Eight faculty members in the Department of Electrical and Computer Engineering at Texas A&M University received 11 early career development awards in 2008, 2009. Drs. Ulisses Braga-Neto, Jean-Francois Chamberland, Jim Ji, Gregory Huff, Peng Li, Tie Liu, Henry Pfister and Haiyan Wang received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF). Huff and Wang also received a Presidential Early Career Award for Scientists and Engineers (PECASE) award and Wang received a Young Investigator Program (YIP) award from the Office of Naval Research (ONR). The PECASE award, established by President Clinton in 1996, is the nation’s highest honor for scientists and engineers at the outset of their independent research careers. Eight federal departments and agencies join together annually to nominate the top young scientists and engineers for the PECASE who broadly advance the frontiers of science and technology to benefit the agencies’ missions. Wang received her award for her work with high-temperature superconductors and Huff received his award for his work on multifunctional antennas and multimodal sensing systems. The NSF established the CAREER program to support junior faculty within the context of their overall career development, combining in a single program the support of research and education of the highest quality and in the broadest sense. Through this program, the NSF emphasizes the importance on the early development of academic careers dedicated to stimulating the discovery process in which the excitement of research is enhanced by inspired teaching and enthusiastic learning. Braga-Neto received his CAREER Award for “Theory and Application of Small-Sample Error Estimation in Genomic Signal Processing.” Chamberland received his award for “Information-Aware Wireless Sensor Net-
Chamberland joined the department in 2004 as an assistant professor. He received his B.S. and M.S. degrees in electrical engineering, from the T singhua University, Beijing, China in 1998 and 2000 respectively. He received his M.S. degree in Mathematics in 2004 and his Ph.D. degree in electrical and computer engineering from the University of Illinois at Urbana-Champaign in 2006. Liu joined the department in 2006 as an assistant professor. He received his B.S. and M.S. degrees in electrical engineering, from Carnegie Mellon University in 2003, and his M.E. and B.E. degrees from Xi’an Jiaotong University, China in 1997 and 1994, respectively.

His research interests are in the general area of VLSI Design and CAD with an emphasis on analog/RF optimization and test, circuit simulation, parallel CAD algorithms and analysis of power and clock distribution networks, interconnect and timing analysis, statistical circuit analysis and optimization. Other honors include receiving Inventor Recognition Awards from the Semiconductor Research Corporation in 2001 and 2004 and from the Microelectronics Advanced Research Corporation in 2006. In 2003 and 2008, he received a Best Paper Award from the IEEE/ACM DAC.

Liu joined the department in 2006 as an assistant professor. He received his B.S. and M.S. degrees in electrical engineering, from the Tsinghua University, Beijing, China in 1998 and 2000 respectively. He received his M.S. degree in Mathematics in 2004 and his Ph.D. degree in electrical and computer engineering in 2006, both from the University of Illinois at Urbana-Champaign. Liu’s research interests are in the field of information theory, wireless communication and signal processing. He is a recipient of the M.E. Van Valkenburg Graduate Research Award from the University of Illinois at Urbana-Champaign and the Best Paper Award from the Third International Conference on Cognitive Radio Oriented Wireless Networks and Communications.

Pfister joined the department’s Telecommunications and Signal Processing group in September 2006 as an assistant professor. He was a postdoctoral fellow from 2005-2006 at the Swiss Federal Institute of Technology (EPFL) in Lausanne, Switzerland. He received his Ph.D., M.S. and B.S. from the University of California, San Diego in 2003, 2000 and 1995 respectively.

Pfister’s research interests include information theory, iterative coding techniques, and statistical inference. He is currently focusing on applications in wireless communication, data storage and compressed sensing.

Wang joined the department in the solid state electronics area in 2006 as an assistant professor. She received her BS degree from Nanchang University (Nanchang, China) in 1998 and her MS degree from the Institute of Metal Research (Shenyang, China) in 1999. She received her Ph.D. degree in materials science and engineering at North Carolina State University (Raleigh, NC) in December 2002. Before she joined the department, she worked at Los Alamos National Lab. Wang’s research interests lie in the area of functional oxide and nitride thin films for microelectronics, optoelectronics, high temperature superconductors, magnetic and structural applications. Her expertise is thin film growth and structural characterizations. In addition to her ONR YIP award, she received a YIP award from the Air Force Office of Scientific Research (AFOSR) in 2007. Wang also was the winner of the TMS Young Leader Award in 2005 and an MRS Graduate Student Award in 2001.
The Department of Electrical & Computer Engineering's graduate electrical and computer engineering programs at Texas A&M University were again among the top schools nationally according to The U.S. News & World Report's recent release of America's best graduate schools for 2010. Electrical engineering at Texas A&M was ranked 20th among 185 Ph.D.-granting engineering schools and 12th among public schools. Computer engineering was ranked 20th overall and 13th among public schools. Specialty rankings are based solely on nomination by educators at peer schools, with the department heads asked to judge the overall academic quality of programs in their field on a scale of 1 ("marginal") to 5 ("outstanding"), and the average scores were used for rankings.

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News from TAMU Qatar

Alnuweiri named ECE Coordinator
Dr. Hussein Alnuweiri, senior professor of electrical and computer engineering, has been named coordinator of the electrical and computer program in Qatar. Alnuweiri, brings private business and academic experience to the post. He succeeds Dr. Mohamed-Slim Alouini, senior professor of electrical and computer engineering.

The Electrical Engineering Program Renamed
The Electrical Engineering Program at Texas A&M at Qatar was renamed the Electrical and Computer Engineering Program. The ELEN prefix for courses offered by the program in Qatar will be changed to ECEN.

Alouini named IEEE Fellow
Dr. Mohamed-Slim Alouini recently was elected to the rank of Fellow of the Institute of Electrical and Electronic Engineers (IEEE).

Alouini received the Ph.D. degree in electrical engineering from the California Institute of Technology (Caltech), Pasadena, CA, in 1998. He was an associate professor with the Department of Electrical and Computer Engineering of the University of Minnesota. In 2005, he joined the electrical engineering program at TAMUQ. His current research interests include the design and performance analysis of wireless communication systems.

RasGas Inaugurates New Research Agreement
RasGas Company Limited (RasGas) inaugurated a new research agreement with Texas A&M University at Qatar for a research project titled “Advanced Designs for Wireline Tool Conveyance.”

ECE Program hosts Seminar
The Electrical and Computer Engineering Program hosted a seminar titled “Protecting National Security and Sailor Lives at Sea” by Dr. Karen Butler-Purry, Butler-Purry, professor of electrical and computer engineering and associate department head of the Department of Electrical and Computer Engineering Department at Texas A&M in College Station, gave the talk as part of a colloquia series sponsored by the Electrical and Computer Engineering Program.

Whitakers endow graduate fellowship in ECE department
Delbert and Linda Whitaker of Dallas have teamed with Texas Instruments Incorporated to provide five graduate student fellowship awards in electrical and computer engineering at Texas A&M University.

The Whitakers and the global semiconductor technology leader each will contribute $50,000, bringing the gift total to $100,000. A single $20,000 award will be presented annually for five years.

The Delbert Whitaker Fellowship will be funded by the Texas A&M Foundation. Each recipient will be a U.S. resident who graduated from a U.S. high school, finished the B.S. degree with a 3.5 GPA or above, and is pursuing a master’s or doctoral degree in electrical or computer engineering.

“Del and Linda Whitaker and Texas Instruments have made a substantial positive impact on our department through their many generous donations over the years,” said Dr. Costas N. Georgiades, department head and holder of the Delbert A. Whitaker Chair in Electrical Engineering.

Graduate fellowships encourage more U.S. undergraduates to pursue advanced degrees at Texas A&M, he said.

“I feel that the shortage of electrical engineers in the United States will become more serious with time,” said Whitaker. “I am just thankful that I have the opportunity to help an outstanding U.S. student at Texas A&M University.”

Whitaker received his bachelor’s degree in electrical engineering from Texas A&M in 1965. Four years later, he began a 31-year career with Texas Instruments, where his positions of increasing responsibility encompassed semiconductors product areas, marketing and sales. He retired in 2000 as senior vice president of TI’s Worldwide Analog and Standard Logic business.

Texas Instruments is the world leader in digital signal processing and analog technologies. The semiconductor and education technology company is headquartered in Dallas with manufacturing, design or sales operations in more than 25 countries. Whitaker was named an Outstanding Alumnus of the Dwight Look College of Engineering in 1999. He is a member of the Engineering Advisory Council and served as chair of the electrical and computer engineering campaign committee for the One Spirit One Vision campaign.

