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

October 29 - November 1, 2000

Asilomar Hotel
Conference Grounds

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

THIRTY-FOURTH ASILOMAR CONFERENCE ON SIGNALS, STEMS, AND COMPUTERS

ORGANIZED IN COOPERATION WITH

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

MONTEREY BAY AQUARIUM RESEARCH INSTITUTE
MOSS LANDING, CALIFORNIA

AND
IEEE SIGNAL PROCESSING SOCIETY

CONFERENCE COMMITTEE

General Chairperson
Prof. Sally Wood
Electrical and Computer Engineering Department
Santa Clara University
E-mail: swood@scu.edu

Publicity Chairman
Prof. Murali Tummala
Department of Electrical & Computer Engineering
Naval Postgraduate School
Monterey, CA 93942-5121
E-mail: tummala@ece.nps.navy.mil

Technical Program Chairman
Dr. Brian Agee
Electrical and Computer Engineering Department
Santa Clara University
E-mail: bgagee@pacbell.net

Conference Coordinator
Prof. Monique P. Fargues
Department of Electrical and Computer Engineering
Naval Postgraduate School
Monterey, CA 93943
E-mail: fargues@ece.nps.navy.mil

Treasurer
Prof. Ralph Hippenstiel
Department of Electrical & Computer Engineering
Naval Postgraduate School
Monterey, CA 93943-5121
E-mail: hippenst@ece.nps.navy.mil

Publication Chairman
Dr. Michael B. Matthews
Monterey Bay Aquarium Research Institute
Moss Landing, CA 95039
E-Mail: matthews@mbari.org

Welcome from the General Chair

On behalf of the organizing committee for the Thirty-fourth Asilomar Conference on Signals, Systems, and Computers it is my pleasure to welcome you to Pacific Grove and the Monterey Peninsula for this year's meeting. This conference has always attracted both long time attendees and new investigators, and I am sure you will enjoy the opportunity to renew old friendships and make new professional connections. If this will be your first Asilomar conference, you will find that the beautiful conference grounds, lodge, and seashore provide a unique environment for discussions and reflection.

The dedicated efforts of many people have come together to bring you this first conference of the new millennium. Special thanks are extended to the Technical Program Chair, Dr. Brian Agee, and to his committee of technical area chairs. They have organized a stimulating technical program with a complementary mixture of perspectives on technical challenges from both the world of industry and the academic world.

For the opening Sydney Parker Memorial Lecture we are fortunate to have a keynote address by Dr. Richard V. Cox of AT&T Research Laboratories, who is internationally recognized for his work in voice compression technology for telecommunications. He will discuss the issues, evolution, and future of Internet Telephony.

The social program for the conference includes two receptions. You should plan to arrive in time for the Welcome Reception on Sunday night. A conference reception will be held the following evening at the Naval Postgraduate School.

Special thanks and appreciation are also extended to the organizing committee members and the faculty and staff of the Naval Postgraduate School who have worked so hard to make this a memorable conference for you. We all hope that you will enjoy the technical conference and the traditional accompanying events of the social program. We look forward to seeing you this year at Asilomar!!

Dr. Sally Wood
General Chairman

Conference Steering Committee

PROF VICTOR E. DEBRUNNER
School of Engineering
University of Oklahoma
Norman, OK

DR. GEORGE M. DILLARD
Code 0141
NCCOSC, RD&TE Div.
San Diego, CA 92152-5000
gdillard@manta.nosc.mil

PROF. MONIQUE P. FARGUES
Conference Coordinator
Dept. of Electrical & Computer Eng.
833 Dyer Road, Room 437, Code EC/Fa
Naval Postgraduate School
Monterey, CA 93943-5121
fargues@ece.nps.navy.mil

PROF. BENJAMIN FRIEDLANDER
Dept. of Electrical and Computer Engineering
University of California, Santa Cruz
Santa Cruz, CA

PROF. FREDERIC J. HARRIS
Dept. of Electrical Engineering
San Diego State University
San Diego, CA 92115
fharris@sdsu.edu

PROF. RALPH D. HIPPENSTIEL
Treasurer
Dept. of Electrcial & Computer Eng.
833 Dyer Road, Room 437, Code EC/Hi
Naval Postgraduate School
Monterey, CA 93943-5121
hippenst@ece.nps.navy.mil

DR. NEIL K. JABLON
Globalstar USA
1340 Treat Blvd., Suite 500
Walnut Creek, CA 94596
neil.jablon@airtouch.com

PROF. W. KENNETH JENKINS
Electrical Engineering Dept.
The Pennsylvania State University
129 Electrical Engineering East
University PArk, PA 16802-2705
jenkins@engr.psu.edu

DR. MICHAEL MATTHEWS
Publications Chair
MBARI
7700 Sandholdt Road
Moss LAnding, CA 95039
matthews@mbari.org

PROF. SHERIFF MICHAEL
Secretary
Dept. of Electrical & Computer Eng.
833 Dyer Road, Room 437, Code EC/Mi
Naval Postgraudate School
Monterey, CA 93943-5121
michael@ece.nps.navy.mil

PROF. WASFY MIKHAEL
Dept. of Electrical Eng.
University of Central Florida
Orlando, FL 32816-2450

PROF. JAMES A. RITCEY
Dept. of Electrical Engineering, FT-10
University of Washington
Seattle, WA 98195
ritcey@ee.washington.edu

PROF. MICHAEL A. SODERSTRAND
Dept. of Electrical & Computer Eng.
University of California-Davis
Davis, CA 95616
dsplab@ece.ucdavis.edu

DR. SAMUEL D. STEARNS
Consultant
3705 Utah NE
Albuquerque, NM 87110
stearns@prodigy.net

PROF. EARL SWARTZLANDER
Dept. of Electrical & Computer Eng.
University of Texas at Austin
Austin, TX 78712
e.swartzlander@compmail.com

PROF FRED TAYLOR
Dept. of Electrical & Computer Eng.
University of Florida
Gainesville, FL 32611
fjt@alpha.ee.ufl.edu

PROF. CHARLES W. THERRIEN
Chairman
Dept. of Electrical & Computer Eng.
833 Dyer Road, Room 437, Code EC/Ti
Naval Postgraduate School
Monterey, CA 93943-5121
c.therrien@ieee.org

PROF. MURALI TUMMALA
Publicity Chair
Dept. of Electrical & Computer Eng.
833 Dyer Road, Room 437, Code EC/Tu
Naval Postgraduate School
Monterey, CA 93943-5121
tummala@ece.nps.navy.mil

DR. STANLEY A. WHITE
SPACE Corp.
433 E. Avenida Cordoba
San Clemente, CA 92672

2000 Asilomar
Technical Program Committee

Chairman
Dr. Sally Wood
ECE Department
Santa Clara University
swood@scu.edu

2000 Asilomar Technical Program Committee Members

Scott T. Action, Ph.D.
Chair, Technical Area D
School of Electrical and Computer Engineering
Oklahoma State University
202 Engineering South
Stillwater, OK 74078-5032
sacton@ceat.okstate.edu

Brian G. Agee, Ph.D., P.E.
Technical Chair
Consulating Engineer
1596 Wawona Drive
San Jose, CA 95125
bgagee@pacbell.net

Bradley J. Bazuin, Ph.D.
Chair, Technical Area F
Dept. of Electrical and Computer Engineering
Western Michigan University
Kalamazoo, MI 49008
brad.bazuin@wmich.edu

Matthew C. Bromberg, Ph.D.
Chair, Technical Area C
Dept. of Electrical and Computer Engineering
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609
mattb@ece.wpi.edu

William A. Brown, Ph.D.
Chair, Technical Area E
Mission Research Corporation
10 Ragsdale Drive, Suite 201
Monterey, CA 93940-5776
brown@mrcmry.com

Prof. Frederick J. Harris P.E.
Chair, Technical Area B
Dept. of Electrical and Computer Engineering
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-1309
fred.harris@sdsu.edu

Mati Wax, Ph.D.
Chair, Technical Area A
43 Kadima Street
Haifa 34383
Israel
wax@tx.technion.ac.il

2000 Asilomar Conference

Sunday Afternoon, October 29

3:00 - 6:00	Registration
7:30 - 9:00	Welcoming Reception at Asilomar

Monday Morning, October 30

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 -10:15	Coffee Social - in front of the Chapel	
10:30 - 12:00	Morning Sessions	
MA1b-	Synthetic Aperture Radar I	Charles Jakowatz
MA2b	Adaptive Array Processing in the Presence of Motion	Michael Zatman
MA3b	Object-Based Image and Video Coding	Til Aach
MA4b	DSP Implementations on Programmable Devices	Ed Deprettere
MA5b	Transmit Diversity Techniques I	Marc Goldburg
MA6b	Special Arithmetic Techniques I	Neil Burgess
MA7b	Orthogonal-Frequency Division Modulation	Wade Lowdermilk
MA8b	Spectral and Hyperspectral Processing and Data Fustion (Poster)	Randy Roberts
12:00-1:00	Lunch	

Monday Afternoon, October 30

1:30-5:10	1 Break - 3:10-3:30	
MP1a	Synthetic Aperture Radar II	Charles Jakowatz
MP1b	Synchronization Techniques	Fred Harris
MP2a	Adaptive Array Processing the Presence of Motion II	Michael Zatman
MP2b	Transmit Diversity Techniques II	Marc Goldburg
MP3	Biomedical Processing	Arye Nehorai
MP4	Field Programmable DSP Arrays	Chris Dick
MP5	Application of Invariance in Signal Processing (Special)	Mike Clark
MP6a	Special Arithmetic Techniques II	Neil Burgess
MP6b	Subband and Wavelet Filters	Fred Harris
MP7	PDE's and Diffusion for Signal Processing (Special)	Anthony Yezzi
MP8a	Space Time Processing (Poster)	Garret Okamoto
MP8b	Advanced Techniques for Direction Finding and Position Location Systems (Poster)	Mark Kahn
6:00-7:00	Dinner	

Session SCHEDULE/continued...

Monday Evening, October 30

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

Tuesday Morning, October 31

7:30-9:00 Breakfast
8:00-4:00 Registration

8:30-12:10 1 Break - 10:10 -10:30

TA1	Space-Time Adaptive Processing and Sonar	John Taque
TA2	Space-Time Coding	Naofal-Al-Dhahir
TA3	Smart Antennas for MIMO Links	David Gesbert
TA4	Adaptive Filtering Applications and Methods for CDMA	Victor DeBrunner
TA5	Signal Structure, Classification and Detection	Michael Ready
TA6	Computer Arithmetic I	Michael Schulte
TA7	Image Segmentation and Texture Processing	Joseph Havlicek
TA8a	Equalization and Interference Cancellation (Poster)	Arye Nehorai
TA8b	Image Coding and Transmission (Poster)	Mita Desai

12:00-1:00 Lunch

Tuesday Afternoon, October 31

1:30-5:10 1 Break - 3:10-3:30

TP1	Radar Processing	John Tague
TP2	Signal Separation Techniques for Multiuser Communications	Upamanyu Madhow
TP3	High-Order Statistics and Signal Classification	Chad Spooner
TP4	Signal Processing in Wireless Networks	Lang Tong
TP5	Signal Processing Techniques for Multiuser/Multirate Communications	Naofal Al-Dhahir
TP6	Computer Arithmetic II	Earl Swartzlander, Jr.
TP7	Video Coding and Transmission	Aggelos Katsaggelos
TP8a	Blind Source and Signal Separation (Poster)	Benjamin Friedlander
TP8b	Algorithms for Audio Coding and Speech Processing (Poster)	Keith Teague

Session SCHEDULE/continued...

