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Conference**



ATLANTA 2004



Featuring the
Wireless Exhibition

A D V A N C E P R O G R A M

Omni Hotel at CNN Center
Atlanta, Georgia, USA
September 19-22, 2004

<http://www.rawcon.org>

General Co-Chairs:

J. Stevenson Kenney, *Georgia Institute of Technology*
Ke Wu, *Ecole Polytechnique de Montreal*

Technical Program Co-Chairs:

Mohammad Madihian, *NEC Laboratories America, Inc.*
Xiaodong Wang, *Columbia University*

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IEEE Microwave Theory and Techniques Society (MTT-S)
IEEE Communications Society (ComSoc)



IEEE





Keynote Address

Don't miss the opening session of the Conference, featuring our keynote speaker, Dr. Al Javed, Vice President of Wireless Networks Technology, Nortel Networks.

"Perceptions of Future Wireless Networks"

Third Generation Wireless Networks are finally beginning to be deployed commercially around the world this year. These networks are extending voice services to multimedia services. This presentation will address design challenges faced by systems beyond 3G, as well as, new and emerging wireless technologies which will enable us to meet those challenges, including the evolution towards fully broadband networks and techniques for making these broadband networks very flexible and offer context and content aware multimedia communications services.

Poster/Exhibition Reception

Monday, September 20, 2004

On Monday evening, please join us from 5:00 to 7:00 PM for a Welcome Reception, held in conjunction with the Monday Poster Session and the opening of the expanded Wireless Exhibition of wireless products and services.

Conference Banquet

On Monday evening at 7:00 PM, following the opening of the Poster Session, Exhibition and Reception, you are invited to the conference Banquet, followed at 8:15 PM by an address by Prof. David J. McLaughlin, Director of the NSF Center for Collaborative Adaptive Sensing of the Atmosphere, at the University of Massachusetts, Amherst. The title of Prof. McLaughlin's talk is "Distributed Collaborative Adaptive Sensing: A new paradigm for detecting and predicting atmospheric hazards".

Monday, September 20, 2004

1:00 PM

Opening Remarks

J. Stevenson Kenney, General CoChair

1:20 PM

Keynote Address: "Perceptions of Future Wireless Networks."

Dr. Al Javed, Vice President of Wireless Networks Technology, Nortel Networks, USA

Session M1 3:00 PM – 5:00 PM

Enabling Technologies for the Next Generation Radio and Wireless Communications

Chair: Mohammad Madhian, NEC Laboratories America, Inc.
Co-Chair: Xiaodong Wang, Columbia University

M1.1 3:00 PM

Radios for Next Generation Wireless Networks (invited)

Reza Rofougaran, Broadcom, Irvine, CA, USA

M1.2 3:30 PM

Multiple Antenna Wireless Systems: A Disruptive Technology Enabling Very High Spectral Efficiency Beyond Conventional Limits (invited)

Reinaldo Valenzuela, Bell Laboratories - Lucent Technologies, Whippany, NJ, USA

M1.3 4:00 PM

Transmit Pre-Coding for MIMO Wireless (invited)

Arogyaswami Paulraj, Stanford University, Stanford, CA, USA

M1.4 4:30 PM

Wireless Sensor and Actor Networks: State-of-the-Art and Challenges (invited)

Ian F. Akyildiz, Georgia Institute of Technology, Atlanta, GA, USA

Poster Session P1 5:00 PM – 7:00 PM

Chair: Ke Wu, Ecole Polytechnique de Montreal

P1.1

Space-Time Block Code for the MIMO-OFDM System

K. Kim, J. Son, T. Reid, Nokia Research Center, Irving, TX, USA

P1.2

A Multistage Quasi-Orthogonal Minimum Output Energy Multiuser Detector for CDMA Systems

M. M. Abd-El Aziz*, S. H. El-Ramly†, *The Cabinet-Information and Decision Support Center, Giza, Egypt, †Ain Shams University, Cairo, Egypt

P1.3

Fast Constant Modulus Algorithm in the DFT Domain

Y. Yang*, C. Park†, *The Univ. of Suwon, Whasung, Korea, †The Univ. of Suwon, Whasung, Korea

P1.4

High Speed Equalizer for GSM/GPRS

N. V. Gottimukkala, P. Garapati, P. Jinuga, V. Gadesina, Hellosoft (India) Pvt. Ltd, Hyderabad, India

P1.5

Novel Optimum Reduced Search MLSE Decoding Algorithm Enabling System-aware Power Savings

A. Wellig*,††, J. Zory†, N. When††, *STMicroelectronics, Geneva, Switzerland, †STMicroelectronics, Geneva, Switzerland, ††University of Kaiserslautern, Kaiserslautern, Germany

P1.6

Fast Bit and Power Allocation Algorithm for OFDM Systems

S. Lee, Y. Park, D. Park, KAIST, Daejeon, Republic of Korea

P1.7

Error Vector Magnitude of OFDM Signals Caused by Sampling Clock Jitter

N. Ando, R. Hayashi, M. Simozawa, T. Takagi, Mitsubishi Electric Corporation, Kamakura, Japan

P1.8

Adaptive Compensation of Nonlinear Distortion in Multicarrier Direct-Conversion Receivers

W. A. Shahed, M. Valkama, M. Renfors, Tampere University of Technology, Tampere, Finland

P1.9

Cluster-Based Location Routing Algorithm for Vehicle to Vehicle Communication

R. Aquino*, R. M. Edwards*, A. Edwards†, *University of Sheffield, Sheffield, United Kingdom, †University of Colima, Colima, Mexico

P1.10

Implementation of the Integrated Network and Link Control Functions for Multi-hop Mesh Networks in Broadband Fixed Wireless Access Systems

Y. Kishi, K. Tabata, T. Kitahara, Y. Imagawa, A. Idoue, S. Nomoto, KDDI R&D Laboratories, Inc., Kamifukuoka, Japan

P1.11

Surface Acoustic Wave Sensors: Attributes and Advantages

P. J. Edmonson*, W. D. Hunt†, *P.J. Edmonson Ltd., Hamilton, Canada, †Georgia Institute of Technology, Atlanta, GA, USA

P1.12

Minimum Traffic Inter-BS SHO Boundary Selection Algorithm for CDMA-Based Wireless Networks

M. H. Abu-Amara, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

P1.13

Modeling Radiowave Scattering by an Elliptical Cylinder and Its Applications in Communications and Imaging

X. Huang*, B. Chen*, H. Cui*, R. Pastore†, M. Farwell†, *Stevens Institute of Technology, Hoboken, NJ, USA, †U.S. Army CECOM-RDEC, Fort Monmouth, NJ, USA

P1.14

Performance Evaluation of an Ultra Wideband Radiolocation System with Directional Beacon

W. Chung*, D. S. Ha*, D. Ni†, *Virginia Tech, Blacksburg, VA, USA, †NASA Johnson Space Center, Houston, TX, USA

P1.15

HW Accelerated Ultra Wide Band MAC Protocol using SDL and SystemC

M. Haroud*, L. Blazevic*, A. Biere†, *STMicroelectronics, Plan-les-ouates, Switzerland, †Swiss Federal Institute of Technology, Zurich, Switzerland

P1.17

A 1-8 GHz MMIC Down-Conversion Mixer with Input/Output Active Baluns using SiGe HBT Process

S. Lee, J. Lee, S. Lee, C. W. Park, J. Kang, Electronics and Telecommunications Research Institute, Daejeon, South Korea

P1.18

Effects of Microwave Switch Isolation on a Butler Matrix Beam-forming Network in Smart Antenna Systems

