WTS 2006

Wireless Telecommunications Symposium 2006

Innovation In Wireless Communications

April 27 - 29, 2006

California State Polytechnic University, Pomona

Kellogg West Conference Center

WELCOME TO WTS 2006

Welcome to the fifth annual Wireless Telecommunications Symposium. We hope that WTS 2006: Innovation In Wireless Communications will be a stimulating and enjoyable experience for you.

Innovation in wireless communications can come in many forms: new technological developments; new products and services; new business strategies; new management processes, just to mention a few of them. It is found in industry, government, and universities. It has no national boundaries. As a result, the subject is an excellent one for an interdisciplinary, global conference on wireless communications like WTS. During the next three days WTS 2006 will explore innovation in wireless communications in depth - in the invited speaker program's two tracks, business and technology, and in the four tracks of the accepted paper program: Wireless Networks and Systems; Algorithms, Methods, Simulation, and Software; Wireless Network Technologies and Standards; and Wireless Business, Management, Security, Policy, and Applications.

The WTS 2006 Program Committee received over 100 paper submissions. We thank all the authors who submitted papers and proposals to WTS 2006, the many reviewers who reviewed them, and the co-chairs, track chairs, and session chairs for coordinating the paper and proposal evaluation and selection process. We also thank the WTS Administration and Operations Committees and support personnel for their tireless efforts behind the scene. Producing an event like WTS 2006 is not an easy task, and they did a marvelous job.

WTS 2006 is fortunate to have three first-rate international professional organizations as co-sponsors. We thank the IEEE Communications Society for its financial and technical co-sponsorship of WTS 2006, and the INFORMS Telecommunications Section and ACM SIGMOBILE for their technical support.

Finally, special thanks go to the more than 30 distinguished invited speakers from the wireless telecommunications industry that are participating in WTS 2006 and to the many organizations that have contributed to the effort or lent it financial support. Notable among the contributors and donors are Cal Poly Pomona's College of Business Administration and College of Engineering, its Computer Information Systems Department, Electrical and Computer Engineering Department, and Computer Science Department, and its Division of Instructional and Information Technology; SWIFT - Cal Poly Pomona's IEEE Communications Society student chapter; Google; the IEEE Foothill Section; MESAQIN; the IEEE Communications Society's Foothill and Los Angeles chapters; the IEEE Foothill AP/MTT Chapter; and Innovation Village Research Park.

On behalf of the WTS 2006 Committee -- Welcome to WTS 2006!

Dr. Steven Powell
WTS General Chair

Dr. Thomas Ketseoglou
WTS Assistant Chair

WTS 2006 Program

Thursday, April 27

7:00 am - 8:00 am	Registration and Continental Breakfast	
	Business	Technology
8:00 am - 10:00 am	Wireless Network Security Panel Discussion	GPS and Wireless Communications
10:00 am - 10:15 am	Networking Break	
10:15 am - 12:15 pm	Mobile Wireless Communications Services and Business Panel Discussion	Future Directions In Wireless Communications Research Panel Discussion
12:15 pm - 1:15 pm	Buffet Lunch at Kellogg West Welcoming Remarks: Dr. Tomas D. Morales, Provost and Vice President for Academic Affairs, Cal Poly Pomona Guest Speaker: Vassiliki Cossiavelou, Communications Secretary A, Greek Embassy, Beijing, China **"China: The Wireless World (2005-2020)"**	
1:15 pm - 3:15 pm	Wireless Communications Investments Panel Discussion	MIMO Wireless Systems Tutorial (I)
3:15 pm - 3:30 pm	Networking Break	
3:30 pm - 5:30 pm	New Wireless Communications Ventures Panel Discussion	MIMO Wireless Systems Tutorial (II)
5:30 pm – 6:30 pm	WTS Organizers' Meeting	
6:30 pm – 9:00 pm	Networking Session, Welcoming Dinner, and Lecture at Kellogg West Co-Hosted by the IEEE Communications Society Welcoming Remarks: Dr. Debra A. Brum, Vice President for Instructional and Information Technology, Cal Poly Pomona Guest Speaker: Dr. Donald Schilling, Chairman, LINEX Technologies **"The Wireless Revolution"**	

Friday, April 28

8:00 am - 9:00 am	Registration and Breakfast
9:00 am - 9:15 am	Opening Remarks: Dr. David R. Klock, Dean, College of Business Administration, Cal Poly Pomona Dr. Edward C. Hohmann, Dean, College of Engineering, Cal Poly Pomona
9:15 am - 10:15 am	Keynote Speaker: Mike Lazaridis, Founder, President, and Co-CEO of Research In Motion

10:15 am - 10:30 am	Networking Break
10:30 am - 11:15 am	Poonacha Machaiah, Senior Director of Seamless Mobility/Wireless Broadband Services, Motorola, Inc.
11:15 am - 12:00 pm	Dr. Raymond Pennotti, Managing Vice President - Professional Services, Lucent Worldwide Services, Lucent Technologies **"Wireless Network Optimization for 3G Networks to Deliver End to End Application QoS"**
12:00 pm - 1:45 pm	Buffet Lunch at Kellogg West Welcoming Remarks: Dr. J. Michael Ortiz, President, Cal Poly Pomona WTS 2006 Co-Sponsor Recognition Guest Speaker: David Cavossa, Executive Director, Satellite Industry Association **"State of the Satellite Industry"**
2:00 pm - 2:45 pm	Simon Aspinall, Director, Internet Business Solutions Group (IBSG) Mobile Worldwide, Cisco Systems Inc. **"Innovation in Mobility for Home and Business"**
2:45 pm - 3:00 pm	Networking Break
3:00 pm - 3:45 pm	Minhyung Eom, Project Leader, DMB Broadcasting, Korea Broadcasting System **"T-DMB Overview in Korea"**
3:45 pm - 4:00 pm	Free Time
4:00pm - 5:00pm	Bus Travel to NASA's Jet Propulsion Laboratory
5:15pm - 8:30pm	Keynote Speaker: Dr. Charles Elachi, Director, Jet Propulsion Laboratory and Vice President, California Institute of Technology **"Telecommunication Enables The Excitement and Challenges of Space Exploration"** Reception and Tour of the Jet Propulsion Laboratory
8:30pm - 9:30pm	Bus Travel to Kellogg West
	Saturday, April 29
8:00 am - 9:00 am	Registration and Breakfast Accepted Paper Author Check-In
9:00 am - 10:30 am	Accepted Paper Sessions (I)
10:30 am - 10:45 am	Networking Break
10:45 am - 12:15 pm	Accepted Paper Sessions (II)
12:15 pm - 1:15 pm	Buffet Lunch at Kellogg West Student Paper Award Ceremony Speaker: **Theresa Swinehart**, General Manager, Global Partnerships, Internet Corporation for Assigned Names and Numbers (ICANN)
1:15 pm - 1:45 pm	Doctoral Students Session/Poster Paper Session

1:45 pm - 3:15 pm	Accepted Paper Sessions (III) Wireless Network Security Workshop (I)
3:15 pm - 3:30 pm	Networking Break
3:30 pm - 5:00 pm	Accepted Paper Sessions (IV) Wireless Network Security Workshop (II)

Tutorials, Workshops, and Panel Discussions

Tutorials and Workshops

MIMO Wireless Systems Tutorial

Dr. Suman Das
Member of the Technical Staff
Wireless Technology Research Department
Bell Laboratories, Lucent Technologies

Wireless Network Security Workshop

D. Kent Stevens
Wireless/Optical Architect, Western Region
Nortel

Panel Discussions

Business Track

Panel Discussion: Wireless Network Security

Moderator: Frederick Gallegos, Adjunct Professor, CIS Department, Cal Poly Pomona
Dr. Francois Cosquer
Chief Security Architect
Alcatel North America

Kevin Moncrief
Principal, West Coast Security and Technology Solutions Practice
Ernst and Young

Brandon R. Brown
Managing Consultant
Nexus Integration Services
"Wireless Network Security Design"

Robert J. Brown
Director of Enterprise Security
WesCorp

Panel Discussion: Mobile Wireless Communications Services and Business

Moderator: Dr. J. P. Shim
Professor of MIS and Director of the International Business Strategy Program
Mississippi State University
"Digital Multimedia Broadcasting (DMB) Cellular Phone: Revisited"

Omar Javaid
Senior Director Business Development
QUALCOMM MediaFLO
"MediaFLO: A Quality Viewing Experience?"

