Fifty-Second Asilomar Conference on Signals, Systems and Computers

October 29–31, 2018
Asilomar Hotel and
Conference Grounds

Technical Co-sponsor

IEEE
Signal Processing Society ®

FIFTY-SECOND ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS AND COMPUTERS

Technical Co-Sponsor

IEEE Signal Processing Society

CONFERENCE COMMITTEE

General Chair
Visa Koivunen
Signal Processing/ELEC
Aalto University
P.O. Box 15400
FIN-00076 Aalto, Finland
visa.koivunen@aalto.fi

Technical Program Chair
Martin Haardt
Ilmenau University of Technology
Communications Research Laboratory
Helmholtzplatz 2
P.O. Box 10 05 65
D-98684 Ilmenau, Germany
martin.haardt@tu-ilmenau.de

Conference Coordinator
Monique P. Fargues*
Department of Electrical & Computer Engineering
Naval Postgraduate School
Monterey, CA 93943
fargues@asilomarssc.org

Publications Chair
Michael B. Matthews
NorthWest Research Associates
301 Webster Street
Monterey, CA 93940
michael.b.matthews@ieee.org

Publicity Chair
Linda S. DeBrunner
Department of Electrical & Computer Engineering
Florida State University
Tallahassee, FL 32310-6046
Linda.debrunner@eng.fsu.edu

Finance Chair
John D. Roth*
Department of Electrical & Computer Engineering
Naval Postgraduate School
Monterey, CA 93943-5121
treasurer@asilomarssc.org

Electronic Media Chair
Marios Pattichis
Department of Electrical & Computer Engineering
MSC01 1100, 1
University of New Mexico
Albuquerque, NM 87131-0001
pattichi@unm.edu

Student Paper Contest Chair
Balu Santhanam
MSC01 1100, 1
University of New Mexico
Albuquerque, NM 87131-1070
bsanthan@unm.edu

*participating in his or her personal capacity

Welcome from the General Chairman

Prof. Visa Koivunen
Aalto University, Finland

Welcome to the 52nd Asilomar Conference on Signals, Systems, and Computers! I am honored to serve as the General Chair for this traditional conference. I first attended Asilomar in the mid-1990's as a post-doc, and I have returned almost every year since then. What keeps me coming back is the high-quality technical program, the friendly atmosphere, and the outdoor activities in the Asilomar beaches and parks. Moreover, many of the emerging research topics and remarkable new results in our research fields are presented for the first time at the Asilomar Conference. Asilomar brings together academic and industry researchers in signal processing, wireless communication, networking, computing, machine learning, multisensor systems, data science, and speech/audio/video, and provides the opportunity to interact and exchange ideas in a relaxed setting.

This year we have a couple of innovations. First, we start a new tradition of a Sunday afternoon tutorial lecture by one of the leading scholars in our field. We start with a big bang. We are honored to have IEEE President Prof. Jose Moura (CMU) as our inaugural tutorial speaker. His tutorial will focus on graph signal processing and learning over graphs. Prof. Moura is truly a pioneer in these research fields. Second, we have expanded the scope of many of the technical area tracks in order to accommodate more machine learning, data science, and large-scale signal processing, wireless connectivity and data analytics related research papers. As an result, we had a record number of 547 submissions this year.

We have a very exciting technical program for you this year with a good mixture of emerging and well-established research topics among invited, regular and poster sessions. I would like to express my gratitude to the Technical Program Chair Prof. Martin Haardt and his team of Technical Area Chairs: Mario Huemer, Emil Björnson, Alejandro Ribeiro, Waheed U. Bajwa, Fauzia Ahmad, Mikko Valkama, Behtash Babadi and Gerald Schuller for a brilliantly crafted technical program. They handled a large number of paper submissions in a timely and highly professional manner. The help of Technical Area Vice Chairs was also invaluable in getting the reviews completed in time. A total of 86 papers were submitted to the student paper contest, from which eight finalists were selected by the Track Chairs. On Sunday before the Welcome Reception, these finalists will present their work before a panel of judges organized by Prof. Balu Santhanam.

We are proud to have Prof. H. Vincent Poor from Princeton University as the plenary speaker this year. He is among the leading scholars in the world in the fields of information and communication theory and statistical signal processing. He will be talking about fundamentals of low-latency wireless communication, which is a key enabling technology in 5G and beyond wireless systems, factory automation, IoT, and autonomous vehicles such as UAVs and self-driving cars.

I am thrilled and deeply honored to serve as the General Chair of the 52nd Asilomar Conference. I hope that you all enjoy the inspiring conference program this year and discover everything that Asilomar has to offer in terms of scholarly work, meeting colleagues and friends, and outdoor experiences in the beautiful Asilomar beaches and parks.

Visa Koivunen, Aalto University, Finland, June 2018.

Conference Steering Committee

*participating in his or her personal capacity

2018 Asilomar Technical Program Committee

Technical Chairman
Prof. Martin Haardt
TU Ilmenau

2018 Asilomar Technical Program Committee Members

TRACK A: COMMUNICATIONS SYSTEMS
Mario Huemer*
Johannes Kepler University, Austria
Mario.Huemer@jku.at

Andreas Springer
Johannes Kepler University, Austria
andreas.springer@jku.at

Michael Lunglmayr
Johannes Kepler University, Austria
michael.lunglmayr@jku.at

Werner Haselmayr
Johannes Kepler University, Austria
werner.haselmayr@jku.at

TRACK B: MIMO COMMUNICATIONS AND SIGNAL PROCESSING
Emil Björnson*
Linköping University, Sweden
emil.bjornson@liu.se

TRACK C: NETWORKS
Alejandro Ribeiro*
University of Pennsylvania, USA
aribeiro@seas.upenn.edu

TRACK D: ADAPTIVE SYSTEMS, MACHINE LEARNING, DATA ANALYTICS
Waheed U. Bajwa*
Rutgers, the State University of New Jersey, USA
waheed.bajwa@rutgers.edu

Osvaldo Simeone
Kings College London, UK
osvaldo.simeone@kcl.ac.uk

George Atia
University of Central Florida, USA
George.Atia@ucf.edu

*Technical Area Chair

TRACK E: ARRAY PROCESSING AND MULTISENSOR SYSTEMS
Fauzia Ahmad*
Temple University, USA
fauzia.ahmad@temple.edu

Aboulnasr Hassanien
Wright State University, USA
hassanien@ieee.org

TRACK F: BIOMEDICAL SIGNAL AND IMAGE PROCESSING
Behtash Babadi*
University of Maryland, USA
behtash@umd.edu

Mehmet Akcakaya
University of Minnesota, USA
akcakaya@umn.edu

TRACK G: ARCHITECTURES AND IMPLEMENTATION
Mikko Valkama*
Tampere Univ of Technology, Finland
mikko.e.valkama@tut.fi

Jani Boutellier
Tampere University of Technology, Finland
jani.boutellier@tut.fi

TRACK H: SPEECH, IMAGE AND VIDEO PROCESSING
Gerald Schuller*
TU Ilmenau, Germany
Gerald.Schuller@TU-Ilmenau.DE

2018 Asilomar Conference Session Schedule

Sunday Afternoon, October 28, 2018

3:00–7:00 PM	Registration — Merrill Hall
4:00–6:00 PM	Student Paper Contest — Heather Hall
4:00–6:00 PM	Tutorial: Graph Signal Processing — Nautilus
7:00–9:00 PM	Welcoming Reception — Merrill Hall

Monday Morning, October 29, 2018

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

10:15–11:55 AM MORNING SESSIONS

MA1b	Signal Processing for GNSS and/or Localization with Terrestrial Networks I (Invited)
MA2b	Machine Learning for Audio Signals (Invited)
MA3b	Distributed Optimization
MA4b	Deep Neural Networks
MA5b	Sparse Sensor Arrays
MA6b	Statistical Signal Processing and Learning in Neuroscience (Invited)
MA7b	Computing Arithmetics and Approximations
MA8b1	Wireless Communications and Wearable Devices (Poster)
MA8b2	Algorithms and Architectures (Poster)
MA8b3	MIMO Decoding and Channel Estimation (Poster)
MA8b4	MIMO Communications and Signal Processing (Poster)

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

Monday Afternoon, October 29, 2018

1:30–5:10 PM AFTERNOON SESSIONS

MP1a	mmWave Communications I
MP1b	mmWave Communications II
MP2a	Machine Learning for Wireless Systems I (Invited)
MP2b	Machine Learning for Wireless Systems II (Invited)
MP3a	Network Games (Invited)
MP3b	Hardware-constrained Signal Processing and Architectures for Multiantenna Transceivers (Invited)
MP4a	Tensor Signal and Information Processing (Invited)
MP4b	Active Online Learning and Tracking (Invited)
MP5a	L1-norm Array Data Processing (Invited)
MP5b	Convex and Non-convex Optimization for Quadratic and Multilinear Inverse Problems (Invited)
MP6a	Multivariate Signal Processing for Neural Signals (Invited)
MP6b	Brain Circuitry and Dynamics (Invited)
MP7a	Far-Infrared/Thermal Image Processing (Invited)
MP7b	Audio Source Separation and Synthesis (Invited)
MP8a1	Radar-Communications and Localization (Poster)
MP8a2	Communication System Design (Poster)
MP8a3	Communication System Analysis (Poster)
MP8a4	Signal Processing for GNSS and/or Localization with Terrestrial Networks II (Invited) (Poster)

Monday Evening, October 29, 2018

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

2018 Asilomar Conference Session Schedule
(continued)

Tuesday Morning, October 30, 2018

7:30–9:00 AM Breakfast — Crocker Dining Hall
8:00 AM–6:00 PM Registration

8:15–11:55 AM MORNING SESSIONS
TA1a Multicarrier Communications
TA1b Radar-Communications RF Convergence (Invited)
TA2a UAV Cellular Communications in 5G (Invited)
TA2b Cell-Free and Distributed Massive MIMO Systems (Invited)
TA3a Graph Signal Processing
TA3b Graph Signal Processing (Invited)
TA4a Optimization for Data Analytics
TA4b Algorithms for Data Analytics
TA5a Machine Learning and Hardware Aspects
TA5b Array Processing for Coexistence of Radio Frequency Systems (Invited)
TA6a Tensor Decompositions for Biomedical Engineering (Invited)
TA6b Waveform Processing for 5G and Beyond (Invited)
TA7a Speech Processing
TA7b Speech and Audio Technologies
TA8a1 Beamforming and Array-Based Estimation I (Poster)
TA8a2 Machine Learning and Data Analytics (Poster)
TA8a3 Array Processing and Multisensor Systems for Radar (Poster)
TA8b1 Source Localization (Poster)
TA8b2 Beamforming and Array-Based Estimation II (Poster)
TA8b3 Signal Processing for Medical Imaging (Poster)
TA8b4 Biomedical Signal Processing and Instrumentation (Poster)

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

Tuesday Afternoon, October 30, 2018

1:30–5:35 PM AFTERNOON SESSIONS
TP1a 5G and Beyond (Invited)
TP1b System and Transceiver Design for THz Communications (Invited)
TP2a Beam and Channel Tracking for Millimeter Wave MIMO Systems (Invited)
TP2b Millimeter Wave MIMO
TP3a Wireless Autonomous Networks (Invited)
TP3b Wireless Networks
TP4a Sequential Analysis in Networked Data (Invited)
TP4b Taming Nonconvexity in High-Dimensional Statistical Inference (Invited)
TP5a Cognitive Radar (Invited)
TP5b Passive Imaging and Detection (Invited)
TP6a Statistical Analysis of Biomedical Data
TP6b Machine Learning Advances in Medical Imaging (Invited)
TP7a Interference Cancellation for FDD and Full Duplex Communications (Invited)
TP7b Architectures for Massive MIMO Communication Systems (Invited)
TP8a1 Network Dynamical Systems (Poster)
TP8a2 Communication Networks (Poster)
TP8a3 Signal and Image Processing and Implementations (Poster)
TP8a4 Autonomous Systems and Image Analysis (Poster)
TP8b1 Physical Layer Security and Privacy (Poster)
TP8b2 Adaptive Signal Processing (Poster)
TP8b3 Detection, Estimation and Inference II (Poster)
TP8b4 Communication Systems and Constraints (Poster)

Tuesday Evening Open Evening — Enjoy the Monterey Peninsula

2018 Asilomar Conference Session Schedule
(continued)

Wednesday Morning, October 31, 2018

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	Biologically Inspired Communications and Signal Processing (Invited)
WA1b	Detection, Estimation and Inference I
WA2a	Uplink Signal Processing for MIMO Communications
WA2b	Implementation and Deployment of Massive MIMO
WA3a	Smart Grids (Invited)
WA3b	Distributed Learning and Adaptation over Networks (Invited)
WA4a	Models and Algorithms for Big-Data Analytics (Invited)
WA4b	Information-theoretic Approaches to Machine Learning (Invited)
WA5a	Waveform Optimization for MIMO/Cognitive Radar
WA5b	Source Localization, Separation and Tracking
WA6a	Signal Processing Advances in Neuroimaging
WA6b	In-band Full-duplex Wireless Communications (Invited)
WA7a	Speech Technologies (Invited)
WA7b	Computer Vision, Image and Video Analysis
WA8a1	Sparse Signal Processing (Poster)
WA8a2	Kernel Methods and Clustering (Poster)
WA8a3	Machine Learning Applications (Poster)
WA8a4	Robust Methods in Multi-sensor Systems (Poster)

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

Student Paper Contest

Heather Hall – Sunday, October 28, 2018, 4:00–6:00 PM

Track A
"Device Free Indoor Localization Using Discriminant Features of CSI : A Canonical Correlation Paradigm"
Tahsina Farah Sanam, Hana Godrich, Rutgers University, United States

Track B
"Fast Blind MIMO Decoding through Vertex Hopping"
Jonathan Perlstein, Thomas Dean, Mary Wootters, Andrea Goldsmith, Stanford University, United States

Track C
"Distributed Non-Convex First-Order Optimization and Information Processing: Lower Complexity Bounds and Rate Optimal Algorithms"
Haoran Sun, Mingyi Hong, University of Minnesota Twin Cities, United States

Track D
"On Generation of Adversarial Examples using Convex Programming"
Emilio Rafael Balda, Arash Behboodi, Rudolf Mathar, RWTH Aachen University, Germany

Track E
"Noncoherent compressive channel estimation for mm-wave massive MIMO"
Maryam Eslami Rasekh, Upamanyu Madhow, University of California Santa Barbara, United States

Track F
"Spatio-Temporal Modeling of EEG Signals using Matrix Variate Distributions"
Shruti Sharma, Santanu Chaudhury, Jayadeva Prof, Indian Institute of Technology Delhi, India

Track G
"Feedforward Architectures for Decentralized Precoding in Massive MU-MIMO Systems"
Kaipeng Li, Rice University, United States; Charles Jeon, Cornell University, United States; Joseph R. Cavallaro, Rice University, United States; Christoph Studer, Cornell University, United States

Track H
"End-to-end Source Separation with Adaptive Front-Ends"
Shrikant Venkataramani, Jonah Casebeer, University of Illinois at Urbana-Champaign, United States; Paris Smaragdis, University of Illinois at Urbana-Champaign, Adobe Research, United States

2018 Asilomar Conference Session Schedule

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

Monday, October 29, 2018

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

1. Welcome from the General Chair

Prof. Visa Koivunen
Aalto University, Finland

2. Session MA1a Distinguished Lecture for the 2018 Asilomar Conference

Fundamentals for Low Latency Communications

Prof. Vincent Poor
Princeton University, USA

Abstract
Information theory provides fundamental insights into communication system capabilities, and the classical theory of Shannon has guided development of such systems over many decades. However, the classical models are based on assumptions of infinite block-length codes and do not address situations in which short block-lengths are imposed by system design considerations. Notably in this context, latency has become a critical design issue in emerging wireless networking paradigms, such as the Internet of Things and associated applications like autonomous driving, factory automation, etc. This situation has inspired the development of a finite-block-length information theory, with many new results coming in recent years. This talk will review these developments, including fundamental finite-block-length limits on basic functions such as channel coding and secure communications, as well as implications of these limits in some practical settings.

Biography

H. Vincent Poor is the Michael Henry Strater University Professor of Electrical Engineering at Princeton University. From 1977, and until joining the Princeton faculty in 1990, he was on the faculty of the University of Illinois. During 2006 – 2016, he served as Dean of Princeton's School of Engineering and Applied Science. He has also held visiting positions at several other universities, including most recently at Berkeley and Cambridge. Dr. Poor's research interests are in signal processing and information theory, and their applications in wireless networks, energy systems and related fields. He is a member of the National Academy of Engineering and the National Academy of Sciences, and is a foreign member of the Chinese Academy of Sciences, the Royal Society, and other national and international academies. He received the Society Award of the IEEE Signal Processing Society in 2011, and the IEEE Alexander Graham Bell Medal in 2017.

