THIRTY-SEVENTH ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS AND COMPUTERS

November 9-12, 2003
Asilomar Hotel and
Conference Grounds

In Cooperation with

IEEE
Signal Processing Society ®

2003 Asilomar Conference
Code Ec/FA
Naval Postgraduate School
833 Dyer Road, Rm. 437
Monterey, CA 93943-5121

THIRTY-SEVENTH ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS & COMPUTERS

Organized in cooperation with

NAVAL POSTGRADUATE SCHOOL
Monterey, California

MISSION RESEARCH CORPORATION
Monterey, California

and

IEEE SIGNAL PROCESSING SOCIETY

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Welcome from the General Chairman

Graham A. Jullien, University of Calgary

It is my great pleasure to welcome you to the Thirty-Seventh Asilomar Conference on Signals, Systems and Computers. This conference is, to many of us who keep returning, a special event of the year. The conference grounds are truly a place for reflection and the conference itself has a unique atmosphere and format. For those of you who are attending the conference for the first time, I trust that the experience will be as special for you as it was for me many years ago. Here you have the chance to meet the top researchers in our field, but in a relaxed and friendly environment. For those who are returning, I am sure that the conference this year will as invigorating as the conferences you have attended in previous years.

For the opening Sydney Parker Memorial Lecture, we are fortunate to have a keynote address by Prof. J. G. McWhirter, FRS, FREng, who will talk about developments in sensor array processing, a topic that has been of considerable interest to Asilomar attendees over many years. Prof. McWhirter has worked as a research scientist at the Royal Signals and Radar Establishment in Malvern, UK, since 1973, and his pioneering research is well-known to many of us. He will bring new insights to this research area along with examples to application areas as diverse as digital communications and medical diagnostics.

We received a record number of paper submissions to the 2003 conference, which is particularly heartening considering the general reduction in travel over the past two years. This year has also seen the maturing of the automated electronic submission system, and I would particularly like to thank Mike Matthews and Lance Cotton for their sterling work in getting the system up and running in time for the paper submissions. This year will also see the return of the student paper contest, and this is being organized by Mike Soderstrand and Scott Acton.

My special thanks, however, are reserved for the Program Chair, Mike Schulte, of the University of Wisconsin, who has done an outstanding job in organizing this year's program of 44 lecture sessions and 16 poster sessions. He assembled a first class team of technical area chairs and they have provided reviewing and organizational skills along with over 170 invited papers from experts in their technical areas. The most demanding job in organizing a technical conference is that of the Program Chair, and Mike has spent countless hours in putting together a program that will appeal to all attendees, whether from the academic world or industry. I would also like to thank the many other people, including the conference steering committee, the conference administrative committee and the faculty and staff of the Naval Postgraduate School, who dedicate themselves, year after year, to organizing this special conference.

Graham Jullien
University of Calgary, July 2003

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2003 Asilomar Conference Session Schedule

Sunday Afternoon, November 9

2:00 - 7:00 PM	Registration – Main Lodge
7:00 - 9:00 PM	Welcoming Reception and Student Paper Contest Poster Session at Asilomar

Monday Morning, November 10

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

10:15 - 12:00 PM MORNING SESSIONS

MA1b	Signal Representations and Spectral Analysis Techniques	Ralph Hippenstiel
MA2b	Adaptive Communication Systems	Aylin Yener
MA3b	Radar Array Processing	Edward Baranoski
MA4b	EDAC – I	Naresh Shanbhag
MA5b	Document Image Processing	Katrin Berkner
MA6b	DSP Implementations	Ken Lever
MA7b	Future Wireless Receivers	Gri Mandyam

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

Monday Afternoon, November 10

1:30 - 5:10 PM AFTERNOON SESSIONS

MP1a	CDMA – I	Pranish Sinha
MP1b	Synchronization	Fred Harris
MP2	Applications of Adaptive Filtering in Communication Systems	Balu Santhanan
MP3	Array Processing for Wireless Communications	Brian Sadler
MP4	Narrowband/Wideband Speech and Audio Coding	Jerry Gibson
MP5	Mathematical Models in Image Processing	Rob Nowak
MP6a	Multimedia Processing	Ruby Lee
MP6b	Security Processing	Ruby Lee
MP7	Biomedical Signal Processing	Neeraj Magotra
MP8a1	CDMA – II (Poster)	Paul Cotae
MP8a2	OFDM and Multicarrier (Poster)	Jim Schroeder
MP8a3	Topics in Speech and Audio Processing and Communications (Poster)	Keith Teague
MP8b1	Advanced Algorithms for Adaptive Signal Processing (Poster)	James Zeidler
MP8b2	Adaptive Technologies for Communication Systems (Poster)	Doug Jones

Monday Evening, November 10

6:30 - 9:30 PM Conference Cocktail/Social – Merrill Hall

2003 Asilomar Conference Session Schedule
(continued)

Tuesday Morning, November 11

7:30 - 9:00 AM Breakfast – Crocker Dining Hall
8:00 AM - 17:00 PM Registration

8:30 AM - 12:10 PM MORNING SESSIONS

TA1	Modulation and Detection Techniques	Wade Lowdermilk
TA2	Intelligent Hearing Aids	Chris Schmitz
TA3	Sonar and Acoustical Array Processing	John Tague
TA4	Low Rank Signal Processing Methods with Applications	Rangaswamy Muralidhar & Ivors P. Kirsteins
TA5	Distributed Methods in Image and Video Coding	Kannan Ramchandran
TA6a	VLSI Implementations	David Harris
TA6b	FPGA Implementations	Chris Dick
TA7a	Adaptive Signal Processing	David Anderson
TA7b	Radar & Sonar Signal Processing	Armin Doerry
TA8a	MIMO/Space-Time Coding (Poster)	Michael Clark
TA8b1	Communications Signal Processing (Poster)	Majid Ahmadi
TA8b2	Multisensor/Multirate Signal Processing (Poster)	Robert Barsanti

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

Tuesday Afternoon, November 11

1:30 - 5:10 PM AFTERNOON SESSIONS

TP1	Ultra Wideband – I	Mikko Valkama
TP2	A European Perspective on Adaptive Filters in Communications	Markus Rupp
TP3	Biological Applications of Signal Processing	Alfred Hero
TP4a	The Robust Adaptive Beamformer Bakeoff	Michael Zatman
TP4b	New Tools, Techniques, and Strategies for use in Education	Sally Wood
TP5	Perceptual Models in Image and Video Processing	Sheila Hemami
TP6	Computer Arithmetic	Earl E. Swartzlander
TP7	Energy Efficient DSP Systems	Rob Brennan
TP8a1	Image and Video Coding Systems (Poster)	Pamela Cosman
TP8a2	Image Processoing & Scene Analysis (Poster)	Brian Evans
TP8b1	Implementation and Performance Bounds (Poster)	Zhengyuan Xu
TP8b2	Networks (Poster)	Daniel Gisselquist

Tuesday Evening, November 11

8:00 - 10:00 PM Bon Fire

2003 Asilomar Conference Session Schedule
(continued)

Wednesday Morning, November 12

7:30 - 9:00 AM Breakfast – Crocker Dining Hall
8:00 AM - 12:00 PM Registration

8:30 AM - 12:10 PM MORNING SESSIONS

WA1a	Ultra Wideband – II	Robert Scholtz
WA1b	EDAC – II	Todd Moon
WA2	MIMO/Space-Time Coding – II	Babak Hassibi
WA3	Array Processing Foundations	Todd McWhorter
WA4	Topics in Speech Recognition	Robert Nickel
WA5	Medical Image Coding	William Karl
WA6a	Still Image Coding	Martin Boliek
WA6b	Image De-noising	Onur Guleyuz
WA7a	Multimedia Signal Processing	Darnell Moore
WA7b	Co-operative Analog-Digital Signal Processing	Paul Hasler
WA8a1	Applied Signal Processing (Poster)	Linda DeBrunner
WA8a2	Applied Adaptive Signal Processing (Poster)	Neeraj Magotra
WA8b1	Application Oriented Processing (Poster)	Neil Burgess
WA8b2	Numerical Processing (Poster)	James Stine

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

2003 Asilomar Conference Session Schedule

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

Monday, November 10

CONFERENCE OPENING AND PLENARY SESSION 8:30 – 9:45 AM

1. Welcome from the General Chairperson:

Prof. Graham Jullien
University of Calgary

2. Session MA1a Sidney Parker Memorial Lecture for the 2003 Asilomar Conference

Prof. J. G. McWhirter, FRS, FREng
QinetiQ, Ltd.
Malvern Technology Centre
Malvern, England

Developments in Sensor Array Signal Processing

Abstract
In this talk I will focus on the topic of sensor array signal processing since that has been my main area of research over the years. I will start with a brief historical overview into the development of algorithms and architectures for adaptive beamforming. This is an important technique which has found application in numerous areas ranging from radar and sonar to mobile communications and hearing aids.

I will then go on to discuss some recent developments and current trends. In particular, I want to draw attention to an important trend from adaptive beamforming to blind signal separation, from principal component analysis (PCA) to independent component analysis (ICA) and from second order statistics (SOS) to higher order statistics (HOS). I would like to point out the convergence which I see between this area and that of artificial neural networks.

Blind signal separation is a relatively new technique which has already found application in several areas including digital communications and medical diagnostics (ECG and EEG). I will describe some of the progress that has already been made in the context of instantaneous mixing and then discuss the challenge of extending the technique to convolutive mixtures.

Professional Biography

John McWhirter gained a First Class Honours degree in Mathematics (1970) and a Ph.D. in Theoretical Physics (1973) from the Queen's University of Belfast. Since then he has worked as a research scientist at the Royal Signals and Radar Establishment in Malvern. This subsequently became part of the Defence Evaluation and Research Agency and, most recently, QinetiQ, Ltd.

He has been carrying out research on adaptive signal processing for sensor arrays since 1980. This has been applied to a wide variety of systems ranging from radar, sonar and communications to medical diagnostic techniques such as ECG and EEG. He has recently been working on techniques for broadband adaptive beamforming and blind signal separation.

Prof. McWhirter is currently a Senior Fellow in the Advanced Signal Processing Group at QinetiQ, a visiting professor in Electrical Engineering at the Queen's University of Belfast and also at the University of Wales in Cardiff. He was elected as a Fellow of the Royal Academy of Engineering in 1996 and the Royal Society in 1999. He has been serving as President of the Institute of Mathematics and its Applications (IMA) since January 2002.

Program of 2003 Asilomar Conference on Signals, Systems, and Computers

Technical Program Chairman
Prof. Michael Schulte
University of Wisconsin-Madison

Track 1 - Communication Systems and Networks

Session MA1b Signal Representations and Spectral Analysis Techniques

Chair: *Ralph Hippenstiel*

MA1b-1 Information content based signal characterization and classification 10:15 AM
Shubha Kadambe, Qin Jiang, HRL Laboratories, LLC

MA1b-2 Signal processing models for discrete-time self-similar and multifractal processes 10:40 AM
Raghuveer Rao, Rochester Institute of Technology

MA1b-3 Time-frequency Analysis in Search of an Acoustic Signature of a Wake Vortex 11:05 AM
Nurgun Erdol, Florida Atlantic University

MA1b-4 Spectral Sharing Across 2G-3G Systems 11:30 AM
Marco Michelini, Università degli Studi di Firenze; Samer Hijazi, Carl Nassar, Zhiqiang Wu, Colorado State University

Track 2 - Adaptive Systems and Processing

Session MA2b Adaptive Communication Systems

Chair: *Aylin Yener*

MA2b-1 Adaptive MIMO Antenna Selection 10:15 AM
Inaki Berenguer, Xiaodong Wang, Columbia University; Vikram Krishnamurthy, University of British Columbia

MA2b-2 Baud Rate Timing Recovery and Slicer Threshold Estimation for Adaptive Dispersion Compensation of Fiber Optical Channels 10:40 AM
Orhan Coskun, Santel Networks; Keith Chugg, University of Southern California

MA2b-3 Joint Space-Time Interference Cancellation and Channel Shortening 11:05 AM
Roopsha Samanta, Robert Heath, Brian Evans, University of Texas, Austin

MA2b-4 Further Results on Adaptive Cell Sectorization with Multiuser Detection 11:30 AM
Changyoon Oh, Aylin Yener, The Pennsylvania State University

Track 3 - Array Processing and MIMO

Session MA3b Radar Array Processing

Chair: *Edward Baranoski*

MA3b-1 A Structured Least-Squares Approach to Blind Channel Identification and Equalization 10:15 AM
Jacob Gunther, Todd Moon, Utah State University

MA3b-2 Multiresolution GMTI Radar 10:40 AM
Joseph Guerci, Allan Steinhardt, Defense Advanced Research Projects Agency (DARPA)

MA3b-3 Multiple-Input Multiple-Output (MIMO) Radar and Imaging: Degress of Freedom and Resolution 11:05 AM
Daniel Bliss, MIT Lincoln Laboratory

MA3b-4 Joint Space-Time Interpolation for Bistatic STAP 11:30 AM
Vijay Varadarajan, Jeffrey Krolik, Duke University

Track 1 - Communication Systems and Networks

Session MA4b EDAC-I

Chair: *Naresh Shangbhag*

MA4b-1 Performance Evaluation of One-way Communication using Block Codes 10:15 AM
Hyeon-Cheol Lee, Tae Sik Kim, KARI (Korea Aerospace Research Institute)

MA4b-2 Efficient Encoding of Cycle Codes: A Graphical Approach 10:40 AM
Jin Lu, Jose M. F. Moura, Haotian Zhang, Carnegie Mellon University

MA4b-3 Effective ARQ Protocols Using Adaptive Modulation and Symbol Mapping Diversity 11:05 AM
Harvind Samra, Zhi Ding, University of California, Davis

MA4b-4 Accelerating the Convergence of Message Passing on Loopy Graphs Using Eigenmessages 11:30 AM
Todd Moon, Jake Gunther, Ojas Chauhan, Utah State University

Track 5 - Image and Video Processing

Session MA5b Document Image Processing

Chair: *Katrin Berkner*

MA5b-1 Reflowable Document Images 10:15 AM
Thomas Breuel, Palo Alto Research Center

MA5b-2 Conversion of PDF Documents into HTML: A Case Study of Document Image Analysis 10:40 AM
Fuad Rahman, Hassan Alam, BCL Technologies, Inc.

MA5b-3 Extraction, Description and Application of Multimedia Using MPEG-7 11:05 AM
Ana Benitez, Shih-Fu Chang, Columbia University

MA5b-4 Linking Presentation Documents using Image Analysis 11:30 AM
Berna Erol, Jonathan J. Hull, Ricoh Innovations - California Research Center

MA5b-5 Resolution-sensitve document image analysis for document repurposing 11:55 AM
Kathrin Berkner, Edward L. Schwartz, Ricoh Innovations, Inc.

