Role of Personal Mastery in Education

As educators we pride ourselves in our most valuable product, our graduates. We do many things to provide them the best possible education we can. We strive to refine our curriculum so that they get the best possible knowledge of our respective fields. We give them technical breadth and depth so that they can be versatile and compete globally. We want them to have a mastery of fundamentals they can use to learn on their own and stay competitive for the entire span of their careers. We also give them knowledge of humanities to make them well-rounded individuals. This knowledge and these skills are aimed towards helping them get good jobs and have productive careers.

However, there is a vital aspect of education that we do not pay much attention to. This aspect relates to equipping our graduates with skills and tools for personal development and mastery. There are some core concepts and principles that can help any individual to enhance his or her experience of life and career. Just as broad scientific and engineering knowledge prepares them for life-long technical learning, the knowledge of these core principles prepares them to continually learn and expand their ability to create a life and career they truly seek.

The following questions came to my mind as I pondered this subject. Do we have a role in cultivating awareness of those psychological processes that Peter Senge calls mental models? These models are assumptions about reality that we carry within us, assumptions about ourselves, those around us and the world at large. These models shape not only what we do but also what we see. I believe that we do have such responsibility, as these models often spell the difference between success and failure of individuals, organizations and products.

Many times, however, these mental models are below the level of our normal awareness, in what we call the subconscious. Do we teach the importance of this subconscious level of our awareness and how it affects the way we perceive and create reality? The knowledge of the subconscious and mental models could open doors for life-long discovery through observation and reflection. Such a process could lead us to uncover mental models that we all hold. This will help us develop more objectivity and continual improvement of these models. It could lead to uncovering and reexamining the limitations we subconsciously impose on ourselves and others with whom we interact. These assumptions limit our capacity to contribute to this world, perhaps more than the external factors. But I think many of our graduates are not even aware of the influence such models have in their professional and personal lives.

Another example is that of creativity. We all want to emphasize innovation. There is an abundant knowledge on the understanding of the creative process that can be useful in our professional and personal lives. There are many ways that have been developed that can enhance the creative capacity of individuals. Should not our graduates be exposed to such knowledge and helped in developing skill in using these tools that can enhance their creative abilities? Another idea is the power inherent in clear purpose and intent that can unlock our latent powers and capacities. Techniques like imagery or visualization have been used to create clarity of intent leading to realization of our deeper aspirations.

These questions that I raise are just examples and are not meant to be an exhaustive set. They comprise the core knowledge and skills for personal mastery. I believe that this set of core concepts and tools can really make a difference in the life that our graduates will experience and contributions they will make to society. Knowledge of such concepts and skill in using these tools will have a more profound impact than learning more history or political science, for example. Yet I believe we do not systematically educate our graduates in these aspects. Some of our graduates will use these ideas unknowingly and others may come across them accidentally or be forced to seek such knowledge when they encounter difficulties. Would it not, however, be more powerful to train our graduates in these skills even before they enter their careers?

-Chanan Singh
First ever forum addresses power consumption needs for Texas’ future

Key players involved with the electric power industry in Texas and the nation met recently for the first Texas Electric Energy Forum: Partnership for Electricity Research at the Annenberg Presidential Conference Center, Texas A&M University.

Hosted by Texas A&M’s Department of Electrical Engineering, the forum’s discussion dealt with research needs and partnership opportunities to assure efficient, reliable power for the state and nation for the next 20 years.

“The energy crises are here. We all know what happens when the power goes out,” said Dr. G. Kemble Bennett (left), vice chancellor and dean of engineering, in welcoming the near 100 university, industry and government participants in attendance. “The spirit of teamwork is the most productive way to conduct research. This forum will set the stage for us to move forward.”

Organized through a collaboration of eight Texas universities, the forum’s major aims were to identify research needs, showcase faculty research programs in participating universities and foster communication leading to partnerships between industry, universities and government. The participating universities all have electric power and power electronics programs, and along with Texas A&M include the University of Texas at Austin, the University of Houston, Texas Tech University, the University of Texas at Arlington, Rice University, the University of Texas at El Paso and Texas A&M University-Kingsville.

Speakers at plenary session, which kicked off the event, included Patrick Wood III, chairman of the Federal Energy Regulatory Commission; Michehl Gent, president and CEO, North American Electric Reliability Council; T.J. Glauthier, president and CEO, Electricity Innovation Institute; and William Parks, acting director, Office of Electric Transmission and Distribution in the U.S. Department of Energy.

“In Texas you have the most sophisticated and developed opportunities to achieve competitive markets in power,” Wood (left center) said, calling the Texas wholesale power market “an underlying foundation and a good design from a market standpoint.”

Blackouts drive research needs, NERC’s Gent (right center) said in talking about the August 2003 blackout that affected the U.S. Northeast and parts of Canada - “the blackout that could never happen.”

“In every investigation, it comes out that the protective relays didn’t work. We need to pay attention to digital technology,” Gent said.

The NERC was an integral part of the joint U.S.-Canada task force that investigated the cause of the August 2003 blackout.

The next session focused on the immediate development opportunities and research needs for the next five years. Featured speakers were Sam R. Jones, Executive VP and Chief Operating Officer, ERCOT; Don Cortez, VP of Distribution Support, CenterPoint Energy; Douglas J. Mader, Director, Technology Delivery, Entergy Services, Inc.; Donna N. Geiger, Governor’s Advisor, Budget, Planning & Policy Office of the Governor of Texas; and Julie Parsley, Commissioner, PUC of Texas. Brett Perlman was the moderator.

Jimmy Glotfelty (right) of ICF Consulting discussed the Texas Opportunity for Federal R&D during lunch.