Tutorial: Graph Signal Processing

Sunday, October 28, 2018, 4:00–6:00 PM

José M. F. Moura
Carnegie Mellon University

Signal Processing has traditionally dealt with time series, images, and video where data is indexed by time ticks and pixels. The structure of the indexing set is taken for granted. In the last few years, new opportunities for signal and data processing have arisen, except data is now indexed by social agents, genes, customers of service providers, or by some other arbitrary enumeration suggested by the application. The tutorial will present Graph Signal Processing by revisiting the fundamentals of Signal Processing, developing for data (signals) arising from these various domains the essential concepts and methods of traditional Signal Processing—signal model, shift, filtering, convolution, spectral analysis, Fourier transform, filter frequency response, among others. We illustrate the concepts with datasets drawn from physical to social networks and applications from improving deep learning to uncovering graphs capturing dependencies among data

Work with Aliaksei Sandryhaila, Joya Deri, and Jonathan Mei.

Ack: NSF grants CCF-1513936

José M. F. Moura is the Philip L. and Marsha Dowd University Professor at CMU, with interests in signal processing and data science. A detector he invented with Alek Kavcic is found in over 60% of the disk drives of all computers sold worldwide in the last 13 years (3 billion and counting)–leading to the largest settlement ever in the information technologies IP area, and 3rd largest overall, of US $750 Million between CMU and Marvell. He is the 2018 IEEE President Elect, was President of the IEEE Signal Processing Society (SPS), and was Editor in Chief for the Transactions on Signal Processing. Professor Moura received the IEEE SPS Technical Achievement Award and Society Award. He is Fellow of the IEEE, AAAS, and the US National Academy of Innovators, corresponding member of the Academy of Sciences of Portugal, and member of the US National Academy of Engineering. He received the Grã Cruz of the Ordem do Infante D. Henrique bestowed to him by the President of the Republic of Portugal.

Program of the 2018 Asilomar Conference on Signals, Systems, and Computers

Technical Program Chairman
Prof. Martin Haardt
TU Ilmenau

Session MA1b Signal Processing for GNSS and/or Localization with Terrestrial Networks I (Invited)

Co-Chairs: *Felix Antreich, ITA, Brazil and Gonzalo Seco-Granados, Universitat Autonoma de Barcelona*

MA1b-1 Beam-based Device Positioning in mmWave 5G Systems under Orientation Uncertainties 10:15 AM
Elizaveta Rastorgueva-Foi, Tampere University of Technology, Finland; Mário Costa, Huawei Technologies, Finland; Mike Koivisto, Jukka Talvitie, Tampere University of Technology, Finland; Kari Leppänen, Huawei Technologies, Finland; Mikko Valkama, Tampere University of Technology, Finland

MA1b-2 Performance Analysis of Hybrid 5G-GNSS Localization 10:40 AM
Giuseppe Destino, Jani Saloranta, University of Oulu, Finland; Gonsalo Seco-Granados, Universitat Autonoma de Barcelona, Spain; Henk Wymeersch, Chalmers University of Technology, Sweden

MA1b-3 Joint Localization, Navigation, and Information Seeking using UAV Swarms 11:05 AM
Anna Guerra, Davide Dardari, University of Bologna, Italy; Petar Djuric, Stony Brook University, United States

MA1b-4 Performance Assessment for Broadband Radio Localization 11:30 AM
Marco Antonio Marques Marinho, Universidade de Brasília, Brazil; Felix Antreich, Universidade Federal do Ceará, Brazil; Fredrik Tufvesson, Lund University, Sweden; Alexey Vinel, Halmstad University, Sweden; João Paulo Carvalho Lustosa da Costa, Universidade de Brasília, Brazil

Session MA2b Machine Learning for Audio Signals (Invited)

Chair: *Konstantinos Drossos, TU Tampere*

MA2b-1 Distillating Speech Knowledge Between Feed-Forward and Recurrent Acoustic Models 10:15 AM
Dmitriy Serdyuk, Mirco Ravanelli, Montreal Institute for Learning Algorithms (MILA), University of Montreal, Canada; Yoshua Bengio, CIFAR Senior Fellow, Canada

MA2b-2 Style Imitation and Transfer through Machine Learning Architectures for Enhancing the Creativity of Musicians 10:40 AM
Dimos Makris, Dimitris Koutsaidis, Yang Zhang, Maximos Kaliakatsos-Papakostas, Mercury Orbit Music, Greece

MA2b-3 Predicting the Perceived Level of Reverberation using Machine Learning 11:05 AM
Saeid Safavi, Andy Pearse, Wenwu Wang, Mark Plumbly, University of Surrey, United Kingdom

Session MA3b Distributed Optimization

Chair: *Mingyi Hong, University of Minnesota*

MA3b-1 COCOA: Communication-Censored ADMM for Decentralized Consensus Optimization 10:15 AM
Yaohua Liu, Wei Xu, Gang Wu, University of Science and Technology of China, China; Zhi Tian, George Mason University, United States; Qing Ling, Sun Yat-Sen University, China

MA3b-2 Distributed Non-Convex First-Order Optimization and Information Processing: Lower Complexity Bounds and Rate Optimal Algorithms 10:40 AM
Haoran Sun, Mingyi Hong, University of Minnesota - Twin Cities, United States

MA3b-3 On the Convergence Rate of Average Consensus and Distributed Optimization over Unreliable Networks 11:05 AM
Lili Su, Massachusetts Institute of Technology, United States

MA3b-4 Distributed Optimization for Phase Retrieval 11:30 AM
Ziping Zhao, Hong Kong University of Science and Technology, Hong Kong SAR of China; Songtao Lu, Mingyi Hong, University of Minnesota, United States; Daniel P. Palomar, Hong Kong University of Science and Technology, Hong Kong SAR of China

Session MA4b Deep Neural Networks

Chair: *Rudolf Mathar, RWTH Aachen University*

MA4b-1 Graph Autoencoder-Based Unsupervised Feature Selection 10:15 AM
Siwei Feng, Marco Duarte, University of Massachusetts Amherst, United States

MA4b-2 On Generation of Adversarial Examples using Convex Programming 10:40 AM
Emilio Rafael Balda, Arash Behboodi, Rudolf Mathar, RWTH Aachen University, Germany

MA4b-3 Data Dropout in Arbitrary Basis for Deep Network Regularization 11:05 AM
Mostafa Rahmani, George Atia, University of Central Florida, United States

MA4b-4 Training Recurrent Neural Networks against Noisy Computations during Inference 11:30 AM
Minghai Qin, Dejan Vucinic, WDC, United States

Session MA5b Sparse Sensor Arrays

Chair: *Yimin Zhang, Temple University*

MA5b-1 Optimizing Minimum Redundancy Arrays for Robustness 10:15 AM
Chun-Lin Liu, P. P. Vaidyanathan, California Institute of Technology, United States

MA5b-2 Compressive Kriging Using Multi-Dimensional Generalized Nested Sampling 10:40 AM
Heng Qiao, Mehmet Can Hucumenoglu, Piya Pal, University of California, San Diego, United States

MA5b-3 Optimum Sparse Array Receive Beamforming for Wideband Signal Model 11:05 AM
Syed Ali Hamza, Moeness Amin, Villanova University, United States

MA5b-4 An Expectation Maximization Algorithm for the Underdetermined Direction of Arrival Estimation Problem 11:30 AM
Hatim Alqadah, Dan Scholnik, Jean De Graaf, U.S. Naval Research Laboratory, United States

Session MA6b Statistical Signal Processing and Learning in Neuroscience (Invited)

Chair: *Tatyana Sharpee, Salk Institute for Biological Studies*

MA6b-1 Quantifying Information Conveyed by Large Neuronal Populations 10:15 AM
John Berkowitz, Yilun Zhang, Bin Yu, Tatyana Sharpee, Salk Institute for Biological Studies, United States

MA6b-2 A Memory Network Model using Spike Phase Precession 10:40 AM
E. Paxon Frady, Friedrich Sommer, University of California, Berkeley, United States

MA6b-3 Competing Inhibition-Stabilized Networks in Sensory and Memory Processing 11:05 AM
Benjamin Lankow, Mark Goldman, University of California, Davis, United States

MA6b-4 Biologically Plausible Online PCA Without Recurrent Neural Dynamics 11:30 AM
Victor Minden, Dmitri Chklovskii, Cengiz Pehlevan, Flatiron Institute, United States

Session MA7b Computing Arithmetics and Approximations

Chair: *Christoph Lauter, University of Alaska Anchorage (UAA)*

MA7b-1 The Return of Table-Based Computing 10:15 AM
Behrooz Parhami, University of California, Santa Barbara, United States

MA7b-2 Rigorous Polynomial Approximation 10:40 AM
Christoph Lauter, Sorbonne Universite, France

MA7b-3 Hardware Implementation of Basic Arithmetics and Elementary Functions for Unum Computing 11:05 AM
Moritz Bärthel, Jochen Rust, Steffen Paul, University of Bremen, Germany

MA7b-4 High-Performance Multiplication Modulo 2**n - 3 11:30 AM
Peter-Michael Seidel, University of Hawai'i at Manoa, United States

Session MA8b1 Wireless Communications and Wearable Devices

Chair: *Behnaam Aazhang, Rice University*

10:15 AM–11:55 AM

MA8b1-1 Base Station MIMO Detector Algorithm Implementations on Zynq SoC
Tuomo Hänninen, Markku Juntti, University of Oulu, Finland

MA8b1-2 A Power Efficient Digital Front-End for Cognitive Radio Systems
Gian Carlo Cardarilli, Luca Di Nunzio, Rocco Fazzolari, University of Rome Tor Vergata, Italy; Alberto Nannarelli, Technical University of Denmark, Denmark; Marco Re, University of Rome Tor Vergata, Italy

MA8b1-3 Low-Area Memoryless Optimized Soft-Decision Viterbi Decoder with Dedicated Paralell Squaring Architecture
John Tobola, James Stine, Oklahoma State University, United States

MA8b1-4 On the Hardware Design of a Complex Filter Bank for Physiological Signal Feature Extraction and Segmentation
Christopher Felton, Barry Gilbert, David Holmes, Clifton Haider, Mayo Clinic, United States

MA8b1-5 Improved Implementation Approaches for 512-tap 60 GSa/s Chromatic Dispersion FIR Filters
Madhur Gokhale, Cheolyong Bae, Oscar Gustafsson, Mario Garrido, Linköping University, Sweden

MA8b1-6 An Energy Harvesting Wireless Leadless Multisite Pacemaker Prototype
Cody Tapscott, Chris Chivetta, Yujun Chen, Yoseph Maguire, Yixin Chen, Joseph Cavallaro, Behnaam Aazhang, Rice University, United States; Mehdi Razavi, Texas Heart Institute, United States

MA8b1-7 A Wearable Platform for Research in Augmented Hearing
Louis Pisha, Sean Hamilton, Dhiman Sengupta, Ching-Hua Lee, Krishna Chaithanya Vastare, Cagri Yalcin, Alex Grant, Mark Stambaugh, Rajesh Gupta, Bhaskar D. Rao, Harinath Garudadri, University of California, San Diego, United States

Session MA8b2 Algorithms and Architectures

Chair: *Joe Cavallaro, Rice University*

10:15 AM–11:55 AM

MA8b2-1 An Area and Power Efficient Architecture for Linear Prediction-Error Filters Based on Split Schur Algorithm
Sayed Ahmad Salehi, University of Kentucky, United States

MA8b2-2 A Noise-resilient Detection Method against Advanced Cache Timing Channel Attack
Hongyu Fang, Sai Santosh Dayapule, Fan Yao, Milos Doroslovacki, Guru Venkataramani, George Washington University, United States

MA8b2-3 Analog Representations in Digital Arithmetic: A Review
Behrooz Parhami, University of California, Santa Barbara, United States

MA8b2-4 A Supply Fluctuation Resilient SRAM
Sepideh Nouri, University of California, Los Angeles, United States; Joseph Cavallaro, Rice University, United States

MA8b2-5 Display Stream Compression Encoder Architectures for Real-time 4K and 8K Video Encoding
Shifu Wu, University of California, Davis, United States; Snehlata Gutgutia, Massimo Alioto, National University of Singapore, Singapore; Bevan Baas, University of California, Davis, United States

MA8b2-6 High Performance Approximation of Elementary Functions Using Quasi-Linear Interpolators
Peter-Michael Seidel, University of Hawai'i at Manoa, United States

Session MA8b3 MIMO Decoding and Channel Estimation

Chair: *Emil Björnson, Linköping University*

10:15 AM–11:55 AM

MA8b3-1 Adaptive Blind Identification of Sparse SIMO Channels using Maximum a Posteriori Approach
Nacerredine Lassami, Abdeldjalil Aïssa-El-Bey, IMT Atlantique, France; Karim Abed-Meraim, University of Orléans, France

MA8b3-2 LR-aided Selective Spanning with Fast Enumeration Decoder for MIMO Systems
Mehnaz Rahman, Intel Research Lab, United States

MA8b3-3 Fast Blind MIMO Decoding through Vertex Hopping
Jonathan Perlstein, Thomas Dean, Mary Wootters, Andrea Goldsmith, Stanford University, United States

MA8b3-4 Equalization of a Wavelet Packet Modulated Multiple-Input Multiple-Output Signal
Michael Cribbs, Frank Kragh, Naval Postgraduate School, United States; Bradley Comar, United States Department of Defense, United States

MA8b3-5 Separable Dictionary Learning aided Channel Estimation for Hybrid mmWave MIMO Systems
Hongxiang Xie, University of Texas at Austin, United States; Nuria Gonzalez Prelcic, University of Vigo, Spain; Robert W. Heath, Jr, University of Texas at Austin, United States

Session MA8b4 MIMO Communications and Signal Processing

Chair: *Emil Björnson, Linköping University*

10:15 AM–11:55 AM

MA8b4-1 Widely Linear Multiuser Precoding for One-dimensional Signalling
Majid Bavand, Steven D. Blostein, Queen's University, Canada

MA8b4-2 Enabling Covariance-Based Feedback in Massive MIMO: A User Classification Approach
Shuang Qiu, Huazhong University of Science and Technology, China; David Gesbert, EURECOM, France; Tao Jiang, Huazhong University of Science and Technology, China

MA8b4-3 Low-Complexity Weighted Sum-Rate Maximization Approach with Per-Antenna Power Constraints
Mostafa Medra, University of Toronto, Canada; Andrew Eckford, York University, Canada; Raviraj Adve, University of Toronto, Canada

MA8b4-4 Linear Multicast Beamforming Schemes for Coded Caching
Antti Tölli, Jarkko Kaleva, University of Oulu, Finland; Seyed Pooya Shariatpanahi, Institute for Research in Fundamental Sciences (IPM), Iran; Babak Khalaj, Sharif University of Technology, Iran

MA8b4-5 A Converse Bound for Cache-Aided Interference Networks
Antonious M. Girgis, Nile University, Egypt; Ozgur Ercetin, Sabanci University, Turkey; Mohammed Nafie, Nile University, Egypt; Tamer ElBatt, American University in Cairo, Egypt

MA8b4-6 Mission-Aware Predictive Network
Richard Lau, Nicholas Chang, Brian Wilson, Tom Banwell, Heechang Kim, Joshua Morman, Sarry Habiby, Vencore Labs, United States

MA8b4-7 Ultra Reliable Low Latency Communications in Massive Multi-Antenna Systems
Alexandru-Sabin Bana, Guixian Xu, Elisabeth De Carvalho, Petar Popovski, Aalborg University, Denmark

Session MP1a mmWave Communications I

Chair: *Markku Juntti, University of Oulu*

MP1a-1 RF-chain ADC Resolution Trade-off in MIMO Hybrid Architecture 1:30 PM
Satya Joshi, Markku Juntti, University of Oulu, Finland

MP1a-2 Robustness of FDM-FDCP Modulation to Phase Noise in Millimeter Wave Systems 1:55 PM
Nicole Grimwood, Thomas Dean, Andrea Goldsmith, Stanford University, United States

MP1a-3 Phase-Noise Analysis of Overlapping Filtered Multitone Waveforms in Millimeter-Wave Radio Systems 2:20 PM
Kai Shao, Chongqing University of Posts and Telecomm, China; Juha Yli-Kaakinen, Toni Levanen, Markku Renfors, Tampere University of Technology, Finland

MP1a-4 Adaptive Bayesian Channel Estimation for Millimeter-Wave MIMO Systems with Hybrid Architecture 2:45 PM
Mathini Sellathurai, Pat Chambers, Heriot-Watt University, United Kingdom; Rongrong Qian, Yunnan University, China

Session MP1b mmWave Communications II

Co-Chairs: *David Love, Purdue University and Dennis Ogbe, Purdue University*

MP1b-1 DFT Beamforming for Millimeter Wave is Asymptotically Optimal 3:30 PM
Dennis Ogbe, Purdue University, United States; Vasanthan Raghavan, Qualcomm, Inc., United States; David Love, Purdue University, United States

MP1b-2 Low-Complexity Adaptive Beam and Channel Tracking for Mobile mmWave Communications 3:55 PM
Yavuz Yapici, Ismail Guvenc, North Carolina State University, United States

MP1b-3 Optimal Interactive Energy Efficient Beam-Alignment for Millimeter-Wave Networks 4:20 PM
Muddassar Hussain, Nicolo Michelusi, Purdue University, United States

MP1b-4 Initial Access and Beamforming in Multi-cell mmWave Networks Using Narrowband Pilots 4:45 PM
Hao Zhou, Dongning Guo, Michael Honig, Northwestern University, United States

Session MP2a Machine Learning for Wireless Systems I (Invited)