K. U-yen, M. Ahn, J. S. Kenney, Georgia Institute of Technology, Atlanta, GA, USA

P1.19

Multi-Slice Behavioral Model of RF Systems and Devices

A. L. Walker, M. B. Steer, K. Gard, K. Gharaibeh, North Carolina State University, Raleigh, NC, USA

P1.20

A Fully Embedded LTCC Stripline Parallel Coupled BPF for 40 GHz BMWs Application

Y. H. Cho*, Y. C. Lee*, C. S. Park*, J. W. Lee†, M. S. Song†, *Information and Communications(ICU), Daejeon, Korea, †Electronics and Telecommunications Research Institute(ETRI), Daejeon, Korea

P1.21

A Low Power Wide Band CMOS VCO for Multi-Standard Radios

A. Fard, T. Johnson, D. Aberg, Mälardalen University, Västerås, Sweden

P1.22

The Impact of Nonlinear Amplifier Distortion on the Performance of CDMA Systems

K. M. Gharaibeh, K. G. Gard, M. B. Steer, North Carolina State University, Raleigh, NC, USA

P1.23

Experimental Characterization of LINC Outphasing Combiners' Efficiency and Linearity

G. Poitau, A. Birafane, A. Kouki, Ecole de Technologie Supérieure, Montreal, Canada

P1.24

A Voltage Controlled Oscillator Using Barium Strontium Titanate (BST) Thin Film Varactor

A. M. Victor*,†, J. Nath*,†, D. Ghosh*,†, B. Boyette*,†, J. P. Maria*,†, A. I. Kingon*,†, M. B. Steer*,†, G. T. Stauff*,†, *North Carolina State Univ., Raleigh, NC, USA, †ATMI Inc., Danbury, CT, USA

P1.25

Equivalent Circuit Model of On-Wafer Interconnects for CMOS RFICs

X. Shi*, J. Ma*, B. Ong*, K. Ye*, M. Do*, E. Li*,†, *Nanyang Technological University, Singapore, Singapore, †Institute of High Performance Computing(IHPC), Singapore, Singapore

P1.26

An Analysis of Small-Signal Source-Body Resistance Effect on RF Power MOSFETs for 5-GHz Band WLAN Applications

Y. Lin, J. Yeh, S. Chen, National Chi-Nan University, Puli, Nantou, Taiwan, R.O.C.

P1.27

Temperature-Dependence of Noise Figure of Monolithic RF Transformers on a Thin (20 μm) Silicon Substrate

Y. Lin, T. Wang, S. Lu, National Chi-Nan University, Puli, Nantou, Taiwan, R.O.C.

Tuesday, September 21, 2004

Session T1A 8:00 AM - 9:50 AM
Wireless Communications and Smart Antenna Techniques

Chair: Mary Ann Ingram, *Georgia Institute of Technology*
Co-Chair: Geoffrey Li, *Georgia Institute of Technology*

T1A.1 8:00 AM
Layered Matrix Modulation (invited)
J. Terry, *Nokia Research Center, Irving, TX, USA*

T1A.2 8:30 AM
Performance of Coherent Receivers with Hybrid Selection/Equal-Gain Combining
C. D. Iskander, *Florida Atlantic University, Boca Raton, FL, USA*

T1A.3 8:50 AM
Real-time Interference Nulling Method for Mobile Communication Systems
L. Maraccioli, R. Vincenti Gatti, R. Sorrentino, *University of Perugia, Perugia, Italy*

T1A.4 9:10 AM
Five-Port Receiver for High Rates 16QAM Modulation in the Ka-band
S. Abou Chakra, B. Huyart, *ENST, Paris, France*

T1A.5 9:30 AM
Dipole-Array Assisted Doppler Spread Compensator for Mobile Digital Terrestrial Television Broadcasting Receiver
Y. Yu, M. Okada, H. Yamamoto, *NAIST, Ikoma, Japan*

Session T1B 8:00 AM - 9:50 AM
Active Front-End Subsystems

Chair: Afshin S. Daryoush, *Drexel University*
Co-Chair: Edmar Camargo, *Fujitsu Compound Semiconductor*

T1B.1 8:00 AM
THz Semiconductor-Based Front-End Receiver Technology for Space Applications (invited)
I. Mehdí, P. Siegel, *Jet Propulsion Laboratory, Pasadena, CA, USA*

T1B.2 8:30 AM
Wideband Impedance Matching of Integrated Antennas and CMOS Low Noise Amplifiers for a Multi-Band UWB Receiver
S. Chung, K. Park, *Korea Advanced Institute of Science and Technology, Daejeon, Korea*

T1B.3 8:50 AM
A 60 GHz Transceiver with Multi-Gigabit Data Rate Capability
B. Bosco, S. Franson, R. Emrick, S. Rockwell, J. Holmes, *Motorola Labs, Tempe, AZ, USA*

T1B.4 9:10 AM
Miniature Fully-integrated Wireless-LAN Frontend-Modules Based on LTCC Technology
P. Heide, A. Chernyakov, *EPCOS AG, Munich, Germany*

T1B.5 9:30 AM
4-bit Flash ADC in InP-HBT Technology Using Distributed Resistor Ladder
M. Mokhtari, J. F. Jensen, T. S. Kaplan, C. H. Fields, D. F. McLaughlin, W. W. Ng, *HRL Laboratories LLC, Malibu, CA, USA*

Session T2A 10:00 AM - 11:50 AM
MIMO Communication: RF and Calibration Issues

Chair: Robert W. Heath Jr., *The University of Texas at Austin*
Co-Chair: Jeff Zhuang, *Motorola Labs*

T2A.1 10:00 AM
RF and Algorithmic Considerations for Practical MIMO Wireless Implementation (invited)
M. A. Jensen, J. W. Wallace, *Brigham Young University, Provo, UT, USA*

T2A.2 10:30 AM
OFDM-MIMO WLAN BS Front-end Gain and Phase Mismatch Calibration
J. Liu*, †, A. Bourdoux*, J. Craninckx*, P. Wambacq*, B. Côme*, S. Donnay*, A. Barel†, *IMEC, *Leuven, Belgium*, †VUB, *Brussels, Belgium*

T2A.3 10:50 AM
Simulation of the Achievable Indoor MIMO Capacity by Using an Adaptive Phased-Array
M. S. Elnaggar, S. Safavi-Naeini, S. K. Chaudhuri, *University of Waterloo, Waterloo, Canada*

T2A.4 11:10 AM
Impact of Front-end Effects on the Downlink Performance of OFDM-MIMO Transceivers
J. Liu* †, A. Bourdoux*, J. Craninckx*, B. Côme*, P. Wambacq*, S. Donnay*, A. Barel†, *IMEC, *Leuven, Belgium*, †VUB, *Brussels, Belgium*

T2A.5 11:30 PM
OFDM WLAN System Utilizing Smart Antenna DBF-IC for Mobile Terminal
K. Sato, K. Akita, T. Kogawa, K. Ito, *Toshiba Corporation, Kawasaki, Japan*

Session T2B 10:00 AM - 11:50 AM
High-Efficiency, Multi-mode Transmitter Architectures

Chair: Jan-Erik Mueller, *Infineon Technology*

Co-Chair: Chul Soon Park, *School of Engineering, Information and Communication University*

T2B.1 10:00 AM
Advanced Architectures for High-Efficiency Multi-mode, Multi-band Terminal Power Amplifiers (invited)
E. W. McCune, *Troplan, Cupertino, CA, USA*

T2B.2 10:30 AM
A Novel Wideband Digital Power Amplifier and Transmitter Architecture for Multimode Handsets
P. Nagle†, R. M. Hussein*, A. Grebennikov†, W. K. Ahmed*, F. McGrath*, *M/A-COM, *Tyco Electronics, Somerset, U.S.A.*, †M/A-COM, *Tyco Electronics, Cork, Ireland*

