandran, University of
 California, Berkeley, United States*
- MP4b-3 A Conditional Central Limit Theorem for 4:20 PM
 Random Projections
Galen Reeves, Duke University, United States
- MP4b-4 Tensor Decompositions and Sparse 4:45 PM
 Log-Linear Models
James Johnrow, Stanford University, United States;
*Anirban Bhattacharya, Texas A&M University, United
 States; David Dunson, Duke University, United States*

Session MP5a Recent Advances in Nonstationary Signal Processing (invited)

Chair: *Antonio Napolitano, Università di Napoli*

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| MP5a-1 | Algorithms for Analysis of Signals with Time-Warped Cyclostationarity
<i>Antonio Napolitano, University of Napoli, Italy; William Gardner, University of California, Davis, United States</i> | 1:30 PM |
| MP5a-2 | The Sound of Silence: Recovering Signals from Time-Frequency Zeros
<i>Patrick Flandrin, CNRS & ENS de Lyon, France</i> | 1:55 PM |
| MP5a-3 | Nonstationary Signal Design for Coexisting Radar and Communications Systems
<i>John Kota, Antonia Papandreou-Suppappola, Arizona State University, United States; Garry Jacyna, MITRE Corporation, United States</i> | 2:20 PM |
| MP5a-4 | Benefits of Noncircular Statistics for Nonstationary Signals
<i>Scott Wisdom, Les Atlas, James Pitton, Greg Okopal, University of Washington, United States</i> | 2:45 PM |

Session MP5b Recent Advances in Covariance Matrix Estimation for Array Processing (invited)

Chair: *Frederic Pascal, Supelec*

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| MP5b-1 | Bounds for Estimating the Parameters of Low-Rank Compound-Gaussian Clutter and White Gaussian Noise
<i>Olivier Besson, ISAE-Supaéro, France</i> | 3:30 PM |
| MP5b-2 | Robust Rank Constrained Kronecker Covariance Matrix Estimation
<i>Arnaud Breloy, LEME, France; Ying Sun, Hong Kong University of Science and Technology, Hong Kong SAR of China; Guillaume Ginolhac, LISTIC, France; Daniel Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China</i> | 3:55 PM |
| MP5b-3 | Quaternion Structured Non-Paranormal Distributions
<i>Yonatan Woodbridge, Hebrew University of Jerusalem, Israel; Gal Elidan, Hebrew University of Jerusalem and Google Inc., Israel; Ami Wiesel, Hebrew University of Jerusalem, Israel</i> | 4:20 PM |
| MP5b-4 | New Properties for the Tyler's Covariance Matrix Estimator
<i>Gordana Draskovic, Frederic Pascal, CentraleSupelec, France</i> | 4:45 PM |

Session MP6a Emerging Models and Methods in Image and Video Processing (invited)

Chair: *Balasubramaniam Santhanam, Department of Electrical and Computer Engineering, The University of New Mexico, USA.*

- MP6a-1 Sampled Efficient Full-Reference Image Quality Assessment Models 1:30 PM
Christos Bampis, Todd Goodall, Alan Bovik, University of Texas at Austin, United States
- MP6a-2 Feature Extraction and Image Recognition from Superpixels on an Automata Architecture 1:55 PM
Tiffany Ly, Rituparna Sarkar, Scott Acton, Kevin Skadron, University of Virginia, United States
- MP6a-3 Distributed Video Analysis for the Advancing Out of School Learning in Mathematics and Engineering Project 2:20 PM
Cody Eilar, Venkatesh Jatla, Marios Pattichis, Carlos LopezLeiva, Sylvia Celedon-Pattichis, University of New Mexico, United States
- MP6a-4 Fingerprint Feature Extraction and Classification using Multirate Frequency Transformations and Wideband AM-FM Energy Demodulation 2:45 PM
Wenjing Liu, Balu Santhanam, University of New Mexico, United States

Session MP6b Speech Signal Processing and Health Applications (invited)

Chair: *Visar Berisha, Speech and Hearing Science & Electrical, Computer, and Energy Engineering, Arizona State University*

- MP6b-1 Models for Objective Evaluation of Dysarthric Speech from Data Annotated by Multiple Listeners 3:30 PM
Ming Tu, Yishan Jiao, Visar Berisha, Julie Liss, Arizona State University, United States
- MP6b-2 Speech and Language Processing for Mental Health Research and Care 3:55 PM
Daniel Bone, James Gibson, Theodora Chaspari, Dogan Can, Shrikanth Narayanan, University of Southern California, United States
- MP6b-3 Characterization of the Relationship Between Semantic and Structural Language Features in Psychiatric Diagnosis 4:20 PM
Natália Bezerra Mota, Federal University of Rio Grande do Norte, Brazil; Facundo Carrillo, Diego Fernandez Slezak, Universidad de Buenos Aires, Argentina; Mauro Copelli, Federal University of Pernambuco, Brazil; Sidarta Ribeiro, Federal University of Rio Grande do Norte, Brazil

- MP6b-4 Detecting Mild Cognitive Impairment (MCI) 4:45 PM
from Unstructured Spontaneous Speech
*Meysam Asgari, Jeffrey Kaye, Hiroko Dodge, Oregon
Health and Science University, United States*

Session MP7a Advances in Neuronal Modeling (invited)

Chair: *Behtash Babadi, University of Maryland*

- MP7a-1 Tracking Epileptic Seizure Activity via 1:30 PM
Information Theoretic Graphs
*Andrea Goldsmith, Jeremy Kim, Yonathan Morin, Stanford
University, United States*
- MP7a-2 A Neural Model of High-Acuity Vision in the 1:55 PM
Presence of Fixational Eye Movements
*Alexander Anderson, Kavitha Ratnam, Austin Roorda,
Bruno Olshausen, University of California, Berkeley,
United States*
- MP7a-3 Towards Automating Sleep Scoring from 2:20 PM
Polysomnography Data
*Kristin M. Gunnarsdottir, Sridevi V. Sarma, Johns Hopkins
University, United States; Rachel M.E. Salas, Charlene E.
Gamaldo, Johns Hopkins Medicine, United States*
- MP7a-4 Probing the Functional Circuitry Underlying 2:45 PM
Auditory Attention via Dynamic Granger Causality
Analysis
*Alireza Sheikhattar, Sina Miran, Jonathan Fritz, Shihab
Shamma, Behtash Babadi, University of Maryland, United
States*

Session MP7b Advances in Neural Array Processing (invited)

Chair: *Jun (Jason) Zhang, University of Denver*

- MP7b-1 Analysis of Signals Recorded from Human 3:30 PM
Cerebral Cortex using Micro-Scale Electrode Arrays
During Articulate Movements and Epileptiform
Activity
*Kevin O'Neill, Denise Oswald, Arizona State University,
United States; Kari Ashmont, David Adelson, Phoenix
Children's Hospital, United States; Bradley Greger,
Arizona State University, United States*
- MP7b-2 Decoding Human Intent using a Wearable 3:55 PM
System and Multi-Modal Sensor Data
*Md Muztoba, Cemil Geyik, Umit Y. Ogras, Daniel W.
Bliss, Arizona State University, United States*
- MP7b-3 Suppression of Neurostimulation Artifacts 4:20 PM
and Adaptive Clustering of Parkinson's Patients
Behavioral Tasks using EEG
*Alexander Maurer, Arizona State University, United
States; Sara Hanrahan, Joshua Nedrud, Adam Hebb,
Colorado Neurological Institute, United States; Antonia
Papandreou-Suppappola, Arizona State University, United
States*

- MP7b-4 Causality Analysis in Parkinson's Disease 4:45 PM
Patients during Behavior Tasks
Abdulaziz Almalaq, Jun Zhang, University of Denver, United States; Sara Hanrahan, Adam Hebb, Joshua Nedrud, Colorado Neurological Institute, United States

Session MP8a1 Beamforming and Array-based Estimation I

Chair: *TBD*

1:30 PM–3:10 PM

- MP8a1-1 Multipath Mitigation Techniques for Nonlinear Adaptive Beamforming
Peter Vouras, Naval Research Laboratory, United States
- MP8a1-2 Array Self Calibration using Multiple Data Sets
Benjamin Friedlander, University of California, Santa Cruz, United States
- MP8a1-3 Convex-Optimization based Geometric Beamforming for FD-MIMO Arrays
Stefan Schwarz, Technische Universität Wien, Austria; Tal Philofof, General Motors, Israel; Markus Rupp, Technische Universität Wien, Austria
- MP8a1-4 Reduced-Complexity Direction-of-Arrival Estimation for Large-Aperture Antenna Arrays Employing Spatial Ambiguities
Chung-Cheng Ho, Scott C. Douglas, Southern Methodist University, United States
- MP8a1-5 Constraint Pursuit Estimator for Covariance-Based Array Processing
Yassine Zniyed, L2S lab., France; Remy Boyer, University of Paris-Sud - L2S lab., France; Mohammed Nabil El Korso, University of Paris X - LEME, France; Sylvie Marcos, CNRS - L2S lab., France
- MP8a1-6 On Spatial Security Outage Probability Derivation of Exposure Region Based Beamforming with Randomly Located Eavesdroppers
Yuanrui Zhang, Youngwook Ko, Roger Woods, Queen's University Belfast, United Kingdom; Alan Marshall, University of Liverpool, United Kingdom; Joe Cavallaro, Kaipeng Li, Rice University, United States