Wednesday Morning, November 1

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 - 10:30

WA1	Automatic Target Recognition	Randolph Moses
WA2	Blind and Nonblind Techniques for MIMO Channel Estimation	Yingbo Hua
WA3	Smart Airlinks	Andrea Goldsmith
WA4	Digital Filters	Claude Lindquist
WA5	DSP Programming and Implementation Techniques	Stephen Wilson
WA6	Design for Low Power	David Martinez
WA7	Signal/Image Enhancement	Til Aach
WA8a	Adaptive Techniques for Equalization and Beamforming (Poster)	Alan Lindsey
WA8b	Multimedia Data Security and Watermarks	Min-Yon Wu

12:00-1:00 Lunch

2000 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 30

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 2000 Asilomar Conference

DR. RICHARD V. COX
SPEECH AND IMAGE PROCESSING SERVICES
RESEARCH VICE-PRESIDENT

AT&T LABS

Internet Telephony

In February 1995, VocalTec produced the first Internet Protocol Telephone software. The call quality was poor but the phone calls were free. In that (long ago) era Internet Telephony (IT) was compared to the CB radio craze of a generation ago. Those using, or working on, IT were referred to as 'the lunatic fringe' by those in conventional telephony. Today, Internet Telephony is accepted as mainstream technology. IT has become the logical successor to the circuit switched telephony that evolved over the past 125 years. What is Internet Telephony and why has this rapid change happened? This talk contains an overview of IT, from its start as a cheaper way to make phone calls from PC to PC up through today. This includes both a description of the technology that has already been created and the technical hurdles that still lie ahead. Conventional telephony is complex. Can it be replaced with a simple technology without eliminating the features that consumers know and love? The talk also contains a discussion of the economics of IT. Why are businesses embracing it? Finally, we include some visions of the future. Where will this all lead? Is it all hype? When will we see IT in the marketplace as a mature technology – or is it one already?

DR. RICHARD V. COX
Professional Biography

Richard V. Cox received his Ph.D. in Electrical Engineering from Princeton University. In 1979 he joined the Acoustics Research Department of Bell Laboratories. He conducted research in the areas of speech coding, digital signal processing, analog voice privacy, audio coding, and real-time implementations. In 1987 he was promoted to Supervisor of the Digital Principles Research Group. The group implemented sophisticated digital compression algorithms for speech, audio, image, and video coding. During this period he became engaged in speech coding standards work for digital cellular telephony and within the International Telecommunications Union. He collaborated on the low-delay CELP algorithm that became ITU-T Recommendation G.728 in 1992. He managed the ITU effort that resulted in the creation of ITU-T Rec. G.723.1 in 1995. In 1992 he was appointed Department Head of the Speech Coding Research Department of AT&T Bell Labs. In 1996 as part of the split-up of AT&T, he joined AT&T Labs as Division Manager of the Speech Processing Software and Technology Research Department. In this capacity he had responsibility for AT&T's research efforts in speech coding, audio coding, hearing, speaker identification, and speech recognition. In August 2000 he was appointed Speech and Image Processing Services Research Vice-President. In this capacity he has responsibility for all of AT&T's research in speech, audio, image, video, and multimedia processing research.

Dr. Cox is a Fellow of the IEEE and presently serves as President-Elect of the IEEE Signal Processing Society. He is also a member of the Board of Directors of Recording for the Blind & Dyslexic, the only US provider of textbooks and reference books for people with print disabilities. At RFB&D he is presently helping to lead the effort to develop digital books combining audio, text, images, and graphics for their consumers.

Program of 2000 Asilomar Conference on Signals, Systems, and Computers

Dr. Brian Agee
Technical Program Chairman

Session MA1b — Synthetic Aperture Radar - I

Session Chair: Charles Jakowatz

MA1b-1 An $N^2 \cdot \log N$ Back-Projection Algorithm for SAR Image Formation **10:30 am**
Shu Xiao, David C. Munson, Jr., Samit Basu, and Yoram Bresler, University of Illinois at Urbana-Champaign

MA1b-2 IFSAR for the Rapid Terrain Visualization Demonstration **10:55 am**
Bryan L. Burns, Paul H. Eichel, William H. Hensley, and Theodore J. Kim, Sandia National Laboratories

MA1b-3 3-D High-Resolution Spectral Technique to Form 3-D ISAR Cube **11:20 am**
S. Lawrence Marple, Jr., Orincon Corp

MA1b-4 The Direction Cosine Method of Scatterer Location Extended to Spotlight Mode IFSAR **11:45 am**
Paul H. Eichel, Sandia National Laboratories

Session MA2b — Adaptive Array Processing in the Presence of Motion I

Session Chair: Michael Zatman

MA2b-1 The MVDR-Beamformer for Circular Arrays **10:30 am**
Benjamin Friedlander, University of California-Santa Cruz

MA2b-2 Adaptive Interference Cancellation using Time-Varying Beamforming Weights for Wideband LFM Waveforms **10:55 am**
S.D. Hayward, P. Baxter, and R.J. Shepherd, Dera Malvern

MA2b-3 Superresolution Direction Finding with Rapidly Rotating Arrays **11:20 am**
Michael Zatman, MIT Lincoln Laboratory

MA2b-4 High-Resolution Sensor Array Processing in the Presence of Multiple Wideband Chirp Signals **11:45 am**
Alex B. Gershman, McMaster University, Moeness G. Amin, Villanova University, Marius Pesavento, McMaster University

Session MA3b — Object-Based Image and Video Coding

Session Chair: Til Aach

MA3b-1 Face Detection and Tracking for Video Coding Applications **10:30 am**
Bernd Menser and Michael Brunig, Aachen University of Technology

MA3b-2 MPEG-4 Compliant Video Encoding: Analysis and Rate Control Strategies **10:55 am**
Paulo Nunes and Fernando Pereira, Instituto Superior Tecnico

MA3b-3 Polygonal Shape Descriptors - An Efficient Solution for Image Retrieval and Object Localization **11:20 am**
Andre KAUP and Jorg Heuer, Siemens Corporate Technology

MA3b-4 Segmentation-Based Image Coding by Morphological Local Monotonicity **11:45 am**
Joseph Bosworth and Scott T. Acton, The University of Virginia

Session MA4b — DSP Implementations of Programmable Devices

Session Chair: Ed Deprettere

MA4b-1 An FPGA Based Digital Radar Receiver for Soft Radar **10:30 am**
Richard Walke, Defence, Evaluation & Research Establishment, David Sadler, Roke Manor Research Ltd.

MA4b-2 Reconfigurable Architecture Exploration for Wireless Base and Receivers **10:55 am**
Ning Zhang and Robert Brodersen, Berkeley Wireless Research Center

MA4b-3 From Basic Concept to Real-Time Implementation: Prototyping WCDMA Downlink Receiver Algorithms - A Case Study **11:20 am**
M. Guillaud, A. Burg, L. Mailaender, B. Haller, Markus Rupp, and E. Beck, Lucent Technologies, Bell Labs

MA4b-4 Configurable Arithmetic Arrays with Data-Driven Control **11:45 am**
Behrooz Parhami, University of California-Santa Barbara

Session MA5b — Transmit Diversity Techniques - I

Session Chair: Marc Goldburg

MA5b-1 Application of Unitary Transforms to Quasi-Closed-Loop Transmit Diversity Systems **10:30 am**
Giridhar D. Mandyam, Nokia Research Center

MA5b-2 Performance of Closed Loop Transmit Diversity with Feedback Delay **10:55 am**
Balaji Raghothaman, Giridhar D. Mandyam, and R. Thomas Derryberry, Nokia Research Center

MA5b-3 Optimal Spread Spectrum Transmit Antenna Diversity Utilizing Channel State Information **11:20 am**
Eko N. Onggosanusi, Barry D. Van Veen, and Akbar M. Sayeed, University of Wisconsin-Madison

MA5b-4 Closed-Loop Transmit Diversity for FDD WCDMA Systems **11:45 am**
Jyri Hamalainen and Risto Wichman, Nokia Research Center

Session MA6b — Special Arithmetic Techniques - I

Session Chair: Neil Burgess, Cardiff University

MA6b-1 A Novel Area-Efficient Binary Adder **10:30 am**
S.B. Furber, the University, J. Liu, Intel Corporation

MA6b-2 Simulated Performance of the Logarithmic Number System **10:55 am**
J.N. Colemand, University of New Castle Upon Tyne, and J. Kadlec, Academy of Sciences of The Czech Republic

MA6b-3 Optimised Squaring with Sliding Windows **11:20 am**
B.J. Phillips and Neil Burgess, Cardiff University

MA6b-4 High-Speed Arithmetic for MPEG-2 Encoders **11:45 am**
Amos R. Omondi, Nanyang Technological University

Session MA7b — OFDM - Orthogonal-Frequency Division Modulation

Session Chair: Wade Lowdermilk

MA7b-1 Code Selection to Eliminate Inter-Channel Interference in a Multi-User OFDM Satellite System **10:30 am**
Bryan Usevitch, University of Texas at El Paso

MA7b-2 OFDM Parameter Estimation a Time Domain Approach **10:55 am**
Walter Akmouche and Eric Kerherve, Celar/TCOM/TR, Andre Quinquis, Ensieta

MA7b-3 Subcarrier and Power Allocation for OFDM **11:20 am**
Didem Kivanc and Hui Liu, University of Washington

MA7b-4 Efficient Matrix Multiplication Methods to Implement a Near-Optimum Channel Shortening Method for Discrete Multitone Transceivers **11:45 am**
Jeffrey Wu, Guner Arslan, and Brian L. Evans, The University of Texas-Austin

Session MA8b — Spectral and Hyperspectral Processing and Data Fusion

(Poster Session)
10:30 - 12:00

Session Chair: Randy Roberts

MA8b-1 Hyperspectral Detection of Buried Land Mines Based on Stochastic Mixture Modeling
Alan D. Stocker, Space Computer Corporation

MA8b-2 Stochastic Target Detection for Hyperspectral Data
L.E. Hoff, Hoff Engineering, Scott G. Beaven, Spawar Systems Center, Edwin M. Winter, Technical Research Associates, Inc.

MA8b-3 Effect of Compression on Detection in Hyperspectral Data
Scott G. Beaven, David Stein, and Steve Stewart, Spawar

MA8b-4 Automatic Normalization of Atmospheric, Environmental, and Sensor Effects in Hyperspectral Data
Eric P. Crist, J.N. Cederquist, and J.A. Nunez, Veridian Erim International

MA8b-5 Characterization of Hyperspectral Data Using Genetic Algorithms
Randy S. Roberts, David W. Paglieroni, Lawrence Livermore National Laboratory

MA8b-6 Requirements for Anomaly Detection in Hyperspectral Data Using Spectral Unmixing
Edwin M. Winter, Technical Research Associates, Inc.

MA8b-7 Correction and Analysis of Agricultural Imagery Acquired by the TRWIS III Hyperspectral Airborne Imager
Stephanie Sandor-Leahy, TRW

MA8b-8 A New Neuro-Fuzzy Adaptive Filter for Maneuvering Target Tracking
M.B. Menhaj and S. Amani, Amirkabir University

MA8b-9 Target Tracking with an Attentive Foveal Sensor
Laura Li and Douglas Cochran, Arizona State University, Ross D. Martin, Lockheed Martin Defense Systems

Continued on next page...

MA8b-10 Perceptual Spectrum Quantization
Fredrik Norden and T. Eriksson, Chalmers University of Technology

MA8b-11 A Modified Discrete Fourier Transform with a Doubled Frequency Resolution
Ben-Dau Tseng, California State University-Chico

MA8b-12 Approximating the DCT with the Lifting Scheme: Systematic Design and Applications
Jie Liang and Trac D. Tran, The Johns Hopkins University

MA8b-13 Generalized Lapped Biorthogonal Transforms Using Lifting Steps
Masahiro Kawada and Masaaki Ikehara, Keio University

MA8b-14 Handling Nonnegative Constraints in Spectral Estimation
Brien Alkire and Lieven Vandenberghe, University of California-Los Angeles

MA8b-15 Spectral Analysis of Gapped Data
Erik G. Larsson and Petre Stoica, Uppsala University,
Jian Li, University of Florida

MA8b-16 Frequency Domain Step-Size Control in Non-Stationary Environments
Julia Vogel, Martin Heckman, and Kristian Kroschel, University of Karlsruhe

Session MP1a — Synthetic Aperture Radar - II

Session Chair: Charles Jakowatz

MP1a-1 Open-Loop Adaptive Filtering for Speckle Reduction in Synthetic Aperture Radar Images **1:30 pm**
J.A. Rohwer, Sandia National Laboratories,
Neeraj Magotra, Texas Instruments, Inc., and Sam D. Stearns

MP1a-2 Modelling SAR Images with a Generalisation of the Rayleigh Distribution **1:55 pm**
Ercan E. Kuruoglu and Josiane Zerubia, Inria - Sophia Antipolis

MP1a-3 Lossless Compression of SAR Imagery Using a Multiple-Pass Gradient Adaptive Lattice Filter **2:20 pm**
Robert Ives, Naval Postgraduate School

MP1a-4 Analysis of an Adaptive Extrapolation Algorithm on the recovery of Harmonic Signals **2:45 pm**
Alejandro E. Brito, Shiu H. Chan, and Sergio D. Cabrera,
The University of Texas at El Paso