T2B.3 10:50 AM
A New Envelope Predistortion Linearization Architecture for Handset Power Amplifiers
W. Woo, J. S. Kenney, *Georgia Institute of Technology, Atlanta, GA, U.S.A.*

T2B.4 11:10 AM
Correlation Techniques for Estimation of Amplifier Nonlinearity
M. Li, I. Galton, L. E. Larson, P. M. Asbeck, *University of California, San Diego, La Jolla, CA, USA*

T2B.5 11:30 AM
Fast and Accurate ACLR Estimation Method
L. Sundström, *Ericsson Mobile Platforms AB, Lund, Sweden*

Lunch 12:00 PM - 1:00 PM

Session T3A 1:00 PM - 2:50 PM
Wireless Sensing and Positioning

Chair: Robert Weigel, *University of Erlangen-Nuremberg*
Co-Chair: Mehdi Shadaram, *University of Texas at San Antonio*

T3A.1 1:00 PM
Passive Wireless Strain and Temperature Sensors Based on SAW Devices (invited)
V. A. Kalinin, *Transense Technologies plc, Bicester, UK*

T3A.2 1:30 PM
Remote Local Positioning Radar
L. Wiebking*, M. Christmann*, D. Mastela†, M. Glaenzert†, *Siemens AG, *Munich, Germany*, †University of Freiburg, *Freiburg, Germany*

T3A.3 1:50 PM
Local Positioning for Wireless sensors Based on Bluetooth™
J. G. Castano, M. Svensson, M. Ekström, Y. Bäcklund, *University of Mälardalen, Västerås, Sweden*

T3A.4 2:10 PM
Low End Extension for Bluetooth
M. Honkanen*, A. Lappeteläinen†, K. Kivekäs†, *Nokia Research Center, *Tampere, Finland*, †Nokia Research Center, *Helsinki, Finland*

T3A.5 2:30 PM
Spiral Chip Implantable Radiator and Printed Loop External Receptor for RF Telemetry in Bio-Sensor Systems
R. N. Simons*, D. G. Hall†, F. A. Miranda*, *NASA Glenn Research Center, *Cleveland, OH, USA*, †ZIN Technologies, *Inc., Brook Park, OH, USA*

Session T3B 1:00 PM - 2:50 PM
RF Circuits for Next Generation Multi-Band/Broad-Band Communication Systems

Chair: Noriharu Suematsu, *Mitsubishi Electric*
Co-Chair: Norman Chiang, *Teledyne Technologies*

T3B.1 1:00 PM
Implementation and Performance of a Multi-band Transceiver for Software Defined Radio (invited)
K. Araki, T. Nakagawa, M. Kawashimi, K. Kboayashi, K. Akabane, H. Shiba, H. Hayashi, *NTT Network Innovation Laboratories, NTT Corporation, Yokosuka-shi, Japan*

T3B.2 1:30 PM
0.8-5.2GHz Band SiGe-MMIC Q-MIX for a Multi-Band Multi-Mode Direct Conversion Receiver
C. Kageyama, K. Nakajima, K. Tsutsumi, E. Taniguchi, M. Shimozawa, N. Suematsu, *Mitsubishi Electric Corporation, Kanagawa, Japan*

T3B.3 1:50 PM
A SiGe BiCMOS Ultra Wide Band RFIC Transmitter Design for Wireless Sensor Networks
J. Zhao, A. Narayanan, C. Masey, S. Raman, *Virginia Tech, Blacksburg, VA, USA*

T3B.4 2:10 PM
1.2V CMOS 1-10GHz Traveling Wave Amplifiers Using Coplanar Waveguides as On-Chip Inductors
K. Bhattacharyya, T. Szymanski, *McMaster University, Hamilton, Canada*

T3B.5 2:30 PM
The Temperature Dependency of a GaAs pHEMT Wideband IQ Modulator IC
K. Ihara†, *Agilent Technologies, *Santa Rosa, USA*, †TRDA, *Inc, San Diego, CA, USA*

Session T4A 3:00 PM - 5:00 PM
Passive Front-End Components

Chair: Aly Fathy, *The University of Tennessee*
Co-Chair: Ahmad Khanifar, *Powerwave Technologies*

T4A.1 3:00 PM
A Compact 30 GHz Low Loss Balanced Hybrid Coupler Fabricated Using Micromachined Integrated Coax
R. T. Chen*, E. R. Brown†, R. S. Singh†, *Microfabrica Inc., *Burbank, USA*, †University of California, *Los Angeles, CA, USA*

T4A.2 3:20 PM
New Type of Band-Pass Filter Using Higher Mode Strip Line for Millimeter Wave Integrated Circuits (invited)
F. Kuroki*, S. Nishida†, *Kure Nat'l Coll of Tech, *Kure, Japan*, †Emeritus Prof. of Tohoku Univ, *Sendai, Japan*

T4A.3 3:40 PM
Novel CMOS Low-Loss Transmission Line Structure
J. Kim, B. Jung, R. Harjani, *University of Minnesota, Minneapolis, MN, USA*

T4A.4 4:00 PM
Equivalent Circuit Design of Multilayer Parallel-Coupled Line Filter
G. Sung, D. Yeo, *Hankyong National University, Ansung, Korea*

T4A.5 4:20 PM
A Novel Electromagnetic Bandgap (EBG) Structure for Mixed-Signal System Applications
J. Choi, V. Govind, M. Swaminathan, *Georgia Institute of Technology, Atlanta, GA, USA*

T4A.6 4:40 PM
Experimental Investigation of a Compact Aperture-coupled Multilayer Bandpass Filter for Wireless Systems
A. Djaiz, T. Denidni, *University Of Quebec, Montreal, Canada*

Session T4B 3:00 PM - 4:50 PM
UWB Technology

Chair: Hauping Liu, *Oregon State University*
Co-Chair: Richard Yao, *Microsoft Research Asia*

T4A.1 3:00 PM
A Decision Feedback Autocorrelation Receiver for Pulsed Ultra-Wideband Systems (invited)
S. Zhao, H. Liu, *Oregon State University, Corvallis, OR, USA*

T4A.2 3:30 PM
The Impact of Ultrawideband Emissions on cdma2000 Forward Link Performance
M. P. Green*, P. Wang†, *Nokia Research Center, *Pomona, CA, USA*, †Nokia Research Center, *Irving, PA, USA*

T4A.3 3:50 PM
A Reduced-Complexity ML Multi-User Detector for Dispersive UWB Signal Based on Combined Stack and Viterbi Trellis Search
W. Xu, Z. Chen, Z. Guo, R. Yao, *Microsoft Research Aisa, Beijing, P.R. China*

T4A.4 4:10 PM
Cyclostationarity Based Air Interface Recognition for Software Radio Systems
M. Oner, F. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

T4A.5 4:30 PM
UWB Communication using SAW Correlators
R. W. Brocato, E. J. Heller, J. R. Wendt, J. D. Blaiich, G. A. Wouters, G. D. Omdahl, D. W. Palmer, *Sandia National Laboratories, Albuquerque, NM, USA*

Poster Session P2, 5:00 PM - 7:00 PM

Chair: J. Stevenson Kenney, *Georgia Institute of Technology*

P2.1
Uplink Spectral Efficiency of Multiuser Distributed MIMO-CDMA Systems using Loosely Synchronised Spreading Codes
Z. Ni, D. Li, *Beijing University of Posts and Telecommunications, Beijing, China*

P2.2
On the Error Probability Performance of STBC under Correlated Rayleigh Fading
A. Maaref, S. Aissa, *INRS-EMT, Montreal, Canada*

P2.3
Cyclostationarity-Based Methods for the Extraction of the Channel Allocation Information in a Spectrum Pooling System
M. Oner, F. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

P2.4
Monte Carlo Estimation of Time Mismatch Effect in an OFDM EER Architecture
J. Bercher, A. Diet, C. Berland, G. Baudoin, M. Villegas, *ESYCOM-ESIEE, Noisy le grand, France*

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The conference room rate is \$155.00, Single/Double. (Please include \$176.70 for 1st night room and tax). This rate is available through July 17, 2004. The event name is **IEEE RAWCON 2004**. We strongly invite you to register on-line at <http://www.rawcon.org>.