Session MP8a2 Communication Networks

Chair: *TBD*

1:30 PM–3:10 PM

- MP8a2-1 Partial Interference Cancellation in Ultra-Dense Cellular Networks: Performance Analysis and Optimization
Italo Atzeni, Marios Kountouris, Huawei Technologies, France
- MP8a2-2 Leader Selection in Cooperative Network Based on MDL Subspace Algorithm for Cognitive Radio
Sander Ulp, Tõnu Trump, Tallinn University of Technology, Estonia

- MP8a2-3 Optimal De-Anonymization in Random Graphs with Community Structure
Efe Onaran, Siddharth Garg, Elza Erkip, New York University, United States
- MP8a2-4 Joint Optimization of Communication Scheduling and Online Power Allocation in Remote Estimation
Xiaobin Gao, Emrah Akyol, Tamer Basar, University of Illinois, Urbana-Champaign, United States
- MP8a2-5 Layered Caching for Heterogeneous Storage
Avik Sengupta, Virginia Tech, United States; Ravi Tandon, University of Arizona, United States; T. Charles Clancy, Virginia Tech, United States
- MP8a2-6 Energy-Efficient Random Sleep Protocol based on Distributed Coding for Sensor-to-Vehicle Communications
Yuki Goto, Shun Ogata, Koji Ishibashi, University of Electro-Communications, Japan
- MP8a2-7 Long-Term Power Allocation for Multi-Channel Device-to-Device Communication Based on Limited Feedback Information
Ruhallah AliHemmati, Ben Liang, University of Toronto, Canada; Min Dong, University of Ontario Institute of Technology, Canada; Gary Boudreau, S. Hossein Seyedmehdi, Ericsson Canada, Canada
- MP8a2-8 Decentralized Coded Caching with Distinct Cache Capacities
Mohammad Mohammadi Amiri, Qianqian Yang, Deniz Gunduz, Imperial College London, United Kingdom

Session MP8a3 Estimation and Learning Theory for Communications

Chair: *TBD*

1:30 PM–3:10 PM

- MP8a3-1 On the Log-Likelihood Ratio Evaluation of CWCU Linear and Widely Linear MMSE Data Estimators
Oliver Lang, Mario Huemer, Johannes Kepler University, Austria; Christian Hofbauer, Linz Center of Mechatronics GmbH, Austria
- MP8a3-2 Improved SNR-based Estimation of the Attainable Net-Data-Rates in Vectoring VDSL2
Driton Statovci, Martin Wolkerstorfer, Sanda Drakulic, Technische Universität Wien, Austria
- MP8a3-3 Effects of Channel Environment on Timing Advance for Mobile Device Positioning in Long-Term Evolution Networks
Allison Hunt, Alex DeGabriele, John Roth, Justin A. Blanco, T. Owens Walker III, Jeremy Martin, United States Naval Academy, United States
- MP8a3-4 Benchmarking of Learning Architectures for Digital Predistortion
Thomas Magesacher, Lund University, Sweden; Peter Singerl, Infineon Technologies AG, Austria

- MP8a3-5 Supervised Machine Learning for Signals Having RRC Shaped Pulses
Mohammad Bari, George Washington University, United States; Hussain Taher, University of Engineering & Technology Peshawar, Pakistan; Syed Saad Sherazi, University of Engineering & Technology Bannu, Pakistan; Milos Doroslovacki, George Washington University, United States
- MP8a3-6 Nonstationary Jammers Suppression Based on Parametric Sparse Reconstruction
Ben Wang, Harbin Engineering University, China; Yimin Zhang, Temple University, United States; Wei Wang, Harbin Engineering University, China
- MP8a3-7 Radio Transformer Networks: Attention Models for Learning to Synchronize in Wireless Systems
Timothy J O'Shea, Latha Pemula, Dhruv Batra, T. Charles Clancy, Virginia Tech, United States

Session MP8a4 Model Selection, Source Separation and Classification

Chair: *TBD*

1:30 PM–3:10 PM

- MP8a4-1 Cross-Validation Techniques for Determining the Number of Correlated Components Between Two Data Sets When the Number of Samples Is Very Small
Christian Lameiro, Peter J. Schreier, Universität Paderborn, Germany
- MP8a4-2 Model Selection for High-Dimensional Data
Arash Owrang, Magnus Jansson, KTH Royal Institute of Technology, Sweden
- MP8a4-3 Bootstrap-Based Detection of the Number of Signals Correlated Across Multiple Data Sets
Tanuj Hasija, Universität Paderborn, Germany; Yang Song, Nanyang Technological University, Singapore; Peter Schreier, Universität Paderborn, Germany; David Ramirez, University Carlos III of Madrid, Spain
- MP8a4-4 Demixing Sparse Signals from Nonlinear Observations
Mohammadreza Soltani, Chinmay Hegde, Iowa State University, United States
- MP8a4-5 Dictionary Driven Vehicle Classification
Jeff Druce, Stefano Gonella, Jarvis Haupt, University of Minnesota, United States
- MP8a4-6 Obfuscating Poisson & Gaussian Data Using a Rotation in the Complex Plane
Ruaridh Macdonald, Muriel Medard, Massachusetts Institute of Technology, United States

Session MP8b1 Beamforming and Array-based Estimation II

Chair: *TBD*

3:30 PM–5:10 PM

- MP8b1-1 The Advanced TOA Trilateration Algorithms with Performance Analysis
Sajina Pradhan, Seokjoo Shin, Goo-Rak Kwon, Jae-young Pyun, Suk-seung Hwang, Chosun University, Nepal
- MP8b1-2 Design and Implementation of a Three-layer Cognitive Radar Architecture
Stefan Brueggenwirth, Fraunhofer FHR, Germany
- MP8b1-3 Real-Time Underdetermined Source Separation for Low-Latency Speech Enhancement
Ryan Corey, Andrew Singer, University of Illinois at Urbana-Champaign, United States
- MP8b1-4 On the Resolution of Diversely Polarized Arrays
Benjamin Friedlander, University of California, Santa Cruz, United States
- MP8b1-5 Super-resolution Direction-of-Arrival Estimation Using a Coprime Sensor Array With the Min Processor
Yang Liu, John R. Buck, University of Massachusetts Dartmouth, United States
- MP8b1-6 Dynamic Formulation of Co-prime Array for DOA Estimation
Xiaomeng Wang, Xin Wang, Stony Brook University, United States
- MP8b1-7 Alternating Optimization Low-Rank Expansion Algorithm to Estimate a Linear Combination of Separable Filters to Approximate 2D Filter Banks
Paul Rodriguez, Pontifical Catholic University of Peru, Peru

Session MP8b2 Communication Theory

Chair: *TBD*

3:30 PM–5:10 PM

- MP8b2-1 Fundamental BER Performance Trade-off in Cooperative Cognitive Radio Systems with Random Number of Secondary Users
Ruo Chen Zeng, Cihan Tepedelenlioglu, Arizona State University, United States
- MP8b2-2 Performance of OFDM Systems with Adaptive DFT-Precoding
Yusaku Yamashita, Hideki Ochiai, Yokohama National University, Japan
- MP8b2-3 Physical Layer Security Analysis for Cooperative Communications with Full-Duplex Relaying under Nakagami-m Fading Model
Yohannes Jote Tolossa, Abreu Giuseppe, Jacobs University Bremen, Germany

- MP8b2-4 On Zero-Forcing Equalization for Short-Filtered Multicarrier Faster-than-Nyquist Signaling
Albert Abelló, Damien Roque, ISAE-Supaéro, France; Cyrille Siclet, Alexandre Marquet, GIPSA-lab, France
- MP8b2-5 Secret Communication on Z-Channel with Cooperative Receivers
Abdallah M.Fayed, Tamer Khattab, Qatar University, Qatar; Lifeng Lai, Worcester Polytechnic Institute, United States
- MP8b2-6 Joint Precoding and Transmit Antenna Selection for Spatial Modulation
Michael Carosino, James Ritcey, University of Washington, United States

Session MP8b3 Implementations of DSP Kernels

Chair: *TBD*

3:30 PM–5:10 PM

- MP8b3-1 Hardware Architecture for Positive Definite Matrix Inversion Based on LDL Decomposition and Back-Substitution
Carl Ingemarsson, Oscar Gustafsson, Linköping University, Sweden
- MP8b3-2 A Scalable Architecture for Massive MIMO Base Stations Using Distributed Processing
Erik Bertilsson, Oscar Gustafsson, Erik G. Larsson, Linköping University, Sweden
- MP8b3-3 Interpolated FIR Based Practically Perfect Reconstruction Filter Bank
Jorge Cadena, A.A. (Louis) Beex, Virginia Tech, United States
- MP8b3-4 Design of a Multi-Core Hardware Architecture for Consensus-based MIMO Detection Algorithms
Konstantin Tscherkaschin, Benjamin Knoop, Jochen Rust, Steffen Paul, University of Bremen, Germany
- MP8b3-5 Dynamically-Loaded Hardware Libraries (HLL) Technology for Audio Applications
Andrea Lomuscio, Angelo Esposito, Gian Carlo Cardarilli, Leonardo Di Carlo, University of Rome Tor Vergata, Italy; Alberto Nannarelli, Technical University of Denmark, Denmark; Marco Re, University of Rome Tor Vergata, Italy

Session TA1b Biological Communications (invited)

Co-Chairs: *Ubli Mitra, USC, Los Angeles, California and Nicolò Michelusi, Purdue University, Indiana*

- TA1b-1 Emergence of Preferential Attachment in Bacterial Colonies by Virtue of Information and Signaling 10:15 AM
Ahmed Alaa, Yingju Ma, Mihaela van der Schaar, University of California, Los Angeles, United States