Chair: *Christoph Studer, Cornell University*

MP2a-1 Learning Decentralized Cooperation in Wireless Networks 1:30 PM
Minhoe Kim, Paul de Kerret, David Gesbert, EURECOM, France

MP2a-2 Multipoint Channel Charting for Wireless Networks 1:55 PM
Junquan Deng, Aalto University, Finland; Saïd Medjkouh, Cornell University, United States; Nicolas Malm, Olav Tirkkonen, Aalto University, Finland; Christoph Studer, Cornell University, Finland

MP2a-3 Distributed Machine Learning in the Context of Function Computation over Wireless Networks 2:20 PM
Miruna Raceala-Motoc, Steffen Limmer, Igor Bjelakovic, Slawomir Stanczak, Technical University Berlin, Germany

MP2a-4 End-to-End Learning of Communications Systems Without a Channel Model 2:45 PM
Faycal Ait Aoudia, Jakob Hoydis, Nokia Bell Labs, France

Session MP2b Machine Learning for Wireless Systems II (Invited)

Chair: *Christoph Studer, Cornell University*

MP2b-1 Design and Implementation of a Neural Network Aided Self-Interference Cancellation Scheme 3:30 PM
Yann Kurzo, Alexios Balatsoukas-Stimming, Andreas Burg, Ecole Polytechnique Fédérale de Lausanne, Switzerland

MP2b-2 Learning from the Syndrome 3:55 PM
Loren Lugosch, Warren J. Gross, McGill University, Canada

MP2b-3 Polar Decoding on Sparse Graphs with Deep Learning 4:20 PM
Weihong Xu, Xiaohu You, Chuan Zhang, Southeast University, China; Yair Be'ery, Tel Aviv University, Israel

MP2b-4 Detection Over Rapidly Changing Communication Channels Using Deep Learning 4:45 PM
Nariman Farsad, Andrea Goldsmith, Stanford University, United States

Session MP3a Network Games (Invited)

Chair: *Ceyhun Eksin, Texas A&M University*

MP3a-1 Projecting Network Games Onto Sparse Graphs 1:30 PM
Philip Brown, University of California, Santa Barbara, United States; Holly Borowski, Numerica, United States; Jason Marden, University of California, Santa Barbara, United States

MP3a-2 Best-Response Dynamics in Potential Games with Continuous Action Sets: Convergence to Potential Function Maximizers 1:55 PM
Brian Swenson, Carnegie Mellon University, United States; Ryan Murray, Pennsylvania State University, United States; Soummya Kar, Carnegie Mellon University, United States

MP3a-3 Incentive Control in State-Based Anti-Coordination Network Games 2:20 PM
Keith Paarporn, Georgia Institute of Technology, United States; Ceyhun Eksin, Texas A&M University, United States

MP3a-4 Signaling Games for Information Dispersion over Networks 2:45 PM
Emrah Akyol, Binghamton University, SUNY, United States

Session MP3b Hardware-constrained Signal Processing and Architectures for Multiantenna Transceivers (Invited)

Chair: *Thomas Eriksson, Chalmers University*

MP3b-1 Digital Predistortion in Large-Array Digital Beamforming Transmitters 3:30 PM
Alberto Brihuega, Lauri Anttila, Mahmoud Abdelaziz, Mikko Valkama, Tampere University of Technology, Finland

MP3b-2 Calibration of a mm-Wave MIMO Testbed 3:55 PM
Thomas Eriksson, Christian Fager, Koen Buisman, Chalmers University of Technology, Sweden

MP3b-3 Hardware and Spectrum Sharing for Distributed Massive MIMO 4:20 PM
Andrea Guevara, Cheng-Ming Chen, Sofie Pollin, KU Leuven, Belgium

MP3b-4 On the Performance of Backhaul Constrained Cell-Free Massive MIMO with Linear Receivers 4:45 PM
Manijeh Bashar, University of York, United Kingdom; Hien Quoc Ngo, Queen's University Belfast, United Kingdom; Alister G. Burr, Dick Maryopi, Kanapathippillai Cumanan, University of York, United Kingdom; Erik G. Larsson, Linköping University, Sweden

Session MP4a Tensor Signal and Information Processing (Invited)

Chair: *André de Almeida, Federal University of Ceara (UFC)*

MP4a-1 Efficient Computation of the PARAFAC2 Decomposition via Generalized Tensor Contractions 1:30 PM
Kristina Naskovska, Yao Cheng, Martin Haardt, Ilmenau University of Technology, Germany; André L. F. de Almeida, Federal University of Ceará (UFC), Brazil

MP4a-2 Computation of Tensor Decompositions via Structured Null Spaces 1:55 PM
Nico Vervliet, Lieven De Lathauwer, KU Leuven, Belgium

MP4a-3 Identifiability of Kronecker-structured Dictionaries for Tensor Data 2:20 PM
Zahra Shakeri, Anand Sarwate, Waheed Bajwa, Rutgers University, United States

MP4a-4 Space-Time-Frequency (STF) MIMO Relaying System with Receiver Based on Coupled Tensor Decompositions 2:45 PM
Danilo Sousa Rocha, Carlos Alexandre Rolim Fernandes, Federal University of Ceará, Brazil; Gérard Favier, University of Côte d'Azur, France

Session MP4b Active Online Learning and Tracking (Invited)

Chair: *Namrata Vaswani, Iowa State University*

MP4b-1 Sequential Experiment Design for Hypothesis Verification 3:30 PM
Dhruva Kartik, Ashutosh Nayyar, Urbashi Mitra, University of Southern California, United States

MP4b-2 Interactive Linear Regression with Pairwise Comparisons 3:55 PM
Yichong Xu, Sivaraman Balakrishnan, Aarti Singh, Artur Dubrawski, Carnegie Mellon University, United States

MP4b-3 Stochastic and Accelerated Gradient Descent for Non-convex Phase Retrieval 4:20 PM
Yuejie Chi, Carnegie Mellon University, United States

MP4b-4 Phaseless Subspace Tracking: Low-Rank Phase Retrieval with Partial Subspace Knowledge 4:45 PM
Seyedehsara Nayer, Namrata Vaswani, Iowa State University, United States

Session MP5a L1-norm Array Data Processing (Invited)

Co-Chairs: *Panos Markopoulos, Rochester Institute of Technology and Dimitris Pados, Florida Atlantic University*

MP5a-1 Robust Subspace Tracking and Online Dynamic Robust PCA via Recursive Projected Compressive Sensing 1:30 PM
Praneeth Narayanamurthy, Namrata Vaswani, Iowa State University, United States

MP5a-2 Convolutional Dictionary Learning for Multi-Channel Signals 1:55 PM
Cristina Garcia-Cardona, Brendt Wohlberg, Los Alamos National Laboratory, United States

MP5a-3 Unsupervised Classification of Array Data Based on the L1-norm 2:20 PM
Rubén Martín-Clemente, Universidad de Sevilla, Spain; Vicente Zarzoso, University of Nice Sophia Antipolis, France

MP5a-4 Near Field Active Imaging Using Sparse Arrays 2:45 PM
Robin Rajamäki, Visa Koivunen, Aalto University, Finland

Session MP5b Convex and Non-convex Optimization for Quadratic and Multilinear Inverse Problems (Invited)

Chair: *Piya Pal, University of California San Diego*

MP5b-1 Efficient Sparse Blind Deconvolution at Near-Optimal Subsampling Rate 3:30 PM
Dominik Stöger, Technische Universität München, Germany; Kiryung Lee, Justin Romberg, Georgia Institute of Technology, United States; Felix Krahmer, Technische Universität München, Germany

MP5b-2 Random Initialization in Nonconvex Phase Retrieval 3:55 PM
Yuxin Chen, Princeton University, United States; Yuejie Chi, Carnegie Melon University, United States; Jianqing Fan, Cong Ma, Princeton University, United States

MP5b-3 Advances in the Numerical Computation of Decompositions of Explicitly or Implicitly Given Tensors 4:20 PM
Lieven De Lathauwer, Michiel Vandecappelle, Nico Vervliet, KU Leuven, Belgium

MP5b-4 Mixed Factor Structured Tensor Decomposition via Solving Quadratic Equations 4:45 PM
Ali Koochakzadeh, Pulak Sarangi, Piya Pal, University of California, San Diego, United States

Session MP6a Multivariate Signal Processing for Neural Signals (Invited)

Chair: *Selin Aviyente, Michigan State University*

MP6a-1 Comparison of Hilbert Vibration Decomposition with Empirical Mode Decomposition for Classifying Epileptic Seizures 1:30 PM
Ali Yener Mutlu, Izmir Katip Celebi University, Turkey

MP6a-2 Quantification of Resting-State fMRI Networks Driven by Hemodynamically Informed Spatiotemporal Regularization 1:55 PM
Fikret Isik Karahanoglu, Harvard Medical School, Massachusetts General Hospital, United States; Younes Farouj, Dimitri Van De Ville, Ecole Polytechnique Fédérale de Lausanne, University of Geneva, Switzerland

MP6a-3 A deep Learning Scheme for Automatic Seizure Detection from Long-term Scalp EEG 2:20 PM
Yuvaraj Rajamanickam, John Thomas, Nanyang Technological University, Singapore; Tillman Kluge, Austrian Institute of Technology, Austria; Justin Dauwels, Nanyang Technological University, Singapore

MP6a-4 Cortical Localization of the Auditory Temporal Response Function from MEG via Non-convex Optimization 2:45 PM
Proloy Das, Christian Brodbeck, Jonathan Simon, Behtash Babadi, University of Maryland, United States

Session MP6b Brain Circuitry and Dynamics (Invited)

Chair: *Behnaam Aazhang, Rice University*

MP6b-1 Inferring Autonomic Nervous System Stimulation from Hand and Foot Skin Conductance Measurements 3:30 PM
Md. Rafiul Amin, Rose T. Faghih, University of Houston, United States

MP6b-2 Computational Frameworks for Identifying Discriminatory Dynamic Brain Networks across Classes of Tasks 3:55 PM
Ali Haddad, Li Zhu, Foroogh Shamsi, Laleh Najafizadeh, Rutgers University, United States

MP6b-3 Learning Structured Neural Dynamics from Single Trial Population Recording 4:20 PM
Josue Nassar, Stony Brook University, United States; Scott Linderman, Columbia University, United States; Yuan Zhao, Mónica Bugallo, Il Memming Park, Stony Brook University, United States

MP6b-4 Using Markov Properties of ECoG Signals to Infer Neuron Connectivity 4:45 PM
Yonathan Morin, Andrea Goldsmith, Stanford University, United States

Session MP7a Far-Infrared/Thermal Image Processing (Invited)

Chair: *James Glenn-Anderson, Supercomputersystems*

MP7a-1 Optimization of Photometric Warp SFSR Noise Transfer in Thermal Imaging Upscalers 1:30 PM
James Glenn-Anderson, Supercomputer Systems, Inc., United States

MP7a-2 A Novel Binary and Multilevel Phase Masks for Enhanced Depth-of-Focus Infrared Imaging 1:55 PM
Vladimir Katkovnik, Tampere University of Technology, Finland; Nicholas Hogasten, FLIR Systems Inc., United States; Karen Egiazarian, Tampere University of Technology, Finland

MP7a-3 A Reduced Complexity SFSR Upscaler for Embedded Far-Infrared Streaming Video 2:20 PM
James Glenn-Anderson, Supercomputer Systems, Inc., United States

MP7a-4 Low-Frequency Nonuniformity Correction in Static Thermal Images 2:45 PM
Enrique Sanchez-Monge, Noiseless Imaging Ltd, Finland; Stephanie Lin, Nicholas Hogasten, FLIR Systems, United States; Alessandro Foi, Tampere University of Technology, Finland

Session MP7b Audio Source Separation and Synthesis (Invited)

Chair: *Gerald Schuller, TU-Ilmenau*

MP7b-1 Examining the Perceptual Effect of Alternative Objective Functions for Deep Learning Based Music Source Separation — 3:30 PM
Stylianos Ioannis Mimilakis, Estefania Cano, Fraunhofer Institute for Digital Media Technology, Germany; Derry FitzGerald, Cork School of Music, Ireland; Konstantinos Drossos, Tampere University of Technology, Finland; Gerald Schuller, Technical University of Ilmenau, Germany

MP7b-2 End-to-end Source Separation with Adaptive Front-Ends — 3:55 PM
Shrikant Venkataramani, Jonah Casebeer, University of Illinois at Urbana-Champaign, United States; Paris Smaragdis, University of Illinois at Urbana-Champaign, Adobe Research, United States

MP7b-3 A Performance Evaluation of Several Deep Neural Networks for Reverberant Speech Separation — 4:20 PM
Qingju Liu, Wenwu Wang, Philip Jackson, University of Surrey, United Kingdom

Session MP8a1 Radar-Communications and Localization

Chair: *Tahsina Farah, Rutgers, The State University of New Jersey*

1:30 PM–3:10 PM

MP8a1-1 A Perspective on Degrees of Freedom for Radar in Radar-Communication Interference Channel
Yuanhao Cui, Visa Koivunen, Aalto University, Finland; Xiaojun Jing, Beijing University of Posts and Telecommunications, China

MP8a1-2 RF Convergent Waveform Design Using Time-Modulated Phase Functions
John Kota, Ravi Prasanth, Greg Ushomirsky, Stephen Kogon, Systems & Technology Research, United States

MP8a1-3 Optimal Radar-Communications Spectral Maneuvering for TDOA-based Tracking
Joao Cabrera, Prabahan Basu, William Watson, BAE Systems, United States; Joao Hespanha, University of California, Santa Barbara, United States

MP8a1-4 A Dual Radar and Communication System Facing Uncertainty About a Jammer's Capability
Andrey Garnaev, Wade Trappe, WINLAB, Rutgers University, United States; Athina Petropulu, Rutgers University, United States

MP8a1-5 Device Free Indoor Localization Using Discriminant Features of CSI : A Canonical Correlation Paradigm
Tahsina Farah Sanam, Hana Godrich, Rutgers University, United States

MP8a1-6 Indoor Mapping Using the VLC Channel State Information
Zafer Vatansever, Jie Lian, Maite Brandt-Pearce, University of Virginia, United States

MP8a1-7 Joint Positioning-Communications System Design: Leveraging Phase-Accurate Time-of-Flight Estimation and Distributed Coherence
Andrew Herschfelt, Daniel W. Bliss, Arizona State University, United States

MP8a1-8 Throughput Characterization and Beamwidth Selection for Positioning-Assisted mmWave Service
Remun Koirala, Gourab Ghatak, Benoît Denis, CEA Leti, France; Bernard Uguen, University of Rennes 1, France; Davide Dardari, University of Bologna, Italy; Antonio De Domenico, CEA Leti, France

Session MP8a2 Communication System Design

Chair: *Stella Batalama, Florida Atlantic University*

1:30 PM–3:10 PM

MP8a2-1 Robustness of Deep Modulation Recognition under AWGN and Rician Fading
Bingbing Luo, Qihang Peng, University of Electronic Science and Technology of China, China; Pamela Cosman, Laurence Milstein, University of California, San Diego, United States

MP8a2-2 Maximum Likelihood Implementation of a Constant Envelope, Quaternary Continuous Phase Modem
fred harris, University of California, San Diego, United States; Neha Nagaraju, Richard Bell, San Diego state University, United States

MP8a2-3 Precoder Design for Multibeam Mobile Satellite Systems
Vahid Joroughi, Bhavani Shankar M R, Sina Maleki, Symeon Chatzinotas, University of Luxembourg, Luxembourg; Joel Grotz, SES S.A, Luxembourg; Bjorn Ottersten, University of Luxembourg, Luxembourg

MP8a2-4 Massively Concurrent NOMA: A Frame-Theoretic Design for Non-Orthogonal Multiple Access
Razvan-Andrei Stoica, Giuseppe Thadeu Freitas de Abreu, Jacobs University Bremen, Germany

MP8a2-5 Complex Gaussian SIMO Channel – Modeling and Cramer Rao Lower Bound for High SNR Estimation
Arshad Hussain, Muhammad Haris Jamil, University of Central Punjab, Pakistan

MP8a2-6 Memory Management in Successive-Cancellation-based Decoders for Multi-Kernel Polar Codes
Valerio Bioglio, Carlo Condo, Ingmar Land, Huawei Technologies SASU, France

MP8a2-7 Semi-Blind Signal Recovery in Impulsive Noise with L1-Norm PCA
Adam Gannon, University at Buffalo, United States; George Sklivanitis, Florida Atlantic University, United States; Panos Markopoulos, Rochester Institute of Technology, United States; Dimitris Pados, Stella Batalama, Florida Atlantic University, United States

MP8a2-8 Channel Modeling for Wireless Information and Power Transfer using Inductive Coupling
Tomohiro Arakawa, James Krogmeier, David Love, Purdue University, United States

Session MP8a3 Communication System Analysis

Chair: *Richard Wesel, UCLA*

1:30 PM–3:10 PM

MP8a3-1 Machine Learning Assisted Wiretapping
Karl-Ludwig Besser, Pin-Hsun Lin, Carsten Janda, Eduard Jorswieck, Technische Universität Dresden, Germany