Poster/Exhibition Reception

Tuesday September 21, 2004
5:30 - 7:00 PM

On Tuesday evening, please join us from 5:30 to 7:00PM for a reception, held in conjunction with the Tuesday Poster Session and the Wireless Exhibition of wireless products and services. Immediately following the Reception, we will proceed to the Panel Session and Buffet Dinner – **CAD Software for Wireless Technology – Where Are We?**, hosted by Wolfgang J. R. Hoefler of University of Victoria, BC, Canada.

Exhibition

Radio and Wireless 2004 includes an expanded Wireless Exhibition featuring wireless products and services. Exhibition hours are Monday 5PM - 7PM in conjunction with the Welcome Reception, Tuesday 7AM - 7PM, Poster/Exhibition Reception 5:00PM - 7:30PM and Wednesday 9AM - 3PM. For more information on availability of booth and tabletop spaces, please contact Kristen Dednah at Horizon House Publications, Inc. kdednah@horizonhouse.com or +1-781-769-9750.

P2.5
Comparative Performance of Hierarchical Cell Architectures
J. B. de Marca, T. T. Vinhoza, *PUC/Rio, Rio de Janeiro, Brazil*

P2.6
A Simple OFDM Diversity Receiver based on Antenna Combining
Y. Yu, M. Suzuki, N. Aoyama, M. Okada, H. Yamamoto, *NAIST, Ikoma, Japan*

P2.7
An Efficient Software-based Implementation of a Joint-Detection/Spatial Processing Receiver for TD-SCDMA
P. Aberl, S. MacMullan, *Texas Instruments, Dallas, TX, USA*

P2.8
EVM Degradation in Edge Two Point Modulation Scheme due to Quantization Effects
G. Avitabile, N. Lofu, *Politecnico di Bari, Bari, Italy*

P2.9
Passive (Zero DC Power) Sensors Using RF Backscatter
S. Mukherjee, *Wireless Dynamics Inc., Palo Alto, CA, USA*

P2.10
Protocol Support for Audio Streaming between Bluetooth Devices
S. Zeadally, A. Kumar, *Wayne State University, Detroit, MI, USA*

P2.11
A CDMA Scheduling Protocol Based on Ants Algorithm for Wireless Multimedia Networks
Z. Li, Y. Zhu, *Dalian Maritime University, Dalian, China*

P2.12
TCP/IP Throughput over an Outdoor Multi-Hop Wireless LAN
F. M. Aziz, B. D. Woerner, *Mobile & Portable Radio Research Group (MPRG), Blacksburg, VA, USA*

P2.13
Three-Frequency Principle for Automotive Radar System
H. Zhang, J. Gagne, K. Wu, *Poly-GRAMES Research Center, Montreal, Canada*

P2.14
Design and Implementation of a Bluetooth Signal Strength Based Location Sensing System
U. Bandara*, †, M. Hasegawa*, M. Inoue†, H. Morikawa††, ‡, T. Aoyama*, **The University of Tokyo, Bunkyo-ku, Japan*, †*Communications Research Laboratory, Yokosuka, Japan*, ††*The University of Tokyo, Bunkyo-ku, Japan*

P2.15
An Energy Adaptive Demodulation for High Data Rates with Impulse Radio
S. Paquelet*, L. Aubert*, †, **Mitsubishi Electric ITE, Rennes, France*, †*ETR - INSA, Rennes, France*

P2.16
Novel Wide-Band Coplanar Antenna for MIMO Communication System
W. Jiang, Y. C. Liu, Z. Q. Kuai, X. W. Zhu, *Southeast University, Nanjing, China*

P2.17
Dielectric Waveguide Structures with Surface – Control Impedance
S. S. Gigoyan†, K. Wu†, **Armenian Ac. Sci., Ashtarak, Armenia*, †*Polygrammes Research Center, Montreal, Canada*

P2.18
An IC Based Self-Oscillating Mixer for Telecommunications
M. Tofighi†, A. Daryoush*, †, **Drexel University, Philadelphia, USA*, †*GEMS Inc., Bryn Mawr, PA, USA*

P2.19
Two-Layer Elliptic Filters With Enhanced Bandwidth
R. Wu, S. Amari, *Royal Military College of Canada, Kingston, Canada*

P2.20
IC Based Broadband Digital Receiver for 4G Wireless Communications
L. Zhou, S. Shetty, R. Spring, H. Ariak, W. Zheng, J. Hyun, M. Tofighi, A. Daryoush, *Drexel University, Philadelphia, PA, USA*

P2.21
Novel Control Architecture for IPHEMT Power Amplifiers achieving High Efficiency EDGE Application
L. Albasha, J. C. Clifton, I. Stubbs, A. Lawrenson, A. Eaton, T. Poon, C. Mariella, *Sony Semiconductors and Electronic Solutions, Basingstoke, UK*

P2.22
Truly Balanced Step Recovery Diode Pulse Generator with Single Power Supply
P. Rulikowski, J. Barrett, *Cork Institute of Technology, Cork, Ireland*

P2.23
A MMIC Smart Power Amplifier with On-Chip Dynamic Bias Controller for WCDMA Mobile Communication
Y. H. Choi, K. Y. Kim, J. H. Kim, Y. S. Noh, C. S. Park, *Information and Communications University(ICU), Daejeon, Korea*

P2.24
Power Amplifier Linearization with Memory Effects Using Digital Pre-distortion and Genetic Algorithms
R. Sperlich*, J. A. Sill†, J. S. Kenney*, **Georgia Institute of Technology, Atlanta, USA*, †*Khi Metrics Inc., Scottsdale, AZ, USA*

P2.25
A Novel Bias Circuit and MMIC Power Amplifier Implementation for W-CDMA Mobile Handsets
Y. Noh*, †, J. Park†, C. Park*, **Information and Communications University (ICU), Daejeon, Korea*, †*Electronics and Telecommunications Research Institute (ETRI), Daejeon, Korea*

P2.26
Design and Analysis of a Low-power Constant Envelope Phase Shift Modulator
X. Yang, J. Lin, K. K. O, J. Brewer, *University of Florida, Gainesville, FL, USA*

Wednesday, September 22, 2004

Session W1A 8:00 AM - 9:40 AM
MIMO Communication: Handset Diversity and Implementation
Chair: Kapil Dandekar, *Drexel University*
Co-Chair: Mary Ann Ingram, *Georgia Institute of Technology*

W1A.1 8:00 AM
Mobile Receive Diversity for cdma2000 (3G) Systems
S. Z. Asif, *Sprint, Overland Park, KS, U.S.A.*

W1A.2 8:20 AM
Performance Evaluation of 2D Rake Algorithms for WCDMA-DL Applications at the Handset
R. Mostafa*, P. Khanna*, W. Chung†, J. Heo††, J. H. Reed*, D. S. Ha†, **MPRG Lab, Blacksburg, USA*, †*TVT Lab, Blacksburg, USA*, ††*Information & Communication Business, Suwon-Si, South Korea*