The third session focused on the long-term future opportunities and research needs from the next five to 20 years. Featured speakers included Charles Jenkins, VP for Grid Management for TXU Electric Delivery; Cliff Braddock, Director, Energy Business Development, Austin Energy; Trudy Harper, President and General Manager of Tenaska Power Service Co.; and Walter Hornaday, President, CIELO Wind Power. Alison Silverstein was the moderator for this session.

The fourth session was moderated by Dr. B. Don Russell. During this session Research and Education issues in the power programs was discussed. Featured speakers included Ross Baldick, The University of Texas Austin; Paul Chu, University of Houston; Michael Gisselmann, Texas Tech; Mladen Kezunovic, Texas A&M University; and Wei-Jen Lee, The University of Texas Arlington.

The next day an introduction of the Electric Power and Power Electronics Programs at Texas Universities was given along with presentations of research programs by individual faculty members, and there was a round table discussion about the opportunities for future research cooperation. For more on the forum, visit http://eent1.tamu.edu/txeef/.
Engineering students receive NSF grants for hi-tech research

The Departments of Electrical Engineering and Computer Science have both received Research Experiences for Undergraduates (REU) site grants from the National Science Foundation. These grants fund research for undergraduate students to work in groups with faculty and other researchers on specific research projects.

The Department of Electrical Engineering is offering their first REU Program this summer, which was co-funded by the National Science Foundation and the Department of Defense. The $300,000 grant will last three years and cover the cost of housing, tuition, fees, meals, research and travel for students.

Headed by Electrical Engineering Associate Professor Dr. Karen Butler-Purry, this summer’s electrical engineering REU involves 10 students: three from Texas A&M and seven from various universities across the United States.

The students will work closely with nine professors on research that deals with homeland security such as power grid reliability, sensor device security, fiber-optic perimeter monitoring intrusion sensors and chemical and biological sensors. Students will also participate in an ethics seminar and a seminar on taking the graduate record exam (GRE), which all prospective graduate students must take in order to apply to graduate schools.

This summer the Department of Computer Science also is offering their first REU Program, which involves eight students, one from Texas A&M, and seven from other universities, and will last 10 weeks. Each participant received $6,000 for research, housing, tuition, fees and meals.

Dr. Valerie Taylor, head of the REU grant and head of the computer science department, hopes that through this grant, an increased number of undergraduate students will pursue graduate studies.

Boeing continues support for high-flying design curriculum at Texas A&M

From preliminary design to successful launch, an interdisciplinary design curriculum funded by the Boeing Co. is yielding significant achievements for Texas A&M Engineering and the Mays Business School.

Boeing representatives were on the Texas A&M University campus recently to present a check for $225,000, the third installment in the five-year partnership that is preparing future engineers and business professionals to collaborate on design and cost decisions.

The program started in 2002 and is the first initiative for engineering design curriculum across colleges at Texas A&M. In its second year, 10 teams of students began designing an 8-foot-tall rocket known as T-BIRD (Texas A&M-Boeing Interdisciplinary Rocket Design). Two launches were completed from West Texas Spaceport in Pecos County last spring.

“We are extremely happy to be able to participate and contribute financial support to these efforts. The interdisciplinary curriculum between the two colleges is a great opportunity for the students, and it more accurately represents what each of these students will face as they enter the workforce – and as the result, they will be more prepared,” said Craig Campbell, Boeing’s director of Project Management and Analysis for Future Combat Systems Program. Boeing’s contributions to the interdisciplinary curriculum partnership currently total $695,000.

Campbell (center) presented the Boeing gift to Dr. Jo W. Howze (right), Electrical Engineering Ford Professor and associate dean of engineering, and Dr. Clair J. Nixon (left), Pricewaterhouse Coopers Accounting Excellence Professor and associate dean of business.

“Interdisciplinary design projects such T-Bird provides our students with the opportunity to experience the real world of engineering. The College of Engineering believes that this type of enriching experience is necessary to educate engineers who can work in a systems approach environment and meet the future engineering needs of the nation,” Howze said.

Participating departments in the Look College include aerospace, civil, electrical and mechanical engineering as well as computer science. Students deal with technical as well as project management and business case analysis issues.

This academic year computer science students from Prairie View A&M University have joined the program. Teams will further refine the design, building and evaluation of an actively controlled rocket capable of reaching approximately one-mile altitude.

Collaboration efforts with Qatar campus

Dr. Chanan Singh, Head of the Department of Electrical Engineering at Texas A&M, recently visited the Texas A&M University Qatar Campus to explore collaboration efforts between the two departments. Singh was given a tour of the EE 214 laboratory during his visit. Pictured: Mike Kemp, CEO of the Qatar Campus, Singh, Visiting Associate Professor, Dr. Khalid Qaraqe and several students taking the first electrical engineering course.

Contributed by Exa York
bacteria-continued from page 1

are picked up by a small antenna, the so-called nanowell.”

Kish said that the observed electrical field fluctuations have very different dynamics than the background noise.

“Due to this reason and due to the selectivity of phages -- phages never infect a wrong bacterium -- the method is virtually free of false alarm,” Kish said.

Cheng said that a method for rapidly and inexpensively detecting bacteria is needed. SEPTIC identifies bacteria within minutes, with no false alarms and very low probability of missed detection. The method is also relatively cheap. Other detection methods such as PCR (polymerase chain reaction) culturing require hours or days of processing and more expensive instrumentation, and also don’t distinguish very well between living and dead bacteria. In addition, other methods require trained personnel, whereas SEPTIC only needs minimal personnel involvement.

“Rapid and sensitive identification of bacteria is extremely important in clinical, veterinary and agricultural practices, as well as in applications to microbiological threat detection and reduction,” Cheng said. “But given its fast response, high specificity and relatively low cost, SEPTIC could be invaluable in a clinical, veterinary and agricultural practice, as well as in the current fight against bioterrorism. Eventually, every nurse or soldier may be equipped with a cell phone-like, wireless SEPTIC biolab.”

