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APRIL 2004

**IEEE FELLOWS  
for 2003**

# IEEE GRID.pdf

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## IEEE-SFBAC 2004

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## From the editor . . .

This month we honor our new 2004 Fellows. On the next few pages you will find short biographies of each of the thirteen Bay Area IEEE members who have been elected to fellow grade. Join us in congratulating these colleagues.

—Ed.

IEEE Grid is the monthly newsmagazine of the San Francisco Bay Area Council of the Institute of Electrical and Electronics Engineers, Inc. As a medium for both news and opinion, the editorial objectives of IEEE Grid are to inform readers in a timely and objective manner of newsworthy IEEE activities taking place in and around the Bay Area; to publish the official calendar of events; to report on IEEE activities on a national and international scope; and to serve as a forum for comment on areas of concern to the engineering community by publishing contributed articles, invited editorials and letters to the editor.

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# IEEE FELLOWS FOR 2004

## **JEROME R. BELLEGARDA**

Apple Computer, Inc., Cupertino, CA



*For contributions to statistical methods for human language processing.*

Jerome R. Bellegarda (M'87, SM'98, F'04) received the MS and PhD degrees in electrical engineering from the University of Rochester, Rochester, NY, in 1984 and 1987, respectively. In 1987 he worked as a research associate at the University of Rochester, developing multiple access coding techniques. From 1988 to 1994 he was a research staff member at the IBM T.J. Watson Research Center, Yorktown Heights, NY, working on speech and handwriting recognition algorithms.

He joined Apple Computer in 1994, where he is currently Apple distinguished scientist in speech and language technologies. At Apple he has worked on many facets of human language processing, including speech recognition, speech synthesis, language modeling, semantic classification, dialog interaction, voice authentication, speaker adaptation, and metadata extraction.

He has written over 100 refereed journal and conference papers, and contributed chapters to five edited books. He also holds more than 20 U.S. and/or foreign patents, with a dozen more pending. His research interests include voice-driven man-machine communications, multiple input/output modalities, and multimedia knowledge management. In these areas, Dr. Bellegarda has served on numerous international scientific committees, review panels, and editorial boards. He is currently a member of the Speech Technical Committee of the IEEE Signal Processing Society, serving as Associate Editor of the IEEE Transactions on Speech and Audio Processing.

## **CONSTANTIN BULUCEA**

National Semiconductor Corp., Santa Clara



*For contributions to transistor engineering in the area of power electronics.*

Constantin Bulucea joined National Semiconductor in 1990, and is currently a senior member of company's technical staff. He is engaged in the development of a series of IC manufacturing processes for high-performance VLSI devices such as analog-optimized CMOS FETs and SiGe-base BJTs. In 1998, he designed National's 0.18- $\mu\text{m}$  CMOS device architecture. Prior to National (1987-1990), he worked for Siliconix, where he led the development of world's highest-current transistor switch, in trench DMOS technology.

During his 41 years in the semiconductor industry, Dr. Bulucea has published over 50 papers, most notable of which are his seminal contributions to the electronics of surface breakdown and hot-carrier-injection in silicon (1970-80), technology of power DMOS transistors (1987-90), and architecture of VLSI devices (1991-). In the above areas, he has 23 US patents, with several others pending.

Dr. Bulucea is a member of the editorial board of Solid-State Electronics. He serves on the Technical Committees of the Bipolar Circuits and Technology Meeting and VLSI Technology Symposium. In 2003, he was the chairman of the Advanced Devices and Technologies thrust of the Semiconductor Research Corporation (SRC). He is the founding chairman of IEEE's Region 8 Annual Conference for Semiconductors and the vice-chairman of the Santa Clara Valley chapter of the Electron Device Society of IEEE.

A native of Romania, Dr. Bulucea is an honor member of the Romanian Academy of Sciences.

## **ALY ELREFAIE**

Cupertino, CA



*For contributions to optical and wireless communication systems.*

Dr. Elrefaie received BSc degree in electrical engineering from Ain Shams University, Cairo, Egypt in 1976, and MSc and PhD degrees in electrical engineering from Polytechnic University, NY, in 1980 and 1983. From 1985 until 1995, he worked for Bellcore, where he conducted advanced research in high speed optical communication systems, and in performance evaluation of DWDM network architectures and received Bellcore President's Recognition Award in 1994.

From 1995 to 2000, Dr. Elrefaie was with Hewlett-Packard, Lucent, and Agilent Labs, working on several projects related to fixed broadband wireless communication systems and DWDM systems. In June 2000, he was vice president of optical subsystems and network architectures for the start-up company Gazillion Bits. In September 2003, he joined the American University of Sharjah, UAE.

*Continued next page*

# FELLOWS

## PER ENGE

Stanford University



*For contributions to the Global Positioning System applications.*

Per Enge is a professor of aeronautics and astronautics at Stanford University, where he is the Kleiner-Perkins, Mayfield, Sequoia Capital professor in the School of Engineering. He directs the GPS Research Laboratory, which develops navigation systems based on the Global Positioning System (GPS). These navigation systems augment GPS to improve accuracy and provide real time error bounds. In addition, the laboratory is developing a suite of technologies to mitigate the navigator's vulnerability to radio frequency interference, and has pioneered two such systems that are now operational.

The first system uses a network of medium frequency radiobeacons to broadcast differential GPS corrections to maritime and land users. This system was developed for the U.S. Coast Guard, and today it covers much of the world's coastline and an increasing inland area. It provides differential GPS data to approximately 1.5 million users. The second is the Wide Area Augmentation System (WAAS) that was developed for the FAA. WAAS already serves millions of users, and became operational for aircraft in 2003.

The laboratory is currently working on auto-land systems based on GPS. Amongst these, the Local Area Augmentation System (LAAS) will support larger airplanes at high-traffic hub airports, and the Joint Precision Approach Landing System (JPALS) will support aircraft carrier operations.

Per has received the Kepler, Thurlow and Burka Awards from the Institute of Navigation (ION) for his work. He is also a Fellow of the ION. He received his PhD from the University of Illinois in 1983, where he designed a direct-sequence multiple-access communication system that provided an orthogonal signal set to each user.

## JULIE ELIZABETH FOUQUET

Agilent Technologies, Palo Alto, CA



*For contributions to optical switch and light-emitting device technologies.*

Julie E. Fouquet received a bachelor's degree in physics from Harvard University in 1980. She earned an MS degree in 1982 and a PhD degree in 1986 both in applied physics from Stanford University. She joined Hewlett-Packard Laboratories in 1985 and is now at Agilent Laboratories, which was formed during the split of the original Hewlett-Packard Company. She has held a variety of scientific and managerial positions.

Optoelectronic devices and material characterization were Fouquet's major research areas until 1995. She invented the high power, low-coherence, edge-emitting light emitting diodes used in Agilent's low coherence reflectometers and optical spectrum analyzers, and investigated the optical properties of a wide range of III-V compound semiconductor materials for devices such as light-emitting diodes.

In 1995 Fouquet invented a photonic switch that uses bubbles to redirect light between waveguides in a planar lightwave circuit, later known as the Agilent Photonic Switching Platform. Fouquet led the multidisciplinary research team that broke performance records for compact optical switches in 1998 and managed technology development in the division Agilent created to commercialize this technology. A 32x32 switch based on this technology was demonstrated at the Optical Fiber Communications Conference in 2000 and a closely-related dual 16x32 design won the Supercomm 2000 Optical Networking Super Quest Award. She currently works on imaging sensors.

Fouquet has written over 75 technical papers and 35 general interest articles, and has earned ten patents. She was awarded Agilent's Barney Oliver Prize for Innovation in 2000 and was selected as a Leading Innovator by U.S. News and World Report in 2001. Fouquet chaired the local LEOS chapter 1987-88 and was elected to the LEOS Board of Governors 1991-93. She was recently elected to the Board of Directors of the Optical Society of America.

## GRANT THEODORE GULLBERG

Lawrence Berkeley National Laboratory, Berkeley, CA



*For contributions to medical imaging technologies.*

Grant T. Gullberg received his BS degree in mathematics from Seattle Pacific University in 1966, MS degree in mathematics from the University of Washington in 1971, and PhD degree in biophysics from the University of California, Berkeley in 1979.