W1A.3 8:40 AM
Direction-of-Transmission Estimation in Multiple-Input Single-Output Wireless Communication Systems
W. Lee, *University of Arkansas, Fayetteville, AR, USA*

W1A.4 9:00 AM
Design and Implementation of a Lattice Decoder for MIMO Systems
J. Ma, X. Huang, *University of New Orleans, New Orleans, LA, USA*

W1A.5 9:20 AM
A New Fast Sub-Optimum Search Method for Closed-Loop Transmit Diversity System with Limited Number of Feedback Bits
S. Ip, Z. Zhang, S. Cheung, T. Yuk, *The University of Hong Kong, Hong Kong, China*

Session W1B 8:00 AM - 9:50 AM
Wireless Channel and Signal Reception
Chair: Mehdi Shadaram, *University of Texas at San Antonio*
Co-Chair: Mohammad Madhian, *NEC Laboratories America, Inc.*

W1B.1 8:00 AM
Antenna Selection with RF Pre-Processing: Robustness to RF and Selection Non-Ideality (invited)
P. Sudarshan*, N. B. Mehta†, A. F. Molisch†, J. Zhang†, **North Carolina State University (NCSU), Raleigh, NC, USA*, †*Mitsubishi Electric Research Labs, Cambridge, MA, USA*

W1B.2 8:30 AM
Novel Mitigation Techniques for OFDM in a Doppler Spread Channel
P. Chayratsami, M. A. Wickert, *University of Colorado at Colorado Springs, Colorado Springs, CO, USA*

W1B.3 8:50 AM
Estimation of Noise plus Interference Power in Adaptive Wireless OFDM Systems
S. B. Reddy, H. Arslan, *University of South Florida, Tampa, FL, USA*

W1B.4 9:10 AM
Seasonal Variations in Path Loss in the 3.7 GHz Band
M. Batarie, T. K. Blankenship, J. Kepler, T. P. Krauss, *Motorola Labs, Schaumburg, IL, USA*

W1B.5 9:30 AM
Measurement-Based Modeling of a 5 GHz WLAN Transmitter
A. P. Webster, J. Liu, L. P. Dunleavy, H. Arslan, *University of South Florida, Tampa, FL, USA*

Session W2A 10:00 AM – 12:00 PM
Antennas for Wireless Communications
Chair: Wee Sang Park, *POSTECH*
Co-Chair: Saieddin Safavi-Naeini, *University of Waterloo*

W2A.1 10:00 AM
Propagation Characteristics of International Space Station Wireless Local Area Network
S. U. Hwu*, Y. Loh*, C. C. Sham†, L. L. Hood†, **Lockheed Martin, Houston, TX, USA*, †*NASA/JSC, Houston, TX, USA*

W2A.2 10:20 AM
Throughput Improvement in Interference Limited Multipath Environments using a Ferroelectric Smart Antenna for IEEE 802.11b WLAN
M. Ahn, D. Kim, J. S. Kenney, *Georgia Institute of Technology, Atlanta, GA, USA*

W2A.3 10:40 AM
Monopole Antenna Array Arrangement for Card-type Mobile Terminal
Y. Okano, K. Cho, *University NTT DoCoMo, Inc., Yokosuka-shi, Japan*

W2A.4 11:00 AM
Novel Very Small Dual-Band Chip-Size Antenna for Wireless Sensor Networks
P. M. Mendes*, J. M. Bartek†, J. N. Burghartz†, J. H. Correia*, **University of Minho, Guimarães, Portugal*, †*Delft University of Technology, Delft, Netherlands*

W2A.5 11:20 AM
A Compact Slot Antenna Array for Digital Beamforming and MIMO Applications
S. Kim, Y. E. Wang, *University of California, Los Angeles, Los Angeles, CA, USA*

W2A.6 11:40 AM
An Integrated Antenna for Pulse Modulation and Radiation
W. Yao, Y. Wang, *University of California, Los Angeles, Los Angeles, CA, USA*

**Session W2B 10:00 AM – 11:50 AM
Advanced RF Power Amplification and Signal Generation Techniques**

Chair: Earl McCune, *Tropian Inc.*
Co-Chair: Jan-Erik Mueller, *Infineon Technology*

W2B.1 10:00 AM
Status and Potential for CMOS Terminal PAs (invited)
D. Leenaerts, G. Grillo, *Philips Research, Eindhoven, Netherlands*

W2B.2 10:30 AM
A Linearized Doherty Amplifier Using Complex Baseband Digital Predistortion Driven by CDMA Signals
O. Hammi, S. Bousnina, F. M. Gahnouchi, *Ecole Polytechnique Montreal, Montreal, Canada*

W2B.3 10:40 AM
Available Load Power in a RF Class D Amplifier with a Sigma-Delta Modulator Driver
T. E. Johnson, S. Stapleton, *Simon Fraser University, Burnaby, Canada*

W2B.4 11:10 AM
Phase Noise Measurement of Free-Running VCO Using Spectrum Analyzer
C. Yuen, K. Tsang, *City University of Hong Kong, Hong Kong, China*

W2B.5 11:30 AM
Low-Cost RF and Microwave Source Design Using Substrate Integrated Waveguide Technique
J. E. Mojiča, Y. Cassivi, K. Wu, *Poly-Grames Research Center École Polytechnique de Montréal, Montréal, Canada*

Lunch 12:00 PM - 1:00 PM

**Session W3A 1:00 PM - 2:50 PM
Broadband Sensor Network Applications**

Chair: Linus Maurer, *DICE GmbH & CoKG, Austria*
Co-Chair: Clemens Ruppel, *EPCOS*

W3A.1 1:00 PM
Self Organization of Wireless Sensor Networks Using Ultra-Wideband Radios (invited)
F. Nekoogar, F. Dowla, A. Spiridon, *Lawrence Livermore National Laboratory, Livermore, CA, USA*

W3A.2 1:30 PM
A Method for Distributed Medium Access in Ultra Wideband Ad Hoc and Sensor Networks
N. J. August, H. Lee, D. S. Ha, *Virginia Tech, Blacksburg, VA, USA*

W3A.3 1:50 PM
UWB Positioning for Wireless Embedded Networks
K. Yu, I. Oppermann, *University of Oulu, Oulu, Finland*

W3A.4 2:10 PM
An Adaptive Load Balancing in Multi-hop Mesh Networks for Broadband Fixed Wireless Access Systems
T. Kitahara, Y. Kishi, Y. Imagawa, K. Tabata, S. Nomoto, A. Idoue, *KDDI R&D Laboratories, Inc., Kamifukuoka, Japan*

W3A.5 2:30 PM
Average Synchronization Time in DSSS Sensor Array Networks
R. E. Ziemer, M. A. Wickert, *University of Colorado at Colorado Springs, Colorado Springs, CO, USA*

**Session W3B 1:00 PM - 2:50 PM
RF Building Blocks for Wireless Communication Terminals**

Chair: Herbert Zirath, *Chalmers University of Technology*
Co-Chair: Kenjiro Nishikawa, *NTT*

W3B.1 1:00 PM
Overview of the Evolution in PLL Synthesizers Used in Mobile Terminals (invited)
K. Itoh, M. Uesugi, S. Murakami, H. Joba, *Mitsubishi Electric, Amagasaki, Japan*

W3B.2 1:30 PM
A 2.4GHz Fully CMOS RF Transceiver for 802.11b Wireless LAN Application
W. Kong, *University of Maryland at College Park, College Park, MD, USA*