Joe Fabris
Director of Wireless Solutions
Palm Inc.

Panel Discussion: Wireless Communications Investments

Moderator: Jonathan Atkin
Managing Director, Equity Research Division
RBC Capital Markets
"Wireless Services Overview"

Julie Ask
Research Director
Jupiter Research
"Outlook for Consumer Adoption of Mobile Data Services"

Charles S. Golvin
Principal Analyst

Forrester Research
"Wireless's Next Stage: The X-Internet"

Dr. Depankar Neogi
Senior Advisor and Manager
Arthur D. Little Inc.
"Business Opportunities and Challenges in Mobile and Broadband Markets"

Panel Discussion: New Wireless Communications Ventures

Moderator: Dr. David Klock, Dean of the College of Business Administration, Cal Poly Pomona

Dr. Daniel Docter
Senior Investment Manager
Intel Capital

Joe Muscat
Partner and Americas Director, Venture Capital Advisory Group
Ernst & Young LLP

James C. Shevlet, Jr.
Managing Director and Co-Head of Carlyle Mezzanine Partners, L.P.
The Carlyle Group

Technology Track

Panel Discussion: GPS and Wireless Communications

Moderator: Thomas Damiani
Consultant
"Spurring Innovation: The FCC's E911 Mandate"

Dr. Phil Dafesh
Associate Director
Digital Communication Implementation Department
The Aerospace Corporation
"The Impact of Modernized GPS Signals on Achieving the E911 Mandate"

Ryan Jones
Director of Marketing, Wireless Segment

SiRF Technology
"E911's Impact on Consumer GPS Technology"

Susan Sherwood
Manager E911
Verizon Wireless
"The Impact of the FCC's E911 Mandate on Wireless Carriers"

Panel Discussion: Future Directions in Wireless Communications Research

Moderator: Dr. George Rittenhouse
Vice President - Wireless Research
Lucent - Bell Laboratories

David Turner
Senior Program Manager
Platforms Product Management
Mobile & Embedded Devices Division
Microsoft Corp.
"Service Interoperability -- The Future"

Dr. Jason Redi
Director, R&D for Mobile Networking
BBN Technologies
"Future Directions in Wireless Networking Research"

Mike Seymour
Vice President, Broadband Wireless Division
Alcatel, North America

WTS 2006 Accepted Paper Sessions
Saturday April 29, 2006

Track 1 - Wireless Networks and Systems

Track Chair: Dr. Hong Zhou
The University of Southern Queensland, Australia

Session Chairs:

Wireless Internet & WML: Dr. Zhongwei Zhang, The University of Southern Queensland, Australia

3G/4G Wireless Networks & Systems: Dr. Kwan-Wu Chin, University of Wollongong, Australia

Wireless IP, Home Networks, and Ad Hoc Networks: Jackson Yin, Telstra Research Lab, Australia

Satellite Based Systems: Dr. James Kang, Cal Poly Pomona

9:00 AM - 10:30 AM
Session A1 - Wireless Internet & WML

Mobility Independent Predictive Services in WLAN Networks with Predictive Reservation Policy under a 2D Mobility Model
Floriano De Rango, University of Calabria, Italy

Wireless Compliant Software Design Model
Sufyan Almajali, Tzilla Elrad, Illinois Institute of Technology

Optimizing Wireless Communication using Adaptive Packet Sizing and Turbo Codes
Manish Mittal, Jill Gemmill, Helmuth Orthner, University of Alabama at Birmingham

10:30 AM - 10:45 AM **Networking Break**

10:45 AM - 12:15 PM
Session B1 - 3G/4G Wireless Networks & Systems

On the Optimal Downlink Power Allocation for Multi-carrier OFCDM Wireless Networks
Jeonghoon Mo, Seong-Lyun Kim, Yonsei University, Korea

I**mproved Channel Codec Implementation and Performance Analysis of OFDM based DAB Systems**
Yu-Pin Chang, Department of Electronic Engineering, Southern Taiwan University of Technology, Taiwan

Efficient Adaptive Transmission Technique for Multiuser OFDMA Systems with Reduced Feedback Rate
Duho Rhee, JungHyoung Kwon, Il Mu Byun, Kwang Soon Kim, Keum Chan Whang, Yonsei University, Korea

12:15 PM - 1:15 PM
Lunch - Kellogg West Dining Room
Student Paper Award Ceremony
Speaker: **Theresa Swinehart**, General Manager, Global Partnerships, Internet Corporation for Assigned Names and Numbers (ICANN)

1:15 PM - 1:45 PM **Doctoral Students Session/Poster Paper Session**

Doctoral Students Session:

A Full-Diversity Space-Time-Frequency Coded MIMO-OFDM System with Linear Decoding Complexity
Chao-Cheng Tu, McGill University, Canada

Poster Paper Session:

Advantages of Seamless Mobility from the Operational Perspective
S J Lincke, University of Wisconsin-Parkside

Biomedical Imaging for Cancer Across Ad Hoc Networks
Ehsan Sheybani, Giti Javidi, Virginia State University

1:45 PM - 3:15 PM
Session C1 - Wireless IP, Home Networks, and Ad Hoc Networks

InPCM: A Network Cache Technique for Improving the Performance of TCP in Wireless Ad-Hoc Networks
Andrew Adinegara, William Lau, Kwan-Wu Chin, Curtin University of Technology

Traffic Allocation in Delay-Tolerant Wireless Ad Hoc Networks
Min Kyoung Park, Volkan Rodoplu, University of California, Santa Barbara

Suitability of UMTS to Act as an Ad Hoc Network Gateway for VoIP Services
Nathan Smith, Motorola Labs

Wireless Usage Analysis and Data-Modeling Using a Performance-Based Approach
Dip Biswas, San Jose State University

3:15 PM - 3:30 PM **Networking Break**

3:30 PM - 5:00 PM
Session D1 – CDMA Systems

An adaptive uplink congestion control scheme of CDMA systems
Wei Wang, Beijing University of Posts and Telecommunications

Multiple Sequence Multicarrier CDMA for Interference-free Multiple Access
Santosh Nagaraj, Mark Bell, Purdue University

Unified micro-cellular network with Pico-cells to avoid local congestion
Takahiko Yamada, Phan Thanh Hoa, Ritsumeikan University, Japan

Track 2 - Algorithms, Methods, Simulation, and Software

Track Co-Chair: Dr. Hussain Al-Rizzo
Systems Engineering Department
University of Arkansas at Little Rock

Track Co-Chair: Dr. Ehsan Sheybani
Virginia State University

Session Chairs:

Wireless Multimedia: Dr. Hong-Chuan (Tim) Lin, Cal Poly Pomona

Wireless Network Modeling, Algorithms, and Simulation: Dr. Antonio Pescape, Università degli Studi di Napoli, Italy

QoS and Wireless Network Reliability: Dr. Jan Holub, Czech Technical University, Czech Republic

Broadband Wireless Access & Mobile and WLAN Interoperability: Dr. David Dellacca, IUPUI

Power Control & Signal Processing: Dr. Giti Javidi, Virginia State University

9:00 AM - 10:30 AM
Session A2 - Wireless Multimedia

Co-existence of Zigbee and WLAN, A Performance Study
Khaled Shuaib, College of IT, UAE University

AQIS with Composite Mobility Prediction for Multimedia Traffic in WLAN Handoff
Mukund Raghavan, Qing-An Zeng, University of Cincinnati

Dynamic Adaptive Resource Allocation Scheme for Multimedia Services in

Wireless and Mobile Networks
Pawan K. Lakshmanan, Qing-An Zeng, University of Cincinnati

10:30 AM - 10:45 AM
Networking Break

10:45 AM - 12:15 PM
Session B2 - Wireless Network Modeling, Algorithms, and Simulation