He and his wife Linda, a volunteer teacher and tutor, previously endowed a faculty chair and scholarship in the Bolton Scholars program, both in the Department of Electrical and Computer Engineering.

“The Whitakers are helping meet a crucial need in providing this type of support for some of our most deserving graduate students,” said Steve Blomstedt, director of development for engineering with the Texas A&M Foundation. The Department of Electrical and Computer Engineering is home to nearly 500 graduate students.
ECE Researchers Study Novel Ultrasound Technology

Researchers in the Biomedical Imaging and Genomic Signal Processing area are working on the development of novel ultrasound technologies for estimating and imaging the mechanical behavior of tissues. The technique has been named ultrasound elastography.

Dr. Raffaella Righetti, assistant professor in the Department of Electrical and Computer Engineering at Texas A&M University, leads this relatively unexplored field of research in the department.

"The idea I've been working on since 1999 is the development of new ultrasound imaging technologies which are complementary to current ultrasound diagnostic methods," Righetti said. "Our techniques use ultrasound data and process them to image additional tissue properties which are related to the mechanical behavior of the tissues."

Righetti said they acquire a set of ultrasound data from the area of interest in the tissue using a standard diagnostic ultrasound scanner. Then they apply a very small compression to the tissue and another set of data is acquired from the same area of interest. The acquired ultrasound data are processed using advanced digital signal processing techniques in order to image the local strains experienced by the tissue due to the application of the compression. Soft areas strain more than hard areas, so cancers will appear as dark (stiff) areas in the elastographic images. It is the same concept at the basis of tissue palpation. Yet, because of its position in the body or because it is very small, a physician may not feel a cancer or the cancer may not be visible using standard ultrasound methodologies.

"For example many cancers do not possess a sonographic contrast that will make them detectable using standard ultrasound imaging methods, but they are much stiffer than the surrounding tissue," Righetti said. "The idea is to create a new contrast mechanism that provides additional tissue information that can help a physician to diagnose and stage diseases or assess tissue physiological states."

Elastography techniques are now clinically used to detect breast cancer and differentiate between malignant and benign lesions. Researchers are also studying the feasibility of using a set of features to actually compare the appearance of tumors in sonograms and in elastograms so that the number of biopsies may be reduced.

In addition to breast and prostate cancers, Righetti said research in ultrasound elastography also focuses on early detection of lymphedema, which is a condition involving an abnormal accumulation of lymphatic fluid in the interstitial space that causes swelling, often related to cancer. The most common methods of evaluation of lymphedema make it difficult to reliably assess the severity of the disease, so the hope with elastography methods is to provide accurate and quantitative measures of the tissue mechanical parameters and relate them to the level of progression of the disease so that appropriate treatments can be promptly administered. Elastography could also help assessing the efficacy of current lymphedema treatments by imaging the tissue properties before and after a treatment and help in the design of more and better lymphedema treatments.

"That's another reason we thought to apply it to lymphedema patients," Righetti said. "Because lymphedema patients usually necessitate frequent examinations and may need several treatments a week, we want to monitor the efficacy of these treatments with high accuracy and precision and it would be difficult and expensive to use MRI or CT methods."

And its cost effectiveness is a major advantage of ultrasound elastography.

"The technique is easy, safe, real-time, non-invasive, it doesn't require a lot of training and it has all the advantages of ultrasound-based imaging methods, including the fact that it could potentially be implemented in small portable devices," Righetti said. "And it's relatively inexpensive compared to MRI and other imaging methods."

But for now the focus for Righetti and other researchers is to improve upon the limitations of elastography, which is one reason she joined the faculty at Texas A&M.

"We've spent a lot of time trying to study the physical limitations of the technique but I think right now we have a pretty good understanding of really what these limitations are and we're trying to find methods to improve these," she said. "But it's definitely a multidisciplinary project because it involves the biomechanics of the tissue, the physics of ultrasound and the engineering of digital signal processing and image processing. It's definitely a challenging project, but at the same time very fascinating as it really applies the knowledge of different disciplines."

She adds that her goal is to do more control experiments and take advantage of the other research labs at Texas A&M, like the MRI lab and other facilities which will allow more comparative studies.

"It's very exciting because you can find a lot of experts in any other field," Righetti said. "The potential is great because the facilities (at Texas A&M) are so amazing and there is a large number of people working on different things. That kind of collaboration makes a big difference. That's what's so exciting about working at Texas A&M, there are a lot of opportunities."

Righetti also collaborates with doctors in the medical field, who she said are very excited about elastography and all its possibilities. However, she gets the most satisfaction actually working with her students.

"I can see the light in their eyes when they're talking about all the different applications and possibilities and I have students come up to me and say 'I didn't know ultrasound could be used in so many applications,'" she said. "It makes me happy to see how excited they are about the possibilities in the field that can help medicine."

And one day she hopes to expand the uses of elastography to possibly include early detection of liver diseases, kidney problems and any other tissue disease or condition where the application of the technique may make a significant contribution.

"It's a very exciting field," she said. "I've seen it grow from the moment it was born until the moment in which it has become clinical. I think that as a scientist and an engineer it's really an amazing experience to be able to observe the technological development of an idea and be part of it."
Segers family endows professorship in the Department of Electrical & Computer Engineering

Former electrical engineering student, Dennis Segers, and his wife Debbie, of Los Altos, CA, recently endowed a $500,000 professorship in the Department of Electrical and Computer Engineering at Texas A&M University.

The Debbie and Dennis Segers ’75 Professorship in Electrical and Computer Engineering will support teaching, research, service and professional development activities of an outstanding faculty in the department.

“We are grateful to Debbie and Dennis Segers for their generous professorship endowment to our department,” said Dr. Costas Georgiades, department head and holder of the Delbert A. Whitaker Chair in Electrical and Computer Engineering. “Their gift will assist us in recruiting an excellent faculty for the benefit of our students.”

Segers is currently the CEO of Tabula, Inc. in Santa Clara, CA. Tabula is a venture capital funded start-up developing a new type of integrated circuit for the telecommunications industry. He also serves on the board of directors of Parade Technologies, another privately held fabless semiconductor company, and Synplicity, Inc., a leader in electronic design automation. Dennis and Debbie grew up in Yoakum, TX, and began dating during their high school years together. His interest in engineering led him to A&M, while Debbie went to Blinn College.

“I had an interest in engineering and science and the place to be was A&M,” Segers said. “There was no question of going anywhere else. It was the only school I applied to.”

They married after his sophomore year at A&M and while he worked to complete his degree, she helped support his tuition by working on campus for the agriculture college.

After graduation from Texas A&M in 1975, Segers began his career with Mostek Corporation as a product development engineer working on computer memory chips. During his 30 years in the semiconductor business he has managed the development of a wide variety of integrated circuits for computer, communications and portable consumer applications.

He attributes much of his success throughout his career to his education at Texas A&M.

“Integrated circuit technology has advanced at an incredible rate and the semiconductor industry has delivered these advancements in a wide array of products and services that are now an integral part of modern life,” Segers said. “I was very fortunate to enter the industry in its early years and be a witness to such innovation. My experience at Texas A&M opened the door to this world for me.”

Segers added that it was the influence of several professors at A&M who were an inspiration to him as a student, including Drs. John Dennison, Jack Stone and Don Parker.

“Professor Dennison first got me started in electrical engineering, he was a brilliant teacher. The energy and enthusiasm he brought to the classroom was amazing,” Segers said. “Jack Stone taught my first semiconductor physics course and later acted as my advisor in my undergraduate research project in the solid state laboratory on the third floor of the Zachry Engineering Building.”

While in this lab Segers met and later worked under Don Parker. “Don Parker was one of the most creative minds I ever worked with, we kept in close touch for several years after I graduated and he had a big influence in my life and career.”

It was these and other influences from Texas A&M that prompted Segers to make his endowment.

“A great teacher can leave an indelible mark within their student,” he said. “Debbie and I hope that our gift can help set the stage for future generations of students to be influenced as I was.”

The couple’s love for Texas A&M carried over to their son, Brian, who also graduated from Texas A&M with a masters degree in economics, and their daughter-in-law, Molly Jo, who has an education degree from A&M.

“And their two girls, Allison, 3, and Holly 1 ½, are already starting out as good Aggies,” Segers added. “They’ve already been to several football and basketball games.”