- TA1b-2 Model and Analysis of Population Density Estimation via Quorum Sensing 10:40 AM
Nicolo Michelusi, Purdue University, United States; Urbashi Mitra, University of Southern California, United States
- TA1b-3 A Fundamental Approach to Communication using Individual Molecules 11:05 AM
Christopher Rose, Brown University, United States
- TA1b-4 Multicellular Information Relays 11:30 AM
Ilya Nemenman, Emory University, United States; Andrew Mugler, Purdue University, United States; Andre Levchenko, Yale University, United States; Tyler Smith, Emory University, United States; Sean Fancher, Purdue University, United States

Session TA2b Recent Advances in Massive MIMO (invited)

Chair: *Erik G. Larsson, Linkoping University*

- TA2b-1 Dual-regularized Precoding: A Robust Approach for D2D-Enabled Massive MIMO 10:15 AM
Junting Chen, Haifan Yin, Laura Cottatellucci, David Gesbert, EURECOM, France
- TA2b-2 FD-MIMO versus Massive MIMO Performance: What do the Data Say? 10:40 AM
Jose Flordelis, Fredrik Rusek, Fredrik Tufvesson, Ove Edfors, Lund University, Sweden; Erik G. Larsson, Linkoping University, Sweden
- TA2b-3 Base Station Cooperation in Massive MIMO Systems: Large System Analysis 11:05 AM
Luca Sanguinetti, University of Pisa, Italy; Emil Bjornson, Linkoping University, Sweden; Merouane Debbah, CentraleSupélec, France
- TA2b-4 Pilot Decontamination Through Compressive Wideband Channel Estimation 11:30 AM
Saeid Haghighatshoar, Giuseppe Caire, Technische Universität Berlin, Germany

Session TA3b Distributed Signal Processing

Chair: *TBD*

- TA3b-1 Doubly Partial-Diffusion LMS over Adaptive Networks 10:15 AM
Ibrahim El Khalil Harrane, Rémi Flamary, Cédric Richard, University Nice Sophia Antipolis, France
- TA3b-2 Decentralized Consensus Optimization with Asynchrony and Delay 10:40 AM
Tianyu Wu, Kun Yuan, University of California, Los Angeles, United States; Qing Ling, University of Science and Technology of China, China; Wotao Yin, Ali H. Sayed, University of California, Los Angeles, United States
- TA3b-3 Thermodynamic Limit of Interacting Particle Systems over Dynamical Networks 11:05 AM
Augusto Santos, Soumya Kar, José M. F. Moura, Carnegie Mellon University, United States; João Xavier, University of Lisbon, Portugal

TA3b-4 Distributed Dictionary Learning 11:30 AM
Amir Daneshmand, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, Italy

Session TA4b Sketching and Optimizing for Big Data (invited)

Co-Chairs: *Georgios Giannakis, University of Minnesota and Gonzalo Mateos, University of Rochester*

TA4b-1 Parallel Asynchronous Lock-free Algorithms 10:15 AM
for Nonconvex Big-Data Optimization
Loris Cannelli, Gesualdo Scutari, Purdue University, United States; Francisco Facchinei, University of Rome, La Sapienza, Italy; Vyacheslav Kungurtsev, Czech Technical University in Prague, Czech Republic

TA4b-2 Sketching for Numerical Linear Algebra and 10:40 AM
Recent Developments
David P. Woodruff, IBM Almaden Research Center, United States

TA4b-3 Large Scale Subspace Clustering Algorithms 11:05 AM
Chong You, Claire Donnat, Daniel Robinson, Rene Vidal, Johns Hopkins University, United States

TA4b-4 Randomized Approaches to Large-Scale 11:30 AM
Subspace Clustering
Panagiotis Traganitis, Georgios Giannakis, University of Minnesota, United States

Session TA5b Hardware Aspects for Compressive Sensing and Analog-to-Information Conversion (invited)

Chair: *Christoph Studer, Cornell University*

TA5b-1 Exploiting System Configurability Towards 10:15 AM
Dynamic Accuracy-Performance Trade-Offs in AIC
and CS Front-ends
Laura Isabel Galindez Olascoaga, Steven Lauwereins, Komail Badami, Juan-Carlos Pena, KU Leuven, Belgium; Rajesh Venkata, Marian Verhelst, KU Leuven and IMEC, Belgium

TA5b-2 Band-Pass Compressive Sampling As an 10:40 AM
Enabling Technology for Rapid Wideband RF
Spectrum Sensing
Rabia Tugce Yazicigil, Tanbir Haque, John Wright, Peter R. Kinget, Columbia University, United States

TA5b-3 Adaptive Compressive Sensing for 11:05 AM
Radio-Frequency Receivers
Michael Pelissier, CEA, LETI, MINATEC Campus & Cornell University, France; Christoph Studer, Cornell University, United States

TA5b-4 Compressed Sampling for Astrophysical 11:30 AM
Signal Processing
*Patrick Loumeau, Yosra Gargouri, Hervé Petit, Telecom
ParisTech Institut Mines-Telecom, France; Baptiste
Ceconi, Observatoire de Paris, France; Patricia
Desgreys, Telecom ParisTech Institut Mines-Telecom,
France*

Session TA6b Phase Retrieval for Imaging: Theory and Methods (invited)

Chair: *Daniel Weller, Charles L. Brown Department of Electrical and
Computer Engineering, University of Virginia*

TA6b-1 Nonconvex Phase Retrieval: From Theory to 10:15 AM
Physical Implementation
*Mahdi Soltanolkotabi, University of Southern California,
United States*

TA6b-2 Robust PhaseLift for Phase Retrieval under 10:40 AM
Corruptions
*Paul Hand, Rice University, United States; Thang Huynh,
New York University, United States*

TA6b-3 Solving Random Quadratic Systems of 11:05 AM
Equations Is Nearly As Easy As Solving Linear
Systems
*Yuxin Chen, Emmanuel Candes, Stanford University,
United States*

TA6b-4 Robust Phase Retrieval with Sparsity under 11:30 AM
Nonnegativity Constraints
Daniel Weller, University of Virginia, United States

Session TA7b Biological Neural Systems (invited)

Chair: *Francisco Solis, Arizona State University*

TA7b-1 A Pulse-Gated, Predictive Neural Circuit 10:15 AM
*Yuxiu Shao, Peking University, China; Andrew Sornborger,
University of California, Davis, United States; Louis Tao,
Peking University, China*

TA7b-2 A Multitaper, Causal Decomposition for 10:40 AM
Stochastic, Multivariate Time Series: Application to
High-Frequency Calcium Imaging Data
*Andrew Sornborger, University of California, Davis,
United States; James D Lauderdale, University of
Georgia, United States*

TA7b-3 The Neural Basis for Sleep Regulation - Data 11:05 AM
Assimilation from Animal to Model
*Fatemeh Bahari, Camila Tulyaganova, Myles Billard,
Kevin Alloway, Bruce Gluckman, Pennsylvania State
University, United States*

TA7b-4 Neuronal Network Models for Sensory 11:30 AM
Discrimination
*Mohammad Samavat, Genevieve Toutain, Sharon Crook,
Arizona State University, United States*

Session TA8b1 Array Processing and Wireless Communications

Chair: *TBD*

10:15 AM–11:55 AM

- TA8b1-1 An Exact Bayesian Detector for Multistatic Passive Radar
Stephen D. Howard, Songsri Sirianunpiboon, DST Group Australia, Australia; Douglas Cochran, Arizona State University, United States
- TA8b1-2 Compressive Direction-of-Arrival Estimation Off The Grid
Shermin Hamzehei, Marco Duarte, University of Massachusetts, United States
- TA8b1-3 Bandpass Signal Design for Passive Time Delay Estimation
Jeffrey Nanzer, Matthew Sharp, Johns Hopkins Applied Physics Laboratory, United States; Donald Brown, Worcester Polytechnic Institute, United States
- TA8b1-4 Estimation of the Ricean K-Factor from Noisy Complex Channel Coefficients
Xavier Leturc, Thales Communications and Security, France; Philippe Ciblat, Télécom Paristech, France; Christophe Le Martret, Thales Communications and Security, France
- TA8b1-5 A Novel Non-Linear Equalizer Structure for Single Carrier Wideband Communication
fredric harris, Xiaofei Chen, San Diego State University, United States; Elettra Venosa, SpaceMicro, United States

Session TA8b2 Communication System Theory

Chair: *TBD*

10:15 AM–11:55 AM

- TA8b2-1 From Dedicated Redundant Subcarriers to Distributed Redundancy in UW-OFDM
Christian Hofbauer, Linz Center of Mechatronics, Austria; Carl Böck, Mario Huemer, Johannes Kepler University, Austria
- TA8b2-2 Coordinated Medium Access in Wireless Industrial D2D Networks: Fast Handshake Procedures Based on Stable Matching Variants
Bernd Holfeld, Thomas Wirth, Fraunhofer Heinrich Hertz Institute, Germany
- TA8b2-3 A User Cooperative Beamforming Approach to PAPR Reduction in MIMO-OFDM Uplink
Antti Arvola, Antti Tölli, University of Oulu, Finland; David Gesbert, EURECOM, France
- TA8b2-4 Delay-Optimal Scheduling and Power Control for Instantaneous-Interference-Limited CRs
Ahmed Ewaisha, Cihan Tepedelenligolu, Arizona State University, United States

- TA8b2-5 Non-Orthogonal Multiple Access with Sub-Constellation Alignment
Sanjeewa Herath, Afshin Haghighat, InterDigital Communications, Inc., Canada
- TA8b2-6 On the Capacity of Diffusion-Based Molecular Timing Channels with Diversity
Nariman Farsad, Yonathan Murin, Milind Rao, Andrea Goldsmith, Stanford University, United States
- TA8b2-7 On Global Channel State Estimation and Dissemination in Ring Networks
Shahab Farazi, Donald Brown, Worcester Polytechnic Institute, United States; Andrew Klein, Western Washington University, United States