He worked as an engineer at the Boeing Company from 1967 to 1971, as a scientist at the Lawrence Berkeley Laboratory from 1972 to 1980, as a senior physicist at GE Medical Systems from 1980 to 1985, and as a professor of radiology at the University of Utah from 1985 to 2002.

He is currently a senior staff scientist at the E. O. Lawrence Berkeley National Laboratory. His research interests involve the study of inverse problems with application to medicine and biology that involve the use of positron and single photon emission computed tomography, magnetic resonance imaging, and magnetocardiography.

## GRAHAM REGINALD HELLESTRAND

VaST Systems Technology Corporation, Sunnyvale, CA



*For contributions to computer system architecture simulations.*

Founder, CEO and president of VaST Systems Technology, Graham Hellestrand, has led the company through its last six formative years to

*Continued on next page*

# FELLOWS

where it is now – in the middle of significant global expansion. VaST develops and sells advanced real-time, hardware-software embedded systems development environments, tools and models. Amongst VaST customers are the largest semiconductor, automotive, and automotive electronics companies in the USA, Japan and Europe. Hellestrand has 30 years experience in engineering systems. He has held the position of R&D executive for a number of high technology corporations including a medical electronics company and two start-up ventures prior to VaST.

Hellestrand was elected emeritus professor of computer science and engineering at the University of New South Wales in Dec 2002. He was a full professor (1989-1999) and academic staff member at the University of New South Wales (UNSW), Sydney, Australia for 26 years (1973-1999), and was the founder and director of the VLSI and Systems Technology (VaST) Laboratory (1981-1996). From 1989-1996, he founded and managed the multi-disciplinary computer engineering undergraduate program at UNSW – one of the first to meld software, hardware and management disciplines into a 4 year professional course. He published more than 100 refereed papers in international conferences and journals. He supervised and graduated 15 PhD students and nine Master's students during this period. He is principal author of three US patents.

Graham holds BSc and PhD degrees in computer science and electrical engineering from the University of New South Wales (UNSW) and MBA and MBA (Exec) degrees from The Australian Graduate School of Management and The University of Sydney.

He is a Fellow of the Institution of Engineers, Australia; and a certified professional engineer (CPEng).

From 1994-1998 he was a board member and vice president, Asia-Pacific, of the Circuits and Systems Society of the IEEE. He was general co-chair of the 2001 Intl. Symposium on Circuits and Systems. From 1990-2001, he was a member of the International Advisory Committee of the Asia Pacific Conference on Circuits and Systems (APCCAS) and in 1992 the General Chair of the first APCCAS which was held in Sydney in November. He is industry liaison chair for ISCAS2003 and ISCAS2005. In 2000 and 2003, a member of IEEE CAS Nominations Committee. During 1997-1998 he

was an associate editor of IEEE Transactions on Very Large Scale Integration.

## BEOMSUP KIM

Berkana Wireless Inc., Campbell, CA



*For contributions to integrated circuits for high speed communication systems.*

Beomsup Kim received the BS and MS degrees in electronic engineering from Seoul National University, Seoul Korea, in 1983 and 1985 respectively, and the PhD degree in electrical engineering and computer sciences from the University of California, Berkeley, in 1990.

From 1990 to 1991, he was with Chips and Technologies, Inc., San Jose, CA, where he was involved in designing high speed-signal processing IC's for disk drive read/write channel. Between 1991 and 1993, he was with Philips Research, Palo Alto, CA, and conducted research on digital signal processing for video and wireless communication.

In 1994 he joined Korea Advanced Institute of Science and Technology (KAIST), Taejon Korea, as a faculty member of the department of electrical engineering. During 1999, he took a sabbatical leave and stayed at Stanford University, and also consulted for Marvell Semiconductor Inc., San Jose, CA on the Gigabit Ethernet (802.11ab) and wireless LAN (802.11b) DSP architecture.

In 2001 he co-founded Berkana Wireless Inc. and is now CTO/VP engineering of the company. His research interests include mixed-mode signal processing IC and system design for wireless communication, telecommunication, disk drive, local area network, high-speed analog IC design, and VLSI system design.

Dr. Kim is a co-recipient of the Best Paper Award (1990-1991) for the IEEE Journal of Solid-State Circuits. Between June 1993 and June 1995, he served as an associate editor for the IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing Society. In 1999, he was one of four lecturers for Gigabit Ethernet short course at IEEE international solid-state circuit conference.

## MEYYA MEYYAPPAN

NASA Ames Research Center, Moffett Field, CA



*For contributions to and leadership in nanotechnology.*

Meyya Meyyappan is director of the Center for Nanotechnology as well as a senior scientist at NASA Ames Research Center in Moffett Field, CA. He is a founding member of the Interagency Working Group on Nanotechnology (IWGN) established by the Office of Science and Technology Policy. The IWGN is responsible for putting together the National Nanotechnology Initiative.

His Center for Nanotechnology consists of 60 scientists working on various aspects of nanotechnology. He is the IEEE Distinguished Lecturer on Nanotechnology and ASME's Distinguished Lecturer on Nanotechnology. He has been awarded NASA's Outstanding Leadership Medal for his work on nanotechnology.

## STEVEN A. NEWTON

Agilent Technologies, Palo Alto, CA



*For contributions to optical reflectometry and spectrum analysis.*

Steven A. Newton is manager of the Measurements & Sensors Department at Agilent Laboratories, the company's central research organization. During the past 18 years, his organization's research projects have produced a wide range of technologies — from lightwave measurements to optical

*Continued on next page*

components to network subsystems — that have enabled the development of numerous commercial products.

Dr. Newton received his BS degree, summa cum laude, in physics from the University of Massachusetts, and his MS and PhD degrees in applied physics from Stanford University. He has authored over 60 journal and conference publications, and has been awarded 13 patents within the field of lightwave technology. He is presently serving as secretary/treasurer of the IEEE Lasers and Electro-Optics Society (LEOS) and as general co-chair of this year's Conference on Lasers & Electro-Optics (CLEO 2004).

## STUART PARKIN

IBM Almaden Research Center, San Jose, CA



*For contributions to the application of material science to devices for magnetic storage and memories.*

Dr. Stuart S.P. Parkin, is an IBM Research experimental physicist whose discoveries into the behavior of thin-film magnetic structures were critical in enabling the huge recent increases in the data density and capacity of computer hard-disk drives.

He made key discoveries that led to IBM's pioneering use of the giant magnetoresistive (GMR) effect to read disk-drive data bits that were far smaller than could be detected before. He was first to use sputtering techniques to create GMR structures, which consist of thin magnetic layers separated by non-magnetic metals. The electrical resistance parallel to the planes of such structures can change dramatically according to whether the magnetizations of consecutive magnetic layers are in the same or opposite directions (parallel or anti-parallel alignment, respectively). In 1991, he discovered that slight changes in the thickness of the non-magnetic spacer layer caused large oscillations between parallel and antiparallel magnetic alignment.

Parkin and IBM Research colleagues quickly used this basic information to design and create GMR elements for what proved to be the most sensitive disk-drive read/write head made to

date (1994). Subsequently, IBM introduced the GMR head in its disk-drive products in 1997. It is now used in all IBM disk drives and all of the world's total production of disk drives. The GMR head has been a key enabler of the more than 20-fold increase in disk-drive data densities from 1997 to present (2.4 to more than 50 gigabits per square inch).

In May 1991, Parkin was awarded the Materials Research Society's Inaugural Outstanding Young Investigator Award and the Charles Vernon Boys Prize of the Institute of Physics (U.K.) Dr. Parkin shared both the American Physical Society's International New Materials Prize (1994) and the European Physical Society's Hewlett-Packard Europhysics Prize (1997) with Albert Fert of University of Paris-Sud in Orsay, France, and Peter Grunberg of KFA Julich in Germany.

Dr. Parkin is a fellow of the American Physical Society. In 1997, he was elected to IBM's Academy of Technology and named one of IBM's Master Inventors. In 1999 he was named an IBM fellow — IBM's highest technical honor — and in May 2000 he was elected fellow of the Royal Society (London). R&D Magazine named Dr. Parkin "Innovator of the Year" in 2001.