ECE Professor Finds Way to Construct Most Efficient Fix-Free Codes

More than 50 years after David Huffman developed Huffman coding, an entropy encoding algorithm used for lossless data compression in computer science and information theory, an electrical and computer engineering faculty member has discovered a way to construct the most efficient fix-free codes.

Huffman coding uses a variable-length code table for choosing the representation for each symbol, resulting in a prefix code (that is, the bit string representing some particular symbol is never a prefix of the bit string representing any other symbol) that expresses the most common characters using shorter strings of bits than are used for less common source symbols. Huffman was able to design the most efficient compression method of this type since no other mapping of individual source symbols to unique strings of bits will produce a smaller average output size when the actual symbol frequencies agree with those used to create the code.

Dr. Serap Savari, an associate professor in the department at Texas A&M University, has developed the first approach to finding the optimal fix-free code, variable length codes in which no codeword is the prefix or suffix of another codeword.

“My method of finding optimal fix-free codes is computationally demanding, but no one has solved the problem before even though it was first posed in 1990,” Savari said. “Earlier algorithms produced good fix-free codes in a reasonably (time) efficient way, but without the guarantee of optimality.”

While there are numerous applications for fix-free codes, the most important applications have been in communications. Fix-free codes have been investigated for joint source-channel coding and have been applied within the video standards H.263+ and MPEG-4 because their property of efficient decoding in both the forward and backward directions assists with error resilience. They are also interesting for problems in information retrieval such as searching for patterns directly in compressed text. Savari is uncertain how her discovery will impact these and other applications of fix-free codes, but hopes that her work will be used by researchers and people implementing practical systems.

“My work is like Huffman’s in that it is basic research that is motivated by practically important problems and which contributes to the theory of data compression,” she said.

Savari has already been invited to discuss her findings at numerous seminars throughout the United States, including Stanford University, The University of Illinois-Urbana-Champaign, The University of California-Berkeley, The University of California-San Diego, Caltech, The University of Southern California and possibly MIT in the fall.

Savari joined the department in 2008. Her research interests include information theory, network coding, data compression and computer and communication systems. She also was an associate editor for Source Coding for the IEEE Transactions on Information Theory from 2002-2005 and was the Bell Labs representative to the DIMACS council from 2001-2003.
Shuguang (Robert) Cui

Dr. Shuguang (Robert) Cui joined the Telecommunications, Controls and Signal Processing group in 2007 as an assistant professor. He received his B.Eng. from Beijing University of Posts and Telecom. in 1997, his M.Eng. from McMaster University in 2000 and his Ph.D. in EE from Stanford University in 2005. Through 2007, he worked in the ECE department at the University of Arizona. Cui has wide research interests in communication theory and signal processing, including network modeling for large-scale networks, statistical signal processing in sensor networks, MIMO and cooperative communications, cross-layer design optimization for energy-constrained networks, cognitive radio networks, and application of convex optimization in communication and signal processing.

Paul Gratz

Dr. Paul Gratz joined the Computer Engineering group in 2009 as an assistant professor. He received his B.S. and M.S. from the University of Florida in 1994 and 1997 respectively and his Ph.D. in electrical and computer engineering from the University of Texas in 2008. Gratz's research interests include on-chip interconnection networks, high performance multicore and distributed computer architectures and processor memory systems. On the TRIPS prototype processor project he designed, implemented and verified the second level memory system, on-chip network and chip-to-chip network. Since the completion of the TRIPS project, his research has focused on workload characterization, load balance and latency in networks-on-chip.

Rusty Harris

Dr. Rusty Harris joined the Solid State Electronics, Photonics and Nano-Engineering group in 2008 as an assistant professor. He earned a BS and MS in 1997 and 1999 respectively, and a Ph.D. in electrical engineering in 2003, all from Texas Tech. His prior experience includes 3D Device Research with Advanced Micro Devices (AMD). Harris also initiated the design and construction of a $1.9M semiconductor lab at the University of Missouri-Columbia as a visiting assistant professor. He is author and co-author of over 70 publications in journals and conferences. His research interests include 3D devices and device processing, new device materials to replace Silicon, semiconductor laser diodes and solid state/photosynthesis interoperability.

Samuel Palermo

Dr. Samuel Palermo joined the Analog and Mixed Signal group in 2009 as an assistant professor. He received his B.S. and M.S. degrees in electrical engineering from Texas A&M in 1997 and 1999, respectively, and his Ph.D. degree in electrical engineering from Stanford University in 2007. From 1999 to 2000, he was with Texas Instruments, where he worked on the design of mixed-signal integrated circuits for high-speed serial data communication. In 2006, he joined Intel Corporation where he worked on high-speed optical and electrical I/O architectures. His research interests include high-speed electrical and optical links, clock recovery systems, and techniques for device variability compensation. He is a member of IEEE andEta Kappa Nu.

Raffaella Righetti

Dr. Raffaella Righetti joined the Biomedical Imaging and Genomic Signal Processing group in 2007 as an assistant professor. She received her Doctor of Engineering from the Università degli Studi di Firenze, Florence, Italy, and her M.S. and Doctor of Philosophy from the University of Houston. Righetti's research interests include biomedical imaging, medical use of ultrasound and methods for imaging the mechanical properties of soft tissues, particularly the development of ultrasound imaging techniques for estimating the elastic and time-dependent behavior of tissues, with applications in the detection and staging of cancers and cancer-related diseases, differentiation between benign and malignant tumors and monitoring of cancer therapies.

Serap Savari

Dr. Serap Savari joined the Telecommunications, Controls and Signal Processing group in 2008 as an associate professor. She received four degrees from the Massachusetts Institute of Technology, including her Ph.D. in 1996. Savari was a member of technical staff in the Computing Sciences Research Center at Bell Labs from 1996-2003 and was the Bell Labs representative to the DIMACS council from 2001-2003. She was an associate professor at the University of Michigan from 2004-2007. Her research interests include information theory, network coding, data compression, and computer and communications systems.

Srinivas Shakkottai

Dr. Srinivas Shakkottai joined the Computer Engineering group in January 2008 as an assistant professor. He received his M.S. and Ph.D. from the University of Illinois at Urbana-Champaign in 2003 and 2007 respectively. He was a post-doctoral associate at Stanford University until December 2007. Shakkottai's research interests center around communication networks, with an emphasis on the Internet. He has collaborated with several different research centers specializing in both analytical and measurement based approaches. His focus areas include graphical models for networks, wireless ad-hoc networks, peer-to-peer systems, pricing approaches and game theory, congestion control and the measurement and analysis of Internet data.

Byung-Jun Yoon

Dr. Byung-Jun Yoon joined the Biomedical Imaging and Genomic Signal Processing group in 2008 as an assistant professor. He received his B.S.E. from the Seoul National University in 1998, his M.S. from Caltech in 2002 and his Ph.D. from the California Institute of Technology in 2007. Prior to joining Texas A&M, Yoon was a Post-Doc at Caltech from 2006-2007, a Microsoft Research Intern and a SecureSoft Inc./Junghwa Systems Inc., software developer from 1998-2001. Yoon's research interests include genomic signal processing, bioinformatics and computational systems biology, especially in developing statistical models and algorithms that can be used in RNA sequence analysis and the identification of noncoding RNA (ncRNA) genes.
Cavin Discusses Physical Limits for Autonomous Infinitesimal Systems

Dr. Ralph K. Cavin, III, Chief Scientist at the Semiconductor Research Corporation, discussed Physical Limits for Autonomous Infinitesimal Systems. He said the design of an autonomous system whose dimensions are on the order of ten microns is important, and while there does not currently exist a technology with which to fabricate such a system, the analyses of physical limits provides useful insight into the ultimate scaling of energy sources, sensors, information processing engines and wireless communication systems. Cavin received his BSEE and MSEE from Mississippi State University and his Ph.D. from Auburn University. Cavin was a full professor in the ECE department at Texas A & M. In 1983 he joined the Semiconductor Research Corporation (SRC) where he served as Director of Design Sciences research programs until 1989. He became Head of the ECE department at North Carolina State University, where he was later named Dean. From 1996 to 2006, he served as SRC’s Vice President of Research Operations and in January 2007 became their Chief Scientist.