Track 6 - Architectures and Implementations

Session MA6b DSP Implementations

Chair: *Ken Lever*

MA6b-1 Logarithmic number system and floating-point implementations of a well-conditioned RLS estimation algorithm on FPGA 10:15 AM
Barry Lee, Ken Lever, University of Wales, Cardiff

MA6b-2 Finite precision implementation of LDPC coded M-ary modulation over wireless channels 10:40 AM
Manyuan Shen, Huaning Niu, Hui Liu, James Ritcey, University of Washington

MA6b-3 Restoration of double-impulse sampled signals at one-half the Nyquist rate 11:05 AM
Jim Schroeder, Sanjeev Naguleswaran, Mark Rice, DSpace Pty Ltd; Steve Collins, University of Iowa

MA6b-4 Blind Signal Separation of Convolutive Mixtures 11:30 AM
John McWhirter, P. D. Baxter, QinetiQ Ltd

Track 7 - Signal Processing Algorithms and Applications

Session MA7b Future Wireless Receivers

Chair: *Gri Mandyam*

MA7b-1 Linear-Aided Decision-Feedback Equalization for the CDMA Downlink 10:15 AM
Laurence Mailaender, Lucent Technologies, Bell Labs; John Proakis, Northeastern University

MA7b-2 An Efficient Sub-carrier and Rate Allocation Scheme for M-QAM Modulated Uplink OFDMA Transmission 10:40 AM
Sushanta Das, University of Texas, Dallas; Giridhar Mandyam, Nokia Research Center; Mohammad Saquib, University of Texas, Dallas

MA7b-3 Efficient Linear Equalization for High Data Rate Downlink CDMA Signaling 11:05 AM
Jianzhong (Charlie) Zhang, Tejas Bhatt, Giridhar Mandyam, Nokia Research Center

MA7b-4 Performance Analysis and Constituent Code Design for Space-Time Turbo Coded Modulation over Fading Channels 11:30 AM
Djordje Tujkovic, University of Oulu

Track 1 - Communication Systems and Networks

Session MP1a CDMA-I

Chair: *Pranish Sinha*

MP1a-1 Improved Rake Finger Time-Tracking for DS-CDMA Systems — 1:30 PM
Fred Harris, San Diego State University; Pranesh Sinha, Texas Instruments, Inc.

MP1a-2 Enhanced Per-Carrier Processing for MC-CDMA Downlink — 1:55 PM
Mikko Valkama, Tobias Hidalgo Stitz, Markku Renfors, Tampere University of Technology

MP1a-3 Linear Complexity Multiuser Detection using Joint Successive Interference Cancellation — 2:20 PM
Ananya Sen Gupta, Andrew Singer, University of Illinois, Urbana-Champaign

MP1a-4 Linear Hybrid Interference Cancellation for DS/CDMA Signals — 2:45 PM
Richard Cagley, John Shynk, University of California, Santa Barbara

Track 1 - Communication Systems and Networks

Session MP1b Synchronization

Chair: *Fred Harris*

MP1b-1 Optimization of Delay Tracking Loops for Binary Modulated Systems — 3:30 PM
Meng-hsuan Chung, Robert A. Scholtz, University of Southern California

MP1b-2 Asymptotic Performance Analysis of a Blind Algorithmfor Signal Parameter Estimation — 3:55 PM
Valentina De Angelis, Luciano Izzo, Antonio Napolitano, Mario Tanda, Universita` di Napoli Federico II

MP1b-3 Analytical and Experimental studies on carrier frequency offset estimation algorithms for OFDM systems — 4:20 PM
Uf Tureli, Krishna Madhavan Pillai, Stevens Institute of Technology

MP1b-4 Blind Symbol Timing and Frequency Offset Estimation — 4:45 PM
Mario Tanda, Universita` di Napoli Federico II

Track 2 - Adaptive Systems and Processing

Session MP2 Applications of Adaptive Filtering in Communication Systems

Chair: *Balu Santhanam*

MP2-1 Multi-Antenna Adaptive Modulation with Transmit-Beamforming based on Bandwidth-Constrained Feedback — 1:30 PM
Pengfei Xia, Shengli Zhou, Georgios B. Giannakis, University of Minnesota

MP2-2 A Blind Interference Canceler for GPS Signals Based on the Constant Modulus Array — 1:55 PM
Suk-seung Hwang, Richard Cagley, John Shynk, University of California, Santa Barbara

MP2-3 Natural Gradient Blind Deconvolution and Equalization Using Causal FIR Filters — 2:20 PM
Scott Douglas, Southern Methodist University; Hiroshi Sawada, Shoji Makino, NTT Corporation

MP2-4 Adaptive Linear Prediction Based Frequency Tracking and CPM demodulation — 2:45 PM
Balu Santhanam, Malay Gupta, University of New Mexico

BREAK — 3:10 PM

MP2-5 A Comparison of the Adaptive Frequency Domain Filters with the Constant Modulus Algorithm in Digital Communications — 3:30 PM
Gerard Coutu, University of California; Samuel D. Stearns, University of New Mexico; Monique Fargues, Naval Postgraduate School

MP2-6 Machine Learning Based CDMA Power Control — 3:55 PM
Judd Rohwer, Sandia National Laboratories; Chaouki Abdallah, University of New Mexico

MP2-7 Using Queue Statistics in Beamforming for ALOHA — 4:20 PM
Vidyut Naware, Lang Tong, Cornell University

MP2-8 Speckle Reduction of SAR Imagery using Multiple-Pass Adaptive Filtering — 4:45 PM
Robert Ives, Delores Etter, Thad Welch, U.S. Naval Academy

Track 3 - Array Processing and MIMO

Session MP3 Array Processing for Wireless Communications

Chair: *Brian Sadler*

MP3-1 Analysis of SDMA Uplink Capacity — 1:30 PM
Zhi-Quan (Tom) Luo, University of Minnesota; Wai-Yin Shum, McMaster University; Gongyun Zhao, National University of Singapore

MP3-2 On Antenna Selection with Maximum Ratio Transmission 1:55 PM
Chandra Murthy, Bhaskar D. Rao, University of California, San Diego

MP3-3 A Performance Bound for Prediction of a Multipath MIMO Channel 2:20 PM
Thomas Svantesson, A. Lee Swindlehurst, Brigham Young University

MP3-4 Cooperative Synchronization and Channel Estimation in Wireless Sensor Networks 2:45 PM
Mi-Kyung Oh, Korea Advanced Institute of Science and Technology; Xiaoli Ma, Georgios B. Giannakis, University of Minnesota; Dong-Jo Park, Korea Advanced Institute of Science and Technology

BREAK 3:10 PM

MP3-5 Field test results for space-time coding 3:30 PM
Parul Gupta, Weijun Zhu, Michael Fitz, University of California, Los Angeles

MP3-6 Signal Detection for MIMO-ISI Channels: A Unitary Linear Recovery Approach 3:55 PM
Yunnan Wu, Sun-Yuan Kung, Princeton University

MP3-7 Timing Estimation in Multiple Antenna Systems over Rayleigh Flat Fading Channels 4:20 PM
Yong Liu, Ashish Pandharipande, Tan Wong, University of Florida

MP3-8 Some asymptotic capacity results for MIMO wireless with and without channel knowledge at the transmitter 4:45 PM
Mai Vu, Arogyaswami Paulraj, Stanford University

Track 4 - Speech and Audio Processing

Session MP4 Narrowband/Wideband Speech and Audio Coding

Chair: *Jerry Gibson*

MP4-1 Quantifying Perceptual Distortion in Scalably Compressed MPEG Audio 1:30 PM
Charles Creusere, New Mexico State University

MP4-2 Wideband Speech Coding for CDMA2000® Systems 1:55 PM
Sassan Ahmadi, Nokia, Inc.; Milan Jelinek, University of Sherbrooke; Redwan Salami, VoiceAge, Corp.; S. Craig Greer, Nokia, Inc.

MP4-3 Voice Transmission Over All-IP Tandem Links 2:20 PM
Bo Wei, Southern Methodist University; Jerry Gibson, University of California, Santa Barbara

MP4-4 Speech Coding for Mobile Ad Hoc Networks 2:45 PM
Hui Dong, Ian Chakeres, Jerry Gibson, Elizabeth Belding-Royer, Upamanyu Madhow, Allen Gersho, University of California, Santa Barbara

BREAK 3:10 PM

MP4-5 A Wideband Differential Coding Algorithm 3:30 PM
Khalid Sayood, Eric Psota, Jarrod Hartman, Michael Hoffman, University of Nebraska

MP4-6 Circular Linear Prediction Modeling for Speech Coding Applications 3:55 PM
Ali Ertan, Thomas Barnwell, Georgia Institute of Technology

MP4-7 Mitigating the effects of channel noise in source compression with reduced rank processing 4:20 PM
Hanna E. Witzgall, William C. Ogle, J. Scott Goldstein, Science Applications International Corp.

MP4-8 An RLS-LMS Algorithm for Lossless Audio Coding 4:45 PM
Rongshan Yu, Institute for Infocomm Research; Chi Chung Ko, National University of Singapore; Susanto Rahardja, Xiao Lin, Institute for Infocomm Research

Track 5 - Image and Video Processing

Session MP5 Mathematical Models in Image Processing

Chair: *Rob Nowak*

MP5-1 Semi-Parametric Skew Distributions in Shape Representation 1:30 PM
Hamid Krim, Sajjad Baloch, North Carolina State University

MP5-2 Maximum-likelihood methods for reconstructing an image in a region-of-interest for transmission tomography 1:55 PM
Donald L. Snyder, Joseph A. O'Sullivan, Ryan Murphy, Bruce R. Whiting, David G. Politte, Washington University; Jeffrey F. Williamson, Virginia Commonwealth University

MP5-3 A New U+V Model for Image Representation and Analysis using the Elliptic Boundary Value Problems and Local Fourier Analysis 2:20 PM
Naoki Saito, Jucheng Zhao, University of California, Davis

MP5-4 Cloud Detection over Ice/Snow surface from Satellite images 2:45 PM
Tao Shi, Bin Yu, University of California, Berkeley; Amy Braverman, California Institute of Technology; Eugene Clothiaux, The Pennsylvania State University

BREAK 3:10 PM

MP5-5 Entropic graphs for learning manifolds 3:30 PM
Alfred Hero, University of Michigan

MP5-6 Multiscale methods in signal detection 3:55 PM
Xiaoming Huo, Georgia Institute of Technology

MP5-7 Optimal Tilings and Best Basis Search in Large Dictionaries. 4:20 PM
Ilya Pollak, Purdue University; Minh Do, University of Illinois, Urbana-Champaign; Charles A. Bouman, Purdue University

MP5-8 A New Interpretation of Translation Invariant Image Denoising 4:45 PM
Gang Hua, Michael T. Orchard, Rice University

Track 6 - Architectures and Implementations

Session MP6a Multimedia Processing

Chair: *Ruby Lee*

MP6a-1 Automated Generation of Configurable Media Processors 1:30 PM
Suman Mamidi, Murugappan Senthilvelan, Shankar Krithivasan, Michael Schulte, University of Wisconsin-Madison

MP6a-2 Design and delay estimates of media-enhanced VLSI adders 1:55 PM
Neil Burgess, Cardiff University

MP6a-3 Micro-Architecture Issues of Predicated Execution 2:20 PM
Zhenghong Wang, Ruby Lee, Princeton University

MP6a-4 Accelerating Floating-Point 3D Graphics for Vector Microprocessors 2:45 PM
David Lutz, Chris Hinds, ARM Ltd.

Track 6 - Architectures and Implementations

Session MP6b Security Processing

Chair: *Ruby Lee*

MP6b-1 Media Processors and Digital Video Surveillance 3:30 PM
Ben Cutler, Pacific Technology Partners, LLC; Woobin Lee, Pixerion, Inc.

MP6b-2 Scoping Security Issues for Interactive Grids 3:55 PM
Jeffrey Dwoskin, Princeton University; Sujoy Basu, Vanish Talwar, Raj Kumar, Fred Kitson, Hewlett-Packard Laboratories; Ruby Lee, Princeton University

MP6b-3 Dual-Field Multiplier Architectures for Cryptographic Applications 4:20 PM
Cetin Kaya Koc, Oregon State University; Erkay Savas, Sabanci University; Alexandre Tenca, Oregon State University

MP6b-4 Fast Montgomery Modular Multiplication and RSA Cryptographic Processor Architectures 4:45 PM
Ciaran McIvor, Máire McLoone, John McCanny, Queen's University Belfast; Alan Daly, William Marnane, University College Cork

Track 7 - Signal Processing Algorithms and Applications

Session MP7 Biomedical Signal Processing

Chair: *Neeraj Magotra*

MP7-1 Capturing signal activity and spatial distribution of neurons in a sub-millimeter^3 volume 1:30 PM
David J. Anderson, University of Michigan; Karim G. Oweiss, Michigan State University

MP7-2 Programmable Ultra-low Power Digital Signal Processing (DSP) Systems Solution 1:55 PM
Neeraj Magotra, Texas Instruments, Inc.

MP7-3 Signal Processing Strategies and Clinical Outcomes for Gain and Waveform Compression in Hearing Aids. 2:20 PM
Julius L. Goldstein, Metin Oz, Peter H. Gilchrist, Hearing Emulations, LLC; Michael Valente, Washington University Medical Center

MP7-4 Categorisation of Panic Disorder by Time-Frequency Methods 2:45 PM
Hubert Dietl, Stephan Weiss, University of Southampton

BREAK 3:10 PM

MP7-5 Implementation of Hearing Aid Signal Processing Algorithms on the TI DHP-100 Platform 3:30 PM
Roger D. Chamberlain, BECS Technology, Inc.; Julius L. Goldstein, Hearing Emulations, LLC; Darko Ivanovich, BECS Technology, Inc.

MP7-6 Applications for modeling of intelligibility of sensorineural hearing loss 3:55 PM
Jeff Bondy, Suzanna Becker, Ian Bruce, Simon Haykin, McMaster University

MP7-7 Computational Scene Analysis of Cocktail-Party Situations based on Sequential Monte Carlo Methods 4:20 PM
Johannes Nix, Michael Kleinschmidt, Volker Hohmann, Universität Oldenburg

MP7-8 Signal Processing for a Biologically-Inspired Vision System using Biomimetic Sensors and Eigenspace Object Models 4:45 PM
Cameron Wright, Steven Barrett, University of Wyoming; Daniel Pack, Michael Wilcox, U.S. Air Force Academy

Track 1 - Communication Systems and Networks
Session MP8a1 CDMA-II
Chair: *Paul Cotae*

MP8a1-1 Log-Concavity of SIR and Characterization of Feasible SIR Region for CDMA Channels
Holger Boche, Slawomir Stanczak, Fraunhofer Institute for Telecommunications, HHI

MP8a1-2 A common access channel distributed queueing MAC protocol for wireless slotted CDMA networks
Xin Wang, Jitendra Tugnait, Auburn University

MP8a1-3 Block Coded Modulation for the QS-CDMA System
Kyeong Jin Kim, Nokia Research Center

MP8a1-4 Transmitter Adaptation of DS-CDMA Signals in Multipath Channels
Paul Cotae, University of Texas, San Antonio

MP8a1-5 Using Multistage Interference Cancellation Smart Antennas in Wideband CDMA Uplink
Hsin-Chin Liu, John Doherty, The Pennsylvania State University

MP8a1-6 Decorrelating code-timing estimation for CDMA systems with long codes and bandlimited chip waveforms
Rensheng Wang, Hongbin Li, Stevens Institute of Technology

MP8a1-7 Iterative Joint Data Detection and Channel Estimation of DS/CDMA Signals in Multipath Fading Using the SAGE Algorithm
Alexander Kocian, Bin Hu, Preben Soerensen, Christian Rom, Bernard Fleury, Aalborg University; Erik Poulsen, RTX Telecom A/S

MP8a1-8 Complex Block Codes with Low Cross-Correlation Spectrum for S-CDMA Systems
Panayiotis Papadimitriou, Texas A&M University / Nokia Mobile Phones; Costas Georghiades, Texas A&M University

MP8a1-9 Improvements in Equalization of Multiuser CDMA Systems: Oversampling and Nonuniqueness
Bojan Vrcelj, P. P. Vaidyanathan, California Institute of Technology

MP8a1-10 Inter-vendor spectrum sharing in DS-CDMA and MC-CDMA systems
Ali Pezeshk, Seyed Alireza Zekavat, Michigan Technological University

MP8a1-11 Chip-Rate Adaptive DFE of Scrambled Downlink CDMA
Adam Margetts, Philip Schniter, Ohio State University

MP8a1-12 On Channel Capacity of Parallel Interference Cancellation with Outage Probability in Coded DS-CDMA Systems
Husheng Li, Vincent Poor, Princeton University

MP8a1-13 CDMA Signature Sequences with Low Peak-to-Average Ratio via Alternating Minimization
Joel Tropp, Inderjit Dhillon, Robert Heath, University of Texas, Austin; Thomas Strohmer, University of California, Davis

MP8a1-14 Combining Techniques for MC-CDMA Systems
Zhiqiang Wu, Colorado State University; Xiaoxia Zhang, QUALCOMM Incorporated

Track 1 - Communication Systems and Networks
Session MP8a2 OFDM and Multicarrier
Chair: *Jim Schroeder*

MP8a2-1 Receivers for Multi-mode Channels
Gary Hutchins, Naval Postgraduate School; Robert Elliott, University of Calgary; Dave Sworder, University of California, San Diego; John Boyd, Cubic Defense Applications, Inc.