Parkin is currently studying magnetic tunnel junctions — which require just a few atomic layers of an electrical insulator between magnetic layers to create large resistance changes perpendicular to the layers' planes — and their use in both disk-drive recording heads more sensitive than GMR heads and a new type of solid-state non-volatile magnetic random access memory. Tunnel-junction heads may enable data-storage densities beyond 100 billion bits per square inch. Magnetic RAM chips could lead to instant-on computers with much better performance, energy-efficiency and battery life because they could combine the best attributes of the three major memories in use today: the data density (and thus low cost) of DRAM, the speed of SRAM, and the non-volatility of Flash memory.

A native of Watford, England, Dr. Parkin received his BA degree (1977) and was elected a Research Fellow (1979) at Trinity College in Cambridge, England, and was awarded his PhD degree (1980) at the Cavendish Laboratory, also in Cambridge.

Parkin joined IBM Research in San Jose in 1982 as a World Trade Post-doctoral fellow, becoming

a permanent member of the staff the following year. His early research included important discoveries in both organic low-temperature superconductors and ceramic high-temperature superconductors. Since 1997, he was also served as a consulting professor in applied physics at Stanford University.

## BRADFORD PARKINSON

Stanford University



*For technical leadership in the development of the Global Positioning System*

Bradford W. Parkinson graduated from the US Naval Academy, commissioned in the US Air Force in 1957; has an SM from MIT and a PhD from Stanford University in aeronautics and astronautics. His Air Force background includes chief internal guidance analyst, head of US Air Force Academy Dept of Astronautics and Computer Science, and Simulation Division chief at USAF Test Pilot School. He flew 26 combat missions over Laos in 1969. As an Air Force colonel, he led the synthesis, definition, development and testing of the Global Positioning System (GPS).

Retiring from the Air Force in 1978, he subsequently was a VP at Rockwell, a group VP at Intermetrics, and the CEO of Plantstar. As a professor at Stanford University since 1984, he was program manager of NASA's Gravity Probe-B, and led a program that pioneered precision blind landings, RPV autonomous control and autopilot steering of farm tractors, all using GPS. During a leave of absence he was president and CEO of Trimble Navigation.

He is a fellow of the AIAA, the ION and the Royal Institute of Navigation. Numerous awards include the ION Thurlow, Burka and Kepler Awards; IEEE Pioneer, Kirchner and Simon Ramo Medal; Royal Institute Gold Medal; NASA Hall of Fame; Elmer Sperry Award and The Magellenic Premium.; The Bronze Star, Legion

*Continued on next page*

of Merit, 2 Air Medals and DOD Superior Service Award as Best Program Manager; NASA Distinguished Public Service Medal. His numerous publications include editing the two volume GPS Theory and Applications. He is a member of the National Academy of Engineering. In 2003 he was awarded the Draper Prize, sometimes called the Nobel Prize for Engineering.

## DAVID L. TENNENHOUSE

Intel Corporation, Santa Clara, CA



*For leadership in the development of active networks.*

David Tennenhouse is an Intel vice president in the Corporate Technology Group and director of research. He has been one of the pioneers of Asynchronous Transfer Mode (ATM) networking, Active networks, Software Radio, and Desktop Media processing.

Tennenhouse previously served as chief scientist and director of the Defense Advanced Research Projects Agency's Information Technology Office. At DARPA, he directed a research program focusing on information technology issues of strategic concern to the U.S. government. As office director, Tennenhouse formulated DARPA's PRO-Active Computing research strategy which emphasizes the networking of embedded and autonomous systems. He was also a key player in the development of the U.S. government's Information Technology for the 21st Century (IT2) initiative.

Tennenhouse received his BSc and MASc degrees from the University of Toronto. In 1989, he completed his PhD at the Computer Laboratory of the University of Cambridge. He then joined MIT, where he held appointments in the Department of Electrical Engineering and Computer Science, and in the Sloan School of Management.

In addition to his research activities, Tennenhouse has been actively involved in the development of commercial technologies and business strategies. He is one of the founders of a consulting firm with expertise in fault tolerant transaction processing and has been

a consultant to a range of technology, venture capital and financial organizations.

Dr. Tennenhouse is a member of the ACM and IEEE and served on the Visiting Committee on Advanced Technology of the National Institute of Standards and Technology. He has been a member of the National Science and Technology Council's Sub-committee on Computing Information and Communications R&D, and chaired the Technology & Policy Working Group of the President's Information Infrastructure Task Force. In addition to his journal and conference publications, Dr. Tennenhouse has chaired various workshops and studies concerned with Information Infrastructure, ATM/Gigabit networking, and Advanced Digital Television (HDTV).



# SCVIMTT – 2004 Short Course **Personal Broadband Communications**



You are cordially invited to attend the **"Personal Broadband Communications"** short course, sponsored by the Santa Clara Valley chapter of the IEEE Microwave Theory and Techniques Society. The course will be held on Saturday, April 17, 2004 from 8:00AM to 4:20PM at the Stanford Linear Accelerator Center-SLAC.

This year, the short course will focus on some of the interesting current and future applications of wireless technology in personal broadband communications. We have been able to assemble a wonderful group of presenters representing the leading edge of technology and market. We have also taken the state of the economy into consideration and kept the cost of registration low with a significant discount for early registration.

For more details, including a registration form and directions, please visit [http://www.mtt-scv.org/short\\_c.html](http://www.mtt-scv.org/short_c.html)

## Lectures:

**Advances in Personal Broadband, A Market Overview**

***by Nitin J. Shah, Dir. Of Broadband RHK***

**Wireless Broadband Investment Opportunities**

***By Rohini Chakraverthy Investment Dir.- Intel Capital***

**802.11 Technology Roadmap**

***By Rick Bahr, VP of Engineering Atheros***

**System on a chip for WiMAX**

***By Aditya Agrawal Sr. Mkt Mgr- Fujitsu***

**Technology Challenges for Mobile Broadband Access**

***by Dr. Khurram Sheikh, Chief Technology Advisor Sprint***

**Adaptive Antenna Concepts and Applications**

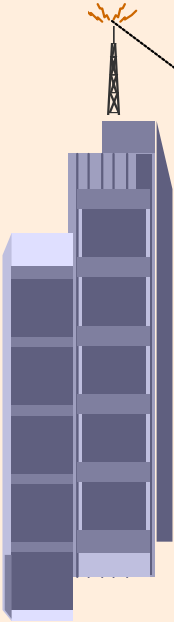
***by Dr. Marc Goldberg CTO- Arraycom***

**Smart Communications: Transmitters for Wireless Broadband Communication**

***by Dr. David Rutledge Caltech***

**Advances in Millimeter Communications**

***By Doug Gray, Exec Dir- Ensemble***



**TUESDAY APRIL 6**

SCV Lasers & Electro Optics Society

Subject: **Silicon-based Light Emitting Devices  
for Optical Links**

Speaker: Don Gardner (Intel)

Time: Pizza Social at 7:00 p.m., presentation at  
8:00

Place: National Semiconductor Credit Union, Bldg.  
31, large auditorium, 955 Kifer Road,  
Sunnyvale

RSVP: [RSVP@silicavalley.com](mailto:RSVP@silicavalley.com)

## Silicon-based Light Emitting Devices for Optical Links

Recently, there has been increasing interest in light emission from silicon for optoelectronic circuits and chip-to-chip interconnections. In this work, the requirements for creating a chip-to-chip optical link were determined. Different silicon-based devices were studied for their potential use in an optical link including silicon diodes and waveguides with silicon nanocrystals and rare earth ions.

Silicon light-emission efficiency was improved by reducing the surface/contact recombination, and bulk recombination (Auger and Shockley-Read-Hall). This can be done by using gas-source diffusion, passivating and texturing the surfaces, and depositing anti-reflective coatings. There are various challenges, but the prospects for creating a silicon-based optical link look promising.