BREAK **3:10 pm**

Session MP1b — Synchronization Techniques

Session Chair: Fred Harris

MP1b-1 Uplink Frequency Synchronizatin for MC-CDMA **3:30 pm**
Ufuk Tureli, Didem Kivanc, and Hui Liu, University of Washington

MP1b-2 Multirate Filters and Processing Techniques for Timing and Carrier Recovery **3:55 pm**
Fred Harris, San Diego State University

MP1b-3 Impact of Synchronization on Receiver Performance in Wideband CDMA Networks **4:20 pm**
Karim Cheikhrouhou, Ecole Nationale d'Ingenieurs de Tunis, Sofiene Affes and Paul Mermelstein, Universite Du Quebec

MP1b-4 Analysis of a Timing Control Algorithm for QS-CDMA **4:45 pm**
Ronald Iltis, University of California-Santa Barbara

MP1b-5 Model Mismatch Studies on OFDM System Frequency Synchronization **5:10 pm**
Ufuk Tureli, Didem Kivanc, and Hui Liu, University of Washington

Session MP2a — Adaptive Array Processing in the Presence of Motion II

Session Chair: Michael Zatman

MP2a-1 **Passive Target Tracking with Uncertain Sensor Positions** **1:30 pm**
Robert J. Barsanti and Murali Tummala, Naval Postgraduate School

MP2a-2 **Convergence Behavior of the Normalized Least Mean Fourth Algorithm** **1:55 pm**
Azzedine Zerguine, King Fahd University of Petro & Minerals

MP2a-3 **Convergence Analysis of the Variable Weight Mixed-Norm LMS-LMF Adaptive Algorithm** **2:20 pm**
Azzedine Zerguine, King Fahd University of Petro & Minerals, Tyseer Aboulnasr, University of Ottawa

MP2a-4 **Rapid Adaptation in Subspace Leakage Environments via Covariance Matrix Tapering** **2:45 pm**
Joseph R. Guerci, Defense Advanced Research Projects Agency, J.S. Bergin, Isl

BREAK **3:10 pm**

Session MP2b — Transmit Diversity Techniques - II

Session Chair: Marc Goldburg

MP2b-1 **The Max-Min Capacity Criterion and the Exploitation of Channel Reciprocity** **3:30 pm**
Matthew C. Bromberg, Worcester Polytechnic Institute, Brian G. Agee

MP2b-2 **Massive Scale Radio Link Reciprocity Survey for the PHS System** **3:55 pm**
Serge Barbosa, Athos Kasapi, Adam Kerr, Alissa Nolan, and Anne-Flore Roger, Arraycomm, Inc.

MP2b-3 **Transmit Diversity for Arrays with Correlated Rayleigh Fading** **4:20 pm**
C. Van Rensburg, University of California-Davis, Benjamin Friedlander, University of California-Santa Cruz

MP2b-4 **Transmission Diversity Combining for Fast Fading Vector Channel** **4:45 pm**
Hang LI and Guanghan Xu, The University of Texas-Austin

Session MP3 — Biomedical Processing

Session Chair: Arye Nehorai, University of Illinois at Chicago

MP3-1 **Spatial-Temporal Analaysis of MEG/EEG Using Bayesian Inference** **1:30 pm**
D.M. Schmidt, J.S. George, D.M. Ranken, and C.C. Wood, Los Alamos National Laboratory

MP3-2 **Synthetic Aperture Magnetometry (SAM), Linear Beamformers, and MUSIC in MEG Applications** **1:55 pm**
J. Vrba and S.E. Robinson, CTF Systems Inc.

MP3-3 **Multipolar Solutions to MEG Source ImagingUsing RAP-MUSIC** **2:20 pm**
John C. Mosher, Los Alamos National Laboratory, Richard M. Leahy, University of Southern California, Sylvain Baillet, Hopital de la Salpetriere

MP3-4 **Estimating Current Density in the Heart Using Spatio-Temporal Analysis and ECG/MCG Sensor Arrays** **2:45 pm**
Aleksandar Jeremic and Arye Nehorai, University of Illinois at Chicago

BREAK **3:10 pm**

MP3-5 **Image Reconstruction for a Novel Compton Scatter Tomograph** **3:30 pm**
Alfred O. Hero, University of Michigan

MP3-6 **An Admissible Solution Approach for Diffuse Optical Tomography** **3:55 pm**
Dana H. Brooks, Richard J. Gaudette, Eric Miller, and Charles DIMARZIO, Northeastern University

MP3-7 **Adaptive Filtering of EKG Signals with Little Apriori Information** **4:20 p m**
Peggy Shen, Santa Clara University, Claude S. Lindquist, University of Miami

MP3-8 **Modeling Directionality of Photoreceptors in the Human Eye as a Function of Monochromatic Aberrations** **4:45 pm**
C. Chao, D.R. Iskander, M.J. Collins, and M. Bennamoun, Queensland University of Technology

MP3-9 **A Signal Separation Algorithm for Fetal Heart-Rate Monitoring** **5:10 pm**
Kuei-Chiang Lai and John J. Shynk, University of California-Santa Barbara

Session MP4 — Field Programmable DSP Arrays

Session Chair: Chris Dick

MP4-1 **Bit-Width Optimizatio for Configurable DSP's by Multi-Interval Analysis** **1:30 pm**
Arrigo Benedetti and P. Perona, Caltech

MP4-2 **Implementation of a Reconfigurable Soft Radio Using the Layered Radio Architecture** **1:55 pm**
Srikathyayani Srikanteswara, Virginia Polytechnic Institute, Jeffrey H. Reed, Virginia Polytechnic Institute, Peter Athanas, Virginia Polytechnic Institute

MP4-3 **Virtex FPGA Implementation of a polyphase Filter for Sample Rate Conversion** **2:20 pm**
C.N. Ang, R.H. Turner, T. Courtney, and Roger Woods, The Queen's University of Belfast

MP4-4 **Perspectives on Custom Computing** **2:45 pm**
Wayne Luk, University of London

BREAK **3:10 pm**

MP4-5 **FPGA Implementation of Adaptive Heterodyne Filter** **3:30 pm**
Michael A. Soderstrand, Karl E. Nelson, Wen Feng Leong, Hooi Miin Soo, and Kah-Howe Tan, Oklahoma State University

MP4-6 **A New RNS Architecture for the Computation of the Scaled 2D-DCT on Field-Programmable Logic** **3:55 pm**
Pedro G. Fernandez, University of Jaen, Javier Ramirez, Antonio Garcia, and Antonio Lloris, University of Granada

MP4-7 **Implementation of Canonical and Retimed RNS Architectures for the Orthogonal 1-D DWT over FPL Devices** **4:20 pm**
Javier Ramirez and Antonio Garcia, University of Granada, Pedro G. Fernandez, University of Jaen, Antonio Lloris, University of Granada

MP4-8 **A 64-Point FFT Design Example Using A/RT-Designer** **4:45 pm**
Markus Rupp, Bell-Labs, Lucent Technologies

MP4-9 **BIG-SKY - A Tool for Mapping Numverically Intensive Computations into Reconfigurable Hardware** **5:10 pm**
Robert Mcilhenny, Zhijun Huang, and Kevin Wong, University of California-Los Angeles

Session MP5 — Application of Invariance in Signal Processing (Special)

Session Chair: Mike Clark

MP5-1 **How and Why Should Invariances be Enforced in Detection and Estimation Theory?** **1:30 pm**
Louis Scharf, University of Colorado-Boulder

MP5-2 **Exploitation of Embedded Invariance in Wireless Communication Networks** **1:55 pm**
Brian G. Agee

MP5-3 **When is a Maximal Invariant Hypothesis test Better than the GLRT?** **2:20 pm**
Alfred O. Hero, University of Michigan

MP5-4 **Rock Music: A Reduced Order Correlation Kernel Extension of the Music Algorithm** **2:45 pm**
J. Witzgall and J. Scott Goldstein, Science Applications INTERNATIONAL Corp., Michael Zoltowski, Purdue University, S. Huang, Science Applications INTERNATIONAL Corp., Irving S. Reed, University of Southern California

BREAK **3:10 pm**

MP5-5 **Coordinate-Free Interpretations of Invariant Statistics** **3:30 pm**
Keith W. Forsythe, MIT Lincoln Laboratory

MP5-6 **Altitude Estimation from Multiple Revisits Using Invariant Statistics** **3:55 pm**
Shawn Kraut, Richard H. Anderson, and Jeffrey Krolik, Duke University

Session MP6a — Special Arithmetic Techniques - II

Session Chair: Neil Burgess

MP6a-1A New Pipelined Implementation of the Fast Fourier Transform **1:30 pm**
Sungwook Yu and Earl E. Swartzlander, JR., University of Texas-Austin

MP6a-2 Development and Fixed-Point Implementation of a Multiband Dynamic Range Compression (MDRC) Algorithm **1:55 pm**
Neeraj Magotra, Sanmati Savadatti, Frank Livingston, and Maria HO, Texas Instruments Inc.

MP6a-3 A Constrained Asymmetry LMS Algorithm for PRML Disk Drive Read Channels **2:20 pm**
Robert B. Staszewski and Khurram Muhammad, Texas Instruments, Poras T. Balsara, University of Texas at Dallas

MP6a-4 Computing Haar Transform Using Algebraic Integers **2:45 pm**
Ramin Baghaie Andvassil S. Dimitrov, Helsinki University of Technology

BREAK **3:10 pm**

Session MP6b — Subband and Wavelet Filters

Session Chair: Fred Harris, California State University, San Diego

MP6b-1 New Optimization Algorithms for Multirate and Cascaded Filters **3:30 pm**
James L. Sullivan, Honeywell Technical Solutions Inc., John W. Adams, California State University-Northridge

MP6b-2 Multirate Filtering and Estimation: The Multirate Wiener Filter **3:55 pm**
Roberto Cristi, D. A. Koupatsiaris, and Charles W. Therrien, Naval Postgraduate School

MP6b-3 An Indoor Wireless Channel Model Based on Wavelet Packets **4:20 pm**
Hongbing Zhang and H. Howard Fan, University of Cincinnati

MP6b-4 Time-Varying Interference Suppression in Communication Systems Using Time-Freqency Signal Transforms **4:45 pm**
Antonia Papandreou-Suppappola and Sanjay Chetwani, Arizona State University

MP6b-5 Time-Frequency Analysis of Auditory Evoked Potential Using STFT-Based Adaptive Filters **5:10 pm**
Yuying Song and Claude S. Lindquist, University of Miami

Session MP7 — PDE's and Diffusion for Signal Processing (Special)

Session Chair: Anthony Yezzi

MP7-1 A PDE Approach to Image Smoothing and Magnification using the Mumford-Shah Functional **1:30 pm**
Andy Tsai, MIT, Anthony Yezzi, Jr., Georgia Institute of Technology, Alan Willsky, MIT

MP7-2 Nonlinear Diffusion: A Probabilistic View **1:55 pm**
Hamid Krim and Y. Bao, North Carolina State University

MP7-3 On the Relationship Between Parametric and Geometric Active Contours **2:20 pm**
Chenyang Xu, Johns Hopkins University, Anthony Yezzi, Jr., Georgia Institute of Technology, Jerry L. Prince, Johns Hopkins University

MP7-4 An Efficient Variational Multiphase Motion for the Mumford-Shah Segmentation Model **2:45 pm**
Tony F. Chan and Luminita A. Vese, University of California-Los Angeles

BREAK **3:10 pm**

MP7-5 Level Set Based Algorithms for Image Restoration, Surface Interpolation and Solving PDES on General Manifolds with Applications to Image Processing and Computer Graphics **3:30 pm**
Stanley Osher, University of California-Los Angeles

MP7-6 Advances in PDE-Based Image Segmentation **3:55 pm**
James Sethian, University of California-Berkeley

MP7-7 Vision, Tangents, and Neural Computation **4:20 pm**
Steven W. Zucker, Yale University

MP7-8 Image Segmentation by Curve Evolution with Clustering **4:45 pm**
Nilanjan Ray and Scott T. Acton, The University of Virginia

Session MP8a — Space Time Processing

(Poster Session)

1:30 - 3:00

Session Chair: Garret Okamoto

MP8a-1 An Improved Algorithm for Dynamic Slot Assignment for the SWL System
Garret Okamoto, Chih-Wei Chen, Amy Slaugtherbeck, and John O'Boyle, Santa Clara University

MP8a-2 Variable Rate Transmission for Vector Multiple Access Channels
Peroor K. Sebastian, Hemanth Sampath, and Arogysawami Paulraj, Stanford University

MP8a-3 Capacity Study of a LEO Satellite Communication Link with Multiple Antennas User Terminal
Nikolai Lebedev and Jean-Francois Diouris, Ecole Polytechnique de L'universite de Nantes

MP8a-4 An Iterative Receiver Algorithm for Space-Time Encoded Signals
Anders Ranheim, Chalmers University of Technology, Andre P. des Rosiers, Paul H. Siegel, and Bhaskar D. Rao, University of California-San Diego

MP8a-5 Spatio-Temporal Array Processing for Down-link Transmission in DS-CDMA Systems
Giuseppe Montalbano, Irfan Ghauri, and Dirk T.M. Slock, Eurecom Institute

MP8a-6 Space-Time Blind MOE Detection for DS-CDMA Wireless Systems
Zhi Tian, Kristine L. Bell, and Harry L. Van Trees, George Mason University

MP8a-7 A Blind and Robust Space-Time Receiver for a Turbo Coded System
Patrik Bohlin and Magnus Lundberg, Chalmers University of Technology

MP8a-8 A Virtual MIMO Framework for Multipath Fading Channels
Ashwin Ganesan and Akbar M. Sayeed, University of Wisconsin-Madison

MP8a-9 A Novel Technique for Simulating Space-Time Array Data
Gary F. Hatke, Massachusetts Institute of Technology

Continued on next page...

