THIRTY-THIRD ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS, AND COMPUTERS

October 24 - 27, 1999
Asilomar Hotel
Conference Grounds

In cooperation with the Signal Processing Society of the Institute of Electrical and Electronics Engineering

THIRTY-THIRD
ASILOMAR CONFERENCE ON
SIGNALS, SYSTEMS, AND COMPUTERS

ORGANIZED IN COOPERATION WITH

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

SAN JOSE STATE UNIVERSITY
SAN JOSE, CALIFORNIA

AND

IEEE SIGNAL PROCESSING SOCIETY

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Welcome from the General Chair

I am both honored and pleased to welcome you to the Thirty-Third Asilomar Conference on Signals, Systems, and Computers. Asilomar alumni already know that the Conference is unique. Asilomar is first a technical conference. It is, however, different from most other professional engineering conferences that showcase only polished and refined results, Asilomar has a history of also encouraging the early disclosure ideas and results. What you see at other national conferences, you may have seen here first. This year's program is no exception, consisting of a blend of unsolicited and invited papers covering a wide range of topics.

I am sure that you will also find the Asilomar conference grounds to be unique, visually breathtaking, and totally engaging. Whether you choose to spend your leisure time walking on the beach, conversing with associates in the lodge, or visiting the Monterey Peninsula, you will be completely enthralled. For those with a high credit card limit, there is also a wealth of commercial attractions in the area.

The Thirty-Third Asilomar Conference is also a celebration of tradition. For those taking advantage of low airfares, arriving in the Monterey area on the weekend, join us at the reception social Sunday night. A conference hallmark of Asilomar has always been the Monday morning keynote address, which for the second year is named the Sydney Parker Memorial Lecture. This year's Sydney Parker Memorial Lecture is being delivered by the world-renowned scholar and entrepreneur, Dr. David G. Messerschmitt (1999 IEEE Graham Bell Medal winner). We are indeed fortunate to have a man of his stature to share a vision of the next millennium. Come and enjoy another Asilomar tradition on Tuesday evening at the Navy Postgraduate School. You will have a completely enjoyable social evening at a great location with your fellow attendees. Asilomar alumni will tell you, however, that the most important Asilomar tradition is developing life-long friendships. Asilomar alumni will point to the fact that it was here that they formed many important interpersonal relationships with their peers that remain active today. For those joining us for the first time, I am confident that you will have the same experience.

Finally kudos to your Technical Conference Chairman, Graham Jullien, whose tireless effort fashioned an excellent program. Graham recruited a first-class group of technical track chairpersons, organized the sessions, and used his extensive experience to fashion the program that I know you will enjoy.

Fred Taylor
General Chairman

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1999 Asilomar Conference
SESSION SCHEDULE

Sunday Afternoon, October 24

1:00 - 6:00	Registration
7:30 - 9:00	Welcoming Reception at Asilomar

Monday Morning, October 25

8:00 - 6:00	Registration	
7:30 - 9:00	Breakfast is available	
8:15 - 9:45	Conference Opening and Plenary Session - in the Chapel	
9:45 -10:30	Coffee Social - in front of the Chapel	
10:30 - 12:10		
MA1b	The Bootstrap and its Applications in Signal Processing	Abdelhak M. Zoubir
MA2b	Communications Over Time-Variant Channels	Rick Wesel
MA3b	Image Segmentation	
MA4b	MIMO System Identification and Equalization	Athina Petropulu
MA5b	Large Adaptive Arrays	Michael Zatman
MA6b	Low-Power/High-Speed Algorithms and Architectures for Adaptive Filtering	Naresh Shanbhag
MA7b	Implementation of SDP on Programmable Processors	Ed Deprettre
MA8b	Wireless Systems (Interactive Lecture)	TBD
12:00-1:00	Lunch	

Monday Afternoon, October 25

1:30-5:10	1 Break - 3:10-3:30	
MP1	Signal Processing Techniques for Multi-User/Multi-Rate Communications Systems	Naofal Al-Dhahir
MP2	Signal and Array Processing in Multiplicative Environments	Olivier Besson
MP3	Channel and Signal Parameter Estimation	TBD
MP4	Robust Multimedia Transmission	Kannan Ramchandran
MP5	Design for Low Power	Luke Seed
MP6	Multi-Sensor Data Fusion: The Pressing Need for the Application of Advanced Signal Processing Techniques and Approaches	Sean Midwood
MP7	Fast Algorithms in Signal Processing	Shiv Chandrasekaran
MP8a	Transform Domain Signal Processing (Interactive Lecture)	Ralph Hippenstiel
MP8b	Adaptive Techniques in Equalization and Beamforming (Interactive Lecture)	I. Provdler
6:00-7:00	Dinner	

Session SCHEDULE/continued...

Monday Evening, October 25

6:30 - 8:30 Cocktails and Hors D'oeuvres at the Naval Postgraduate School Officers' Club - Ballroom

Tuesday Morning, October 26

7:30-9:00	Breakfast	
8:00-4:00	Registration	
8:30-12:10	1 Break - 10:10 -10:25	
TA1	FPGAs for DSP	Chris Dick
TA2a	Blind Source and Signal Separation	B. Friedlander
TA2b	Space-Time Processing in Communications	B. L. Hughes
TA3	Advanced Algorithms for High Performance Adaptive Filter Applications	Robert A. Soni
TA4	Signal Structure, Classification and Detection	A. N. Wilson
TA5	Multimedia Signal Processing	T. Parks
TA6	Rapid Design Approaches for DSP	Roger Woods
TA7	Adaptive Algorithms	K. Jenkins
TA8a	Radar and Sonar (Interactive Lecture)	M. Farques
TA8b	Adaptive Filtering Applications and Methods for CDMA (Interactive Lecture)	V. DeBrunner

12:00-1:00 Lunch

Tuesday Afternoon, October 26

1:30-5:10	1 Break - 3:10-3:30	
TP1	Information Filtering	Jose Principe
TP2	Signal Processing for Communications	James A. Ritcey
TP3a	Signal Characterization and Representation	R. Kumaresan
TP3b	Equalization and Interference Cancellation in Communications	M. Moonen
TP4a	Techniques for Frequency Estimation and Spectral Analysis	P. Stoica
TP4b	Algorithms for Audio Coding and Speech Processing	K. C. Chung
TP5a	Channel Estimation in Fading	Ali Sayed
TP5b	Channel Estimation	L. Scharf
TP6	Image Coding	M. T. Orchard
TP7a	High Performance Multiplier Design	E. Swartzlander
TP7b	Automatic Target Recognition Theory	Randolph L. Moses
TP8a	Image Enhancement and Classification (Interactive Lecture)	M. Matthews
TP8b	Special Arithmetic Techniques (Interactive Lecture)	N. Burgess

Session SCHEDULE/continued...

Wednesday Morning, October 27

8:00-12:00	Registration — Papers must be turned in before the registration closes at 12:00 noon	
7:30-9:00	Breakfast	
8:30-12:10	1 Break — 10:10 -10:25	
WA1	Implementation of Adaptive Filters	Richard Walke
WA2	Video Signal Processing	Zixiang Xiong
WA3	Computer Arithmetic	Michael Schulte
WA4	Multimedia Security and Watermarking	B. Liu
WA5	Antenna Arrays for Communication Systems	R. S. Blum
WA6	CDMA Interference Cancellation	B. L. Hughes
WA7	Sub-Band and Wavelet Filters	F. Harris
WA8a	Turbo Codes and Channel Simulation (Interactive Lecture)	J. Cavallaro

12:00-1:00 Lunch

1999 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 the Chapel from 9:45-10:30.)

Monday, October 25

8:15- 9:45 Conference Opening and Plenary Session

1. Welcome from the General Chairperson:

Fred Taylor
University of Florida

2. Session MA1a : Distinguished Lecture for the 1999 Asilomar Conference

DR. DAVID G. MESSERSCHMITT
Roger A. Strauch Professor of Electrical Engineering
and Computer Sciences
University of California at Berkeley

Reconstructing Electrical Engineering for the 21st Century

The gateway to a new millennium is a good opportunity to reflect on the past and future of electrical engineering. Advances in technology and methodology have rapidly transformed electrical engineering, its allied fields (such as computer science and engineering), and many other engineering fields (such as mechanical, transportation, and aerospace engineering). These trends will continue and accelerate in the 21st century, dramatically affecting what it means to be a practicing engineer, researcher, or educator. In this talk we attempt to anticipate these changes, particularly from the perspective of identifying shortcomings in today's profession and how it could be reconstructed to better address future needs. The dramatically rising importance of systems and applications, the changing societal context and impact of the technology, and how students can be better prepared to meet the challenges of the future are emphasized.

Professional Biography

David G. Messerschmitt is the Roger A. Strauch Chaired Professor of Electrical Engineering and Computer Sciences at the University of California at Berkeley. From 1993-96 he served as Chair of EECS, and prior to 1977 he was with AT&T Bell Laboratories in Holmdel, N.J. Current research interests include wireless access to broadband networks, network management, the role of mobile code in network infrastructure, and the economics of networks. Active in developing new courses on information technology in business and information science programs, and introducing relevant economics and business concepts into the computer science and engineering curriculum, he is a co-founder and Director of TCSI Corporation. He is on the Advisory Board of the Fisher Center for Management & Information Technology in the Haas School of Business, the Kawasaki Berkeley Concepts Research Center, the Directorate for Computer and Information Sciences and Engineering at the National Science Foundation, and currently co-chairs a National Research Council study on the future of information technology research. He received a B.S. degree from the University of Colorado, and an M.S. and Ph.D. from the University of Michigan. He is a Fellow of the IEEE, a Member of the National Academy of Engineering, and a recipient of the IEEE Alexander Graham Bell Medal.