Ephremides Discusses The Concept of Cross-layering in Wireless Networks

Dr. Anthony Ephremides, Cynthia Kim Professor of Information Technology in the Department of Electrical and Computer Engineering at The University of Maryland at College Park, discussed The Concept of Cross-layering in Wireless Networks. He said The idea of cooperation among nodes for enhanced network performance is a new idea that sprang out of the MIMO developments of recent years. Ephremides holds a joint appointment at the Institute for Systems Research, of which he was among the founding members in 1986. He obtained his PhD from Princeton University in 1971 and has been with the University of Maryland ever since. He has held various visiting positions at other Institutions and co-founded and co-directed the NASA-funded Center on Satellite and Hybrid Communication Networks in 1991. He has been the president of Pontos, Inc since 1980 and has served as president of the IEEE Information Theory Society and as a member of the IEEE Board of Directors. He was the founding director of the Fairchild Scholars and Doctoral Fellows Program, a university-industry partnership from 1981 to 1985.

Mitra Discusses The Digital Allpass Filter: A Versatile Signal Processing Building Block

Dr. Sanjit K. Mitra, Professor in the Ming Hsieh Department of Electrical Engineering at the University of Southern California, Los Angeles, discussed the Digital Allpass Filter: A Versatile Signal Processing Building Block. He said the digital allpass filter is a computationally efficient signal processing building block which is useful in many signal processing applications. He then reviewed the properties of digital allpass filters and provided a broad overview of the diversity of applications in digital filtering. Mitra has published more than 640 papers in the areas of analog and digital signal processing and image processing. He has also authored and co-authored 12 books and holds five patents. Mitra has held visiting appointments in numerous countries. He has been awarded Honorary Doctorate degrees from the Tampere University of Technology, Finland, the Technical University of Bucharest, Romania, and the Technical University of Iasi, Romania. He is a member of the U.S. National Academy of Engineering.

Patel Discusses CMOS Process Variations: A ‘Critical Operation Point’ Hypothesis

Dr. Janak H. Patel, the Donald Biggar Willett Professor of Engineering in the Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign, discussed CMOS Process Variations: A ‘Critical Operation Point’ Hypothesis. He said the prevailing understanding of a chip’s behavior under large process variations with statistical delay assumptions leads one to conclude that a small number of errors are likely as we progress further down on Moore’s Law. This understanding is challenged by a new hypothesis on the behavior of very large CMOS chips in the presence of process variations. Patel received a BS degree from Gujarat University, India, a BT degree from the Indian Institute of Technology, Madras, India and an MS and Ph.D. degree from Stanford University. He is a fellow of ACM and IEEE and a recipient of the 1998 IEEE Piore Award. Patel’s research contributions include Pipeline Scheduling, Cache Coherence, Cache Simulation, Interconnection Networks, Online Error Detection and Reliability analysis of memories with ECC and scrubbing.

Varaiya Discusses Behavior of Freeway Traffic and Effectiveness of Ramp Control

Dr. Pravin Varaiya, the Nortel Networks Distinguished Professor in the Department of EECS, University of California, Berkeley, discussed the behavior of freeway traffic and the effectiveness of ramp control. He said if the demand of traffic control exceeds capacity and the ramps are not controlled, every trajectory converges to the most congested equilibrium and when the demand is feasible but the freeway is initially congested, there is a ramp control strategy that moves the system to the uncongested equilibrium. Varaiya was a visiting distinguished professor at the University of Hong Kong. He also was director of the California PATH program on Intelligent Transportation Systems. His research is concerned with communication networks, transportation and hybrid systems. Varaiya has held a Guggenheim Fellowship and a Miller Research Professorship. He has received two Honorary Doctorates and the Field Medal and Bode Prize of the IEEE Control Systems Society. He is a Fellow of IEEE, a member of the U.S. National Academy of Engineering and a Fellow of the American Academy of Arts and Science.
Research being conducted in the department on rectifying antennas, which are used in wireless microwave power transmission, was recently featured on the Discovery Channel during a special report on future green energy.

Dr. Kai Chang, professor in the department who is considered a world leader in rectifying antenna research, lead the team at Texas A&M in collaboration with Dr. Nobuyuki Kaya, professor at the Kobe University in Japan. Kaya and several of his students provided Chang with a retro-directive high power microwave transmitter with a power output of 270W. Chang said the experiment will be carried out at 2.45 GHz, which is the frequency for the magnetron in a commercial microwave oven. Texas A&M will provide a rectenna (rectifying antenna) array panel with a size of one square meter.

Chang describes microwave power transmission (MPT) as the wireless transfer of large amounts of power at microwave frequencies from one location to another. It often is referred to as wireless power transmission (WPT) at microwave frequencies.

Rectifying antennas are integral parts of microwave power transmission systems. Chang said in WPT systems, RF power is transmitted from one location and captured at another location. The term rectenna consists of parts of the words rectifier and antenna since its function is to absorb incoming radio frequency (RF) energy and convert this energy to usable DC power.

Since most of the world’s energy comes from the consumption of fossil fuels which are limited resources that produce harmful byproducts when consumed, Chang said the idea of Space Solar Power (SSP) providing readily available clean and continuous power for our future energy needs has generated widespread interest. SSP is an MPT system with the addition of solar cells and magnetrons for microwave power generation. SSP can be delivered to the most remote locations without a connective infrastructure, such as pipes or powerlines. So Chang said by making SSP an available technology, terrestrial solar cells. In addition, Chang said the closer the satellites are placed to the sun, the larger their effective collection area since light intensity decreases by the inverse-square of distance. The solar cell panels output large DC voltages to awaiting cavity magnetrons positioned on various subarrays within each of the SPS’s phased-array apertures. These magnetrons convert the high-voltage DC outputs of the solar panel arrays to microwave power. The microwave energy is then beamed to Earth to “farms” of rectenna arrays that convert the incoming microwave energy back to DC power.

Both the fruition of SSP and the present-day desire to remotely power unmanned aerial vehicles (UAVs) serve as the main driving forces behind current advancements being made in MPT. Chang said the use of UAVs for communication and surveillance is seen as an essential capability, especially for the U.S. military. WPT can also be useful in supplying power to remote locations such as islands where the infrastructure to generate power is either absent or not cost effective to build.

However, he said the primary future use for WPT is seen in a myriad of space applications, which include supplying power to space colonies and space shuttles from nuclear powered satellites. This will enable space explorers to obtain the necessary power needed, at locations far from Earth, to further explore the depths of space.

Applied Materials, Inc. donates equipment for thin film education

Recently, Applied Materials, Inc. donated more than $50,000 worth of equipment for use in thin film education in the Solid State area of the Department of Electrical and Computer Engineering at Texas A&M University.

This equipment will be used by Dr. Haiyan Wang in her undergraduate and graduate courses on Thin Film Science and Technology. “Students will be able to have hands-on research experience with vacuum systems and thin film deposition assembly,” she said. “We appreciate their generosity in the equipment donation and thank our TAMU Champion, Mr. Guillermo Ponce, at Applied Materials for facilitating this donation for us.”

A list of the donated equipment includes: two 200mm chamber bodies, two Turbo Pumps and two Heat Exchangers. Wang said thin film processing is one of the major techniques used in the semiconductor industry. The ECE department started offering the Thin Film Science and Technology course at both undergraduate and graduate level in the 2006 spring semester after Wang joined the department, and there has been extensive interest in the class from all areas of engineering, including the electrical and computer engineering department, chemical engineering, aerospace engineering and mechanical engineering.

The class covers a wide range of topics in thin film structures, growth techniques, thin film and vacuum systems, and applications. However, students often found it difficult to picture a vacuum system for thin film growth and how the thin films are processed in side the vacuum systems. So Wang submitted the proposal to Applied Materials to supply the equipment for a practical thin film lab.

She adds that students who attend the class will also have hands-on experience in Applied Materials’ equipment modules to better prepare them and make them more competitive for their future careers in the semiconductor industry.

Applied Materials is the global leader in Nanomanufacturing™ solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass.
The Dwight Look College of Engineering at Texas A&M University honored two outstanding alumni recently.

Receiving the 2008 Dwight Look College of Engineering Outstanding Alumni Honor Awards were Mark B. Puckett ’73, (left) president of Chevron Energy Technology Co.; and ECE graduate, Dennis L. Segers ’75, (right) CEO and director of Tabula Inc.

“We are incredibly proud of these former students and both are truly outstanding representatives of Texas A&M Engineering,” said Dr. G. Kemble Bennett, vice chancellor and dean of engineering. “Through their professional achievements and significant personal contributions of service and support, Mark and Dennis embody the finest Aggie attributes, bringing great pride and distinction to their alma mater.”