Simulation-based Design Tool for GSM/GPRS Networks
Paul Kubik, Maxim Gitlits, Telstra Research Laboratories

Dynamic System Level Simulations of Uplink Synchronization for TD-SCDMA
Zizhou Wang, Bo Chen, Yafeng Wang, Dacheng Yang, Beijing University of Posts and Telecommunications

Delay Performance under the Joint Scheduling over Gilbert-Elliot Channel
Fumio Ishizaki, Gang Uk Hwang, Korea University

12:15 PM - 1:15 PM
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S J Lincke, University of Wisconsin-Parkside

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Ehsan Sheybani, Giti Javidi, Virginia State University

1:45 PM - 3:15 PM
Session C2 – QoS, Wireless Network Reliability, Broadband Wireless

Access & Mobile and WLAN Interoperability

A Performance Evaluation of a Distributed QoS Load Sharing Scheme
Susan Lincke, University of Wisconsin-Parkside

A Novel Non-Intrusive Voice Transmission Quality Measurement Algorithm
Jan Holub, Michael Street, Ondrej Tomiska, Czech Technical University, Faculty of Electrical Engineering

BER and PER Evaluation for IEEE 802.16e Protocol in HAP Architecture with User Mobility
Floriano De Rango, Salvatore Marano, University of Calabria, Italy

Stability of Random Access Protocol with Newly Generated Packet Rejection and Retransmission Cut-Off
Jahangir Sarker, VTT Technical Research Centre of Finland

3:15PM - 3:30 PM **Networking Break**

3:30-5:00 PM
Session D2 – Power Control & Signal Processing

Design Considerations and Performance Analysis of Good pi-Rotation LDPC Codes
Rich Echard, S. C. Chang, Naval Research Laboratory

Prediction based adaptive modulation and coding for MIMO systems on flat rayleigh fading channels
Duho Rhee, Jung Hyung Kwon, Hae Gwang Hwang, Kwang Soon Kim, Yonsei University, Korea

Low Complexity BICM-OFDM-based MIMO Receiver using Successive Interference Cancellation
Youngjae Kim, John Cioffi, Keith Holt, Stanford University

Directional Antenna Multi-Path Location Aided Routing (DA-MLAR)
Sanjaya Gajurel, Limin Wang, Behnam Malakooti, Siva Tanguturi, Case Western Reserve University

Track 3 - Wireless Network Technologies and Standards

Track Chair: Dr. Rose Q. Hu
ECE Department
Mississippi State University

Session Chairs:

Spread-spectrum/CDMA/OFDM Technologies: Richard Cockrum, Cal Poly Pomona

UWB Technology: Dr. Hsiao-Chun Wu, Louisiana State University

802.11, Bluetooth and RFID: Dr. Tareef Al-Mahdawi,Sr. Intelleflex Corporation

Location Systems and Modeling: Lionel Garin, SIRF Technology

9:00 AM - 10:30 AM
Session A3 - OFDM Technologies

Approximate Maximum-Likelihood of SDMA OFDM over unknown Time-Varying Frequency-Selective Channels
Thomas Ketseoglou, Meghana Gaikwad, California State Polytechnic University, Pomona

Construction of QAM Codes for Low-Cost OFDM Systems
Karen Guan, UIUC, Chi Guan, MIT

Blind channel identification in MIMO OFDM systems
Xin Lv, Lanzhou University, China

Reducing the Clipping Noise in OFDM Systems
Wu Linjun, LI/Yanwen, Henan University of Technology, China

10:30 AM - 10:45 AM **Networking Break**

10:45 AM - 12:15 PM
Session B3 – Spread-spectrum/CDMA/UWB Technology

Performance of Coherent Direct Sequence Spread Spectrum Frequency Shift Keying
Sudhir K. Sunkara, David W. Matolak, Ohio University

A UWB Sensor Network Using Simplex Motes for Hospitals
Reza Pasand, TRLabs, Calgary, AB, Canada

Mean Time Acquisition for Ultra-Wideband Communication Systems
Rashid A. Saeed, Universiti Putra, Malaysia

Fast Ds-Ss Acquisition Implementation For High Sensitivity Receivers

Phani Sagiraju, David Akopian, University of Texas at San Antonio

12:15 PM - 1:15 PM
Lunch - Kellogg West Dining Room
Student Paper Award Ceremony
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Biomedical Imaging for Cancer Across Ad Hoc Networks
Ehsan Sheybani, Giti Javidi, Virginia State University

1:45 PM - 3:15 PM
Session C3 – 802.11, Bluetooth and RFID

Perspective of CMOS Power Amplifier in RFID Technology
Gao Tongqiang, Tsinghua University, China

Easy Embedded Security Protocol for Low Cost Radio Frequency Identification System
Kun Yang, Leibo Liu, Zhihua Wang, Tsinghua University, China

Starvation Prevention Scheme for the IEEE 802.11e EDCF Using Dynamic MAC Layer Parameters
Qing-An Zeng, University of Cincinnati

3:15PM - 3:30 PM **Networking Break**

3:30 PM - 5:00 PM
Session D3 – Location Systems, Modeling, and Algorithms

Energy and Channel Aware Geographic Forwarding Algorithms for Wireless Sensor Net
Mirko Dal Pozzo, Riccardo Veronesi, Velio Tralli, ENDIF, University of

Ferrara, Italy

A Unified Geolocation Channel Model: Part II (Multi-path Distribution)
Ilir Progri, California Sate Polytechnic University, Pomona

Improving Accuracy of WiFi Positioning System by Using Geographical Information System (GIS)
Tussanai Parthornartt, Kittiphan Techakittiroj, Assumption University

Automatic Classification of Location Based Information
Deepthi Bhupathiraju, Phani Sagiraju, University of Texas at San Antonio

Track 4 - Business, Management, Security, Policy, and Applications

Track Chair: Dr. Michael Bartolacci
Information Sciences and Technology
Penn State University

Session Chairs:

Spectral Management & Policy: Dr. Sasha Dekleva, Depaul University

Global Wireless Services, Business, and Applications: Dr. Majed Muhtaseb, Cal Poly Pomona

Wireless Telecommunications Management: Vassiliki Cossiavelou, Greek Embassy, Beijing, China

Mobile and Wireless Network Security and Privacy: Dr. Timothy Matis, Texas Tech University, TX

9:00 AM - 10:30 AM
Session A4 – Global Wireless Services, Business, Applications, and Management

Economics of Wireless Broadcasting over DVB-H Networks
Anssi Hoikkanen, Nokia Corp.

Optimisation of Enhanced UMTS Cellular Planning Based in Economic Aspects
Fernando Velez, Cátia Franco, Ricardo Rei, University of Texas at San Antonio

Taming Wireless in Business: New Services and Capabilities Bring Increased Complexity
Kevin Whitehurst, mindWireless

An Examination of Select Wireless Technologies in the Asia-Pacific Market
Vassiliki Cossiavelou, Greek Embassy, Beijing, China

12:15 PM - 1:15 PM **Networking Break**

10:45 AM - 12:15 PM
Session B4 - Mobile and Wireless Network Security and Privacy (I)

Secure Service Sharing over Networks for Mobile Users Using Service Network Graphs
David Lai, Zhongwei Zhang, University of Southern Queensland

Forward-Secure Identity-Based Signcryption with Pubilc Verifiability and Short Ciphertext
Huiyan Chen, Graduate School of Chinese Academy of Sciences

Implementing and Evaluating An Adaptive Secure Routing Protocol for Mobile Ad Hoc Network
Lu Jin, Zhongwei Zhang, Hong Zhou, David Lai, University of Southern Queensland

Secure Architecture For Extensible Mobile Internet Transport Services (SAFEMITS) Design and Testing
Patrick Fitzgibbons, Digen Das, Larry Hash, SUNY Institute of Technology

12:15 PM - 1:15 PM
Lunch - Kellogg West Dining Room Student
Paper Award Ceremony
Speaker: **Theresa Swinehart**, General Manager, Global Partnerships, Internet Corporation for Assigned Names and Numbers (ICANN)

1:15 PM - 1:45 PM **Doctoral Students Session/Poster Paper Session**

Doctoral Students Session:

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Chao-Cheng Tu, McGill University, Canada

Poster Paper Session:

Advantages of Seamless Mobility from the Operational Perspective
S J Lincke, University of Wisconsin-Parkside

Biomedical Imaging for Cancer Across Ad Hoc Networks
Ehsan Sheybani, Giti Javidi, Virginia State University

1:45 PM - 3:15 PM
Session C4 - Mobile and Wireless Network Security and Privacy (II)

Wireless Network Security Workshop (I)
Instructor: D. Kent Stevens, Wireless/Optical Architect, Western Region, Nortel

3:15PM - 3:30 PM **Networking Break**

3:30 PM - 5:00 PM
Session D4 - Mobile and Wireless Network Security and Privacy (III)

Wireless Network Security Workshop (II)
Instructor: D. Kent Stevens, Wireless/Optical Architect, Western Region, Nortel

Speaker Biographies

Mike Lazaridis is President and Co-CEO of Research In Motion, a company he founded while a student at the University of Waterloo, Canada. At RIM, Mike is responsible for product strategy, research and development, product development, and manufacturing.