Kish said, “Our ultimate aim is to have a biochip where hundreds of nanowells and their preamplifiers are integrated. Each nanowell covers a different phage, and if a relevant bacterium is present, the corresponding nanowell will signal and identify the bacterium. This would be a pen-size biolab that would be able to identify hundreds of bacteria in five minutes.”

The researchers are now working also with Dr. Cheng Kao in the Department of Biochemistry and Biophysics on implanting their nanowell device in plants. Plant cells die after a virus attack, and the device can send a signal warning of a viral attack.

Contributed by Lesley Kriewald

Texas A&M electrical engineering students help design, fly rocket

There’s more to getting a rocket off the ground than lighting the fuse and getting out of the way. Just ask a team of Texas A&M University engineering students who launched their own rocket earlier this year.

The rocketeers -- 30 students from the university’s Departments of Electrical, Aerospace and Mechanical Engineering -- began designing their rocket last fall as part of a multidisciplinary design course funded by the Boeing Co. The eight-foot-tall rocket (T-BIRD, short for Texas A&M-Boeing Interdisciplinary Rocket Design) roared into the sky in April from the West Texas Spaceport in Pecos County.

The process is every bit as complicated as you might expect, says project coordinator Dr. Reza Langari, associate professor of mechanical engineering in Texas A&M’s Look College of Engineering, who worked with Dr. Tom Pollock, associate professor of aerospace engineering, and Dr. Jeff McDougall, lecturer in electrical engineering, as the three faculty members overseeing the student teams. And it didn’t end with a successful launch; students still had to complete the project’s final report for Boeing.

“Rockets are not easy to build,” Langari said. “This was a complex project, and altogether the students put in a significant amount of work -- probably a total of at least 5,000 hours.”

Ten teams -- aerodynamics; documentation; guidance; navigation and control; launch site and launch support; manufacturing and assembly; payload; propulsion; recovery; structures; and test and evaluation -- spent last fall working out their designs and the details of manufacturing the parts of the rocket. In December, they presented their designs to a panel of Boeing engineers and Texas A&M faculty members with expertise in rocket design and construction.

The students’ designs had to meet the requirements of a request for proposal, or RFP, provided by Boeing. To meet Boeing’s RFP, the rocket had to weigh 30 pounds at liftoff, carry a camera to a specific point 6,000 feet in the air, deploy the camera, return high-resolution images from 5,000 feet in the air in “realtime,” and recover everything without damage. The students spent the spring semester turning their designs into a rocket. Design and manufacturing challenges ranged from turning Kevlar fabric and epoxy into the six-inch diameter by six-foot fuselage to designing and fabricating the complex shape of the solid fuel inside the engine. Altogether, the students dealt with 50 vendors for items ranging from a digital altimeter to plywood for internal bulkheads and ripstop nylon for parachutes.

Meeting the deadline was a challenge, Langari said. “You want to focus on the content and at the end you realize management and scheduling are equally if not more important,” he said.

The students flew the rocket twice in from the West Texas launch site.

The team drew on technical advice from David Lund of the TEES Aerospace Vehicle Systems Institute, Dr. Don Ward of the aerospace engineering department, Dr. Terry Creasy of the department of mechanical engineering, and Dr. Ken Reinschmidt of the civil engineering department. The team also benefited from lectures by Dr. Clair Nixon of Texas A&M’s Mays Business School and received valuable assistance from machinists in the aerospace and mechanical engineering departments.
Enhanced design course benefits both students and industry

Undergraduate students taking ELEN 405 at Texas A&M University will get a better idea what it’s like in the industry environment after some recent enhancements.

“The ‘Capstone Design Course’ is structured to provide students with an industry sandbox where they can experience design, implementation and testing in a supervised and benign environment, said Dr. Jeff McDougall, instructor for the course.

The formal course content includes structured design, implementation basics, formal communications (both written and oral) and testing approaches. Students are required to submit three written reports, perform one formal presentation, participate in four status reports and complete a design, build, test cycle with their project.

“In an attempt to enhance the design experience, we have sought out and acquired industry mentors and sponsors, “McDougall said. “Our industry partners provide challenging projects, technical support, financial resources and most importantly - motivation for the students.”

This not only benefits the students, but also industry members.

“Lockheed Martin enjoys the opportunity to work with the students on their EE 405 Projects,” said Tom Byrd of Lockheed. “Lockheed Martin benefits through technology development through the students that we can inject into our products. The students provide solutions to the problems we present with very good solutions that can work in our environment.”

“In fact, on one project we actually preferred the project team’s solution to a solution we had received from a subcontractor,” adds Dale Gulick of AMD.

“Advanced Micro Devices (AMD) strongly supports EE 405 (and contributes $10K each year),” adds Mc Dougall said. “The benefits to AMD are getting the name of our company in front of graduating students, which helps with recruiting, and the practical nature of the course helps to prepare students—who have spent most of their academic careers heads-down in text books—for life in industry.”

McDougall said it is important for the students to have this interaction with industry to better understand what it’s like having a real job.

“I think the important aspects of 405 include the required ‘design-build-test’ cycle, industry interaction and the focus upon professionalism,” he said.

“Personally, I enjoy working with the students; seeing their energy and ambition for solving fun and unique problems,” adds Byrd. “I think that the real world problems we present give the student added incentive on their projects.”

And this feeling is reciprocated by the students.

“The design class is actually coming in handy these days, said Michael Jackson, former 405 student and graduate of Texas A&M. “I am working for a consulting company and seeing the design process employed in a consulting type setting is very familiar to what we went through.”