MP8a2-2 Theory and Design of Multipulse Multicarrier Systems for Wireless Communications
Manfred Hartmann, Gerald Matz, Dieter Schafhuber, Vienna University of Technology

MP8a2-3 Comparison of Error Probability for OFDM and SC-FDE
Yeesoo Han, Heon Huh, James. V. Krogmeier, Purdue University

MP8a2-4 Iterative Equalization for Single-Carrier Cyclic-Prefix in Doubly-Dispersive Channels
Philip Schniter, Ohio State University

MP8a2-5 Adaptive Beamforming for Interference Rejection in an OFDM System
Vishwanath Venkataraman, Richard Cagley, John Shynk, University of California, Santa Barbara

MP8a2-6 A Merger of OFDM and Smart Antenna Beam Pattern Scanning (BPS): Achieving Directionality and Transmit Diversity
Peh Keong Teh, Seyed Alireza Zekavat, Michigan Technological University

MP8a2-7 Downlink Dynamic Resource Allocation for Multi-cell OFDMA System
Guoqing Li, Hui Liu, University of Washington

MP8a2-8 Throughput of IEEE 802.11e
Todor Cooklev, Xintong Li, San Francisco State University

MP8a2-9 108 Mbps OWSS WLANs: CSMA/CA Throughput and Delay Analysis
Vijay Jain, University of South Florida

Track 4 - Speech and Audio Processing

Session MP8a3 Topics in Speech and Audio Processing and Communications

Chair: *Keith Teague*

MP8a3-1 Alternative Window Designs for the ETSI AMR Speech Coding Standard
Wai Chu, DoCoMo USA Laboratories, Inc.

MP8a3-2 A Novel Transcoding Scheme from EVRC to G.729AB
Pankaj Rabha, Texas Instruments, Inc.

MP8a3-3 Voice Quality Assessment Using Classification Trees
Wei Zha, Wai-Yip Chan, Queen's University

MP8a3-4 Transient Detection of Audio Signals Based on an Adaptive Comb Filter in the Frequency Domain
Mylène Kwong, Roch Lefebvre, Université de Sherbrooke

MP8a3-5 The Influence of Reverberation on Multichannel Equalization:An Experimental Comparison Between Methods
Sunil Bharitkar, Chris Kyriakakis, University of Southern California

MP8a3-6 Robust Speech Recognition in Noisy Backgrounds Based on Teager Energy Operator and Auditory Process
Junhui Zhao, Jingming Kuang, Beijing Institute of Technology

MP8a3-7 A Network Performance Application for Modeling, Simulation, and Characterization of Packet Network Behavior
Chris White, Edward Daniel, Keith Teague, Oklahoma State University

MP8a3-8 Decision Combination in Speech Metadata Extraction
Xiaofan Lin, Hewlett-Packard Laboratories

Track 2 - Adaptive Systems and Processing

Session MP8b1 Advanced Algorithms for Adaptive Signal Processing

Chair: *James Zeidler*

MP8b1-1 LMS Adaptive Filtering with Multirate Observations
Charles W. Therrien, Anthony H. Hawes, Naval Postgraduate School

MP8b1-2 Adaptive Filtering Via Particle Swarm Optimization
Dean Krusienski, W. Kenneth Jenkins, The Pennsylvania State University

MP8b1-3 NEXT Cancellers Using FDLMS Filters with Improved Convergence Rate
Rajeev Nongpiur, Dale Shpak, Andreas Antoniou, University of Victoria

MP8b1-4 New Training Algorithms for Dependently Initialized Multilayer Perceptrons
Walter Delashmit, Lockheed Martin Missiles and Fire Control; Michael Manry, University of Texas, Arlington

MP8b1-5 Quality of Approximation in the Error Transfer Function Approach of the LMS Adaptive Filters
Jun Han, QuickSilver Technology, Inc; Walter Ku, James Zeidler, University of California, San Diego

MP8b1-6 ICA based Signature Separation for Time-Varying Radiant Objects
Michael Eaton, Philip Sementilli, Raytheon Company / Discrimination Product Center

MP8b1-7 Unbiased Bilinear Equation Error System Identification
Bruce Dunne, Grand Valley State University; Geoffrey Williamson, Illinois Institute of Technology

MP8b1-8 Active Machine Learning using Adaptive Set Estimation
Dale Joachim, Tulane University; John Deller, Michigan State University

MP8b1-9 Adaptive Projected Subgradient Method and Its Applications to Set Theoretic Adaptive Filtering
Isao Yamada, Nobuhiko Ogura, Tokyo Institute of Technology

MP8b1-10 Overcoming the Independence Assumption in LMS Filtering
Markus Rupp, TU Wien; Hans Juergen Butterweck, Eindhoven University of Technology

MP8b1-11 ADAPTIVE FILTER-BANK TREE FOR POWER SPECTRUM ESTIMATION
Sriram Murali, P.P. Vaidyanathan, California Institute of Technology

MP8b1-12 SVD-Based Important Theorem for Designing Variable Fractional-Delay Filters
Tian-Bo Deng, Toho University

MP8b1-13 Hybrid Adaptive Beamforming for Multiline Towed Arrays
Henry Cox, Orincon Corporation, International

Track 2 - Adaptive Systems and Processing

Session MP8b2 Adaptive Technologies for Communication Systems

Chair: *Doug Jones*

MP8b2-1 Property-Restoral Algorithms for Blind Equalization of OFDM
Douglas L. Jones, University of Illinois, Urbana-Champaign

MP8b2-2 Time-Varying AR Modeling and Subspace Projection for FM Jammer Suppression
Lichuan Liu, Hongya Ge, New Jersey Institute of Technology

MP8b2-3 Coefficients - Delay Simultaneous Adaptation for Linear Transversal Equalizers on Nonminimum Phase Channels
Yusuke Tsuda, Jonah Gamba, Tetsuya Shimamura, Saitama University

MP8b2-4 A Merger of Maximum Noise Fraction Beam Forming and MC-CDMA Systems: Perturbation Analysis in Dispersive Channels
Fatemeh Emdad, Colorado State University; Seyed Alireza Zekavat, Michigan Technological University; Michael Kirby, Colorado State University

MP8b2-5 Analysis of the Effect of Timing Synchronization Errors on Pilot-aided OFDM Systems
Yasamin Mostofi, Stanford University

MP8b2-6 Performance Analysis of Adaptive Beamforming for OFDM-CDMA Systems in Ground-Based Communications
Jiann-An Tsai, Industrial Technology Research Institute

MP8b2-7 Square Contour Algorithm: A New Algorithm for Blind Equalization and Carrier Phase Recovery
Trasapong Thaiupathump, Chiang Mai University; Saleem A. Kassam, University of Pennsylvania

MP8b2-8 Adaptive IIR Phase Equalizers Based on Evolutionary Algorithms
Sunaina Pi, Kenneth Jenkins, Dean Krusienski, The Pennsylvania State University

MP8b2-9 Multistage Interference Cancellation Smart Antennas with Initial Weight Vector Substitution
Hsin-Chin Liu, John Doherty, The Pennsylvania State University

MP8b2-10 Performance Comparison of Adaptive Modulation Schemes for OFDM System Using Cluster
Cho Juphil, Lee Heesoo, ETRI

MP8b2-11 Convergence Analysis of A Linear Turbo Equalizer
Seok-Jun Lee, Andrew Singer, Coordinated Science Laboratory, UIUC

MP8b2-12 Sphere-constrained ML detection for channels with memory
Haris Vikalo, Babak Hassibi, California Institute of Technology; Urbashi Mitra, University of Southern California

Track 1 - Communication Systems and Networks

Session TA1 Modulation and Detection Techniques

Chair: *Wade Lowdermilk*

TA1-1 OFDM Transmission with Receiver Windowing for Improved Interference Rejection 8:30 AM
Mikko Valkama, Tampere University of Technology; Ron Porat; Fred Harris, San Diego State University

TA1-2 Advantages and Implementation Considerations of Shaped OFDM Signals 8:55 AM
Dragan Vuletic, Signum Concepts; Fred Harris, San Diego State University

TA1-3 Frequency-Dependent Modulator Imbalance in Predistortion Linearization Systems: Modeling and Compensation 9:20 AM
Lei Ding, Georgia Institute of Technology; Zhengxiang Ma, Dennis Morgan, Mike Zierdt, Bell Labs, Lucent Technologies; G. Tong Zhou, Georgia Institute of Technology

TA1-4 Channel Estimation and Equalization for High Speed Mobile OFDM Systems 9:45 AM
Heejung Yu, Sok-kyu Lee, ETRI

BREAK 10:10 AM

TA1-5 Time and Frequency Equalization in 802.11a 10:30 AM
Oghenekome Oteri, Stanford University; X. Wang, S. A. Mujtaba, Agere Systems; A. Paulraj, Stanford University

TA1-6 Blind Bluetooth Interference Detection and Suppression for OFDM Transmission in the ISM Band 10:55 AM
Sven Vogeler, Lars Broetje, Karl-Dirk Kammeyer, University of Bremen; Reinhard Rueckriem, Stefan Fechtel, Infineon Technologies AG

TA1-7 Channel Shortening Based on Output Cumulants for Multicarrier Modulation Systems 11:20 AM
Jeremy Roberson, Zhi Ding, University of California, Davis

TA1-8 Optimum Subcarrier Assignment in OFDMA 11:45 AM
Zhongren Cao, Stevens institute of Technology; Pei Liu, Polytechnic University

Track 2 - Adaptive Systems and Processing

Session TA2 Intelligent Hearing Aids

Chair: *Chris Schmitz*

TA2-1 Dynamic-Range Compression using Digital Frequency Warping — 8:30 AM
James Kates, Cirrus Logic, Inc.

TA2-2 Predicting intelligibility of hearing aid algorithms using the neural articulation index — 8:55 AM
Jeff Bondy, Simon Haykin, Ian Bruce, Suzanna Becker, McMaster University

TA2-3 Acoustic scene analysis using estimated impulse responses — 9:20 AM
Erik Larsen, University of Illinois, Urbana-Champaign

TA2-4 Effect of multiple nonstationary sources on MVDR beamformers — 9:45 AM
Michael Lockwood, Douglas L. Jones, Charissa Lansing, William O'Brien, Jr., Bruce Wheeler, Albert Feng, Beckman Institute, University of Illinois

BREAK — 10:10 AM

TA2-5 Computational Scene Analysis of Cocktail-Party Situations based on Sequential Monte Carlo Methods — 10:30 AM
Johannes Nix, Michael Kleinschmidt, Volker Hohmann, Universität Oldenburg

TA2-6 On The Reduction of Masking Effects on the Target while Preserving Competing Binaural Audio Streams — 10:55 AM
Christopher Schmitz, University of Illinois, Urbana-Champaign

TA2-7 Directional Microphone Arrays for Hearing Aids — 11:20 AM
Bernard Widrow, Stanford University

TA2-8 Loudspeaker Linearization Using Perceptual Distortion Measures — 11:45 AM
Khosrow Lashkari, DoCoMo USA Laboratories, Inc.; Nobuhiko Naka, NTT DoCoMo

Track 3 - Array Processing and MIMO

Session TA3 Sonar and Acoustical Array Processing

Chair: *John Tague*

TA3-1 Widely-Linear Beamforming — 8:30 AM
Todd McWhorter, Mission Research Corporation

TA3-2 Passive Source Localization in the Presence of Near-Endfire Interference — 8:55 AM
Shawn Kraut, Queen's University; Jeffrey Krolik, Duke University

TA3-3 Steering Direction Invariant Sidelobe Cancellation — 9:20 AM
Norman Owsley, ONR / University of Rhode Island; John Tague, ONR

TA3-4 Multi-Channel Spectrum Analysis of Surface Waves — 9:45 AM
Mubashir Alam, James McClellan, Waymond Scott, Georgia Institute of Technology

BREAK — 10:10 AM

TA3-5 Adaptive Detection of Distributed Sources Using Subarrays — 10:30 AM
Benjamin Friedlander, University of California, Santa Cruz; Yuanwei Jin, University of California, Davis

TA3-6 The Use of Fractional Lower-Order Statistics in acoustical environments — 10:55 AM
J. Michael Peterson, Panayiotis Georgiou, Chris Kyriakakis, University of Southern California

TA3-7 Spectral properties of Nonstationary and Inhomogeneous Harmonizable Random Fields — 11:20 AM
Yngvar Larsen, Alfred Hanssen, University of Tromsø

TA3-8 Reduced Complexity Covariance Matrix Estimate for Subspace-Based Array Processing — 11:45 AM
Claudio Marino, Orincon Defense; Paul Chau, University of California, San Diego

Track 7 - Signal Processing Algorithms and Applications

Session TA4 Low Rank Signal Processing Methods with Applications

Chair: *Rangaswamy Muralidhar & Ivars P. Kirsteins*

TA4-1 Detection and Estimation in Nonstationary Environments — 8:30 AM
Donald Tufts, Timothy Toolan, University of Rhode Island

TA4-2 Subspace Signal Processing: A Breezy Review of Developments from 1982 to 2002 — 8:55 AM
Louis Scharf, Colorado State University

TA4-3 Applications of Reduced-Rank Interference Cancellation to Underwater Signal Processing — 9:20 AM
Ivars Kirsteins, Naval Undersea Warfare Center

TA4-4 Radar Applications of Low Rank Signal Processing Methods — 9:45 AM
Muralidhar Rangaswamy, Air Force Research Laboratory

BREAK 10:10 AM

TA4-5 Reduced Rank Space-Time Adaptive Processing with Quadratic Pattern Constraints for Airborne Radar 10:30 AM
Kristine Bell, Kathleen Wage, George Mason University

TA4-6 Adaptive Threat Warning 10:55 AM
Edward Real, Michael Kotrlik, Melissa Chevalier, BAE SYSTEMS IEWS

TA4-7 An Approach to Direction Finding Based on a Subspace Perturbation Expansion 11:20 AM
Richard Vaccaro, Pranab Majumdar, Norman Owsley, University of Rhode Island

Track 5 - Image and Video Processing

Session TA5 Distributed Methods in Image and Video Coding

Chair: *Kannan Ramchandran*

TA5-1 Wyner-Ziv coding based on TCQ and LDPC codes 8:30 AM
Yang Yang, Samuel Cheng, Zixiang Xiong, Wei Zhao, Texas A&M University

TA5-2 Compression of lightfield rendered images using coset codes 8:55 AM
Ashish Jagmohan, Anshul Sehgal, Narendra Ahuja, University of Illinois, Urbana-Champaign

TA5-3 On the use of LDPC codes for the general Slepian-Wolf problem 9:20 AM
Daniel Schonberg, University of California, Berkeley; Sandeep Pradhan, University of Michigan; Kannan Ramchandran, University of California, Berkeley

TA5-4 Turbo-like codes for distributed joint source-channel coding of correlated senders in multiple access channels 9:45 AM
Wei Zhong, Ying Zhao, Javier Garcia-Frias, University of Delaware

BREAK 10:10 AM

TA5-5 Robust Distributed Video Compression based on Multilevel Coset Codes 10:30 AM
Jim Chou, Sony Electronics Inc.; Abhik Majumdar, Kannan Ramchandran, University of California, Berkeley

TA5-6 Transforms for High Rate Distributed Source Coding 10:55 AM
David Rebollo-Monedero, Anne Aaron, Bernd Girod, Stanford University

TA5-7 On Wyner-Ziv Networks 11:20 AM
Michael Gastpar, University of California, Berkeley

TA5-8 Multistage Quantization via Conditional Hierarchical Mapping 11:45 AM
Amit Eshet, Meir Feder, Tel-Aviv University

Track 6 - Architectures and Implementations

Session TA6a VLSI Implementations

Chair: *David Harris*

TA6a-1 Optimized Synthesis of Sum-Of-Products 8:30 AM
Reto Zimmermann, David Q. Tran, Synopsys, Inc.