Mike is known in the global wireless community as a visionary, innovator, and engineer of extraordinary talent. Since founding RIM he has earned more than thirty patents and dozens of industry and community awards for his innovations in wireless radio technology and software.

Mike supports his community and country through generous philanthropic gifts made possible by his success in business. His most noted commitment established Perimeter Institute for Theoretical Physics in 2000. In its short history, Perimeter has established itself as a leading centre for fundamental research and has attracted the attention of the world's scientific community.

In recognition of his leadership and innovation Mike was named Canada's Nation Builder of the Year for 2002 by readers of The Globe and Mail. He holds an honorary Doctor of Engineering degree from the University of Waterloo and in June 2003 was named the University's 8th Chancellor.

Dr. Charles Elachi was born April 18, 1947 in Lebanon. He received a B.S. in physics from the University of Grenoble, France and the Diplome Ingenieur in engineering from the Polytechnic Institute, Grenoble in 1968 where he graduated first in the class, and M.S. and Ph.D. degrees in electrical sciences from the California Institute of Technology, Pasadena in 1969 and 1971, respectively. He later received an MBA from USC (1978) and an M.S. degree in geology from UCLA (1983).

He is currently the Director of the Jet Propulsion Laboratory and Vice President of the California Institute of Technology, where he is also a Professor of Electrical Engineering and Planetary Science. He taught "The Physics of Remote Sensing" at Caltech from 1982 to 2000. Elachi was Principal Investigator on numerous research and development studies and flight projects sponsored by the National Aeronautics and Space Administration. He was Principal Investigator for the Shuttle Imaging Radar series (SIR-A in 1981, SIR-B in 1984 and SIR-C in 1994), was a Co-Investigator on the Magellan imaging radar, and is presently the Team Leader of the Cassini Titan Radar experiment and a co-investigator on the Rosetta Comet Nucleus Sounder Experiment. He is the author of over 230 publications in the fields of space and planetary exploration, Earth observation from space, active microwave remote sensing, electromagnetic theory, and integrated optics, and he holds several patents in those fields. In addition, he has authored three textbooks in the field of remote sensing. One of these textbooks has been translated into Chinese.

In his 30 year career at JPL, Dr. Elachi played the lead role in developing the field of spaceborne imaging radar from a small research area to a major field of scientific research and application. As a result, JPL and NASA became the world leaders in the field of spaceborne imaging radars, and over the last decade, developed Seasat, SIR-A, SIR-B, SIR-C, Magellan, SRTM and the Cassini Radar. He received numerous national and international awards for his leadership in this field.

During the late 80's and 90's, as the Director of Space and Earth Science programs, Dr. Elachi was responsible for the definition and development of JPL flight instruments and missions for Solar System Exploration, the Origins program, Earth Observation and Astrophysics. During this period more than 45 flight missions and instruments were conceived, developed, and flown.

In the mid to late 90s. Dr. Elachi chaired a number of national and international committees which developed NASA roadmaps for the exploration of neighboring Solar Systems (1995), our Solar System (1997), and Mars (1998).

In January 2001, Dr. Elachi was appointed as the Director of the Jet Propulsion Laboratory and Vice President of Caltech.

Dr. Elachi has received numerous awards, including the Takeda Award (2002), the NASA Outstanding Leadership Medal (2002), the Wernher Von Braun Award (2002), the UCLA Department of Earth and Space Science Distinguished Alumni Award (2002), Dryden Award (2000,), the NASA Distinguished Service Medal (1999), the COSPAR Nordberg Medal (1996), the Nevada Medal (1995), NASA Outstanding Leadership Medal (1994), the IEEE Medal of Engineering Excellence (1992), the IEEE Geoscience and Remote Sensing Distin- guished Achievement Award (1987), the W.T. Pecora Award (1985), the NASA Exceptional Scientific Medal (1982), and the ASP Autometric Award (1980 and 1982).

In 1988, the L.A. Times selected him as one of "Southern California's rising stars who will make a difference in L.A."

In 1989, Asteroid 1982 SU was renamed 4116 Elachi in recognition of his contribution to planetary exploration.

In 1989, at the age of 42, he was elected to the National Academy of Engineering. In 1993-1995 he was a member of the NAE 4th Decadal Committee. In 1995, he chaired the NAE membership committee. He served on numerous NAE committees.

He is a fellow of IEEE and the American Institute of Aeronautics and Astronautics, and is a member of the International Academy of Astronautics.

He was a member of the University of Arizona Engineering School Advisory Committee and the Boston University Center of Remote Sensing Advisory Council. He is a member of the UCLA Science Board of Visitors.

Dr. Elachi participated in a number of archeological expeditions in the Egyptian Desert, the Arabian Peninsula and Western Chinese Desert in search of old trading routes and buried cities using satellite data, some of which were featured in National Geographic Magazine.

He has lectured and given keynote speeches at numerous international conferences and universities inside and outside the U.S., including China, Japan, Australia, France, England, Holland, Denmark, Austria, Switzerland, Norway, Germany, Italy, Greece, Egypt, Kenya, India, Morocco, and Brazil. He also was a speaker at the Caltech Alumni Day and the Watson Lectures.

He is married to Valerie Gifford and has two daughters, Joanna and Lauren. His outside interests include skiing, woodworking, history and travel. He is a member of the Pasadena Twilight Club and chaired the JPL United Way Campaign in 1988-1989.

Dr. Donald Schilling taught at both the Polytechnic Institute of Brooklyn, and the City College of New York, where he held the Position of Herbert Kayser Distinguished Professor. He retired in 1992 and is now Professor Emeritus. Professor Schilling has held a variety of private-sector positions to develop commercial applications of spread-spectrum technology, including CEO of InterDigital Communications Corporation (1992-1994), and he is currently Chairman of LINEX Technologies. From 1996-98, Dr Schilling headed the TIA 46.1 Standards Committee, WIMS, which joined with ETSI and ARIB to form the 3GPP Wideband CDMA Standard.

Dr. Schilling has authored or co-authored twelve textbooks, over 200 papers, and holds more than 100 patents. He has been very active in the IEEE and the Communications Society. He helped start the IEEE Communications Society

Magazine, the IEEE Journal on Selected Areas in Communications (JSAC), MILCOM, and INFOCOM. He served as Editor of the Transactions on Communications and Director of Publication (1968-1978). He was President of the IEEE Communications Society from 1980-1981 and was a member of the IEEE Board of Directors from 1982-1983. Among his honors, he is a Fellow of the IEEE and has received the Donald W. McLellan Meritorious Service Award in 1978, the Edwin Howard Armstrong Achievement Award in 1998, MILCOM's Technical Achievement Award in 2000, and has served as a member of the US Army Science Advisory Board.

Dr. Schilling received his undergraduate degree in Electrical Engineering from the City College of New York in 1956, his M.S.E.E. from Columbia University in 1958, and his doctorate from the Polytechnic Institute of Brooklyn in 1962.