Program of 1999
Asilomar Conference
on
Signals, Systems, and Computers

PROF. GRAHAM JULLIEN
Technical Program Chairman

MA1b - The Bootstrap and its Applications in Signal Processing

Chair : Abdelhak M. Zoubir

MA1b-1 Bootstrap and MCMC Sampling in Signal Processing: A Comparison **10:30 am**
Petar Djuric, State University of New York

MA1b-2 Multipath Track Association for Over-the-Horizon Radar Using a Bootstrapped Statistical Ionospheric Model **10:55 am**
Jeffrey Krolik and Richard Anderson, Duke University

MA1b-3 Bootstrapping Tolerance Intervals **11:20 am**
Abdelhak M. Zoubir, Curtin University of Technology and
Donald W. Tufts, University of Rhode Island

MA1b-4 Using the Bootstrap for Robust Detection in Array Signal Processing **11:45 am**
Mats Viberg, Chalmers University of Technology and
Istvan Bogdan, University of Sheffield

MA2b- Communications Over Time-Variant Channels

Chair: Rick Wesel

MA2b-1 Adaptive Coding for Statistically Uncertain Operating Environment **10:30 am**
Dennis Goeckel, University of Massachusetts

MA2b-2 Rotationally-Invariant Concatenated (Turbo) TCM Codes **10:55 am**
Weixiao Liu and Stephen G, Wilson, University of Virginia

MA2b-3 Quantization-Based Estimation **11:20 am**
Keith M. Chugg, Kriang Lerdsuwanakij, and
Andreas Polydoros, University of Southern California

MA2b-4 Space-time Designs for Narrowband Communications **11:45 am**
Mike Fitz and Defne Kucukyavuz, The Ohio State University

MA3b- Image Segmentation

Chair:

MA3b-1 The Analysis of Underwater Acoustic Data via 3-D Segmentation **10:30 am**

Todd R. Reed, Linkoping University and R.E. Loke and J.M.H. du Buf, University of Algarve

MA3b-2 Morphological Image Segmentation by Local Monotonicity **10:55 am**

Scott T. Acton and Joseph H. Bosworth, Oklahoma State University

MA3b-3 An Unsupervised Method of Rough Color Image Segmentation **11:20 am**

Taneli Haverinen, Pauli Kuosmanen, and Marius Tico, Tampere University of Technology

MA3b-4 General Unsupervised Multiscale Segmentation of Images **11:45 am**

Alvin H. Kam and William J. Fitzgerald, University of Cambridge

MA4b- MIMO System Identification and Equalization

Chair: Athina Petropulu

MA4b-1 Blind Identification of MIMO Channels A Closed Form Solution Based on Second Order Statistics **10:30 am**

Joao Xavier and Victor Barroso, Instituto Superior Tecnico

MA4b-2 Blind Channel Identification on CDMA Forward Link Based on Dual Antenna Receiver at Hand-set and Cross-Relation **10:55 am**

Mike Zoltowski and Tom Krauss, Purdue University

MA4b-3 Channel Equalization for DS-CDMA Downlink over Multipath Channels **11:20 am**

Kemin Li and Hui Liu, University of Washington

MA4b-4 On the Estimation of MIMO System Excited by Inputs with Known Statistics **11:45 am**

Athina P. Petropulu and Binning Chen, Drexel University and Konstantinos Diamantaras, Technological Education Institute

MA5b- Large Adaptive Arrays

Chair: Michael Zatman

MA5b-1 Adaptive Clutter and Jammer Cancellation for Element-Digitised Airborne Radar **10:30 am**
J.L. Mather, I.D. Skidmore, and H.D. Rees, DERA

MA5b-2 Multirate Adaptive Beamforming **10:55 am**
Daniel J. Rabideau, MIT Lincoln Laboratory

MA5b-3 Passive Sonar Limits Upon Nulling Multiple Moving Ships with Large Aperture Arrays **11:20 am**
Henry Cox, Orincon Corporation and Arthur B. Baggeroer, MIT

MA5b-4 Degree of Freedom Architectures for Large Radar Arrays **11:45 am**
Michael Zatman, MIT Lincoln Laboratory

MA6b- Low-Power/High-Speed Algorithms and Architectures for Adaptive Filtering

Chair: Naresh Shanbhag

MA6b-1 Variable Delay LMS with Applications in HDTV and Cable Modems **10:30 am**
K.J. Raghunath, Lucent Digital Radio

MA6b-2 Rapid Design of a Single Chip Adaptive Beamformer with a Novel Linear QR Architecture **10:55 am**
John McCanny, The Queen's University of Belfast; Richard Walke, Defence Evaluation & Research Agency (DERA); Roger Woods, The Queen's University of Belfast and Alan S. Willsky, MIT

MA6b-3 Design of a Low Power Matched Filter For Code Acquisition in CDMA Systems **11:20 am**
Sundararajan Sriram, Texas Instruments Inc.

MA6b-4 A 100 uW 20 Mcps Versatile Correlator Chip for Third Generation WCDMA Systems **11:45 am**
Babak Daneshrad and Suk Won Kim, University of California-Los Angeles

MA7b- Implementation of SDP on Programmable Processors

Chair: Ed Deprettre

MA7b-1 Parallel Viterbi Algorithm for a VLIW DSP **10:30 am**

Shoab Ahmad Khan and Maliq Muhammad Saqib, National University of Sciences & Technology and Sherjil Ahmed, Communication Enabling Technology

MA7b-2 Real-Time High-Throughput Sonar Beamforming Kernels Using Native Signal Processing and Memory Latency Hiding Techniques **10:55 am**

Brian L. Evans, Gregory E. Allen, and Lizy K. John
The University of Texas at Austin

MA7b-3 Optimal Scheduling and Mapping of Digital Signal Processing Algorithms on TMS320C6x SDP **11:20 am**

Raheel Khan and Muhammad Sohail Sadiq, National University of Sciences & Technology

MA7b-4 An Enhanced Floating-Point Coprocessor for Embedded Signal Processing and Graphics Applications **11:45 am**

Chris N., Hinds, ARM, Inc.

MA8b- Wireless Systems (Interactive Lecture) 10:30 am - 12:00 am

MA8b-1 Dynamic Scheduling in Antenna Array Packet Radio

Hujun Yin and Hui Liu, University of Washington

MA8b-2 A Novel Fast Joint Detector in Smart Antenna CDMA Systems

Weidong Yang, Sang-Youb Kim, and Guanghan Xu, The University of Texas at Austin and Hui Liu, University of Washington

MA8b-3 Array Processing Application: Angular Superresolution for Scanning Antenna

Andrzej Z. Manitius, George Mason University; Herbert Dropkin and Canh Ly, Army Research Laboratory

MA8b-4 Implementation of a Tunable Heterodyne Notch Filter

Louis Johnson, Oklahoma State University; Karl E. Nelson, University of California-Davis; Michael, A., Soderstrand, Seong-Jhin Choi, and Asad Azam, Oklahoma State University, Gary E. Ford, University of California-Davis, and Dhinesh Sasidaran, Oklahoma State University

MA8b-5 Least-Squares Channel Equalization Performance Versus Equalization Delay in the SIMO Channel Context

Athanasios P. Liavas, University of Ioannina

MA8b-6 Optimal Quantization for Third-Generation CDMA Transmitters

Giridhar D. Mandyam, Nokia Research Center

MA8b-7 Performance of MC-CDMA Systems Using Antenna Arrays

Guanghan Xu and Murat Torlak, The University of Texas at Austin

MA8b-8 Wideband Wireless Peer to Peer Propagation Measurements in Urban and Suburban Environments

Clark Hendrickson, SPAWARSYSCEN, Gerald Gerace, Science Applications International Corporation, and Chris Yerkes, SPAWARSYSCEN

MP1- Signal Processing Techniques for Multi-User/Multi-Rate Communications Systems

Chair: Naofal Al-Dhahir

MP1-1 Outage Probability of Cellular Mobile Radio Systems with Partial Interference Cancellation **1:30 pm**

Emad Ebbini, Alireza Bastami, and Mohamed-Slim Alouini, University of Minnesota

MP1-2 Throughput Maximization in Dual-Rate DS/CDMA Packet-Based Networks **1:55 pm**

U. Mitra, The Ohio State University and K. Wassernab, University of Michigan

MP1-3 Global Optimization of Orthogonal FIR Transmitter and Receiver Filters for Data Transmission Over Noisy Channels **2:20 pm**

Jamal Tuqan, IBM Thomas J. Watson Research Center

MP1-4 **A Computationally-Efficient FIR MMSE-DFE for Multi-User Communications** **2:45 pm**

Naofal Al-Dhahir, GE Corporate R&D Center and Ali H. Sayed, University of California-Los Angeles

BREAK **3:10 pm**

MP1-5 **Transmission Optimization Over Flat Rayleigh Fading Channel with Multiple Antennas** **3:30 pm**

Guanghan Xu, Hang Li, and Weidong Yang, The University of Texas at Austin

MP1-6 **Joint Transmit and Receive Optimization for High Data Rate Wireless Communications Using Multiple Antennas** **3:55 pm**

Hemanth Sampath and Arogyaswami J. Paulraj, Stanford University

MP1-7 **alpha-Repetition/Modulation and Blind Second-Order Identification** **4:20 pm**

Antoine Chevreuil, Philippe Loubaton, and Philippe Ciblat, Universite de Marne-La-Vallee

MP1-8 **Iterative MMSE Multiuser Interference Suppression for Coded Dispersive CDMA Wireless Channels with Multisensor Receivers** **4:45 pm**

Evaggelos Geraniotis and Joseph Thomas, University of Maryland

MP2- Signal and Array Processing in Multiplicative Environments

Chair: Olivier Besson

MP2-1 **Array Performance in the Presence of Distributed Fading** **1:30 pm**

Benjamin Friedlander, Signal Processing Technology, Ltd.

MP2-2 **Linear Chirp Parameter Estimation from Multi Channel Data** **1:55 pm**

Bjorn Volcker, Royal Institute of Technology and Madhavi Kadiyala, University of Oklahoma

MP2-3 **On Non-Data-Aided Carrier Recovery in Time-Selective Rician-Fading Channels** **2:20 pm**

Ananthram Swami, Army Research Lab and Tariq Durrani and Mounir Ghogho, University of Strathclyde

MP2-4 Estimation and Equalization of Time-Selective Channels Using Precoding **2:45 pm**

G. Tong Zhou, Georgia Institute of Technology; Georgios, B., Giannakis, University of Minnesota; and Yongsub Kim, Georgia Institute of Technology

BREAK **3:10 pm**

MP2-5 Decoupled Estimation of DOA and Angular Spread for Spatially Distributed Sources **3:30 pm**

Petre Stoica, Uppsala University and Olivier Besson, ENSICA

MP2-6 Array Self Calibration with Large Sensor Position Errors **3:55 pm**

Brian P. Flanagan, The MITRE Corporation and Kristine L. Bell, George Mason University

MP2-7 Adaptive Non Coherent Integration Algorithms for Array Detection **4:20 pm**

Ram Raghavan, MIT

MP2-8 An Analysis of the Effect of Motion and Phase Errors on the Implementation of Interferometric Processing by Synthetic Aperture Sonar **4:45 pm**

William W. Bonifant, Jr., James H. McClellan, and Mark A. Richards, GeorgiaTech Research Institute

MP3- Channel and Signal Parameter Estimation

Chair: J. Drake

MP3-1 Generalized Channel Impulse Response Shortening for Discrete Multitone Transceivers **1:30 pm**

Bo Wang and Tulay Adali, University of Maryland

MP3-2 On the Use of Orthogonal Transforms for Fractionally-Spaced Blind Equalisation **1:55 pm**

P. Sirisuk and Anthony G. Constantinides, Imperial College of Science, Technology & Medicine

MP3-3 Delay Estimation for CDMA Communications with the RSRQ Algorithm **2:20 pm**