TA6a-2 Logical Effort of Carry Propagate Adders 8:55 AM
David Harris, Harvey Mudd College; Ivan Sutherland, Sun Microsystems

TA6a-3 Implementation Complexity of Bit Permutation Instructions 9:20 AM
Zhijie Shi, Ruby Lee, Princeton University

TA6a-4 Logical Effort analysis of Register File Architectures 9:45 AM
Neil Burgess, Cardiff University

Track 6 - Architectures and Implementations

Session TA6b FPGA Implementations

Chair: *Chris Dick*

TA6b-1 DSP System Design Using the BEE Hardware Emulation Environment 10:30 AM
Chen Chang, Brian Richards, University of California, Berkeley; Bob Brodersen, Berkeley Wireless Research Center

TA6b-2 An FPGA Based Rapid Prototyping Platform for MIMO Systems 10:55 AM
Patrick Murphy, Feifei Lou, Ashu Sabharwal, Patrick Frantz, Rice University

TA6b-3 User Adaptable Secure Wireless Platform 11:20 AM
Peter Athanas, Virginia Tech

TA6b-4 FPGA Implementation of OFDM Communication Systems 11:45 AM
Chris Dick, Xilinx, Inc.; Fred Harris, San Diego State University

Track 7 - Signal Processing Algorithms and Applications

Session TA7a Adaptive Signal Processing

Chair: *David Anderson*

TA7a-1 An Optimal Threshold for Sidelobe Control in Adaptive Beamforming Using Second-Order Cone Programming 8:30 AM
Xiaoli Lu, R. Lynn Kirlin, University of Victoria

TA7a-2 Implementation of an LMS Adaptive Filter on an FPGA Employing Multiplexed Multiplier Architecture 8:55 AM
Daniel Allred, Venkatesh Krishnan, Walter Huang, David Anderson, Georgia Institute of Technology

TA7a-3 Adaptive Translinear Analog Signal Processing: A Prospectus 9:20 AM
Eric McDonald, Kofi Odame, Bradley A. Minch, Cornell University

TA7a-4 Design Analysis of a Distributed Arithematic Adaptive FIR Filter on an FPGA. 9:45 AM
Walter Huang, Venkatesh Krishnan, Daniel Allred, HeeJong Yoo, Georgia Institute of Technology

Track 7 - Signal Processing Algorithms and Applications

Session TA7b Radar & Sonar Signal Processing

Chair: *Armin Doerry*

TA7b-1 Gust Front Detection Using Template Matching on Fused and Multi-resolution Radar Data Sets 10:30 AM
Victor DeBrunner, Ewa Matusiak, University of Oklahoma

TA7b-2 A Performance Evaluation of Autoregressive Clutter Mitigation Methodswith Over-the-Horizon Radar Data 10:55 AM
Veena Gadwal, Jeffrey Krolik, Duke University

TA7b-3 Linearly Constrained Minimum Variance Beamforming with Quadratic Pattern Constraints for Spatially Spread Sources 11:20 AM
Kristine Bell, George Mason University

TA7b-4 Digital Signal Processing Applications in High-Performance Synthetic Aperture Radar Processing 11:45 AM
Armin Doerry, Dale Dubbert, Sandia National Laboratories

Track 3 - Array Processing and MIMO

Session TA8a MIMO/Space-Time Coding

Chair: *Michael Clark*

TA8a-1 Performance Analysis for Bit-Interleaved Space-Time Coded Modulation with Iterative Decoding
Yuheng Huang, James Ritcey, University of Washington

TA8a-2 On the Capacity of MIMO Broadcast Channel with Partial Side Information
Masoud Sharif, Babak Hassibi, California Institute of Technology

TA8a-3 Performance of Iterative Data Detection and Channel Estimation for Single-Antenna and Multiple-Antennas Wireless Communications
Stefano Buzzi, Marco Lops, Stefania Sardellitti, University of Cassino

TA8a-4 Interference Cancelling Receivers with Global MMSE-ZF Structure and Local MMSE Operations
Ahmet Bastug, Dirk Slock, Eurecom Institute

TA8a-5 Performance Criterion for Space-Time Codes Revisited
Mohammad Gharavi-Alkhansari, University of Duisburg-Essen; Alex Gershman, McMaster University

TA8a-6 Analytical Space-Time-Frequency Fading Correlation for Mobile Vector Channels
Jiann An Tsai, Industrial Technology Research Institute

TA8a-7 How Bad is Spatially-Greedy Scheduling in Multi-User MIMO Systems?
Manish Airy, Sanjay Shakkottai, Robert Heath, University of Texas, Austin

TA8a-8 An Optimal Two Transmit Antenna Space-Time Code and its Stacked Extensions
Pranav Dayal, Mahesh Varanasi, University of Colorado

TA8a-9 Channel Aware Scheduling for Multiple Antenna Multiple Access Channels
Holger Boche, Eduard Jorswieck, Thomas Haustein, Fraunhofer Institute for Telecommunications, HHI

TA8a-10 Sub-Channel Grouping and Statistical Water-filling for MIMO-OFDM Systems
Ying-Chang Liang, Rui Zhang, John M Cioffi, Stanford University

TA8a-11 Virtual Antenna Arrays with Khatri-Rao Space-Time Coding
Yu Chang, Yingbo Hua, University of California, Riverside

TA8a-12 Partially Coherent Constellations for Multiple-Antenna Systems
Mohammad Jaber Borran, Ashutosh Sabharwal, Behnaam Aazhang, Rice University; Prabodh Varshney, Nokia Mobile Phones

TA8a-13 Differential Space-Time Modulation with APSK Constellation
Hongbin Li, Stevens Institute of Technology

TA8a-14 Minimum Variance Linear Receiver for Multi-Access InterferenceRejection in a Space-Time Block Code Based Communication System
Shahram Shahbazpanahi, University of Duisburg-Essen; Mohammadali Beheshti, McMaster University; Mohammad Gharavi-Alkhansari, University of Duisburg-Essen; Alex Gershman, Kon Max Wong, McMaster University

TA8a-15 Space-Time Turbo Equalization for Dual-Polarized Broadband Wireless Systems
Mutlu Koca, INRIA

TA8a-16 Fast Maximum Likelihood Decoding of Quasi-orthogonal Codes
Lei He, Hongya Ge, New Jersey Institute of Technology

TA8a-17 802.11b Wireless LAN Enhancement Using Space-Time Transmitter Beamforming
Seung-Jun Kim, Ronald A. Iltis, University of California, Santa Barbara

TA8a-18 Space-Time Block Coded Rate-Adaptive Modulation with Uncertain SNR Feedback
Youngwook Ko, Cihan Tepedelenlioglu, Telecommunications Research Center

TA8a-19 A Block-Toeplitz VCMA Equalizer for MIMO-OFDM Systems
Traian Abrudan, Marius Sirbu, Visa Koivunen, Helsinki University of Technology

TA8a-20 The Capacity of Bit-Interleaved Space-Time Coded Modulation with Imperfect Channel State Information
Yuheng Huang, James Ritcey, University of Washington

TA8a-21 Approximate Transmit Covariance Optimization of MIMO Systems with Covariance Feedback
Cristoff Martin, Bjorn Ottersten, Royal Institute of Technology

TA8a-22 Generalized Beamforming for MIMO Systems with Limited Transmitter Information
Krishna Mukkavilli, Ashutosh Sabharwal, Behnaam Aazhang, Rice University

TA8a-23 Ubiquitous MIMO Digital Array Radar
Daniel Rabideau, Massachusetts Institute of Technology, Lincoln Lab

TA8a-24 A Transmitter Design for Coded Systems in the Presence of CSI Errors
Francesc Rey, Universitat Politècnica de Catalunya; Meritxell Lamarca, Gregori Vazquez, Univeristat Politecnica de Catalunya

TA8a-25 Outdoor PCS MIMO Wireless Communication Channel Phenomenology
Daniel Bliss, Amanda Chan, MIT Lincoln Laboratory

TA8a-26 Optimal transmission strategy for multiple antenna systems with uninformed transmitter and correlation
Eduard Jorswieck, Holger Boche, Fraunhofer Institute for Telecommunications, HHI

TA8a-27 Blind MIMO system identification using PARAFAC decomposition of an output HOS-based tensor
Turev Acar, Athina Petropulu, Drexel University

TA8a-28 Dual-Mode Antenna Selection for Spatial Multiplexing Systems with Linear Receivers
Robert Heath, David Love, University of Texas, Austin

TA8a-29 Optical MIMO Transmission Using Q-ary PPM for Atmospheric Channels
Stephen Wilson, Maite Brandt-Pearce, Qianling Cao, University of Virginia

TA8a-30 Soft Output Decoding Algorithm for Spacetime Block Codes over Unknown Time varying Channels with Intersymbol interference
Sangeetha Somayajula, Kevin Buckley, Richard Perry, Villanova University

TA8a-31 Correlated MIMO Channel Capacity
Tharmalingam Ratnarajah, Remi Vaillancourt, University of Ottawa

TA8a-32 On the Gaussian Approximation in the Analysis of Iterative MIMO Processing
Yibo Jiang, Ralf Koetter, Andrew Singer, University of Illinois at Urbana-Champaign

Track 7 - Signal Processing Algorithms and Applications

Session TA8b1 Communications Signal Processing

Chair: *Majid Ahmadi*

TA8b1-1 Almost Jitter-Free Feedforward Symbol Timing Recoveryfor MSK-type Modulations
Kai Shi, Erchin Serpedin, Texas A&M University

TA8b1-2 A Single Error Correction Double Burst Error Detection Code
Lance Bodnar, VIASAT; Gregory Chapelle, Nokia Mobile Phones

TA8b1-3 Space-Time Adaptive Multistage Receiver for Asynchronous DS-CDMA
Chia-Chang Hu, National Chung Cheng University; Irving S. Reed, University of Southern California

TA8b1-4 Approximate Best Linear Unbiased Channel Estimation for Frequency Selective Multipath Channels with Long Delay Spreads
Serdar Özen, Mark Fimoff, Christopher Pladdy, Sreenivasa Nerayanuru, Zenith Electronics Corporation; Michael Zoltowski, Purdue University

TA8b1-5 Equalization of CDMA Downlink Channels via Kalman Filtering
Hoang Nguyen, University of California, Davis; Jianzhong (Charlie) Zhang, Balaji Raghothaman, Nokia, Inc.

TA8b1-6 Iterative Multiuser Detection For Non Constant Modulus Constellations
Hedi Laamari, Jean-Claude Belfiore, Ecole Nationale Supérieure des Télécommunications; Nicolas Ibrahim, Wavecom, S.A

TA8b1-7 Delta-Signed Correlation Method for Noisy Channel Identification
Jussi Järvinen, Visa Koivunen, Helsinki University of Technology

TA8b1-8 An Improved Channel Estimation for OFDM Based Systems with Transmitter Diversity
Ai Ling Chua, Mehul Motani, National University of Singapore

TA8b1-9 Short Range Wireless Channel Prediction Using Local Information
Zukang Shen, Jeffrey Andrews, Brian Evans, University of Texas, Austin

TA8b1-10 Minimum Variance Receiver for Multicarrier CDMA Systems with Space-Time Coding
Wei Sun, Moeness Amin, Villanova University

TA8b1-11 Multisource time delay estimation with receiver frequency errors
Johan Falk, Swedish Defence Research Agency; Peter Handel, Magnus Jansson, Royal Institute of Technology

TA8b1-12 Downlink, Chip-Level, MMSE Equalization with Non-uniform Sampling for Multi-Code CDMA Systems
Haichang Sui, Elias Masry, Bhaskar D. Rao, University of California, San Diego; Young Yoon, Ericsson Wireless Communications Inc.

TA8b1-13 Blind Synchronization of Bandlimited OFDM with Diversity
Patrick, J. Honan, Ufuk Tureli, Stevens Institute of Technology

TA8b1-14 Correlated MIMO Rayleigh Fading Channels:Capacity and Optimal Signaling
Yingbin Liang, Venugopal Veeravalli, Coordinated Science Lab

Track 7 - Signal Processing Algorithms and Applications

Session TA8b2 Multisensor/Multirate Signal Processing

Chair: *Robert Barsanti*

TA8b2-1 Wavelet-Based Time Delay Estimates for Transient Signals
Robert Barsanti, The Citadel; Murali Tummala, Naval Postgraduate School

TA8b2-2 Polarimetric Time-Frequency ESPRIT
Baha Obeidat, Yimin Zhang, Moeness Amin, Villanova University

TA8b2-3 Detection of Short Transients in Colored Noise by Multiresolution Multirate (MRMR) Analysis
John Stevens, U.S. Naval Academy; Albert Kinney, U.S. Naval Security Group Activity Yokosuka, Japan

TA8b2-4 Improved Estimation of Discrete Probability Density Functions Using Multirate Models
Byung-Jun Yoon, P. P. Vaidyanathan, California Institute of Technology

TA8b2-5 Near-field inverse coherent imagingproblems: solutions simulations, and applications
Seth Silverstein, Yibin Zheng, University of Virginia

TA8b2-6 GLRT-Based Detection-Estimation of Uncorrelated Gaussian Sources in Circular Antenna Arrays
Yuri Abramovich, Nicholas Spencer, Cooperative Research Centre for Sensor Signal and Information Processing; Alexei Gorokhov, Philips Research Laboratory

TA8b2-7 A Simple Approach to the Design of One-Dimensional Sparse Arrays
Sanjit K. Mitra, University of California, Santa Barbara; Mikhail Tchobanou, Moscow Power Engineering Institute; Gordana Jovanovic-Dolecek, National Institute of Astrophysics, Optics and Electronics (INAOE)

TA8b2-8 Iterative Eigenfilter Method For Designing Optimum Overdecimated Orthonormal FIR Compaction Filter Banks
Andre Tkacenko, P. P. Vaidyanathan, California Institute of Technology

TA8b2-9 Optimal Filtering with Multirate Observations
Ryan Kuchler, Charles W. Therrien, Naval Postgraduate School

TA8b2-10 Parallel Detection Fusion for Multisensor Tracking of a Maneuvering Target in Clutter using IMMPDA Filtering
Soonho Jeong, Jitendra Tugnait, Auburn University

Track 1 - Communication Systems and Networks

Session TP1 Ultra Wideband-I

Chair: *Mikko Valkama*

TP1-1 Frequency domain processing of ultra-wideband signals 1:30 PM
Robert Weaver, University of Southern California