“Looking back, I am glad to have worked on this (405) project,” adds Adam Hall, another former 405 student. “Despite all the long hours and my grumblings at the time, it taught me a lot about teamwork, hard work and technical documentation. Heck, I have even put soldering skills to work many times since being hired on.”
U.S. News & World Report ranks Texas A&M’s electrical engineering programs
The Department of Electrical Engineering’s graduate electrical engineering program at Texas A&M University was again ranked in the top 20 nationally and the Computer Engineering Program was ranked in the top 25 nationally. The U.S. News & World Report released on newsstands its report on America’s best graduate schools for 2006.
Electrical engineering was ranked 18th among 185 Ph.D.-granting engineering schools (11th among state schools). In 2005 it was ranked 19th. Computer Engineering was ranked 23rd (14th among state schools). In 2004 it was ranked 21st.
Specialty rankings are based solely on nomination by educators at peer schools. Department heads are 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. With this scoring system, Texas A&M’s electrical engineering and computer engineering programs had the 13th best overall score in the country. In addition, the graduate engineering program at Texas A&M was again ranked 14th nationally and eight other graduate specialties were also ranked among the top 25. Extended specialty rankings and other data are available online from U.S. News & World Report. For more information, see www.usnews.com.

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Jean-Francois Chamberland

Jean-Francois Chamberland is an assistant professor in the Department of Electrical Engineering at Texas A&M University. 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. He also received several prestigious scholarships and fellowships.

Chamberland's research interests are in the area of communication and control theory and, recently, he has been studying the efficient design of wireless sensor networks in the context of decentralized detection. His work on wireless systems has appeared in a variety of outlets, including the IEEE Transactions on Signal Processing, the IEEE Journal of Selected Areas in Communications and the IEEE Transactions on Wireless Communications. He is the author of numerous publications.

Sunil Khatri

Sunil Khatri joins the department as an assistant professor. From January 2000 to June 2004 Khatri 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.

Khatri’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 cross-talk 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, cross-talk 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.

Jun Kameoka

Jun Kameoka, who was born in Osaka, Japan, earned his bachelor’s degree in applied physics and image science from Chiba University, Japan. He received his M. Eng in Nuclear Science in 1997, and his M.S. and Ph.D. in electrical engineering in 1999 and 2002 respectively, all from Cornell University, where he worked as a postdoctoral associate. Currently he is an assistant professor at Texas A&M in the electrical engineering department.

Kameoka has been working on a number of projects including research on nano and microfluidics, nanosensors and Molecular Manipulation, bio-nanomaching, nano-structure science and engineering and BioMEMS. He also is the author of numerous publications and has received several patents.

Christi K. Madsen

Christi K. Madsen joins the department as a professor. She comes from Lucent Technologies, Bell Laboratories, where she was a Distinguished Member of the technical staff in the Integrated Photonics Research Department. She received her Ph.D. from Rutgers University, New Brunswick, NJ in 1996, her M.S. from Stanford University, Stanford, CA in 1987 and her B.S. from the University of Texas at Austin in 1986, all in electrical engineering.

Madsen’s research interests are in Digital filter and signal processing theory applied to optical filters and optical signal processing, adaptive filters for mitigating intersymbol interference such as from chromatic and polarization mode dispersion (PMD), novel integrated optical devices, polarization controllers and polarimeters, wavelength-dependent modulators, solid-state variable optical delay lines, real-time PMD measurement, optical signal quality monitoring, channel estimation for control of adaptive optical filters, and applications for ring resonators, allpass and subband optical filters. She is a Fellow of the Optical Society of America and an IEEE LEOS Distinguished Lecturer 2004-2005.

Jun Zou

Jun Zou received his Ph.D. from the University of Illinois at Urbana-Champaign in 2002, his M.S. from Tsinghua University, Beijing, China in 1997, both is Microelectromechanical Systems (MEMS) and his B.S. from Chongqing University, Chongqing, China in 1994. Before joining the department as an assistant professor, Zou was a post-doctoral researcher in the Micro and Nanotechnology Laboratory (MNTL) at the University of Illinois at Urbana-Champaign.

Zou’s research interests are in the development of micro sensors, micro actuators and Microelectromechanical systems (MEMS), and nanofabrication and nanoeengineering based on scanning probe microscopy (SPM). He has extensive experience in microfabrication and micromachining technology. Since 1994, he has been doing interdisciplinary research in this area and successfully developed a number of micro devices for applications in microfluidics, acoustics, micro sensing/actuation, RF communication and nanotechnology. He also invented a patent-pending microfabrication process - Plastic Deformation Magnetic Assembly (PDMA) for efficient fabrication of complicated 3D microstructures. Up to date, he has contributed more than 30 peer-reviewed journal and conference publications and holds one U.S. patent. Zou is a member of IEEE and the IEEE Electron Devices Society.

Peng Li

Peng Li joins the computer engineering area of the department as an assistant professor in August 2004. He received his bachelor’s and master’s degrees from Xi’an Jiaotong University, Xi’an, China in 1994 and 1997 respectively. In October 2003, he received his Ph.D. degree in electrical and computer engineering from Carnegie Mellon University, Pittsburgh, PA, where he also worked as a post-doctoral research associate for eight months before joining Texas A&M.

Li’s research interests lie in the general area of VLSI CAD and design automation, with an emphasis on modeling and simulation of digital and analog integrated circuits. In 2001 and 2004, he received Inventor Recognition Awards from the Semiconductor Research Corporation. In 2003, he received a best paper award from 40th IEEE/ACM Design Automation Conference.
The Kennedy Professorship is trical engineering.