MP8a-10 A Space-Time Receiver for Asynchronous Multiuser System Basedon Kalman Filter
Kun Wang and Hongya GE, New Jersey Institute of Technology

MP8a-11 Turbo Space-Time Equalization of TCM with Receiver Diversity II: Optimum Symbol-by-Symbol Detection
Mutlu Koca and Bernard C. Levy, University of California-Davis

MP8a-12 Turbo Space-Time Equalization of TCM with Receiver Diversity I: Maximum Likelihood Detection
Mutlu Koca, Bernard C. Levy, University of California-Davis

MP8a-13 Iterative Decoding of Space-Time Trellis Codes and Related Implementation Issues
Zhipei Chi, University of Minnesota, Zhongfeng Wang, University of Minneapolis, Keshab K. PARHI, University of Minnesota

MP8a-14 Near-Optimal Selection of Transmit Antennas for a MIMO Channel Based on Shannon Capacity
Sumeet Sandhu, Rohit U. Nabar, and Dhananjay Gore, Stanford University, Arogyaswami J. Paulraj, Stanford Univ./Gigabit Wireless Inc.

MP8a-15 Time-Reversal Space-Time Block Coding and Transmit Delay Diversity - Separate and Combined
Erik Lindskog and Dino Flore, Arraycomm, Inc.

MP8a-16 Wireless Communication with BICM and GSC over Rayleigh Fading Channels
Aik Chindapol and James A. Ritcey, University of Washington

Session MP8b — Advanced Techniques for Direction Finding and Position Location Systems

(Poster Session)
3:30 - 5:00

Session Chair: Mark Kahn

MP8b-1 Direction-Of-Arrival Estimation Using Separated Sub-Arrays
Fredrik Athley, Chalmers University of Technology, Christer Engdahl, Ericsson Microwave Systems AB, Svante Bjorklund, Defence Research Establishment

MP8b-2 Mobil Position Location with the Constrained Bootstrap Filter in a Cellular Communication System
Haekyung Jwa and Joohwan Chun,
Korea Advanced Institute of Science & Technology

MP8b-3 Multimode Based Direction Finding
Thomas Svantesson, Chalmers University of Technology

MP8b-4 On Pulse Shape Filter Estimation in a Multipath Context
Lisa Perros-Meilhac and Eric Moulines, Enst/Tsi, Pascal Chevalier, Thomson-Csf Communications

MP8b-5 Separable Dimension Subspace Method for Joint Signal Frequencies, DOAs and Sensor Mutual Coupling Estimation
Jian Mao, Inrs-Telecommunications, Benoit Champagne, McGill University, Mairtin O'Droma, University of Limerick

MP8b-6 Feedforward DOA Estimation in CDMA with Uniform Linear Antenna Array Receivers
Davide Bosetto and Gabriella Olmo, Politecnico di Torino

MP8b-7 A Modified Expectation Maximum (EM) Algorithm for Maximum Likelihood Direction-of-Arrival (DOA) Estimation
Yifeng Zhou and Jim P.Y. Lee, Defence Research Establishment Ottawa

MP8b-8 Using DSP Technology to Simplify Deep Space Ranging
Scott Bryant, Jet Propulsion Laboratory

MP8b-9 Adaptive Acquisition of DOA in Space Time Cochannel TDMA
Chia-Chang Hu and Xiaoli Yu, University of Southern California

Continued on next page...

MP8b-10 Performance Characterization of External Array Self-Calibration Algrorithms Using Experimental Data
Gary H. Whipple, Department of Defense, Catherine M. Keller, MIT Lincoln Laboratory, Keith W. Forsythe, MIT Lincoln Laboratory

MP8b-11 Integrated Preprocessing for Direction of Arrival Estimation with Unknown Gain, Phase and Location Errors
Youming LI and Y.H. Sng, Nanyang Technological University

MP8b-12 Time Difference of Arrival Estimation of Denoised Unequal SNR Communication Signals
Spiros Mantis and Ralph Hippenstiel, Naval Postgraduate School

Sesson TA1 — Space-Time Adaptive Processing and Sonar

Session Chair: John Tague

TA1-1 **Computation Reduction in Space Time Adaptive Processing (STAP) of Radar Signals Using Orthogonal Wavelet Decompositions** **8:30 am**
Shubha Kadambe and Y. Owechko, Hrl Laboratories

TA1-2 **Performance Characterization of STAP Algorithms with Mismatched Steering and Clutter Statistics** **8:55 am**
Keith F. Mcdonald, The Mitre Corporation, R. S. Blum, Lehigh University

TA1-3 **A Kronecker Product Improvement to PCI for Sapce Time Adaptive Processing** **9:20 am**
Aik Chindapol, University of Washington

TA1-4 **What is Optimal Processing for Nonstationary Data?** **9:45 am**
David Ricks, Paula Cifuentes, and J. Scott Goldstein,
Science Applications INTERNATIONAL Corp.

BREAK **10:10 am**

TA1-5 **Stochastic Matched Field Array Processing forDetection and Nulling in Uncertain Ocean Environments** **10:30 am**
Arthur B. Baggeroer and Peter M. Daly, Massachusetts Institute of Technology

TA1-6 **Performance of Sample-Covariance-Based Adaptive Sonar Detectors** **10:55 am**
Nigel Lee and Nicholas Pulsone, MIT Lincoln Laboratory

TA1-7 **New Comb Waveforms for Sonar** **11:20 am**
James Alsup, Spawar Systems Center

TA1-8 **Experimental Testing of Passive Phase Conjugation for Underwater Acoustic Communication** **11:45 am**
Darrell R. Jackson, Warren L.J. Fox, Christopher D. Jones, and Daniel Rouseff, University of Washington, David R. Dowling, University of Michigan

Session TA2 — Space-Time Coding

Session Chair: Naofal Al-Dhahir

TA2-1 **Performance Analysis of Space-Frequency Coded OFDM** **8:30 am**
Helmut Bolcskei, Stanford University, Arogyaswami J. Paulraj,
Stanford Univ./Gigabit Wireless Inc.

TA2-2 **Capacity Scaling in Dual Antenna Array Wireless Systems** **8:55 am**
D. Tse and Joseph M. Kahn, University of California-Berkeley

TA2-3 **Space-Time Group Codes** **9:20 am**
Brian Hughes, North Carolina State University

TA2-4 **Finite-Length Channel-Shortening Space-Time Equalizers for MIMO Linear Frequency-Selective Channels** **9:45 am**
Naofal Al-Dhahir, AT&T Labs

BREAK **10:10 am**

TA2-5 **Concatenated Space-Time Coding** **10:30 am**
Andres Reial and Stephen G. Wilson, University of Virginia

TA2-6 **Some Unitary Space-Time Codes for Differential Space-Time Modulation** **10:55 am**
Xuebin Liang and Xiang-Gen Xia, University of Delaware

TA2-7 **Frequency Domain Space Time Coding for MIMO FIR Channels** **11:20 am**
Jonathan H. Manton and Yingbo Hua, The University of Melbourne

TA2-8 **Differential Space-Code Modulation for Interference Suppression** **11:45 am**
Jian Li, University of Florida, Hongbin Li, Stevens Institute of Technology

Session TA3 — Smart Antennas for MIMO Links

Session Chair: David Gesbert

TA3-1 **Spatial Characterization of Indoor MIMO Channel Measurements at 5 GHz** **8:30 am**
Rickard Stridh, Peter Karlsson, and Bjorn Ottersten, Royal Institute of Technology

TA3-2 **MIMO Radio Channel Measurements** **8:55 am**
Carol C. Martin, Jack H. Winters, and Nelson R. Sollenberger, AT&T Labs

TA3-3 **Optimal Training in Space-Time Systems** **9:20 am**
Babak Hassibi and Bertrand Hochwald, Lucent Bell Labs

TA3-4 **Performance Models for MIMO Wireless Channels in the Prepsence of Multipath** **9:45 am**
D. Gesbert, Gigabit Wireless, Inc., Helmut Bolcskei, Stanford University, Arogyaswami J. Paulraj, Stanford Univ./Gigabit Wireless Inc.

BREAK **10:10 am**

TA3-5 **A QoS Based Precoder and Equalizer Design for MIMO Systems Using the Weighted MMSE Criterion** **10:30 am**
Hemanth Sampath, Stanford University, Petre Stoica, Uppsala University, Arogyaswami J. Paulraj, Stanford Univ./Gigabit Wireless Inc.

TA3-6 **New Processing Techniques for Wideband BLAST Systems** **10:55 am**
Constantinos Papadias, Lucent Bell Labs

TA3-7 **MIMO Environmental Capacity Sensitivity** **11:20 am**
Daniel W. Bliss, Massachusetts Institute OF Technology, Keith W. Forsythe, MIT Lincoln Laboratory, Alfred O. Hero, University of Michigan, A. Lee Swindlehurst, Brigham Young University

TA3-8 **A Simple Multiplexing Scheme for MIMO Wireless Channels Using Multiple Spreading Codes** **11:45 am**
Sriram Mudulodu, Stanford University, Arogyaswami J. Paulraj, Stanford Univ./Gigabit Wireless Inc.

Session TA4 — Adaptive Filtering Applications and Methods for CDMA

Session Chair: Victor DeBrunner, The University of Oklahoma

TA4-1 **A Ramanujan Spherical Code** **8:30 am**
Mohammed Allali and Victor E. Debrunner, The University of Oklahoma

TA4-2 **Comparative Performance Evaluation of Three Symbol-Level MMSE Equalizers for CDMA Forward Link in Frequency Selective Multipath** **8:55 am**
Michael Zoltowski and William Hillery, Purdue University

TA4-3 **Adaptive Linear-Quadratic Receivers and Coded Modulation for Uncertain Code-Division-Multiple-Access Fading Channels** **9:20 am**
Richard Barton and Jian-Jun Ni, Iowa State University

TA4-4 **Constrained Adaptive Algorithms for Code Acquisition and Interference Cancellation in Asynchronous DS-CDMA Systems** **9:45 am**
Milos I. Doroslovacki, George Washington University

BREAK **10:10 am**

TA4-5 **A New Scheme for MC-CDMA Systems in the Presence of Imperfections** **10:30 am**
Tamer A. Kadous, University of Wisconsin-Madison, Akbar M. Sayeed, University of Wisconsin-Madison

TA4-6 **Data-Record-Based Criteria for the Selection of an Auxiliary-Vector Estimator of the MVDR Filter** **10:55 am**
Haoli Qian and Stella N. Batalama, State University of New York at Buffalo

TA4-7 **An Adaptive MMSE Rake Receiver** **11:20 am**
Garrey W. Rice, Daniel Garcia-Alis, and Robert W. Stewart, University of Strathclyde, Stephan Weiss, Universityof Southampton

TA4-8 **Subspace Based Blind Detector for Multi-Carrier CDMA over Dispersive Channels** **11:45 am**
Chengyang Li and Sumit Roy, University of Washington