Louis L. Scharf and Michael L. McCloud, University of Colorado-Boulder

MP3-4 **Lower Bounds for Phase Estimation of M-PSK Packets with Random Phase** **2:45 pm**
Jeffrey Drake, New Mexico State University

BREAK **3:10 pm**

MP3-5 **EM Algorithms for Sequence Estimation over Random ISI Channels** **3:30 pm**
Kevin Buckley, Villanova University; W. Andrew Berger, University of Scranton; and Richard Perry, Villanova University

MP3-6 **Estimation of Mobile Speed and Average Received Power in Wireless Systems Using Best-Basis Methods** **3:55 pm**
Donald C. Cox and Ravi Narasimhan, Stanford University

MP3-7 **Performance of Equalized I-Q QPSK Over 2-Ray Rayleigh Fading** **4:20 pm**
Azzedine Zerguine, S.A. Al-Semari, and A.B. Adinoyi, KFUPM

MP3-8 **A Training Based Projection Receiver for the UMTS WCDMA** **4:45 pm**
Irfan Ghauri and Dirk T.M. Slock, Institut Eurecom

MP4- Robust Multimedia Transmission

Chair: Kannan Ramchandran

MP4-1 **Progressive Video Compression for a Power Constrained Channel** **1:30 pm**
Samuel S. Cheng, Zixiang Xiong, and Marc Fossorier

MP4-2 **A Factor Graph Framework for Joint Source-Channel Decoding of Images** **1:55 pm**
Ralf Koetter, Igor Kozintsev, and Kannan Ramchandran, University of California-Berkeley

MP4-3 **Joint Source-Channel Coding Using Soft Output Quantizers** **2:20 pm**
Keith M. Chugg, Antonio Ortega, and Kemal Demirciler, University of Southern California

MP4-4 **Optimal Intra/Inter Mode Switching for Robust Video Communication Over the Internet** **2:45 pm**
Kenneth Rose, Shankar L. Regunathan, and Rui Zhang, University of California-Santa Barbara

BREAK **3:10 pm**

MP4-5 **Broadcast System Source Codes: A New Paradigm for Data Compression** **3:30 pm**
Qian Zhao and Michelle Effros

MP4-6 **Efficient Internet Video Streaming via the Coordination of Multiple Description Codes with Novel Congestion Control** **3:55 pm**
Tae-eun Kim and Rohit Puri, University of Illinois; Kannan Ramchandran, University of California-Berkeley; Kang-Won Lee and Vaduvur Bharghavan, University of Illinois

MP4-7 **High-Quality Internet Audio Over ATM Networks** **4:20 pm**
Chris Kyriakakis and Sherali Zeadally, University of Southern California

MP4-8 **Robust Stack-Run Image Coding for Noisy Channels** **4:45 pm**
Philippe Raffy, Robert M. Gray, and Christine Pepin, Stanford University

MP5- Design for Low Power

Chair: Luke Seed, University of Sheffield

MP5-1 **Segmentation Strategies for Low Power Implementation of Digital Filters** **1:30 pm**
Tughrul Arslan, University of Edinburgh and A.T. Erdogan, Stanford University

MP5-2 **Single-Ended Pass Transistor Logic for Low-Power Design** **1:55 pm**
Marios Psilogeogopolis, Mihai Munteanu, Istvan Bogdan, Peter Ivey, Tzung Shiun Chuang, Neil Powell, and Luke Seed, University of Sheffield

MP5-3 **Advanced Clock-Powered Logic** **2:20 pm**
William Athas, University of Southern California

MP5-4 **Information-Theoretic Bounds for Switching Activity Analysis in Finite-State Machines Under Temporally Correlated Inputs** **2:45 pm**
Diana Marculescu and Radu Marculescu, University of Maryland

BREAK **3:10 pm**

MP5-5 **Optimal Supply Voltage Selection Through a Multiobjective Design Strategy** **3:30 pm**
M. S. Bright, Cardiff University and Tughrul Arslan, University of Edinburgh

MP5-6 **Power and Performance Comparison Between Crossbars and Buses as On-Chip Interconnect Structures** **3:55 pm**
Yan Zhang and Mary Jane Irwin, Penn State University

MP5-7 **Exploring the Impact of Logic Synthesis on Area, Delay and Power Dissipation of CMOS Circuits** **4:20 pm**
Alberto Macii and Enrico Macii, Politecnico di Torino

MP5-8 **Algorithm and Circuit Co-Design for a Low-Power Sequential Decoder** **4:45 pm**
Peter Beerel, Sunan Tugsinavisut, Keith M. Chugg, Ramesh Chokkalingam, Sushil Singh, Recep Ozdag, and Phunsak Thiennviboon, University of Southern California

MP6- Multi-Sensor Data Fusion: The Pressing Need for the Application of Advanced Signal Processing Techniques and Approaches

Chair: Sean Midwood

MP6-1 **Extraction of 3-D Coordinates from Fusion of OMNI-Camera Images** **1:30 pm**
Rick S. Blum, Lehigh University

MP6-2 **An Introduction to Multi-sensor Data Fusion** **1:55 pm**
James Llinas, State University of NY at Buffalo

MP6-3 **Perspectives on the Progress of Data Fusion for Soldiers** **2:20 pm**
David L. Hall, Penn State University

MP6-4 **Multi-Source Data Fusion in a NATO Coalition - A Canadian Army Perspective** **2:45 pm**
Ian Glenn, NDHQ

BREAK **3:10 pm**

MP6-5 **Managing the Development of MSDF Systems for use in Joint and Coalition Warfare** **3:30 pm**
Frank White, SPAWAR SYSTEMS CENTER

MP6-6 **Multi-Sensor Data Fusion System Architectures** **3:55 pm**
Pramed Varshney, Syracuse University

MP6-7 **Data Fusion Applications for Military and Civilian Purposes Developed on DND/L-M Canada Decision Support Test Bed** **4:20 pm**
Elisa Shahbazian, Lockheed Martin

MP6-8 **A COTS Sonar Informatino Management Concept Demonstrator for Naval Multi-Platform Operations** **4:45 pm**
Anthony Ashley, Defence Research Establishment Atlantic

MP7- Fast Algorithms in Signal Processing

Chair: Shiv Chandrasekaran

MP7-1 **The Unitary Hessenberg Eigenproblem** **1:30 pm**
Bill Gragg, Naval Postgraduate School

MP7-2 **Balanced Model Reduction** **1:55 pm**
Ming Gu, University of California-Los Angeles

MP7-3 **Superfast Algorithms for Toeplitz and Toeplitz-plus-Hankel Systems** **2:20 pm**
Georg Heinig, Kuwait University

MP7-4 **Fast Updating of Structured Linear Systems of Equations with Applications in Adaptive Filtering** **2:45 pm**
Ali H. Sayed, University of California-Los Angeles;
Shivkumar Chandrasekaran University of California-Santa Barbara; and
Ming Gu, University of California-Los Angeles

BREAK **3:10 pm**

MP7-5 **Eigenvector Computations for Almost-Unitary-Hessenberg Matrices via Discrete Transmission Lines** **3:30 pm**
Vadim Olshevsky, Georgia State University

MP7-6 Efficient Implementation of the 2-D Capon Spectral Estimator 3:55 pm

S. Lawrence Marple, Jr., Orincon Corporation; Petre Stoica and Andreas Jakobsson, Uppsala University

MP7-7 The Schur Algorithm for Ill-Conditioned Hankel Matrices 4:20 pm

M. Sharma, Joohwan Chun, and T. Kailath, Stanford University

MP7-8 Reduced-Order Filters with Order-Reduction Constraints 4:45 pm

Celestino A. Corral, Motorola and Claude S. Lindquist, University of Miami

MP8a-Transform Domain Signal Processing (Interactive Lecture) 1:30 - 3:00 PM

Chair: Ralph Hippenstiel

MP8a-1 Orthogonal Polyphase Image Resampling Structures and Implementations

Fred Harris, San Diego State University and Scott Andrews, Logic Devises

MP8a-2 Time/Frequency Techniques for Signal Feature Detection

Adele B. Doser, The University of Texas at Dallas

MP8a-3 Localization of GSM Signals Using Wavelet Denoising Using the 4-th Order Moment

Ralph Hippenstiel and Unal Aktas, Naval Postgraduate School

MP8a-4 Hyperspectral Biomedical Image Formation

P. Soliz, Kestrel Corporation; E. Wu, University of New Mexico; P.Gelabert, Texas Instruments; Magotra Neeraj, University of New Mexico; and J. Otten, Kestrel Corporation

MP8a-5 Observations on Centralized Linear Prediction

Charles W. Therrien, Naval Postgraduate School

MP8a-6 Two-Dimensional Fast Computational Lattice Algorithm

S. Lawrence Marple, Jr., Orincon Corporation

MP8a-7 Withdrawn

MP8a-8 Combing Clustering Technique and Information Theoretic Criteria Based Approach for Emitter Number Detection in ESM Applications
Jim P.Y. Lee and Yifeng Zhou, Defence Research Establishment Ottawa (DREO)

MP8a-9 Withdrawn

MP8a-10 The Linear Estimation of a Non-Uniformly Sampled Multi-Resolution Random Process in Noise
Michael B. Matthews, Monterey Bay Aquarium Research Institute (MBARI)

MP8b-Adaptive Techniques in Equalization and Beamforming (Interactive Lecture) 3:30 - 5:00 PM

Chair: I. Proudler

MP8b-1 Implementation of Adaptive Beamforming Algorithms Using a URV-like Factorization
Joohwan Chun and T. Kailath, Stanford University

MP8b-2 Adaptive and Non-Adaptive Beampattern Control Using Quadratic Beampattern Constraints
Kristine L. Bell and Harry L. Van Trees, George Mason University

MP8b-3 A New Adaptive Estimation Algorithm for Wireless Location Finding Systems
Ali H. Sayed and Nabil R. Yousef, University of California-Los Angeles

MP8b-4 An Efficient Scheme for Broadband Adaptive Beamforming
Robert W. Stewart, University of Strathclyde; Ian K. Proudler, Defense Evaluation and Research Agency; Marion Schabert, University of Strathclyde; Stephan Weiss, University of Southampton

MP8b-5 Two Dimensional Beam Forming for Spatially Correlated Users in Mobile Systems
Chris Gao and Elvino Sousa, University of Toronto

MP8b-6 Multichannel Adaptive Beamforming for Interference Mitigation and Spatial Diversity in Multiuser CDMA Systems
Catherine M. Keller, Daniel W. Bliss, and Keith W. Forsythe, MIT Lincoln Laboratory

MP8b-7 Structured Gradient Method Applied to Circular Arrays

James H. Morse, Jr., Iowa State University

MP8b-8 A Reduced Complexity Least Squares Algorithm for Look Direction Constrained Broadband Arrays with Maximally Flat Response Zeros