Session TA8b3 MIMO and Multistatic Radars

Chair: *TBD*

10:15 AM–11:55 AM

- TA8b3-1 Analyzing and Improving MIMO Radar Detection Performance in the Presence of Cybersecurity Attacks
Hao Chen, Boise State University, United States; Braham Himed, Air Force Research Laboratory, United States
- TA8b3-2 Direct Tracking of Multiple Targets in MIMO Radar
Phuoc Vu, Alexander Haimovich, New Jersey Institute of Technology, United States; Braham Himed, Air Force Research Lab (AFRL/RYMD), United States
- TA8b3-3 Super-Resolution in Position and Velocity Estimation for Short-Range mmWave Radar
Anant Gupta, Upamanyu Madhow, University of California, Santa Barbara, United States; Amin Arbabian, Stanford University, United States
- TA8b3-4 High Resolution Geolocation with a Multi-Static Radar
Benjamin Friedlander, University of California, Santa Cruz, United States
- TA8b3-5 Using WCP-OFDM Signals with Time-Frequency Localized Pulses for Radar Sensing
Damien Roque, Stephanie Bidon, University of Toulouse, ISAE-SUPAERO, France
- TA8b3-6 Canonical Correlations for Target Detection in a Passive Radar Network
Yuan Wang, Washington State University, United States; Louis Scharf, Colorado State University, United States; Ignacio Santamaria, University of Cantabria, Spain; Haonan Wang, Colorado State University, United States
- TA8b3-7 Compressive Radar Sensing via One-Bit Sampling with Time-Varying Thresholds
Jian Li, University of Florida, United States; Mohammad Mahdi Naghsh, Sayed Jala Zahabi, Mahmoud Modarres-Hashemi, Isfahan University of Technology, Iran

Session TP1a Millimeter Wave Cellular Systems (invited)

Co-Chairs: *Robert Heath, University of Texas at Austin and Nuria Gonzalez Prelcic, University of Vigo, Spain*

- TP1a-1 mmWave Overlaid 5G Heterogeneous Cellular Networks - From Central Resource Management to Distributed Edge Cloud 1:30 PM
Kei Sakaguchi, Tokyo Institute of Technology / Fraunhofer HHI, Germany; Gia Khanh Tran, Tokyo Institute of Technology, Japan; Thomas Haustein, Fraunhofer Heinrich Hertz Institute, Germany
- TP1a-2 On the Design and Performance of Initial Access in mmWave Cellular Networks 1:55 PM
Yingzhe Li, Jeffrey Andrews, Francois Baccelli, University of Texas at Austin, United States; Thomas Novlan, Charlie Zhang, Samsung Research America, United States
- TP1a-3 On the Feasibility of Interference Alignment in Ultra Dense Millimeter Wave Cellular Networks 2:20 PM
Jian Song, Thanh Tu Lam, Marco Di Renzo, Paris-Saclay University / CNRS, France
- TP1a-4 Performance Characteristics of 5G mmWave Wireless To-the-Home 2:45 PM
Frederick Vook, Eugene Visotsky, Timothy Thomas, Amitava Ghosh, Nokia Bell Labs, United States

Session TP1b 5G Cellular Theory

Chair: *Robert Heath, UT Austin*

- TP1b-1 5G New Radio and Ultra Low Latency Applications: A PHY Implementation Perspective 3:30 PM
Thomas Wirth, Bernd Holfeld, Matthias Mehlhose, Jens Pilz, Dennis Wieruch, Fraunhofer Heinrich Hertz Institute, Germany
- TP1b-2 Fundamental Limits of Secure Device-to-Device Coded Caching 3:55 PM
Ahmed A. Zewail, Aylin Yener, Pennsylvania State University, United States
- TP1b-3 On the Impact of Blockage on the Throughput of Multi-tier Millimeter-Wave Networks 4:20 PM
Shuqiao Jia, David Ramirez, Rice University, United States; Lei Huang, Yi Wang, Huawei Technologies Co. Ltd., China; Behnaam Aazhang, Rice University, United States
- TP1b-4 Spatial Channel Covariance Estimation for mmWave Hybrid MIMO Architecture 4:45 PM
Sungwoo Park, Robert Heath, University of Texas at Austin, United States
- TP1b-5 Joint User Association and Resource Allocation in Small Cells with Limited Backhaul Capacity 5:10 PM
Jong Gyu Jang, Woojin Park, Hyun Jong Yang, Ulsan National Institute of Science and Technology, Republic of Korea; Hye Gyung Jwa, Electronics and Telecommunications Research Institute, Republic of Korea

Session TP2a Implementation of Decoders for Polar Codes (invited)

Chair: *TBD*

- TP2a-1 Low Complexity SC Stack Polar Decoder 1:30 PM
Based on Segmented CRC Scheme
Yi Zhao, Chuan Zhang, Southeast University, China; Shunqing Zhang, Intel Labs, China; Xiaohu You, Southeast University, China
- TP2a-2 Low Memory Complexity Successive 1:55 PM
Cancellation Decoder for Very Long Polar Codes
Bertrand Le Gal, Camille Leroux, Christophe Jego, University of Bordeaux, France
- TP2a-3 A Multi-Gbps Unrolled Hardware List 2:20 PM
Decoder
Pascal Giard, McGill University, Canada; Alexios Balatsoukas-Stimming, Thomas Christoph Müller, Andreas Burg, École polytechnique fédérale de Lausanne, Switzerland; Claude Thibeault, École de technologie supérieure, Canada; Warren J. Gross, McGill University, Canada
- TP2a-4 Error Patterns in Belief Propagation Decoding 2:45 PM
of Polar Codes and Their Mitigation Methods
Shuanghong Sun, Sung-Gun Cho, Zhengya Zhang, University of Michigan, United States

Session TP2b Beamforming and Linear Processing

Chair: *TBD*

- TP2b-1 Max-Min Transmit Beamforming via Iterative 3:30 PM
Regularization
Ahmad Gharanjik, University of Luxembourg / KTH Royal Institute of Technology, Luxembourg; Bhavani Shankar, University of Luxembourg, Luxembourg; Mojtaba Soltanalian, University of Illinois at Chicago, United States Virgin Islands; Björn Ottersten, University of Luxembourg / KTH Royal Institute of Technology, Luxembourg
- TP2b-2 Two-Stage Downlink Beamforming in MISO 3:55 PM
Multicell Networks with Limited Backhaul
Signaling
Youjin Kim, Hyun Jong Yang, Ulsan National Institute of Science and Technology, Republic of Korea
- TP2b-3 A Class of Scalable Feedback Algorithms for 4:20 PM
Beam and Null-forming from Distributed Arrays
Sairam Goguri, Ben Peiffer, Raghu Mudumbai, Soura Dasgupta, University of Iowa, United States
- TP2b-4 Dirty Paper Coding versus Beamforming in 4:45 PM
Multi-user MIMO under OFDM
Ajay Mohanan, Arjun Nadh, Andrew Thangaraj, Radha Krishna Ganti, Indian Institute of Technology, Madras, India

- TP2b-5 Linear Detection Schemes for MIMO 5:10 PM
 UW-OFDM
*Sher Ali Cheema, Jianshu Zhang, Ilmenau University of
 Technology, Germany; Mario Huemer, Johannes Kepler
 University, Austria; Martin Haardt, Ilmenau University of
 Technology, Germany*

Session TP3a Multiagent Systems and Game Theory (invited)

Chair: *Ceyhun Eksin, Georgia Tech*

- TP3a-1 Strategic Communication in Multi-Agent 1:30 PM
 Systems
*Emrah Akyol, Cedric Langbort, Tamer Basar, University
 of Illinois at Urbana Champaign, United States*
- TP3a-2 A Decentralized Algorithm with Signaling for 1:55 PM
 Learning Nash Equilibria in Bilinear Graphical
 Games
*Ceyhun Eksin, Georgia Institute of Technology, United
 States; Jeff S. Shama, King Abdullah University of Science
 and Technology, Saudi Arabia*
- TP3a-3 Computationally Efficient Learning in 2:20 PM
 Large-Scale Games: Sampled Fictitious Play
 Revisited
*Brian Swenson, Soumya Kar, Carnegie Mellon
 University, United States; Joao Xavier, Instituto Superior
 Tecnico, Portugal*
- TP3a-4 Equivalence Between Dynamic Games and its 2:45 PM
 Effect on Equilibrium Characterization
*Dhruva Kartik, Ashutosh Nayyar, University of Southern
 California, United States*

Session TP3b Graph Signal Processing (invited)

Co-Chairs: *Mike Rabbat, McGill University and Antonio Ortega,
 University of Southern California*

- TP3b-1 Network Topology Identification from 3:30 PM
 Imperfect Spectral Templates
*Santiago Segarra, University of Pennsylvania, United
 States; Antonio Marques, King Juan Carlos University,
 Spain; Gonzalo Mateos, University of Rochester, United
 States; Alejandro Ribeiro, University of Pennsylvania,
 United States*
- TP3b-2 Models that Generate Approximately 3:55 PM
 Band-limited Graph Signals
*Takeshi Musgrave, Michael Rabbat, McGill University,
 Canada*
- TP3b-3 Representations for Localized Signals on 4:20 PM
 Graphs
*Rohan Varma, Siheng Chen, Jelena Kovacevic, Carnegie
 Mellon University, United States*
- TP3b-4 Graph Learning with Laplacian Constraints: 4:45 PM
 Modeling Attractive Gaussian Markov Random
 Fields
*Hilmi Enes Egilmez, Eduardo Pavez, Antonio Ortega,
 University of Southern California, United States*