MP8a3-2 Impact of Cooperation in Flow-Induced Diffusive Mobile Molecular Communication
Neeraj Varshney, Indian Institute of Technology Kanpur, India; Adarsh Patel, Syracuse University, United States; Werner Haselmayr, Johannes Kepler University Linz, Austria; Aditya K. Jagannatham, Indian Institute of Technology Kanpur, India; Pramod K. Varshney, Syracuse University, United States; Weisi Guo, University of Warwick, United Kingdom

MP8a3-3 Optimal Power Control for Superimposed Pilots in Uplink Massive MIMO Systems
Daniel Verenzuela, Emil Björnson, Andreas Bergström, Linköping University, Sweden

MP8a3-4 ZigZag Decodable Frameless ALOHA
Shun Ogata, Koji Ishibashi, University of Electro-Communications, Japan

MP8a3-5 Efficient Computation of Convolutional Decoder Reliability Without a CRC
Alexander Baldauf, Adam Belhouchat, Nathan Wong, Richard Wesel, University of California, Los Angeles, United States

MP8a3-6 Age of Information in Two-Hop Multicast Networks
Baturalp Buyukates, University of Maryland, United States; Alkan Soysal, Bahcesehir University, Turkey; Sennur Ulukus, University of Maryland, United States

MP8a3-7 Efficient Pole-Zero Modeling and Computation for the Nuttall Q-Function
James Ritcey, James Ritcey, University of Washington, United States

Session MP8a4 Signal Processing for GNSS and/or Localization with Terrestrial Networks II (Invited)

Co-Chairs: *Felix Antreich, ITA, Brazil and Gonzalo Seco-Granados, Universitat Autonoma de Barcelona*

1:30 PM–3:10 PM

MP8a4-1 Single-anchor, Multipath-assisted Indoor Positioning with Aliased Antenna Arrays
Thomas Wilding, Graz University of Technology, Austria; Stefan Grebien, Christian Doppler Laboratory for Location-aware Electronic Systems, Austria; Michael Rath, Erik Leitinger, Josef Kulmer, Graz University of Technology, Austria; Ulrich Mühlmann, NXP Semiconductors, Austria; Klaus Witrisal, Christian Doppler Laboratory for Location-aware Electronic Systems, Austria

MP8a4-2 Dual Kalman Filtering based Analysis of GNSS Data from Low Latitudes
Friederike Fohlmeister, German Aerospace Center (DLR), Germany; Felix Antreich, Josef A. Nossek, Federal University of Ceará, Brazil

MP8a4-3 Novel Solution for Multi-Connectivity 5G-mmW Positioning
Jani Saloranta, Giuseppe Destino, Antti Tolli, Henk Wymeersch, University of Oulu, Finland

MP8a4-4 5G mmWave Vehicular Tracking
Hyowon Kim, Hanyang University, Republic of Korea; Henk Wymeersch, Nil Garcia, Chalmers University of Technology, Sweden; Gonzalo Seco-Granados, Universitat Autònoma de Barcelona, Spain; Sunwoo Kim, Hanyang University, Republic of Korea

MP8a4-5 Unequal Error Protection for Cooperative Localization with Message Passing
Ronald Raulefs, Siwei Zhang, Armin Dammann, German Aerospace Center (DLR), Germany

MP8a4-6 Event-Based Communication Strategy for Collaborative Navigation with Signals of Opportunity
Joshua Morales, Zaher (Zak) Kassas, University of California, Riverside, United States

MP8a4-7 Low Resolution mmWave Radar: Bounds and Performance
Khurram U. Mazher, Amine Mezghani, Robert W. Heath Jr., University of Texas at Austin, United States

MP8a4-8 H-BLADE: A Bayesian Probabilistic GNSS/LTE-OTDOA Hybrid Localization Algorithm for Harsh Environments
Chunhua Geng, Nokia Bell Labs, United States; Robert Saxon, Nokia, United States; Howard Huang, Nokia Bell Labs, United States

Session TA1a Multicarrier Communications

Co-Chairs: *Maite Brandt-Pearce, University of Virginia and Jie Lian, University of Virginia*

TA1a-1 Reliable Low Resolution OFDM Receivers via Deep Learning 8:15 AM
Eren Balevi, Jeffrey Andrews, University of Texas at Austin, United States

TA1a-2 Magnitude-Phase Optical OFDM for IM/DD Communication Systems 8:40 AM
Jie Lian, Maite Brandt-Pearce, University of Virginia, United States

TA1a-3 Blind Index Modulation Detection for Pilot-Free Short-Packet Communications 9:05 AM
Jiwook Choi, Seunghoon Lee, Yunseo Nam, Namyoon Lee, Pohang University of Science and Technology, Republic of Korea

TA1a-4 Successive Self-Interference Cancellation in a Low-Complexity WCP-OFDM Radar Receiver 9:30 AM
Steven Mercier, Damien Roque, Stéphanie Bidon, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE-SUPAERO), Université de Toulouse, France

Session TA1b Radar-Communications RF Convergence (Invited)

Chair: *Dan Bliss, Arizona State University*

TA1b-1 Cooperative Radar and Communications Coexistence Using Reinforcement Learning 10:15 AM
Owen Ma, Alex Chiriyath, Andrew Herschfelt, Daniel Bliss, Arizona State University, United States

TA1b-2 Implications and Methods for Co-existing Automotive Radar and Communication Systems 10:40 AM
Zora Slavik, FZI Research Center for Information Technology, Germany; Oliver Bringmann, Wolfgang Rosenstiel, Eberhard-Karls-University of Tuebingen, Germany; Yonina Eldar, Israel Institute of Technology, Israel

TA1b-3 Generalized Likelihood Ratio Test Performance for Cooperative Radar-Communications 11:05 AM
Christ Richmond, Arizona State University, United States

TA1b-4 Joint Design of Communication and Radar Transceiver in Spectrum-Sharing Architectures 11:30 AM
Emanuele Grossi, Marco Lops, Luca Venturino, University of Cassino and Southern Latium, Italy

Session TA2a UAV Cellular Communications in 5G (Invited)

Chair: *Emil Björnson, Linköping University*

TA2a-1 Wireless Communications and Control for Swarms of Cellular-Connected UAVs 8:15 AM
Tengchan Zeng, Mohammad Mozaffari, Virginia Polytechnic Institute and State University, United States; Omid Semiari, Georgia Southern University, United States; Walid Saad, Virginia Polytechnic Institute and State University, United States; Mehdi Bennis, University of Oulu, Finland; Merouane Debbah, Huawei, France

TA2a-2 Learning to Rest: A Q-Learning Approach to Flying Base Station Trajectory Design with Landing Spots 8:40 AM
Harald Bayerlein, Rajeev Gangula, David Gesbert, EURECOM, France

TA2a-3 A Joint Optimization of Access and Backhaul links for UAV Networks 9:05 AM
Azade Fotouhi, University of New South Wales, Australia; Ming Ding, Data61 CSIRO, Australia; Mahbub Hassan, University of New South Wales, Australia

TA2a-4 Enhancing Physical Layer Security for NOMA Transmission in mmWave Drone Networks 9:30 AM
Nadisanka Rupasinghe, Yavuz Yapici, Ismail Guvenc, Huaiyu Dai, North Carolina State University, United States; Arupjyoti Bhuyan, Idaho National Laboratory, United States

Session TA2b Cell-Free and Distributed Massive MIMO Systems (Invited)

Chair: *Jiayi Zhang, Beijing Jiaotong University*

TA2b-1 A Weighted MMSE Approach to Amorphous Cell for Low-cost Distributed Massive MIMO 10:15 AM
Jide Yuan, Southeast University, China; Qi He, University of Electronic Science and Technology of China, China; Michail Matthaiou, Queen's University Belfast, British Virgin Islands; Shi Jin, Southeast University, China; Tony Quek, Singapore University of Technology and Design, Singapore

TA2b-2 Cell-Free Massive MIMO with Rician Fading: Estimation Schemes and Spectral Efficiency 10:40 AM
Özgecan Özdogan, Emil Björnson, Linköping University, Sweden; Jiayi Zhang, Beijing Jiaotong University, Sweden

TA2b-3 On the Performance of Cell-Free Massive MIMO in Ricean Fading 11:05 AM
Hien Quoc Ngo, Harsh Tataria, Michail Matthaiou, Queen's University Belfast, United Kingdom; Shi Jin, Southeast University, China; Erik G. Larsson, Linköping University, Sweden

TA2b-4 Access Point Location Design in Cell-Free Massive MIMO Systems 11:30 AM
Elina Nayebi, Bhaskar D. Rao, University of California, San Diego, United States

Session TA3a Graph Signal Processing

Chair: *Geert Leus, TU Delft*

TA3a-1 Observing Bandlimited Graph Processes from Subsampled Measurements 8:15 AM
Elvin Isufi, TU Delft, Netherlands; Paolo Banelli, University of Perugia, Italy; Paolo Di Lorenzo, Sapienza, University of Rome, Italy; Geert Leus, TU Delft, Netherlands

TA3a-2 Spread and Sparse: Learning Interpretable Transforms for Bandlimited Signals on Directed Graphs 8:40 AM
Rasoul Shafipour, Gonzalo Mateos, University of Rochester, United States

TA3a-3 Signal and Graph Perturbations via Total Least-Squares 9:05 AM
Elena Ceci, Sapienza, University of Rome, Italy; Yanning Shen, Georgios B. Giannakis, University of Minnesota, United States; Sergio Barbarossa, Sapienza, University of Rome, Italy

TA3a-4 Classification with Vertex Based Graph Convolutional Neural Networks 9:30 AM
John Shi, Jian Du, Jose Moura, Carnegie Mellon University - Pittsburgh, United States

Session TA3b Graph Signal Processing (Invited)

Chair: *Gonzalo Mateos, University of Rochester*

TA3b-1 On the Limits of Finite Time Distributed Consensus Through Graph Filters 10:15 AM
Mario Coutino, Elvin Isufi, Geert Leus, TU Delft, Netherlands

TA3b-2 Graph-based Semi Supervised Learning: A Sampling Perspective 10:40 AM
Rohan Varma, Jelena Kovačević, Carnegie Mellon University, United States

TA3b-3 Asynchronous Nonlinear Updates on Graphs 11:05 AM
Oguzhan Teke, P. P. Vaidyanathan, California Institute of Technology, United States

TA3b-4 Graph Gaussian Mixture Model Inference 11:30 AM
Hermina Petric Maretic, Pascal Frossard, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Session TA4a Optimization for Data Analytics

Chair: *Visa Koivunen, Aalto University*

TA4a-1 Gradient Variable Splitting Method with Convergence to Second-Order Stationary Solutions 8:15 AM
Songtao Lu, University of Minnesota - Twin Cities, United States; Jason Lee, Meisam Razaviyayn, University of Southern California, United States; Mingyi Hong, University of Minnesota - Twin Cities, United States

TA4a-2 Time Varying Optimization via Inexact Proximal Online Gradient Descent 8:40 AM
Rishabh Dixit, Amrit Singh Bedi, Ruchi Tripathi, Ketan Rajawat, Indian Institute of Technology Kanpur, India

TA4a-3 A Gradient Descent Approach for Incomplete Linear Systems 9:05 AM
Anna Ma, Claremont Graduate University, United States; Deanna Needell, University of California, Los Angeles, United States

TA4a-4 Scalable Statistical Inference using Distributed Bootstrapping and Iterative l1-Norm Minimization 9:30 AM
Emadaldin Mozafari-Majd, Visa Koivunen, Aalto University, Finland

Session TA4b Algorithms for Data Analytics

Chair: *Andrzej Tarczynski, University of Westminster*

TA4b-1 An Iterative DFT-based Approach to the Polynomial Matrix Eigenvalue Decomposition 10:15 AM
Fraser Coutts, Keith Thompson, Ian Proudler, Stephan Weiss, University of Strathclyde, United Kingdom

TA4b-2 Quantile Search with Time-Varying Search Parameter 10:40 AM
John Lipor, Portland State University, United States; Gautam Dasarathy, Rice University, United States

TA4b-3 High-Order Hybrid Stratified Sampling: Fast Uniform-Convergence Fourier Transform Estimation 11:05 AM
Mustafa Al-Ani, University of Exeter, United Kingdom; Andrzej Tarczynski, University of Westminster, United Kingdom; Bashar Ahmad, University of Cambridge, United Kingdom

TA4b-4 Robust Smoothing for State-Space Models with Unknown Noise Statistics 11:30 AM
Roozbeh Dehghannasiri, Xiaoning Qian, Edward Dougherty, Texas A&M University, United States

Session TA5a Machine Learning and Hardware Aspects

Chair: *Tokunbo Ogunfunmi, Santa Clara University*

TA5a-1 Efficient Reconfigurable Hardware Core for Convolutional Neural Networks 8:15 AM
Haonan Wang, Jun Lin, Nanjing University, China; Yi Xie, Bo Yuan, Rutgers University, United States; Zhongfeng Wang, Nanjing University, China

TA5a-2 Area-efficient K-Nearest Neighbors Design using Stochastic Computing 8:40 AM
Yi Xie, Chunhua Deng, Siyu Liao, Bo Yuan, City University of New York, United States

TA5a-3 Elasto-Net: An HDL Conversion Framework For Convolutional Neural Networks. 9:05 AM
Anaam Ansari, Tokunbo Ogunfunmi, Santa Clara University, United States

TA5a-4 Bayesian Belief Network Based Occupancy Assessment Framework 9:30 AM
Mohsin M Jamali, University of Texas of Permian Basin, United States; Golrokh Mirzaei, Ohio State University, United States

Session TA5b Array Processing for Coexistence of Radio Frequency Systems (Invited)

Chair: *Yimin Zhang, Temple University*

TA5b-1 Multiple-Antenna Multi-User Detector for Joint Radar and Communications Reception 10:15 AM
Daniel Bliss, Arizona State University, United States

TA5b-2 Physical Waveform Optimization for Multiple-Beam Multifunction Digital Arrays 10:40 AM
Patrick McCormick, Air Force Research Laboratory, United States; Shannon Blunt, University of Kansas, United States

TA5b-3 Additional DoF in Cooperative Radar-Communication Systems 11:05 AM
Marian Bica, Visa Koivunen, Aalto University, Finland

TA5b-4 Distributed MIMO Dual-Function Radar-Communication System with Optimized Resource Allocation 11:30 AM
Ammar Ahmed, Yimin D. Zhang, Temple University, United States

Session TA6a Tensor Decompositions for Biomedical Engineering (Invited)

Chair: *Ahmad Karfoul, Université de Rennes 1*

TA6a-1 Tensor-Based ECG Signal Processing Applied to Atrial Fibrillation Detection 8:15 AM
Simon Geirnaert, Griet Goovaerts, Sibasankar Padhy, Martijn Boussé, Lieven De Lathauwer, Sabine Van Huffel, Katholieke Universiteit Leuven, Belgium

TA6a-2 A New Coupled PARAFAC2 Decomposition for Joint Processing of Somatosensory Evoked Magnetic Fields and Somatosensory Evoked Electrical Potentials 8:40 AM
Yao Cheng, Kristina Naskovska, Martin Haardt, Ilmenau University of Technology, Germany; Theresa Götz, University Hospital Jena, Germany; Jens Haueisen, Ilmenau University of Technology, Germany

TA6a-3 Brain Source Localization using Constrained Low Rank Canonical Polyadic Decomposition 9:05 AM
Nasrin Taheri, University of Rennes 1, France; Xu Han, Southeast University, France; Ahmad Karfoul, University of Rennes 1, France; Karim Ansari-ASL, Shahid Chamran University of Ahvaz, Iran; Isabelle Merlet, Lotfi Senhadji, Laurent Albera, Amar Kachenoura, University of Rennes 1, France

TA6a-4 Temporal Stability of Block Term Decomposition in Noninvasive Atrial Fibrillation Analysis 9:30 AM
Pedro Marinho R. de Oliveira, Vicente Zarzoso, Université Côte d'Azur, CNRS, I3S Laboratory, France

Session TA6b Waveform Processing for 5G and Beyond (Invited)

Chair: *Mikko Valkama, Tampere University of Technology*

TA6b-1 FFT-Domain Signal Processing for Spectrally-enhanced CP-OFDM Waveforms in 5G New Radio 10:15 AM
Juha Yli-Kaakinen, Toni Levanen, Markku Renfors, Mikko Valkama, Tampere University of Technology, Finland; Kari Pajukoski, Nokia Bell Labs, Finland

TA6b-2 Filter-bank OFDM transceivers for 5G and beyond 10:40 AM
David Demmer, Commissariat à l'Énergie atomique et aux Énergies alternatives (CEA), France; Rostom Zakaria, Conservatoire National des Arts et Métiers (CNAM), France; Jean-Baptiste Doré, Commissariat à l'Énergie atomique et aux Énergies alternatives (CEA), France; Robin Gerzaguet, Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA), France; Didier Le Ruyet, Conservatoire National des Arts et Métiers (CNAM), France

TA6b-3 CP-Free OFDM Waveform with Alignment Signals 11:05 AM
Jehad M. Hamamreh, Istanbul Medipol University, Turkey; Z. Esat Ankarali, Huseyin Arslan, University of South Florida, United States

TA6b-4 Optimally Combining Active Interference Cancellation and FIR-Filtering for Spectral Shaping of Multicarrier Waveforms 11:30 AM
Xiaojie Wang, Simon Burkert, Stephan ten Brink, University of Stuttgart, Germany