Dennis Segers earned a bachelor’s degree in electrical engineering from Texas A&M. He joined Tabula in May 2006. He was previously president, CEO and director of Matrix Semiconductor, which pioneered the design and development of three-dimensional integrated circuits. At Matrix, Segers oversaw the transition of the company from the early technology feasibility phase to high-volume production, culminating in the acquisition of the company by SanDisk in January 2006. From 1994 through 2001 Segers worked for Xilinx Inc. in a variety of roles, including senior vice president and general manager of the FPGA product groups. He began his career at Mostek Corp. as a product development engineer.

More recently, Segers’ career activities have broadened to include guidance and counsel to a number of young CEOs in high tech. He and his wife, Debbie, have endowed the Debbie and Dennis Segers ’75 Professorship in Electrical and Computer Engineering, and he is currently a member of the Dwight Look College of Engineering Advisory Council at Texas A&M.

“Through his groundbreaking entrepreneurial successes in the semiconductor industry and dedication to developing the technology leaders of tomorrow, Dennis embodies the very qualities Aggie engineers hold in highest regard,” Bennett said. “His genuine dedication to excellence is an inspiration to all affiliated with Texas A&M University.”

Segers and his wife, Debbie, have a son, Brian, and a daughter, Shannon.

Puckett earned a bachelor’s degree in civil engineering from Texas A&M in 1973. He completed the Tuck Executive program at Dartmouth College in 1997. He started his career with Chevron in 1973 as a construction engineer in Lafayette, La., and rose through the ranks with positions of increasing responsibility in West Texas and California. From 1991 to 2001, he held managing director roles for Chevron operations in Papua New Guinea, Angola/Zaire and Southern Africa. In 2001 he was named president of Chevron Petroleum Technology Co., and in 2004 he assumed his current position as head of Chevron’s combined upstream and downstream technology organizations.

Puckett is a member of the Society of Petroleum Engineers and the Dwight Look College of Engineering Advisory Council at Texas A&M. He and his wife, Rita, have endowed two scholarships in the Zachry Department of Civil Engineering at Texas A&M and supported the Harold J. Haynes Dean’s Chair in Engineering. He has served as a director of various professional, civic and educational organizations.

“During his 34 years with Chevron, Mark has demonstrated exceptional leadership at the highest corporate levels,” Bennett said. “His contributions to the engineering profession and the energy industry, dedication to our students, and support of engineering project management education at Texas A&M University will benefit generations of Aggies to come.”

Puckett and his wife have one son, Jeff, Class of ‘94, and are 30-year Century Club members with the Texas A&M Association of Former Students.

Michael W. Marcellin ’87
Dr. Michael W. Marcellin, the International Foundation for Telemetering Professor at the University of Arizona, was named Regents Professor.

Marcellin is a Fellow of IEEE, and is a member of Tau Beta Pi, Eta Kappa Nu and Phi Kappa Phi. He is a 1992 recipient of the NSF Young Investigator Award, and a co-recipient of the 1993 IEEE Signal Processing Society Senior (Best Paper) Award. He has received teaching awards from NTU, IEEE/Eta Kappa Nu student sections, and the University of Arizona College of Engineering. In 2003, he was named the San Diego State University Distinguished Engineering Alumnus and is the recipient of the 2006 University of Arizona Technology Innovation Award.

He received the M.S. and Ph.D. degrees in Electrical Engineering from Texas A&M University in 1985 and 1987, respectively.

We want to hear from you!!!

If you are a graduate in electrical or computer engineering from the Department of Electrical & Computer Engineering at Texas A&M we would love to hear how you’re doing. You can E-mail your information to deana@ece.tamu.edu, or if you prefer, you can mail us news about your career, family or anything else to:

Deana Totzke, Currents Editor
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TAMU 3128
Zachry Engineering Center
College Station, TX 77843-3128

Please notify us of any address changes so we can continue giving you news from the department.
making waves

U. Braga-Neto
Dr. Ulisses Braga-Neto, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF).

Braga-Neto joined the Biomedical Imaging and Genomic Signal Processing group of the department in January 2007 as an assistant professor. Prior to that he was an assistant researcher with the Aggeu Magalhães Research Center from 2004-2006 and from 2002-2004 he was a post-doctoral researcher with the Section of Clinical Cancer Genetics of the University of Texas M.D. Anderson Cancer Center.

Braga-Neto received his Ph.D. degree in electrical and computer engineering from The Johns Hopkins University in 2002, and M.S.E. degrees in electrical and computer engineering and mathematical sciences, also from The Johns Hopkins University, in 1998. He received an M.S. degree from the State University of Campinas, Brazil, in 1994 and his B.S. degree from the Federal University of Pernambuco, Brazil, in 1992. Honors include being awarded the Abel Wolman Fellowship from The Johns Hopkins University in 1996. Braga-Neto’s research interests include genomic signal processing and statistical pattern recognition, with applications in the study of cancer and infectious diseases. He is particularly interested in the design and analysis of statistical methods of small-sample classification and error estimation for genomics and proteomics applications.

A. Datta
Dr. Aniruddha Datta, professor in the Department of Electrical and Computer Engineering, was appointed holder of the J.W. Runyon Jr. Professorship II in Electrical Engineering.

Datta came to the Texas A&M University in 1991 after receiving his Ph.D. from the University of Southern California. Currently he also holds an Adjunct Professor appointment in the Department of Epidemiology and Biostatistics at the University of Texas at San Antonio Health Sciences Campus.

He is a senior member of IEEE and is serving as the general chair for the IEEE International workshop on Genomic Signal Processing and Statistics (GENSIPS) 2008. He was named a Eugene E. Webb 43 Fellow and a TEES Special Research Fellow. He was a previous winner of the Presidential Silver Medal awarded by the Indian Institute of Technology (Kharagpur) and he also received an Outstanding Professor Award from the Electrical and Computer Engineering Department in 2004. He has been an associate editor for the IEEE Transactions on Automatic Control and the IEEE Transactions on Systems, Man and Cybernetics and currently serves as an Associate Editor for the EURASIP Journal on Bioinformatics and Systems Biology. He has authored numerous journal and conference papers and has published four books, including the first introductory text in the area of genomic signal processing.

His research interests include adaptive control, PID control, and genomic signal processing and control. His current research, supported by the National Science Foundation and the W. M. Keck Foundation, is focused on using control theory in cancer therapy.

E. Dougherty
Dr. Edward R. Dougherty, a professor in the department, presented his research in genomics during the final talk of Texas A&M University’s 2007-2008 Distinguished Lecture Series.

Dougherty said that while “systems medicine” does not exist yet, it is the wave of the future and could one day replace the way diseases such as cancer are treated.

Dougherty has been working to try and model the communication system of the human genome to understand how the failures of that system cause genetic diseases like cancer.

“Most diseases do not result from a single gene product,” Dougherty said. “It is usually very complex and there are usually numerous genes involved in the disease.”

Dougherty is considered a pioneer in the study of translational genomics via the use of engineering techniques such as signal processing, pattern recognition, and control theory. He is the Director of the Genomic Signal Processing Lab at Texas A&M University, Director of the Computational Biology Division of the Translational Genomics Research Institute, Interim Director of the Computational Biology and Bioinformatics Program of the Greehey Children’s Cancer Research Institute, of the University of Texas Health Science Center at San Antonio, and Adjunct Professor in the Department of Pathology at the University of Texas M. D. Anderson Cancer Center. Dougherty, holder of the Robert M. Kennedy ’26 Chair in the Department of Electrical and Computer Engineering, has been awarded the Doctor Honoris Causa from the Tampere University of Technology and is both a Fellow and recipient of the Presidential Award from the International Society for Optical Engineering. Other honors include being named a Distinguished Lecturer by Texas A&M University and being named a Texas Engineering Experiment Station (TEES) Fellow at Texas A&M.

Dr. Edward R. Dougherty, a professor in the department, presented his research in genomics during the final talk of Texas A&M University’s 2007-2008 Distinguished Lecture Series.

J. Ji
Dr. Jim Ji, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF).

Ji joined the department in the fall of 2003 in the Biomedical Imaging and Genomic Signal Processing area. He received his bachelor’s and master’s degrees from Tsinghua University, Beijing, China. He has received the National Outstanding (NSF) for his research on the design and implementation of novel and multifunctional RF antennas and systems for microwave applications. His research interests include the design and implementation of novel and multifunctional RF antennas and systems for microwave applications. His research interests include the design and implementation of novel and multifunctional RF antennas and systems for microwave applications.