TP3b-5 Discrete Uncertainty Principles on Graphs 5:10 PM
Oguzhan Teke, Palghat Vaidyanathan, California Institute of Technology, United States

Session TP4a Bilinear Inverse Problems (invited)

Chair: *Yuejie Chi, The Ohio State University*

TP4a-1 Simultaneous Blind Deconvolution and Blind Demixing via Convex Programming 1:30 PM
Shuyang Ling, Thomas Strohmer, University of California, Davis, United States

TP4a-2 Ambiguities of Convolutions with Application to Phase Retrieval Problems 1:55 PM
Philipp Walk, California Institute of Technology, United States; Peter Jung, Technische Universität Berlin, Germany; Goetz E. Pfander, Philipps-University Marburg, Germany

TP4a-3 Blind Deconvolution with Sparsity: Optimal Identifiability Conditions and Efficient Recovery 2:20 PM
Yanjun Li, University of Illinois at Urbana-Champaign, United States; Kiryung Lee, Georgia Institute of Technology, United States; Yoram Bresler, University of Illinois at Urbana-Champaign, United States

TP4a-4 Time-Varying Narrowband Channel Estimation: Exploiting Low-Rank and Sparsity Structures in Delay-Doppler Domain via Bilinear Representation 2:45 PM
Sajjad Beygi, Urbashi Mitra, University of Southern California, United States

Session TP4b Five Puzzles and Euclid's Bag of Tricks (invited)

Co-Chairs: *Ivan Dokmanić, Ecole Polytechnique Fédérale de Lausanne and Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne*

TP4b-1 Recovering Spatial Organization of Genomes from Hi-C Contact Maps: High-Dimensional Statistical Estimation and Optimization with Euclidean Distance Matrices 3:30 PM
Aleksandr Aravkin, University of Washington, United States; Stephen Becker, University of Colorado at Boulder, United States; Dmitriy Drusvyatskiy, University of Washington, United States; Aurelie Lozano, IBM T.J. Watson Research Center, United States

TP4b-2 Graph Rigidity, Unassigned Distance Geometry and the Nanostructure Problem 3:55 PM
Phillip Duxbury, Michigan State University, United States; Simon Billinge, Columbia University, United States

TP4b-3 Biologically Inspired Unsupervised Algorithms for Streaming Data Analysis 4:20 PM
Dmitri Chklovskii, Simons Center for Data Analysis, United States

- TP4b-4 Look, no beacons! Optimal all-in-one 4:45 PM
 EchoSLAM
Miranda Krekovic, Ivan Dokmanic, Martin Vetterli, École polytechnique fédérale de Lausanne, Switzerland
- TP4b-5 Eternity II Insoluble: Damn You, Monckton 5:10 PM
Jon Dattorro, Systems Optimization Laboratory, United States

Session TP5a Detection over Very Large Datasets (invited)

Co-Chairs: *Vincent H. Poor and Yingbin Liang*

- TP5a-1 Detection of Sparse Mixtures: the Finite 1:30 PM
 Alphabet Case
Jonathan Ligo, University of Illinois at Urbana-Champaign, United States; George Moustakides, University of Patras, Greece; Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States
- TP5a-2 Quickest Hub Discovery in Correlation 1:55 PM
 Graphs
Taposh Banerjee, Massachusetts Institute of Technology, United States; Alfred Hero, University of Michigan, Ann Arbor, United States
- TP5a-3 Quickest Combined Anomaly Detection and 2:20 PM
 Estimation in Networked Data
Javad Heydari, Ali Tajer, Rensselaer Polytechnic Institute, United States
- TP5a-4 Nonparametric Composite Outlier Detection 2:45 PM
Weiguang Wang, Yingbin Liang, Syracuse University, United States; H. Vincent Poor, Princeton University, United States

Session TP5b Source Localization and Sparse Array Design

Chair: *TBD*

- TP5b-1 An Ideal-Theoretic Criterion for Localization 3:30 PM
 of an Unknown Number of Sources
Matthew W. Morency, Delft University of Technology, Netherlands; Sergiy A. Vorobyov, Aalto University, Finland; Geert Leus, Delft University of Technology, Netherlands
- TP5b-2 Exact Localization of Correlated Sources 3:55 PM
 using 2D Harmonics Retrieval
Ali Koochakzadeh, Piya Pal, University of Maryland, College Park, United States
- TP5b-3 Two-Dimensional Sparse Arrays with 4:20 PM
 Hole-Free Coarray and Reduced Mutual Coupling
Chun-Lin Liu, Palghat Vaidyanathan, California Institute of Technology, United States
- TP5b-4 Multiple Source Detection Performance of 4:45 PM
 Linear Sparse Arrays
Yu Rong, Daniel Bliss, Arizona State University, United States

- TP5b-5 Gridless Super-Resolution Direction Finding 5:10 PM
 for Strictly Non-Circular Sources Based on Atomic
 Norm Minimization
*Jens Steinwandt, Florian Roemer, Ilmenau University
 of Technology, Germany; Christian Steffens, Technische
 Universität Darmstadt, Germany; Martin Haardt, Ilmenau
 University of Technology, Germany; Marius Pesavento,
 Technische Universität Darmstadt, Germany*

Session TP6a Big Data Analytics for Image and Video Processing (invited)

Chair: *Marios Pattichis, Department of Electrical and Computer
 Engineering, The University of New Mexico, USA.*

- TP6a-1 Food Image Analysis: the Big Data Problem 1:30 PM
 You Can Eat!
*Yu Wang, Chang Liu, Shaobo Fang, Fengqing Zhu,
 Purdue University, United States; Deborah Kerr, Curtin
 University, Australia; Carol Boushey, University of
 Hawaii, United States; Edward Delp, Purdue University,
 United States*
- TP6a-2 Automated Monitoring by Behavior 1:55 PM
 Classification of Healthcare Providers using Big
 Data Analysis
*Nasrin Sadeghzadehyazdi, Laura Barnes, Scott Acton,
 University of Virginia, United States*
- TP6a-3 Building a Living Atlas of the Earth in the 2:20 PM
 Cloud
*Daniela I. Moody, Steven P. Brumby, Michael S. Warren,
 Samuel W. Skillman, Ryan Keisler, Rick Chartrand, Tim
 Kelton, Mark Mathis, Descartes Labs, United States*
- TP6a-4 A Review of Big Data Technologies and 2:45 PM
 Challenges in Image and Video Analytics in
 Healthcare
*Andreas Panayides, University of New Mexico, United
 States; Constantinos Pattichis, University of Cyprus,
 Cyprus; Marios Pattichis, University of New Mexico,
 United States*

Session TP6b Optimization and Adaptive Methods

Chair: *TBD*

- TP6b-1 A New Formulation of Generalized 3:30 PM
 Approximate Message Passing
*Subrata Sarkar, Philip Schniter, The Ohio State University,
 United States; Alyson Fletcher, University of California,
 Los Angeles, United States; Sundeep Rangan, New York
 University, United States*
- TP6b-2 Mean-Reverting Portfolio Design via 3:55 PM
 Majorization-Minimization Method
*Ziping Zhao, Daniel P. Palomar, Hong Kong University of
 Science and Technology, Hong Kong SAR of China*

- TP6b-3 Online Kernel Dictionary Learning on a Budget 4:20 PM
Jeon Lee, University of Texas Southwestern Medical Center, United States; Seung-Jun Kim, University of Maryland, Baltimore County, United States
- TP6b-4 A New Strategy for Effective Learning in Adaptive Importance Sampling 4:45 PM
Monica Bugallo, Stony Brook University, United States; Victor Elvira, Universidad Carlos III de Madrid, Spain; Luca Martino, Universidad de Valencia, Spain
- TP6b-5 A Bayesian Framework for Robust Kalman Filtering Under Uncertain Noise Statistics 5:10 PM
Roozbeh Dehghannasiri, Texas A&M University, United States; Mohammad Shahrokh Esfahani, Stanford School of Medicine, United States; Edward Dougherty, Texas A&M University, United States

Session TP7a Signal Processing for Dynamic Functional Brain Network Analysis (invited)

Chair: *Seline Aviyente, Michigan State University*

- TP7a-1 Connectivity Dynamics from Wakefulness to Sleep 1:30 PM
Eswar Damaraju, Robyn Miller, Devon Hjelm, Vince Calhoun, Mind Research Network, United States
- TP7a-2 An EEG and fTCD based BCI for Control 1:55 PM
Matthew Sybeldon, Aya Khalaf, Ervin Sejdic, Murat Akcakaya, University of Pittsburgh, United States
- TP7a-3 Source-Informed Segmentation: Towards Capturing the Dynamics of Brain Functional Networks Through Eeg 2:20 PM
Ali Haddad, Laleh Najafzadeh, Rutgers University, United States
- TP7a-4 Functional Connectivity Metrics for Wavelet Clustering of rs-fMRI Data 2:45 PM
Alessio Medda, Georgia Tech Research Institute, United States; Jacob Billings, Emory University, United States; Shella Keilholz, Georgia Institute of Technology and Emory University, United States

Session TP7b Implementation of Full-Duplex Radio Transceivers (invited)

Co-Chairs: *Joseph Cavallaro, Rice University and Ashutosh Sabharwal, Rice University*

- TP7b-1 Advanced Architectures for Self-Interference Cancellation in Full-Duplex Radios: Algorithms and Measurements 3:30 PM
Dani Korpi, Mona Aghababaeetafreschi, Mauno Piiilä, Lauri Anttila, Mikko Valkama, Tampere University of Technology, Finland