Poonacha Machaiah is the Senior Director of Seamless Mobility/Wireless Broadband Services at Motorola, Inc. Mr. Machaiah joined Motorola from Vibrant Solutions where he was responsible for strategic engagements and involved himself in the sales of revenue assurance applications and cost management solutions to service providers.

Prior to that, for two years Mr. Machaiah was the vice president/general manager of the Visonael Corporation overseeing all worldwide sales, professional services and operations. Before Visonael, he worked at Dimension Enterprises as Executive Director of IDC/ASP Practice, when Nortel Networks acquired it in 2000. He continued at Nortel's Global Professional Services division, where, as the vice president of business enabling solutions practice, he was involved with; operations management, strategic planning, business development and technology design.

Early in his career, Mr. Machaiah also worked for Iridium LLC & Sprint, in various leadership roles. Mr. Machaiah first started his career at Nomadic Technologies as a software engineer where he developed technology for robot path planning and motion control. He holds an MBA from the College of William and Mary in Virginia and a Bachelor of Science in Computer Science and Engineering from the B.M.S. College of Engineering in India.

David Cavossa is the executive director of the Satellite Industry Association has been with the organization since 2001, originally as the Director of External Relations. In his current role, he helps coordinate the education, outreach, regulatory and legislative strategies for the commercial satellite industry on a broad range of issues ranging from regulatory, trade, export controls, space transportation, broadband, and the protection, planning, and acquisition of commercial SATCOM by the U.S. Government. As one of the chief advocates for the commercial satellite industry he deals with a wide range of commercial, civil and military space issues on a daily basis.

During his tenure at SIA Mr. Cavossa has re-focused the efforts of the association

on educating the public, press, policy-makers, and the government users of commercial satellite services of the critical role satellites play in our national, economic, and homeland security.

Before joining the SIA Mr. Cavossa worked at NASA Headquarters, first in the Office of External Relations and then in the Office of Legislative Affairs where he was exposed to a variety of NASA programs and their impact and perception on the American public. While at NASA he participated in NASA's education and outreach campaign for Congressional Staff as well as staffing the NASA "War Room" during the 2001 NASA Appropriations floor votes in Congress.

David obtained a Masters Degree in Science, Technology and Public Policy from the George Washington University (GWU) Space Policy Institute as a Space Policy Fellow. David also holds a Bachelors Degree in Physics/Astronomy and Political Science from Wheaton College, in Norton MA.

Dr. Raymond Pennotti is Managing Vice President - Professional Services, Lucent Worldwide Services at Lucent Technologies, where he is responsible for working with clients on network planning, design, integration, optimization, and program management services. Dr. Pennotti moved to LWS from Lucent's AT&T wireless communications business unit, where he was responsible for field introduction of the first TDMA system in the U.S., and deployment and technical support of large-scale CDMA systems.

Previously, he had global responsibility for system test and field test, deployment and technical support of GSM and UMTS systems. This role was incorporated into Lucent Worldwide Services when it was formed in 2000. He worked in data communications and data networking for AT&T, and when the company acquired Paradyne, Dr. Pennotti participated in the consolidation of the two companies, serving as Vice President, Networking Products. During the 1970s, he worked on fundamental issue for cellular radio systems at Bell Labs and authored a series of Technical Feasibility Studies on spectrum allocations, which were submitted to the FCC.

Dr. Pennotti earned a Ph.D. in electrical engineering from the Polytechnic Institute of Brooklyn, where he conducted research on channel assignment in cellular mobile telecommunications systems.

Simon Aspinall is Director of the Cisco Internet Business Solutions Group (IBSG) Mobile organization worldwide. He leads a team that is responsible for driving, identifying, and developing new business opportunities with mobile operators-linking the mobile, service provider, and business sectors.

Since its inception, the IBSG Mobile team has built relationships with 80 percent of the leading operators in Europe, along with key operators in the U.S. and Asia-Pacific. The team has assisted these operators in entering and developing new

markets, making operational improvements, and applying Internet business solutions. Aspinall is a frequent speaker at industry events and a commentator on the IT, telecoms, and networking sectors.

Aspinall has held a number of senior management roles at Cisco, leading the European field operations team with responsibility for new business solutions, Cisco Powered Networks marketing, service consulting, business consulting, and market intelligence for the European telecommunications business.

Before Cisco, he spent eight years at Mercer Management Consulting, a firm providing management, financial, and marketing consultancy to the worldwide telecommunications sector. Aspinall was also the founder and non-executive director of an Internet incubator with operations in five countries. He holds an MBA (Insead) and a master's degree in engineering and computing science from Oxford University.

Minhyung Eom leads the Digital Multimedia Broadcasting team at the Korean Broadcasting System (KBS). He joined the flagship public broadcaster of South Korea in 1985 and took part in TV show production, programming, and new media policy-making before taking on the head position of the DMB team in 2004, when it was officially launched.

In 1990, Mr. Eom was arrested by the military government for leading the KBS unionists` anti-government demonstration on the liberalization and democratization of broadcasting. However, he was pardoned and reinstated to his previous position at KBS three years later.

Mr. Eom changed his career direction at KBS from program production to policy and planning in 1997. Since then, he has been involved in a variety of tasks related to broadcasting laws, policies, regulations, new media, media fusion, cooperation with the government and related institutions and bodies.

He participated in the Digital Audio Broadcasting project in 2003 and played a leading role in transforming DAB into DMB. In 2004, as the chairman of the association of the 12 candidate T-DMB service providers, he established the T-DMB (Terrestrial DMB) business model and policy. Since 2005, Mr. Eom has been the managing director for the three major terrestrial broadcasters and three smaller licenses were finally selected as T-DMB service providers. He is also the vice president of the Korea Mobile Industry Association.

Vassiliki Cossiavelou is currently the Press and Communications Attache for the Greek Embassy in Beijing, China. Ms. Cossiavelou is an expert on the state of the Chinese telecommunications industry and its ever-growing role in the wireless telecommunications arena. Ms. Cossiavelou has extensive industry experience in the area of telecommunications and networking with such companies as IBM, Mobil and Interface-Altec in Europe. She has worked on related information

systems projects with NATO and the European Union.

Ms. Cossiavelou is completing her Ph.D. at Aegean University in the Cultural Technology and Communications Department related to the impact of emerging telecommunication technologies on the broadcasting and news/mass media industries. She has a Bachelor's degree in Mathematics (Computer Science specialization) from the University of Ioannina and Masters degrees in both Applied Mathematics from the University of Patras and Cultural Policy, Administration and Communication from Panteoin University of Athens.

Theresa Swinehart is General Manager, Global Partnerships at ICANN, a position she has held since 2004. In this capacity, she leads ICANN's efforts in globally coordinating ICANN's planning activities and work with regional communities. Theresa continues to lead ICANN's outreach activities, building relationships with all interested participants and regional organizations (both those in the private sector and governmental organizations). Theresa is also in the process of concluding her work with the ccNSO launching group.

Theresa joined ICANN in 2001 as Counsel for International Legal Affairs, where her work involved ICANN's Governmental Advisory Committee, country code Top Level Domains (ccTLDs), and other global coordination activities. Previously, she was Director for Global E-Commerce at MCI, responsible for international issues relating to e-commerce, such as data protection, ISP liability, and monitoring emerging technical areas such as ENUM (telephone numbering on the Internet). Theresa also actively participated in the global Internet community's discussions that led to the 1998 transition of the Domain Name System to private sector management and the establishment of ICANN and served as a North American representative on the ICANN Domain Name Supporting Organization's Names Council from 1999-2001.

Theresa is fluent in English and German, and conversant in other languages. She holds a law degree from American University (USA), Washington College of Law (USA), a postgraduate degree in International Studies from Universität Wien (Austria), and a BA in International Relations from the University of California, Davis (USA).

Dr. Francois Cosquer is Chief Security Architect for Alcatel North America where he currently coordinates the security effort for Alcatel Strategic Solutions. Francois is acting chair of the ATIS TOPS Council Focus Group on Network Security. He has been speaker and chair for security sessions at USTA Telecom, Supercomm, VON, CTIA Tower Summit, Global Mobile Enterprise, Wireless Industry Congress, Globecom and Broadband Services Forum. Francois came to Ottawa in 2001 to lead Alcatel's Corporate Security Research Center.