Don Gardner, the speaker for this early April meeting, has been with Intel Corporation since 1991 and is currently a senior research engineer in the Microprocessor Research Lab and also is a visiting scholar at Stanford University. He has had appointments as a research scientist at Hitachi Research Labs in Japan and as an instructor at Stanford CIS.

Don received his PhD in electrical engineering from Stanford University. He is the inventor or co-inventor of 29 patents including for Al-Ti layered metal for interconnections, embedded ground planes, reflow of copper metal, and high-frequency magnetic materials. Don has published and presented over 85 electrical engineering, materials science, and computer science papers. He has received three Best Paper and Poster awards at international conferences and his recent paper on RF inductors was judged the best at the IEEE IITC conference.

He enjoys bringing new life to old technologies by blending them with different technologies or recent science and materials. His current interests include silicon-based optoelectronic devices, magnetic materials for high-frequency inductors, microstructure design, process technology, and materials science.

### MONDAY APRIL 12

SCV Signal Processing Society

Subject: **On the Deployment of the Voice Biometric: Challenges and Best Practices**

Speaker: Larry Heck, PhD (Nuance Communications)

Time: Fast food and drinks at 6:30 p.m. (\$1 Donation Requested towards Refreshments), announcements at 7:00, presentation at 7:05

Place: National Semiconductor Credit Union, Building 31, 955 Kifer Road, Sunnyvale

RSVP: Not required

Web: <http://www.ewh.ieee.org/r6/sps/>

## On the Deployment of the Voice Biometric: Challenges and Best Practices

**Wouldn't it be great** not to have to remember all those PINs we are forced to use for transactions over the telephone? As it turns out, those companies that subject us to PINs would like to get rid of them too. Recent analyst estimates show that approximately 30 percent of all help desk calls to human agents are for resetting forgotten PINs, costing an average of \$20 per call and millions per year for large enterprises.

The solution is to replace PINs with a biometric: verify people by their physiological or behavioral characteristics (e.g., fingerprints, voice, iris). Comparing biometrics, voice has a number of distinct advantages for securing telephone-based transactions: it leverages existing infrastructure, uses an inexpensive and ubiquitous input device (telephone), and is the most intuitive and least obtrusive biometric.

So why is it taking so long for the voice biometric to save us from PINs? In this talk, Larry Heck will address that question and will discuss how Nuance has been working hard to make the voice biometric pervasive on the telephone network.

Larry Heck, PhD, is vice president of R&D at Nuance Communications, leading Nuance's R&D efforts in natural language processing, speech recognition, voice authentication, and text-to-speech synthesis.

After receiving his PhD in electrical engineering from Georgia Tech in 1991, Dr. Heck worked at SRI International and served as principal investigator for a number of federally funded research programs (NSA, DARPA, ORD/CIA) in acoustics and speech, including active noise and vibration control, acoustic machinery monitoring, and speaker recognition.

In speaker recognition, he invented several of the key algorithms around the detection and compensation for distortion over wire line and wireless telephone communication channels and the integration of higher level knowledge into voice authentication systems. He began working with Nuance (then Corona) in 1995 to initiate efforts towards developing the Nuance Verifier(tm).

**TUESDAY APRIL 13**

SCV Electron Devices Society

Subject: **Nonlithographic Nanostructured Devices**

Speaker: Prof. Biswajit Das (University of Nevada/Las Vegas)

Time: Pizza social at 6:00 p.m., presentation at 6:15

Place: National Semiconductor Corp., Building 31 Large Auditorium, 955 Kifer Road, Sunnyvale

RSVP: not required

## Nonlithographic Nanostructured Devices

**Nanotechnology research** has demonstrated that no single fabrication technique is universally applicable for the production of nanoscale semiconductor devices, and nonlithographic techniques are being increasingly investigated to complement the more traditional lithographic techniques. Dr. Biswajit Das will discuss this topic at the April 13 meeting of SCV EDS.

These nonlithographic techniques capitalize on the self-patterning of natural systems where the semiconductor material is fabricated in the size and shape of the desired nanostructure. We have developed a thin film template based nanostructure fabrication technique that is applicable for the development of high performance nanostructured devices on an arbitrary substrate, including silicon substrates. The technique is based on the anodization, or electrolytic oxidation, of a thin film of aluminum to form a nanoporous alumina template, which is then used as a guide to fabricate the nanostructures.

The pore diameter and the inter-pore spacing can be varied between 4 nm to 100s of nm and the pores can be several microns deep. Due to the excellent periodicity of the pores, and the ability to control the pore diameters, such anodized alumina films can be used as templates for the fabrication of periodic arrays of nanostructures. Currently we are using this technique to implement high performance devices including flash memory, infrared detectors, electro-optic modulators and flexible displays.

Dr. Biswajit Das is an associate professor of electrical and computer engineering at University of Nevada, Las Vegas. Dr. Das received his PhD degree in electrical engineering from Purdue University in 1989; his dissertation work involved spin transport in low dimensional semiconductors which was the foundation of the proposed Spin Field effect Transistor.

Dr. Das served as a faculty member of electrical engineering at University of Notre Dame and West Virginia University between 1990 and 2002. He joined University of Nevada in 2003 as the director of the newly proposed Nanotechnology Research Center. Dr. Das's research interests include nanoscale device fabrication/characterization, spintronics, electron beam lithography, nanoscale sensors, sensor networks, and electronic properties of biological systems. He is the author/co-author of over 80 journal and conference papers.

**WEDNESDAY APRIL 14**

SCV Communications Society

Subject: **Beyond 3G: Evolution of mobile networks and services**

Speaker: Dr. Minoru Etoh (DoCoMo  
Communications Laboratories USA, Inc.)

Time: Pizza and soda at 6:00 p.m., presentation  
at 6:30

Cost: \$1 donation to partially cover food cost

Place: National Semiconductor Credit Union,  
Bldg. 31, 955 Kifer Rd., Sunnyvale

RSVP: (required): [rsvp@comsocscv.org](mailto:rsvp@comsocscv.org)

Web: <http://www.comsocscv.org>

## **Beyond 3G: Evolution of Mobile Networks and Services**

**An April 14 discussion on research** directions toward the next generation mobile networks. As for the wireless access technologies, in Japan, the focus is on pushing the envelope and trying to get extremely broadband wireless, broader than even most wired broadband in the US. Hence the DoCoMo works on a very complex physical layer that gets 100 Mbps.

In the U.S., the focus is on getting a physical layer and media access that is a much better fit with IP than the current 3G protocols, but can deliver over a wide area and to faster moving vehicles, which 802.11 can't.

In Europe, the focus is on getting value out of the existing 3G wireless access protocols by working on seamless intertechnology handover between GPRS and 802.11. They are uninterested in any new wireless protocol work.

To summarize the three directions, it is a commonly stated proposition that the next generation mobile network will operate on Internet technology combined with various access technologies such as wireless LAN, and run at speeds ranging from 100 Mbps in cell-phone networks to 1 Gbits in hot-spot networks (i.e., the definition in ITU-R Vision).

The point of this presentation, however, is that the wireless technologies implied by this rather limited technical definition are absolutely necessary, but not sufficient to provide the required leap into a new generation. In order to produce the significant functional leap required for the next generation, full and seamless convergence of mobile networks with the Internet is essential. Moreover the efficacy

*Continued on next page*

(and therefore value) of the new network must exceed that of the current Internet. This will be achieved with enhanced capabilities such as mobility support, realtime service provision, reliable security and so on. We also touch upon media delivery technologies, which are necessary to fill the gap between wired and wireless networks, through the examination of existing mobile networks, commercialized or standardized transport and coding technologies.

Minoru "Mick" Etoh started his career as a research engineer at the the Central Research Laboratories of Matsushita Electric in 1985 In 90s, he was leading an image communication research team and participated in MPEG-4 standardization.

He joined the Multimedia Laboratories of NTT DoCoMo, Inc., Yokosuka in May 2000. He was director of signal processing at NTT DoCoMo Laboratory, at which he was involved in multimedia communication research and development. He was simultaneously serving as adjunct lecturer of Osaka University.