Session TA7a Speech Processing

Chair: *Balu Santhanam, University of New Mexico*

TA7a-1 Speech Emotion Recognition with Data Augmentation and Layer-wise Learning Rate Adjustment 8:15 AM
Caroline Etienne, LIMSI, France; Guillaume Fidanza, Andrei Petrovskii, DreamQuark, France; Laurence Devillers, LIMSI, France; Benoit Schmauch, DreamQuark, France

TA7a-2 Large Deviation First Formant Demodulation Via Empirical Mode Decomposition And Multirate Frequency Transformations 8:40 AM
Wenjing Liu, Balu Santhanam, University of New Mexico, United States

TA7a-3 A New Feature Set for Masking-based Monaural Speech Separation 9:05 AM
Shadi Pirhosseinloo, Jonathan Scott Brumberg, University of Kansas, United States

TA7a-4 Bayesian Glottal Inverse Filtering and Vocal Tract Area Recovery for Articulatory Speech Synthesis 9:30 AM
Adarsh Venkataramani, Antonia Papandreou-Suppappola, Arizona State University, United States

Session TA7b Speech and Audio Technologies

Chair: *Gerald Schuller, TU Ilmenau*

TA7b-1 Sound Zones as an Optimal Filtering Problem 10:15 AM
Jesper Kjær Nielsen, Taewoong Lee, Jesper Rindom Jensen, Mads Græsbøll Christensen, Aalborg University, Denmark

TA7b-2 End-to-End Multimodal Speech Recognition 10:40 AM
Shruti Palaskar, Ramon Sanabria, Florian Metze, Carnegie Mellon University, United States

TA7b-3 On Musical Onset Detection via the S-Transform 11:05 AM
Nishal Silva, Sheffield Hallam University, United Kingdom; Chathuranga Weeraddana, Sri Lanka Institute of Information Technology, Sri Lanka; Carlo Fischione, KTH Royal Institute of Technology, Sweden

TA7b-4 Improving Understanding of Dysarthric Speech By Speech Comparison 11:30 AM
All-Waled Al-dulaimi, Stephanie Borrie, Todd Moon, Jacob Gunther, Utah State University, United States

Session TA8a1 Beamforming and Array-Based Estimation I

Chair: *Panos Markopoulos, Rochester Institute of Technology*

8:15 AM–9:55 AM

TA8a1-1 Omnidirectional Beamforming Base on Complete Complimentary Codes for Uniform Rectangular Array
Yi Jiang, Dongliang Su, Xin Wang, Fudan University, China

TA8a1-2 Direction-of-Arrival Estimation with Diversely Polarized Sparse Arrays
Benjamin Friedlander, University of California, Santa Cruz, United States

TA8a1-3 A Statistically Efficient Estimator for Co-array Based DoA Estimation
Saeid Sedighi, Bhavani Shankar Mysore R, Björn Ottersten, University of Luxembourg, Luxembourg

TA8a1-4 Time-Frequency Beamforming Adaptation for Micro Aerial Vehicle (MAV) Noise Suppression and Source Localization
Aprameya Satish, Georgia Institute of Technology, United States; Alessio Medda, David Alvord, Georgia Tech Research Institute, United States

TA8a1-5 5G-NR (New Radio) CSI Computation Algorithm and Performance
Bishwarup Mondal, Victor Sergeev, Avik Sengupta, Alexei Davydov, Intel Corporation, United States

TA8a1-6 Noncoherent Compressive Channel Estimation for mm-wave Massive MIMO
Maryam Eslami Rasekh, Upamanyu Madhow, University of California, Santa Barbara, United States

TA8a1-7 Determining Basis Vectors for Continuous Response Regions of a Uniform Rectangular Array with Applications to Two-Dimensional Nulling
Manuel Fernandez, Independent Researcher, United States; Kai-Bor Yu, Shanghai Jiao Tong University, China

TA8a1-8 Ambiguity Function Analysis for Dual-Function Radar Communications Using PSK Signaling
Indu Priya Eedara, Villanova University, United States; Aboulnasr Hassanien, Wright State University, United States; Moeness Amin, Villanova University, United States; Brian Rigling, Wright State University, United States

Session TA8a2 Machine Learning and Data Analytics

Chair: *Alexander Jung, Aalto University*

8:15 AM–9:55 AM

TA8a2-1 Discriminative Dictionary Learning for Mixture Component Detection with Application to RF Signal Recognition
Hao Chen, Seung-Jun Kim, University Maryland, Baltimore County, United States; Thomas Chatt, Lockheed Martin Corporation, United States

TA8a2-2 Graphical Modeling of High-Dimensional Time Series
Jitendra Tugnait, Auburn University, United States

TA8a2-3 Tensor Completion via the CP Decomposition
Fatoumata Sanogo, Carmeliza Navasca, University of Alabama at Birmingham, United States

TA8a2-4 Latent Group Structured Multi-task Learning
Xiangyu Niu, University of Tennessee, Knoxville, United States; Yifan Sun, University of British Columbia, United States; Jinyuan Sun, University of Tennessee, Knoxville, United States

TA8a2-5 Classifying Big Data over Networks via the Logistic Network Lasso
Henrik Ambos, Nguyen Tran, Alexander Jung, Aalto University, Finland

TA8a2-6 Decision Tree Design for Classification in Crowdsourcing Systems
Baocheng Geng, Qunwei Li, Pramod Varshney, Syracuse University, United States

TA8a2-7 Why ReLU Units Sometimes Die: Analysis of Single-Unit Error Backpropagation in Neural Networks
Scott Douglas, Southern Methodist University, United States

Session TA8a3 Array Processing and Multisensor Systems for Radar

Chair: *Aboulnasr Hassanien, Wright State University*

8:15 AM–9:55 AM

TA8a3-1 Impact of Motion Measurement Errors on the Multistatic Radar Resolution Ellipse
Duy Nguyen, Julie Jackson, Air Force Institute of Technology, United States

TA8a3-2 A Geometric View of Multistatic Radar Detection
Stephen D. Howard, Songsri Sirianunpiboon, Defence Science and Technology Group, Australia; Douglas Cochran, Arizona State University, United States

TA8a3-3 LTE Time-Varying Bandwidth Effects on Passive Radar
Forrest Taylor, James Lievsay, Air Force Institute of Technology, United States

TA8a3-4 A Combinatorial Approach to One-Bit Compressive Radar Sensing
Mohammad Mahdi Kazemi Esfeh, Mohammad Mahdi Naghsh, Sayed Jalal Zahabi, Isfahan University of Technology, Iran; Jian Li, University of Florida, United States

TA8a3-5 Single-snapshot DOA Estimation in MIMO Radar Using Fast Iterative Interpolated Beamforming
Fang Ann, Hamed Nosrati, Elias Aboutanios, University of New South Wales, Australia; Aboulnasr Hassanien Hassanien, Wright State University, United States

TA8a3-6 Phase-Coherent Extension of Beat Signals For High Resolution Ranging
Amro Lulu, Bijan Mobasseri, Villanova University, United States

TA8a3-7 Outer Bounds for MIMO Communicating Radars: Three-node Uplink
Cheng Li, Shanghai Jiao Tong University, China; Nate Raymondi, Rice University, United States; Bin Xia, Shanghai Jiao Tong University, China; Ashutosh Sabharwal, Rice University, United States

TA8a3-8 Outer Bounds for MIMO Communicating Radars: Three-node Downlink
Nate Raymondi, Rice University, United States; Cheng Li, Shanghai Jiao Tong University, China; Ashutosh Sabharwal, Rice University, United States

Session TA8b1 Source Localization

Chair: *Kristine Bell, Metron Scientific Solutions*

10:15 AM–11:55 AM

TA8b1-1 Local Calibration of Antenna Arrays
Benjamin Friedlander, University of California, Santa Cruz, United States

TA8b1-2 Source Localization and Room Mapping Using Information Derived from Independent Component Analysis
Todd Moon, Michael Schena, Jacob Gunther, Utah State University, United States

TA8b1-3 Geolocation From Received Signal Strength
Sam Whiting, Todd Moon, Jacob Gunther, Utah State University, United States

TA8b1-4 New Subspace-Based Method for Localization of Multiple Near-Field Signals and Statistical Analysis
Weiliang Zuo, Jingmin Xin, Nanning Zheng, Xi'an Jiaotong University, China; Akira Sano, Keio University, Japan

TA8b1-5 AOA Estimation Algorithm Based on Composite and Null Despreaders for Multiple GPS Signals
Suk-seung Hwang, Seokjoo Shin, Jae-young Pyun, Chung Ghiu Lee, Chosun Univerisity, Republic of Korea

TA8b1-6 A Bayesian Framework for Array-Based Scene Analysis and Tracking in Time-Varying Convolutive Scenarios
Herbert Buchner, University of Cambridge, United Kingdom; Karim Helwani, Starkey Hearing Technologies, United States; Bashar Ahmad, Simon Godsill, University of Cambridge, United Kingdom

TA8b1-7 LDL Decomposition-based Real-time FPGA Implementation of DOA Estimation
Ahmed Hussain, Prince Mohammad University, Saudi Arabia; Nizar Tayem, Texas A&M University, United States; Abdel-hamid Soliman, Staffordshire University, United Kingdom

TA8b1-8 An Alert-Confirm Approach to Track Confirmation
Vaughan Clarkson, Independent Consultant, Australia; Jason Williams, Defence Science and Technology Group, Australia

Session TA8b2 Beamforming and Array-Based Estimation II

Chair: *Kristine Bell, Metron Scientific Solutions*

10:15 AM–11:55 AM

TA8b2-1 On the Number of Co-Channel Signals Resolvable by an Antenna Array
Benjamin Friedlander, University of California, Santa Cruz, United States

TA8b2-2 On Improved Accuracy Chirp Parameter Estimation using the DFRFT with Application to SAR-based Vibrometry
Satish Mandal, Balu Santhanam, Majeed M. Hayat, University of New Mexico, United States

TA8b2-3 Array Shape Calibration using Low Rank Projections
Mark Wagner, Michael Bianco, Santosh Nannuru, Peter Gerstoft, University of California, San Diego, United States

TA8b2-4 Sinusoidal Parameter Estimation from Signed Measurements Obtained via Time-Varying Thresholds
Jiaying Ren, Tianyi Zhang, Jian Li, University of Florida, United States; Petre Stoica, Uppsala University, Sweden

TA8b2-5 Atomic Decomposition based Sparse Recovery for Space-Time Adaptive Processing
Yujie Gu, Yimin Zhang, Temple University, United States

TA8b2-6 Deep Learning for Seismic Event Detection of Earthquake Aftershocks
Lijun Zhu, Zhigang Peng, Jim McClellan, Georgia Institute of Technology, United States

TA8b2-7 Dual-Function MIMO Radar-Communications Via Frequency-Hopping Code Selection
William Baxter, Elias Aboutanios, University of New South Wales, Australia; Aboulnasr Hassanien, Wright State University, United States

TA8b2-8 Phase Noise Power Spectral Density Estimation in Cascaded Automotive Radar Transceiver MMICs
Michael Gerstmair, DICE Danube Integrated Circuit Engineering GmbH & Co. KG, Austria; Alexander Melzer, Infineon Technologies Austria AG, Austria; Alexander Onic, DICE Danube Integrated Circuit Engineering GmbH & Co. KG, Austria; Mario Huemer, Johannes Kepler University, Austria

Session TA8b3 Signal Processing for Medical Imaging

Chair: *Ahmad Karfoul, Université de Rennes 1*

10:15 AM–11:55 AM

TA8b3-1 Fusing Multimodal Microscopy Data for Improved Cell Boundary Estimation and Fluorophore Localisation of Pseudomonas Aeruginosa
Scott Ward, Niall Adams, Edward Cohen, Imperial College London, United Kingdom

TA8b3-2 Altered Structural Connection Between Hippocampus and Insula in Adolescent Major Depressive Disorder using DTI
Shu-Hsien Chu, Christophe Lenglet, Mindy Westlund Schreiner, Bonnie Klimes-Dougan, Kathryn Cullen, Keshab K. Parhi, University of Minnesota, United States

TA8b3-3 Bayesian Filtering for Spatial Estimation of Photo-Switching Fluorophores Imaged in Super-Resolution Fluorescence Microscopy
Lekha Patel, Edward Cohen, Imperial College London, United Kingdom

TA8b3-4 All-in-One Approach for Constrained All-Voxel Tri-Exponential IVIM Model Identification: Application to Diffusion-weighted MR Imaging in the Liver
Jie Lieu, Université de Rennes 1 & Southeast University, France; Giulio Gambarota, Université de Rennes 1, France; Huazhong Shu, Longyu Jiang, Southeast University, China; Benjamin Leporq, Olivier Beuf, Université de Lyon, France; Ahmad Karfoul, Université de Rennes 1, France

TA8b3-5 Classifying Adolescent Major Depressive Disorder using Linear SVM with Anatomical Features from Diffusion Weighted Imaging
Shu-Hsien Chu, Christophe Lenglet, Mindy Westlund Schreiner, Bonnie Klimes-Dougan, Kathryn Cullen, Keshab K. Parhi, University of Minnesota, United States

TA8b3-6 Optimal Bayesian Feature Selection with Bounded False Discovery Rate
Ali Foroughi pour, Lori A. Dalton, Ohio State University, United States

TA8b3-7 Optimum Degriding via Robust PCA in Digital Radiography
Yongjian Yu, University of Virginia, United States; Jue Wang, Union College, United States

Session TA8b4 Biomedical Signal Processing and Instrumentation

Chair: *Christopher Felton, Mayo Clinic*

10:15 AM–11:55 AM

TA8b4-1 Research on EEG Emotion Recognition Based on DWT-MSE
Qunfeng Niu, Jidong Zhou, Li Wang, Yanbo Hui, Lanfang Feng, Henan University of Technology, China

TA8b4-2 Study on Cardiopulmonary Activity Monitoring Using Doppler Radar with Hardware Imperfection
Wuyuan Li, North Carolina State University, United States; Prasad Shamain, Klaus Doppler, Nokia Bell Labs, United States

TA8b4-3 Direct RF Signal Processing For Heart-Rate Monitoring Using UWB Impulse Radar
Yu Rong, Daniel Bliss, Arizona State University, United States

TA8b4-4 Temporally Smoothed Wavelet Coherence for Multivariate Point Processes with Application to Neuron-Firing
Alexander Gibberd, Edward Cohen, Imperial College London, United Kingdom

TA8b4-5 Instantaneous Time-Frequency Features in Characterizing Ventricular Arrhythmias using Empirical Mode Decomposition
Matthew Hotradat, Krishnanand Balasundaram, Ryerson University, Canada; Stephane Masse, Krishnakumar Nair, Kumaraswamy Nanthakumar, Toronto General Hospital, Canada; Karthikeyan Umapathy, Ryerson University, Canada

TA8b4-6 A Least Squares Approach to Estimation of Far-field Voltage in Unipolar Electrograms in Atrial Fibrillation
Rupin Dalvi, Adrian Suszko, Sachin Nayyar, Vijay Chauhan, University Health Network, Canada

TA8b4-7 Frequency-Warped Cepstral Heatmaps for Deep Learning of Human Gait Signatures
Baris Erol, Villanova University, United States; Sevgi Gurbuz, University of Alabama, United States; Moeness Amin, Villanova University, United States

TA8b4-8 Stockwell Transform Detector For Photoplethysmography Signal Segmentation
Victoria S. Marks, Mayo Clinic Graduate School of Biomedical Sciences, United States; Christopher L. Felton, Robert Techentin, Barry K. Gilbert, Mayo Clinic, United States; Victor A. Convertino, US Army Institute of Surgical Research, United States; Michael J. Joyner, Timothy B. Curry, David R. Holmes III, Clifton R. Haider, Mayo Clinic, United States

Session TP1a 5G and Beyond (Invited)

Chair: *Markku Renfors, Tampere University Of Technology*

TP1a-1 5G New Radio (NR): Overview and Performance 1:30 PM
Amitabha (Amitava) Ghosh, Frederick Vook, Nokia Bell Labs, United States

TP1a-2 How Energy-Efficient can a Wireless Communication System Become? 1:55 PM
Emil Björnson, Erik G. Larsson, Linköping University, Sweden

TP1a-3 A Deep-Learning Framework for Power Allocation in Massive MIMO 2:20 PM
Luca Sanguinetti, University of Pisa, Italy; Alessio Zappone, CentraleSupélec, France; Merouane Debbah, Huawei France R&D, France

TP1a-4 User Association and Load Balacing for Massive MIMO through Deep Learning 2:45 PM
Alessio Zappone, CentraleSupélec, France; Luca Sanguinetti, University of Pisa, Italy; Merouane Debbah, Huawei R&D France, France

Session TP1b System and Transceiver Design for THz Communications (Invited)

Chair: *Markku Juntti, University of Oulu*

TP1b-1 Compressive Sensing for Indoor THz Channel Estimation 3:30 PM
Viktoria Schram, Anamaria Moldovan, Wolfgang H. Gerstacker, Friedrich-Alexander University Erlangen-Nürnberg, Germany