Chi Chung Ko and Fei Ye, National University of Singapore

MP8b-9 On the Learning Behavior of Decision Feedback Equalizers

Markus Rupp, Bell-Labs-Lucent Technologies

MP8b-10 Decision Feedback Equalization Using an Euclidean Direction Based Adaptive Algorithm

Tanawat Mathurasai, Tamal Bose, and Delores M. Etter, University of Colorado-Boulder

MP8b-11 Optimum Design for Adaptive Equalizers Based on Fractional Lower-Order Statistics in Non-Gaussian Environment

E. Del Re and Marilli Rupi, Universita di Firenze

MP8b-12 Zero Forcing Equalization of Multiuser Time-Varying Nonlinear Systems

G Tong Zhou and Arthur J. Redfern, Georgia Institute of Technology

MP8b-13 Subband Adaptive Equalization of Time-Varying Channels

Daniel Garcia-Alis, University of Strathclyde; Stephan Weiss, University of Southampton; and Robert W. Stewart, University of Strathclyde

MP8b-14 Adaptive Equalization: The Gaussian Kernel-Based Contrast Functions

Antoine Chevreuil and Christophe Vignat, Universite de Marne-La-Vallee

MP8b-15 New Insights for the Filtered-X Algorithm and Robust Adaptive Equalization

J. Hu and H.R. Wu, Monash University

MP8b-16 Adaptive Equalization of Multiple-Input Multiple-Output Frequency Selective Channels

Babak Hassibi, Bell Labs - Lucent Technologies and Ardavan M. Tehrani, Stanford University

TA1- FPGAs for DSP

Chair: Chris Dick

TA1-1 A Configurable Soft Radio: Design, Implementation, and Evaluation 8:30 am

John Davies, Prinya Atiniramit, Kathyayani Srikanteswara, and Peter Athanas, Virginia Tech

TA1-2 Developing and Debugging FPGA Applications in Hardware with JHDL 8:55 am

Brad Hutchings, Brigham Young University

TA1-3 FPGAs Make Radar Signal Processing on a Chip a Reality 9:20 am

Raymond J. Andraka, Andraka Consulting Group, Inc.

TA1-4 Configurable Logic for Digital Communications: It's About Time 9:45 am

Chris Dick, Xilinx Inc., and fred harris, San Diego State University

BREAK 10:10 am

TA1-5 Efficient Implementation of a Filter Bank Architecture for Demultiplexing in Satellites Applications 10:25 am

G. Rovigatti, Alenia Divisione Spazio; A. Del Re, Marco Re, R. Lojacono, Gian-Carlo Cardarilli, University of Rome Tor Vergata, and V. Piloni, Alenia Divisione Spazio

TA1-6 FPGA Implementation of An Antenna Array MC-CDMA Demodulator 10:50 am

Hui Liu, Richard Shi, and Guanbin Xing, University of Washington

TA1-7 Performance Trade-off of DCT Architectures in Xilinx FPGAs 11:15 am

Keshab K. Parhi, University of Minnesota and Dhiraj Kumar, Lucent Technologies

TA1-8 FPGA Implementation of Two-Dimensional Wavelet Transform 11:40 am

Ali M. Reza, University of Wisconsin-Milwaukee and Robert D. Turney, Lilinx Inc.

TA2a- Blind Source and Signal Separation

Chair: B. Friedlander

TA2a-1 **Comparison of Approximate Maximum Likelihood and Cumulant Based Techniques for Blind Source Separation** **8:30 am**

Benjamin Friedlander, Signal Processing Technology, Ltd. and Daniel Yellin, University of California - Davis

TA2a-2 **A Non-Iterative Blind Signal Separation Algorithm Based on Transmit Diversity and Coding** **8:55 am**

Geert Leus, Marc Moonen, and Piet Vandaele, Katholieke Universiteit Leuven -ESAT

TA2a-3 **Polyhedral Concepts for Deterministic Blind Separation of Binary Sources** **9:20 am**

Joao Xavier and Victor Barroso, Instituto Superior Tecnico

TA2a-4 **BER Improvement in a TDMA/FDMA Cellular System Using Antenna Array** **9:45 am**

S. Valaee, Sharif University of Technology; M. Biguesh, B. Champagne, and A. Stephenne, INRS-Telecommunications

BREAK **10:10 am**

TA2b- Space-Time Processing in Communications

Chair: B. L. Hughes

TA2b-1 **Joint Detection and Estimation in Space-Time Coding and Modulation** **10:25 am**

Carmela Cozzo and Brian L. Hughes, North Carolina State University

TA2b-2 **Blind Space-Time Minimum Variance Receiver for CDMA Systems** **10:50 am**

Soohong Kim and Joohwan Chun, Korea Advanced Institute of Science and Technology

TA2b-3 **Space-Time Equalization for DVB-T in Single Frequency Networks** **11:15 am**

Alexei Gorokhov, CNRS-L2S and Pierre Magniez, TSI/ENST

TA2b-4 **A General Approach to Differential Transmit Diversity** **11:40 am**

Brian L. Hughes, North Carolina State University

TA3- Advanced Algorithms for High Performance Adaptive Filter Applications

Chair: Robert A. Soni

TA3-1 **On the Convergence of Non-Linear Iterative Interference Cancellation** **8:30 am**
R. Michael Buehrer, Bell Laboratories - Lucent Technologies

TA3-2 **On the Spectral Efficiency of Space-Time Spreading Schemes for Multiple Antenna CDMA Systems** **8:55 am**
Constantinos Papadias, Bell Laboratories - Lucent Technologies

TA3-3 **An Adaptive Linear Prediction Algorithm for Joint Blind Equalization and Blind Multiuser Detection in CDMA** **9:20 am**
Howard Fan and Xiaohua Li, University of Cincinnati

TA3-4 **Set-Membership Filtering and Adaptive Space-Time Processing for Multiple-Access Wireless Communications** **9:45 am**
Sridhar Gollamudi and Yih-Fang Huang, University of Notre Dame

BREAK 10:10 AM

TA3-5 **Adaptive Antenna Schemes for Transmission in IS-2000 and WCDMA Systems** **10:25 am**
Robert A. Soni, Bell Laboratories - Lucent Technologies

TA3-6 **Adaptive Fault Tolerant Digital Filters with Coefficient Bit Errors in Fixed-Point and Floating-Point Binary Representations** **10:50 am**
G. Leon and W. Kenneth Jenkins, University of Illinois

TA3-7 **Global Stability of Adaptive IIR Filters Based on the Output** **11:15 am**
Miloje Radenkovic and Tamal Bose, University of Colorado-Denver

TA3-8 **Fixed-Point Analysis of an Adaptive Eigenvector Algorithm for Use in Sensor Networks** **11:40 am**
Fan Xu and Alan N. Willson, Jr., University of California-Los Angeles

TA4- Signal Structure, Classification and Detection

Chair: A. N. Wilson

TA4-1 Optimal Binary Thresholds for Distributed Detection in Gaussian Noise **8:30 am**

Wei Shi, Richard D. Wesel, and
Thomas W. Sun, University of California-Los Angeles

TA4-2 Support Vector Machine for Multiuser Detection in CDMA Communications **8:55 am**

Xiaohong Gong and Anthony Kuh, University of Hawaii at Manoa

TA4-3 A DMT Transceiver Loading Algorithm for Data Transmission with Unequal Priority Over Band-Limited Channels **9:20 am**

Fengqi Yu and Alan N. Willson, Jr., University of California-Los Angeles

TA4-4 A Novel Bit Allocation Algorithm for Duplex Operation of DMT Based DSL Modems **9:45 am**

Ranjan Sonalkar, James Basso, and Hamid Sadjadpour,
AT&T Shannon Lab

BREAK **10:10 am**

TA4-5 Detection of Nonlinearity in a Time-Series by Synthesis of Surrogate Data Using a Kolmogorov-Smirnoff Tested Hidden Markov Model **10:25 am**

Stephen McLaughlin, Charles Peter Unsworth, and Bernie Mulgrew,
The University of Edinburgh

TA4-6 Detection of a Random Amplitude Modulation in Chirp Signals **10:50 am**

Mark R. Morelande and Abdelhak M. Zoubir,
Curtin University of Technology

TA4-7 Aperiodic Auto-Correlation of Polyphase Sequences with a Small Peak-Factor **11:15am**

Holger Boche and Slawomir Stanczak, Heinrich-Hertz-Institut

TA4-8 Enhanced Signal Classification Scheme Using a Selected Information in the Ambiguity Domain **11:40 am**

Christian Doncarli, University of Nantes and Dean Korosec, University of Maribor

TA5- Multimedia Signal Processing

Chair: T. Parks

TA5-1 **Efficient Region-Selective Subdivision for 3-D Meshes** **8:30 am**
Wenlong Dong, Jiankun Li, and C.-C. Jay Kuo, University of Southern California

TA5-2 **Knowledge Based Inference Engine for On-Line Video Classification** **8:55 am**
Asha Vellaikal and Wensheng Zhou, HRL Laboratories, LLC

TA5-3 **Modeling of Head-Related Transfer Functions for Immersive Audio Using a State-Space Approach** **9:20 am**
Chris Kyriakakis and Panayiotis G. Georgiou, University of Southern California

TA5-4 **A Subset Approach to Contour Tracking in Clutter** **9:45 am**
Michael S. Brandstein and Daniel Freedman, Harvard University

BREAK **10:10 am**

TA5-5 **Classification and Retrieval of Sound Effects in Audiovisual Data Management** **10:25 am**
Tong Zhang and C.-C. Jay Kuo, University of Southern California

TA5-6 **A Modified Chroma-Keyed Technique for Simple Shape Coding** **10:50 am**
Krit Panusopone and Xuemin Chen, General Instrument Corporation

TA5-7 **Nose Detection for Consumer Images** **11:15 am**
Thomas W. Parks and Michael S. Richman, Cornell University and Hsien-Che Lee, Eastman Kodak Company

TA5-8 **Frontal Face Localization Using Linear Discriminant** **11:40 am**
Truong Q. Nguyen and Meng Meng, Boston University

TA6- Rapid Design Approaches for DSP

Chair: Roger Woods

TA6-1 **XXC - A Tool for Designing Parameterizable IP Cores in VHDL** **8:30 am**
Sujoy Mitra, Xilinx Inc.

TA6-2 **FILU-200 DSP Coprocessor IP Core** **8:55 am**
Brian Murray, Paul Costigan, Jose Rodriguez, Chris Bleakley, and Vincent Berg, Massana Ltd.