Session TA5 — Signal Structure, Classification and Detection

Session Chair: Michael Ready

TA5-1 **Characterization of Multipath Distortion of CPFSK Signals** **8:30 am**
Shawn P. Neugebauer, University of California-Davis, Gary E. Ford, Transcendent Technologies, S.D. Hayward, Dera Malvern

TA5-2 **Separable Nonlinear Least-Squares Methods for Efficient Adaptation of Kautz Filters in Identifying Dynamic Systems** **8:55 am**
Lester S.H. Ngia, Chalmers University of Technology

TA5-3 **Nonlinear System Modeling Using Independent Component Analysis and Neuro-Fuzzy Method** **9:20 am**
Sung-Soo Kim, Woosuk University, Keun-Chang Kwak, Jeong-Woong Ryu, Junjin Oh, and Jhoonshik Hong, Chungbuk National University

TA5-4 **Time Delay Estimation Using a Signal Sub-space Model** **9:45 am**
Charles W. Therrien, S. D. Kouteas, and Kevin S. Smith, Naval Postgraduate School

BREAK **10:10 am**

TA5-5 **Suboptimal Robust Estimation for Signal Plus Noise Models** **10:30 am**
Matthew Green, Anisse Taleb, and Ramon Brcich, Curtin University of Technology

TA5-6 **Unsupervised Detection and Parameter Estimation of Multi-component Sinusoidal Signals in Noise** **10:55 am**
G. Tong Zhou and Muhammad Z. Ikram, Georgia Institute of Technology

TA5-7 **Statistics of Blind Spatial Signature Estimators** **11:20 am**
Thomas E. Biedka, Jeffrey H. Reed, and William H. Tranter, Virginia Polytechnic Institute

TA5-8 **Blind Multipath Parameters Estimation with an Unknown Pulse Shape Filter** **11:45 am**
Lisa Perros-Meilhac and Eric Moulines, Enst/Tsi, Pascal Chevalier, Thomson-CSF Communications

Session TA6 — Computer Arithmetic, Part I

Session Chair: Michael Schulte

TA6-1 **Intervals: The Connection Between Computing and the World** **8:30 am**
Bill Walster, Sun Microsystems

TA6-2 **Towards Tight Rounding Error Bounds on Rational Expression Evaluations** **8:55 am**
Ping Tak Peter Tang, Intel Corp

TA6-3 **On Efficient Techniques for Difficult Operations in One and Two Digit DBNS Index Calculus** **9:20 am**
R. Muscedere, G.A. Jullien, V.S. Dimitrov, and W.C. Miller, University of Windsor

TA6-4 **Correctly Rounded Functions for Better Arithmetic** **9:45 am**
Jean-Michel Muller, CNRS-Laboratoire LLP

BREAK **10:10 am**

TA6-5 **Reducing Power Dissipation in Complex Digital Filters by Using the Quadratic Residue Number System** **10:30 am**
Gian Carlo Cardarilli, Alberto Nannarelli, and Marco RE, University of Rome "Tor Vergata"

TA6-6 **Design and Performance of Residue Number System Based Multicarrier CDMA in Frequency-Selective Rayleigh Fading Channels** **10:550 am**
A.S. Madhukumar and Francois Chin, Centre for Wireless Communications

TA6-7 **On Producing Exactly Rounded Results in Digit-Serial On-Line Arithmetic** **11:20 am**
Behrooz Parhami, University of California-Santa Barbara

TA6-8 **Designs of Counters with Near Minimal Counting/Sampling Periods and Hardware Complexity** **11:45 am**
Chi-Hsiang Yeh, Queen's University, Behrooz Parhami, University of California-Santa Barbara

Sesson TA7 — Image Segmentation and Texture Processing

Session Chair: Joseph Havlicek

TA7-1 **Image Interpolation While Retaining Textural Information** **8:30 am**
Linda S. Debrunner, Victor E. Debrunner, and Minghua Yao, The University of Oklahoma

TA7-2 **MRI Brain Image Segmentation Using an AM-FM Model** **8:55 am**
Marios S. Pattichis, Helen Petropoulos, and William M. Brooks, University of New Mexico

TA7-3 **Unsupervised Texture Segmentation Using Dominant Image Modulations** **9:20 am**
T. Tangsukson, T.B. Yap, N.D. Mamuya, and Joseph P. Havlicek, University of Oklahoma

TA7-4 **Texture Segmentation Using Level Set Analysis** **9:45 am**
B. Raghunathan and Scott T. Acton, The University of Virginia

BREAK **10:10 am**

TA7-5 **Maximum Likelihood Texture Analysis and Classification Using Wavelet-Domain Hidden Markov Models** **10:30 am**
Guoliang Fan and Xiang-Gen Xia, University of Delaware

TA7-6 **A Modified Gray Level Morphological Gradient with Accurate Orientation Estimates and Reduced Noise Sensitivity** **10:55 am**
Sally L. Wood and Gongyuan Qu, Santa Clara University

TA7-7 **Performance of a Modified Gray Level Morphological Gradient with Low Sensitivity to Threshold Values and Noise** **11:20 am**
Gongyuan Qu and Sally L. Wood, Santa Clara University

TA7-8 **Edge Enhancement Techniques for Reconstructing Continuous-Tone Images from Error-Diffused Halftones** **11:45 am**
Xin Li, Princeton University, Litao Gang, New Jersey Institute of Technology

Session TA8a — Blind Source and Signal Separation

(Poster Session)
8:30 - 10:00

Session Chair: Ben Friedlander, University of California-Santa Cruz

TA8a-1 **Coordinated Training and Transmission for Improved Interference Cancellation in a Cellular Network**
Robert W. Heath, Jr and Sebastian K. Peroor, Stanford University, Jose Tellado, Gigabit Wireless Inc., Arogyaswami J. Paulraj, Stanford Univ./Gigabit Wireless Inc.

TA8a-2 **Joint Data Detection and Channel Estimation for Interference Cancellation in Multi-Channel Systems**
Cristoff Martin and Bjorn Ottersten, Royal Institute of Technology

TA8a-3 **Channel Equalization for DMT with Insufficient Cyclic Prefix**
Jie Zhu and Wee Ser, Nanyang Technological University, Arye Nehorai, University of Illinois at Chicago

TA8a-4 **An Adaptive-Receiver for DS/CDMA Signals**
Richard E. Cagley, Kuei-Chiang Lai, and John J. Shynk, University of Californi-Santa Barbara

TA8a-5 **Channel Estimation for Multirate DS-CDMA Systems**
Urbashi Mitra, The Ohio State University, Ashutosh Sabharwal, Rice University

TA8a-6 **Reduced-Rank Adaptive MMSE Equalization for High-Speed CDMA Forward Link with Sparse Multipath Channels**
Michael Zoltowski and Samina Chowdhury, Purdue University, J. Scott Goldstein, Science Applications INTERNATIONAL Corp.

TA8a-7 **Channel Estimation Errors Versus Doppler Diversity in Fast Fading Channels**
Marc-Antoine R. Baissas, Texas Instruments, Akbar M. Sayeed, University of Wisconsin-Madison

TA8a-8 **Finite-Alphabet Based Channel Estimation for Space-Time Block Coded Systems**
B. Muquet, Motorola, S. Zhou and G.B. Giannakis, University of Minnesota

Continued on next page...

TA8a-9 Source Separation by Using a Electromagnetic Vector Sensor
J. Zhang, National University of Singapore, Peggy Shen, Santa Clara University, Arye Nehorai, University of Illinois at Chicago

TA8a-10 PTV-CMA Blind Equalization and Interference Suppression
Giacinto Gelli and Francesco Verde, Universita Degli Studi Federico II Di Napoli

TA8a-11 A RBF Equalizer Using Fast Clustering Algorithm
Jung-Su Kim, Bong-Sik Shin, and Jong-Hwa Chong, Hanyang University

TA8a-12 Performance of Antenna Array Receivers in General Flat Fading Channels
Ming Yan and Bhaskar D. Rao, University of California-San Diego

TA8a-13 Subspace Projection Array Processing Suppression of FM Jammer in GPS Receivers
Liang Zhao and Moeness G. Amin, Villanova University, Alan Lindsey, Air Force Research Laboratory / Ifgc, Yimin Zhang, Villanova University

TA8a-14 Time-Recursive Maximum Likelihood Based Sequence Estimation for Unknown ISI Channels
Hai Chen, Kevin Buckley, and Richard Perry, Villanova University

TA8a-15 A Fast Constant Modulus Algorithm for Blind Equalization
Nelatury Sudarshan, RAO and Sathyanarayan S. Rao, Villanova University

TA8a-16 Application of Evolution Programming for Blind Equalization
Nelatury Sudarshan RAO and Sathyanarayan S. RAO, Villanova University

Session TA8b — Image Coding and Transmission
(Poster Session)
10:30 - 12:00

Session Chair: Mita Desai

TA8b-1 Performance Analysis and Optimization of Progressive Image Transmission in Memory Channels (9)
Minyi Zhao and Ali N. Akansu, New Jersey Institute of Technology

TA8b-2 Optimal Refinement/Significance Map Tradeoffs in SPIHT-Based Image Compression
Charles d. Creusere, New Mexico State University

TA8b-3 Low-Memory, Fixed-Latency Huffman Encoder for Unbounded-Codelength Codes
Robert A. Freking and Keshab K. Parhi, University of Minnesota

TA8b-4 Error-Resilient Transmission of Compressed Images Over Very Noisy Channels Using Soft-Input Source Decoding
Jorg Kliewer and Norbert Gortz, University of Kiel

TA8b-5 A Fast, Accurate and Forward Rate Prediction and Control Algorithm for Wavelet Image Coders
Zhihai HE, Tian-Hu Yu, and Sanjit Mitra, University of California-Santa Barbara

TA8b-6 Adaptive Image Pyramid Based Compression Algorithm
Simant Dube and Li Hong, ST Microelectronics, Inc.

TA8b-7 A Novel Low Complexity and Efficient Progressive Quadtree Wavelet Encoder
Marco Grangetto, Enrico Magli, and Gabriella Olmo, Politecnico di Torino

TA8b-8 Prediction of the Quality of JPEG-Compressed Color Images Based on the SCIELAB Metric
GAMAL F. Fahmy and Lina J. Karam, Arizona State University

TA8b-9 System Modeling and Software-Based Implementation of MPEG-4 Video
Chen He and Shi Zhong, University of Texas-Austin

Continued on next page...

TA8b-10 A Sampling Approach to Region-Selective Image Compresion
Shahrnaz Azizi and Douglas Cochran, Arizona State University

TA8b-11 Wavelet Image Coding Using Trellis Coded Quantization and Blockwise Binary Classification
Zhihai He, Tian-Hu Yu, and Sanjit Mitra, University of California-Santa Barbara

TA8b-12 Novel Coding Scheme for Wavelet Image Compression
Tian-Hu Yu, Zhihai He, and Sanjit Mitra, University of California-Santa Barbara

TA8b-13 Nonlinear Vector Multiresolutional Analysis
Maya Gupta, Stanford University, Anna Gilbert, AT&T Shannon Laboratory

TA8b-14 Design of Denoising Filter for Ultrasound Images Based on Wavelet Method
Su Cheol Kang, Incom I&C, Seung Hong Hong, Inha University

TA8b-15 Selection of the Best Wavelet Basis for a Time-Varying Volterra Model
Matthew Green and Abdelhak M. Zoubir, Curtin University of Technology

TA8b-16 Channel-Optimized Trellis-Coded Quantizatino for Channels with Memory
David Giguet, Arizona State University, Glen P. Abousleman, Motorola SSG, Lina J. Karam, Arizona State University

Session TP1 — Radar Processing

Session Chair: John A. Tague

TP1-1 Resource Allocation in Surveillance Radar **1:30 pm**
Johannes Wintenby, Chalmers University of Technology

TP1-2 Target Tracking Using Arbitrarily Located Detectors and a Continuous-State Viterbi Algorithm **1:55 pm**
Cary Champlin, Consultant, Darryl Morrell, Arizona State University

TP1-3 Matched and Adaptive Subspace Detectors when Interference Dominates **2:20 pm**
Louis Scharf, University of Colorado-Boulder

TP1-4 Probability of Error Metrics for Best Basis Selection **2:45 pm**
Todd McWhorter and Michael Clark, Mission Research Corporation

BREAK **3:10 pm**

TP1-5 Statistical Analysis of the Nonhomogeneity Detector **3:30 pm**
Muralidhar Rangaswamy, Arcon Corporation, B. Himed, US Air Force Rsrch Lab/Snrt, J.H. Michels, US Air Force Rsrch Lab/Snrt

TP1-6 Adaptive Spectral Conditioning for Improved Radar Detection **3:55 pm**
Robert J. Bonneau, Air Force Research Lab

TP1-7 Adaptive Clutter Cancellation in Bistatic Radar **4:20 pm**
William L. Melvin, Georgia Tech Research Institute, Michael J. Callahan, USAF Research Laboratory, Michael C. Wicks, USAF Research Laboratory

TP1-8 24GHz Side Looking Radar for Vehicle Application **4:45 pm**
KENJI Inomata, Shinsaku Noda, Katsuji Okazaki, Masahiro Watanabe, Takamasa Fukae, and Katsuji Matsuoka, Mitsubishi Electric Corp.