TP1b-2 Beamforming and Transceiver HW Design for THz Band 3:55 PM
Oskari Tervo, University of Oulu, Finland; Thomas Merkle, Fraunhofer Institute for Applied Solid State Physics, Germany; Janne Lehtomäki, Markku Juntti, University of Oulu, Finland

TP1b-3 Towards All-cigital Multigigabit mmWave Massive MIMO 4:20 PM
Mohammed Abdelghany, Ali Farid, Upamanyu Madhow, Mark Rodwell, University of California, Santa Barbara, United States

TP1b-4 Dynamic Beamforming Algorithms for Ultra-directional Terahertz Communication Systems Based on Graphene-based Plasmonic Nano-antenna Arrays 4:45 PM
Michael Andrello III, Air Force Research Laboratory, United States; Arjun Singh, University at Buffalo, United States; Ngwe Thawdar, Air Force Research Laboratory, United States; Josep Jornet, University at Buffalo, United States

Session TP2a Beam and Channel Tracking for Millimeter Wave MIMO Systems (Invited)

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

TP2a-1 Robust Beam Management for Mobility in mmWave Systems 1:30 PM
Salam Akoum, Andrew Thornburg, Xiaoyi Wang, Arunabha Ghosh, AT&T Labs, United States

TP2a-2 Tracking Sparse mmWave Channel under Time Varying Multipath Scatterers 1:55 PM
Veljko Boljanovic, Han Yan, Danijela Cabric, University of California, Los Angeles, United States

TP2a-3 Bayesian Channel Estimation and Tracking for Frequency-Selective Multi-User Air-to-Air Millimeter Wave MIMO Systems 2:20 PM
Javier Rodriguez-Fernandez, Nuria Gonzalez-Prelcic, University of Texas at Austin, United States

TP2a-4 Efficient Millimeter-Wave Beam Management Using Prior Knowledge of Wireless Channel 2:45 PM
Anfu Zhou, Beijing University of Posts and Telecommunications, China; Xinyu Zhang, University of California, San Diego, United States

Session TP2b Millimeter Wave MIMO

Chair: *Erik G. Larsson, Linköping University*

TP2b-1 Millimeter Wave Channel Estimation using Data-Aided DoA Estimation 3:30 PM
Sami Alzeer, Sulaiman Almatrudi, Hatim Bukhari, King Abdulaziz City for Science and Technology, Saudi Arabia; Yonghee Han, Yacong Ding, Bhaskar Rao, University of California, San Diego, Saudi Arabia

TP2b-2 Generative Adversarial Estimation of Channel Covariance in Vehicular Millimeter Wave Systems 3:55 PM
Xiaofeng Li, Ahmed Alkhateeb, Cihan Tepedelenlioglu, Arizona State University, United States

TP2b-3 Towards Robustness: Machine Learning for MmWave V2X with Situational Awareness 4:20 PM
Yuyang Wang, University of Texas at Austin, United States; Murali Narasimha, Huawei Technologies, United States; Robert Heath, University of Texas at Austin, United States

TP2b-4 Low Complexity Transform Coding for Millimeter Wave MIMO CSI Compression 4:45 PM
Brenda Vilas Boas, Nilma Fonseca, Aldebaro Klautau, Federal University of Para, Brazil; Nuria Gonzalez-Prelcic, University of Vigo, Spain

Session TP3a Wireless Autonomous Networks (Invited)

Co-Chairs: *Alejandro Ribeiro, University of Pennsylvania and Brian Sadler, Army Research Lab*

TP3a-1 Online Deep Learning in Wireless Communication Systems 1:30 PM
Mark Eisen, Clark Zhang, Luiz F. O. Chamon, Daniel D. Lee, Alejandro Ribeiro, University of Pennsylvania, United States

TP3a-2 Recent Advances in Learning to Optimize Wireless Resources 1:55 PM
Haoran Sun, Xiangyi Chen, University of Minnesota, United States; Qingjiang Shi, Tongji University, China; Mingyi Hong, University of Minnesota, United States; Xiao Fu, Oregon State University, United States; Nikos Sidiropoulos, University of Virginia, United States

TP3a-3 Convergence Rate of Distributed Consensus with Heterogeneous Delays 2:20 PM
Thinh Doan, Carolyn Beck, Rayadurgam Srikant, University of Illinois at Urbana-Champaign, United States

TP3a-4 Ordered Transmission for Efficient Wireless Autonomy 2:45 PM
Brian Sadler, Army Research Laboratory, United States; Rick Blum, Yicheng Chen, Lehigh University, United States

Session TP3b Wireless Networks

Chair: *Timothy Davidson;, McMaster University*

TP3b-1 Planning and Optimization of Cellular Networks Using Load-based Voronoi Algorithm 3:30 PM
Mohsen Abedi, Risto Wichman, Aalto university, Finland

TP3b-2 Simultaneous Learning and Placement (SLAP) of UAV-based Relay in Wireless Networks 3:55 PM
Omid Esrafilian, Rajeev Gangula, David Gesbert, EURECOM, France

TP3b-3 Multiple Access Binary Computational Offloading in the K-user Case 4:20 PM
Mahsa Salmani, Timothy N. Davidson, McMaster University, Canada

TP3b-4 Benefits of Coded Placement for Caching in Heterogeneous Networks 4:45 PM
Abdelrahman Ibrahim, Ahmed Zewail, Aylin Yener, Pennsylvania State University, United States

Session TP4a Sequential Analysis in Networked Data (Invited)

Chair: *Ali Tajer, Rensselaer Polytechnic Institute*

TP4a-1 Quickest Detection of Significant Events in Structured Networks 1:30 PM
Shaofeng Zou, Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States; Jian Li, Donald Towsley, University of Massachusetts Amherst, United States

TP4a-2 Quick Best Action Identification in Linear Bandit Problems 1:55 PM
Jun Geng, Harbin Institute of Technology, China; Lifeng Lai, University of California, Davis, United States

TP4a-3 Sequential Graph Scanning Statistic for Change-Point Detection 2:20 PM
Xi He, Yao Xie, Georgia Institute of Technology, United States; Sin-Mei Wu, Fan-Chi Lin, University of Utah, United States

TP4a-4 Learning from Dissimilarity 2:45 PM
Xiao Xu, Qing Zhao, Cornell University, United States; Ananthram Swami, United States Army Research Laboratory, United States

Session TP4b Taming Nonconvexity in High-Dimensional Statistical Inference (Invited)

Co-Chairs: *Yuejie Chi, Carnegie Mellon University and Yuxin Chen, Princeton University*

TP4b-1 Generalization Error Bounds with Probabilistic Guarantee for SGD in Nonconvex Optimization 3:30 PM
Yi Zhou, Yingbin Liang, Ohio State University, United States

TP4b-2 Nonconvex Matrix Completion without Regularization 3:55 PM
Cong Ma, Kaizheng Wang, Princeton University, United States; Yuejie Chi, Carnegie Mellon University, United States; Yuxin Chen, Princeton University, United States

TP4b-3 Nonconvex Matrix Completion: Assumption-free Local Minimum Analysis and Applications in Memory-efficient Kernel PCA 4:20 PM
Ji Chen, Xiaodong Li, University of California, Davis, United States

TP4b-4 Optimization-Based AMP for Phase Retrieval: the Impact of Initialization and l_2-Regularization 4:45 PM
Junjie Ma, Ji Xu, Arian Maleki, Columbia University, United States

Session TP5a Cognitive Radar (Invited)

Chair: *Ric Romero, Naval Postgraduate School*

TP5a-1 Waveform Optimization for Multi-target Detection with a Reinforcement Learning Approach 1:30 PM
Wang Li, Tsinghua University, China; Stefano Fortunati, Maria Sabrina Greco, Fulvio Gini, University of Pisa, Italy

TP5a-2 Aperture Reconfiguration for Multiple Target Tracking 1:55 PM
David Lucking, Nathan Goodman, University of Oklahoma, United States

TP5a-3 Jammer Nulling Adaptive Waveforms with Cognitive Radar for Aircraft RCS Recognition in Presence of Frequency Sweep and Base Jammers 2:20 PM
Jeanette Tan, Ric Romero, Naval Postgraduate School, United States

TP5a-4 Multiple Task Hierarchical Fully Adaptive Radar 2:45 PM
Kristine Bell, Metron, Inc., United States; Graeme Smith, Adam Mitchell, Ohio State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

Session TP5b Passive Imaging and Detection (Invited)

Chair: *Birsen Yazici, Rensselaer Polytechnic Institute*

TP5b-1 Performance Analysis for Passive Radar Estimation Using Non-Cooperative Illuminators 3:30 PM
Sandeep Gogineni, University of Dayton, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States; Michael Wicks, University of Dayton, United States

TP5b-2 Correlation-based Imaging of Fast Moving Objects using a Sparse Network of Passive Receivers 3:55 PM
Jacques Fournier, Ecole Normale Superieure, France; Josselin Garnier, Ecole Polytechnique, France; George Papanicolaou, Stanford University, United States; Chrysoula Tsogka, University of California, Merced, United States

TP5b-3 Phaseless Passive Radar Imaging using Generalized Wirtinger Flow 4:20 PM
Eric Mason, US Naval Research Laboratory, United States; Bariscan Yonel, Birsen Yazici, Rensselaer Polytechnic Institute, United States

TP5b-4 Fast Iterative Interpolated Beamforming for Interference DOA Estimation in GNSS Receivers Using Fully Augmentable Arrays 4:45 PM
Kenneth Mills, Fauzia Ahmad, Temple University, United States; Moeness Amin, Villanova University, United States

Session TP6a Statistical Analysis of Biomedical Data

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

TP6a-1 Capturing Common and Individual Components in fMRI Data by Discriminative Dictionary Learning 1:30 PM
Krishna Dontaraju, Seung-Jun Kim, Tulay Adali, University Maryland, Baltimore County, United States

TP6a-2 Sequential Sampling for Optimal Bayesian Classification of Sequencing Count Data 1:55 PM
Ariana Broumand, Siamak Zamani Dadaneh, Texas A&M University, United States

TP6a-3 Weak Mutual Information Between Functional Domains in Schizophrenia 2:20 PM
Mustafa Salman, University of New Mexico, Mind Research Network, United States; Victor Vergara, Eswar Damaraju, Mind Research Network, United States; Vince Calhoun, University of New Mexico, Mind Research Network, United States

TP6a-4 Quantifying Neural Information Flow in Response to Frequency and Intensity Changes in the Auditory Cortex 2:45 PM
Ketan Mehta, Baylor College of Medicine, United States; Joerg Kliewer, Antje Ihlefeld, New Jersey Institute of Technology, United States

Session TP6b Machine Learning Advances in Medical Imaging (Invited)

Chair: *Mehmet Akcakaya, University of Minnesota*

TP6b-1 Signal Recovery using Trained CNNs: Its Connection to Compressed Sensing and Application to Sparse-View CT 3:30 PM
Il Yong Chun, University of Michigan, United States; Ben Adcock, Simon Fraser University, Canada; Jeffrey Fessler, University of Michigan, United States

TP6b-2 Accelerated MR Imaging using Deep Convolutional Framelets 3:55 PM
Yoseob Han, Dongwook Lee, Jooyoung Lee, Jong Chul Ye, Korea Advanced Institute of Science & Technology, Republic of Korea

TP6b-3 Accelerated Simultaneous Multi-slice MRI using Subject-Specific Convolutional Neural Networks 4:20 PM
Chi Zhang, Steen Moeller, Sebastian Weingartner, Kamil Ugurbil, Mehmet Akcakaya, University of Minnesota, United States

TP6b-4 Recovery of Points on Bandlimited Surfaces: Application to Free Breathing and Ungated Cardiac MRI 4:45 PM
Sunrita Poddar, Qing Zou, Mathews Jacob, University of Iowa, United States

TP6b-5 Calibration Techniques for Model-based Ultrasound Imaging 5:10 PM
Pim van der Meulen, Delft University of Technology, Netherlands; Pieter Kruizinga, Johannes G. Bosch, Erasmuc Medical Center, Netherlands; Geert Leus, Delft University of Technology, Netherlands

Session TP7a Interference Cancellation for FDD and Full Duplex Communications (Invited)

Chair: *Mario Huemer, Johannes Kepler University Linz*

TP7a-1 Digital Cancellation of Passive Intermodulation in FDD Transceivers 1:30 PM
Muhammad Zeeshan Waheed, Pablo Pascual Campo, Dani Korpi, Adnan Kiayani, Lauri Anttila, Mikko Valkama, Tampere University of Technology, Finland

TP7a-2 Mixed-Signal Based Widely Linear Modulated Spur Interference Cancellation in LTE-CA RF Transceivers 1:55 PM
Ram Sunil Kanumalli, Intel Corporation Austria, Austria; Ahmed Elmaghraby, Intel Corporation Germany, Germany; Andreas Gebhard, Christian Motz, Thomas Paireder, Christina Auer, Mario Huemer, Christian Doppler Laboratory for Digitally Assisted RF Transceivers for Future Mobile Communications, Johannes Kepler University Linz, Austria

TP7a-3 An In-Band Full-Duplex Transceiver for Concurrent Communications and Environmental Sensing Operation 2:20 PM
Seyed Ali Hassani, KU Leuven, Belgium; Barend van Liempd, Karthick Parashar, IMEC, Belgium; Sofie Pollin, KU Leuven, Belgium

TP7a-4 Robust Frame Boundary Synchronization for In-Band Full-Duplex OFDM System 2:45 PM
Sergey Shaboyan, Alireza Behbahani, Ahmed Eltawil, University of California, Irvine, United States

Session TP7b Architectures for Massive MIMO Communication Systems (Invited)

Chair: *Joe Cavallaro, Rice University*

TP7b-1 A Modular Base Station Architecture for Massive MIMO with Antenna and User Scalability per Processing Node 3:30 PM
Erik Bertilsson, Oscar Gustafsson, Erik G. Larsson, Linköping University, Sweden

TP7b-2 A Fully Decentralized Architecture for Massive MIMO Processing 3:55 PM
Muris Sarajlić, Jesús Rodríguez Sánchez, Liang Liu, Fredrik Rusek, Ove Edfors, Lund University, Sweden

TP7b-3 RENEW: Programmable and Observable Massive MIMO Networks 4:20 PM
Rahman Doost-Mohammady, Oscar Bejarano, Lin Zhong, Joseph R. Cavallaro, Edward Knightly, Rice University, United States; Z. Morley Mao, University of Michigan, United States; Wei Wayne Li, Xuemin Chen, Texas Southern University, United States; Ashutosh Sabharwal, Rice University, United States

TP7b-4 Feedforward Architectures for Decentralized Precoding in Massive MU-MIMO Systems 4:45 PM
Kaipeng Li, Rice University, United States; Charles Jeon, Cornell University, United States; Joseph R. Cavallaro, Rice University, United States; Christoph Studer, Cornell University, United States

Session TP8a1 Network Dynamical Systems

Chair: *Usman A. Khan, Tufts University*

1:30 PM–3:10 PM

TP8a1-1 Product Adoption in Heterogeneous Networks: An Epidemiological Perspective
Fakhteh Saadatniaki, Usman A. Khan, Tufts University, United States

TP8a1-2 Max Consensus in the Presence of Additive Noise
Gowtham Muniraju, Cihan Tepedelenlioglu, Arizona State University, United States; Mahesh K Banavar, Clarkson University, United States; Sai Zhang, Andreas Spanias, Arizona State University, United States

TP8a1-3 Semi-Supervised Spectral Clustering using the Signed Laplacian
Thomas Dittrich, Peter Berger, Gerald Matz, Technische Universität Wien, Austria

TP8a1-4 Decentralized Clustering for Node-Variant Graph Filtering with Graph Diffusion LMS
Fei Hua, Université Nice Sophia Antipolis, France; Roula Nassif, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Cédric Richard, Université Nice Sophia Antipolis, France; Haiyan Wang, School of Marine Science and Technology, Northwestern Polytechnical University, China; Ali H. Sayed, Ecole Polytechnique Fédérale de Lausanne, Switzerland

TP8a1-5 Distributed Ridge Regression with Feature Partitioning
Cristiano Gratton, Naveen Venkategowda, Norwegian University of Science and Technology (NTNU), Norway; Reza Arablouei, CSIRO's Data 61, Australia; Stefan Werner, Norwegian University of Science and Technology (NTNU), Norway

TP8a1-6 Energy Efficient Head Node Selection for Load Balancing in a Heterogeneous Wireless Sensor Network
Soumya Ranjan Samal, Technical University of Sofia, Bulgaria; Shuvabrata Bandopadhaya, BML Munjal University, India; Ashutosh Pathy, Silicon Institute of Technology, India; Vladimir Poulkov, Technical University of Sofia, Bulgaria; Albena Mihovska, Aarhus University, Denmark

TP8a1-7 On the Comparative Performance of Information Provision Policies in Network Routing Games
Olivier Massicot, Cedric Langbort, University of Illinois at Urbana-Champaign, United States

TP8a1-8 Distributed Multiple Gaussian Filtering for Multiple Target Localization in Wireless Sensor Networks
Jordi Vilà-Valls, CTTC, Spain; Pau Closas, Northeastern University, United States; Mónica F. Bugallo, Stony Brook University, United States; Joaquín Míguez, Universidad Carlos III de Madrid, Spain