TA6-3 **JPEG Encoder System-on-a-chip Demonstrator** **9:20 am**
Jill Hunter, Albert Simpson, and Yi Hu, Integrated Silicon Systems Ltd., and John McCanny, The Queen's University of Belfast

TA6-4 **Low Power Design of Signal Processing Systems Using Characterization of Silicon IP Cores** **9:45 am**
J.R. Spanier, Roger Woods, and Gareth Keane, The Queen's University of Belfast

BREAK **10:10 am**

TA6-5 **A Table-Based Macromodel for Behavioral Delay Estimation** **10:25 am**
Enrico Macii and Giuseppe Odasso, Politecnico di Torino

TA6-6 **Power Characterization of Functional Units** **10:50 am**
Wu Ye, Kanning Li, Ming Cheng, and Mary Jane Irwin, The Pennsylvania State University

TA6-7 **A Low-Power System-on-Chip for Telecommunicaitons: Single Chip Digital FM Receiver/Demodulator IP** **11:15AM**
Tolga Yalcin and Neslin Ismailoglu, Tubitak-Bilten VLSI Design Group

TA6-8 **High Data Rates Digital Communication System Design Compilers for VLIW DSPs** **11:40 am**
Shoab Ahmad Khan and Durdana Habib, National University of Sciences & Technology, and Sherjil Ahmed, Communication Enabling Technology

TA7- Adaptive Algorithms

Chair: K. Jenkins

TA7-1 **Tracking Analysis of the LMF and LMMN Adaptive Algorithms** **8:30 am**
Nabil R. Yousef and Ali H. Sayed, University of California-Los Angeles

TA7-2 **Variable Weight Mixed-Norm LMS-LMF Adaptive Algorithm** **8:55 am**
Azzedine Zerguine, KFUPM and Tyseer Aboulnasr, University of Ottawa

TA7-3 **A Super-Linear Converging Two-Point Gradient Algorithm for Adaptive Filters** **9:20 am**
George Keratiotis and Larry Lind, University of Essex

TA7-4 **Adaptive Line Enhancement via Subspace Tracking** **9:45 am**
S.D. Hayward and C. Sprigings, DRA Malvern

BREAK **10:10 am**

TA7-5 **Fast Block LMS Adaptive Volterra Filters** **10:25 am**
Junghsi Lee, Yuan-Ze University; Ginkou Ma, ERSO/ITRI; and Shih-Tse Hsu, Yuan-Ze University

TA7-6 **Direct Line Spectral Frequency Adaptation in Second Order Cascade Sections** **10:50 am**
Gaguk Zakaria, Hughes Network Systems & Virginia Tech and A.A. (Louis) Beex, Virginia Tech

TA7-7 **Relative Convergence of the Cascade Recursive Least Squares with Subsection Adaptation Algorithm** **11:15 am**
A.A. (Louis) Beex, Virginia Tech and Gaguk Zakaria, Hughes Network Systems & Virginia Tech

TA7-8 **Two Dimensional Adaptive Filter Based on a t-Distribution Assumption and Full-Plane Support** **11:40 am**
Junibakti Sanubari, Satya Wacana University and Keiichi Tokuda, Nagoya Institute of Technology

TA8a- Radar and Sonar (Interactive Lecture) 8:30- 10:00 AM

Chair: M. Farques

TA8a-1 **Signal Processing of Elastic Surface Waves for Localizing Buried Land Mines**
James H. McClellan, Ali Behboodian, and W.R. Scott, Georgia Tech

TA8a-2 **Multiple Test Procedures for Radar-based Detection of Buried Landmines**
Abdelhak M. Zoubir, Curtin University of Technology and Hakan Brunzell, The Ohio State University

TA8a-3 Element Position Considerations for Robust Direction Finding Using Sparse Arrays
Mats Viberg, Chalmers University of Technology and Christer Engdahl, Ericsson Microwave Systems AB

TA8a-4 A HMM-based Approach to Detect Mine-Like Objects from Seismo-Acoustic Data
Monique P. Fargues and Michael Zambartas, Naval Postgraduate School

TA8a-5 On the Use of a Rejection Class to Enhance Airborne Collected Imagery
H.H. Bennett and R.L. Campbell Jr., U.S. Army Corps of Engineers

TA8a-6 Maximum-Likelihood Estimation and Detection for Wide-Band Moving Sources in Waveguides
Stuart Golden, Orincon Corp.

TA8a-7 Bootstrap-Based Detection of Targets with Unknown Parameters in Unspecified Correlated Interference
Abdelhak M. Zoubir and Hwa-Tung Ong, Curtin University of Technology

TA8a-8 Multiscale Modelling of Manmade Object Discrimination in Synthetic Aperture Radar Imagery
Jim Schroeder, University of South Australia

TA8a-9 Comb Waveforms for Sonar
James Alsup and Harper Whitehouse, SPAWAR Systems Center

TA8a-10 Nonlinear preprocessing of heavy tailed reverberations
D. W. Rickers, A. J. Cutezo, Penn State University

TA8a-11 Optimum Transmit-Receiver Design in the Presence of Signal-Dependent Interference
S.U. Pillai, D.C. Youla, and H.S. Oh, Polytechnic University, and J. R. Guerci, SAIC

TA8a-12 Evaluation of Reduced-Rank, Adaptive Matched Field Processing Algorithms for Passive Sonar Detection in a Shallow-Water Environment
James Ward, Lisa M. Zurk, and Nigel Lee, MIT Lincoln Laboratory

TA8a-13 Space-Time Adaptive Processing for the Detection of Ground Moving Targets: Performance Analysis and Experimental Results
Stephen M. Kogon, MIT Lincoln Laboratory

TA8b- Adaptive Filtering Applications and Methods for CDMA (Interactive Lecture) 10:30 - 12:00 AM

Chair: V. DeBrunner

TA8b-1 Adaptive Baseband Predistortion Techniques for Amplifier Linearization
Mohsen Kavehrad and Kathleen J. Muhonen, The Pennsylvania State University and Rajeev Krishnamoorthy, Lucent Technologies

TA8b-2 An Adaptive Notch Filter Used for Sinusoidal and Transient Modeling of Speech Signals
Victor DeBrunner, University of Oklahoma

TA8b-3 Adaptive Time Delay Estimation With Allpass Constraints
Scott C. Douglas and Michael X. Sun, Southern Methodist University

TA8b-4 Polyphase Analysis of Subbands Adaptive Filters
Robert W. Stewart, University of Strathclyde and Stephan Weiss, University of Southampton

TA8b-5 Rationally Decimated Constituent-Based Filterbanks for Subband Adaptive Filters
Michael Lightner and Jacob D. Griesbach, University of Colorado-Boulder

TA8b-6 Spatio-Temporal Array Processing for Aperiodic DS-CDMA Downlink Transmission
Giuseppe Montalbano, Dirk T.M.Slock, and Irfan Ghauri, Institut Eurecom

TA8b-7 Adaptive Equalizers for Lapped Multitone Systems
Juergen Vollmer, GMD-German National Research Center for Information Theory

TA8b-8 GPS Jamming Effects on CRPA-Equipped F-15 and F-16 Aircraft
Tri Phoung and Gary F. Hatke, MIT Lincoln Laboratory

TA8b-9 A Multidimensional Adaptive Linear Receiver for the Excision of NBI in CDMA Transmission

James P. LeBlanc and Julio E. Castro, New Mexico State University and Predrag Rapajic, The Australian National University

TA8b-10 On the Performance Analysis of Synchronous Code Division Multiple Access with Adaptive Smart Antenna Systems

Weidong Yang, Sang-Youb Kim, and Guanghan Xu, The University of Texas at Austin

TA8b-11 Realization and Performance Analysis of an Adaptive MMSE CDMA Receiver Based on the Truncated Multistage Wiener Filter

Dongjun Lee and Irving S. Reed, University of Southern California

TA8b-12 Adaptive IIR Filtering for Asynchronous Mulituser CDMA Detection

Siew Ying Wong, National University of Singapore and Teng Joon Lim, Centre for Wireless Communications

TA8b-13 Adaptive Low-Rank MMSE Detector for DS-CDMA

Hongya Ge, Xiaodong Cai, and Ali N. Akansu, New Jersey Institute of Technology

TA8b-14 A Statistical Approach to Signal Detection in Non-Gaussian Interference and Noise

Mohammad Shikh-Bahaei and A.H. Aghvami, King's College London

TA8b-15 Adaptive Linear-Quadratic Receivers for Time-Varying, Frequency-Selective Code-Division-Multiple-Access Channels

Jian-Jun Ni and Richard J. Barton, Iowa State University

TA8b-16 Performance Analysis of a Convolutionally-Encoded Synchronous CDMA System with Adaptive Beamforming and Linear Multiuser Detection

Zartash Afzal Uzmi, Stanford University and Syed Aon Mujtaba, Bell Laboratories - Lucent Technologies

TP1- Information Filtering

Chair: Jose Principe

TP1-1 **Adaptive Multichannel Semi-Blind Deconvolution Using Neural Networks and State-Space Models** **1:30 pm**
Thomas Huang and You Zhang,
University of Illinois at Urbana-Champaign

TP1-2 **The Geometry of Inference, Rate, and Capacity for Least Squares Problems** **1:55 pm**
Louis L. Scharf, University of Colorado-Boulder

TP1-3 **A Nonlinear Adaptive Beamforming Technique for Wireless Communications** **2:20 pm**
Simon Haykin and Mathini Sellathurai, McMaster University Hamilton

TP1-4 **Maximum Partial Likelihood Methods for Nonlinear Signal Processing** **2:45 pm**
Tulay Adali, University of Maryland

BREAK 3:10 PM

TP1-5 **An Introduction to Information Theoretic Learning** **3:30 pm**
Dongxin Xu and Jose C. Principe, University of Florida

TP1-6 **Novel Algorithms for Learning Overcomplete Dictionaries** **3:55 pm**
R. Jacobs, Katholieke Universiteit Leuven; K. Kreutz-Delgado,
University of California-San Diego, and
Kjersti Engan, Hogskolen i Stavanger

TP1-7 **PCA Neural Network for JPEG Image Enhancement** **4:20 pm**
Paul Bao and Horace Hung, The Hong Kong Polytechnic University

TP1-8 **Edge-Preserving Neural Network Based Image Restoration** **4:45 pm**
Dianhui Wang and Paul Bao, The Hong Kong Polytechnic University

TP1-9 **Blind Equalization of DCMA Systems with Nonlinear Channels** **5:10 pm**
Arthur J. Redfern and G Tong Zhou, Georgia Institute of Technology

TP2- Signal Processing for Communications

Chair: James A. Ritcey

TP2-1 Rapid Prototyping for a High Data Rate Wireless Local Loop **1:30 pm**

Rajeev Krishnamoorthy, Lucent Technologies; Markus Rupp, Bell Labs - Lucent Technologies, and Eric Beck, Bell-Labs

TP2-2 A Tracking Mode Receiver for Joint Channel Estimation and Detection of Asynchronous CDMA Signals **1:55 pm**

Ronald A. Iltis, University of California-Santa Barbara

TP2-3 Bit-interleaved Coded Modulation with Rotated QAM Constellations in Rayleigh Fading **2:20 pm**