Bhattacharyya, a professor for the department, joined the Texas A&M electrical engineering faculty in 1980. Prior to this he was professor and head of the electrical engineering department at the Federal University in Rio de Janeiro, Brazil. His honors include being chosen as a NASA Research Fellow in 1974 and a Fellow of the Institute of Electrical and Electronics Engineers in 1989. He won a Fulbright Lecturing Award in 1989, was chosen as a TEES Fellow in 1989 and TEES Senior Fellow in 2000, a Haliburton Professor in 1991, and won a Boeing “A.D. Welliver” Faculty Fellowship from Boeing Corporation in 1998. He has given invited lectures and short courses in the United States, Italy, Japan, Korea, Brazil, Germany, India and Mexico.

Bhattacharyya’s research focus is control theory and is directed at developing new approaches for Computer Aided Control System Design (CACSD) that will enable advanced control theory to be applied to real world systems. His research has been continuously supported by the National Science Foundation since 1981 and National Instruments of Austin since 2003. He has authored or coauthored five books and more than 200 journal and conference papers in the field of automatic control.

A registered professional engineer in Texas, Bhattacharyya received his Bachelor of Technology from the Indian Institute of Technology (Bombay) and his master’s and doctorate degrees from Rice University, all in electrical engineering.

The Kennedy Professorship is one of two established in 2003 by an estate gift from the late Robert M. Kennedy, Texas A&M Class of 1926. An electrical engineer who spent his career with Southwestern Bell, Kennedy was among the first professional engineers licensed by the Texas Legislature and was inducted into the Telephone Pioneers of America.

Karen Butler-Purry Dr. Karen Butler-Purry, associate professor of electrical engineering, was a keynote speaker at the 76th National Technical Association (NTA) Conference student luncheon. She discussed students striving for excellence in all aspects of their lives and the importance of minority participation in technical fields. This year’s conference, “Science and Technology: The Research, The Business, The Impact on HBCUs/MIs,” took place at the Kellogg Conference Center in Tuskegee, Ala. The National Technical Association is the premier technical organization of scientists, engineers, architects, technologists, educators and technical business entrepreneurs for African-Americans.

Butler-Purry came to Texas A&M in 1994 as a visiting assistant professor. She earned bachelor’s and master’s degrees from Southern University in Baton Rouge, La. and the University of Texas-Austin. She holds a Ph.D. in electrical engineering from Howard University. Her research interests are in the areas of distribution automation and intelligent systems for power quality, state estimation, equipment deterioration and fault diagnosis. Among her recent honors, Butler-Purry received Charles W. Crawford Service Award from the College of Engineering at Texas A&M, the B. P. Amoco for Teaching Excellence Award and the Office of Naval Research Young Investigator Program Award. She also was named a 1998-99 Montague Center for Teaching Excellence Scholar and in 1995 and was awarded the National Science Foundation Faculty Career Award.

Anirrudha Datta Dr. Anirrudha Datta, professor, received an Outstanding Faculty Award from the Department of Electrical Engineering. He joined the department 1991. He received the B. Tech degree in electrical engineering from the Indian Institute of Technology, Kharagpur in 1985, the M.S.E.E. degree from Southern Illinois University in 1987 and the M.S. and Ph.D. degrees from the University of Southern California in 1991. His areas of interest include adaptive control, parameter robust control, decentralized control and process control. Other honors include being named a TEES Special Research Fellow. He also has been a member of several program committees, has been an associate editor for IEEE Transactions on Automatic Control, has won best presentation awards and has authored numerous journals and other publications.

Ed Dougherty Dr. Ed Dougherty, professor in the Department of Electrical Engineering at Texas A&M University, recently was named recipient of the Presidential Award from SPIE, the International Society for Optical Engineering. The SPIE President’s Award, a discretionary award plaque, may be given to an individual who, in the opinion of the President and the Board of Directors, has rendered a unique and meritorious service of outstanding benefit to the Society. Dougherty received the award for his distinguished service as a conference chair, course instructor, book author, journal editor and Society leader.

Other recent honors for Dougherty included being elected chair of the Society of Industrial and Applied Mathematics (SIAM) activity group on imaging science and having a paper accepted to the Proceedings of the National Academy of Science, which represents joint work with MDACC and Tampere. Dougherty also was named a Texas Engineering Experiment Station (TEES) Fellow at Texas A&M.

He received his Bachelors of Science and his Masters of Science in mathematics from Fairleigh Dickinson University in 1967 and 1969, respectively. He earned another Masters in Science in computer science from Stevens Institute of Technology in 1986 and his Ph.D. in mathematics from Rutgers University in 1974.

Dougherty is considered a leader in the study of the Human Genome Project by measuring gene activity with engineering techniques such as signal processing, pattern recognition and image analysis. He is the editor of several technical journals and has chaired a number of conferences.

Mehrdad (Mark) Ehsani Dr. Mark Ehsani was named inaugural holder of one of two Robert M. Kennedy ’26 Professorships in Electrical Engineering. Ehsani joined the electrical engineering faculty in 1981. Prior to that he was a research engineer for Argonne National Laboratory.

Ehsani has served as a consultant to many companies and government agencies since 1981. He served as director for the Texas Applied Power Electronics Center in the Department of Electrical Engineering from 1992 to 1999, and has served as the director of the Advanced Vehicle Systems Research Program in the electrical engineering department since 1999. Widely recognized in the electrical engineering industry, Ehsani’s research focuses on power electronics, motor drives, and hybrid vehicles and their control systems. He has written or contributed to 11 books, written more than 300 journal and conference papers and holds 23 United States and European Commission patents.
Enjeti's research focuses on power quality and clean power in the area of power electronics, the Power Quality Laboratory at Texas Instruments, and Power Electronics and Power Quality Laboratory at Texas A&M. He is the lead developer of the Fuel Cell Power Systems Laboratory and Power Electronics and Power Quality Laboratory at Texas A&M, and does consulting work in the area of power electronics, power quality and clean power utility interface issues.