In 2002, Dr. Etoh was promoted to president & CEO of DoCoMo Communications Laboratories USA, Inc., where he is now conducting several research groups in charge of mobile network architecture design, cryptography, terminal software, audio, speech and video coding technologies, and media delivery over mobile networks. He is also a visiting professor of Nara Institute of Science and Technology.

Dr. Minoru Etoh received his BE and MSEE from Hiroshima University, PhD degree from Osaka University, in 1983, 1985 and 1993 respectively.

He also received the 1995 Best Paper Award of IEICE Japan, the 14th Telecom System Technology Prize of the Telecommunications Advancement Foundation(1998), the 7th Sakai Commemorative Prize of IPSJ(1998), and the 39th Achievement Award of IEICE (2002). He is a member of IEEE, IEICE, and IPSJ.

**THURSDAY APRIL 15**

SF Power Engineering Society

Subject: **Annual Spring Banquet – The Northeast Blackout**

Speaker: Bob Stuart (PG&E) and Terry Winter (CAISO)

Time: No host bar at 5:00 p.m., dinner at 6:00, presentations at 7:00

Place: The Atrium Restaurant, 101 California Street, San Francisco - free parking in the garage of 101 California with validation, and just steps from the Embarcadero BART Station.

Cost: Early Bird Special \$30 before April 8 - \$35 after April 8. Students \$15 - Deadline for all reservations is April 12

RSVP: Please do not send cash. Make checks payable to IEEE SF PES. Mail check and reservation form to: Bhaskar Ray, Pacific Gas & Electric Co., 245 Market Street, Mailcode N3B, San Francisco, Ca. 94105. Phone: 415 973-0582

**Annual Spring Banquet  
The Northeast  
Blackout**

**What was the cause?** What were the contributing factors? Could it happen here? This year we have two distinguished speakers who can give you the answers. They are Bob Stuart, manager of Electric Operations at PG&E and a member of the North American Reliability Council's (NERC) N.E. Blackout Investigation Team, and Terry Winter, CEO of the California Independent System Operator (CAISO), operators of California's transmission grid and member of the NERC Steering Committee investigating the N.E. Blackout.

In addition, we will be enjoying fine dining at the Atrium Restaurant, <http://www.restaurant.com/atrium>. Dinner is being subsidized by the S.F. PES ADCOM committee, so that all can enjoy this great evening at a reasonable price! This will be an enjoyable evening for engineers and non-engineers alike, so tell a friend. All are welcome!



**THURSDAY APRIL 15**

SCV Solid State Circuits Society

Subject: **A Single-Chip, Dual-Band, Tri-Mode CMOS Transceiver for IEEE 802.11a/b/g Wireless LAN**

Speakers: Masoud Zargari (Atheros Communications, Irvine) and Manolis Terrovitis (Atheros Communications, Sunnyvale)

Time: Refreshments at 6:30 p.m., presentation at 7:00

Place: Cadence Design Systems, Bldg. 5, 2655 Seely Ave., San Jose

RSVP: [ssc\\_scv\\_rsvp@yahoo.com](mailto:ssc_scv_rsvp@yahoo.com) For email reminder, send email to the ssc-chpt-scv mailing list ([listserv@listserv.ieee.org](mailto:listserv@listserv.ieee.org))

Web: <http://www.ewh.ieee.org/r6/scv/ssc/>

**A Single-chip, Dual-band, Tri-mode CMOS Transceiver for IEEE 802.11a/b/g Wireless LAN**

The proliferation of multiple WLAN standards in the past few years has created the need for integrated, low cost, multi-mode multi-band transceivers. This April 15 presentation describes a single-chip dual band, tri-mode CMOS transceiver that implements the RF and analog front-end of an IEEE 802.11a/g/b wireless LAN standards.

The chip is integrated in a 0.25um standard CMOS process and occupies a total silicon area of 23mm square. The IC transmits 9dBm/8dBm EVM compliant output power at 5GHz/2.4GHz for a 64QAM OFDM signal. The overall receiver noise figure is 5.5/4.5dB at 5GHz/2.4GHz.

In the first part of presentation Massoud Zargari describes the architecture of the chip, insisting on the major blocks of the transceiver: LNA, selection filters, mixers, power amplifier, predrivers and the measured performance of the transceiver. The transceiver operates in both 2.4 and 5GHz unlicensed frequency bands and has fully integrated transmit and receive channels. It includes on chip baseband GmC filters, synthesizer loop filters and VCOs. The dual-band relies heavily on reusing circuits blocks for different modes of operation to reduce the overall die size.

In the second part of the presentation Manolis Terrovitis describes the frequency synthesizer, a critical block of the WLAN transceiver and the design features applied in order to achieve good phase noise and spur performance necessary to insure high receiver sensitivity and low transmitter error-vector - magnitude required for the 64-QAM OFDM signals. It is a fully integrated integer-N PLL with programmable loop filter and on chip regulators. It uses switchable tuning capacitors in VCO to assure wide covering frequency range from 3.2-4GHz. The phase

*Continued next page*

# Solid State Circuits

## TUESDAY APRIL 15

noise is -105dBc/Hz at 10KHz offset, and the spurs are below -64dBc when measured at the 5GHz transmitter output. The settling time is shorter than 150us. The block diagram of the synthesizer, the VCO topology, the high frequency divide-by-2, the charge pump and the synthesizer performance are presented.

Masoud Zargari received his MSc and PhD degrees in electrical engineering from Stanford University in 1993 and 1997 respectively. From 1996 to 1998 he was a member of the technical staff at Wireless Access Inc., Santa Clara, CA. where he worked on the design and development of wireless systems for two-way messaging networks. In 1998 he joined Atheros Communications as a member of the founding team where he is currently director of

analog design focusing on integrated systems for the IEEE 802.11 based wireless local area networks. During 1999 and 2000 Dr. Zargari was a consulting assistant professor at Stanford University where he taught courses in the area of RF and analog integrated circuit design.

Manolis Terrovitis obtained his diploma in engineering from the National Technical University of Athens, Greece in 1992 and his MS and PhD degrees from the University of California at Berkeley in 1996 and 2001 respectively. He held internship positions at Texas Instruments, Cadence Design Systems, and Philips Semiconductors. Since August of 2000 he has been with Atheros Communications working on analog RF and Mixed Signal circuits for wireless LAN applications.

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**SATURDAY APRIL 17**

6th IEEE/NATEA Annual Conference on New Frontier in Computing

**Semiconductors to Nanotechnology: the coming convergence**

Speakers: (keynote) Dr. Meyya Meyyappan, NASA Ames, Director, Center for Nanotechnology; Prof. Yosio Nishi, Director, Stanford Nanofabrication Facility; Prof. Peidong Yang, UC Berkeley; and Dr. Maw-Kuen Wu, Academia Sinica

Place: Braun Auditorium, Stanford University  
Fee: \$70 non-member, \$60 member, \$30 student  
RSVP: Registration On Line  
For more details contact T. Y. Lin, Chair of IEEE-CS SCV, tylin@cs.sjsu.edu or Shinn Lee, President of NATEA-SV, shinn-horng.lee@intel.com

**Semiconductors to Nanotechnology: the coming convergence**

IEEE (the Institute of Electronic and Electrical Engineers) and NATEA (North American Taiwanese Engineers Association) share a common interest in providing their members significant technical information in a timely fashion. Members of both organizations often feel the lack of solid technical background on emerging technologies and do not possess time or funding to attend expensive commercial or academic courses. As a solution to this problem local chapters of both NATEA and the IEEE Computer Society have joined resources over the last six years to provide an annual one day conference on an emerging technology.

By gathering a panel of noted experts in a given technical area and having them cover the salient technical issues on a given topic this inexpensive one day conference provides individual members with enough information to make informed decisions regarding a given technology. This is the conference's sole aim - to provide members with the kind of technical background that allows them to cope with an increasing mass of new information in an organized and effective way.

This year we plan to cover the march towards nanotechnology from traditional semiconductor technology. What is happening in this transformation and how fast it is happening are critical questions. The answer or the beginning of an answer to these questions will be addressed by a panel of noted experts from academic and quasi public research facilities as well as private companies.