James A. Ritcey and Aik Chindapol, University of Washington

TP2-4 Cyclic Correlation Based Symbol Rate Estimation **2:45 pm**

L. Mazet and Philippe Loubaton, Universite de Marne-la-vallee

BREAK **3:10 pm**

TP2-5 Content Analysis of Random Cell Injection in ATM Networks **3:30 pm**

O.K. Fuller, J.C. McEachen, and C.W. Therrien, Naval Postgraduate School

TP2-6 A Semi-Blind Equalizer Based on CMA and Decision-Direction **3:55 pm**

Xiangyang Zhuang and A. Lee Swindlehurst, Brigham Young University

TP2-7 Blind Zero-Forcing Equalization Without Channel Estimation **4:20 pm**

Xiaohua Li and Howard Fan, University of Cincinnati

TP2-8 Prewhitened Blind Source Separation With Orthogonality Constraints **4:45 pm**

Scott C. Douglas, Southern Methodist University

TP2-9 Noise Robust Blind System Identification Using Second Order Statistics **5:10 pm**

Mirai Oshiro and Hiroshi Ochi, Kyushu Institute of Technology

TP3a- Signal Characterization and Representation

Chair: R. Kumaresan

TP3a-1 A Magnitude-Only Detector for Complex-Valued Gaussian Processes **1:30 pm**
Michael Clark and Todd McWhorter, Mission Research Corporation

TP3a-2 On Using Zero-Crossings to Represent Band-Pass Signals **1:55 pm**
Ramdas Kumaresan, University of Rhode Island

TP3a-3 Parameter Estimation for Harmonic Sinusoidal Signals **2:20 pm**
Hongbin Li, Stevens Institute of Technology; Petre Stoica, Uppsala University; Jian Li, University of Florida

TP3a-4 Characterization of Non-Uniformly Spaced Discrete-Time Signals from Their Fourier Magnitude **2:45 pm**
Andrew Siefker, Murray State University

BREAK 3:10 PM

TP3b- Equalization and Interference Cancellation in Communications

Chair: M. Moonen

TP3b-1 A Frequency-domain Eigenfilter Approach for Equalization in Discrete Multitone Systems **3:30 pm**
Bo Wang and Tulay Adah, University of Maryland

TP3b-2 Suppression of FM Interference in DSSS Communication Systems Using Projection Techniques **3:55 pm**
Moeness G. Amin and Raja S. Ramineni, Villanova University and Alan R. Lindsey, USAF Research Laboratory, IFGC

TP3b-3 Frequency Domain Equalization with Tone Grouping in DMT/ADSL-Receivers **4:20 pm**
Katleen Van Acker and Marc Moonen, Katholieke Universiteit Leuven - ESAT; Thierry Pollet, ALCATEL Telecom; and Geert Leus, Katholieke Universiteit Leuven - ESAT

TP3b-4 A Frequency Offset Estimation Architecture of OFDM System in Multipath Doppler Spread Channel **4:45 pm**

Woonpyo Hong, Korea Telecomm

TP3b-5 Peak Power Reduction in OFDM and DMT via Active Channel Modification **5:10 pm**

Dougles L. Jones, University of Illinois

TP4a- Techniques for Frequency Estimation and Spectral Analysis

Chair: P. Stoica

TP4a-1 Optimally Smoothed Periodogram **1:30 pm**

Petre Stoica and Tomas Sundin, Uppsala University

TP4a-2 Orthogonal Subspace Decomposition of Periodic Signals **1:55 pm**

Thomas W. Parks and D. Darian Mureasn, Cornell University

TP4a-3 Characterization of Windowing Effects in Adaptive Extrapolation of Sinusoids **2:20 pm**

Sergio D. Cabrera, Alejandro E. Brito, and Shiu H. Chan, The University of Texas at El Paso

TP4a-4 Asymptotically Decoupled Angle-Frequency Estimation with Sensor Arrays **2:45 pm**

Fredrik Athley, Chalmers University of Technology

BREAK **3:10 pm**

TP4b- Algorithms for Audio Coding and Speech Processing

Chair: K. C. Chung

TP4b-1 High Quality Studio Coding Using a Novel Hybrid WLP-Subband Coding Algorithm **3:30 pm**

Yu Rongshan and Ko Chi Chung, National University of Singapore

TP4b-2 A Progressive Algorithm for Perceptual Coding of Digital Audio Signals **3:55 pm**

C.-C. Jay Kuo and Ye Shen, University of Southern California

TP4b-3 Using Kautz Filter for Adaptive Acoustic Echo Cancellation **4:20 pm**

Lester S.H. Ngia, Chalmers University of Technology and Fredrik Gustafsson, Linkoping University

TP4b-4 Beamformer Based Blind Signal Separation Preprocessing in Practical Environments **4:45 pm**

Mark Girolami, Colin Fyfe, and Robert Geary, University of Paisley

TP4b-5 The Estimation of Fundamental Frequency of Speech Using Microphone Array **5:10 pm**

Tateo Yamaoka, Takafumi Kikuchi, Nozomu Hamada, and Shinichi Tanigawa, Keio University

TP5a- Channel Estimation in Fading

Chair: Ali Sayed

TP5a-1 Iterative Decoding for Joint Data Recovery and Channel Estimation in Fading **1:30 pm**

Richard D. Wesel and Christos Komninakis, University of California-Los Angeles

TP5a-2 Blind Channel Estimation in Transmit-Receive Antenna Diversity Schemes Using Antenna Precoding **1:55 pm**

Robert W. Heath, Jr., Helmut Bolcskei, and Arogyaswami J. Paulraj, Stanford University

TP5a-3 Joint Estimation of Fading Channel and Data with Antenna Arrays **2:20 pm**

Ming Yan and Bhaskar D. Rao, University of California-San Diego

TP5a-4 Semi-Blind Suppression of MAI in Multipath CDMA Channels **2:45 pm**

Ryan A. Pacheco and Dimitrios Hatzinakos, University of Toronto

BREAK **3:10 pm**

TP5b- Channel Estimation

Chair: L. Scharf

TP5b-1 Adaptive Estimators of Output SNR in Communication Channels: Distributions and Performance **3:30 pm**

Louis L. Scharf and Shawn Kraut, University of Colorado-Boulder

TP5b-2 **Adaptive Detection in Fading Channels via Monte Carlo Filtering** **3:55 pm**
Rong Chen and Xiaodong Wang, Texas A&M University

TP5b-3 **Decision-Directed Tracking of Fading Channels Using Linear Prediction of the Fading Envelope** **4:20 pm**
Raphael J. Lyman and William Edmonson, University of Florida

TP5b-4 **Channel Estimation and Equalization in Fading** **4:45 pm**
Richard D. Wesel, Christos Komninakis, Christina Fragouli, and Ali H. Sayed, University of California-Los Angeles

TP5b-5 **Blind System Identification for Impulse-Radio Channels Using Higher-Order Cumulants** **5:10 pm**
Richard J. Barton and Prashanth V. Rao, Iowa State University

TP6- Image Coding

Chair: M. T. Orchard

TP6-1 **Memory Efficient Quadtree Wavelet Coding for Compound Images** **1:30 pm**
Ken Zeger and Pamela Cosman, University of California-San Diego

TP6-2 **Wavelet-Based Image Coding: Comparison of MPEG-4 and JPEG-2000** **1:55 pm**
Homer Chen and Iole Moccagatta, Rockwell Science Center

TP6-3 **Rate-Distortion Optimized Image Coding via Least Square Estimation Quantization (LS-EQ)** **2:20 pm**
Michael T. Orchard and Xin Li, Princeton University

TP6-4 **Optimal Quantization in Non-Orthogonal Subband Coders** **2:45 pm**
Sanjit K. Mitra and Rajeev Gandhi, University of California-Santa Barbara

BREAK **3:10 pm**

TP6-5 **Low-Memory Packetized SPIHT Image Compression** **3:30 pm**
Frederick W. Wheeler and William A. Pearlman, Rensselaer Polytechnic Institute

TP6-6 **Oversampling in Steerable Transforms with Consistent Reconstruction** **3:55 pm**
Antonio Ortega and Baltasar Beferull-Lozano, University of Southern California

TP6-7 **On Successively Refinable Trellis-Coded Quantization** **4:20 pm**
Michael T. Orchard and Xin Wang, Princeton University

TP6-8 **Scalable Low Bit-Rate Image Coding Using an HC-Riot Coder** **4:45 pm**
Yasser F. Syed and K. R. Rao, University of Texas at Arlington

TP6-9 **The Effect of Spectral Compression of Hyperspectral Imagery on the Performance of Linear and Quadratic Detection Algorithms** **5:10 pm**
Scott Beaven and David Stein, SPAWARSYSCEN

TP7a- High Performance Multiplier Design

Chair: E. Swartzlander

TP7a-1 **Combined Unsigned and Two's Complement Squarers** **1:30 pm**
Louis P. Marquette, Kent E. Wires, and Michael J. Schulte, Lehigh University

TP7a-2 **VLSI Design Improvements in a Binary Multiplier Based on Analog Digits** **1:55 pm**
Majid Ahmadi, University of Windsor; Aryan Saed, Nortel Networks Microelectronics Group; and Graham A. Jullien, University of Windsor

TP7a-3 **Interconnection Effects in Fast Multipliers** **2:20 pm**
Earl E. Swartzlander, Jr. and Gwangwoo Choe, The University of Texas at Austin

TP7a-4 **A Computational Redundancy Reduction Approach for High Performance Multiplication in DSP Algorithm Implementation** **2:45 pm**
K. Muhammed and K. Roy

BREAK **3:10 pm**

TP7b- Automatic Target Recognition Theory

Chair: Randolph L. Moses

TP7b-1 **Hierarchical Ship Classifier for Airborn Synthetic Aperture Radar (SAR) Images** **3:30 pm**

Pierre Valin, Yves Tessier, and Alexandre Jouan, Lockheed Martin Canada

TP7b-2 **Neural Network ATR for High Range Resolution Radar Signatures of Moving Ground Vehicles** **3:55 pm**

David Gross, Veridian Engineering and Robert Williams, Air Force Research Laboratories

TP7b-3 **Performance Analysis for Ground-Based Target Orientation Estimation: FLIR/LADAR Sensor Fusion** **4:20 pm**

Asuman Koksal, MIT; Michael I. Miller, The Johns Hopkins University; and Jeffrey H. Shapiro, MIT

TP7b-4 **Information Theoretic Feature Extraction for ATR** **4:45 pm**

Alan S. Willsky and John W. Fisher, III, MIT

TP7b-5 **Scatterer Identification via a Subaperture Filtering Approach** **5:10 pm**

Rajesh Sharma, ERIM International, Inc.