Enjeti's research focuses on power electronics and power quality; advancing switching power supply designs and solutions to complex power management issues in the context of analog mixed-signal applications; exploring alternative designs to meet the demands of high slew rate load currents at low output voltages; power conditioning systems for fuel cells, wind and solar energy systems; and design of high temperature power conversion systems with wide band-gap semiconductor devices.

Enjeti holds four United States patents, has licensed two new technologies in the industry, and has written six book chapters and more than 100 journal and conference papers. Enjeti was elected as an IEEE Fellow in 2000 and received a Ford Motor Co. Fellow award in 2001.

Enjeti also was elected as a Fellow of the Institute of Electrical and Electronics Engineers in 1986. He was selected for the IEEE Vehicular Society 2001 Avant Garde Award. In 2003 he was selected for a BP Amoco Faculty Award for Teaching Excellence and the IEEE Undergraduate Teaching Award. In 1992, he was named the Halliburton Professor in the Dwight Look College of Engineering at Texas A&M and in 1994, he was named the Dresser Industries Professor in the Look College. In 2001 he was selected as the Ruth & William Neely ’52/Dow Chemical Faculty Fellow of the Look College.

A registered professional engineer in Texas, Ehsani received his bachelor's and master's degrees from the University of Wisconsin-Madison, all in electrical engineering.

The Kennedy Professorship is one of two established in 2003 by an estate gift from the late Robert M. Kennedy, Texas A&M Class of 1926. An electrical engineer who spent his career with Southwestern Bell, Kennedy was among the first professional engineers licensed by the Texas Legislature and was inducted into the Telephone Pioneers of America.

Prasad Enjeti
Dr. Prasad Enjeti was named the inaugural holder of the TI Professorship in Engineering. A professor in the department, Enjeti joined the Texas A&M electrical engineering faculty in 1988. He is the lead developer of the Fuel Cell Power Systems Laboratory and Power Electronics and Power Quality Laboratory at Texas A&M, and does consulting work in the area of power electronics, power quality and clean power utility interface issues.

Enjeti's research focuses on power electronics and power quality; advancing switching power supply designs and solutions to complex power management issues in the context of analog mixed-signal applications; exploring alternative designs to meet the demands of high slew rate load currents at low output voltages; power conditioning systems for fuel cells, wind and solar energy systems; and design of high temperature power conversion systems with wide band-gap semiconductor devices.

Enjeti holds four United States patents, has licensed two new technologies in the industry, and has written six book chapters and more than 100 journal and conference papers. Enjeti was elected as an IEEE Fellow in 2000 and received a Ford Motor Co. Fellow award in 2001.

Enjeti also received a TEES (Texas Engineering Experiment Station) Select Young Fellow Award in 1992 for research contributions and a Texas A&M University Faculty Fellow Award in 2001. He is the recipient of a university level Distinguished Achievement Award for Teaching from the Association of Former Students of Texas A&M University for 2004.

A registered professional engineer in Texas, Enjeti received his bachelor's degree from Osmania University in India, his master's from the Indian Institute of Technology (ITT) Kanpur and his doctorate from Concordia University in Canada, all in electrical engineering.

Texas Instruments (TI) Inc. established the TI Professorship in Engineering in 1998 as part of a major gift to support research and teaching in the field of analog engineering.

Theresa Maldonado
Dr. Theresa A. Maldonado, associate dean of the Dwight Look College of Engineering at Texas A&M and associate director of the Texas Engineering Experiment Station (TEES), has been named a senior member of the Lasers and Electro-optics Society of the Institute of Electrical and Electronics Engineers.

Maldonado, a professor in the Department of Electrical Engineering, joined Texas A&M in September 2003. From 1981 to 1986, Maldonado was a member of the technical staff at AT&T Bell Laboratories, working in fiber optic systems, fiber components and cable design. After completing her doctoral studies in 1990, she joined the University of Texas at Arlington as an assistant professor in the Department of Electrical Engineering. In 1999-2001 she was a program director at the National Science Foundation, where she managed Engineering Research Centers and served on a number of NSF-wide committees, including CAREER and Nanoscale Science and Engineering. She returned to UTA in 2001 as associate dean of engineering for research and graduate studies. In July 2002 she was appointed associate vice president for research and became director of the UTA Institute for Nanoscale Science and Engineering Research and Teaching.

Recently Maldonado was named to a national committee on engineering workforce diversity. She also was a 1991-96 NSF Presidential Young Investigator, and received the Halliburton Award for Teaching Excellence and the Halliburton Award for Outstanding Young Faculty from the UTA College of Engineering. In 1995 she was inducted into the inaugural Council of Outstanding Young Engineering Alumni at Georgia Tech. At NSF, Maldonado was recognized with the 2001 Director's Award for Program Management Excellence and the Director's Award for Collaborative Integration for her services on the CAREER Coordinating Committee, and with a Certificate of Appreciation for Distinguished Service in the Development of the NSF Program, ADVANCE.

A registered professional engineer in Texas, Maldonado is a senior member of the Institute of Electrical and Electronics Engineers and a member of the Optical Society of America, the International Society for Optical Engineering,Eta Kappa Nu, Tau Beta Pi, Eta Kappa Nu, and the Society of Hispanic Professional Engineers.

She holds bachelor's, master's and Ph.D. degrees in electrical engineering from the Georgia Institute of Technology.

Cam Nguyen
Dr. Cam Nguyen was elected to the rank of Fellow of the Institute of Electrical and Electronic Engineers (IEEE) for his “contributions to microwave integrated circuits and systems.”

Nguyen, a professor, is one of 18 faculty members in the Department of Electrical Engineering at Texas A&M University to reach the rank of Fellow. This is considered a significant honor since the number of IEEE members who may be advanced to Fellow grade in one year is 0.10 percent of the total 320,000 Institute membership.