- TP7b-2 Self-Interference Cancellation for Full-Duplex Wireless Communications 3:55 PM
Tho Le-Ngoc, Robert Morawski, Ahmed Masmoudi, McGill University, Canada
- TP7b-3 Real Time Adaptive RF and Digital Self-Interference Cancellation for Full-Duplex Transceivers 4:20 PM
Visa Tapio, Markku Juntti, Aarno Pärssinen, Kari Rikkinen, University of Oulu, Finland
- TP7b-4 Full-Duplex in a Hand-held Device - From Fundamental Physics to Complex Integrated Circuits, Systems and Networks: An Overview of the Columbia FlexICoN project 4:45 PM
Harish Krishnaswamy, Gil Zussman, Jin Zhou, Jelena Marasevic, Tolga Dinc, Negar Reiskarimian, Tingjun Chen, Columbia University, United States
- TP7b-5 Integrating Full-duplex Capabilities in Heterogeneous Spectrum Sharing 5:10 PM
Wessam Afifi, Marwan Krunz, Mohammed Hirzallah, University of Arizona, United States

Session TP8a1 Network Data Analysis

Chair: *TBD*

1:30 PM–3:10 PM

- TP8a1-1 A New Approach to Distributed Hypothesis Testing
Gil Katz, Pablo Piantanida, Merouane Debbah, CentraleSupélec, France
- TP8a1-2 Worst-case Robust Attacks by Limited Adversaries Against Electricity Markets
Mengheng Xue, Ali Tajer, Rensselaer Polytechnic Institute, United States
- TP8a1-3 Efficient and Cooperative Smart Grid Failure Control with Low Communication Overhead
Jose Cordova-Garcia, Xin Wang, Stony Brook University, United States
- TP8a1-4 A Distributed Range-Based Algorithm for Localization in Mobile Networks
Sam Safavi, Usman Khan, Tufts University, United States
- TP8a1-5 Random Matrix Improved Community Detection in Heterogeneous Networks
Hafiz Tiomoko Ali, Romain Couillet, CentraleSupélec, University of Paris-Saclay, France
- TP8a1-6 Distributed Learning over Multitask Networks with Linearly Related Tasks
Roula Nassif, Cédric Richard, André Ferrari, University of Nice-Sophia-Antipolis, France; Ali H. Sayed, University of California, Los Angeles, United States
- TP8a1-7 Distributed Linear Prediction of a Single Source
Kevin Wagner, Naval Research Laboratory, United States; Milos Doroslovacki, George Washington University, United States

- TP8a1-8 A Latent Variable Clustering Method for Wireless Sensor Networks
Vladislav Vasilev, Georgi Iliev, Vladimir Poulkov, Technical University of Sofia, Bulgaria; Alben Mihovska, Aalborg University, Denmark

Session TP8a2 Relaying and Full Duplex Communications

Chair: *TBD*

1:30 PM–3:10 PM

- TP8a2-1 Robust Message Recovery for Non-Cooperative Compute-And-Forward Relaying
Miruna Raceala-Motoc, Jan Schreck, Peter Jung, Slawomir Stanczak, Fraunhofer Heinrich Hertz Institute, Germany
- TP8a2-2 Performance Analysis for Multi-Source Multi-Relay Transmission over κ - μ Fading Channels
Shen Qian, Japan Advanced Institute of Science and Technology, Japan; Jiguang He, Markku Juntti, University of Oulu, Finland; Tad Matsumoto, Japan Advanced Institute of Science and Technology, Japan
- TP8a2-3 Randomized Space-Time Codes with Imperfect Channel Estimation
Behrouz Shayesteh, Birsen Sirkeci, San Jose State University, United States
- TP8a2-4 Joint Relay Beamforming and Receiver Processing for Multi-way Multi-antenna Relaying
Wen Li, Min Dong, University of Ontario Institute of Technology, Canada
- TP8a2-5 Spatial Half-duplex: Precoder Design and Experimental Evaluation
Niranjan M Gowda, Ashutosh Sabharwal, Rice University, United States
- TP8a2-6 Degrees of Freedom of Spatial Self-Interference Suppression for In-Band Full-Duplex with Inter-node Interference
Yujun Chen, Ashutosh Sabharwal, Rice University, United States
- TP8a2-7 On the Achievability of Interference Alignment for Full-Duplex Cellular Networks with Multiple Antennas
Wonjae Shin, Seoul National University, Republic of Korea; Jong-Bu Lim, Samsung Electronics, Republic of Korea; Hyun-Ho Choi, Hankyong National University, Republic of Korea; Jungwoo Lee, Seoul National University, Republic of Korea

Session TP8a3 Subspaces, Covariances and Tensors

Chair: *TBD*

1:30 PM–3:10 PM

- TP8a3-1 Covariance Estimation in Terms of Stokes Parameters with Application to Vector Sensor Imaging
Ryan Volz, Mary Knapp, Frank Lind, Frank Robey, Massachusetts Institute of Technology, United States
- TP8a3-2 Principal Subspace Estimation for Low-rank Toeplitz Covariance Matrices with Binary Sensing
Haoyu Fu, Yuejie Chi, The Ohio State University, United States
- TP8a3-3 Complexity and Search Space Reduction in Cyclic-by-Row PEVD Algorithms
Fraser Coutts, Jamie Corr, Keith Thompson, Stephan Weiss, University of Strathclyde, United Kingdom; Ian Proudler, Loughborough University, United Kingdom; John McWhirter, Cardiff University, United Kingdom
- TP8a3-4 Investigation of a Polynomial Matrix Generalised EVD for Multi-Channel Wiener Filtering
Jamie Corr, Jennifer Pestana, Stephan Weiss, University of Strathclyde, United Kingdom; Soydan Redif, European University of Lefke, Cyprus; Marc Moonen, KU Leuven, Belgium
- TP8a3-5 Multiscale Tensor Decomposition
Alp Ozdemir, Mark A. Iwen, Selin Aviyente, Michigan State University, United States
- TP8a3-6 Maximum Likelihood Identification of an Information Matrix Under Constraints in a Corresponding Graphical Model
Randy Paffenroth, Nan Li, Worcester Polytechnic Institute, United States; Louis Scharf, Colorado State University, United States; Myung Hee Lee, Weill Cornell Medical College, United States

Session TP8b1 Computer Arithmetic II

Chair: *TBD*

3:30 PM–5:35 PM

- TP8b1-1 Optimized Memristor-Based Ripple Carry Adders
Lauren Guckert, Earl Swartzlander, Jr., University of Texas at Austin, United States
- TP8b1-2 Computing Subtraction and Polynomial Computation using Unipolar Stochastic Logic
Yin Liu, Keshab Parhi, University of Minnesota, Twin Cities, United States
- TP8b1-3 Precise Digital Implementations of Hyperbolic Tanh and Sigmoid Function
Shaghayegh Gomar, Mitra Mirhassani, Majid Ahmadi, University of Windsor, Canada
- TP8b1-4 Optimized Multipartite Table Methods for Elementary Functions Computation
James Stine, Masoud Sadeghian, Oklahoma State University, United States

TP8b1-5 Radix-4 Energy Efficient Carry-Free Truncated Multiplier
Wen Yan, Beijing Institute of Technology, China; Milos Ercegovac, University of California, Los Angeles, United States

Session TP8b2 Image and Video Sensor Processing and Communications

Chair: *TBD*

3:30 PM–5:35 PM

TP8b2-1 Focal Plane Processing for HOG Detection with Bayer Pattern Sensors
Allen Rush, Sally Wood, Santa Clara University, United States

TP8b2-2 Performance of Maximum Likelihood Temperature/Emissivity Separation of Hyperspectral Images with Correlated Gaussian Downwelling Radiance
David Neal, Todd Moon, Jacob Gunther, Utah State University, United States; Gus Williams, Brigham Young University, United States

TP8b2-3 Spatially Scalable Video Broadcasting in Multiple Antenna Systems
Arash Vosoughi, LG Electronics, United States; Seok-Ho Chang, Dankook University, Republic of Korea; Sang-Hyo Kim, Sungkyunkwan University, Republic of Korea; Pamela Cosman, Laurence Milstein, University of California, San Diego, United States

Session TP8b3 Processing of Physiological Signals

Chair: *TBD*

3:30 PM–5:35 PM

TP8b3-1 Modeling the P300-based Brain-computer Interface as a Channel with Memory
Vaishakhi Mayya, Boyla Mainsah, Galen Reeves, Duke University, United States

TP8b3-2 The Addition of Adaptive Comb Filtering to Sequential Adaptive Processing for Fetal Electrocardiograms (ECGs)
Yuqing Dong, Jacob Kovarskiy, William Jenkins, Pennsylvania State University, United States

TP8b3-3 Fast Respiratory Rate Estimation from PPG Signal Using Sparse Signal Reconstruction Based on Orthogonal Matching Pursuit
Xiaorong Zhang, San Francisco State University, United States; Quan Ding, The Home Depot Techshed, United States

TP8b3-4 Modeling of Oxygen Saturation and Respiration for Sleep Apnea Detection
Sandeep Gutta, Qi Cheng, Oklahoma State University, United States

TP8b3-5 Do Retinal Ganglion Cells Project Natural Scenes to Their Principal Subspace?
Reza Abbasi-Asl, University of California, Berkeley, United States; Cengiz Pehlevan, Simons Foundation, United States; Bin Yu, University of California, Berkeley, United States; Dmitri B. Chklovskii, Simons Foundation, United States