For more information, go to (<http://www.siliconvalleyics.org/> or <http://natea.org/sv/index.php>)

**TUESDAY, APRIL 20**

SCV Magnetics Society

Subject: **Assault on storage density of 1 Terabit/sq-in and beyond**

Speaker: Dr. Dieter Weller (Seagate Research, Pittsburgh) Distinguished IEEE Lecturer for 2004

Time: Coffee and conversation at 7:30 p.m., presentation at 8:00

Place: Komag, 1710 Automation Parkway, San Jose

RSVP: Not required

## Assault on Storage Density of 1 Terabit/sq-in and Beyond

The areal density in magnetic recording has surpassed ~70 Gbit/in<sup>2</sup> in products and ~110 Gbit/in<sup>2</sup> in laboratory demonstrations. Respective recording media are Co-alloy nanostructured materials with horizontal orientation of the magnetization (longitudinal recording).

Going beyond ~100 Gbit/in<sup>2</sup> requires magnetically harder materials with smaller, thermally stable grains. Enhanced write fields are expected in perpendicular recording owing to a soft magnetic imaging layer, enabling such magnetically harder materials to be recorded on.

Basic technology demonstrations of about 170 Gbit/in<sup>2</sup> have been reported and modeling suggests that extensions to about 1 Tbit/in<sup>2</sup> should be possible. It is envisioned that even higher areal densities are possible by using an assisted assembly process e.g. of chemically synthesized FePt nanoparticles.

Writing on such self-organized magnetic array media (SOMA) will require temporal heating and cooling in a magnetic field (HAMR: Heat-Assisted Magnetic Recording). A combination of SOMA and HAMR may once lead to single particle per bit recording, with ultimate density capability of 50 Tbit/in<sup>2</sup> (10 yrs storage time, ambient temperature, FePt type anisotropies).

Dieter Weller received a Diploma in physics from University Marburg, Germany in 1982 and a PhD degree in physics from University Cologne, Germany in 1985. From 1985 to 1990 he worked at the Siemens AG Central Research Laboratories in Erlangen, Germany on the design, fabrication and characterization of magneto-optic recording materials and disks.

From 1990 through 2000 he has been with the IBM Research Division in San Jose working on electronic, magnetic and magneto-optical properties of thin films and multilayers. He joined Seagate Research in Pittsburgh in April 2000 as director of media research. One of his current interests is the exploration of extremely high-density magnetic recording schemes and the fabrication of novel nano-phase magnetic materials.

Dieter is a fellow of the American Physical Society (APS) and is a member of the IEEE and the American Vacuum Society (AVS). He is also "Distinguished IEEE Lecturer" for calendar year 2004. Dieter has published over 200 scientific journal papers, several book articles, holds eight U.S. patents and has 15 pending patent applications. He has served as guest editor for the Journal of Applied Physics and IEEE Transactions on Magnetics and was program co-chair of the eighth Joint MMM-Intermag Conference, January 7-11, 2001, San Antonio Texas. He is co-editor of a book on "The Physics of High Density Magnetic Recording", Springer Verlag (2001).

**TUESDAY APRIL 20**

SCV Product Safety Technical Committee  
Subject: **Overview of IEC TC 108 and the  
Hazard Based Standard  
Development Team**

Speaker: Rich Pescatore (Hewlett-Packard)

Time: Dinner at 5:30 p.m., presentation  
at 7:00

Place: Dinner at El Torito, 2950 Lakeside Dr.,  
Santa Clara (408 727-4426),  
presentation at Applied Materials  
Bowers Café, 3090 Bowers Ave.,  
Santa Clara

RSCV: Not required

Info: Julia Luke, 408 463-0885-Ext. 112  
jluke@ccsemc.com

Web: [www.scvemc.org/scv2003meetmap.gif](http://www.scvemc.org/scv2003meetmap.gif)

**Overview of  
IEC TC 108  
and the Hazard-based  
Standard  
Development Team**

**IEC TC 108 is a new technical committee** that has under its scope information technology equipment, telecommunications equipment and consumer electronics.

The major goal of TC 108 is to develop a new product safety standard that will apply to all equipment currently in the scopes of IEC 60065 and IEC 60950-1. The intent is to produce a standard that is quite different than the current standards; different in format, different in style, and different in the development process.

Speaker for this April 20 Safety Technical Committee meeting, Rich Pescatore, will present a brief overview of IEC TC 108, followed by a more in depth view of the work in progress of the Hazard Based Standard Development Team, with particular emphasis of requirements to address external ignition.

Rich Pescatore is global product safety standards and certification manager for Hewlett-Packard's Worldwide Technical Regulations Department. He also chairs the U.S. National Committee Technical Advisory Group for IEC TC 108, the US National Committee to the IECCE, and the Hazard Based Standard Development Team in IEC TC 108.

**WEDNESDAY APRIL 21**

SCV Engineering in Medicine & Biology  
Society

Subject: **Recent advances in non-invasive  
MR imaging of the coronary arteries**

Speaker: Phillip Yang, MD (Stanford School of  
Medicine)

Time: Dinner at 6:30 p.m., presentation at 7:30

Place: Dinner in the Stanford Hospital  
Cafeteria, presentation in Room M114  
of the Stanford Medical School

RSVP: Not required

## Recent Advances in Non-invasive MR Imaging of the Coronary Arteries

**Optimal spatial and temporal resolution**, accurate motion compensation, wide anatomical coverage, and high signal and contrast to noise ratios are the inherent challenges in MR coronary angiography. Fundamental problems with coronary angiography are their small size (<4mm), tortuosity, competing MR signals from adjacent epicardial fat and myocardium, and the constant dyssynchrony between cardiac and respiratory motions.

Significant technical developments have occurred in recent years in order to address these problems. Both two- and three-dimensional image acquisitions have become possible. Acquisition strategies have evolved from rectilinear segmented k-space to more complex echo planar and spiral imaging. Motion compensation has evolved from simple breath-hold to more complex navigator-based techniques. Other strategies to enhance contrast, signal, and imaging speed have also been developed to implement MR coronary angiography as a routine clinical test.

Phillip Yang, MD, will address this technology at the April 21 meeting of the EMB chapter. The talk will review the current state-of-the-art of MR coronary angiography.

Phillip Yang received BAS and MA degrees in biology and East Asian studies from Stanford University in 1984, and an MD degree from Yale University School of Medicine in 1989. He subsequently completed residency in internal medicine in 1993 at UCLA Hospital and fellowship in cardiovascular medicine in 1999 at Stanford University Hospital.

In 1999 he joined the Division of Cardiovascular Medicine at Stanford University, where he is now a clinical instructor and staff physician. His research and clinical interests are in cardiovascular imaging using MRI and ultrasound. His research has focused on new technologies in cardiovascular and in vivo molecular and cellular imaging using MRI.

**THURSDAY APRIL 22**

OEB Industry Applications Society

Topic #1: **Infrared Cameras and Troubleshooting**

Speaker: Eric Hughes (FLIR Systems)

Topic #2: **Performance Contracting & California Energy Rebate Programs**

Speaker: Eugene Gutkin (Integrated Building Solutions, Inc.)

Time: No-host social at 5:30 p.m., presentation #1 at 6:15, dinner at 7:15, presentation #2 at 8:00

Place: Marie Callendar Restaurant, The Garden Room, 2090 Diamond Blvd. Concord nearby to Concord Hilton Hotel). 925 827-4930

RSVP:(by April 21) Gregg Boltz, 925 210-2571 or [gboltz@brwncald.com](mailto:gboltz@brwncald.com)

Cost: (dinner) \$22 for IEEE members; \$25 for non-members.

## Infrared Cameras and Rebate Programs

The April 22 meeting of the Industry Applications Society of the Oakland East Bay Area is going to offer you something different. It will be a “double-header” featuring two worthy topics and speakers.

### **Infrared Cameras and Troubleshooting**

Eric Hughes from Flir Systems will begin with basic infrared theory, discuss different applications and uses for infrared cameras, discuss the latest developments with cameras and software, and end with a demonstration. It's a good opportunity for all to review the fundamentals and learn what's new.