TP1-9 Analysis of Array Antenna Measurements with a Rough Surface Reflector **5:10 pm**
Svante Bjorklund, Per Grahn, and Anders Nelander, Defence Research Establishment (FOA)

Session TP2 — Signal Separation Techniques for Multiuser Communications

Session Chair: Upamanyu Madhow

TP2-1 **Reduced-Rank Interference Suppression with Time- and Frequency-Selective Fading** **1:30 pm**
W. Xiao and Michael Honig, Northwestern University

TP2-2 **Turbo Multiuser Detection for M-ary Orthogonal Modulation via Gibbs Sampling** **1:55 pm**
Xiaodong Wang, Texas A&M University

TP2-3 **Optimum Noncoherent Multiuser Detection for Multi-Antenna Diversity Communications Over Rayleigh Fading Channels** **2:20 pm**
Mahesh K. Varanasi, University of Colorado-Boulder

TP2-4 **A Subspace Approach for Blind Multiuser Detection Based on Second-order Nonstationarity** **2:45 pm**
Ruifeng Zhang and Michail Tsatsanis, Stevens Institute of Technology

BREAK **3:10 pm**

TP2-5 **Constrained MMSE Detection for Noncoherent Nonlinear Multiuser Communications** **3:30 pm**
Rajnish Sinha, Aylin Yener, and Roy D. Yates, Rutgers University

TP2-6 **A Family of Linear-Complexity Likelihood-Ascent-Search Detectors for CDMA Multiuser Detection** **3:55 pm**
Yi Sun, The City College of City University of New York

TP2-7 **On Robust Multiuser Detection** **4:20 pm**
Haris Vikalo and Thomas Kailath, Stanford University

TP2-8 **Iterative Coded Multiuser Detection with a Verdu Soft Demodulator** **4:45 pm**
A. Robert Golshan and Keith M. Chugg, University of Southern California

Session TP3 — Higher-Order Statistics and Signal Classification

Session Chair: Chad Spooner, Mission Research Corporation

TP3-1 **Automatic Radio-Frequency Environment Analysis** **1:30 pm**
Chad M. Spooner, William A. Brown, and Grace K. Yeung, Mission Research Corporation

TP3-2 **Blind Source Separation and Signal Classification** **1:55 pm**
Ananthram Swami, Army Research Lab

TP3-3 **The Blind Deconvolution of the Multi-Channel Based on the Higher Order Statistics** **2:20 pm**
Janghoon Yang and Chrysostomos L. Nikias, University of Southern California

TP3-4 **Normalized, HOS-Based, Blind Speech Separation Algorithms** **2:45 pm**
Phillip De Leon, New Mexico State University, Chengyang Li, University of Washington

BREAK **3:10 pm**

TP3-5 **Blind Deconvolution Algorithms for MIMO-FIR Channels Driven by White but Fourth-Order Colored Signals** **3:30 pm**
Mitsuru Kawamoto and Yujiro Inouye, Shimane University, Ruey-Wen Liu, University of Notre Dame

TP3-6 **A Combination of Statistical and Structural Approachesin Blind Equalization Algorithms** **3:55 pm**
Monica Corlay, Pierre Duhamel, and Maurice Charbit, Enst/Tsi

TP3-7 **Blind Channel Identification Using Evolutionary Programming** **4:20 pm**
Charulatha Kalluri, Sathyanarayan S. RAO, and Nelatury Sudarshan RAO, Villanova University

TP3-8 **Open Set Classification Using Tolerance Intervals** **4:45 pm**
Edward C. Real and Andrew H. Baumann, Sanders, A Lockheed Martin Company

Session TP4 — Signal Processing in Wireless Networks

Session Chair: Lang Tong

TP4-1 **Diversity and Code Combining for CDMA Packet Radio Networks** **1:30 pm**
Rajat Prakash, Venugopal V. Veeravalli, and Vinayak Tripathi, University of Illinois

TP4-2 **Multicarrier Random Access Racket Radio** **1:55 pm**
Nikos Sidiropoulos and G. Dimic, University of Minnesota

TP4-3 **A Dynamic Multiaccessing Protocol for Random Access Channels with Multipacket Reception** **2:20 pm**
Q. Zhao and Lang Tong, Cornell University

TP4-4 **Networking Issues in Large Microsensor Nets** **2:45 pm**
Ananthram Swami, Army Research Lab

BREAK **3:10 pm**

TP4-5 **A New Resource Allocation Scheme for VBR Video Sources** **3:30 pm**
Krishnamurthy Nagarajan and G. Tong Zhou, Georgia Institute of Technology

TP4-6 **Supporting Integrated Services in Wireless Networks with Space-Time Block-Coded Transmissions** **3:55 pm**
A. Stamoulis and Georgios B. Giannakis, University of Minnesota

TP4-7 **A Fast Square-Root Implementation for BLAST** **4:20 pm**
Babak Hassibi, Lucent Bell Labs

TP4-8 **Mobile Adhoc Network Routing Protocol Analysis and its Application to a Programmable Modular Communications System** **4:45 pm**
Kevin M. Shea, Robert Ives, and Murali Tummala, Naval Postgraduate School

TP4-9 **The Capacity of Three Dimensional Ad Hoc Networks** **5:10 pm**
Stavros Toumpis and Andrea Goldsmith, Stanford University

Session TP5 — Signal Processing Techniques for Multiuser/Multirate Communications

Session Chair: Naofal Al-Dhahir

TP5-1 **Blind Channel Estimation for Precoded Variable Bit-Rate Multiuser Systems** **1:30 pm**
Zhengyuan Xu, University of California-Riverside

TP5-2 **CDMA Multiuser Detection Based on State Space Estimation Techniques** **1:55 pm**
Sriram Mudulodu, Haris Vikalo, and Thomas Kailath, Stanford University

TP5-3 **A SINR Maximizing RAKE Receiver for DS-CDMA Downlinks** **2:20 pm**
Massimiliano Lenardi, Abdelkader Medles, and Dirk T.M. Slock, Eurecom Institute

TP5-4 **Multistage Nonlinear Blind Interference Cancellation for DS-CDMA Systems** **2:45 pm**
Dragan Samardzija, Narayan Mandayam, and Ivan Seskar, Rutgers University

BREAK **3:10 pm**

TP5-5 **Influence of Periodic Correlation Properties of Sequences on the Sum Capacity of CDMA Systems** **3:30 pm**
Slawomir Stanczak and Holger Boche, Heinrich-Hertz-Institut

TP5-6 **Improved Constrained Optimization Method for CDMA Systems** **3:55 pm**
Zhengyuan Xu, University of California-Riverside

TP5-7 **Parallel Digital Architectures for High-Speed Adaptive DSSS Receivers** **4:20 pm**
Stephan Berner and Phillip De Leon, New Mexico State University

TP5-8 **On the Design of Optimal Orthogonal Finite Order Transmitter and Receiver Filters Over Noisy Channels** **4:45 pm**
Jamal Tuqan, IBM Thomas J. Watson Research Center

TP5-9 **Phase Predistortion for a CDMA2000 System** **5:10 pm**
Giridhar D. Mandyam, Nokia Research Center

Session TP6 — Computer Arithmetic, Part II

Session Chair: Earl Swartzlander, University of Texas at Dallas

TP6-1 **Computer Arithmetic for Processing of Media Signals** **1:30 pm**
Vojin Oklobdzija, University of California-Davis

TP6-2 **Improving the Recursive Multiplier** **1:55 pm**
John Kim, Motorola, Inc., Earl E. Swartzlander, Jr., University of Texas-Austin

TP6-3 **Parallel Square and Cube Computation** **2:20 pm**
Albert A. Liddicoat and Michael J. Flynn, Stanford University

TP6-4 **Left-to-Right Carry-Free Scheme for Computing AB+CD** **2:45 pm**
Milos D. Ercegovac, University of California-Los Angeles

BREAK **3:10 pm**

TP6-5 **The IEEE Rounding for Multiplier with Redundant Operands** **3:30 pm**
M. Ian Ferguson and Milos D. Ercegovac, University of California-Los Angeles

TP6-6 **Modular Multiplication in the Residue Number System with Application to Massively Parallel Public-Key Cryptography Systems** **3:55 pm**
William L. Freking and Keshab K. Parhi, University of Minnesota

TP6-7 **Variable-Correction Truncated Floating Point Multipliers** **4:20 pm**
Michael Schulte and Kent E. Wires, Lehigh University, James E. Stine, Ilinois Institute of Technology

TP6-8 **Optimal-Depth Circuits for Prefix Computation and Addition** **4:45 pm**
Chi-Hsiang Yeh, Queen's University, Behrooz Parhami, University of California-Santa Barbara

Session TP7 — Video Coding and Transmission

Session Chair: Aggelos Katsaggelos

TP7-1 **Optimal Scheduling for Streaming of Scalable Media** **1:30 pm**
Zhourong Miao and Antonio Ortega, University of Southern California

TP7-2 **Rate-Distortion Optimizations for Region and Object-based Video Coding** **1:55 pm**
Yan Yang, Aware Inc., Sheila S. Hemami, Cornell University

TP7-3 **Pre- and Post-Processing Algorithms for Compressed Video Enhancement** **2:20 pm**
C. Andrew Segall and Aggelos K. Katsaggelos, Northwestern University

TP7-4 **Optimal Estimation for Error Concealment in Scalable Video Coding** **2:45 pm**
Rui Zhang, Shankar L. Regunathan, and Kenneth Rose, University of California-Santa Barbara

BREAK **3:10 pm**

TP7-5 **Projection-Based Block Matching Motion Estimation** **3:30 pm**
Chengjie Tu, Trac D. Tran, and Jerry L. Prince, the Johns Hopkins University, Pankaj Topiwala, Fastvdo Llc

TP7-6 **Frame Interpolation for Video Frame Rate Up Conversion** **3:55 pm**
Hezerul Abdul Karim, Multimedia University, Kyeong H. Yang, Bell Labs, Lucent Technologies, Rosli Besar, Multimedia University, M.U. Siddiqi, Multimedia University

TP7-7 **Robust Image Communication Using Bandwidth Reducing and Expanding Mappings** **4:20 pm**
Helge Coward and Tor A. Ramstad, Norwegian University of Science and Technology

TP7-8 **Error-Robust Video Coding with Channel-Optimized Trellis-Coded Quantization** **4:45 pm**
Zhen Liu, Arizona State University, Glen P. Abousleman, Motorola SSG, Lina J. Karam, Arizona State University

Session TP8a — Blind Source and Signal Separation

(Poster Session)
3:30 - 5:00

Session Chair: Matt Bromberg

TP8a-1 Code Gated Beamforming: A Blind Adaptive Antenna Array Algorithm for the Wideband CDMA
Yash M. Vasavada, Hughes Networks Systems, Thomas E. Biedka, Virginia Polytechnic Institute, Jeffrey H. Reed, Virginia Polytechnic Institute

TP8a-2 A New Approach to Array Denoising
Karim G. Oweiss and David J. Anderson, University of Michigan

TP8a-3 Signal Design for a Random Array with Unknown Sensor Positions
Peter S. Wyckoff and Randy K. Young, The Pennsylvania State University

TP8a-4 Data-Aided Nonlinear Filter for Narrowband Interference Rejection in DS-SS Systems: Closed-Form Analytical Results
Yeheskel Bar-Ness and Kunjie Wang, New Jersey Institute of Technology

TP8a-5 Multichannel Blind Deconvolution of Arbitrary Signals: Adaptive Algorithms and Stability Analyses
Xiaoan Sun and Scott C. Douglas, Southern Methodist University

TP8a-6 Successive Interference Cancellation Receiver with Neural Network Compensation in the CDMA Systems
Ming-Huang Yang and Jiann-Liang Chen, National Dong Hwa University, PO-Yuen Cheng, Symmetry Communications Systems

TP8a-7 Performance Enhancement of a Wavelet Based Multicarrier DS-CDMA System Through Adaptive Interference Cancellation
A.S. Madhukumar and Francois Chin, Centre for Wireless Communications, AB Premkumar, Nanyang Technological University

TP8a-8 ICA for Blind Signal Detection in CDMA Communications
Xiaohong Gong and Anthony Kuh, University of Hawaii

Continued on next page...