Session WA1a Approximate Computing and Fault Tolerance (invited)

Co-Chairs: *Andrew Singer, University of Illinois at Urbana Champaign and Pulkit Grover, Carnegie Mellon University*

- WA1a-1 Approximate and Error-Tolerant Computing: 8:15 AM
From Shannon-Theory to Circuits
Pulkit Grover, Carnegie Mellon University, United States; Andrew Singer, University of Illinois at Urbana Champaign, United States
- WA1a-2 Energy Efficiency Limits in Approximate 8:40 AM
Computing: A Fundamental Physical Perspective
Neal Anderson, University of Massachusetts Amherst, United States
- WA1a-3 Flash Memories in High Radiation 9:05 AM
Environments: LDPC Decoder Study
Frederic Sala, Clayton Schoeny, Shahroze Kabir, University of California, Los Angeles, United States; Dariush Divsalar, NASA Jet Propulsion Laboratory, United States; Lara Dolecek, University of California, Los Angeles, United States
- WA1a-4 Analog Processing to Enable Scalable 9:30 AM
High-Throughput mm-Wave Wireless Fiber Systems
Mahmoud Sawaby, Stanford University, United States; Babak Mamandipour, Upamanyu Madhow, University of California, Santa Barbara, United States; Amin Arbabian, Stanford University, United States

Session WA1b Communication System Development

Chair: *TBD*

- WA1b-1 Maximizing Wireless Power Transfer using 10:15 AM
Distributed Beamforming
Sairam Goguri, University of Iowa, United States; Dennis Ogbe, Purdue University, United States; Raghuraman Mudumbai, University of Iowa, United States; David Love, Purdue University, United States; Soura Dasgupta, University of Iowa, United States; Patrick Bidigare, BBN Technologies, United States
- WA1b-2 Digitally Enhanced Inter-modulation 10:40 AM
Distortion Compensation in Wideband Spectrum Sensing
Han Yan, Danijela Cabric, University of California, Los Angeles, United States

WA1b-3 Hybrid Analog-Digital Transceiver Designs 11:05 AM
for Cognitive Radio Millimeter Wave Systems
*Christos G. Tsinos, Sina Maleki, Symeon Chatzinotas,
Bjorn Ottersten, University of Luxembourg, Luxembourg*

Session WA2a Physical Layer Security (invited)

Chair: *Rafael Schaefer, TU Berlin*

WA2a-1 Keyless Authentication over Noisy Channel 8:15 AM
*Wenwen Tu, Lifeng Lai, Worcester Polytechnic Institute,
United States*

WA2a-2 Secure Computation of Linear Functions over 8:40 AM
Linear Discrete Multiple-Access Wiretap Channels
*Mario Goldenbaum, Princeton University, United States;
Holger Boche, Technical University of Munich, Germany;
H. Vincent Poor, Princeton University, United States*

WA2a-3 Physical Layer Based Authentication Without 9:05 AM
Phase Detection
*Sarah Rumpel, Anne Wolf, Eduard A. Jorswieck,
Technische Universität Dresden, Germany*

WA2a-4 Private Authentication with Controllable 9:30 AM
Measurement
*Kittipong Kittichokechai, Rafael F. Schaefer, Giuseppe
Caire, Technische Universität Berlin, Germany*

Session WA2b Massive MIMO in the Field

Chair: *TBD*

WA2b-1 Massive MIMO Proof-of-Concept: 10:15 AM
Emulations and Hardware-in-the-Loop Field Trials
at 3.5 GHz
*Thomas Wirth, Lars Thiele, Martin Kurras, Matthias
Mehlhose, Thomas Haustein, Fraunhofer Heinrich Hertz
Institute, Germany*

WA2b-2 Directional Propagation Measurements and 10:40 AM
Modeling in an Urban Environment at 3.7 GHz
*Leszek Raschkowski, Stephan Jaeckel, Fabian Undi,
Lars Thiele, Wilhelm Keusgen, Fraunhofer Heinrich
Hertz Institute, Germany; Boonsarn Pitakdumrongkija,
Masayuki Ariyoshi, NEC Corporation, Japan*

WA2b-3 Massive MIMO Properties based on 11:05 AM
Measured Channels: Channel Hardening, User
Decorrelation and Channel Sparsity
*Alex Oliveras Martinez, Elisabeth De Carvalho, Jesper
Ødum Nielsen, Aalborg University, Denmark*

Session WA3a Cognitive Networking (invited)

Chair: *Tara Javidi, University of California, San Diego*

WA3a-1 On the Equivalence Between Information 8:15 AM
Acquisition-Utilization and Generalized Tracking
*Tara Javidi, University of California, San Diego, United
States*

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|--------|---|---------|
| WA3a-2 | Correlation-Aware Sensing in Active and Passive Modes for Source Localization
<i>Ali Koochakzadeh, Heng Qiao, Pia Pal, University of Maryland, College Park, United States</i> | 8:40 AM |
| WA3a-3 | Approximate K-Means++ in Sublinear Time
<i>Hamed Hassani, ETH, Switzerland</i> | 9:05 AM |
| WA3a-4 | A POMDP Approach for Active Collision Detection via Networked Sensors
<i>Daphney-Stavroula Zois, University of Illinois, Urbana Champaign, United States</i> | 9:30 AM |

Session WA3b Signal Processing with Lattices (invited)

Chair: *Vaughan Clarkson, University of Queensland*

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|--------|---|----------|
| WA3b-1 | Convolutional Lattices
<i>Joseph Boutros, Nicola Di Pietro, Texas A&M University at Qatar, Qatar; Fanny Jardel, Télécom Paristech, France</i> | 10:15 AM |
| WA3b-2 | Typical Sumsets of Lattice Points
<i>Jingge Zhu, Michael Gastpar, École polytechnique fédérale de Lausanne, Switzerland</i> | 10:40 AM |
| WA3b-3 | Lattice Parameter Estimation from Sparse, Noisy Measurements
<i>Vaughan Clarkson, University of Queensland, Australia; Robby McKilliam, Myriota Pty Ltd, Australia; Barry Quinn, Macquarie University, Australia</i> | 11:05 AM |

Session WA4a Decentralized Optimization and Learning (invited)

Co-Chairs: *Cédric Richard, Université de Nice Sophia-Antipolis and Pascal Bianchi, Telecom ParisTech*

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|--------|---|---------|
| WA4a-1 | Doubly Stochastic Algorithms for Large-Scale Optimization
<i>Alec Koppel, Aryan Mokhtari, Alejandro Ribeiro, University of Pennsylvania, United States</i> | 8:15 AM |
| WA4a-2 | On Hypothesis Testing in Networks
<i>Angelia Nedich, Alexander Olshevsky, Cesar Uribe, University of Illinois, United States</i> | 8:40 AM |
| WA4a-3 | Expander Graph and Communication-Efficient Decentralized Optimization
<i>Yat-Tin Chow, University of California, Los Angeles, United States; Wei Shi, University of Illinois at Urbana Champaign, United States; W Yin, University of California, Los Angeles, United States</i> | 9:05 AM |
| WA4a-4 | An Empirical Comparison of Multi-Agent Optimization Methods for Distributed Learning
<i>Mahmoud Assran, Michael Rabbat, McGill University, Canada</i> | 9:30 AM |

Session WA4b Modelling and Inference with Graphs

Chair: *TBD*

- WA4b-1 Semi-parametric Reconstruction of Signals over Graphs 10:15 AM
Vassilis N. Ioannidis, Daniel Romero, Georgios B. Giannakis, University of Minnesota, United States
- WA4b-2 Hierarchical Representations of Network Data with Optimal Distortion Bounds 10:40 AM
Zane Smith, Samir Chowdhury, Facundo Memoli, The Ohio State University, United States
- WA4b-3 Efficient Graph Signal Recovery over Big Networks 11:05 AM
Gabor Hannak, Peter Berger, Gerald Matz, Vienna University of Technology, Austria; Alexander Jung, Aalto University, Finland

Session WA5 Tensor Signal Processing (invited)

Chair: *Nicholas D. Sidiropoulos, University of Minnesota*

- WA5-1 First-Order Perturbation Analysis of Low-Rank Tensor Approximations Based on the Truncated HOSVD 8:15 AM
Emilio Rafael Balda, Sher Ali Cheema, Jens Steinwandt, Martin Haardt, Ilmenau University of Technology, Germany; Amir Weiss, Arie Yeredor, Tel-Aviv University, Israel
- WA5-2 Extension of the Semi-Algebraic Framework for Approximate CP Decompositions via Simultaneous Matrix Diagonalization to the Efficient Calculation of Coupled CP Decompositions 8:40 AM
Kristina Naskovska, Martin Haardt, Ilmenau University of Technology, Germany
- WA5-3 Tensorlab 3.0 – Numerical Optimization Strategies for Large-Scale (Constrained, Coupled) Matrix/Tensor Factorization 9:05 AM
Nico Vervliet, Otto Debals, Lieven De Lathauwer, KU Leuven, Belgium
- WA5-4 Inferring Directed Network Topologies via Tensor Factorization 9:30 AM
Yanning Shen, Brian Baingana, Georgios Giannakis, University of Minnesota, United States
- BREAK 9:55 AM
- WA5-5 Robust PCA via Tensor Outlier Pursuit 10:15 AM
Jineng Ren, Xingguo Li, University of Minnesota, United States; Jarvis Haupt, University of Minnesota, Twin Cities, United States
- WA5-6 Tensor Completion via Group-Sparse Regularization 10:40 AM
Bo Yang, Gang Wang, Nikos Sidiropoulos, University of Minnesota, United States