Eric Hughes is FLIR System's Northern California district sales manager. FLIR Systems is the global leading manufacturer of thermal imaging cameras used for a wide variety of applications in the commercial, industrial and government markets. Prior to coming to Flir, Eric was in the electrical and automated process industry for ten years, working in the Bay Area since 1992. He is based in San Carlos.

### **Performance Contracting & California Energy Rebate Programs**

Eugene Gutkin will discuss the latest California energy rebate programs. He will also cover the energy details and case studies of several standard performance contracts he has worked on for local Bay Area companies, such as NUMMI, Adobe Systems, and Hewlett Packard. We will hear what results were accomplished and what lessons were learned.

Eugene Gutkin is the president of Integrated Building Solutions, Inc. (IBS), a building automation, systems integration and energy conservation company based in San Ramon, and founded in 1997. Mr. Gutkin has 20 years of experience with HVAC systems and building automation. He previously worked with large mechanical contractors and Landis & Staefa (Siemens).

### SATURDAY APRIL 24

SCV Communications Society

Subject: **Short course - Wireless LAN Security: Technologies, Standards, and Deployment Issues and An Overview of WLAN Products**

Time: 8:00 a.m. to 5:00 p.m.

Place: Braun Auditorium, Stanford University

Fee: (includes breakfast, lunch, coffee, and presentation material): before April 1 - general \$249, IEEE Member, \$199, and Students \$99 after April 1 general \$299, IEEE Member \$249, and Students \$129

RSVP: For Information and Registration, go to [www.comsocscv.org](http://www.comsocscv.org) or [www.amrutek.com](http://www.amrutek.com) and click on SEMINAR.

## One-day Short Course: Wireless LAN Security

**This one-day course** will be taught by Dr. Amruthur Narasimhan, president, Amrutek Services Inc. and Dr. Manu Malek, industry professor and director of CyberSecurity Certificate Program, Stevens Institute of Technology

The dramatic cost reduction of Wireless LANs (WLANs) in the Small Office Home Office (SOHO) market has fueled their proliferation in the enterprise environment. The explosion of wireless devices requiring network services is driving the need to evaluate, implement and support WLAN applications in the network. While WLANs provide flexibility, cost savings, and convenience, they introduce security vulnerabilities apart

from limitations of scalability, performance, resilience and manageability.

In this short course, the lecturers discuss the impending challenges of deploying wireless, and how wireless and wired networks can be deployed assuring security. The growing number and intensity of security incidents, coupled with the post-9/11 heightened security concerns, have made security the most important issue relative to the progress of WLAN deployment. Recently, new security methods based on IEEE 802.1X, WPA (Wi-Fi Alliance and IEEE), 802.11i and strong EAP authentication have emerged, which offer strong WLAN security.

An overview of WLAN, standards, deployment and security needs will be provided. Some related security services and mechanisms will be discussed. A general introduction to the field of security covering threats, countermeasures, as well as design principles, and practical examples of how to integrate security services into WLAN will be discussed. Security vulnerabilities will be explained by presenting a few examples of security attacks and the safeguards needed to counter them.

A brief description of products from prominent players such as Cisco, AirFlow, Aruba, Airdefense, Symbol, and other product vendors will be provided. Also, deployment challenges, covering typical architectures for WLANs, with the related security issues, will be provided. The short course will conclude with pointers to future trends in WLAN on secured roaming and privacy issues.

Dr. Manu Malek is director of certificate in CyberSecurity Program at Stevens Institute of Technology. Prior to joining Stevens full time in October 2001, he was a distinguished member of technical staff at Lucent Technologies Bell Laboratories, and an adjunct professor of electrical engineering, computer science, and technology management at Stevens.

*Continued next page*

He has more than 20 years of experience in teaching, practicing, and research in telecommunication networks design, optimization, operations, and management. He has held various academic positions in the US and overseas, as well as technical management positions with Bellcore (now Telcordia Technologies) and AT&T Bell Laboratories.

He is the author, co-author, or editor of six books, co-holder of two patents, and the author or co-author of over fifty published technical papers and numerous internal technical reports in the areas of network design, computer communications, and network operations and management.

Dr. Malek is a fellow of the IEEE, an IEEE Communications Society distinguished lecturer, and the founder and editor-in-chief of Journal of Network and Systems Management. He earned his PhD in EE/CS from University of California, Berkeley.

Dr. Amruthur Narasimhan is currently president of Amrutek Services Inc., a company that provides consulting services in the area of information technology, enterprise communication infrastructure, VOIP, wireless LAN and security areas. He was a technical manager at Avaya Inc in architecture and strategy team for multiservice networks.

While at AT&T, he was a lead designer for eProcurement service, an eBusiness service. He was lead designer for global hosting service. He has been coordinator, speaker and panel member of many IEEE conferences, workshop and seminar in areas of electronic commerce, multimedia communications, and artificial intelligence. He has developed a course entitled Multimedia Communications: Technologies, System and Services for AT&T Bell Laboratories. Prior to this he was associate professor at Stevens Institute of Technology in New Jersey. He has published several research papers in the above areas.

Dr. Narasimhan has received IEEE Region 1 technical achievement award in 2002 for eBusiness and Internet Technologies and in 1977 for Innovations in Artificial Intelligence technology. He has received an award of Excellence for Outstanding Research and Contribution to IEEE NJ Coast Section, 1995-97.

Dr. Narasimhan was the chair for Computer Chapter and chair of New Jersey IEEE coast section from 1994 through 2002. He was an IEEE technical committee member for computer graphics and pattern analysis, and machine intelligence. He is a senior member of IEEE, and a member of Eta Kappa Nu.

**WEDNESDAY APRIL 28**

SCV Engineering Management Society

Subject: **Fostering Trust on Virtual Teams**

Speaker: Kathie Sinor (Mentor Consultant)

Subject: **Outsourcing and Off-shoring is good for you!**

Speaker: Kevin Walsh (Santa Clara U, Ridge Partners LLC – Investment & Buy-out Co.)

Time: Forum at 6:00 p.m., dinner at 7:00, after dinner presentation at 7:45

Place: Wyndham Garden Hotel, 1300 Chesapeake Terrace, Sunnyvale - off Lawrence Expressway/Caribbean Drive at Hwy 237

RSVP: <http://www.ieee-scv-ems.org>

Cost: (with reservations by Friday before meeting)

\$25 (IEEE member), \$30 (non member), \$5

surcharge thereafter. (Cash or check at the door).

Student IEEE members - \$5. For *other* information

leave message with Rich Hendrickson at 408 203-3462.

## Challenges and Opportunities of Global Teams and Outsourcing and Off-shoring

The Santa Clara Valley Engineering Management Society presents a before-dinner forum on creating and maintaining trust in a global virtual team whose members transcend time, space, and culture. Following networking and a sit-down dinner, the after-dinner topic will be on the business of out-sourcing and off-shoring.

### Forum

#### Fostering Trust on Virtual Teams

Many skeptics say it is not possible to build trust on a virtual team and as a result these leaders don't try creative ways to build and foster this important aspect of team collaboration. Learn how to enhance your team collaboration skills while creating the environment of trust to develop on your virtual team.

Building trust is at the heart of all team collaboration and leads to higher team performance. It takes longer to build trust on a virtual team but only a few minutes to breach it and destroy what you built.

What is your personal experience with building trust on virtual teams? Is it possible or must you be face-to-face to build trust? What is the role of the team leader as well as team members in fostering trust? Once you have it, how do you maintain it? These questions and potential solutions are explored in this presentation.

Kathie Sinor, MA, specializes in mentoring, virtual leadership and team collaboration. She has personally experienced the challenges of remote management while responsible for the leadership and team curriculum at Sun Microsystems. Her 20 years of experience comes from practical knowledge as the founder of an eight-store retail chain and training manager at several corporate universities. She is an affiliate with Virtual

*Continued next page*

Connection and recently presented at its web conference on the topic of *Fostering Trust on Virtual Teams*.

As Sun moved toward a virtual workforce, Kathie became passionate about facilitating teams to share best practices for working from home, dispersed team management and running effective virtual meetings. Her group developed on line training and communities of practices for knowledge sharing about effective virtual team collaboration.