Prior to joining Alcatel, he worked in Europe for a number of Research Institutions, Equipment Vendors and Telecom Operators. Francois' 15 years

experience covers networking, operating systems, middleware and multimedia applications. He is author of several international publications and co-author of LNCS book on Advances in Distributed Systems. He is Advisory Board Member at the Concordia Institute of Information Systems Engineering and for the European Security & Dependability Task Force. Francois graduated in Electronics and Computing and holds an MSc in Computer Science and Ph.D. in Computer Engineering.

Kevin W. Moncrief is an Ernst and Young Principal leading the West Coast Security and Technology Solutions (STS) Practice. His areas of expertise include Information technology consulting and services. Mr. Moncrief has consulted with major corporate clients in the use of advanced technologies for business applications. He has over 25 years of experience assisting clients with the selection of information systems technology and application solutions in the pharmaceutical, medical device, and chemical industries. He is also a former Information Security Officer for the United States Air Force and Military Policeman for the U.S. Army National Guard. He has spoken at major conferences such as the 2005 Computer Associates CIO Compliance Conference and 2005 Microsoft Computer Security Summit on computer security issues and concerns. He is currently pursuing his PhD on ERP II.

Brandon Brown is currently the Managing Consultant of Orange County, CA and Nevada for Nexus Integration Systems. In this role, he is ultimately responsible for the design check and implementation of large scale deployments to include traditional TDM, IP Telephony, Network Infrastructure, Network Solution Security and Wireless Communications Architectures. He manages a team of highly skilled engineers, technicians, and project managers and consultants. Mr. Brown was previously engaged as Manager of Network Engineering for eTelecare Global Services where he was responsible for the design and deployment of data and VoIP networks in their Asian Call Center Practice. Mr. Brown is a Veteran of the United States Marine Corps where he graduated from that institutions Computer Science School's Networking Systems Program and participated in many deployments around the world in which he was responsible for the design, deployment and support of both non-secure and secure networks no matter what the environmental conditions. Mr. Brown's industry credentials include the Certified Information Systems Security Professional (CISSP) Cisco Systems Network Professional (CCNP) and Cisco Systems Design Professional (CCDP). Mr. Brown is a graduate of Cal Poly Pomona's MSBA IT-Audit program class of 2003 with accreditation thru the Committee on National Security Systems (CNSS) and holds his Bachelors in CIS from Campbell University in North Carolina.

Robert J. Brown is the Director of Enterprise Security for WesCorp, the nation's largest Corporate Credit Union with $25B in assets and more than 1,000 member/owner credit unions located throughout the United States and Guam. Mr. Brown has overall responsibility for identifying, assessing, and managing risks to

WesCorp information and systems. This includes strategic and tactical security planning, policy development, IT risk assessment, and implementation and administration of security technology. He joined WesCorp in 2005 from the Security and Privacy practice at PricewaterhouseCoopers where he was responsible for managing key client projects in the areas of compliance, governance, and risk. He was also a founding Partner of an INC 500 security services firm and was a Senior Consultant for one of the first commercial firewall vendors.

Mr. Brown has more than 10 years' experience in the information security field and is a regular speaker at conferences and events for organizations such as SANS and ISSA as well as industry-specific groups including the Los Angeles County Bar Association, the Association of Certified Fraud Examiners, Hospitality Financial and Technology Professionals, and others. He holds the Certified Information Systems Security Professional (CISSP) and Certified Information Systems Auditor (CISA) certifications as well as numerous technology-specific credentials.

Omar Javaid is senior director of business development for QUALCOMM MediaFLO. Javaid joined QUALCOMM in 2003 as senior director of business development for QUALCOMM Wireless Business Solutions (QWBS). Javaid brings more than a decade of technology and entrepreneurial experience to QUALCOMM, ranging from strategic business planning to advanced information systems planning, development and implementation.

Prior to joining QUALCOMM, Javaid was the chief technologist for Wireless Knowledge, overseeing and driving thought leadership and enterprise client development for Wireless Knowledge.

Previously Javaid was the founder, chairman, and chief technology officer at Mobilocity, Inc., a professional services firm providing mobile technology solutions. In this capacity, Javaid was instrumental in establishing Mobilocity as one of the world's leading mobile and wireless consulting firms. In addition to his entrepreneurial experience, he has held key technology leadership roles in Deloitte & Touche LLP, Advance Publications, and The University of Michigan.

Javaid holds a bachelor's degree in chemistry and cellular and molecular biology from the University of Michigan.

Joe Fabris is Director of Wireless Solutions at Palm Inc. where he is responsible for developing and implementing go-to-market strategies for the company's enterprise customers. He joined Palm through the merger of Handspring and palmOne in 2003. Before working in the handheld and smartphone world, Mr. Fabris worked for ten years at Microsoft in various positions, including Systems Engineer, Sales Executive, and Marketing Director. He received the "Chairman's Award" from Bill Gates in 1992 and 1997 for being the country's top sales executive. Prior to Microsoft, he spent five years at IBM as a Mechanical Engineer and Marketing Representative. Mr. Fabris holds a BS in engineering and an MBA

from California Polytechnic State University at San Luis Obispo. He is a member of the Board of Directors of Villa Montalvo, and The Tech Museum of Innovation.

Dr. J. P. Shim, John Grisham Faculty Excellence recipient, is Professor of MIS and Director of the International Business Strategy Program at Mississippi State University. He received his Ph.D. from University of Nebraska, MBA from Seoul National University, and completed the Harvard Business School's Executive Education Program. Dr. Shim was John Grisham Faculty Excellence winner in 1994 and received numerous grants and awards, including NSF, DOE, Microsoft, Booz-Allen & Hamilton, U.S. EPA, Mississippi Institution of Higher Learning, Korea Sanhak (school-industry) Foundation, and is a seven-time recipient of outstanding faculty awards. Professor Shim has authored and co-authored over 150 research articles, including Communications of the ACM, IEEE, Journal of AIS, Decision Support Systems, Interfaces, CAIS, Computers & Operations Research, and other leading journals. He consulted with Booz-Allen & Hamilton, EPA, and several other ICT companies. He was a keynote speaker at International Conference on Ubiquitous Computing, a frequent speaker at companies and universities in 15 different countries. His current research interests are DMB, wireless telecommunications, DSS, podcasting, and blog.

Julie Ask is a Research Director with Jupiter Research. Ask focuses on evolving trends in the telecommunications - specifically wireless - industry, examining both the marketing and technology issues these companies face as they look to deploy new technologies and services to enhance their businesses. Jupiter Research's wireless coverage examines business models, technology trends, and consumer behavior and attitudes to provide strategic advice and insight to those in the industry or those looking for a presence on the "third screen." Ask joined Jupiter Research in May 2001.

Ask's telecom experience dates back to her research at COMSAT Laboratories where as an engineer she did microwave circuit design - the focus of her graduate work. After graduating, she began her career in as an engineer in Germany. After earning her M.B.A., she worked for almost five years as a management consultant within the both the Operations Management and Communications Groups at Booz Allen & Hamilton where her primary area of focus was telecommunications strategy in the US and Europe. Prior to joining Jupiter Research, she worked as a Business Development and Product Marketing Manager for a wireless data company, Livemind, a start-up in San Francisco.

Ask holds a B.S. in Electrical Engineering and a M.S. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology as well as an M.B.A. from the University of Michigan. She lives in San Francisco.

Charles S. Golvin is a Principal Analyst at Forrester Research. As part of Forrester's Devices, Media, & Marketing team, Charles' research focuses on

consumer communications and home networking. His coverage includes wireless carriers, mobile phones and handheld devices, home networking, instant messaging, and public access wireless LANs. Charles' research and analysis have been widely cited in publications including Business Week and The New York Times, as well as on CNN and CNBC.