W3B.3 1:50 PM
Linearity Analysis of SiGe HBT Amplifiers Using a Power-Dependent Coefficient Volterra Technique
J. Deng, P. Gudem, L. E. Larson, *University UC, San Diego, La Jolla, CA, USA*

W3B.4 2:10 PM
A 3.3V Operation Single HBT MMIC Power Amplifier For 2.4GHz/5GHz Dual-Band WLAN Applications
Y. Noh*, J. Kim*, J. Park†, C. Park*, **Information and Communications University (ICU), Daejeon, Korea*, †*Electronics and Telecommunications Research Institute (ETRI), Daejeon, Korea*

W3B.5 2:30 PM
High Dynamic Range Transient Simulation of Microwave Circuits
S. Luniya*, M. B. Steer*, C. Christoffersen†, **North Carolina State University, Raleigh, NC, USA*, †*Lakehead University, Thunder Bay, Canada*

**Session W4A 3:00 PM - 4:40 PM
CDMA for Wireless Systems**

Chair: George Heiter, *Heiter Microwave Consulting*
Co-Chair: Xiaodong Wang, *Columbia University*

W4A.1 3:00 PM
Performance of Multicode DS/CDMA with Noncoherent M-ary Orthogonal Modulation subject to Power Amplifier Nonlinear Distortion
C. D. Iskander, *Florida Atlantic University, Boca Raton, FL, USA*

W4A.2 3:20 PM
Simulation Results for the Impact of Users' Locations and Distribution Characteristics on the Performance of Downlink WCDMA/TDD in Fading Channels
M. H. Ismail, M. M. Matalgah, *The University of Mississippi, University, MS, USA*

W4A.3 3:40 PM
A Split Band Duplexer for PCS CDMA Mobile Phones
C. Block, T. Keiler, *EPCOS OHG, Deutschlandsberg, Austria*

W4A.4 4:00 PM
Reduction of Cochannel Interference on the Forward Link CDMA Systems
M. A. Salam, M. M. Al-Khatib, *University of South Alabama, Mobile, AL, USA*

W4A.5 4:20 PM
An Alternative Multi-tone Representation of Complex Signals for Feedforward Systems
A. H. Koskun*, A. Mutlu*, S. Demir†, **ASELSAN Electronics Ind., Ankara, Turkey*, †*Middle East Tech Univ, Ankara, Turkey*

**Session W4B 3:00 PM - 4:50 PM
UWB and Soft Radio Technologies**
Chair: Zhi Ning Chen, *Institute for Infocomm Research (IIR)*
Co-Chair: Haoping Liu, *Oregon State University*

W4B.1 3:00 PM
The Characteristics of UWB Signal Transmitting Through a Lossy Dielectric Slab (invited)
Z. Chen, R. Yao, Z. Guo, *Microsoft Research Asia, Beijing, P. R. China*

W4B.2 3:30 PM
An Empirical Study of Electromagnetic Interference Caused by Ultrawideband Transmissions in an IEEE 802.11a Wireless Local Area Network
J. Lopez*, R. A. Raines*, M. A. Temple*, R. O. Baldwin*, J. P. Stephens†, **Air Force Institute of Technology, Wright Patterson AFB, USA*, †*Air Force Research Laboratory, Wright Patterson AFB, OH, USA*

W4B.3 3:50 PM
Multimode Detector and IQ Imbalance Compensator in a Software Defined Radio
P. Rykaczewski, I. Martoyo, Z. Liu, F. K. Jondral, *University of Karlsruhe, Karlsruhe, Germany*

W4B.4 4:10 PM
Multi-user Detection Using Hidden Training Sequence for DS-CDMA UWB System
S. Jung, D. Park, *Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea*

W4B.5 4:30 PM
Design and Implementation of a Multirate Sub-sampling Front-end in Software Radio Systems
M. R. Yuce*, W. Liu*†, **NC State University, Raleigh, USA*, †*University of California at Santa Cruz, Santa Cruz, CA, USA*



at a Glance

Sunday September 19, 2004

Sunday registration ends at 2PM

9 AM - 2 PM Registration
9 AM - 10 AM Coffee Break
10 AM - 6:00 PM Workshops:
WS1: UWB Technology: Components, Systems and Architectures
WS2: MIMO Implementation Aspects
WS3: Frequency Agile and Software Defined Radio

Monday, September 20, 2004

Monday registration ends at 6 PM

7 AM - 6 PM Registration
7 AM - 8 AM Workshop Breakfast
8 AM - 12 PM Workshops
WM1: Front End Opto-Electronics for Future Radio Communications
WM2: Wireless Sensors – Devices, Systems, and Applications
WM3: Advances in RF and High-Speed System Integration

12 PM - 1 PM Workshop Lunch
1 PM - 5:00 PM Technical Sessions
5 PM - 7 PM Exhibition
5 PM - 7 PM Poster Session and Reception
7 PM - 8:30 PM Banquet
8:15 PM Banquet Address:
Distributed Collaborative Adaptive Sensing: A new paradigm for detecting and predicting atmospheric hazards

Tuesday, September 21, 2004

Tuesday registration ends at 6 PM

7 AM - 6 PM Registration
7 AM - 7 PM Exhibition
7 AM - 8 AM Breakfast
8 AM - 11:50 AM Technical Sessions
12 PM - 1 PM Lunch
1:00 PM - 4:50 PM Technical Sessions
5:30 PM - 7 PM Poster Session, Reception
7 PM - 9 PM Panel Session and Buffet Dinner:
CAD Software for Wireless Technology – Where Are We?

Wednesday, September 22, 2004

Wednesday registration ends at 5 PM

7 AM - 5 PM Registration
7 AM - 8 AM Breakfast
10 AM - 3 PM Exhibition
8 AM - 11:50 AM Technical Sessions
12 PM - 1 PM Lunch
1 PM - 4:50 PM Technical Sessions

Watch [//www.rawcon.org](http://www.rawcon.org) for the latest information on **Radio and Wireless 2004**.

SPECIAL TECHNICAL PROGRAMS

Sunday Workshops

WORKSHOP WS1: UWB TECHNOLOGY: COMPONENTS, SYSTEMS AND ARCHITECTURES

Sunday, September 19, 2004

10:00 AM – 5:30 PM

Organizer: Zhi Ning Chen, *Institute for Infocomm Research, Singapore*

Speakers:

Robert J. Fontana, *Multispectral Solutions, Inc.*
Ahmed H. Tewfik, *University of Minnesota*
Robert A. Scholtz, *University of Southern California*
Naiel K. Askar, *General Atomics*
Huseyin Arslan, *University of South Florida*
Ian Oppermann, *University of Oulu, Finland*
Won Namgoong, *University of Southern California*
Thomas Kaiser, *University of Duisburg-Essen, Germany*
M. Y. W. Chia, *Institute for Infocomm Research, Singapore*
Zhi Ning Chen, *Institute for Infocomm Research, Singapore*

The new allocation of extremely wide frequency ranges has greatly promoted the applications of Ultra Wideband (UWB) technology in wireless/wired communications. The transmission of digital data at very high rates and with very low power over a very wide frequency band will raise many issues in UWB systems. The workshop at RAWCON 2003 discussed more issues pertaining to standards, which was successfully attractive to many participants from both industry and academia. This workshop will highlight the advances in the research and development related to UWB components, systems and architectures. The distinguished speakers in the area will share their in-depth understanding of emerging UWB technology with you.