TP8a-9 Turbo Multiuser Detection for Coded DS-CDMA Systems: A Gibbs Sampling Approach
Vincent Buchoux, Olivier Cappe, and Eric Moulines, Enst/Tsi

TP8a-10 Semi-Blind Downlink Inter-Cell Interference Cancellation for FDD DS-CDMA Systems
Hafedh Trigui, Telecom Modus Ltd., Dirk T.M. Slock, Eurecom Institute

TP8a-11 A Joint Adaptive MMSE Down-Link Receiver
Daniel Garcia-Alis, University of Strathclyde, Stephan Weiss, University of Southampton, Robert W. Stewart, University of Strathclyde

TP8a-12 Designing Orthonormal Subspace Tracking Algorithms
Scott C. Douglas and Xiaoan Sun, Southern Methodist University

Session TP8b — Algorithms for Audio Coding and Speech Processing

(Poster Session)
3:30 - 5:00

Session Chair: Keith Teague, Oklahoma State University

TP8b-1 A C++ Research and Development Environment for Speech and Audio Processing Applications
Ali Erdem Ertan and Thomas P. Barnwell, Georgia Institute of Technology

TP8b-2 Algorithm Compatible Improvements for FS-1016 CELP
Walter Andrews, Department of Defense, Keith A. Teague, Oklahoma State University

TP8b-3 Method for Accurately Identifying and Reconstructing the Unvoiced Component in Speech
W. Bastiaan Kleijn, A. Jefremov, and M. Murthi, Royal Institute of Technology

TP8b-4 Spectral Entropy-Based Wideband Speech Coding
Mark G. Kokes and Jerry D. Gibson, Southern Methodist University

TP8b-5 Nonuniform Oversampled Filter Banks for Audio Signal Processing
Zoran Cvetkovic and James Johnston, AT&T Shannon Laboratory

TP8b-6 PDF Optimized Parametric Vector Quantization with Application to Speech Coding
Anand D. Subramaniam and Bhaskar D. Rao, University of California-San Diego

TP8b-7 Identification System of Music Notes through the use of DST-rot Adaptive Filter
Antonio C.P. Veiga, Universidade Federal de Uberlandia, Yuzo Iano, Universidade Estadual de Campinas, Luciano V. Lima, Keiji Iamanaka, and Carlos A.L. Da Silva, Universidade Federal de Uberlandia

TP8b-8 Maximum Entropy Classification Applied to Speech
Maya Gupta, Michael P. Friedlander, and Robert M. Gray, Stanford University

TP8b-9 Scaling of Audio Signals Using Frequency Domain Techniques
K.P. Padhi and S.S. Abeysekera, Nanyang Technological University, J. Absar, St Microelectronics Asia Pacific PTE. Ltd., S. George, St Microelectronics Asia Pacific PTE. Ltd.

Continued on next page...

TP8b-10 Spectral Domain MMSE Estimators for System Modeling Non-Uniform Subband Adaptive Filters
Jacob D. Griesbach, Michael Lightner, and Delores M. Etter, University of Colorado Boulder

TP8b-11 Speech Analysis for Hearing Impaired Using Chirped Wavelets
Adele B. Doser, University of Texas-Dallas

TP8b-12 Speech Recognition Using Integra-Normalizer and Neuro-Fuzzy Method
Sung-Soo Kim, Woosuk University, Dae-Jong Lee, Keun-Chang Kwak, and Jeong-Woong RYU, Chungbuk National University

TP8b-13 Speech Spectrum Modeling - Applied to Spectrum Coding and Prediction
Jonas Lindblom and Jonas Samuelsson, Chalmers University of Tehcnology

TP8b-14 An Adaptive Multi-rate Speech Codecfor Cellular Mobile Telephony
K.R. Pankaj, Voice Over IP, Joy Kuri, Indian Institute of Science

TP8b-15 Algebraic Separation Applied to Concurrent Vowel Separation and ECG Signal Separation
Balasubramaniam Santhanam, University of New Mexico

TP8b-16 Maximum Likelihood Noise HMM Estimation in Model-Based Robust Speech Recognition
Martin Graciarena, Universidad de Buenos Aires

Session WA1 — Automatic Target Recognition

Session Chair: Randolph Moses

WA1-1 **Signature Manifold Representation and Matching** **8:30 am**
Mike Bryant, Air FORCE Research Laboratory, Fred Garder, Sright State University

WA1-2 **Analytical and Experimental Performance—Complexity Tradeoffs in Automatic Target Recognition** **8:55 am**
Joseph A. O'Sullivan, Michael D. Devore, and Natalia Schmid, Washington University

WA1-3 **Expected Recognition Performance for SAR ATR Using Local Point Scatterers** **9:20 am**
Dave Doria, Raytheon

WA1-4 **Wavelet-Based Compression of High Range Resolution Radar Data for Moving Targets** **9:45 am**
Michael Clark, Chad M. Spooner, Todd McWhorter, and Sheeyun Park, Mission Research Corporation

BREAK **10:10 am**

WA1-5 **Reduced-Rank Automatic Target Detection and Recognition** **10:30 am**
Piyapong Thanyasrisung, Irving S. Reed, and Xiaoli Yu, University of Southern California

WA1-6 **Optimization of Single Transmit Pulse Shape to Maximize Detection and Identification of Ground Mobile Targets** **10:55 am**
David A. Garren, Michael K. Osborn, Anne C. Odom, and J. Scott Goldstein, Science Applications INTERNATIONAL Corp., S. Unnikrishna Pillai, Polytechnic University, Joseph R. Guerci, Defense Advanced Research Projects Agency

WA1-7 **Comparison of Selected Features for Target Discrimination in SAR Imagery** **11:20 am**
Tristrom Cooke, CSSIP, Nick Redding, DSTO, Jim Schroeder, University of South Australia, Jingxin Zhang, CSSIP

WA1-8 **Optimized Automatic-Target-Recognition Algorithm on Scalable Myrinet/Field Programmable Array Nodes** **11:45 am**
Young CHO, University of Texas-Austin

Session WA2 — Blind and Nonblind Techniques for MIMO Channel Estimation

Session Chair: Yingbo Hua

WA2-1 **Linear Space-Time Precoding for Multipath-Transparent Diversity Gains with Transmit-Antennas** **8:30 am**
Georgios B. Giannakis, Yan Xin, and Zhengdao Wang, University of Minnesota

WA2-2 **Application of Blind MIMO Identification Methods to Blind Detection of Asynchronous DS-CDMA Signals in Multipath Channels** **8:55 am**
Jitendra K. Tugnait, Auburn University

WA2-3 **Polynomial Ambiguity Resistant Precoders (PARP) for MIMO Channels: Necessity and Sufficiency for the Blind Indentifiability and PARP Characterization and Construction** **9:20 am**
Xiang-Gen Xia, University of Delaware, Weifeng Su and Hui Liu, University of Washington

WA2-4 **Combining Blind Equalization with Finite Alphabet Properties** **9:45 am**
Alle-Jan Van Der Veen and Ant'onio Trindade, Delft University of Technology

BREAK **10:10 am**

WA2-5 **FIR Multichannel Identification Using Weighted Cumulant Matrix** **10:30 am**
Jing Liang and Zhi Ding, University of Iowa

WA2-6 **Blind Identification of FIR MIMO Channels with Colored Input** **10:55 am**
Yingbo Hua and Yong Xiang, The University of Melbourne

WA2-7 **A Randomised Algorithm for Improving Source and Channel Estimates by Exploiting the Finite Alphabet Property** **11:20 am**
Jonathan H. Manton and Yingbo Hua, The University of Melbourne

WA2-8 **An Online Calibration Algorithm for the CDMA-Based Adaptive Antenna Array** **11:45 am**
Chong Hyun Lee, Soohong Kim, and Joohwan Chun, Korea Advanced Institute of Science & Technology, Jong Heun Lee, SK-Telecom

Session WA3 — Smart Airlinks

Session Chair: Andrea Goldsmith

WA3-1 **Space-Time Transmit Strategies and Channel Feedback Generation for Wireless Fading Channels** **8:30 am**
Upamanyu Madhow, University of California-Santa Barbara, Eugene Visotsky, University of Illinois

WA3-2 **Spreading in Block Fading Channels** **8:55 am**
Muriel Medard, MIT, D. Tse, University of California-Berkeley

WA3-3 **Capacity and Adaptive Modulation for Wideband Fading Channels** **9:20 am**
SEONG-Taek Chung and Andrea Goldsmith, Stanford University

WA3-4 **Downlink Transmit Beamforming with Selective Feedback** **9:45 am**
Shirish Nagaraj and Yih-Fang Huang, University of Notre Dame

BREAK **10:10 am**

WA3-5 **Performance Evaluation of a High-Speed Data Transmission System with Molulo-Type Preequalization** **10:30 am**
Daqing Gu and Jay Bao, Mitsubishi Electric ITA

WA3-6 **An Antenna Solution for MIMO Channels: The Multimode Antenna** **10:55 am**
Thomas Svantesson, Chalmers University of Technology

WA3-7 **Design of Spreading Sequences for SMPT-based CDMA Systems** **11:20 am**
Slawomir Stanczak, Heinrich-Hertz-Institut, Frank Fitzek, Technical University Berlin, Holger Boche, Heinrich-Hertz-Institut, Adam Wolisz, Technical University Berlin

WA3-8 **A Multi-User Precoding Scheme Achieving Crosstalk Cancellation with Application to DSL Systems** **11:45 am**
George Ginis and John M. Cioffi, Stanford University

Session WA4 — Digital Filters

Session Chair: Claude Lindquist

WA4-1 **Nomographs for MFMBO Filters (Maximally Flat Magnitude Beyond the Origin)** **8:30 am**
Claude S. Lindquist, University of Miami, Celestino A. Corral, Motorola, Inc.

WA4-2 **Direct Digital Frequency Synthesizer Architecture Based on Chebyshev Approximation** **8:55 am**
Kalle Palomaki and Jarkko Niittylahti, Tampere University of Technology

WA4-3 **Design of IIR Digital Filters in the Complex Domain by Transforming the Desired Response** **9:20 am**
Tatsuya Matsunaga, Masahiro Yoshida, and Masaaki Ikehara, Keio University

WA4-4 **Adaptive Phase Equalizer for Minimum Phase SAW Filters** **9:45 am**
V. Hedge, S. Pai, and W. Kenneth Jenkins, Penn State University, T. Wilborn, Qualcom, Inc.

BREAK **10:10 am**

WA4-5 **Canonic Signed Digit FIR Filter Design** **10:30 am**
Yassin M. Hasan and Lina J. Karam, Arizona State University, Matt Falkinburg, Art Helwig, and Matt Ronning, Motorola Ground Systems Div.