WA5-7 Coupled Graph Tensor Factorization 11:05 AM
Ahmed S. Zamzam, Vassilis Ioannidis, Nikos D. Sidiropoulos, University of Minnesota, United States

Session WA6a Emerging Sensing Technologies for Assisted Living (invited)

Co-Chairs: *Yimin D. Zhang, Temple University and Fauzia Ahmad, Villanova University*

WA6a-1 Continuous-Wave Sensors for Non-contact Physiological Monitoring and Human-Aware Localization 8:15 AM
Changzhi Li, Texas Tech University, United States

WA6a-2 Training-Free Sleep Behavior Monitoring using Smartphones 8:40 AM
Rui Wang, Dartmouth College, United States; Saeed Abdullah, Cornell University, United States; Fazlay Rabbi, Xiao Zeng, Mi Zhang, Michigan State University, United States

WA6a-3 Breathing Detection Based on the Topological Features of IR Sensor and Accelerometer Signals 9:05 AM
Fatih Erden, Atilim University, Turkey; Ahmet Enis Cetin, Bilkent University, Turkey

WA6a-4 Wideband Radar Based Fall Motion Detection for a Generic Elderly 9:30 AM
Baris Erol, Moeness Amin, Fauzia Ahmad, Villanova University, United States; Yimin Zhang, Temple University, United States

Session WA6b Image and Video Quality Assessment

Chair: *TBD*

WA6b-1 No-Reference Image Quality Assessment for High Dynamic Range Images 10:15 AM
Debarati Kundu, Deepti Ghadiyaram, Alan Bovik, Brian Evans, University of Texas at Austin, United States

WA6b-2 A Multi-Stage Temporal Pooling Mechanism for Video Quality Assessment 10:40 AM
Venkata Phani Kumar M, Sudipta Mahapatra, Indian Institute of Technology, Kharagpur, India

WA6b-3 Sparsity Based Stereoscopic Image Quality Assessment 11:05 AM
Sameeulla Khan, Sumohana Channappayya, Indian Institute of Technology, Hyderabad, India

Session WA7 Cognitive Radar (invited)

Co-Chairs: *Hugh Griffiths, University College London and Muralidhar Rangaswamy, Air Force Research Laboratory*

WA7-1 Semi-Cognitive Angle Estimation for Adaptive Array Radars 8:15 AM
Michal Meller, PIT-RADWAR S.A., Poland

- WA7-2 Challenge Problems in Cognitive Radar 8:40 AM
Hugh Griffiths, University College London, United Kingdom; Alex Charlish, Fraunhofer Institute for Communication, Information Processing and Ergonomics (FKIE), Germany; Nathan Goodman, University of Oklahoma, United States
- WA7-3 Joint Design of Waveform and Receive Filter 9:05 AM
for MIMO Radar using Parametric Programming
Bosung Kang, Omar Aldayel, Vishal Monga, Pennsylvania State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States
- WA7-4 Experimental Validation of Cognitive Radar 9:30 AM
Anticipation using Stochastic Control
Colin Horne, Matthew Ritchie, Hugh Griffiths, University College London, United Kingdom; Folker Hoffmann, Alex Charlish, Fraunhofer Institute for Communication, Information Processing and Ergonomics (FKIE), Germany
- BREAK 9:55 AM
- WA7-5 Learning Radar for Airborne Maritime 10:15 AM
Surveillance Applications
Myriam Nouvel, Stéphane Kemkemia, THALES Airborne Systems, France
- WA7-6 Cognitive Radar Testbed Development 10:40 AM
Roland Oechslin, armasuisse, Science and Technology, Switzerland; Graeme Smith, The Ohio State University, United States; Uwe Aulenbacher, Klaus Rech, Sebastian Hinrichsen, Ingenieurbüro für Sensorik und Signalverarbeitung, Germany; Kristine Bell, Metron, Inc., United States; Peter Wellig, armasuisse, Science and Technology, Switzerland
- WA7-7 Big Data Capon Beamforming: Random 11:05 AM
Matrix Theory Perspectives
Pawan Setlur, AFRL/WSRI, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

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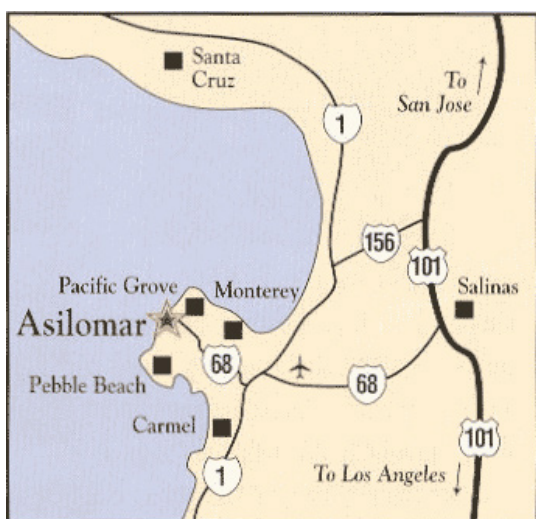
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Vidal, Rene	TA4b-3	Wolkerstorfer, Martin	MP8a3-2
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Visotsky, Eugene	TP1a-4	Wood, Sally	TP8b2-1
Vogel, Christian	MA8a1-2	Woodbridge, Yonatan	MP5b-3
Vogel, Christian	MA8a1-3	Woodruff, David P.	TA4b-2
Volz, Ryan	TP8a3-1	Woods, Roger	MP8a1-6
Vook, Frederick	TP1a-4	Wright, John	TA5b-2
Vorobyov, Sergiy A.	TP5b-1	Wu, Tianyu	TA3b-2
Vosoughi, Arash	TP8b2-3	Xavier, Joao	TP3a-3
Vouras, Peter	MP8a1-1	Xavier, João	TA3b-3
Vu, Phuoc	TA8b3-2	Xi, Peng	MA8a1-4
Vuppala, Satyanarayana	MP2a-1	Xi, Xuelie	MA6-3
Wack, David	MA8a4-2	Xie, Yao	MA5a-4
Wagner, Kevin	TP8a1-7	Xu, Luzhou	MA8b2-7
Wainwright, Martin	MA4b-2	Xue, Mengheng	TP8a1-2
Walk, Philipp	TP4a-2	Yamashita, Yusaku	MP8b2-2
Walker III, T. Owens	MP8a3-3	Yan, Han	WA1b-2
Walton, Marc	MA6-7	Yan, Wen	TP8b1-5
Wang, Ben	MP8a3-6	Yang, Bo	WA5-6
Wang, Chenwei	MA1-1	Yang, Hyun Jong	TP1b-5
Wang, Chuang	MP4b-1	Yang, Hyun Jong	TP2b-2
Wang, Gang	WA5-6	Yang, Qianqian	MP8a2-8
Wang, Haonan	TA8b3-6	Yazdandoost, Erfan	MP3b-1
Wang, Meng	MA8b2-2	Yazicigil, Rabia Tugce	TA5b-2
Wang, Rui	WA6a-2	Yener, Aylin	TP1b-2
Wang, Wei	MP8a3-6	Yeredor, Arie	WA5-1
Wang, Weiguang	TP5a-4	Yi, Chen	MA8a2-4
Wang, Xiaomeng	MP8b1-6	Yin, Dong	MP4b-2
Wang, Xin	MP8b1-6	Yin, Haifan	TA2b-1
Wang, Xin	TP8a1-3	Yin, W	WA4a-3
Wang, Yi	TP1b-3	Yin, Wotao	TA3b-2
Wang, Yu	TP6a-1	You, Chong	TA4b-3
Wang, Yuan	TA8b3-6	You, Xiaohu	TP2a-1
Ward, E. Sally	MA7b-1	Yu, Bin	TP8b3-5
Warren, Michael S.	TP6a-3	Yu, Qian	MP3a-1
Webb, Jennifer	MA8b3-2	Yu, Xianghao	MA2b-1
Weiss, Amir	WA5-1	Yuan, Kun	TA3b-2
Weiss, Stephan	TP8a3-3	Zahabi, Sayed Jala	TA8b3-7
Weiss, Stephan	TP8a3-4	Zamzam, Ahmed S.	WA5-7
Weissman, Tsachy	MA4b-3	Zeng, Ruochen	MP8b2-1

NAME	SESSION	NAME	SESSION
Zeng, Xiao	WA6a-2		
Zhai, Yuanhao	MA6-5		
Zhang, Charlie	TP1a-2		
Zhang, Chuan	TP2a-1		
Zhang, Jiangfan	MA5b-4		
Zhang, Jianshu	TP2b-5		
Zhang, Jun	MA2b-1		
Zhang, Jun	MP7b-4		
Zhang, Mi	WA6a-2		
Zhang, Shunqing	TP2a-1		
Zhang, Wenyi	MA5a-1		
Zhang, Xiaorong	TP8b3-3		
Zhang, Yimin	MP8a3-6		
Zhang, Yimin	WA6a-4		
Zhang, Yuanrui	MP8a1-6		
Zhang, Zhengya	TP2a-4		
Zhang, Zisheng	MA7b-4		
Zhao, Yi	TP2a-1		
Zhao, Yue	MA3b-1		
Zhao, Ziping	TP6b-2		
Zhong, Lin	MP1a-1		
Zhou, Jin	TP7b-4		
Zhu, Fengqing	TP6a-1		
Zhu, Hao	MA3b-4		
Zhu, Jingge	WA3b-2		
Zniyed, Yassine	MP8a1-5		
Zois, Daphney-Stavroula	WA3a-4		
Zorzi, Michele	MA1-4		
Zussman, Gil	TP7b-4		

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