WORKSHOP WS2: MIMO IMPLEMENTATION ASPECTS

Sunday, September 19, 2004

10:00 AM – 5:30 PM

Organizer: Thomas Kaiser, *University of Duisburg-Essen, Germany*

Speakers:

Frederick W. Vook, *Motorola Labs*
S. Haene, *ETH Zürich, Switzerland*
Mary Ann Ingram, *Georgia Tech*
Matthias Stege, *Signalion, Germany*
Daniel Borkowski, *RWTH Aachen, Germany*
Steve Ellingson, *Virginia Tech*
Andreas Wilzeck, *Uni Duisburg-Essen, Germany*
Jürgen Rinas, *University of Bremen, Germany*
Steffen Paul, *Infineon Technologies, Germany*
Ernst Aschbacher, *Vienna University of Technology, Austria*
Nam-kyu Ryu, *Hanyang University, Korea*
Ramón Martínez Rodríguez-Osorio, *Universidad Politécnica de Madrid, Spain*
Ludwig Schwörer, *Nokia, Germany*

MIMO techniques have emerged as a key technology for third and higher generations of wireless communication systems because they add a new spatial dimension to the currently used time, frequency, and code multiple access technologies. The recent past of 3G wireless systems licensing process in Europe has shown that spectral bandwidth may cost billions of EURO to wireless system providers. In light of this fact, MIMO techniques offer an elegant and relatively inexpensive opportunity of increasing system capacity, number of users served, and quality of service. Today developments and progress in this strategic area are away from cost efficient practical implementation. The MIMO workshop at RAWCON 2004 will demonstrate the numerous implementation challenges from different perspectives. Distinguished speakers will cover a multitude of typical applications, i.e. drawing the bow from smart antennas and MIMO techniques for CDMA based cellular networks and ending up with multi-antenna techniques for wireless local area networks.

WORKSHOP WS3: FREQUENCY AGILE AND SOFTWARE DEFINED RADIO

Sunday, September 19, 2004

10:00 AM – 5:30 PM

Organizers: Robert Weigel, *University Erlangen, Germany*
Clemens Ruppel, *EPCOS AG, Germany*
Linus Maurer, *DICE GmbH & CoKG, Austria*
Georg Fischer, *Lucent Bell Labs Europe, Germany*

Speakers:

Thomas Müller, *DaimlerChrysler, Germany*
Patrick Scheele, *Technische Universität Darmstadt, Germany*
Jörg Brakensiek, *Nokia, Germany*
Linus Maurer, *DICE, Linz, Austria*
Clemens Ruppel, *EPCOS, Germany*
Patrick Morgan, *Silicon Laboratories*
Geoff Dawe, *BitWave Semiconductor*

Interest in Reconfigurability with terminals, basestations and also whole networks is significantly rising. Various research projects look at reconfigurability from an end to end perspective of a communication link. This implies that reconfigurability is reflected with the baseband signal processing part as well as with the RF part of a communication device. The workshop therefore addresses aspect of reconfigurability with RF through offering frequency agility with the radio and with baseband processing through reconfigurable digital signal processing. Frequency agility is therefore understood as one aspect of a general view on software radio to realize Multimode devices that are Multistandard and Multiband capable. A great challenge with reconfigurable devices is the optimization for the right balance between analog and digital signal processing and the way how imperfections of the hardware are compensated. The level of reconfigurability further depends on the tuneability of the used materials, the components and the architectural choices made. For cost efficient implementations of reconfigurable devices, integration techniques play a key role.

Monday Morning Workshops

WORKSHOP WM1: FRONT END OPTO-ELECTRONICS FOR FUTURE RADIO COMMUNICATIONS

Monday, September 20, 2004

8:00 AM – 12:00 PM

Organizer: Afshin S. Daryoush, *Drexel University*

Speakers:

A. Nirmalathas, *University of Melbourne, Australia*
K. Kitayama, *Osaka University, Japan*
T. Nagatsuma, *NTT, Japan*
Tibor Bercei, *Budapest University of Technology and Economics, Hungary*
Hiroyo Ogawa, *Communication Research Laboratory, Japan*
M. Ali Khatibzadeh, *Anadigics, Inc.*

Future wireless communications are being pushed to broadband communications with rates well above Gb/s. Millimeter wave access systems require innovation in optical and electronic hardware as part of the front end subsystems. This workshop addresses system architectures and performance of the front end opto-electronics that could meet information throughput of well above Gb/s. Topics include: fiber-wireless networks, millimeter-wave radio-on-fiber systems, over 100 GHz mm-wave technologies for 10 Gbit/s wireless links, 24 GHz UWB radar, and front-end RF module integration trends in wireless mobile terminals.

WORKSHOP WM2: WIRELESS SENSORS – DEVICES, SYSTEMS, AND APPLICATIONS

Monday, September 20, 2004

8:00 AM – 12:00 PM

Organizers: Olga Boric-Lubecke and Victor Lubecke, *University of Hawaii at Manoa*

Speakers:

Amy Droitcour, *Stanford University*
Sokwoo Rhee, *Millennial Net, Inc.*
Carsten Munde, *Stanford University*
Robert Weikle, *University of Virginia*

Wireless sensors offer the advantage of minimizing physical constraints on the monitored environment and thus enable various embedded applications where conventional monitoring is not possible or desirable. On the other hand, wireless sensors must meet the challenges of compact size, low power consumption, and limited bandwidth. This workshop will address the issues of using wireless devices in physiological monitoring, including design constraints on single-chip Doppler radars, minimizing power consumption in wireless sensor networks, Bluetooth enabled wearable sensors, and development of millimeter wave components that will enable use of that part of the spectrum for future wireless networks.

WORKSHOP WM3: ADVANCES IN RF AND HIGH-SPEED SYSTEM INTEGRATION

Monday, September 20, 2004

8:00 AM – 12:00 PM

Organizers: Joy Laskar, Kyutae Lim, and Sudipto Chakraborty, *Georgia Institute of Technology*

Speakers:

Modest M. Oprysko, *IBM*
Udy A. Srivastava, *Intel*
Chang-Ho Lee, *Georgia Institute of Technology*
Manos Tantzaris, *Georgia Institute of Technology*
Kevin Oh, *Skyworks*

This workshop focuses on advanced circuits and packaging technologies for high data rate mixed signal communication front-ends. The subtopics include development of millimeterwave integrated circuits in silicon, packaging technologies for densely integrated mixed signal products, circuits/systems codesign for front-end communication modules, vertical integration aspects of the integrated module for small form factor implementation, along with the development of power amplifier module. This workshop covers all aspects of advanced developments on circuits and systems for mixed signal systems.

MESSAGE FROM THE GENERAL CHAIRS

RAWCON began nine years ago out of a recognized need within the wireless community to create a unique forum for engineers to discuss the latest topics in radio systems and technology. Today, this multidisciplinary view is no less important than it was in 1996. This year, we maintain our commitment to this balance with a collection of high-quality papers that explore connections between hardware design and system performance. A variety of system contexts are examined: cellular telephone, wireless LAN, fixed wireless access, ultra wideband, etc. Within these applications, advanced architectures are treated, such as software defined radio, multiple-input and multiple-output (MIMO) smart antenna systems, ad hoc networks, and wireless sensor techniques. The latest advances in RF component technologies are also presented. In another year of record growth, we received over 230 papers, of which 141 were selected for presentation in the 18 technical sessions, organized in two parallel tracks, and in the two poster sessions. In addition, our conference keynote and banquet addresses on Monday, our traditional panel discussion on Tuesday evening, and the array of invited speakers highlight technological evolutions and innovation in the industry. This year we have also added two more workshops, totaling six, which present overview talks on an assortment of wireless systems and technologies. Of course, none of this would be possible without the volunteer effort of our Technical Program Committee, under the guidance of our TPC Co-Chairs: Mohammad Madihian and Xiaodong Wang, and our Workshops Organizer, Jenshan Lin.