Session TP8a2 Communication Networks

Chair: *Cihan Tepedelenlioglu, Arizona State University*

1:30 PM–3:10 PM

TP8a2-1 Offloading Deadline-Constrained Cellular Traffic
Ahmed Ewaisha, Cihan Tepedelenlioglu, Arizona State University, United States

TP8a2-2 Delay-aware Conflict-free Scheduling for LTE-V, Sidelink 5G V2X Vehicular Communication, in Highways
Zahra Naghsh, Shahrokh Valaee, University of Toronto, Canada

TP8a2-3 Deep Q-Learning for Self-Organizing Networks Fault Management and Radio Performance Improvement
Faris Mismar, Brian Evans, University of Texas at Austin, United States

TP8a2-4 Randomized Edge-Assisted On-Sensor Information Selection for Bandwidth-Constrained Systems
Igor Burago, Marco Levorato, University of California, Irvine, United States

TP8a2-5 Stochastic Control of Power Supply in Data Centers
Georgios Rovatsos, Shaofeng Zou, Alejandro Dominguez-Garcia, Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States

TP8a2-6 Scheduling a Human Channel
Melih Bastopcu, Sennur Ulukus, University of Maryland, United States

TP8a2-7 Low-Complexity Distributed Set-Theoretic Decoders for Analog Fountain Codes
Renato Luis Garrido Cavalcante, Slawomir Stanczak, Fraunhofer Heinrich Hertz Institute/TU Berlin, Germany

TP8a2-8 Q-Learning Algorithm for VoLTE Closed-Loop Power Control in Indoor Small Cells
Faris Mismar, Brian Evans, University of Texas at Austin, United States

Session TP8a3 Signal and Image Processing and Implementations

Chair: *Tom Baeckstroem, Aalto University*

1:30 PM–3:10 PM

TP8a3-1 Analysis of Cascaded Signal Processing Operations Using Entropy Rate Power
Jerry Gibson, Hoontaek Oh, Kruthika Koratti Sivakumar, University of California, Santa Barbara, United States

TP8a3-2 Improving Object Tracking Accuracy in Video Sequences Subject to Noise and Occlusion Impediments by Combining Feature Tracking with Kalman Filtering
Mark Heimbach, Kamak Ebadi, Sally Wood, Santa Clara University, United States

TP8a3-3 Modeling and Characterization of Singular/Nonsingular Gaussian Conditionally Markov Sequences
Reza Rezaie, X. Rong Li, University of New Orleans, United States

TP8a3-4 Driver's Visibility Enhancement in Poor Weather-Vehicles Tracking and Distance Calculation
Marwan S. Alluhaidan, Ikhlas Abdel-Qader, Western Michigan University, United States

TP8a3-5 Hardware Implementation of Hirschman Optimal Transform Based on Distributed Arithmetic
Dingli Xue, Linda S. DeBrunner, Victor DeBrunner, Florida State University, United States

TP8a3-6 Fixed-Point Implementation of Discrete Hirschman Transform
Rajesh Thomas, Victor Debrunner, Linda Debrunner, Florida State University, United States

TP8a3-7 Resources and Performance Analysis of Machine Learning-Based Fast Motion Estimation Algorithm
Pavel Arnaudov, Tokunbo Ogunfunmi, Santa Clara University, United States

TP8a3-8 Comparison of Algorithms for Raw Handwritten Digits Recognition
Mohammad Bari, George Washington University, AT&T, United States; Nabeel Lughmani, AT&T, United States; Ambaw Ambaw, Milos Doroslovacki, George Washington University, United States

Session TP8a4 Autonomous Systems and Image Analysis

Chair: *Gerald Schuller, TU Ilmenau*

1:30 PM–3:10 PM

TP8a4-1 Vision-Based Aerial-to-Ground Localization in a Mars-Like Environment
Kamak Ebadi, Sally Wood, Santa Clara University, United States

TP8a4-2 Monoscopic Vision System for Lane Detection and Vehicle Tracking
Samuel Giatti, Roberto Freire, Pontifical Catholic University of Parana, Brazil

TP8a4-3 High Resolution Centroid Hirschman Descriptor For Moving Object Detection
Peng Xi, Victor DeBrunner, Florida State University, United States

TP8a4-4 Dynamic Group Interactions in Collaborative Learning Videos
Wenjing Shi, Marios Pattichis, Sylvia Celedon-Pattichis, Carlos LopezLeiva, University of New Mexico, United States

TP8a4-5 Information Distance based Photoshop Metric
Nima Nikvand, Ryerson University, Canada; Zhou Wang, University of Waterloo, Canada; Xavier Fernando, Wisam Farjow, Ryerson University, Canada

Session TP8b1 Physical Layer Security and Privacy

Chair: *Hua Sun, University of North Texas*

3:30 PM–5:35 PM

TP8b1-1 Mitigation of Pilot Spoofing Attack in Frequency Selective Channels
Jitendra Tugnait, Auburn University, United States

TP8b1-2 Detection of Pilot Contamination Attack in Massive MIMO System
Muhammad Zia, Muhammad Hasan, Awais Ahmed, Quaid-i-Azam University, Pakistan

TP8b1-3 The Capacity of Private Information Retrieval with Eavesdroppers
Qiwen Wang, KTH Royal Institute of Technology, Sweden; Hua Sun, University of North Texas, United States; Mikael Skoglund, KTH Royal Institute of Technology, Sweden

TP8b1-4 On Interplay Between Network Topology and Alternating CSIT for Multi-Receiver Wiretap Channel
Zohaib Awan, Rudolf Mathar, RWTH Aachen University, Germany

TP8b1-5 Downlink Non-Orthogonal Multiple Access Systems With an Untrusted Relay
Ahmed Arafa, Princeton University, United States; Wonjae Shin, Pusan National University, Republic of Korea; Mojtaba Vaezi, Villanova University, United States; H. Vincent Poor, Princeton University, United States

TP8b1-6 Noisy Private Information Retrieval
Karim Banawan, Sennur Ulukus, University of Maryland, College Park, United States

TP8b1-7 Fundamental Limits in Detecting Whether a Signal Has Been Quantized
Ke Li, Hossein Pishro-Nik, Dennis Goeckel, University of Massachusetts Amherst, United States

TP8b1-8 Interference Channels with Confidential Messages: Scaling up the Secure Degrees of Freedom with No CSIT
Jean de Dieu Mutangana, Ravi Tandon, University of Arizona, United States

Session TP8b2 Adaptive Signal Processing

Chair: *Azzedine Zerguine, KFUPM*

3:30 PM–5:35 PM

TP8b2-1 Essentially Separable 2-D FIR Adaptive Filters with Computationally Efficient Adaptive Fault Tolerance
William Jenkins, Pennsylvania State University, United States; Niranjan Yardi, ClearEdge3D, Inc., United States

TP8b2-2 Adaptive Multi-Trace Carving Based on Dynamic Programming
Qiang Zhu, Mingliang Chen, University of Maryland, College Park, United States; Chau-Wai Wong, North Carolina State University, United States; Min Wu, University of Maryland, College Park, United States

TP8b2-3 Linearly Constrained Wiener Filter Estimates For Linear Discrete State-Space Models
Eric Chaumette, Francois Vincent, ISAE-SUPAERO, France; Jordi Vila-Valls, CTTC, Spain

TP8b2-4 Convex Combination of Transform Domain LMS and Sparse LMS
Naveed Iqbal, Murwan Bashir, Azzedine Zerguine, King Fahd University of Petroleum & Minerals, Saudi Arabia

TP8b2-5 Low-Complexity Approximation to the Kalman Filter using the Dichotomous Coordinate Descent Algorithm
Raffaello Claser, Vítor Heloiz Nascimento, University of São Paulo, Brazil; Yuriy V. Zakharov, University of York, United Kingdom

TP8b2-6 On Self-Localization and Tracking with an Unknown Number of Targets
Pranay Sharma, Augustin-Alexandru Saucan, SYRACUSE UNIVERSITY, United States; Donald J. Bucci Jr., Lockheed Martin Corporation, United States; Pramod K. Varshney, SYRACUSE UNIVERSITY, United States

Session TP8b3 Detection, Estimation and Inference II

Chair: *Mojtaba Soltanalian, University of Illinois at Chicago*

3:30 PM–5:35 PM

TP8b3-1 An Alternating Optimization Algorithm for Two-Channel Factor Analysis with Common and Uncommon Factors
David Ramírez, Universidad Carlos III de Madrid, Spain; Ignacio Santamaria, Steven Van Vaerenbergh, Universidad de Cantabria, Spain; Louis L. Scharf, Colorado State University, United States

TP8b3-2 Constrained Best Linear and Widely Linear Unbiased Estimation
Oliver Lang, Alexander Onic, Danube Integrated Circuit Engineering GmbH & Co KG, Austria; Mario Huemer, Markus Steindl, Johannes Kepler University, Austria

TP8b3-3 Generalisation of Crozier's Single Tone Frequency Estimator to Arbitrary Data Lengths
Songsri Sirianunpiboon, Stephen D. Howard, Stephen D. Elton, Defence Science and Technology Group, Australia

TP8b3-4 Signal Recovery From 1-Bit Quantized Noisy Samples via Adaptive Thresholding
Shahin Khobahi, Mojtaba Soltanalian, University of Illinois at Chicago, United States

TP8b3-5 Mismatched Cramer-Rao Bounds for Variational Bayes Estimation with Application to Bilinear Models
Kalyana Gopala, Dirk Slock, EURECOM, France

TP8b3-6 Dependent Dirichlet Process Modeling and Identity Learning for Multiple Object Tracking
Bahman Moraffah, Antonia Papandreou-Suppappola, Arizona State University, United States

TP8b3-7 Explorations of Causality using the Information Matrix
Yuan Wang, Washington State University, United States; Louis Scharf, Colorado State University, United States

TP8b3-8 A Topological Approach to Understanding Location-Based Data
Carson McAbee, Naval Postgraduate School, United States; Max Wakefield, U.S. Naval Academy, United States; John Roth, James Scrofani, Naval Postgraduate School, United States

Session TP8b4 Communication Systems and Constraints

Chair: *Yao Xie, Georgia Institute of Technology*

3:30 PM–5:35 PM

TP8b4-1 Communication Efficient Signal Detection for Distributed Ambient Noise Imaging
Liyan Xie, Yao Xie, Georgia Institute of Technology, United States; Sin-Mei Wu, Fan-Chi Lin, University of Utah, United States; WenZhan Song, University of Georgia, United States

TP8b4-2 Time Synchronization in Wireless Sensor Networks based on Newton's Adaptive Algorithm
Azzedine Zerguine, Ramadan Abdul-Rashid, King Fahd University of Petroleum & Minerals, Saudi Arabia

TP8b4-3 Training-Based Joint Estimation of Channel and Antenna Impedance with Bias Reduction
Shaohan Wu, Brian Hughes, North Carolina State University, United States

TP8b4-4 On Distributed Computing with Heterogeneous Communication Constraints
Nishant Shakya, Fan Li, Jinyuan Chen, Louisiana Tech University, United States

TP8b4-5 A Learning Approach for Optimal Codebook Selection in Spatial Modulation Systems
Vidit Saxena, Baptiste Cavarec, Joakim Jalden, Mats Bengtsson, KTH Royal Institute of Technology, Sweden; Hugo Tullberg, Ericsson, Sweden

TP8b4-6 Multilevel MIMO Detection with Deep Learning
Vincent Corlay, Telecom ParisTech, France; Joseph J. Boutros, Texas A&M University, Qatar; Philippe Ciblat, Telecom ParisTech, France; Loic Brunel, Mitsubishi Electric R&D Centre Europe, France

TP8b4-7 Adaptive Detection of Structured Signals in Low-Rank Interference
Philip Schniter, Evan Byrne, Ohio State University, United States

Session WA1a Biologically Inspired Communications and Signal Processing (Invited)

Co-Chairs: *Urbashi Mitra, USC and Marcos Vasconcelos, USC*

WA1a-1 On the Entropy of Biological Sequences 8:15 AM
Hao Lou, Farzad Farnoud, University of Virginia, United States; Moshe Schwartz, Ben Gurion University, Israel

WA1a-2 Analysis of Quorum Sensing as a Networked Decision System 8:40 AM
Marcos Vasconcelos, Urbashi Mitra, University of Southern California, United States

WA1a-3 Using Detection Theory and Molecular Computation to Understand Signal Processing in Living Cells 9:05 AM
Chun Tung Chou, University of New South Wales, Australia

WA1a-4 Compression of High-Throughput Sequencing Data via Light Assembly 9:30 AM
Thomas Courtade, University of California, Berkeley, United States

Session WA1b Detection, Estimation and Inference I

Chair: *George Atia, University of Central Florida*

WA1b-1 Randomized Robust Matrix Completion for the Community Detection Problem 10:15 AM
Adel Karimian, Mostafa Rahmani, Andre Beckus, George Atia, University of Central Florida, United States

WA1b-2 Minimal Non-Uniform Sampling For Multi-Dimensional Period Identification 10:40 AM
Srikanth Tenneti, Vaidyanathan P. P., California Institute of Technology, United States

WA1b-3 Controlled Sensing for Composite Multihypothesis Testing with Application to Anomaly Detection 11:05 AM
Aditya Deshmukh, University of Illinois at Urbana-Champaign, United States; Srikrishna Bhashyam, Indian Institute of Technology Madras, India; Venugopal Veeravalli, University of Illinois at Urbana-Champaign, United States

WA1b-4 Identification Rates for Block-correlated Gaussian Sources 11:30 AM
Markus Flierl, Hanwei Wu, Qiwen Wang, KTH Royal Institute of Technology, Sweden

Session WA2a Uplink Signal Processing for MIMO Communications

Chair: *Antti Tölli, University of Oulu*

WA2a-1 Massive MU-MIMO-OFDM Uplink with Hardware Impairments: Modeling and Analysis 8:15 AM
Sven Jacobsson, Ericsson Research and Chalmers University of Technology, Sweden; Ulf Gustavsson, Ericsson Research, Sweden; Giuseppe Durisi, Chalmers University of Technology, Sweden; Christoph Studer, Cornell University, United States

WA2a-2 Detection and Channel Equalization with Deep Learning for Quantized Massive MIMO 8:40 AM
Aldebaro Klautau, Federal University of Para, Brazil; Nuria Gonzalez-Prelcic, University of Vigo, Spain; Amine Mezghani, Robert Heath, University of Texas at Austin, United States

WA2a-3 Multi-Layer Linear Processing for Uplink Massive MIMO Systems in the Presence of Unequal-Power Co-Channel Interferers 9:05 AM
Wahiba Abid, Sébastien Roy, University of Sherbrooke, Canada; Mohamed Lassaad Ammari, Laval University, Canada

WA2a-4 A Multiple Access Scheme for Non-Coherent Uplink MIMO Communications 9:30 AM
Khac-Hoang Ngo, Alexis Decurninge, Maxime Guillaud, Huawei Technologies France SASU, France; Sheng Yang, LSS, CentraleSupelec, France

Session WA2b Implementation and Deployment of Massive MIMO

Chair: *Luca Sanguinetti, University of Pisa*

WA2b-1 Multi-User MIMO Measurements in Urban-Macro Deployments with Cylindrical Antennas at 3.5 GHz 10:15 AM
Lars Thiele, Moritz Lossow, Thomas Wirth, Martin Kurras, Fraunhofer HHI, Germany

WA2b-2 Evaluation of Self-Calibration Techniques for NR Massive MIMO Systems 10:40 AM
Thomas Wirth, Lars Thiele, Thomas Haustein, Fraunhofer Heinrich Hertz Institute, Germany; Christian Schieblich, Oliver Braz, EnNet GmbH, Germany

WA2b-3 Subband Beamforming in Hybrid Massive MIMO Using Eigenbeams 11:05 AM
Chris Ng, Mihai Banu, Blue Danube Systems, United States

WA2b-4 Coordinated Multi-Point Massive MIMO Cellular Systems with Sectorized Antennas 11:30 AM
Shahram Shahsavari, New York University, United States; Alexei Ashikhmin, Bell Labs, Nokia, United States; Elza Erkip, Thomas Marzetta, New York University, United States

Session WA3a Smart Grids (Invited)

Chair: *Nikolaos Gatsis, University of Texas at San Antonio*

WA3a-1 Real-time Identification of Successive Events 8:15 AM
Wenting Li, Meng Wang, Rensselaer Polytechnic Institute, United States

WA3a-2 Learning to Infer Voltage Stability Margin in Power Systems 8:40 AM
Young-hwan Lee, University of Maryland, Baltimore County, United States; Yue Zhao, Stony Brook University, United States; Seung-Jun Kim, University of Maryland, Baltimore County, United States; Jiaming Li, Stony Brook University, United States

WA3a-3 On Static and Adaptive Policies for Chance-Constrained Voltage Regulation 9:05 AM
Krishna Sandeep Ayyagari, Nikolaos Gatsis, Ahmad Taha, Bing Dong, University of Texas at San Antonio, United States

WA3a-4 Learning in Power Distribution Grids under Correlated Injections 9:30 AM
Deepjyoti Deka, Los Alamos National Laboratory, United States; Sejun Park, Korea Advanced Institute of Science & Technology, Republic of Korea; Michael Chertkov, Los Alamos National Laboratory, United States