The IEEE Directory describes the honor as “one of unusual professional distinction conferred only by the [IEEE] Board of Directors upon a person of extraordinary qualifications and experience.” To be considered, candidates must have made an outstanding contribution to the electrical and electronics profession.

Nguyen has been with the department since 1990. His current research interests encompass both the theoretical and practical aspects of RF, microwaves, millimeter waves and electromagnetics, with concentration on the developments of novel RF, microwave and millimeter-wave integrated circuits, antennas, receivers, transmitters and sensors for wireless communications, and subsurface and surface sensing for different engineering applications. He has written one book, several book chapters, more than 100 papers, edited two books and given several invited lectures. Another recent honor includes being named a...
3M Fellow by the Dwight Look College of Engineering at Texas A&M University.
He received his B.S. degree from the California Polytechnic University in 1980, his M.S. degree from the California State University at Northridge in 1983 and his Ph.D. degree from the University of Central Florida in 1990, all in electrical engineering.

**Erchin Serpedin**
Dr. Erchin Serpedin received an Outstanding Faculty Award from the Department of Electrical Engineering. Serpedin, an assistant professor for the department, joined the faculty in 1999. He received his Diploma of Electrical Engineer from the Polytechnic Institute of Bucharest, his Specialization Degree in Transmission and Processing of Information, L'Ecole Superieure d'Electricite (SUPELEC), in Paris, his MS degree from the Georgia Institute of Technology, ECE School in Atlanta and his Ph.D. from the University of Virginia.

His research interests are in the areas of signal processing for wireless communications, equalization/synchronization of communication channels, statistical signal processing, spectral analysis, and antenna array signal processing. Other honors include being awarded the prestigious Faculty Early Career Development (CA-REER) Award sponsored by the National Science Foundation (NSF). He also is the associate Editor for several journals and has authored numerous journals and other publications.

**Lihong Wang**
Dr. Lihong Wang, joint professor in the Department of Electrical Engineering and holder of the Royce E. Wisenbaker II Professorship in Engineering at Texas A&M University, has been named a Fellow of the International Society for Optical Engineering (SPIE).

Wang, who is a member of the biomedical engineering department, also directs the Optical Imaging Laboratory there.

Wang came to Texas A&M in 1996 as an assistant professor in the Biomedical Engineering Program, then part of the Department of Industrial Engineering. He was previously with the Laser Biology Research Laboratory in the University of Texas M.D. Anderson Cancer Center.

Wang's research interests are in the areas of acousto-optical tomography (ultrasound-modulated optical tomography); Mueller optical-coherence tomography; photo-acoustic tomography; photon transport in biological tissues; spectroscopic oblique-incidence reflectometry; and thermo-acoustic tomography.

He is a senior member of the Institute of Electrical and Electronics Engineers. He is a Fellow of the American Institute for Medical and Biological Engineering, the Optical Society of America and the Society of Photo-Optical Instrumentation Engineers. Wang is the topical editor for Applied Optics and serves on the editorial board for the Journal of Biomedical Optics.

Among Wang's numerous awards are a FIRST Award from the National Institutes of Health in 1995; the Outstanding Young Scientist Award from Johnson & Johnson Medical Inc. and the Houston Society for Engineering in Medicine and Biology in 1996; and the prestigious CAREER Award from the National Science Foundation in 1998. He has also received a University Faculty Fellow Award from Texas A&M and several awards from the Engineering Program of The Texas A&M University System, including the TEES (Texas Engineering Experiment Station) Select Young Faculty Award, the Ernest A. Baetz Faculty Fellow award, two TEES Fellow Awards and the TEES Senior Fellow Award. Wang earned his Ph.D. from Rice University in 1992.

Robert Atkins
Robert Atkins, Technical Laboratory Coordinator for the Institute for Solid State Electronics, received the Outstanding Staff Award from the department. Recipients of these awards are nominated by their fellow co-workers for their outstanding work performance.

Atkins worked for the department from 1979-1994 and rejoined the department in 2000. His experience encompasses research, product development, microprocessor and semiconductor circuit design, management, consulting, marketing, sales and or teaching.

Atkins received his Associate of Applied Science in Laser Electro Optics at the Texas State Technical College, Waco, Texas in 1978, he earned an Advanced Course Degree in Vacuum Coatings Deposition and is a member of the Texas State Technical College Laser Advisory Board.

Atkins, who has been married 26 years to his wife, Jacqueline, has a daughter, Shannon, and a son, Colton. His hobbies include his family, fishing and hunting and watching his son show his Brahman cattle at livestock shows.

Lynn Krueger
Lynn Krueger also was the recipient of an Electrical Engineering Outstanding Staff Award. She joined the department in 2001 as a Clerk III and worked her way up to her current position as Accounting Assistant III.

Prior to her job in the department, Krueger, who graduated valedictorian from Snook High School, was a stay-at-home mother of two daughters and in Customer Service and Retail Sales at the Snook Grocery and Market from 1997-1999. Her hobbies include freshwater and coastal fishing, reading and spending time with her children.