Like all management and team skills leaders must continually refine and upgrade their competencies. Virtual Connection has a virtual leadership assessment tool to help you determine your skill gaps and find the best learning solutions. Kathie uses these and other team assessment tools to coach remote leaders and their team members to gain the skills that put them at the leading edge of managers.

### **After-Dinner presentation**

#### **Outsourcing and Off-shoring is good for you!**

This presentation will explore the questions about what are outsourcing and off-shoring? and why they are good for you, by an authority on the subject from Santa Clara University's School of Business, and Ridge Partners, LLC. The political issues of Globalization will be covered, along with the following topics: Host and Donor countries' viewpoints; International trade and business theory; Adam Smith – David Ricardo – Karl Marx – Michael Porter - what do they all have in common? Globalization - why it makes everyone better off in the long run; Politics and the fight for the minds of the voter; A cost and benefit analysis of a typical off-shoring project; What does this mean for your career and your future; and

How you can optimize your business success in the new global economy.

This will be a stand up presentation by Mr. Kevin Walsh, the Dean's Executive Professor of Management at Leavey School of Business, Santa Clara University. After the presentation we can open up the discussion for Q and A, including use of a subsidiary vs. contracting, and the question of how good outsourcing and off-shoring is for the US-employed engineer.

Kevin Walsh is a member of the advisory board of the Leavey School of Business. He is also a general partner responsible for business and financial evaluations of potential investments with Ridge Partners LLC – Investment & Buy-out Company.

Previously, Mr. Walsh was with Sun Microsystems as VP of corporate and strategic planning, responsible for company wide strategy and planning processes and business development. He was COO and CFO for Spatial Technology, Inc. a Colorado based CAD-CAM Software Company. For fourteen years he was VP of finance for Schlumberger Group, with responsibilities for ATE, board test, CAD-CAM software, Instrumentation and electronic transactions; and group controller for Fairchild Semiconductor memory and logic devices in California and then European controller based in Paris, where he was assigned as plant manager for a medium sized electronics business.

Mr. Walsh has a BSc Economics (Hons) from the London School of Economics. He is a Chartered Certified Accountant (UK), and a member of the Institute of Management Consultants (UK).

**WEDNESDAY APRIL 28**

SCV Women in Engineering

Subject: **How to Get Out of Your Own Way**

Speaker: Kimberley Wiefling (Wiefling Consulting)

Time: Networking and refreshments at 6:30 p.m., presentation at 7:00

Place: to be announced

RSVP: Info: [s.woo@ieee.org](mailto:s.woo@ieee.org)

## How to Get Out of Your Own Way

**Many problems are of our own making.** Self-limiting beliefs prevent many people from even attempting to reach their goals, let alone act on them. Discover 'optimism as a strategy!' This presentation is based on well documented concepts of behavioral modification called *acting as if*.

If you are ready to move beyond anger, blame and grief, this presentation is for you. Open to the possibility of accepting, even embracing, changes not of our own choosing as opportunities that would not otherwise have been available. Re-interpret the story of your career transition in ways that will energize you, inspire others, and attract your next opportunity.

You'll leave this presentation with practical tools you can start using today to: re-interpret circumstances in ways that will energize you and inspire others; stop sabotaging yourself with negativity; and communicate more effectively and get unstuck.

Kimberly Wiefling is the founder and principal of Wiefling Consulting. She is a proven business leadership and program management consultant with over 15 years of experience enabling leaders, companies and teams to get results. Kimberly's client list includes Extreme Networks, Xerox PARC, AMD, Symantec, and Chiron Corporation.

Prior to Wiefling Consulting, Kimberly was at Hewlett-Packard for 10 years as an engineer and manager in R&D and manufacturing. Her contributions were in the area of biotech-centric analytical products, and timing and network synchronization.

Kimberly received her BS in physics and chemistry from Wright State University and her MS in physics from Case Western University.

**FRIDAY MAY 7**

**FRIDAY MAY 7**

SCV Electron Devices Society

Subject: **Half-day Symposium on  
Compact Modeling**

Speakers: Prof. R. Dutton, Prof. C. Yang, Prof.  
M. Miura-Mattausch, Dr. J. Xi, Dr. P. Bendix,  
Dr. N. Arora and Dr. P. Jansen

Time: Doors open at 1:00 p.m., presentations  
start at 1:30

Place: National Semiconductor, Building 31  
Large Auditorium, 955 Kifer Road, Sunnyvale

RSVP: Info: [ssaha@sst.com](mailto:ssaha@sst.com)

## **Half-day Symposium on Compact Modeling**

**The Santa Clara Valley** Chapter of the IEEE Electron Device Society, in collaboration with IEEE Compact Modeling Committee has organized a half-a-day symposium on Compact Modeling. The main focus area of the symposium is to learn from the invited distinguished speakers on the recent development in transistor level IC device model as well as IC interconnect model.

Some of the topics of presentation are: interconnect modeling for frequency-dependent crosstalk noise analysis; recent development in BSIM MOSFET models; HiSIM MOSFET models; and compact modeling for ESD optimization.

The panel of distinguished speakers is comprised of: Prof. Robert. W. Dutton, Stanford University; Prof. Gary Yang, Santa Clara University; Prof. Mitiko Miura-Mattausch, Hiroshima University, Japan; Dr. Jane Xi, University of California, Berkeley; Dr. Peter Bendix, LSI Logic Corp.; Dr. Narayan Arora, Cadence Design Systems; and Dr. Philippe Jansen, IMEC, Belgium.

**TUESDAY MAY 18**

SCV Magnetics Society

Subject: **Dynamics, damping and defects in thin ferromagnetic films**

Speaker: Dr. Robert D. McMichael (National Institute of Standards and Technology) Distinguished IEEE Lecturer for 2004

Time: Coffee and conversation at 7:30 p.m., presentation at 8:00

Place: Komag, 1710 Automation Parkway, San Jose

RSVP: Not required

## Dynamics, Damping, and Defects in Thin Ferromagnetic Films

**Modern disk drives** can read and write bits every two nanoseconds, a time scale that is very similar to the magnetic damping time of the ferromagnetic metals used in the heads. The damping characteristics are also important for thermally driven magnetic noise in sensors.

Further, it seems likely that damping will limit data rates in MRAM since the magnetization in a memory cell must be allowed to settle between switching events. For all of these applications, measurements of damping are important, and these measurements are most commonly made by ferromagnetic resonance line width. The two problems that complicate measurements of damping by ferromagnetic resonance are 1) that defects contribute to the line width so that the line width is the combined effect of defects and damping, and 2) that the form of the damping itself is under some debate.

In this May 18 lecture, Dr. Robert D. McMichael will primarily discuss the role of defects in magnetization dynamics with an emphasis on the competition between interactions, which promote the collective behavior typified by spinwaves, and inhomogeneity, which promotes local behavior. An understanding of these effects allows one to use line width data to characterize damping and inhomogeneity separately. He will show examples of line width data and modeling from nominally uniform films, exchange biased films, films with wavy substrates and films with nonuniform magnetization.

Patterning is perhaps the ultimate form of magnetic inhomogeneity in a thin film. Unlike the spin-wave normal modes of a continuous film, the normal modes of patterned elements are shape and size dependent. The dynamic properties can be addressed using available micromagnetic modeling software to obtain images of the normal mode precession patterns.

Robert D. McMichael received the BS degree in engineering-physics from Pacific Lutheran University in 1985, and the MS and PhD degrees in physics from Ohio State University in 1990. In 1990, he was awarded a National Research Council postdoctoral associateship at the National Institute of Standards and Technology, and he has continued on in the Magnetic Materials Group of the Materials Science and Engineering Laboratory of NIST. His research interests have touched on a diverse set of topics including nonlinear magnetization dynamics, ferromagnetic resonance, magnetic refrigeration, hysteresis modeling, giant magnetoresistance, exchange bias, computational micromagnetics and magnetization dynamics. He currently serves as leader of the Nanomagnetodynamics project in NIST's Metallurgy Division.

Bob serves on the editorial board of IEEE Transactions on Magnetics, and on the Advisory Committee for the MMM conference. He created the logos of several recent MMM conferences.

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