Prior to joining Forrester, Charles held senior technology positions at Citigroup, providing strategic technology guidance across business units in consumer and corporate finance. Among his projects were initiatives in consumer mobile banking in Japan, mobile commerce in Japan, and mobile payments in the US. His previous experience covers a wide variety of technologies and markets, including CAD for integrated circuit design, 3-D graphics for film and broadcast, consumer entertainment software, interactive television, and production systems for game development.

Charles holds M.S. and B.S. degrees in mathematics from the University of California, Santa Cruz.

Dr. Depankar Neogi, a Senior Advisor and Manager in the Boston office of Arthur D. Little Inc., has over 12 years of experience in business strategy, mergers and acquisitions and technology management for companies in the telecommunications, networking, and information systems industries. His advisory activities cover a wide range of critical and complex issues that are continuously faced by competitors in the high tech and telecommunications sectors. At times when standards are evolving and operators are evaluating many different pre-standard technologies, he has advised operators on how to objectively assess the long term impact of technological changes and investment strategies to migrate their networks and solutions towards converged models.

Before Arthur D. Little, Dr. Neogi worked in the strategy and business development group of Motorola's Networks Division focusing on areas of M&A, partnerships as well as providing technical leadership in seamless mobility and fixed-mobile convergence. He was instrumental in evangelizing Motorola's corporate vision of seamless mobility in the CTO's office. He has also been involved with standardization work in PacketCable and 3GPP driving cellular-interoperability and IP Multimedia Subsystem among fixed and mobile networks in the standards groups. He joined Motorola through its acquisition of the startup Winphoria Networks, where he architected, designed and developed what has become Motorola's wireless softswitch platform. Before Winphoria Networks, he worked as technical manager and software architect for Inktomi (now Yahoo) and Comverse Networks. He has received several US and International patents, several publications including International Journals, and has been an invited speaker at key International conferences and symposiums. He received his MBA from Columbia Business School in New York City, Ph.D. and M.S. in engineering from University of Massachusetts and B.S. in engineering from Indian Institute of Technology, Kanpur, India all with high honors.

Jonathan Atkin , a Managing Director in the Equity Research Division, has been with RBC Capital Markets since 2000. Previously, he held equity research positions with Alex Brown, Toronto Dominion, and Ferris Baker Watts, covering wireless, wireline, and Internet service providers. Previously, Jonathan was a senior consultant at BIA Companies, worked in corporate strategy at Daimler-Benz AG, and was a policy analyst with the United States Congress. Jonathan has BS and MS degrees in mechanical engineering from Stanford University and an MBA from Columbia University.

Dr. Daniel Docter is a Senior Investment Manager with Intel Capital where he has worked for nearly six years. Daniel covers the southern California region for Intel Capital (San Diego to Santa Barbara), and also supports the worldwide investment activities of the Intel Communications Infrastructure Group, which includes broadband access, enterprise and telecomm network, and semiconductor investments. Daniel received his PhD. from the University of Bradford, England in 1993 in solid-state physics, and spent more than 11 years working on components and systems for optical and RF communications applications at AT&T Bell Labs (6 yrs) and Hughes Research Labs (5 ½ yrs). He has more than 50 journal publications and more than 10 patents to his credit in areas of material science, semiconductor fabrication, optoelectronic integration, and microwave device and circuit applications. Prior to joining Intel Capital, Daniel worked for Merrill Lynch in the Private Wealth Management Group where he advised clients involved in initial public offerings, mergers and acquisitions. Daniel lives in Los Angeles and is active in supporting the southern California entrepreneurial and venture capital communities.

Joe Muscat serves as a Partner in the Audit and Advisory Business Services group for Ernst & Young LLP in Palo Alto. His clients include public and private life science and technology companies such as Alza, Boston Scientific, Connetics, MIPS Technologies, Molecular Devices, Silicon Graphics, Sun Microsystems and VeriFone.

Joe is also the Americas Director of the Venture Capital Advisory Group (VCAG). As the leader of the VCAG effort, Joe coordinates the venture capital relationships with a number of leading venture capital firms. Joe also works closely with the Area Venture Capital Advisory Group professionals and certain clients to understand how changing market conditions and regulatory environments affect E&Y's offerings.

Joe serves as Chairman of the Ernst & Young IPO Transformation – CEO Retreat. The Retreat hosts 100 rapidly growing private companies considering an IPO or other strategic transaction. Joe has also spent significant time helping companies position themselves for a successful initial public offering and realizing this value

in the aftermarket. He has performed research on the characteristics of successful public companies and is a frequent lecturer on this topic.

Previously, Joe was a Managing Director of the Ernst & Young Corporate Finance LLC - practice based in Palo Alto. Joe has advised companies on strategic transaction opportunities including initial public offerings, private equity financings, mergers and acquisitions, divestitures and strategic alliances.

Mr. Muscat holds a B.S. in Commerce – Accounting with Honors from Santa Clara University. He is a C.P.A in California and member of the AICPA and California Society of CPAs.

James C. Shevlet, Jr. is a Managing Director and co-head of Carlyle Mezzanine Partners, L.P. (CMP). CMP is a $435 million fund affiliated with The Carlyle Group, one of the largest global private equity firms with more than $35 billion under management and 37 funds in 14 countries.

CMP's strategy includes investing in senior debt, second-lien debt, subordinated debt, preferred stock and minority common equity securities. CMP invests in leveraged buyouts, recapitalizations, and growth financings across a broad group of industries. The Fund's investments usually include some form of current return and participation in equity upside.

Prior to joining Carlyle in September 2003, Mr. Shevlet was a Senior Vice President with TCW/Crescent Mezzanine Partners and Trust Company of the West, where he was responsible for investing and managing a portfolio of mezzanine capital across three private partnerships. Prior to joining TCW, Mr. Shevlet was a Vice President and Principal of Pacific Mezzanine Investors, LLC, where he analyzed and structured a variety of mezzanine transactions. Mr. Shevlet has over 16 years of experience in the private debt and equity markets.

Mr. Shevlet graduated with distinction from the University of Michigan and received his M.B.A. from the Wharton School of the University of Pennsylvania.

Dr. George Rittenhouse is Vice President of Wireless Research, Bell Laboratories, where he heads several projects, including MIMO system development, network optimization, wireless IP networks, and fourth generation wireless.

Dr. Rittenhouse joined Bell Laboratories as a Member of the Technical Staff where he developed a high-speed 0.1 um NMOS process for optical networking. He later joined the Wireless Research Laboratory at Bell Laboratories where his research focused on RF front-end radio architectures and cellular system engineering. In 2000 he was promoted to Director of the Wireless Technology Research Department. In 2001 he received the Bell Labs Fellow award.

Dr. Rittenhouse is active on several national policy and standards boards, working with FCC and Homeland Security subgroups on the scientific side of wireless in the post 9/11 era. He has numerous publications and patents in the areas of wireless systems and circuits. Dr. Rittenhouse received an undergraduate degree in physics from the University of California, Los Angeles and a PhD in electrical engineering and computer science from the Massachusetts Institute of Technology.

David Turner, Senior Program Manager, Platforms Product Management, manages the Industry Standards & Leadership team within the Mobile & Embedded Devices Division (MED) at Microsoft. He is responsible for defining MED's standards strategy and leading their engagements within industry standards organizations such as OMA, GSMa, NFC Forum, OMTP and CTIA. David is Microsoft's primary Board member in the NFC Forum, alternate Board member in OMA and a member of the CTIA WIC Leadership Council.

Before working in MED, David was a principal driver of XML and Web services technologies in Microsoft's Developer Platform Division since early 1998 and he was Microsoft's representative to the W3C Advisory Committee for over three years. Prior to joining Microsoft, David shipped a variety of SGML and HTML authoring products and other Internet development tools. In total, he has been working with XML and structured information for over 12 years.

David has a degree in Engineering Science from the University of Western Ontario, Canada.

Dr. Jason Redi received a BS from Lehigh University, and an MS and PhD from Boston University in 1998. He is currently Director, R&D for Mobile Networking at BBN Technologies. He has been the principal investigator on a large number of programs focused on the research, design, and field testing of ad hoc and sensor networks. Recent projects include the first demonstration of ad hoc networks fully utilizing directional antennas, and the first demonstration of an ad hoc network using MIMO technology. Most recently he has been focused on the DARPA Connectionless Networks program which is designing sensor network technology that uses orders of magnitude less energy than current sensor networks.