Session WA3b Distributed Learning and Adaptation over Networks (Invited)

Chair: *Cedric Richard, University of Nice Sophia-Antipolis*

WA3b-1 Decentralized Online Nonparametric Learning 10:15 AM
Alec Koppel, U.S. Army Research Laboratory, United States; Santiago Paternain, University of Pennsylvania, United States; Cedric Richard, University of Nice Sophia-Antipolis, France; Alejandro Ribeiro, University of Pennsylvania, United States

WA3b-2 Tomography of Large Adaptive Networks under the Dense Latent Regime. 10:40 AM
Augusto Santos, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Vincenzo Matta, University of Salerno, Italy; Ali Sayed, Ecole Polytechnique Fédérale de Lausanne, Switzerland

WA3b-3 Random Matrix Theory for Diffusion LMS Analysis 11:05 AM
Ibrahim Harrane, Rémi Flamary, Cédric Richard, Université Nice Sophia Antipolis, OCA, France; Romain Couillet, CentraleSupélec, France

WA3b-4 Secure Edge Computing in IoT via Online Learning 11:30 AM
Bingcong Li, Tianyi Chen, University of Minnesota, United States; Xin Wang, Fudan University, China; Georgios Giannakis, University of Minnesota, United States

Session WA4a Models and Algorithms for Big-Data Analytics (Invited)

Chair: *Konstantinos Slavakis, University at Buffalo, The State University of New York*

WA4a-1 The Optimization Landscapes of High-Dimensional Binary Regression with Applications to Massive MIMO 8:15 AM
Cheng Shi, Yue Lu, Harvard University, United States

WA4a-2 Stochastic Composite Convex Minimization with Affine Constraints 8:40 AM
Konstantinos Slavakis, University at Buffalo, The State University of New York, United States

WA4a-3 Distributed Nonconvex Optimization with Quantization 9:05 AM
Chang-Shen Lee, Nicolo Michelusi, Gesualdo Scutari, Purdue University, United States

WA4a-4 Graph-aware Weighted Hybrid ADMM for Fast Decentralized Optimization 9:30 AM
Meng Ma, Georgios B. Giannakis, University of Minnesota, United States

Session WA4b Information-theoretic Approaches to Machine Learning (Invited)

Chair: *Matthew Nokleby, Wayne State University*

WA4b-1 Understanding Generative Adversarial Networks via a Distance Metric 10:15 AM
Kaiyi Ji, Yi Zhou, Yingbin Liang, Ohio State University, United States

WA4b-2 On Optimal Training Statistics for Neural Network Based Channel Decoders 10:40 AM
Meryem Benammar, ISAE Supaero, France; Pablo Piantanida, CentraleSupélec, France

WA4b-3 Distributed Variational Inference -- An Information Theoretic View 11:05 AM
Iñaki Estella Aguerri, Huawei Technologies, France; Abdellatif Zaidi, Huawei Technologies and Université Paris-Est, France

WA4b-4 GAP: A Data-driven Approach to Information-theoretic Privacy 11:30 AM
Chong Huang, Arizona State University, United States; Peter Kairouz, Stanford University, United States; Lalitha Sankar, Arizona State University, United States

Session WA5a Waveform Optimization for MIMO/ Cognitive Radar

Chair: *Aboulnasr Hassanien, Wright State University*

WA5a-1 Minimax Design of Constant Modulus MIMO Waveforms 8:15 AM
Zhen Lin, Chinese University of Hong Kong, Shenzhen, China; Wenqiang Pu, Xidian University, China; Zhi-Quan Luo, Chinese University of Hong Kong, Shenzhen, China

WA5a-2 Joint Optimization of Waveform and Quantization in Spectral Congestion Conditions 8:40 AM
Wei Jiang, Alexander Haimovich, New Jersey Institute of Technology, United States

WA5a-3 MIMO Radar Beampattern Design Under Joint Constant Modulus and Orthogonality Constraints 9:05 AM
Khaled Alhujaili, Vishal Monga, Pennsylvania State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

WA5a-4 Association-Aware Radar Beamforming 9:30 AM
Urs Niesen, Jayakrishnan Unnikrishnan, Qualcomm Research, United States

Session WA5b Source Localization, Separation and Tracking

Chair: *Piya Pal, University of California San Diego*

WA5b-1 Joint Ranging and Clock Synchronization for a Dense Heterogeneous IoT Networks 10:15 AM
Tarik Kazaz, Mario Coutino Minguez, Geert Leus, Alle-Jan van der Veen, Gerard Janssen, Delft University of Technology, Netherlands

WA5b-2 Scheduling Variable Field-of-View Sensors for Tracking Multiple Objects 10:40 AM
Joao Cabrera, BAE Systems, United States

WA5b-3 Independent Component Analysis Based on Non-Polynomial Approximation of Negentropy: Application to MRS Source Separation 11:05 AM
Majd Saleh, Ahmad Karfoul, Amar Kachenoura, Laurent Albera, Lotfi Senhadji, Univ Rennes 1, Inserm, LTSI - UMR 1099, France

WA5b-4 On the Polarization Sensitivity of Antenna Arrays 11:30 AM
Benjamin Friedlander, University of California, Santa Cruz, United States

Session WA6a Signal Processing Advances in Neuroimaging

Chair: *George Atia, University of Central Florida*

WA6a-1 Absence Seizure Detection Using Ramanujan Filter Banks 8:15 AM
Srikanth Tenneti, Vaidyanathan P. P., California Institute of Technology, United States

WA6a-2 Periodicity Transforms for Multichannel and Multiclass Detection of Visual Evoked Potentials 8:40 AM
Pouria Saidi, George Atia, Azadeh Vosoughi, University of Central Florida, United States

WA6a-3 Spatio-Temporal Modeling of EEG Signals using Matrix Variate Distributions 9:05 AM
Shruti Sharma, Santanu Chaudhury, Jayadeva Prof, Indian Institute of Technology Delhi, India

WA6a-4 Constrained Tensor Decomposition Optimization with Applications to fMRI Data Analysis 9:30 AM
Bhaskar Sen, Keshab Parhi, University of Minnesota - Twin Cities, United States

Session WA6b In-band Full-duplex Wireless Communications (Invited)

Chair: *Risto Wichman, Aalto University*

WA6b-1 System-Level Analysis of Full-Duplex mmWave Cellular Networks 10:15 AM
Christodoulos Skouroumounis, Constantinos Psomas, Ioannis Krikidis, University of Cyprus, Cyprus

WA6b-2 Transferring the Full-Duplex Radio Technology from Wireless Networking to Defense and Security 10:40 AM
Karel Pärlin, Rantelon, Estonia; Taneli Riihonen, Tampere University of Technology, Finland; Risto Wichman, Aalto University, Finland; Dani Korpi, Nokia Bell Labs, Finland

WA6b-3 Full-duplex DOCSIS: A Modem Architecture for Wideband (1GHz) Self-interference Cancellation for Cable Modem Termination Systems (CMTS) 11:05 AM
Niranjan M Gowda, Rice University, United States; Xiaoshu Si, Huawei Technologies, China; Ashutosh Sabharwal, Rice University, United States

WA6b-4 Fairness and Delay in Heterogeneous Half- and Full-Duplex Wireless Networks 11:30 AM
Tingjun Chen, Columbia University, United States; Jelena Diakonikolas, Boston University, United States; Javad Ghaderi, Gil Zussman, Columbia University, United States

Session WA7a Speech Technologies (Invited)

Chair: *Gerald Schuller, TU Ilmenau*

WA7a-1 Speech Coding, Speech Interfaces and IoT - Opportunities and Challenges 8:15 AM
Tom Bäckström, Aalto University, Finland

WA7a-2 Estimation of the Noise Covariance Matrix for Rotating Sensor Arrays 8:40 AM
Alastair Moore, Wei Xue, Mike Brookes, Patrick Naylor, Imperial College London, United Kingdom

WA7a-3 Annoyance Model Driven Selective Active Noise Control 9:05 AM
Ritwik Giri, Karim Helwani, Tao Zhang, Starkey Hearing Technologies, United States

WA7a-4 Revisiting the Linear Prediction Analysis-by-Synthesis Speech Coding Paradigm using Real-time Convex Optimization 9:30 AM
Daniele Giacobello, Sonos Inc., United States; Manohar Murthi, University of Miami, United States; Tobias Lindstrøm Jensen, Mads Græsbøll Christensen, Aalborg University, Denmark

Session WA7b Computer Vision, Image and Video Analysis

Chair: *Florian Metze, Carnegie-Mellon University*

WA7b-1 Image Content Identification from CNNs with Sparse Sampling 10:15 AM
Allen Rush, Sally Wood, Santa Clara University, United States

WA7b-2 Image Completion with Discriminator Guided Context Encoder 10:40 AM
Fatih Altay, Senem Velipasalar, Syracuse University, United States

WA7b-3 3D Capsule Networks for Object Classification from 3D Model Data 11:05 AM
Ayesha Ahmad, Burak Kakillioglu, Senem Velipasalar, Syracuse University, United States

WA7b-4 Obstacle Detection and Identification with Portable Uncalibrated Patterned Light 11:30 AM
Maria Cornacchia, Senem Velipasalar, Yu Zheng, Burak Kakillioglu, Syracuse University, United States

Session WA8a1 Sparse Signal Processing

Chair: *Jamie Haddock, University of California, Davis*

8:15 AM–9:55 AM

WA8a1-1 Three-dimensional Super-resolution with Nonuniform Cutoff Frequencies
Wanshan Yang, Lijun Chen, Youjian (Eugene) Liu, University of Colorado Boulder, United States

WA8a1-2 Non-convex Approach to Binary Compressed Sensing
Sophie M. Fosson, Politecnico di Torino, Italy

WA8a1-3 Generalized Approximate Message Passing for Noisy 1-bit Compressed Sensing with Side-Information
Swatantra Kafle, Thakshila Wimalajeewa, Pramod K. Varshney, Syracuse University, United States

WA8a1-4 Sparse Recovery via Variational Bayesian Inference: Comparing Bernoullis-Gaussians-Inverse Gamma and Gaussians-Inverse Gammas Modeling
Mohammad Shekaramiz, Todd Moon, Jacob Gunther, Utah State University, United States

WA8a1-5 Addressing the Noise Variance problem in Sparse Bayesian Learning
Tharun Adithya Srikrishnan, Bhaskar Rao, University of California, San Diego, United States

WA8a1-6 A Bayesian Approach for Asynchronous Parallel Sparse Recovery
Alireza Zaeemzadeh, University of Central Florida, United States; Jamie Haddock, University of California, Davis, United States; Nazanin Rahnavard, University of Central Florida, United States; Deanna Needell, University of California, Los Angeles, United States

WA8a1-7 SAVED - Space Alternating Variational Estimation for Sparse Bayesian Learning with Parametric Dictionaries
Christo Kurisummoottil Thomas, Dirk Slock, EURECOM, France

Session WA8a2 Kernel Methods and Clustering

Chair: *John Lipor, Portland State University*

8:15 AM–9:55 AM

WA8a2-1 Nonlinear Discriminative Dimensionality Reduction of Multiple Datasets
Jia Chen, Gang Wang, Georgios Giannakis, University of Minnesota, United States

WA8a2-2 Graph Clustering using One-Bit Comparison Data
Naveed Naimipour, Mojtaba Soltanalian, University of Illinois at Chicago, United States

WA8a2-3 Clustering Quality Metrics for Subspace Clustering
John Lipor, Portland State University, United States; Laura Balzano, University of Michigan, United States

WA8a2-4 Kernel K-mace Clustering
Faizan Rahman, Soosan Beheshti, Ryerson University, Canada

WA8a2-5 Unsupervised Kernel Learning for Correlation Based Clustering
Akshay Malhotra, Kazi Shahid, Ioannis Schizas, University of Texas at Arlington, United States

WA8a2-6 Semi-supervised Spectral Clustering
Xiaoyi Mai, CentraleSupélec, Université Paris-Saclay, France; Romain Couillet, GIPSA-lab, University Grenoble-Alpes, France

WA8a2-7 Kernel Coherence Pursuit: A Manifold Learning-based Outlier Detection Technique
Mahlagha Sedghi, George Atia, Michael Georgiopoulos, University of Central Florida, United States

WA8a2-8 Locally Adaptive Kernel Estimation Using Sparse Functional Programming
Maria Peifer, Luiz Chamon, Santiago Paternain, Alejandro Ribeiro, University of Pennsylvania, United States

Session WA8a3 Machine Learning Applications

Chair: *Raviraj Adve, University of Toronto*

8:15 AM–9:55 AM

WA8a3-1 Policy Gradient for Observer Trajectory Planning with Application in Multi-target Tracking Problems
Aliakbar Gorji Daronkolaei, ThomsonReuters, Canada; Raviraj Adve, University of Toronto, Canada

WA8a3-2 Improving Monitoring of Participatory Civil Issue Requests through Optimal Online Classification
Daphney-Stavroula Zois, Christopher Yong, Charalampos Chelmis, Angeliki Kapodistria, Wonhyung Lee, University at Albany, SUNY, United States

WA8a3-3 Improved ISAR Imaging by Exploiting the Local Structures of the Target Scene
Lin Sun, Weidong Chen, Key Laboratory of Electromagnetic Space Information, Chinese Academy of Sciences, China

WA8a3-4 3D Deep Residual Learning for CT Image Denoising with Multi-GPU implementation
Amirkoushyar Ziabari, Dong Hye Ye, Purdue University, United States; Somesh Srivastava, Jean-Baptiste Thibault, General Electric Healthcare, United States; Ken Sauer, Notre Dame University, United States; Charles Bouman, General Electric Healthcare, United States

WA8a3-5 Moving Target Classification in Automotive Radar Systems Using Transposed Convolutional Networks
Sangtae Kim, Kwangjin Lee, Seoul National University, Republic of Korea; Seungho Doo, Hyundai Mobis Co., Republic of Korea; Byonghyo Shim, Seoul National University, Republic of Korea

WA8a3-6 Optimal Sequential Detection of Freeway Accidents
Yasitha Warahena Liyanage, Daphney-Stavroula Zois, Charalampos Chelmis, University at Albany, SUNY, United States

WA8a3-7 A Self-Organizing Map-Based Adaptive Traffic Light Control System with Reinforcement Learning
Ying-Cih Kao, Cheng-Wen Wu, National Tsing Hua University, Taiwan

Session WA8a4 Robust Methods in Multi-sensor Systems

Chair: *Fauzia Ahmad, Temple University*

8:15 AM–9:55 AM

WA8a4-1 On Robust Comparison of Multivariate Complex Random Signals
Jitendra Tugnait, Auburn University, United States

WA8a4-2 Detection of Swerling III-IV Rank-One Signals in Gaussian Noise with Unknown Statistics
Eric Chaumette, Francois Vincent, ISAE-SUPAERO, France; Guillaume Ginolhac, Polytech Annecy-Chambéry, France

WA8a4-3 Adaptive Feedback Cancellation for Hearing Aids Using Prediction-Error Method with Fixed Pole Kautz Filtering
Sahar Hashemgeloogerdi, Mark Bocko, University of Rochester, United States

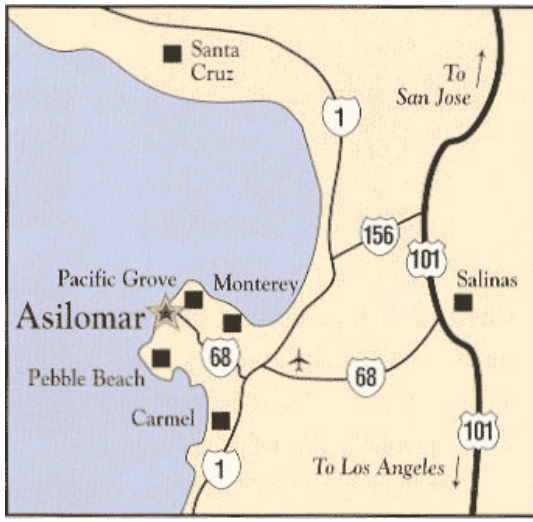
WA8a4-4 Robust Detection for Forward-Looking GPR in Rough-Surface Clutter Environments
Afief Dias Pambudi, Michael Fauß, Technische Universität Darmstadt, Germany; Fauzia Ahmad, Temple University, United States; Abdelhak M. Zoubir, Technische Universität Darmstadt, Germany

WA8a4-5 Effects of Mismatched Training on Adaptive Detection.
Ram Raghavan, Air Force Research Laboratory, United States

WA8a4-6 Time-Frequency Separation of Matched-Waveform Signatures of Coexisting Multimodal System
Vineet Sunil Gattani, Arizona State University, United States; John Kota, Systems & Technology Research, United States; Antonia Papandreou-Suppappola, Arizona State University, United States

WA8a4-7 Estimation of Compound K-distribution Modeling Parameters of Sea Clutter Reflectivity with Unknown Thermal Noise Power
Judith Northrop, Antonia Papandreou-Suppappola, Arizona State University, United States

Author List


Santa Cruz
To San Jose
1
156
101
Salinas
Pacific Grove
Monterey
Asilomar
68
68
Pebble Beach
Carmel
101
1
To Los Angeles

SS&C Conf. Corp.
P.O. Box 8236
Monterey, CA 93943