J-F Chamberland
Dr. Jean-Francois Chamberland, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF).

Chamberland joined the department in 2004. He received the B.Eng. degree from McGill University, Montreal, Canada, in 1998; and the M.S. degree from Cornell University, Ithaca, NY, in 2000. He completed the Ph.D. degree at the University of Illinois at Urbana-Champaign in electrical engineering in 2004. In 2006, he received a young author best paper award from the IEEE signal processing society. He is generally interested in the area of machine learning and data mining applications. His current research focuses on statistical problems in the context of wireless and hybrid communication systems, sensor networks, and genomic signal processing. He also researches the topics of control under communication constraints and complex optimization, with applications to networks, biological systems, and economics. He is especially interested in techniques and paradigms that permit the analysis and the design of complex systems.

G. Huff
Dr. Greg Huff, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF). He also received a Young Scientist Award at the General Assembly of L’Union Radio-Scientifique Internationale (URSI) (International Union of Radio Science).

Huff joined the Electromagnetics and Microwaves group in the department in September 2006 as an assistant professor. He received his Ph.D., his M.S. and his B.S., all from the University of Illinois at Urbana-Champaign in 2006, 2003 and 2000 respectively.

Recent honors include receiving a Young Scientist Award from L’Union Radio-Scientifique Internationale (URSI) (International Union of Radio Science) - presented at their General Assembly meeting in 2008. Huff’s research interests include biologically inspired mechanisms and dynamic material systems (microfluidics, nanoparticles, etc.) for electromagnetic, acoustic, and IR agility; the theory, design and application of reconfigurable antennas and circuits (sensors, phase shifters, filters, etc.); multifunctional (structural, electromagnetic, etc.) RF, microwave and millimeter-wave radiating systems and smart skins; studying the role of reconfigurable/multifunctional antennas in spread spectrum digital communication techniques; multiple antenna techniques; and the placement and electromagnetic interference (EMI) issues arising from the conformal integration high speed devices and radiators into host chassis.

J. Ji
Dr. Jim Ji, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF).

Ji joined the department in the fall of 2003 in the Biomedical Imaging and Genomic Signal Processing area. He received his bachelor’s and master’s degrees from Tsinghua University, Beijing, China. He has received the National Outstanding (NSF) for his research on the design and implementation of novel and multifunctional RF antennas and systems for microwave applications. His research interests include the design and implementation of novel and multifunctional RF antennas and systems for microwave applications.

J-F Chamberland
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M. Kezunovic

Dr. Mladen Kezunovic was selected by the U.S. National Committee of CIGRÉ (Conseil International des Grands Réseaux Électriques, or International Council on Large Electric Systems) as a recipient of its Attwood Associate Award for 2008. He also was invited to speak at the Department of Energy’s National Electricity Delivery Forum in Washington, DC. Kezunovic, the Eugene E. Webb Professor in the department, received the Dipl. Ing., M.S., and Ph.D. degrees in electrical engineering in 1974, 1977, and 1980, respectively. Currently he is the Eugene E. Webb Professor in the electrical and computer engineering department at Texas A&M University and Site Director of Power Engineering Research Center (PSERC), an NSF I/UCRC at Texas A&M. Before joining Texas A&M he worked for Westinghouse Electric Corp., Pittsburgh, PA, 1979-1980 and the Energoinvest Company, in Europe 1980-1986. His main research interests are digital simulators and simulation methods for relay testing as well as application of intelligent methods to power system monitoring, control and protection. Kezunovic is a Fellow of the IEEE, a member of CIGRÉ and a registered professional engineer in Texas. He has published more than 350 papers in journals and conference proceedings, and gave more than 30 seminars, short courses and tutorials. He was invited to give more than 100 lectures world-wide and is listed as a Distinguished Speaker of the IEEE PES. While at Texas A&M, Kezunovic was the principal investigator on more than 60 research projects and supervised 40 graduate students. He is the principal of Test Laboratories International, Inc, a consulting firm that has served more than 20 domestic and 10 international customers in the last 15 years. Kezunovic’s CIGRÉ contributions span almost 30 years, nine as a member of the National Committee in former Yugoslavia (1979-1988), and 20 as a member of the U.S. National Committee (1988-2008). He has been a convener or member of seven working groups, received two U.S. Committee Paper Recognition Awards and published 30 CIGRÉ papers: two in Electra, six at CIGRÉ General Sessions and 22 at CIGRÉ regional conferences, workshops and Colloquia. He also acted as a special reporter and was a co-author of several CIGRÉ Reports.

D. Kundur

Dr. Deepa Kundur, an associate professor, received the Outstanding Faculty Award, which is given for continuous endeavors towards excellence and promotion of the continued success of the department. Kundur joined the department in 2005 as an assistant professor. From January 2000 to June 2004 Kundur was an assistant professor at the University of Colorado at Boulder. He completed his Ph.D. from the University of California at Berkeley in 1999. Before this, he worked with Motorola, Inc. on the designs of the MC88110 and PowerPC 603 RISC Microprocessors. He obtained his M.S. from the University of Texas at Austin and his B.Tech. from the Indian Institute of Technology at Kanpur. Kundur’s research is in the areas of VLSI CAD (logic as well as physical design automation), VLSI Design (techniques to address specific Deep Submicron issues like crosstalk and power) and cross-disciplinary topics (VLSI implementation of LDPC codes, embedded systems design and scheduling approaches, wavelength-division multiplexed (DWDM) optical network routing and wavelength assignment (RWA), VLSI applications in IP networking). Some recent areas of interest are design automation for datapath circuits, crosstalk avoidance in on-chip buses, leakage-power reduction, extreme low power circuit design, asynchronous circuit design methodologies, approximate Compatible Observability Don’t Care computation, hierarchical logic synthesis, timing estimation, efficient test generation, fast logic simulation and cross-talk immune VLSI design.

P. Li

Dr. Peng Li, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF). He also won a Best Paper Award at the 45th IEEE/ACM Design Automation Conference (DAC) along with his students Wei Dong and Xiaoji Ye. Li joined the department in 2004 in the computer engineering group. Prior to that he was a post-doctoral research associate from December 2003 to July 2004 at Carnegie Mellon. Li received his Ph.D. degree in electrical and computer engineering from Carnegie Mellon University in 2003, and his M.E. and B.E. degrees from Xi’an Jiaotong University, China in 1997 and 1994, respectively. His research interests are in the general area of VLSI Design and CAD with an emphasis on analog/RF optimization and test, circuit simulation, parallel CAD algorithms, design and analysis of power and clock distribution networks, interconnect and timing analysis, statistical circuit analysis and optimization. Other honors include receiving Inventor Recognition Awards from the Semiconductor Research Corporation (SRC) in 2001 and 2004 and from the Microelectronics Advanced Research Corporation (MARCO) in 2006. In 2003 and 2008, he received a Best Paper Award from the IEEE/ACM Design Automation Conference.

T. Maldonado

Dr. Theresa A. Maldonado has been named executive associate vice president for research at Texas A&M University and will also serve as the institution’s new interim vice president for research.
Prior to joining Texas A&M in 2003, Maldonado served as associate vice president for research at the University of Texas at Arlington, where she had also served on the faculty and in various administrative roles since 1990. She previously was a member of the technical staff at AT&T Bell Laboratories and served as an Engineering Research Centers program director in the Engineering Directorate at the National Science Foundation. Maldonado earned her bachelor's, master's and doctorate degrees in electrical engineering from the Georgia Institute of Technology, and she is a registered professional engineer in Texas.

“A.D.” Patton
Dr. Alton D. “A.D.” Patton has been selected as an Electric Reliability Council of Texas (ERCOT) independent board member (unaffiliated with any market participants) and began his three-year-term this month. He was selected unanimously by the board’s nominating committee and approved in an email vote of ERCOT’s 220 corporate members. Patton is professor emeritus in the department with 35 years experience as a faculty member, including four years as head of the electrical engineering department. He also is president of Associated Power Analysts Inc. in College Station, an engineering consulting service providing electric power system analysis, power system reliability and failure analysis.

Patton was a former director and past board member of the Center for Space Power at the Texas Engineering Experiment Station. Honors include being named recipient of the 2000 Institute of Electrical and Electronics Engineers (IEEE) Richard Harold Kaufmann Award for outstanding achievement in the field of industrial systems engineering.

Patton also is a Life Fellow of IEEE, was named a TEEs Fellow in 1985 and is on the Editorial Advisory Board for the International Journal of Electrical Power & Energy Systems. He has a bachelor’s degree from the University of Texas at Austin, a master’s from the University of Pittsburgh, and doctorate from Texas A&M University, all in electrical engineering.