TP1-2 Ultra Wideband (UWB) Transmitter Location Using Time Difference of Arrival (TDOA) Techniques 1:55 PM
Derek Young, Catherine Keller, Daniel Bliss, Keith Forsythe, MIT Lincoln Laboratory

TP1-3 On the Power Spectrum Density and Parameter Choices of Multi-Carrier UWB Communications — 2:20 PM
Jun Tang, Keshab K. Parhi, University of Minnesota

TP1-4 System Performance of UWB based Low Rate Wireless Persoanal Area Network — 2:45 PM
Chin Francois, Institute for Infocomm Research; Wanjun Zhi, Chi Chung Ko, National University of Singapore

BREAK — 3:10 PM

TP1-5 Unification of Ultra-Wideband Multiple Access Schemes and Comparison in the Presence of Interference — 3:30 PM
Liuqing Yang, Georgios B. Giannakis, University of Minnesota

TP1-6 A Least Squares Technique for UWB Receiver Template Design Robust to Narrowband Interference — 3:55 PM
Robert Wilson, Robert A. Scholtz, University of Southern California

TP1-7 A Subspace Approach to Blind Estimation of Ultra-Wideband Channels — 4:20 PM
Zhengyuan Xu, Ping Liu, Jin Tang, University of California, Riverside

TP1-8 Estimation of channel parameters using iterative least squares approach for W-CDMA and UWB systems — 4:45 PM
Hyuck Kwon, Raja Balakrishnan, Wichita State University

TP1-9 High-Resolution Channel Estimation Methods for Ultra-WidebandSystems — 5:10 PM
Irena Maravic, Martin Vetterli, Swiss Federal Institute of Technology, Lausanne

Track 2 - Adaptive Systems and Processing

Session TP2 A European Perspective on Adaptive Filters in Communications

Chair: *Markus Rupp*

TP2-1 Kalman Tracking of Time-Varying Channels in Wireless MIMO-OFDM Systems — 1:30 PM
Dieter Schafhuber, Gerald Matz, Franz Hlawatsch, Vienna University of Technology

TP2-2 Practical Low Complexity Linear Equalization for Interference Limited MIMO Communication Systems — 1:55 PM
Andreas Burg, ETH-Zurich

TP2-3 Bayesian Methods for Sparse RLS Adaptive Filters — 2:20 PM
Heinz Koeppl, Gernot Kubin, Graz University of Technology; Gerhard Paoli, Infineon Technologies AG

TP2-4 Wideband algorithms versus narrowband algorithms for adaptive filtering in the DFT domain — 2:45 PM
Walter Kellermann, Herbert Buchner, University Erlangen-Nuremberg

BREAK — 3:10 PM

TP2-5 Adaptive Chip-Rate Equalisation for TD-CDMA Downlink Receiver — 3:30 PM
Stephan Weiss, University of Southampton; Markus Rupp, Technische Universitaet Wien; Mahmoud Hadef, Markus Konrad, University of Southampton

TP2-6 Equalization of Time Varying Channels for MC-CDMA via Finite Prolate Spheroidal Wave Functions — 3:55 PM
Thomas Zemen, Siemens Austria; Christoph Mecklenbraeuker, Telecommunications Research Center Vienna

TP2-7 On the relationships between least squares and constant modulus criteria for adaptive filtering — 4:20 PM
Ricardo Suyama, Romis Attux, Joao Romano, FEEC-UNICAMP; Maurice Bellanger, CNAM

TP2-8 Identification of a Nonlinear Power-Amplifier L-N-L Structure for Pre-Distortion Purposes — 4:45 PM
Ernst Aschbacher, Markus Rupp, University of Technology Vienna

TP2-9 The Gauss-Seidel Pseudo Affine Projection Algorithm and its Application for Echo Cancellation — 5:10 PM
Felix Albu, Lake Communications; Anthony Fagan, University College Dublin

Track 3 - Array Processing and MIMO

Session TP3 Biological Applications of Signal Processing

Chair: *Alfred Hero*

TP3-1 Single Spin Detection in Magnetic Resonance Force Microscopy — 1:30 PM
Alfred Hero, Chun Yu Yip, University of Michigan; Dan Rugar, IBM Almaden Research Center

TP3-2 Face Recognition Using Multi-Modal Images — 1:55 PM
Anuj Srivastava, Xiuwen Liu, Curt Hesher, Florida State University

TP3-3 High-Resolution Biosensor Spectral Peak Shift Estimation — 2:20 PM
William Karl, Boston University; Homer Pien, SRU Biosystems

TP3-4 Imaging Neural Networks: Improved Confocal Microscopy using Multiscale Reconstruction — 2:45 PM
Robert Nowak, Ben Graf, Rebecca Willett, Rice University

BREAK 3:10 PM

TP3-5 Time-Protein Models for Allergic Reactions? A Signal Processing Approach to Allergies 3:30 PM
Nurgun Erdol, Salvatore Morgera, Oleg Andric, Florida Atlantic University

TP3-6 Identification of Differentially Expressed Proteins Using MALDI-TOF Mass Spectra 3:55 PM
Balaji Krishnapuram, Pallavi Pratapa, Xuejun Liao, Qiuhua Liu, Alexander Hartemink, Lawrence Carin, Duke University

TP3-7 Modeling of Relaxation Effects in Liver NMR Spectroscopy 4:20 PM
Yang Wu, North Carolina State University; Jeffrey Macdonald, University of North Carolina; Hamid Krim, North Carolina State University

Track 2 - Adaptive Systems and Processing

Session TP4a The Robust Adaptive Beamformer Bakeoff

Chair: *Michael Zatman*

TP4a-1 Doubly Constrained Robust Capon Beamforming 1:30 PM
Jian Li, University of Florida; Petre Stoica, Uppsala University; Zhisong Wang, University of Florida

TP4a-2 A Comparison of Robust Adaptive Beamforming Algorithms 1:55 PM
James Ward, Lincoln Laboratory; Henry Cox, Orincon Defense; Stephen Kogon, Lincoln Laboratory

TP4a-3 Robust minimum-variance beamforming 2:20 PM
Robert Lorenz, Stephen Boyd, Stanford University

TP4a-4 Robust Adaptive Beamforming Using Worst-Case Performance Optimization 2:45 PM
Alex Gershman, Zhi-Quan Luo, Shahram Shahbazpanahi, Sergiy Vorobyov, McMaster University

Track 4 - Speech and Audio Processing

Session TP4b New Tools, Techniques, and Strategies for use in Education

Chair: *Sally Wood*

TP4b-1 Why we need a ‘‘new systems science’’ 3:30 PM
Edward Lee, University of California, Berkeley

TP4b-2 Digital Systems and Signal Processing: Creating Connections in the Curriculum 3:55 PM
Linda DeBrunner, Victor DeBrunner, University of Oklahoma

TP4b-3 DSP Concepts and Experiments in a High School Curriculum 4:20 PM
Sally L. Wood, Santa Clara University; Geoffrey Orsak, Southern Methodist University

TP4b-4 Re-discovering Signal Processing: A Configurable Logic Based Approach 4:45 PM
Chris Dick, Xilinx, Inc.

TP4b-5 On the use of J-DSP for on-line laboratories in linear systems courses; description and assessment 5:10 PM
Andreas Spanias, Arizona State University

Track 5 - Image and Video Processing

Session TP5 Perceptual Models in Image and Video Processing

Chair: *Sheila Hemami*

TP5-1 The role of the visual system’s orientation mechanismsin the perception of spatial aliasing 1:30 PM
Scott Daly, Sharp Laboratories of America

TP5-2 Picturing Appearance 1:55 PM
James A. Ferwerda, Cornell University

TP5-3 The challenge of video quality estimation 2:20 PM
Andrew B. Watson, NASA Ames Research Center

TP5-4 Quantifying the visual quality of wavelet-compressed images based on local contrast, visual masking, and global precedence 2:45 PM
Damon Chandler, Mark A. Masry, Sheila S. Hemami, Cornell University

BREAK 3:10 PM

TP5-5 Multi-scale Structural Similarity for Image Quality Assessment 3:30 PM
Zhou Wang, Eero Simoncelli, New York University; Alan Bovik, University of Texas, Austin

TP5-6 Blind Quality Assessment of JPEG2000 Compressed Images Using Natural Scene Statistics 3:55 PM
Hamid Rahim Sheikh, Alan Bovik, Lawrence Cormack, University of Texas, Austin

TP5-7 Normalized Image Representation for Efficient Coding 4:20 PM
Jesus Malo, Universitat de Valencia

TP5-8 Phase and Magnitude Perceptual Sensitivities in Nonredundant Complex Wavelet Representations 4:45 PM
Michael Wakin, Ramesh Neelamani, Michael Orchard, Richard Baraniuk, Rutger van Spaendonck, Rice University

TP5-9 Perceptual tuning of low-level color and texture features for image segmentation 5:10 PM
Junqing Chen, Thrasyvoulos Pappas, Northwestern University

Track 6 - Architectures and Implementations

Session TP6 Computer Arithmetic

Chair: *Earl E. Swartzlander*

TP6-1 Hierarchical Synthesis of complex DSP functions on FPGAs 1:30 PM
Ying Yi, Roger Woods, Queen's University Belfast

TP6-2 Asymmetric and Compressed Logarithmic Number Systems for a Multimedia Coprocessor 1:55 PM
Mark Arnold, Lehigh University

TP6-3 Energy-delay optimization and trade-offs in arithmetic circuits 2:20 PM
Vojin Oklobdzija, Bart Zeydel, Hoang Dao, University of California, Davis

TP6-4 Computer Arithmetic Structures for Quantum Cellular Automata 2:45 PM
Konrad Walus, Graham Jullien, Vassil Dimitrov, University of Calgary

BREAK 3:10 PM

TP6-5 Digit-Recurrence Algorithms for Division and Square Root with Limited Precision Primitives 3:30 PM
Milos Ercegovac, University of California, Los Angeles; Jean-Michel Muller, ENS Lyon

TP6-6 Significance-Based Fast Computation of Double Precision Nonlinear Functions and Error Prediction 3:55 PM
Vijay Jain, University of South Florida

TP6-7 An efficient and scalable radix-4 modular multiplier design using recoding techniques 4:20 PM
Alexandre Tenca, Lo'ai Tawalbeh, Oregon State University

TP6-8 Left-to-Right Squarer with Overlapped LS and MS Parts 4:45 PM
Milos Ercegovac, University of California, Los Angeles

TP6-9 Re-usable CORDIC- based processor for the SoC implementation of SVD systems 5:10 PM
Zhaohui Liu, Kevin Dickson, John McCanny, Queen's University Belfast

Track 7 - Signal Processing Algorithms and Applications

Session TP7 Energy Efficient DSP Systems

Chair: *Rob Brennan*

TP7-1 The Modular Pipeline Fast Fourier Transform Algorithm and Architecture 1:30 PM
Ayman El-Khashab, Earl E. Swartzlander, Jr., University of Texas, Austin

TP7-2 System Design of a Low-Power I/O Link 1:55 PM
Srinivasa Sridhara, Naresh Shanbhag, University of Illinois, Urbana-Champaign

TP7-3 Low-complexity and Low-power Adaptive Processing in WOLA Filterbank Systems 2:20 PM
Robert Brennan, Dspfactory

TP7-4 Modelling the Weakly Non-Linear Behavior of Fixed Precision Multiplierless ISCIC Filters 2:45 PM
Kamakshi Sivaramakrishnan, Ivan Linscott, Leonard Tyler, Stanford University

BREAK 3:10 PM

TP7-5 Signal processing in digital and floating-gate analog circuits, design trade-offs 3:30 PM
Sunil Kamath, David Anderson, Georgia Institute of Technology

TP7-6 Power-Delay Optimization with Logical Effort 3:55 PM
Peter-Michael Seidel, Southern Methodist University

TP7-7 Improved Power Efficiency of the LC-LMS Equalizer Through Partial Elimination of the Constraint Update 4:20 PM
Frank Bologna, SPAWAR Systems Center

TP7-8 Energy-efficient Soft Error-Tolerant Digital Signal Processing 4:45 PM
Byonghyo Shim, Naresh Shanbhag, University of Illinois, Urbana-Champaign

Track 5 - Image and Video Processing

Session TP8a1 Image and Video Coding Systems

Chair: *Pamela Cosman*

TP8a1-1 Lossless DNA microarray image compression
Naser Faramarzpour, Shahram Shirani, McMaster University

TP8a1-2 Source-optimized irregular repeat accumulate codes with inherent unequalerror protection capabilities and their application to image transmission
Chingfu Lan, Krishna Narayanan, Zixiang Xiong, Texas A&M University

TP8a1-3 Wavelet-based modeling and smoothing for call admission control of VBR video traffic
Jing Jiang, Zixiang Xiong, Texas A&M University

TP8a1-4 Dual Frame Video Encoding with Feedback
Athanasios Leontaris, Pamela Cosman, University of California, San Diego

TP8a1-5 Low-Delay Reconstruction of Punctured Frame-coded Streams
Riccardo Bernardini, Roberto Rinaldo, Marco Durigon, University of Udine

TP8a1-6 On Low Bit-Rate Coding Using the Contourlet Transform
Ramin Eslami, Hayder Radha, Michigan State University

TP8a1-7 A 3D-TV System Based On Video Plus Depth Information
Christoph Fehn, Fraunhofer-Institut für Nachrichtentechnik

TP8a1-8 Analysis of Motion Vector Errors in Motion-Compensated Frame Rate Up-Conversion
Gokce Dane, Truong Nguyen, University of California, San Diego

TP8a1-9 Dual frame motion compensation for a rate switching network
Vijay Chellappa, University of California, San Diego

TP8a1-10 Multi-State vs. Single-State Video Coding over Error-Prone Channels
Sila Ekmekci, Thomas Sikora, Technical University Berlin

TP8a1-11 Video Communications with Optimal Intra/Inter-Mode Switchingover Wireless Internet
Yushi Shen, Pamela Cosman, Laurence Milstein, University of California, San Diego

TP8a1-12 A Subband Image Coder for Channels with Both Errors and Erasures
Tomas Sköllermo, Mikael Skoglund, Royal Institute of Technology

TP8a1-13 Compute-Resource Allocation for Motion Estimation in Real-Time Video Compression
Joseph Yeh, John Wawrzynek, University of California, Berkeley

TP8a1-14 Stochastic Sampling from Image Coder Induced Probability Distributions
Onur Guleryuz, Viresh Ratnakar, Epson Palo Alto Laboratory; Regunathan Radhakrishnan, Nasir Memon, Polytechnic University

TP8a1-15 ORBit: An Adaptive Method of Shaping Video Data for Transmission Over Imperfect Channels
Clark Taylor, University of California, San diego; Sujit Dey, University of California, San Diego

Track 5 - Image and Video Processing

Session TP8a2 Image Processing & Scene Analysis

Chair: *Brian Evans*

TP8a2-1 Key Frame Extraction Using MPEG-7 Motion Descriptors
Rajesh Narasimha, Georgia Institute of technology; Andreas Savakis, Raghuveer Rao, Rochester Institute of Technology; Ricardo De Queiroz, Xerox Corporation

TP8a2-2 Modulation Domain Texture Retrieval for CBIR in Digital Libraries
Joseph Havlicek, University of Oklahoma; Jinshan Tang, Scott Acton, University of Virginia; Robert Antonucci, Science Systems and Applications, Inc.; Fabrice Ouandji, University of Oklahoma

TP8a2-3 Boost SVM Active Learning for Content-Based Image Retrieval
Wei Jiang, Guihua Er, Qionghai Dai, Tsinghua University