Another conscious change for 2004 is the expansion of the Wireless Exhibition. This year, the exhibits are being managed by Horizon House (<http://www.horizonhouse.com>), the same company that runs the exhibition for the International Microwave Symposium (IMS) and the European Microwave Conference (EuMC). More than 50 booth spaces have been allocated to allow vendors show their latest wares to the technical attendees over the three day conference.

RAWCON heads south to Atlanta, Georgia for the first time this year! Scheduling the conference in September assures us of a cooler climate in the friendly southern atmosphere. The spacious accommodations at the Omni Hotel will provide a pleasant experience to all attendees and exhibitors. Located across from Centennial Park, and adjacent to CNN Center, the Omni provides access to Atlanta's best restaurants, shops, and other downtown attractions. Our housing is being managed by International Event Connection, Inc. See our website (<http://rawcon.org>) for links to the Housing web pages. Space is limited, so book now!

We look forward to seeing you in September!

J. Stevenson Kenney and Ke Wu, General Co-Chairs

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Tuesday Panel Session

Panel Session 7:00 PM - 8:30 PM

CAD Software for Wireless Technology – Where Are We?

Tuesday, September 21, 2004

Mediator: Wolfgang J. R. Hofer, *University of Victoria, BC, Canada*

Panel Speakers from the following Corporations

Sonnet Software

Applied Wave Research

Ansoft

Zeland Software and AC Microwave

Eagleware

Agilent EEsof

Cadence

With ever-increasing speed and bandwidth of RF and microwave circuits and systems, wireless research and development heavily rely on advanced CAD and modeling. Today, the widespread popularity and applications of commercial software packages in support of circuit and system designs have fundamentally changed the landscape of our RF and microwave wireless industry in connection with both analog and digital worlds.

This panel consists of distinguished software experts and developers who will present a wide array of viewpoints regarding the use of existing software packages in the market. Various design issues will be discussed ranging from analog RF front-ends to digital base-band circuits. State-of-the-art components and system design tools will be highlighted with regards to simulation accuracy and speed, optimization, and application range. Emerging CAD platforms and future trends will also be shown.

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Dr. Mohammad Madihian, *NEC Laboratories America, Inc.*

Prof. Xiaodong Wang, *Columbia University*

Area 1) MIMO Technologies

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

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Prof. Kapil Dandekar, *Drexel University*

Prof. Mary Ann Ingram, *Georgia Institute of Technology*

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Dr. Jeff Zhuang, *Motorola Labs Inc.*

Area 2) Wireless Communication Systems

Chair: Prof. Geoffrey Li, *Georgia Institute of Technology*

Prof. Nallanathan Arumugam, *National University of Singapore*

Prof. Dirk Dahlhaus, *Swiss Federal Institute of Technology*

Prof. Rose Qingyang Hu, *Mississippi State University*

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Area 3) Wireless Sensors / Ad Hoc Networks

Chair: Prof. Robert Weigel, *University of Erlangen-Nuremberg*

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Dr. Clemens Ruppel, *EPCOS*

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Prof. Mehdi Shadaram, *University of Texas at San Antonio*

Area 4) Emerging Technologies

Chair: Dr. Richard Yao, *Microsoft Research*

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Dr. Joe Huang, *Flarion Technology*

Prof. Erik G. Larsson, *The George Washington University*

Prof. Huaping Liu, *Oregon State University*

Area 5) Front-End Electronics & Antennas

Chair: Prof. Afshin Daryoush, *Drexel University*

Dr. John Bojarski, *US Army, CECOM*

Dr. Edmar Camargo, *Fujitsu*

Prof. Aly Fathy, *The University of Tennessee*

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Dr. Harris Moyer, *HRL*

Dr. Takashi Ohira, *ATR Adaptive Communications*

Prof. Weesang Park, *Pohang University of Science and Technology*

Prof. Safieddin Safavi-Naeini, *University of Waterloo*

Dr. Ralf Tempel, *ATMEL*

Dr. Xiangdong Zhang, *Communicant Semiconductor Technologies*

Area 6) Signal Generation/Power Amplification

Chair: Dr. Jan-Erik Mueller, *Infineon Technologies*

Dr. Genevieve Baudoin, *ESYCOM - ESIEE*

Dr. Andre van Bezooijen, *Philips*

Prof. Giorgio Leuzzi, *University of L'Aquila*

Dr. Earl McCune, *Tropian*

Prof. Chul Soon Park, *Information and Communications University*

Dr. Joel Vuolevi, *RFIC*

Area 7) RF/Analog IC's for Wireless Comm.

Chair: Dr. Noriharu Suematsu, *Mitsubishi Electric Corporation*

Prof. Masami Akaike, *Science University of Tokyo*

Dr. Norman Chiang, *Teledyne Technologies*

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- Printed Workshop Notes
- Admission to Industry hosted Receptions, Exhibition, and Poster Sessions.
- Continental breakfast and lunch.

Exhibition

- Admission to Industry Hosted Receptions, Exhibition and Poster Sessions.

Additional Options

- Meals and access to Exhibition/Industry Hosted Receptions and Poster Sessions.

REGISTRATION FEES

Technical Sessions

	Price <input type="checkbox"/> Until July 24	<input type="checkbox"/> From July 25
<input type="checkbox"/> IEEE Member	\$315	\$400
<input type="checkbox"/> Non-member	\$400	\$455
<input type="checkbox"/> IEEE Student Member	\$250	\$300
<input type="checkbox"/> Retired IEEE Member	\$250	\$300
<input type="checkbox"/> Presenter	\$250	\$300

Optional Workshops (including lunch and notes)

<input type="checkbox"/> WS1: UWB Technology, Components, Systems and Architectures FULL DAY	\$100	
<input type="checkbox"/> WS2: MIMO Implementation Aspects FULL DAY	\$100	
<input type="checkbox"/> WS3: Frequency Agile and Software Defined Radio FULL DAY	\$100	
<input type="checkbox"/> WM1: Front End Opto-Electronics for future Radio Communications HALF DAY	\$80	
<input type="checkbox"/> WM2: Wireless Sensor-Device, System, and Applications HALF DAY	\$80	
<input type="checkbox"/> WM3: Advances in RF and High-Speed System Integration HALF DAY	\$80	

Exhibition

<input type="checkbox"/> Attendee Exhibits-only	\$20	\$20
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Additional Options

<input type="checkbox"/> Monday Banquet	\$35	\$40
<input type="checkbox"/> Tuesday Buffet Dinner and Panel	\$25	\$30
<input type="checkbox"/> Guest on-site	\$100	\$100
<input type="checkbox"/> Additional CD-ROM Copy of the Proceedings of Technical Sessions (on-site pickup only)	\$35	\$35
<input type="checkbox"/> Additional Hardcopy of the Proceedings of Technical Sessions (on-site pickup only)	\$35	\$35

Total Payment Due \$ _____

REGISTRATION PAYMENT AND RESERVATION GUARANTEE

Charge my registration fee to and guarantee my hotel reservation with:
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Pay for my registration and guarantee my hotel reservation with check payable in US dollars to IEEE RAWCON 2004.
(Please remember to include \$176.70 for one night room and tax).

CANCELLATIONS

Cancellations must be made in writing and sent via FAX: (617) 864-3767 or Email: reghousing@internationaleventconnection.com. Cancellations received by July 17 will be fully refundable.

TO REGISTER BY MAIL, SEND

THIS FORM AND PAYMENT TO:

International Event Connection, Inc.
Brickyard Office Park
90 Sherman Street
Cambridge, MA 02140, USA
ATTN: Jane Davis

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