TP8a- Image Enhancement and Classification (Interactive Lecture) 1:30 - 3:10 PM

Chair: M. Matthews

TP8a-1 **Blind Superresolution with Generalized Cross-Validation Using Gauss-Type Quadrature Rules**

Gene Golub, Nhat Nguyen, and Payman Milanfar, Stanford University

TP8a-2 **Sensor Optimal Image Interpolation**

Jeffery R. Price and Monson H. Hayes, Georgia Institute of Technology

TP8a-3 **Blind Multiframe Point Source Image Restoration Using MAP Estimation**

Brent A. Chipman and Brian D. Jeffs, Brigham Young University

TP8a-4 A New Look at Maximum Entropy Image Restoration
Matthew Willis, David Long, and Brian D. Jeffs, Brigham Young University

TP8a-5 Shift-Invariant Denoising Using Wavelet-domain Hidden Markov Trees
Hyeokho Choi, Justin K. Romberg, and Richard D. Baraniuk, Rice University

TP8a-6 Blind Denoising Using a Wavelet Coder
Amir Najmi, Philippe Raffy, and Robert M. Gray, Stanford University

TP8a-7 Regularized Denoising by Wavelet Thresholding
Hamid Krim, Yun He, and Gozde B. Unal, North Carolina State University

TP8a-8 Analysis of Wavelet-Domain Multiscale Classification Using Kullback-Leibler Distances
Hyeokho Choi, Richard D. Baraniuk, and Brent M. Hendricks, Rice University

TP8a-9 Effect of Wavelet Bases in Texture Classification Using a Tree-Structured Wavelet Transform
Victor DeBrunner and Madhavi Kadiyala, University of Oklahoma

TP8a-10 Zero Sheet Separation of Blurred Images with Symmetrical Point Spread Functions
P. Premaratne and C.C. Ko, National University of Singapore

TP8b- Special Arithmetic Techniques (Interactive Lecture) 3:30- 5:00 PM

Chair: N. Burgess

TP8b-1 A New Implementation of the Discrete Cosine Transform in the Residue Number System
Pedro G. Fernandez, University of Jaen; Luis Parrilla, Antonio Lloris, and Antonio Garcia, Universidad de Granada

TP8b-2 A Novel RNS-Based SIMD RISC Processor for Digital Signal Processing
Luis Parrilla, Antonio Lloris, and Antonio Garcia, Universidad de Granada and Steven J. Skretkowicz, Naval Postgraduate School

TP8b-3 Montgomery Modular Multiplication and Exponentiation in the Residue Number System
William L. Freking and Keshab K. Parhi, University of Minnesota

TP8b-4 Optimal Digital Design and Implementation of CSD FIR Filter

Muhammad Sohail Sadiq, Shoab Ahmad Khan, and Charm Tanner, National University of Sciences & Technology

TP8b-5 Round-off Error Free Fixed-Point Design of Polynomial FIR Predictors

Vassil S. Dimitrov and Jarno M.S. Tanskanen, Helsinki University of Technology

TP8b-6 A Multiplier with Redundant Operands

Milos D. Ercegovac and M.I. Ferguson, University of California-Los Angeles

TP8b-7 Analysis of the Lookup Table Size for Square-Rooting

Behrooz Parhami, University of California

TP8b-8 Optimal-Depth threshold Circuits for Multiplication and Related Problems

Emmanouel A. Varvarigos, Chi-Hsiang Yeh, Hua Lee, and Behrooz Parhami, University of California

TP8b-9 Efficient Digit Serial Rational Function Evaluations and Digital Filtering Applications

Oskar Mencer, Michael J. Flynn, and Martin Morf, Stanford University

TP8b-10 Efficient Designs for Multi-Input Counters

Behrooz Parhami and Chi-Hsiang Yeh, University of California

TP8b-11 New Efficient RNS-to-Weighted Decoders for Conjugate-Pain-Moduli Residue Number Systems

Yuke Wang, Concordia University and Alexander Skavantzos, Louisiana State University

TP8b-12 Computing Discrete Hartley Transform Using Algebraic Integers

Ramin Baghaie and Vassil Dimtrov, Helsinki University of Technology

TP8b-13 A Floating Point Vectoring Algorithm Based on Fast Rotations

Kees-Jan van der Kolk and Ed F. Deprettere, Delft University of Technology and Jeong-A. Lee, Chosun

TP8b-14 A New CORDIC Roatation Method for Generalized Coordinate Systems

Keshab K. Parhi and Martin Kuhlmann, University of Minnesota

TP8b-15 Sum-of-Products Computation Based on A Weight-Sorting Algorithm
Jae hun Choi and Earl E. Swartzlander, Jr., University of Texas at Austin

WA1- Implementation of Adaptive Filters

Chair: Richard Walke

WA1-1 Architectures for Adaptive Weight Calculation on ASIC and FPGA **8:30 am**
Richard Walke, Defence Evaluation & Research Agency (DERA) and Gayle Lightbody, The Queen's University of Belfast

WA1-2 Real-time Array Signal Processors for Embedded Applications **8:55 am**
Edward J. Baranoski, MIT Lincoln Laboratory

WA1-3 Application and Architecture Modeling for Parallel Execution of Jacobi **9:20 am**
Ed F. Deprettere, Delft University of Technology

WA1-4 A Low-Power, Reconfigurable Adaptive Equalizer Architecture **9:45 am**
Naresh Shanbhag, University of Illinois at Urbana-Champaign

BREAK **10:10 am**

WA1-5 FPGA Implementation of an Adaptive Noise Canceller with Low Signal Distortion **10:25 am**
Vijay K. Subramaniam, Visshwanth M. Reddy, and Sathyanarayan S. Rao, Villanova University

WA1-6 An Algorithm Transformation Approach to CORDIC Based Paralled Singular Value Decompositions Architectures **10:50 am**
Keshab K. Parhi and Jun Ma, University of Minnesota and Ed F. Deprettere, Delft University of Technology

WA1-7 Reduced Complexity Variable Precision Signal Processing for Digital Communications **11:15 am**
Paul M. Chau and Claudio S. Marino, University of California-San Diego

WA1-8 A Programmable Interpolation and Decimation Structure for Constant-Rate High-Speed Sigma-Delta Converters **11:40 am**
Lajos Gazsi, Ruhr University Bochum and Thomas Magesacher, Infineon Technologies

WA2- Video Signal Processing

Chair: Zixiang Xiong

WA2-1 **A Fast Algorithm for Semi-Automatic Segmentation of Semantic Video Object** **8:30 am**

Ju Guo, Jongwon Kim, and C.-C. Jay Kuo,
University of Southern California

WA2-2 **3-D Wavelet Coding of Video with Arbitrary Regions of Support** **8:55 am**

Albert Wang, Gavin Minami, and Zixiang Xiong, University of Hawaii;
Sanjeev Mehrotra, Microsoft Corporation; and Philip A. Chou,
University of Hawaii

WA2-3 **Low-Complexity, Adaptive Layered Video Coder for Video Teleconferencing** **9:20 am**

Robert E. Parker, Jr., Steven J. Skretkowicz, and Murali Tummala,
Naval Postgraduate School

WA2-4 **Image Sequence Segmentation Using Compensated Frame Differencing and Curve Evolution** **9:45 am**

Jun Zhang and J. Gao, University of Wisconsin-Milwaukee

BREAK **10:10 am**

WA2-5 **3-D Structure and Motion Estimation Using Range and Intensity Images** **10:25 am**

Mohammed Benjelloun, C. Boucher, and J.-C. Noyer,
Universite du Littoral Cote d'Opale

WA2-6 **Feature Detection in Analog VLSI** **10:50 am**

Christof Koch and Alberto Pesavento, California Institute of Technology

WA2-7 **Greedy Quantization of Control Points for 2-D and 3-D Data Using Blending Surfaces Representation** **11:15 am**

Joceli Mayer, Universidade Federal de Santa Catarina & UCSC

WA2-8 **Subpixel Registration of Images** **11:40 am**

Herold S. Stone, NEC Research Institute

WA3- Computer Arithmetic

Chair: Michael Schulte

WA3-1 **High Performance Universal Multiplier for Media Applications** **8:30 am**

Aamir A. Farooqui, Farzad Chehrazi, and Vojin G. Oklobdzija, SONY US Research Laboratories

WA3-2 **On-Line Scheme for Normalizing a 3-D Vector** **8:55 am**

Milos D. Ercegovac, University of California-Los Angeles and Tomas Lang, University of California-Irvine

WA3-3 **Fast Division Algorithm with a Small Lookup Table** **9:20 am**

Michael J. Flynn and Patrick J. Hung, Stanford University

WA3-4 **Arithmetic Acceleration Techniques for Wireless Communication Receivers** **9:45 am**

Suman Das, Chaitali Sengupta, Joseph Cavallaro, and Sridhar Rajagopal, Rice University

BREAK **10:10 am**

WA3-5 **Redundancy Management in Arithmetic Processing via the HSD Representation and its Applications** **10:25 am**

Il Koren, University of Massachusetts and Dhananjay S. Phatak, State University of New York

WA3-6 **Truncated Multiplication with Approximate Rounding** **10:50 am**

Earl Swartzlander, University of Texas at Austin

WA3-7 **On the Design of an On-line FFT Network for FPGA's** **11:15 am**

Milos D. Ercegovac and Robert McIlhenny, University of California-Los Angeles

WA3-8 **Efficient Implementation of Rounding Units** **11:40 am**

Neil Burgess, ChiPTec and Simon Knowles, Element-14

WA4- Multimedia Security and Watermarking

Chair: B. Liu

WA4-1 **Watermarking in the Real World: An Application to DVD** **8:30 am**
Ingemar J. Cox, NEC Research Institute

WA4-2 **Duality Between Data-Hiding and Distributed Source Coding** **8:55 am**
Jim Chou, University of Illinois; Kannan Ramchandran, University of California-Berkeley; and Sandeep Pradhan, University of Illinois

WA4-3 **Attacks on Digital Watermarks** **9:20 am**
Min Wu and Bede Liu, Princeton University

WA4-4 **Image Watermarking with Zero-Mean Patches** **9:45 am**
Viresh Ratnakar, Epson Palo Alto Laboratory

BREAK **10:10 am**

WA4-5 **Protocols for Digital Watermarking** **10:25 am**
Nasir Memon, Polytechnic University

WA4-6 **Digital Watermarking in a Perceptually Normalized Domain** **10:50 am**
Wenjun Zeng and Shawmin Lei, Sharp Laboratories of America

WA4-7 **Secure Digital Communications by Means of Stochastic Process Shift Keying** **11:15 am**
Alfred Hanssen and Arnt-Borre Salberg, University of Tromso

WA4-8 **Some Design Issues for Robust Data Hiding Systems** **11:40 am**
Ali N. Adansu and Mahalingam Ramkumar, New Jersey Institute of Technology

WA5- Antenna Arrays for Communication Systems

Chair: R. S. Blum

WA5-1 **Space-Time Coding for the Parametric Wireless Channel - Further Results** **8:30 am**
Arogyaswami J. Paulraj and S. Sandhu, Stanford University

WA5-2 **Two-Channel Zero Forcing Equalization on CDMA Forward Link: Trade-Offs Between Multi-User Access Interference and Noise** **8:55 am**
Samina Chowdhury, Mike Zoltowski, and Tom Krauss, Purdue University

WA5-3 **On Space-Frequency Rates That Exploit the Structure of the Space-Frequency Covariance Matrices in WCDMA** **9:20 am**
Josef A. Nossek, Martin Haardt, and Christopher Brunner, Siemens Communications on Air

WA5-4 **An Analysis of Vector CMA for Multichannel Receiver Design. 1** **9:45am**
Lang Tong and Azzedine Touzni, Cornell University

BREAK **10:10 am**

WA5-5 **Decoding and Equalization of Unknown Multipath Channels based on Block Precoding and Transmit-Antenna Diversity** **10:25 am**
A. Scaglione, Z. Liu, S. Barbarossa, and Georgios B. Giannakis, University of Minnesota

WA5-6 **Expoliting Spatial Diversity by Joint Design of Transmit and Receive Schemes** **10:50 am**
Bjorn Ottersten and George Jongren, Royal Institute of Technology

WA5-7 **Distributed Multiuser Detection** **11:15 am**
Rick S. Blum and Jun Hu, Lehigh University

WA5-8 **Adaptive Array Thinning for STAP Beamforming** **11:40 am**
Amir Sarajedini, Science Applications International Corp.