H. Pfister
Dr. Henry Pfister, an assistant professor, received the Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF).

Pfister joined the department’s Telecommunications and Signal Processing group in September 2006. He was a postdoctoral fellow from 2005-2006 at the Swiss Federal Institute of Technology (EPFL) in Lausanne, Switzerland. He received his Ph.D., M.S. and B.S. from the University of California, San Diego in 2003, 2000 and 1995 respectively.

Pfister’s research interests include information theory, iterative coding techniques, and statistical inference. He is currently focusing on applications in wireless communication, data storage and compressed sensing.

B. D. Russell
Dr. B. Don Russell was named inaugural holder of the Harry E. Boyav, Jr. Endowed Chair in the Dwight Look College of Engineering. He also named a fellow of the National Academy of Forensic Engineers and was elected Vice-Chair of the Electric Power and Energy section of the National Academy of Engineering (NAE). The Electric Power and Energy section is one of 12 technical sections of NAE.

Russell, a professor in the Department of Electrical and Computer Engineering at Texas A&M University, is a nationally recognized forensic electrical engineer. His specialty is in electrocution and the effects of electricity on the human body. Other recent honors include being named a fellow of the National Academy of Forensic Engineers and being elected Vice-Chair of the Electric Power and Energy section of the National Academy of Engineering (NAE).

Previously, Russell has been named fellow of the Institute of Electrical and Electronics Engineers and fellow of the Institute of Electrical Engineers of England. He also is a fellow of the National Society of Professional Engineers.

Russell previously held the J.W. Runyon Professorship in the Department of Electrical and Computer Engineering and is a Regents professor. He is a recipient of the University Faculty Distinguished Achievement award in research and formally served as Executive Associate Dean of the Dwight Look College of Engineering.

E. Sánchez-Sinencio
Dr. Edgar Sánchez-Sinencio received the Technical Achievement Award from the Institute of Electrical and Electronics Engineers (IEEE) Circuits and Systems Society. Sánchez-Sinencio, the TI J. Kilby Chair Professor of Electrical Engineering, received the award "For continuous outstanding technical contributions for nearly three and half decades to analog and mixed signal integrated circuits, computer-aided circuit design, neural network implementations, continuous-time filters and RF transceivers, emphasizing theoretical and practical aspects ranging from analog circuit fundamentals to applied areas such as built-in testing circuits and ultra wide band receivers. And for sustained leadership efforts in developing a research group, promoting circuits and systems through textbooks, research publications, and numerous CAS Society technical and BoG committees/editorial/conference activities."

Sánchez-Sinencio’s research interests are in the areas of continuous-time integrated circuits, analog built-in testing, low-voltage/low-power mixed signal circuits and RF communication circuits. He leads the analog and mixed-signal group and is director of the Analog and Mixed-Signal Center at the Texas Engineering Experiment Station.

Sánchez-Sinencio is a Fellow of the IEEE. Among his numerous awards are the 1997 IEEE Circuits and Systems (CAS) Darlington Award, the 1996 IEEE CAS Outstanding Young Author Award (with graduate student Alex Reyes) and the 1995 IEEE CAS Guillemin- Cauer Award for his work on cellular networks. In 1996, Sánchez-Sinencio received the Texas Senate Proclamation No. 373 for outstanding accomplishments in recognition of his research. INAOE awarded him its first honorary doctorate in 1995.

C. Singh
Dr. Chanan Singh received the Merit Award by the Probabilistic Methods Applied to Power Systems (PMAPS) International Society “in recognition and appreciation for contributions to the development and application of probability methods applied to power systems.” The award is a lifelong achievement award given every second year by PMAPS.

Singh, former department head, Regents Professor and holder of the J.R. Runyon Chair in Electrical and Computer Engineering, is an Institute of Electrical and Electronics Engineers (IEEE) Fellow and is internationally recognized as an expert on the reliability and security of power systems.

As department head, Singh helped with the continued improvement of the graduate program, helped obtain two competitive grants worth $1.2 million to enhance the quality and quantity of the department’s undergraduates as well as a $5.1 million gift from Texas Instruments to expand and enhance the departments’ analog design and research program. During his tenure he also helped with building the faculty strength of the computer engineering program and quadrupled the department’s endowed chairs and professorships from four to 16, as well as initiating the allocation of 19 new faculty positions through the university’s faculty reinvestment plan.

Other honors Singh has received include the IEEE Outstanding Power Engineering Educator Award, being holder of the J.W. Runyon, Jr. Professorship II, the Haliburton Professorship, the Dresser Professorship, the Association of Former Students’ Distinguished Achievement Award and the University of Saskatchewan awarded him a D.Sc. He received his B.Sc. (Honors) from the Punjab Engineering College and M.Sc. and Ph.D. from the University of Saskatchewan.

Singh’s research interests include Electric Power Systems, System Reliability, Theory and Applications, Production Costing and Power Quality. The PMAPS International Conference fills a needed role in the power engineering community by providing a regular forum for engineers and scientists worldwide to interact around the common theme of power engineering decision problems under uncertainty.
H. Toliyat
Dr. Hamid Toliyat, professor in the department, was appointed holder of the Raytheon Company Professorship in electrical engineering. He also was elected to the rank of Fellow of the Institute of Electrical and Electronic Engineers (IEEE) and was named a winner of IEEE’s Power Engineering Society (PES) Prize Paper, along with Dr. Sabhais Nandi and Xiaodong Li. Toliyat came to Texas A&M University in 1994 after being an assistant professor at Ferdowsi University of Mashhad. He received his Ph.D. from the University of Wisconsin-Madison in 1991.

Toliyat received the prestigious Cyril Veinott Award in Electromechanical Energy Conversion from the IEEE Power Engineering Society in 2004; the TEES Fellow Award in 2004 and 2006; Outstanding Professor Award in 2005 from Texas A&M; Distinguished Teaching Award in 2003; E.D. Brockett Professorship Award in 2002; Eugene Webb Faculty Fellow Award in 2000; and the Texas A&M Select Young Investigator Award in 1999 from Texas A&M University. He has also received the Space Act Award from NASA in 1999 and the Schlumberger Foundation Technical Awards in 2001 and 2000. Dr. Toliyat is an Editor of IEEE Transactions on Energy Conversion and was an associate editor of IEEE Transactions on Power Electronics. He is also the Chair of IEEE-IES Industrial Power Conversion Systems Department of IEEE-IES and is a member of Sigma Xi. His main research interests and experience include analysis and design of electrical machines, variable speed drives for traction and propulsion applications, fault diagnosis of electric machinery, and sensorless variable speed drives. Toliyat has supervised more than 36 graduate students, published more than 310 technical papers (92 papers in IEEE Transactions) and has presented more than 50 invited lectures all over the world. Toliyat is also an inventor and has 10 issued and pending U.S. patents in these fields. He is the author of DSP-Based Electromechanical Motion Control and the co-editor of Handbook of Electric Motors. He was the general chair of the 2005 IEEE International Electric Machines and Drives Conference in San Antonio. Toliyat is also a Professional Engineer in the State of Texas.

S. M. Wright
Dr. Steven M. Wright, professor in the department, gave a plenary speech at the 2007 Joint Annual Meeting of ISM RM -ESMRMB recently in Berlin, Germany, which drew about 5,800 registered international attendees. His talk entitled “Multidisciplinary Approaches to MR Engineering” discussed and envisioned how fundamental ideas, emerging technologies and emerging applications are driving the development of the magnetic resonance technology. Wright is a professor in the department with a joint appointment to the Department of Biomedical Engineering. He holds the Royce E. Wiesenbaker Professorship II in Engineering. Wright’s research interests are in the areas of magnetic resonance imaging (MRI), antenna theory and electromagnetics. He directs the department’s Magnetic Resonance Systems Lab, which aims to develop instrumentation and techniques to improve magnetic resonance imaging and to train students in MRI, radio frequency, applied electromagnetics, and image and signal processing.

Prior to joining the Texas A&M electrical & computer engineering faculty, Wright was a research engineer for magnetic resonance imaging at Saint Francis Medical Center in Peoria, Ill., and an adjunct assistant professor of electrical engineering at the University of Illinois at Urbana-Champaign. Wright also is a member of the International Society for Magnetic Resonance in Medicine and the Institute of Electrical and Electronics Engineers Engineering in Medicine and Biology Society.