TP8a2-4 Digital watermarking using local contrast-based texture masking
Mark A. Masry, Damon M. Chandler, Sheila S. Hemami, Cornell University

TP8a2-5 Object detection and tracking using the particle filtering
Jean-Charles Noyer, Mohammed Benjelloun, Patrick Lanvin, ULCO

TP8a2-6 The use of CNN models and vertical rectification for a direct trigonometric recovery of 3D scene Geometry from a stream of images
Salah Derrouich, Keichiro Izumida, Kenji Murao, Kazuhisa Shiiya, Miyazaki University

TP8a2-7 Texture Characterisation Using a Novel Optimisation Formulation for Two-dimensional Autoregressive Modelling and K-means Algorithm
Sarah Lee, Tania Stathaki, Imperial College London

TP8a2-8 Image Classification Using Tree-Structured Discriminant Vector Quantization
Kivanc Ozonat, Stanford University

TP8a2-9 Estimation of Multi-Dimensional Homeomorphisms for Object Recognition in Noisy Environments
Joseph Francos, Rami Hagege, Ben Gurion University; Benjamin Friedlander, University of California, Santa Barbara

TP8a2-10 An Experimental Study of Object Detection in the Wavelet Domain
Srivatsan Kandadai, Charles Creusere, New Mexico State University

TP8a2-11 Exploration of Linear Discriminant Analysis forTransform Coding in Distributed Image Classification
Hua Xie, Univeristy of Southern California; Antonio Ortega, University of Southern California

TP8a2-12 Compact Range ISAR Emulations of Moving SAR Targets: Theory andExperiments
Coy Hawkins, U.S. Army; Seth Silverstein, University of Virginia

TP8a2-13 A Pixel Mixture and Restoration Method for a Single Color CCD Imager
Ikuko Tsubaki, Kiyoharu Aizawa, University of Tokyo

TP8a2-14 A Novel Gradient Induced Main Subject Segmentation Algorithm for Digital Still Cameras
Serene Banerjee, Brian Evans, University of Texas, Austin

Track 1 - Communication Systems and Networks
Session TP8b1 Implementation and Performance Bounds

Chair: *Zhengyuan Xu*

TP8b1-1 Robust Blind Channel Estimation via Subspace Approximation
Zhengyuan Xu, University of California, Riverside

TP8b1-2 Predicting BPSK Demodulator Performance
Daniel Gisselquist, AF Institute of Technology

TP8b1-3 Efficient Coherent Detector VLSI Design for Continuous Phase Modulation
Tong Zhang, Jie Wu, Gary Saulnier, Rensselaer Polytechnic Institute

TP8b1-4 Asymptotic Efficiency of a Blind Maximum Likelihood Sequence Detector
Jill Nelson, Andrew Singer, University of Illinois, Urbana-Champaign

TP8b1-5 Performance Analysis for Maximal-Ratio Combining in Correlated Generalized Rician Fading
Jay Cheng, Toby Berger, Cornell University

TP8b1-6 Matched Filter Bounds without Channel Knowledge at the Receiver
Abdelkader Medles, Dirk Slock, Eurecom Institute

TP8b1-7 Modeling and Mitigation of Jitter in High-Speed Source-Synchronous Inter-Chip Communication Systems
Ganesh Balamurugan, Naresh Shanbhag, University of Illinois, Urbana-Champaign

Track 1 - Communication Systems and Networks
Session TP8b2 Networks

Chair: *Daniel Gisselquist*

TP8b2-1 Connectivity of Sensor Networks with Power Control
Balaji Rengarajan, Jeremy Chen, Sanjay Shakkottai, Theodore Rappaport, University of Texas, Austin

TP8b2-2 Survivable Fiber Optics Networks (SFON)
Sairam Kanduri, Anna University

TP8b2-3 Support of Packet Video over Ad Hoc Wireless Networks
Yong Pei, University of Miami

TP8b2-4 Power Efficient Wireless Sensor Networks with Distributed-Transmission-Induced Space Spreading
Xiaohua (Edward) Li, N. Eva Wu, State University of New York at Binghamton

TP8b2-5 Throughput Analysis for Decentralized Slotted Peer-to-Peer Regular Wireless Networks
Tarik Tabet, Swiss Federal Institute of Technology Lausanne; Raymond Knopp, Eurecom Institute

TP8b2-6 Detecting Byzantyne Faults in Mobile Ad-hoc Networks
Sirisha Medidi, Muralidhar Medidi, Washington State University

TP8b2-7 QoS Constrained Statistical Resource Reservation for Wireless Networks
Chunpeng Xiao, Raviv Raich, G. Tong Zhou, Georgia Institute of Technology

TP8b2-8 Optimal puncturing of unreliable bits in hybrid ARQ protocol to enhance network performance
Yeong-Hyeon Kwon, Dong-Jo Park, Mi-Kyung Oh, Korea Advanced Institute of Science and Technology

TP8b2-9 Stability Analysis of Stochastic Sensor Networks
Shi Chao Zhang, Pak Kin Wong, Daniel Grobe Sachs, Ralf Koetter, Douglas L. Jones, University of Illinois, Urbana-Champaign

TP8b2-10 Estimation of the Number of Operating Sensors in a Sensor Network
Cristian Budianu, Lang Tong, Cornell University

TP8b2-11 Cross-Layer Optimization of the Reservation Channel in a Pseudocellular Network: Mobile-Centric Fast Handoffs via Multi-user Detection
Kristoffer Bruvold, Upamanyu Madhow, University of California, Santa Barbara

TP8b2-12 An Inter-arrival Delay Jitter Model using Multi-Structure Network Delay Characteristics for Packet Networks
Edward Daniel, Chris White, Keith Teague, Oklahoma State University

TP8b2-13 A Step Toward Ad hoc Networks: Can Relays Really Improve the Performance of Cellular Networks?
Raymond Wang, Donald Cox, Stanford University

TP8b2-14 Should we break a Wireless Network into Sub-networks?
Amir F. Dana, Masoud Sharif, Babak Hassibi, Michelle Effros, California Institute of Technology

TP8b2-15 Understanding Ad hoc Networks: How Much an Accurate Physical Layer Model Matters
Raymond Wang, Donald Cox, Stanford University

Track 1 - Communication Systems and Networks

Session WA1a Ultra Wideband-II

Chair: *Robert Scholtz*

WA1a-1 Tracking UWB Monocycles in IEEE 802.15 Multi-path channels — 8:30 AM
Chee-Cheon Chui, Robert A. Scholtz, University of Southern California

WA1a-2 Detection and Interference Suppression for Ultra-Wideband Signaling with Analog Processing and One Bit A/D — 8:55 AM
Onkar Dabeer, Upamanyu Madhow, University of California, Santa Barbara

WA1a-3 Blind v.s. Training-based UWB Timing Acquisition with Effective Multipath Capture — 9:20 AM
Zhi Tian, Lin Wu, Michigan Technological University

WA1a-4 Ternary Complementary Sets for Orthogonal Pulse based UWB — 9:45 AM
Di Wu, Predrag Spasojevic, Ivan Seskar, WINLAB, Rutgers University

Track 1 - Communication Systems and Networks

Session WA1b EDAC-II

Chair: *Todd Moon*

WA1b-1 Bit-level erasure decoding beyond design distance of Reed-Solomon codes over GF(2^m) — 10:30 AM
Todd Moon, Scott Budge, Utah State University

WA1b-2 Design of Interleavers for Multiple Turbo Codes — 10:55 AM
Neda Ehtiati, M. Reza Soleymani, Concordia University; Hamid R. Sadjadpour, University of California, Santa Cruz

WA1b-3 An Optimal Two-Stage Decoding Algorithm for Linear Block Codes — 11:20 AM
Xianren Wu, Hamid Sadjadpour, University of California, Santa Cruz

WA1b-4 Exploiting the Nature of Extrinsic Information in Iterative Decoding — 11:45 AM
Yogananda Isukapalli, Sathyanarayan Rao, Villanova University

Track 3 - Array Processing and MIMO

Session WA2 MIMO/Space-Time Coding-II

Chair: *Babak Hassibi*

WA2-1 Fully-Diverse Space-Time Codes for Three-Transmit-Antenna Systems — 8:30 AM
Yindi Jing, Babak Hassibi, California Institute of Technology

WA2-2 Nonlinear Hierarchical Space-Time Block Codes — 8:55 AM
Jifeng Geng, Urbashi Mitra, University of Southern California

WA2-3 Optimal Downlink Beamforming with Additional Constraints — 9:20 AM
David Samuelsson, Mats Bengtsson, Bjorn Ottersten, Royal Institute of Technology

WA2-4 Capacity Complying MIMO Channel models — 9:45 AM
Mérouane Debbah, Ralf Müller, Forschungszentrum Telekommunikation Wien

BREAK 10:10 AM

WA2-5 Ergodic Capacity of Frequency Selective MIMO Burst Channels — 10:30 AM
Olli Piirainen, Nokia Networks; Markku Juntti, University of Oulu

WA2-6 Augmenting the Training Sequence Part in Semiblind Estimation for MIMO Channels — 10:55 AM
Abdelkader Medles, Dirk Slock, Eurecom Institute

WA2-7 Design of FIR Precoders and Equalizers for Broadband MIMO Wireless Channels with Power Constraints — 11:20 AM
Yongfang Guo, Bernard Levy, University of California, Davis

WA2-8 Exact Symbol Error Probability of Space-Time Block Codes — 11:45 AM
Mohammad Gharavi-Alkhansari, University of Duisburg-Essen; Alex Gershman, McMaster University

Track 3 - Array Processing and MIMO

Session WA3 Array Processing Foundations

Chair: *Todd McWhorter*

WA3-1 Matrix Conjugate Gradients for Generation of High-Resolution Bearing-Time Spectrograms — 8:30 AM
Michael Zoltowski, Purdue University

WA3-2 Mean Squared Error Threshold Prediction of Adaptive Maximum-Likelihood Techniques — 8:55 AM
Christ Richmond, MIT Lincoln Laboratory

WA3-3 Statistical Properties of Eigenvector-Based Adaptive Beamformers — 9:20 AM
Stephen Kogon, MIT Lincoln Laboratory

WA3-4 Hybrid Adaptive beamforming For Multi-line Arrays — 9:45 AM
Henry Cox, Hung Lai, Kevin Heaney, James Murray, Orincon Defense

BREAK 10:10 AM

WA3-5 UMP Invariance of the Multi-rank Adaptive Coherence Estimator 10:30 AM
Shawn Kraut, Queen's University; Louis Scharf, Colorado State University

WA3-6 Second-Order DOA Estimation from Digitally Modulated Signals 10:55 AM
Javier Villares, Gregori Vazquez, Polytechnic University of Catalunya (UPC)

WA3-7 Signal waveform estimation in the presence of uncertainties about the steering vector 11:20 AM
Olivier Besson, ENSICA; Andrei Monakov, St. Petersburg State University of Aerospace; Christophe Chalus, TéSA

WA3-8 Parameter estimation of wideband chirp signals in sensor arrays through DPT 11:45 AM
Suwandi Lie, National University of Singapore; A. Rahim Leyman, Y. Huat Chew, Institute for Infocomm Research

Track 4 - Speech and Audio Processing

Session WA4 Topics in Speech Recognition

Chair: *Robert Nickel*

WA4-1 Optimal Pitch Bases Expansions in Speech Signal Processing 8:30 AM
Robert Nickel, Sachin Oswal, The Pennsylvania State University

WA4-2 Robust Speaker Verification in Colored Noise Environment 8:55 AM
Cesar Medina, Jose Apolinario, Instituto Militar de Engenharia; Abraham Alcaim, Pontificia Universidade Catolica do Rio de Janeiro; Rogerio Alves, Clarity, LCC

WA4-3 Generalized EM Training of Tied Parameters in Conditionally Gaussian Graphical Model-Based Speech Systems 9:20 AM
Jeff Bilmes, University of Washington

WA4-4 Speaker Normalization with the Band-Pass Transform 9:45 AM
Amro El-Jaroudi, Pierre Dognin, University of Pittsburgh

BREAK 10:10 AM

WA4-5 Speech Recognition using Filter-Bank Features 10:30 AM
Sourabh Ravindran, Cenk Demiroglu, David Anderson, Georgia Institute of Technology

WA4-6 Robust Noise Estimation applied to different speech estimators 10:55 AM
Markus Schwab, Hyoung-Gook Kim, Wiryadi Wiryadi, Peter Noll, Technical University Berlin

WA4-7 Speech watermarking with objective fidelity and robustness criteria 11:20 AM
Aparna R. Gurijala, J. R. Deller, Jr., Michigan State University

WA4-8 Rayleigh fading channel model versus AWGN channel model in audio watermarking 11:45 AM
Nedeljko Cvejic, Tapio Seppänen, University of Oulu

Track 5 - Image and Video Processing

Session WA5 Medical Image Coding

Chair: *William Karl*

WA5-1 Direct Reconstruction of Kinetic Parameter Images from Dynamic PET Data 8:30 AM
Mustafa Kamasak, Charles A. Bouman, Purdue University; Evan Morris, Indiana University; Ken D. Sauer, University of Notre Dame

WA5-2 Region of Interest Cone Beam Tomography with Prior CT Data 8:55 AM
Krishnakumar Ramamurthi, Jerry Prince, Johns Hopkins University

WA5-3 Reconstruction from digital holograms by statistical methods 9:20 AM
Saowapak Sotthivirat, Jeffrey Fessler, University of Michigan

WA5-4 Accurate and Fast Discrete Polar Fourier Transform 9:45 AM
Michael Elad, Stanford University; Amir Averbuch, Tel-Aviv University; Moshe Israeli, Technion; David Donoho, Stanford University; Ronald Coifman, Yale University

BREAK 10:10 AM

WA5-5 Bias-Minimizing Filters for Gradient-Based Motion Estimation 10:30 AM
Dirk Robinson, University of California, Santa Cruz

WA5-6 A Semi-Definite Programming Approach to Estimating Distributed Sources 10:55 AM
Venkatesh Saligrama, William Karl, Boston University

WA5-7 Tracking Rolling Leukocytes with Motion Gradient Vector Flow 11:20 AM
Nilanjan Ray, Scott Acton, University of Virginia

WA5-8 DCT based computation of 2D Cepstrum and its Application for Visual Echo Detection 11:45 AM
Amjad Awawdeh, Guoliang Fan, Oklahoma State University

Track 5 - Image and Video Processing

Session WA6a Still Image Coding

Chair: *Martin Boliek*

WA6a-1 Iterative Joint Source/Channel Decoding for JPEG2000 — 8:30 AM
Lingling Pu, Zhenyu Wu, Ali Bilgin, Michael W. Marcellin, Bane V. Vasic, University of Arizona

WA6a-2 A Nonlinear Image Representation In Wavelet Domain Using Complex Signals With Single Quadrant Spectrum — 8:55 AM
Hasan Ates, Princeton University; Michael Orchard, Rice University

WA6a-3 Document Image Coding and JPM — 9:20 AM
Robert Buckley, Xerox Corporation

WA6a-4 Beyond compression: a survey of functionality derived from still image coding — 9:45 AM
Martin Boliek, Ricoh Innovations, Inc.