WA6- CDMA Interference Cancellation

Chair: B. L. Hughes

WA6-1 **A Nonlinear Programming Approach to CDMA Multiuser Detection** **8:30 am**
Aylin Yener, Rutgers University; Sennur Ulukus, AT&T Labs-Research; and Roy D. Yates, Rutgers University

WA6-2 **On Impulsive Models of Multiuser Interference** **8:55 am**
Brian L. Hughes, North Carolina State University

WA6-3 **Fast Delay Estimation for Asynchronous CDMA Communication Systems** **9:20 am**

Hongya Ge, Kun Wang, and Keun Hong,
New Jersey Institute of Technology

WA6-4 **On the Performance of the Successive Interference Canceller for DS/CDMA Signals** **9:45 am**

Kuei-Chiang Lai and John J. Shynk,
University of California-Santa Barbara

BREAK **10:10 am**

WA6-5 **Block Spreading for Discrete Multi-Tone CDMA Systems in the Presence of Frequency Selective Fading** **10:25 am**

Geert Leus and Marc Moonen, Katholieke Universiteit Leuven - ESAT

WA6-6 **Network Diversity Multiple Access for Wireless CDMA Networks** **10:50 am**

Yi Sun and Tarek Saadawi, City College of New York

WA6-7 **A Novel Downlink W-CDMA Blind Interference Cancellation Using the Subspace Approach** **11:15 am**

Someshwar C. Gupta and Mohamed F. Madkour,
Southern Methodist University and Y.E. Wang, Ericsson Inc.

WA6-8 **A Cross-Uncorrelator-Initiliser for the Super-Exponential Algorithms in Multi-User Environment** **11:40 am**

S. Lambotharan and J.A. Chambers, Brunel University

WA7- Sub-Band and Wavelet Filters

Chair: F. Harris

WA7-1 **Optimal Subband Coder with Crossband Prediction** **8:30 am**

C.W. Kok, Hong Kong University of Science and Technology

WA7-2 **On the Relation Between Pseudo-QMF Designs and Perfect Reconstruction Solutions for Modulated Filter Banks** **8:55 am**

Jorg Kliewer, University of Kiel

WA7-3 **An Efficient Top-Down Approach for the Design of Tree-Structured Orthonormal Filter Banks** **9:20 am**

Rajeev Gandhi and Sanjit K. Mitra, University of California-Santa Barbara

WA7-4 **Wavelet-based Orthogonal Modulation Code** **9:45 am**

E.-J. Yi and Edward J. Powers, University of Texas at Austin

BREAK **10:10 am**

WA7-5 **New Optimization Algorithms for Designing Wavelet Scaling Filters** **10:25 am**

James L. Sullivan, Allied Signal Technical Services and John W. Adams, California State University-Northridge

WA7-6 **Channel Estimation in Noisy Conditions Using Time-Frequency Domain Filtering** **10:50 am**

Richard A. Haddad and Aykut Bultan, New Jersey Center for Wireless Research

WA7-7 **Lifting Integer Wavelets Towards Linearity** **11:15 am**

Enrico Magli, Marco Grangetto, and Gabriella Olmo, Politecnico di Torino

WA7-8 **A New Multi-Window Time-Frequency Approach Yielding Accurate Low-Order Conditional Moments** **11:40 am**

Patrick J. Loughlin and Ferhat Cakrak, University of Pittsburgh

WA8a-Turbo Codes and Channel Simulation (Interactive Lecture) 8:30 - 10:00 AM

Chair: J. Cavallaro

WA8a-1 **On the Performance of Turbo Coding for the Land Mobile Channel with Delay Constraints**

Kai Tang, Paul H. Siegel, and Laurence B. Milstein, University of California-San Diego

WA8a-2 **Performance of High Rate Turbo Codes Employing the Soft-Output Viterbi Algorithm (SOVA)**

William E. Ryan and Ali Ghrayeb, University of Arizona

WA8a-3 Iterative Turbo-Equalization (ITE) for Dual Channels

Jill Nelson, Ralf Koetter, and Andrew Singer,
University of Illinois at Urbana-Champaign

WA8a-4 Simulation of Time-Varying, Frequency-Selective Multipath Fading Channels for Spread-Spectrum Waveforms

Lei-Lei Lock and Richard J. Barton, Iowa State University

WA8a-5 A Software Simulation Testbed for Third Generation CDMA Wireless Systems

Vishwas Sundaramurthy and Joseph Cavallaro, Rice University

WA8a-6 A Broadband Simulator for Multipath Received on Multiple Coherent Antenna Channels

Catherine M. Keller and Keith W. Forsythe, MIT Lincoln Laboratory

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Milstein, Laurence B.	WA8a-1	Papadias, Constantinos	TA3-2
Minami, Gavin	WA2-2	Parhami, Behrooz	TP8b-7
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Munteanu, Mihai	MP5-2	Perry, Richard	MP3-5
Mureasn, D. Darian	TP4a-2	Pesavento, Alberto	WA2-6
Murray, Brian	TA6-2	Petropulu, Athina P.	MA4b-4
Najmi, Amir	TP8a-6	Phatak, Dhananjay S.	WA3-5
Narasimhan, Ravi	MP3-6	Phoung, Tri	TA8b-8

NAME	SESSION	NAME	SESSION
Pillai, S.U.	TA8a-11	Rupp, Markus	TP2-1
Piloni, V.	TA1-5	Rupp, Markus	MP8b-9
Pollet, Thierry	TP3b-3	Ryan, William E.	WA8a-2
Polydoros, Andreas	MA2b-3	Saadawi, Tarek	WA6-6
Powell, Neil	MP5-2	Sadiq, Muhammad Sohail	MA7b-3
Powers, Edward J.	WA7-4	Sadiq, Muhammad Sohail	TP8b-4
Pradhan, Sandeep	WA4-2	Sadjadpour, Hamid	TA4-4
Premaratne, P.	TP8a-10	Saed, Aryan	TP7a-2
Price, Jeffery R.	TP8a-2	Salberg, Arnt-Borre	WA4-7
Principe, Jose C.	TP1-5	Sampath, Hemanth	MP1-6
Proudler, Ian K.	MP8b-4	Sandhu, S.	WA5-1
Psilogeogopolis, Marios	MP5-2	Sanubari, Junibakti	TA7-8
Puri, Rohit	MP4-6	Saqib, Maliq Muhammad	MA7b-1
Rabideau, Daniel J.	MA5b-2	Sarajedini, Amir	WA5-8
Radenkovic, Miloje	TA3-7	Sasidaran, Dhinesh	MA8b-4
Raffy, Philippe	MP4-8	Sayed, Ali H.	TP5b-4
Raffy, Philippe	TP8a-6	Sayed, Ali H.	MP1-4
Raghavan, Ram	MP2-7	Sayed, Ali H.	MP7-4
Raghunath, K.J.	MA6b-1	Sayed, Ali H.	TA7-1
Rajagopal, Sridhar	WA3-4	Sayed, Ali H.	MP8b-3
Ramchandran, Kannan	MP4-6	Scaglione, A.	WA5-5
Ramchandran, Kannan	WA4-2	Schabert, Marion	MP8b-4
Ramchandran, Kannan	MP4-2	Scharf, Louis L.	TP1-2
Ramineni, Raja S.	TP3b-2	Scharf, Louis L.	TP5b-1
Ramkumar, Mahalingam	WA4-8	Scharf, Louis L.	MP3-3
Rao, Prashanth V.	TP5b-5	Schroeder, Jim	TA8a-8
Rao, Sathyanarayan S.	WA1-5	Schulte, Michael J.	TP7a-1
Rao, Bhaskar D.	TP5a-3	Scott, W.R.	TA8a-1
Rao, K.R.	TP6-8	Seed, Luke	MP5-2
Rapajic, Predrag	TA8b-9	Sellathurai, Mathini	TP1-3
Ratnakar, Viresh	WA4-4	Sengupta Chaitali	WA3-4
Re, A. Del	TA1-5	Shahbazian, Elisa	MP6-7
Re, Marco	TA1-5	Shanbhag, Naresh	WA1-4
Reddy, Visshwanth M.	WA1-5	Shapiro, Jeffrey H.	TP7b-3
Redfern, Arthur J.	TP1-9	Sharma Rajesh	TP7b-5
Redfern, Arthur J.	MP8b-12	Sharma M.	MP7-7
Reed, Todd R.	MA3b-1	Shen, Ye	TP4b-2
Reed, Irving S.	TA8b-11	Shi, Wei	TA4-1
Rees, H.D	MA5b-1	Shi, Richard	TA1-6
Regunathan, Shankar L.	MP4-4	Shikh-Bahaei, Mohammad	TA8b-14
Reza, Ali M.	TA1-8	Shynk, John J.	WA6-4
Richards, Mark A.	MP2-8	Siefker, Andrew	TP3a-4
Richman, Michael S.	TA5-7	Siegel, Paul H.	WA8a-1
Ritcey, James A.	TP2-3	Simpson, Albert	TA6-3
Rodriguez, Jose	TA6-2	Singer, Andrew	WA8a-3
Romberg, Justin K.	TP8a-5	Singh, Sushil	MP5-8
Rongshan, Yu	TP4b-1	Sirisuk, P.	MP3-2
Rose, Kenneth	MP4-4	Skavantzos, Alexander	TP8b-11
Rovigatti, G.	TA1-5	Skidmore, I.D.	MA5b-1
Roy, K.	TP7a-4	Skretkowicz, Steven J.	TP8b-2
Rupi, Marilli	MP8b-11	Skretkowicz, Steven J.	WA2-3

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