Other recent honors include being named a Fellow of The American Institute for Medical and Biological Engineering.

H. Wang
Dr. Haiyan Wang received a Presidential Early Career Award for Scientists and Engineers (PECASE) award in a White House Ceremony. She also received the Faculty Early Career Development ( CAREER) award from the National Science Foundation (NSF) and a Young Investigator Program (YIP) award from the Office of Naval Research (ONR).

Wang, an assistant professor, joined the department in the solid state electronics area in 2006. She received her BS degree from Nanchang University (Nanchang, China) in 1998 and her MS degree from the Institute of Metal Research (Shenyang, China) in 1999. She received her Ph.D. degree in materials science and engineering at North Carolina State University (Raleigh, NC) in December 2002. Before she joined the department, she worked at Los Alamos National Lab. Wang’s research interests lie in the area of functional oxide and nitride thin films for microelectronics, optoelectronics, high temperature superconductors, magnetic and structural applications. Her expertise is thin film growth and structural characterizations. In addition to her ONR YIP award, she received a YIP award from the Air Force Office of Scientific Research (AFOSR) in 2007. Wang also was the winner of the TMS Young Leader Award in 2005 and an MRS Graduate Student Award in 2001.

D. Hanson
Debbie Hanson, senior administrative coordinator in the department received the Dean’s Staff Achievement Award.

Hanson has worked in the department since 1984 and was nominated for the award for her dedication and perfection in all avenues of her job. She works with many of the departmental committees, including the Promotion and Tenure, Awards and Departmental Advisory and Hiring committees, and is closely involved with all major administrative functions of the department, providing crucial “institutional memory” support to a number of department heads.

L. Krueger
Lynn Krueger, Business Associate II for the department, was a recipient of the “Best in Business Awards given at the spring Council of Senior Business Administrator (CSBA) workshop.

The award, which includes a check for $500 and an engraved plaque, were established in 1999 by CSBA to recognize and reward superior service by Texas A&M support staff in business-related positions.

Krueger joined the department in 2001 as a Clerk III and worked her way up to her current position as Business Associate II. Prior to her job in the department, Krueger, who graduated valedictorian from Snook High School, was in Customer Service and Retail Sales at the Snook Grocery and Market from 1997-1999.

J. Marshall
Jeanie Marshall received the Outstanding Staff Award, which is given for continuous endeavors towards excellence and promotion of the continued success of the department.

In 1977 Marshall worked in the Heavy Construction Division on the Riverside Campus at Texas A&M. From 1977 to 2001, Marshall had several entrepreneurial endeavors, which include the Marshall Ford Mercury Dealership in Hempeed, Coldwell Banker and Marshall & Marshall Real Estate. Marshall also has been a professional real estate agent since the early 1990s and belongs to numerous organizations, such as being a lifetime member of the American Quarter Horse Association and the Palomino Horse Association. She has been a Texas Notary Public since 1985.

Marshall rejoined Texas A&M in 2002 in the electrical and computer engineering department as a clerk, and was promoted to her current position of office associate in the graduate advisor’s office.

C. Witmer
Chris Witmer received the Outstanding Staff Award, which is given for continuous endeavors towards excellence and promotion of the continued success of the department.

ECE Students receive prizes at SRW

Several students in the Department of Electrical and Computer Engineering at Texas A&M recently received prizes during the university’s Student Research Week (SRW) for either their oral or paper presentations.

The winners in the department for this year were Mohammad Asad Rehman Chaudhry, Elizabeth Wells, Hesam Amir-Aslanzadeh, Erik Pankratz, Vincent Pham, Rachel Anderson, Joel Barrera, Jamie Edelen, Justin Marshall, Zied Bouida and Sean Goldberger.

Chaudhry, a graduate student of Dr. Alex Sprintson, received first place in his session for their research titled “Efficient Algorithms for Index Coding.” They also received first place in the taxonomy competition, which is a competition between winners of different sessions. In this research, he presented some exact and heuristic approaches for the index coding problem.

Wells, an electrical engineering senior, received two recognitions during SRW. Wells was the session winner and taxonomy winner for her presentation titled, “Optimization of Surveys for Detection of Energized Structures to Eliminate Electrical Hazards to the Public in New York City.” She is an undergraduate research scholar. Her advisor for this work is Dr. B. Don Russell.

Amir-Aslanzadeh and Pankratz, electrical engineering graduate students, won second place for their poster titled, “A Multi-Standard, Power-Adjustable, High Linear, Continuously Tunable Active-RC LPF.” They are students of Dr. Edgar Sanchez-Sinencio.

Vincent Pham, a senior in the department, won second place for his poster titled, “Quantitative Analysis of Arterial Spin Labeling of MRI.” He is a student of Dr. Jim Ji.

Bouida, an electrical engineering graduate student, won second place for his poster titled, “Design and Performance Evaluation of Fully Joint Diversity Combining, Adaptive Modulation, and Power Control Schemes.” He began his research at the Texas A&M University Qatar campus under the advisement of Drs. Khalid Qarage and Mohamed-Slim Alouini. He continued his research at the College Station campus with Dr. Jean-Francois Chamberland.

A multidisciplinary group advised by Dr. Gregory H. Huff won an SRW award for their poster titled “Multifunctional Materials Antenna Array.” It included the following undergraduate students: Rachel Anderson (ECE), Joel Barrera (ECE), Amy Bolon (ME), Stephen Davis (AERO), Jamie Edelen (ECE), Justin Marshall (ECE), Cameron Peters (AERO) and David Umana (ECE). Their graduate mentors were Sean Goldberger (ECE) and Frank Drummond (AERO).

The mission of Student Research Week (SRW) is to recognize and celebrate student research at Texas A&M University by providing an opportunity for students to present research and to foster an environment for students, faculty, staff and administration to learn about the research occurring at Texas A&M University and the resources available on campus. The goal is to promote understanding and communication about research among disciplines, as well as to the public, thereby promoting a positive university research environment.

Student Research Week exemplifies Texas A&M University’s long-standing commitment to providing educational research opportunities for students at all levels. It is one of the largest university-wide student led research week programs in the nation.
ECE group takes second place in an SRC/SIA IC contest

Recently, a group from the Department of Electrical and Computer Engineering at Texas A&M University placed second among the top eight finalists in an IC contest sponsored by Semiconductor Research Corporation (SRC), the world’s leading university research consortium for semiconductors and related technologies.

The contest consisted of two phases: Phase One, a design phase, and Phase Two, a fabrication and evaluation phase. The ECE team was among the top eight out of 47 teams from the first phase. They qualified to compete in the final phase of the SRC/SIA Design Challenge where they fabricated their designs in Jazz Semiconductor’s SBC18 180nm SiGe technology. All eight teams presented posters at SRC’s TECHCON 2008. The A&M took second place in the final phase, earning $15,000 in cash prizes.

The ECE team includes Dr. Edgar Sanchez-Sinencio as faculty team leader, Dr. Kamran Entesari as assistant faculty team leader, and three of their Ph.D. students. Their design was titled “A Dual-Band Millimeter-Wave Receiver using SiGe Technology.”

The key objective of the SRC/SIA IC Design Challenge is for university teams to create novel, high performance circuit designs that make end products more competitive. These products can be digital, analog, mixed-signal or wireless. Using the provided technology and design kit, successful contest teams will design circuits that clearly demonstrate potential for high performance for a target application offering advantages over existing designs. Specific circuitries of particular interest to the sponsors are LNAs, mixers, high speed I/Os, low power, high resolution graphics and thermal management; however the contest is not limited to these areas. Sponsors are looking for creativity, innovation, and the best usage of the given technology to implement an important new or improved circuit or circuit subsystem. A secondary objective is to assist faculty in stimulating greater interest in IC design careers among students, both graduate and undergraduate and from diverse populations.

About SRC

Celebrating 26 years of collaborative research for the semiconductor industry, SRC defines industry needs, invests in and manages the research that gives its members a competitive advantage in the dynamic global marketplace. Awarded the National Medal of Technology, America’s highest recognition for contributions to technology, SRC expands the industry knowledge base and attracts premier students to help innovate and transfer semiconductor technology. For more information, visit www.src.org.

About SIA

The SIA is the leading voice for the semiconductor industry and has represented U.S. semiconductor companies since 1977 and SIA member companies comprise more than 85 percent of the U.S. semiconductor industry. Collectively, the chip industry employs a domestic workforce of 232,000 people. More information about the SIA can be found at www.sia-online.org.