Track 5 - Image and Video Processing

Session WA6b Image De-noising

Chair: *Onur Guleyuz*

WA6b-1 Data and Rate Adaptive Quantization for Joint Image Denoising and Compression — 10:30 AM
Nikhil Gupta, Eugene Plotkin, M. N. S. Swamy, Concordia University

WA6b-2 The Contourlet Transform for Image De-noising Using Cycle Spinning — 10:55 AM
Ramin Eslami, Hayder Radha, Michigan State University

WA6b-3 Three-dimensional Speckle Reducing Anisotropic Diffusion — 11:20 AM
Yongjian Yu, Scott Acton, University of Virginia

WA6b-4 Weighted Overcomplete Denoising — 11:45 AM
Onur Guleryuz, Epson Palo Alto Laboratory

Track 7 - Signal Processing Algorithms and Applications

Session WA7a Multimedia Signal Processing

Chair: *Darnell Moore*

WA7a-1 JPEG2000 for handheld applications — 8:30 AM
Darnell Moore, Texas Instruments, Inc.

WA7a-2 Bayesian Networks in Multimodal Speech Recognition and Speaker Identification — 8:55 AM
Ara Nefian, Intel Corporation

WA7a-3 Multimedia Sensor Networks for ISR Applications — 9:20 AM
James DeBardelaben, Daniel Decicco, Johns Hopkins Applied Physics Laboratory

WA7a-4 Boosted Audio-Visual HMM for Speech Reading — 9:45 AM
Pei Yin, Irfan Essa, Jim Rehg, Georgia Institute of Technology

Track 7 - Signal Processing Algorithms and Applications

Session WA7b Co-operative Analog-Digital Signal Processing

Chair: *Paul Hasler*

WA7b-1 On delay structures for the analog adaptive filters with long filter taps — 10:30 AM
Heejong Yoo, David Anderson, Paul Hasler, CSIP / Georgia Institute of Technology

WA7b-2 Low-Power Speech Processing based upon Floating-Gate Circuits — 10:55 AM
Paul Smith, David Graham, Paul Hasler, Georgia Institute of Technology

WA7b-3 A Supervised Neural Network Layer of Continuously Adapting, Analog Floating-Gate Nodes — 11:20 AM
Jeff Dugger, Venkatesh Srinivasan, Paul Hasler, Georgia Institute of Technology

WA7b-4 Highly Linear, Wide-Dynamic-Range Multiple-Input Translinear Element Networks — 11:45 AM
Kofi Odame, Eric McDonald, Bradley A. Minch, Cornell University

Track 7 - Signal Processing Algorithms and Applications

Session WA8a1 Applied Signal Processing

Chair: *Linda DeBrunner*

WA8a1-1 Design of Canonical Signed Digit IIR Filters Using Genetic Algorithm
Li Liang, Majid Ahmadi, Maher Sid-Ahmed, University of Windsor

WA8a1-2 Factorizations of Two Families of Two-dimensional IIR Paraunitary Matrices
Farshid Delgosha, Faramarz Fekri, Georgia Institute of Technology

WA8a1-3 Active Nonlinear Noise Control with Certain Non-Linearities in the Secondary Path
Victor DeBrunner, Dayong Zhou, University of Oklahoma

WA8a1-4 A Secure and Efficient Fingerprint Verification System for Embedded Systems
Shenglin Yang, Kazuo Sakiyama, Ingrid M. Verbauwhede, University of California, Los Angeles

WA8a1-5 Classification of Cancerous Cells Images using Clustered Fuzzy-Neural Machine Techniques
Ephraim Nwoye, University of Newcastle upon Tyne

WA8a1-6 Automated Worm Tracking and Classification
Wei Geng, Pamela Cosman, William Schafer, University of California, San Diego

WA8a1-7 Fully Integrated Low Power Phase-Locked Loop for Various Inputs in Sensor Network Applications
Jianhua Gan, Cirrus Logic, Inc.

WA8a1-8 Frequency-Domain Adaptive Filtering -- A Set-Membership Approach
Li Guo, Anthony Ekpenyong, Yih-Fang Huang, University of Notre Dame

WA8a1-9 Decomposition of a Bandpass Signal
Ramdas Kumaresan, University of Rhode Island

WA8a1-10 Chemical/Biological Round Discrimination using Acoustic, Seismic, and Imaging Data
Monique Fargues, Naval Postgraduate School; Chris Reiff, U.S. Army Research Laboratory; Bruce Nelson, Geo-Centers Incorporated; David Gonski, U.S. Army Research Laboratory; Amnon Birenzvige, Edgewood Chemical Biological Center

WA8a1-11 A Numerical Optimization Approach for Color Correction in Forensic DNA Genotyping
Sameh El-Difrawy, Dan Ehrlich, Whitehead Institute for Biomedical Research

WA8a1-12 Subspace Learning in Generalized Gaussian Noise
Mukund Desai, Rami Mangoubi, Draper Laboratory MS77

Track 7 - Signal Processing Algorithms and Applications

Session WA8a2 Applied Adaptive Signal Processing

Chair: *Neeraj Magotra*

WA8a2-1 Signal Extraction in Multi-signal/Noisy Environments Using Profile Hidden Markov Models
Keith Mathias, Northrop Grumman

WA8a2-2 Singular Random Signals
Picinbono Bernard, Supélec

WA8a2-3 Parameter estimation for reduced-rank multivariate linear regressions in the presence of correlated noise
Karl Werner, Magnus Jansson, Royal Institute of Technology (KTH)

WA8a2-4 A Neural Network Approach for Pre-Classification in Musical Chords Recognition
Thierry Gagnon, Steeve Larouche, Roch Lefebvre, University of Sherbrooke

WA8a2-5 New Combinitorial Methods for the Improvement of the Convergence Speed and the Tracking Abilities of the Fast Stable RLS Adaptive Algorithm
Mohamed Djendi, Ahmed Benallal, Abderazak Guessoum, University of BLIDA; Daoued Berkani, Ecole polytechnique d'Alger

WA8a2-6 A Least Squares Design for a Time Domain Equalizer
Prem Ramaswamy, Signia-IDT

WA8a2-7 On the estimation of correlated noise statistics in a class of state-space models
Mihai Enescu, Helsinki University of Technology

WA8a2-8 Improved Integer Transforms for Lossless Audio Coding
Ralf Geiger, Yoshikazu Yokotani, Gerald Schuller, Fraunhofer IIS AEMT

WA8a2-9 Softening the Multiscale Product Method for Adaptive Noise Reduction
Jun Ge, Gagan Mirchandani, University of Vermont

WA8a2-10 High-Resolution M-Channel, Two-Dimensional Lattice Linear Prediction Algorithm
Lawrence Marple, Jr., Oregon State University; Claudio Marino, Orincon Defense

Track 6 - Architectures and Implementations

Session WA8b1 Application Oriented Processing

Chair: *Neil Burgess*

WA8b1-1 Interleaved Cyclic Redundancy Check (CRC) Code
Jun Jin Kong, Keshab K. Parhi, University of Minnesota

WA8b1-2 Multiuser detector (MUD) for integration in 3G receivers
Humberto Campanella, Jorge Navas, Carlos Varela, Universidad del Norte

WA8b1-3 A High-Throughput VLSI Architecture for Linear Turbo Equalization
Seok-Jun Lee, Naresh Shanbhag, Coordinated Science Laboratory, UIUC

WA8b1-4 Speed-Area Trade-off for 10 to 100 Gbits/s Throughput AES Processor
Alireza Hodjat, Ingrid M. Verbauwhede, University of California, Los Angeles

WA8b1-5 Low Power and High Speed Novel Architecture for EBCOT Block in JPEG2000 System
Ramy Aly, Magdy Bayoumi, University of Louisiana at Lafayette; Bertrand Zavidovique, University of Paris-Sud

WA8b1-6 Novel CSD-Based Digital Heterodyne Circuit
Michael Soderstrand, Grace Cho, Oklahoma State University

WA8b1-7 Programmable Code Generator for Software Defined Radio
David Perels, Reinhard Bischoff, Jonas Biveroni, Markus Bruehwiler, Andreas Burg, Norbert Felber, Wolfgang Fichtner, Swiss Federal Institute of Technology Zurich

WA8b1-8 Efficient Implementation of a rake receiver on the TMS320C64x
Daniel Menard, ENSSAT - Rennes I University; Michel Guitton, Philippe Quemerais, Olivier Sentieys, ENSSAT

WA8b1-9 Energy Tradeoffs for DSP-based Implementation of IntDCT
Andrea Molino, Fabrizio Vacca, Politecnico di Torino; Truong Nguyen, University of California, San Diego

WA8b1-10 Scalable FPGA Architectures for LMMSE-based SIMO Chip Equalizer in HSDPA Downlink
Yuanbin Guo, Dennis McCain, Jianzhong (Charlie) Zhang, Nokia Research Center; Joseph Cavallaro, Rice University

WA8b1-11 DNA Microarray Image Compression by Pipeline Architecture
Shadrokh Samavi, Shahram Shirani, Nader Karimi, Naser Faramarzpour, McMaster University

WA8b1-12 Efficient Third-Order Volterra Filter Computation in the Time Domain
Konstantina Karagianni, Vassilis Paliouras, University of Patras

WA8b1-13 A Parallel Programmable Energy-Efficient Architecture For Computationally-Intensive DSP Systems
Bevan Baas, University of California, Davis

WA8b1-14 Hardware Implementation of a Feedforward Neural Network Using FPGAs.
Serkan Ünsal, Aydogan Savran, Ege University

Track 6 - Architectures and Implementations

Session WA8b2 Numerical Processing

Chair: *James Stine*

WA8b2-1 Multiplier Architectures for Media Processing
Shankar Krithivasan, Michael Schulte, University of Wisconsin-Madison

WA8b2-2 Some Results on Taylor-series Function Approximation on FPGA
Barry Lee, University of Wales, Cardiff; Neil Burgess, University of Wales, Cardiff.

WA8b2-3 Accurate Motion Capture at High Rotational Rates Using the CORDIC Algorithm
Jeanette Arrigo, Paul Chau, University of California, San Diego

WA8b2-4 Characterization of the Quantization Properties of Similarity-Related DSP Structures by Means of Interval Simulations
Juan A. Lopez-Martin, Gabriel Caffarena, Carlos Carreras, Octavio Nieto-Taladriz, Universidad Politecnica Madrid

WA8b2-5 A Taxonomy of Parallel Prefix Networks
David Harris, Harvey Mudd College / Sun Microsystems Labs

WA8b2-6 Improving Euclidean Division and Modular Reduction for some Classes of Divisors
Jean-Claude Bajard, LIRMM, Université Montpellier 2; Laurent Imbert, CNRS, LIRMM; Thomas Plantard, Thomas Plantard, LIRMM, Université Montpellier 2

WA8b2-7 The Quiet State - a new approach to low-power multiplier design
Nikos Mallios, Neil Burgess, Cardiff University

WA8b2-8 A VHDL Library of LNS Operators
Jérémie Detrey, Florent de Dinechin, École Normale Supérieure de Lyon

WA8b2-9 Multiplierless Implementations of Adaptive FIR Filters
Yunhua Wang, Linda DeBrunner, Victor DeBrunner, Monte Tull, University of Oklahoma

WA8b2-10 Direct digital frequency synthesis using piece-wise polynomial approximation
Waqas Akram, Cirrus Logic, Inc.; Earl E. Swartzlander, University of Texas, Austin

WA8b2-11 A Combined Interval and Floating-Point Comparator
Chris Kaas, James Stine, Illinois Institute of Technology

WA8b2-12 Comparing RNS Scaling Techniques
Braden Phillips, University of Adelaide

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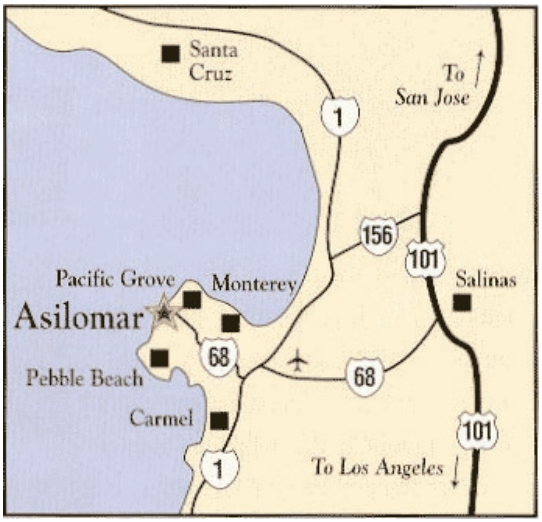
Matusiak, Ewa	TA7b
Matz, Gerald	MP8a2
Matz, Gerald	TP2
McCain, Dennis	WA8b1
McCanny, John	MP6b
McCanny, John	TP6
McClellan, James	TA3
McDonald, Eric	TA7a
McDonald, Eric	WA7b
McIvor, Ciaran	MP6b
McLoone, Máire	MP6b
McWhirter, John	MA6b
McWhorter, Todd	TA3
Mecklenbraeuker, Christoph	TP2
Medidi, Muralidhar	TP8b2
Medidi, Sirisha	TP8b2
Medina, Cesar	WA4
Medles, Abdelkader	TP8b1
Medles, Abdelkader	WA2
Memon, Nasir	TP8a1
Menard, Daniel	WA8b1
Michelini, Marco	MA1
Milstein, Laurence	TP8a1
Minch, Bradley A.	TA7a
Minch, Bradley A.	WA7b
Mirchandani, Gagan	WA8a2
Mitra, Sanjit K.	TA8b2
Mitra, Urbashi	MP8b2
Mitra, Urbashi	WA2
Molino, Andrea	WA8b1
Monakov, Andrei	WA3
Moon, Todd	MA3b
Moon, Todd	MA4b
Moon, Todd	WA1b
Moore, Darnell	WA7a
Morgan, Dennis	TA1
Morgera, Salvatore	TP3
Morris, Evan	WA5
Mostofi, Yasamin	MP8b2
Motani, Mehul	TA8b1
Moura, Jose M. F.	MA4b
Mujtaba, S. A.	TA1
Mukkavilli, Krishna	TA8a
Muller, Jean-Michel	TP6
Müller, Ralf	WA2
Murali, Sriram	MP8b1
Murao, Kenji	TP8a2
Murphy, Patrick	TA6b
Murphy, Ryan	MP5
Murray, James	WA3
Murthy, Chandra	MP3
Naguleswaran, Sanjeev	MA6b
Naka, Nobuhiko	TA2
Napolitano, Antonio	MP1b
Narasimha, Rajesh	TP8a2
Narayanan, Krishna	TP8a1
Nassar, Carl	MA1
Navas, Jorge	WA8b1