Dr. Redi is author of over 30 papers and patents in the area of mobile communications. He is the Vice-Chair of ACM SIGMOBILE, General Chair of ACM SenSys, and has been on a wide number of technical program committees including those for MobiCom, MobiHoc, and SECON. He was previously the Editor-in-Chief of ACM Mobile Computing and Communications Review (MC2R), and is on the editorial board of Ad Hoc Networks Journal, Wireless Communications and Networking Journal, and the International Journal of Ad Hoc and Sensor Wireless Networks. Dr. Redi is a senior member of the IEEE, member of ACM, Sigma Xi, Tau Beta Pi, and Order of the Engineer.

Mike Seymour Mike Seymour is the Vice President of Alcatel's Broadband Wireless Division in North America. In this capacity, he is responsible for business development, marketing, strategy and go-to-market plans for all market segments in NA.

He joined Alcatel as a result of Alcatel's acquisition of PacketVideo Network Solutions (pvNS) in 2003 where he held various positions during his tenure, most recently as the Vice President of Engineering and Program Management. In this role, he was responsible for gaining customer acceptance of pvNS products and solutions with top-tier customers.

Mr. Seymour began his career at Motorola as a Systems Engineer supporting Motorola's CDMA Radio Access Network products where he was part of the team that deployed the first CDMA systems in the world.

He received his Bachelor of Science Degree in Electrical Engineering from the University of Iowa.

Dr. Phil Dafesh is the Associate Director of the Digital Communication Implementation Department at The Aerospace Corporation. He has worked at The Aerospace Corporation for 17 years in the areas of signal design, modulator and receiver design, performance assessment, hardware system implementation, reconfigurable electronics, GPS and spread-spectrum systems. He also has experience in electro-optical sensor research, detector design, focal plane array testing and spectroscopic analysis of nanostructure devices, as an MTS in Laboratory Operations and the Sensor Systems Subdivision.

Phil's current work involves management and technical direction of staff involved in the design, assessment and development of next-generation GPS and communication systems including signal structures, digital receivers and transmitters. He also directs efforts in the development and application of reconfigurable transceivers, hardware proof of concepts, GPS modernization, and investigation of advanced signal processing technologies. He has conducted research in software-defined radio technology, signal detection and processing, optical spread spectrum communications and real-time, rapid communication system simulation. Dr. Dafesh has authored or co-authored 29 publications and is the recipient of one patent, 5 invention awards and one ESD individual achievement award for "Leading the Development of the Aerospace Flexible GPS Digital Receiver."

Phil received B.S. degrees from California State Polytechnic University, Pomona in Electrical Engineering and Physics with a math minor. He received M.S. and Ph.D. degrees in Electrical Engineering from UCLA specializing in solid-state device physics, with minors in physics and applied math. He is currently a member of IEEE, ION, Sigma Pi Sigma and Tau Beta Pi.

Thomas Damiani is a private consultant specializing in applications, products, and services related to mobile phone and Global Positioning System (GPS) systems. He has represented clients at global standards bodies developing GPS-based location technology standards, performed market studies focused on the location-related mobile phone regulatory environment, conducted market and system architecture studies concerning application of mobile phone systems to asset tracking and management and advised clients on GPS-related patents.

Prior to beginning a consulting practice, Mr. Damiani spent over thirty years in industry where he held various marketing, product development, program management and technical positions. His GPS experience began in 1975 and has involved civil GPS receivers and components, GPS military receivers, GPS satellites, and mobile phone GPS applications. At Rockwell International he was responsible for commercial GPS marketing activities in the Asia Pacific region, developed product requirements for GPS chipsets and board-level products, managed chipset development activities, led GPS satellite marketing and business development activities, managed an engineering department, and developed GPS real-time navigation software.

Mr. Damiani holds a MSEE from Purdue University, a BS from the University of Minnesota and has done MBA course work at the University of California, Irvine.

Ryan Jones is the Director of Marketing for the Wireless Segment at SiRF Technology. SiRF Technology is a global market leader in driving the creation and consumption of location solutions. As Director of Marketing, Ryan is responsible for defining, marketing and implementing SiRF's worldwide "Location" product strategy aimed at tier 1 and 2 wireless carriers, network infrastructure providers and wireless handset manufacturers. As a 6 year member of SiRF's management team, Ryan has been involved in sales, marketing and business development roles.

Susan Sherwood is an E911 Manager for Verizon Wireless, a position that she has held since 2004. In addition to managing E911 Phase I and II deployments her responsibilities include policy development, and regulatory and legislative support.

From 2001 to 2004 Ms. Sherwood was a Sprint PCS Principle Engineer, leading a project team in deploying the A-GPS handset-based location technology in three FMAs. She also served as the E911 Phase II Deployment Manager and provided E911 regulatory support to the business.
In 1999 and 2000, Ms. Sherwood led an internal Sprint team in the development of product requirements for an E911 Phase II location technology that would satisfy the FCC Report and Order 94-102. She worked closely with the Technology Development in the selection and development of the chosen technology.

Susan Sherwood is a member of ESIF, NRIC, E911 Institute and Chair of the NENA PSAP Service Integration Committee.

Dr. Suman Das is a Member of the Technical Staff in the Wireless Technology Research Department, Bell Laboratories, Lucent Technologies at Murray Hill, NJ. At Bell Labs he has worked on developing a research prototype of a Bell Labs multiple antenna (MIMO-BLAST) based CDMA system. He was one of the primary architects of a base station router with a novel collapsed architecture for next generation cellular radio networks. Currently his research is in the area of 4G wireless system design, distributed MAC algorithms and interference avoidance protocol design.

Dr. Das has published over 25 IEEE conference and journal articles and been author/co-author of 12 patents. He received his undergraduate degree in Computer Science and Engineering from Indian Institute of Technology, Kharagpur in 1994 and his MS and PhD degrees from Rice University, Houston, Texas in 1997 and 2000 respectively.

D. Kent Stevens is a Wireless/Optical Architect with Nortel's Western Region. He has been at Nortel since 1992 and is responsible for emerging technologies like wireless (WiFi, WiMax) and Nortel's industry leading Optical Transport(Sonet/WDM) products supporting the design of many Enterprise Private Build and Carrier Managed Networks.

After receiving his BS in MIS from San Diego State University, Stevens started with Startel Corporation writing system software(Firmware) for an 80x8x Multibus based Analog/Digital ACD. As digital telephony was being introduced into the marketplace, he began work at Rockwell Digital Products supporting the design of numerous system level products using Rockwell TDM Chipsets and was responsible for products (ATM, PRI, Frame Relay, SMDS, T1 interface controllers) homologation tested with most of the Worldwide carriers. Stevens also served in a Pre-Sales Engineering position with Synoptics Communications. His initial role was working as an SE, then Area Switching Specialist with primary responsibilities including Network Design support for the emerging Ethernet Switching and ATM markets.

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SWIFT (Students With an Interest in the Future of Telecommunications) is Cal Poly Pomona's student branch chapter of the IEEE Communications Society. SWIFT is chartered by the College of Business and open to all Cal Poly Pomona students interested in telecommunications and networking. SWIFT was created in 1990 with the objective of enhancing and enriching the students' learning experience and preparing students for careers in the telecommunications and networking industry. Some of the ways in which SWIFT attempts to achieve this objective include: inviting speakers to Cal Poly to discuss the latest technologies, industry practices, and career trends; co-hosting telecommunications and networking seminars and symposia; holding "hands-on" workshops; and hosting social events.

Wireless Telecommunications Symposium Committees

Steven Powell, WTS General Chair Cal Poly Pomona srpowell@csupomona.edu	Thomas Ketseoglou, WTS Assistant Chair Cal Poly Pomona tketseoglou@csupomona.edu
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Dr. Michael Bartolacci. WTS 2007 Co-Chair Pennsylvania State University mrb24@psu.edu	Dr. Katia Passerini, WTS 2007 Co-Chair New Jersey Institute of Technology pkatia@adm.njit.edu
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