WA4-6 **Probabilistic Design of Long Round-off Error Free Fixed-Point Polynomial FIR Predictors and Predictive FIR Differentiators** **10:55 am**
Vassil S. Dimitrov and Jarno M.S. Tanskanen, Helsinki University of Technology

WA4-7 **The Design of Peak Constrained Least SquaresFIR Filters with Finite Precision Coefficients** **11:20 am**
Trevor W. Fox and Laurence E. Turner, University of Calgary

Session WA5 — DSP Programming and Implementation Techniques

Session Chair: Stephen Wilson

WA5-1 **VLIW vs. Superscalar Implementation of a Baseline H.263 Video Encoder** **8:30 am**
Serene Banerjee, Hamid R. Sheikh, Lizy K. John, Brian L. Evans, and Alan C. Bovik, The University of Texas at Austin

WA5-2 **Optimization of Vertical and Horizontal Beamforming Kernels on the PowerPC G4 Processor with AltiVec Technology** **8:55 am**
Young Cho, University of Texas-Austin

WA5-3 **A Programmable Data-Path for MPEG-4 and Natural Hybrid Video Coding** **9:20 am**
Aamir Farooqui, Synopsys Inc., Vojin Oklobdzija, University of California-Davis

WA5-4 **High Data Rtes Digital Communication System Design Compliers for VLIW DSPs** **9:45 am**
Shoab Khan, National University of Sciences & Technologies, Maliq M. SAQIB, Aaman Sultana, and Sherjil Ahmed, Communications Enabling Technologies

BREAK **10:10 am**

WA5-5 **Impact of Architecture Extensions for Media Signal Processing on Data-Path Organization** **10:30 am**
Aamir Farooqui, Synopsys Inc., Vojin Oklobdzija, University of California-Davis

WA5-6 **Optimal Time-Shared Design of Digital Signal Processing Architectures** **10:55 am**
M. Sohail Sadiq, National University of Sciences & Technologies, Sheikh M. Farhan and Sherjil Ahmed, Communications Enabling Technologies

WA5-7 **An Evaluation of Compiler-Processor Interaction for DSP Applications** **11:20 am**
Allan Frederikson and Rasmus Christiansen, Aalborg University, Jeff Bier, Berkeley Design Technology, Inc. Peter Koch, Aalborg University

WA5-8 **BURAQ: A DSP Development Framework** **11:45 am**
Muddassar Farooq, and Shoab Khan, National University of Sciences & Technologies, Maliha Riaz, Wamiq Ali, and Sherjil Ahmed, Communications Enabling Technologies

Session WA6 — Design for Low Power

Session Chair: David Martinez

WA6-1 **High-Performance Low-Power Polyphase Channelizer Chip-Set** **8:30 am**
William S. Song, Michael M. Vai, Huy T. Nguyen, and Albert H. Horst, MIT

WA6-2 **Power Aware Systems** **8:55 am**
Manish Bhardwaj and Anantha Chandrakasan, MIT

WA6-3 **Adaptive Error-Cancellation for Low-Power Digital Filtering** **9:20 am**
Lei Wang, and Naresh Shanbhag, University of Illinois at Urbana-Champaign

WA6-4 **A New Low-Power Binary Adder** **9:45 am**
Yuke Wang, the University of Texas-Dallas, Keshab K. Parhi, University of Minnesota

BREAK **10:10 am**

WA6-5 **Effect of Wire Delay on the Design of Prefix Adders in Deep-Submicron Technology** **10:30 am**
Zhijun Huang and Milos D. Ercegovac, University of California-Los Angeles

WA6-6 **Optimal Digital Design of Signal Processing Subsystems Using Hybrid Architectures** **10:55 am**
Shoab Khan, National University of Sciences & Technologies, Sherjil Ahmed, Communications Enabling Technologies

Session WA7— Signal/Image Enhancement

Session Chair: Til Aach

WA7-1 **Matched Subspace Detectors for Discrimination Targets From Trees in SAR Imagery** — **8:30 am**
Anshul Sharma and Randolph L. Moses, The Ohio State University

WA7-2 **Parametric Modeling of Blurred Images for Image Restoration** — **8:55 am**
Prashan Premaratne and C.C. KO, The National University of Singapore

WA7-3 **An Adaptive Algorithm for Image Resolution Enhancement** — **9:20 am**
Simant Dube and Li Hong, Stmicroelectronics, Inc.

WA7-4 **An Algorithm for Fingerprint Image Postprocessing** — **9:45 am**
Marius Tico and Pauli Kuosmanen, Tampere University of Technology

BREAK — **10:10 am**

WA7-5 **Two-Channel Noise Reduction with Pitch-Adaptive Post-Processing** — **10:30 am**
Fahmi Cheikh-Rouhou and Jan Tilp, Darnstadt University of Technology

WA7-6 **Manifold Reconstruction from Unorganized Points** — **10:55 am**
Daniel Freedman, Harvard University

WA7-7 **Data Fusion Using Multiple Models** — **11:20 am**
D.D. Sworder, University of California-San Diego, J.E. Boyd, Cubic Defense Systems, R.J. Elliott, University of Alberta, R. Gary Hutchins, Naval Postgraduate School

Session WA8a — (Poster Session) 8:30 - 10:00 Adaptive Techniques for Equalization and Beamforming

Session Chair: Alan Lindsey, University of Southern California

WA8a-1 **A Blind Adaptive Equalizer for Sparse Channels**
Yuanwei Jin, University of California-Davis, Benjamin Friedlander, University of California-Santa Cruz

WA8a-2 **Stable Simplified Gradient Algorithms for Total Least Square Adaptive Filtering**
Bruce E. Dunne, Tellabs Research Center, Geoffrey A. Williamson, Illinois Institute of Technology

WA8a-3 **A Fractionally Spaced DFE with Subband Decorrelation**
Stephan Weiss, University of Southampton, Markus Rupp, Bell-Labs, Lucent Technologies, Hafizal Mohamad, and Lajos Hanzo, University of Southampton

WA8a-4 **Convex Optimization Algorithms for Blind Channel Equalization**
Mung Chiang, David Julian, Daniel O'Neill, and Arak Sutivong, Stanford University

WA8a-5 **The Adaptive Matching Pursuit Algorithm for Estimation and Equalization of Sparse Time-Varying Channels**
S.F. Cotter and Bhaskar D. RAO, University of California-San Diego

WA8a-6 **Blind Equalization for 256-QAM CATV Networks**
Juergen Bogenfeld, Wolfgang Sauer-Greff, and Werner Rupprecht, University of Kaiserslautern, Eckard Bogenfeld, T-Nova German Telekom

WA8a-7 **Seletion of Time-Varying Volterra Model Using Multiple Hypothesis Testing**
Matthew Green and Abdelhak M. Zoubir, Curtin University of Technology

WA8a-8 **A Fast Newton Second-order Volterra Filter**
Junghsi Lee and Chia-Yi Lu, Yuan-Ze University

WA8a-9 **Turbo-Equalization for Bit-Interleaved Coded Modulations**
P. Magniez, Enst/Tsi, B. Muquet, Motorola Paris, Pierre Duhamel, Enst/Tsi, M. De Courville, Motorola Paris

Continued on next page...

WA8a-10 Adaptive Variable Rate Data Transmission Over Fading Channel with Adaptive Feedback Equalization
R.E. Goot and E. Dolev, Holon ACADEMIC Institute of Technology

WA8a-11 Adaptive Per-Survivor Processing
Zhenyu Zhu, Lucent Technologies Microelectronics, Hamid Sadjadpour, AT&T Research

WA8a-12 BER of Frequency Adaptive Radiotelecommunication System with Sounding Signals
R.E. Goot and V.E. Levit, Holon Academic Institute of Technology

WA8a-13 Blind Equalization of OFDM Signals on HF-Channels
Walter Akmouche, Celar/Tcom/TR, Stephanie Gruffaz and ANDRE Quinquis, Ensieta

WA8a-14 An Alias-Free Subband Adaptive Equalizer for OFDM System
Tomohide Miyagi and Hiroshi Ochi, Kyushu Institute of Technology

WA8a-15 Turbo-Equalization for Multicarrier Transmissions
B. Muquet, Motorola Paris, P. Magniez and Pierre Duhamel, Enst/TSI, M. De Courville, Motorola Paris, Georgios B. Giannakis, University of Minnesota

WA8a-16 On the Impact of Channel Estimation for Diversity Reception in Mobile OFDM Systems
Andreas A. Hutter, Technische Universitat Munchen, Elisabeth de Carvalho and John M. Cioffi, Stanford University

Session WA8b — Data Security and Watermarks
(Poster Session)
10:30 - 12:00

Session Chair: Min-You Wu

WA8b-1A Blind Watermarking Algorithm with Semantic Meaningful Watermarks
Chun-Hsiang Huang, JA-Ling Wu, and Ding-Yun Chen, National Taiwan University

WA8b-2 Technical Challenges Assoicated with Protecting On-Line Images
Gregory L. Heileman and Carlos E. Pizano, University of New Mexico

WA8b-3 A Secure Method for Quality Layered Encryption of MP3 Audio
Niels Thorwirth and Petar Horvatic, Fraunhofer Crcg, Inc., Rudiger Weis, Universitat Mannheim, Jian Zhao, Fraunhofer Crcg, Inc.

WA8b-4 Optimum Attack on Digital Watermarks and its Defense
Johathan K. Su and Joachim J. Eggers, University of Erlangen-Nuremberg, Bernd Girod, Stanford University

WA8b-5 Illustration of the Duality Between Channel Coding and Rate Distortion with Side Information
Johathan K. Su and Joachim J. Eggers, University of Erlangen-Nuremberg

WA8b-6 Covert Communications Through Spread-Spectrum Watermarking
Arak Sutivong, Stanford University

WA8b-7 Robust Image Watermark with Wavelet Packet Transform and Spread Spectrum Techniques
Yu-Pin Wang, National Dong Hwa University, PO-Yuen Cheng, Symmetry Communications Systems

WA8b-8 Detection of Security Attacks on Routers in Mobile ATM Networks
Sirisha R. Medidi and Edward A. Ashcroft, Arizona State University

WA8b-9 Periodic Signaling Scheme in Oblivious Data Hiding
Litao Gang, Ali N. Akansu, and Mahalingam Ramkumar, New Jersey Institute of Technology

Continued on next page...

WA8b-10 Adaptive Image Database Using Wavelets

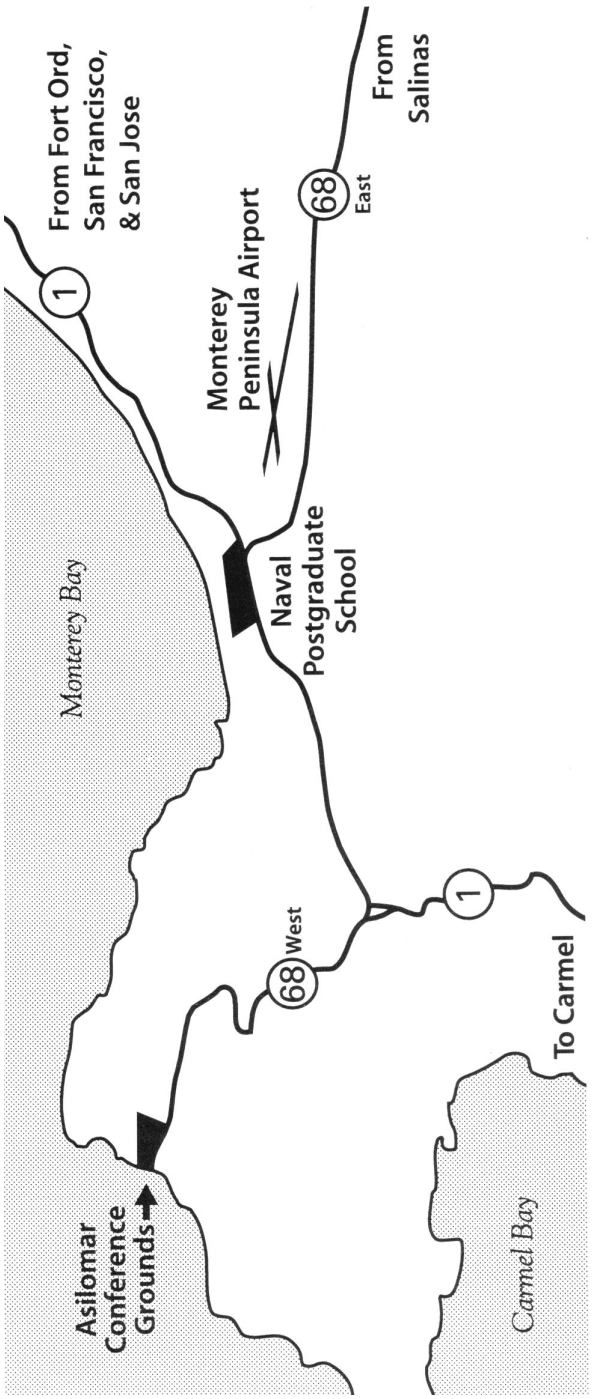
Shantanu Chakrabartty, Milutin Stanacevic, and Trac D. Tran,
The Johns Hopkins University

WA8b-11 An Energy Spreading Transform Approach to Efficient Image Retrieval

Waranan Saengow and Bundit Thipakorn, King Mongkut's University of Technology Thonburi, Douglas Cochran, Arizona State University

Author List

Notes. . .


From Fort Ord,
San Francisco,
& San Jose
1
Monterey Bay
Monterey
Peninsula Airport
68
East
From
Salinas
Naval
Postgraduate
School
68
West
1
To Carmel
Asilomar
Conference
Grounds
Carmel Bay