NAME	SESSION
Naware, Vidyut	MP2
Neelamani, Ramesh	TP5
Nefian, Ara	WA7a
Nelson, Bruce	WA8a1
Nelson, Jill	TP8b1
Nerayanuru, Sreenivasa	TA8b1
Nguyen, Hoang	TA8b1
Nguyen, Truong	TP8a1
Nguyen, Truong	WA8b1
Nickel, Robert	WA4
Nieto-Taladriz, Octavio	WA8b2
Niu, Huaning	MA6b
Nix, Johannes	MP7
Nix, Johannes	TA2
Noll, Peter	WA4
Nongpiur, Rajeev	MP8b1
Nowak, Robert	TP3
Noyer, Jean-Charles	TP8a2
Nwoye, Ephraim	WA8a1
O'Brien, Jr., William	TA2
O'Sullivan, Joseph A.	MP5
Obeidat, Baha	TA8b2
Odame, Kofi	TA7a
Odame, Kofi	WA7b
Ogle, William C.	MP4
Ogura, Nobuhiko	MP8b1
Oh, Changyoon	MA2b
Oh, Mi-Kyung	MP3
Oh, Mi-Kyung	TP8b2
Oklobdzija, Vojin	TP6
Orchard, Michael	TP5
Orchard, Michael	WA6a
Orchard, Michael T.	MP5
Orsak, Geoffrey	TP4b
Ortega, Antonio	TP8a2
Oswal, Sachin	WA4
Oteri, Oghenekome	TA1
Ottersten, Bjorn	TA8a
Ottersten, Bjorn	WA2
Ouandji, Fabrice	TP8a2
Oweiss, Karim G.	MP7
Owsley, Norman	TA3
Owsley, Norman	TA4
Oz, Metin	MP7
Özen, Serdar	TA8b1
Ozonat, Kivanc	TP8a2
Pack, Daniel	MP7
Paliouras, Vassilis	WA8b1
Pandharipande, Ashish	MP3
Paoli, Gerhard	TP2
Papadimitriou, Panayiotis	MP8a1
Pappas, Thrasyvoulos	TP5
Parhi, Keshab K.	TP1
Parhi, Keshab K.	WA8b1
Park, Dong-Jo	MP3
Park, Dong-Jo	TP8b2
Paulraj, A.	TA1
Paulraj, Arogyaswami	MP3
Pei, Yong	TP8b2
Perels, David	WA8b1
Perry, Richard	TA8a
Peterson, J. Michael	TA3
Petropulu, Athina	TA8a
Pezeshk, Ali	MP8a1
Phillips, Braden	WA8b2
Pi, Sunaina	MP8b2
Pien, Homer	TP3
Piirainen, Olli	WA2
Pladdy, Christopher	TA8b1
Plantard, Thomas	WA8b2
Plantard, Thomas	WA8b2
Plotkin, Eugene	WA6b
Politte, David G.	MP5
Pollak, Ilya	MP5
Poor, Vincent	MP8a1
Porat, Ron	TA1
Poulsen, Erik	MP8a1
Pradhan, Sandeep	TA5
Pratapa, Pallavi	TP3
Prince, Jerry	WA5
Proakis, John	MA7b
Psota, Eric	MP4
Pu, Lingling	WA6a
Quemerais, Philippe	WA8b1
Rabha, Pankaj	MP8a3
Rabideau, Daniel	TA8a
Radha, Hayder	TP8a1
Radha, Hayder	WA6b
Radhakrishnan, Regunathan	TP8a1
Raghothaman, Balaji	TA8b1
Rahardja, Susanto	MP4
Rahman, Fuad	MA5b
Raich, Raviv	TP8b2
Ramamurthi, Krishnakumar	WA5
Ramaswamy, Prem	WA8a2
Ramchandran, Kannan	TA5
Ramchandran, Kannan	TA5
Rangaswamy, Muralidhar	TA4
Rao, Bhaskar D.	MP3
Rao, Bhaskar D.	TA8b1
Rao, Raghuveer	MA1
Rao, Raghuveer	TP8a2
Rao, Sathyanarayan	WA1b
Rappaport, Theodore	TP8b2
Ratnakar, Viresh	TP8a1
Ratnarajah, Tharmalingam	TA8a
Ravindran, Sourabh	WA4
Ray, Nilanjan	WA5
Real, Edward	TA4
Rebollo-Monedero, David	TA5
Reed, Irving S.	TA8b1
Rehg, Jim	WA7a
Reiff, Chris	WA8a1
Renfors, Markku	MP1a
Rengarajan, Balaji	TP8b2
Rey, Francesc	TA8a
Rice, Mark	MA6b
Richards, Brian	TA6b
Richmond, Christ	WA3
Rinaldo, Roberto	TP8a1
Ritcey, James	MA6b
Ritcey, James	TA8a
Ritcey, James	TA8a
Roberson, Jeremy	TA1
Robinson, Dirk	WA5
Rohwer, Judd	MP2
Rom, Christian	MP8a1
Romano, Joao	TP2
Rueckriem, Reinhard	TA1
Rugar, Dan	TP3
Rupp, Markus	MP8b1
Rupp, Markus	TP2
Rupp, Markus	TP2
Sabharwal, Ashu	TA6b
Sabharwal, Ashutosh	TA8a
Sabharwal, Ashutosh	TA8a
Sachs, Daniel Grobe	TP8b2
Sadjadpour, Hamid	WA1b
Sadjadpour, Hamid R.	WA1b
Sadjadpour, Xianren	WA1b
Saito, Naoki	MP5
Sakiyama, Kazuo	WA8a1
Salami, Redwan	MP4
Saligrama, Venkatesh	WA5
Samanta, Roopsha	MA2b
Samavi, Shadrokh	WA8b1
Samra, Harvind	MA4b
Samuelsson, David	WA2
Santhanam, Balu	MP2
Saquib, Mohammad	MA7b
Sardellitti, Stefania	TA8a
Sauer, Ken D.	WA5
Saulnier, Gary	TP8b1
Savakis, Andreas	TP8a2
Savas, Erkay	MP6b
Savran, Aydogan	WA8b1
Sawada, Hiroshi	MP2
Sayood, Khalid	MP4
Schafer, William	WA8a1
Schafhuber, Dieter	MP8a2
Schafhuber, Dieter	TP2
Scharf, Louis	TA4
Scharf, Louis	WA3
Schmitz, Christopher	TA2
Schniter, Philip	MP8a1
Schniter, Philip	MP8a2
Scholtz, Robert A.	MP1b
Scholtz, Robert A.	TP1
Scholtz, Robert A.	WA1a
Schonberg, Daniel	TA5
Schroeder, Jim	MA6b
Schuller, Gerald	WA8a2
Schulte, Michael	MP6a
Schulte, Michael	WA8b2
Schwab, Markus	WA4
Schwartz, Edward L.	MA5b
Scott, Waymond	TA3
Sehgal, Anshul	TA5
Seidel, Peter-Michael	TP7
Sementilli, Philip	MP8b1
Sen Gupta, Ananya	MP1a
Senthilvelan, Murugappan	MP6a
Sentieys, Olivier	WA8b1
Seppänen, Tapio	WA4
Serpedin, Erchin	TA8b1
Seskar, Ivan	WA1a
Shahbazpanahi, Shahram	TA8a
Shahbazpanahi, Shahram	TP4a
Shakkottai, Sanjay	TA8a
Shakkottai, Sanjay	TP8b2
Shanbhag, Naresh	TP7
Shanbhag, Naresh	TP7
Shanbhag, Naresh	TP8b1
Shanbhag, Naresh	WA8b1
Sharif, Masoud	TA8a
Sharif, Masoud	TP8b2
Sheikh, Hamid Rahim	TP5
Shen, Manyuan	MA6b
Shen, Yushi	TP8a1
Shen, Zukang	TA8b1
Shi, Kai	TA8b1
Shi, Tao	MP5
Shi, Zhijie	TA6a
Shiiya, Kazuhisa	TP8a2
Shim, Byonghyo	TP7
Shimamura, Tetsuya	MP8b2
Shirani, Shahram	TP8a1
Shirani, Shahram	WA8b1
Shpak, Dale	MP8b1
Shum, Wai-Yin	MP3
Shynk, John	MP1a
Shynk, John	MP2
Shynk, John	MP8a2
Sid-Ahmed, Maher	WA8a1
Sikora, Thomas	TP8a1
Silverstein, Seth	TA8b2
Silverstein, Seth	TP8a2
Simoncelli , Eero	TP5
Singer, Andrew	MP1a
Singer, Andrew	MP8b2
Singer, Andrew	TA8a
Singer, Andrew	TP8b1
Sinha, Pranesh	MP1a
Sirbu, Marius	TA8a

NAME	SESSION
Sivaramakrishnan, Kamakshi	TP7
Skoglund, Mikael	TP8a1
Sköllermo, Tomas	TP8a1
Slock, Dirk	TA8a
Slock, Dirk	TP8b1
Slock, Dirk	WA2
Smith, Paul	WA7b
Snyder, Donald L.	MP5
Soderstrand, Michael	WA8b1
Soerensen, Preben	MP8a1
Soleymani, M. Reza	WA1b
Somayajula, Sangeetha	TA8a
Sotthivirat, Saowapak	WA5
Spanias, Andreas	TP4b
Spasojevic, Predrag	WA1a
Spencer, Nicholas	TA8b2
Sridhara, Srinivasa	TP7
Srinivasan, Venkatesh	WA7b
Srivastava, Anuj	TP3
Stanczak, Slawomir	MP8a1
Stathaki, Tania	TP8a2
Stearns, Samuel D.	MP2
Steinhardt, Allan	MA3b
Stevens, John	TA8b2
Stine, James	WA8b2
Stoica, Petre	TP4a
Strohmer, Thomas	MP8a1
Sui, Haichang	TA8b1
Sun, Wei	TA8b1
Sutherland, Ivan	TA6a
Suyama, Ricardo	TP2
Svantesson, Thomas	MP3
Swamy, M. N. S.	WA6b
Swartzlander, Earl E.	WA8b2
Swartzlander, Jr., Earl E.	TP7
Swindlehurst, A. Lee	MP3
Sworder, Dave	MP8a2
Tabet, Tarik	TP8b2
Tague, John	TA3
Talwar, Vanish	MP6b
Tanda, Mario	MP1b
Tanda, Mario	MP1b
Tang, Jin	TP1
Tang, Jinshan	TP8a2
Tang, Jun	TP1
Tawalbeh, Lo'ai	TP6
Taylor, Clark	TP8a1
Tchobanou, Mikhail	TA8b2
Teague, Keith	MP8a3
Teague, Keith	TP8b2
Teh, Peh Keong	MP8a2
Tenca, Alexandre	MP6b
Tenca, Alexandre	TP6
Tepedelenlioglu, Cihan	TA8a
Thaiupathump, Trasapong	MP8b2
Therrien, Charles W.	MP8b1
Therrien, Charles W.	TA8b2
Tian, Zhi	WA1a
Tkacenko, Andre	TA8b2
Tong, Lang	MP2
Tong, Lang	TP8b2
Toolan, Timothy	TA4
Tran, David Q.	TA6a
Tropp, Joel	MP8a1
Tsai, Jiann An	TA8a
Tsai, Jiann-An	MP8b2
Tsubaki, Ikuko	TP8a2
Tsuda, Yusuke	MP8b2
Tufts, Donald	TA4
Tugnait, Jitendra	MP8a1
Tugnait, Jitendra	TA8b2
Tujkovic, Djordje	MA7b
Tull, Monte	WA8b2
Tummala, Murali	TA8b2
Tureli, Uf	MP1b
Tureli, Ufuk	TA8b1
Tyler, Leonard	TP7
Ünsal, Serkan	WA8b1
Vacca, Fabrizio	WA8b1
Vaccaro, Richard	TA4
Vaidyanathan, P. P.	MP8a1
Vaidyanathan, P. P.	TA8b2
Vaidyanathan, P. P.	TA8b2
Vaidyanathan, P.P.	MP8b1
Vaillancourt, Remi	TA8a
Valente, Michael	MP7
Valkama, Mikko	MP1a
Valkama, Mikko	TA1
van Spaendonck, Rutger	TP5
Varadarajan, Vijay	MA3b
Varanasi, Mahesh	TA8a
Varela, Carlos	WA8b1
Varshney, Prabodh	TA8a
Vasic, Bane V.	WA6a
Vazquez, Gregori	TA8a
Vazquez, Gregori	WA3
Veeravalli, Venugopal	TA8b1
Venkataraman, Vishwanath	MP8a2
Verbauwhede, Ingrid M.	WA8a1
Verbauwhede, Ingrid M.	WA8b1
Vetterli, Martin	TP1
Vikalo, Haris	MP8b2
Villares, Javier	WA3
Vogeler, Sven	TA1
Vorobyov, Sergiy	TP4a
Vrcelj, Bojan	MP8a1
Vu, Mai	MP3
Vuletic, Dragan	TA1
Wage, Kathleen	TA4
Wakin, Michael	TP5
Walus, Konrad	TP6
Wang, Raymond	TP8b2
Wang, Raymond	TP8b2
Wang, Rensheng	MP8a1
Wang, X.	TA1
Wang, Xiaodong	MA2b
Wang, Xin	MP8a1
Wang, Yunhua	WA8b2
Wang, Zhenghong	MP6a
Wang, Zhisong	TP4a
Wang, Zhou	TP5
Ward, James	TP4a
Watson, Andrew B.	TP5
Wawrzynek, John	TP8a1
Weaver, Robert	TP1
Wei, Bo	MP4
Weiss, Stephan	MP7
Weiss, Stephan	TP2
Welch, Thad	MP2
Werner, Karl	WA8a2
Wheeler, Bruce	TA2
White, Chris	MP8a3
White, Chris	TP8b2
Whiting, Bruce R.	MP5
Widrow, Bernard	TA2
Wilcox, Michael	MP7
Willett, Rebecca	TP3
Williamson, Geoffrey	MP8b1
Williamson, Jeffrey F.	MP5
Wilson, Robert	TP1
Wilson, Stephen	TA8a
Wiryadi, Wiryadi	WA4
Witzgall, Hanna E.	MP4
Wong, Kon Max	TA8a
Wong, Pak Kin	TP8b2
Wong, Tan	MP3
Wood, Sally L.	TP4b
Woods, Roger	TP6
Wright, Cameron	MP7
Wu, Di	WA1a
Wu, Jie	TP8b1
Wu, Lin	WA1a
Wu, N. Eva	TP8b2
Wu, Yang	TP3
Wu, Yunnan	MP3
Wu, Zhenyu	WA6a
Wu, Zhiqiang	MA1
Wu, Zhiqiang	MP8a1
Xia, Pengfei	MP2
Xiao, Chunpeng	TP8b2
Xie, Hua	TP8a2
Xiong, Zixiang	TA5
Xiong, Zixiang	TP8a1
Xiong, Zixiang	TP8a1
Xu, Zhengyuan	TP1
Xu, Zhengyuan	TP8b1
Yamada, Isao	MP8b1
Yang, Liuqing	TP1
Yang, Shenglin	WA8a1
Yang, Yang	TA5
Yeh, Joseph	TP8a1
Yener, Aylin	MA2b
Yi, Ying	TP6
Yin, Pei	WA7a
Yip, Chun Yu	TP3
Yokotani, Yoshikazu	WA8a2
Yoo, HeeJong	TA7a
Yoo, Heejong	WA7b
Yoon, Byung-Jun	TA8b2
Yoon, Young	TA8b1
Young, Derek	TP1
Yu, Bin	MP5
Yu, Heejung	TA1
Yu, Rongshan	MP4
Yu, Yongjian	WA6b
Zavidovique , Bertrand	WA8b1
Zeidler, James	MP8b1
Zekavat, Seyed Alireza	MP8a1
Zekavat, Seyed Alireza	MP8a2
Zekavat, Seyed Alireza	MP8b2
Zemen, Thomas	TP2
Zeydel, Bart	TP6
Zha, Wei	MP8a3
Zhang, Haotian	MA4b
Zhang, Jianzhong (Charlie)	MA7b
Zhang, Jianzhong (Charlie)	TA8b1
Zhang, Jianzhong (Charlie)	WA8b1
Zhang, Rui	TA8a
Zhang, Shi Chao	TP8b2
Zhang, Tong	TP8b1
Zhang, Xiaoxia	MP8a1
Zhang, Yimin	TA8b2
Zhao, Gongyun	MP3
Zhao, Jucheng	MP5
Zhao, Junhui	MP8a3
Zhao, Wei	TA5
Zhao, Ying	TA5
Zheng, Yibin	TA8b2
Zhi, Wanjun	TP1
Zhong, Wei	TA5
Zhou, Dayong	WA8a1
Zhou, G. Tong	TA1
Zhou, G. Tong	TP8b2
Zhou, Shengli	MP2
Zhu, Weijun	MP3
Zierdt, Mike	TA1
Zimmermann, Reto	TA6a
Zoltowski, Michael	TA8b1
Zoltowski, Michael	WA3

Notes


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