The objective of this award is to recognize support staff for their continuous endeavors towards excellence and promotion of the continued success of the department.
undergraduate scholarships and fellowships

AEP
Adrian Gonzalez
Gregory Hajovsky

Bolton Scholarship/Kennedy
Idan Anis
James Arnold
Joshua Baer
George Buckmaster
Jacob Chacko
Priya Damle
Guarav Garg
James Glowkowski
Michael Graham
Michael Hall
Michael Hanna
Dennis Mallory
Kyle McGeehee
Tyrel Parks
Chad Pinopurusarerk
Thomas Walling

Bolton Scholarship/Whitaker
Jon Gardiol
Christopher Sconyers

Chevron
Andrew Flournoy
Nikhil Kohari
Lorne Liechty
Justin Oettmeier

Cisco Digital Systems
Yang Yang

Friends of EE
Jeff Cobb
Nathan Davis
Josh Deaton
Haydee DeLeon
Isil Durma
Jagadeesh Dyaberi
Evan Gardner
Gaurav Garg
Jim Griffin
Ayman Kabire
Kyle Lueckemeyer
Hoyt McMillan
Hugo Mean
Kirti Patel
Ibrahim Pekucuksen
Jose Silva-Rivas
Sarah Su
Emily White
Murat Yapici

Flour Aggie Endowed Scholarship
Matthew Freeman
George Millas
Emily White

Fred D. Lege III Scholarship
Daniel Humphrey
Brandon Turner

James M. Crawford Scholarship
John W. Lee

Lewis M. Haupt Scholarship
Aaron Patton
Lisa Zsohar

Lockheed Martin
William Mitchell

Kevin D. Faske Scholarship
Sara Jeanne Barnard

Kennedy Scholars
Vijay Balasubramanian
Yufei Gou
Richard Hall
Charles Koch
Sendi Kusnadi
John W. Lee
Benjamin Longenecker
Hoyt McMillan
Brandon Moore
Ryan Morris
Matthew Osterhaus
Phuc-Loc Phan
Brett Sommers
Reuben Terry
Benjamin Vail
Daniel Brent White

Sandy Family Trust
Anthony Lau

Shell Chemical
Feyza Berber
Rishi Chaturvedi
Jianhong Chen
Patrick Chinery
Raghav Dube
Prabhavathi Kareswaran
Haobin Li
Sang Wook Park
Yong Wook Shin
George Thomas

Marvin W. Smith Scholarship
Laura Gurley
Marcus Rendon
Andrew Singh
Clayton Spoor

M.T. Tuddenham Scholarship
Jason Cooley
Eric Lasmanta
Philippus Oh
Sigil Simon

MTT-S
Aaron Scher

Raymond Van Hook
Alan Cooper
Travis Ernst
Kendra Johnson
Wayne Kanemitsu
Daniel Limbrick
Lauren Mitchell
Sean Zich

Robert D. Chenoweth
Erik Johnson

Robert Kennedy Scholarship
Jeffrey Compton
Charles Koch
Sandi Kusnadi
John Wahynko Lee
Benjamin Longenecker
Brandon Moore
Ryan Morris
Matthew Osterhaus
Phuc-Loc Phan
Aaron David Scher
Brett Sommers
Reuben Terry
Benjamin Vail
Daniel Brent White

Graduate Electrical Engineering Department
Prabha Acharya
Adeoti Adediran
Camelia Al-Najjar
Ravish Alinani
Rida Asaad
Anantaraman Balasubramanian
David G. Brown
Ming Hung Chang
Patrick Chinery
Alexandra Czarlinska
Parikshit Deshpande
Puneet Dhawan
Raghav Dube
Manisha Gambhir
Ranirda Garach
David Hoelscher
Wenchang Huang
Lung-Hwa Hsieh
Saurabh Jain
Burak Kelleci
Prabhavathi Koteeswaran
Changdong Kim
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Young Bok Kim
Praveen Kota
Harini Kuppuswami
Andreas Larsson
Hyun Nam Lee
Myung Jin Lee
Melissa Lipscomb
Xiaochun Liu
Zhan Liu
Ian Macpherson
Nabeel Malik
Chad Marquardt
Robert Milliken
Unoma Ndili
Kyoung-Lae Noh
Joongsuk Park
Kirti Patel
Hugo Mean
Hoyt McMillan
Benjamin Longenecker
John Wahnyko Lee
Sandi Kusnadi
Charles Koch
Jeffrey Compton
Erik Johnson
Robert D. Chenoweth
Sean Zich

EPPE Fellowship
Peyman Niazi
Nadar Amin Aziz Samaan
Slavko Vasic

Fouraker Fellowship
Julio Ayala

General Electric Scholarship
Krishna Kurpad
Hyokwon Nam

Graduate Merit Fellowship
Lori Dalton
Johnny Lee
Andrew Puryear
Kelly Wong

Motorola
Xiaohua Fan
Sivansankari Krishnanji

National Instruments
Aaron Van Slyke

Watermark Initiative
Jae Hoon Kwon

CURRENTS • Spring 2005

Nortel Networks
Arzu Karear

Regent’s Graduate Fellowship
Brion Ryan

Rocketchips Fellowship
Farmanz Bahmani
Mingding Chen
Burak Kelleci

Telecommunications Fellowship
Ryung Kim
Christopher Rodenbeck

Texas Instruments
Kit Fai Chan
Jianlong Chen
Sivakumar Ganesan
Cui Su
Tamer Sumesaglam
Radhika Venkatasubramanian
Guang Zhang

TI Professorship
Lin Chen
Xuemei Liu

Willard P. Worley
Evan Gardner
Jennifer Guillickson
Antonio Tellez
Jeremy Todd
Townsend

Watermark Initiative
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Antonio Tellez
Jeremy Todd
Townsend

Watermark Initiative
Jae Hoon Kwon
Electrical engineering student earns first place in prestigious paper contest

Recently a graduate student in the Department of Electrical Engineering at Texas A&M University won first place in a student paper contest coordinated by The IEEE Engineering in Medicine and Biology Society (EMBS) with support from the Whitaker Foundation.

Mary Preston McDougall, graduate student in the area of Biomedical Imaging and Genomics Signal Processing, was selected as the winner out of more than 475 entries from around the world. Submissions were evaluated on merit, structure, clarity of composition and originality. Fifteen people were selected as finalists out of the 479 entries. These finalists then traveled to the EMBS conference where they presented their papers as either a platform or poster presentation. The top three won prizes and McDougall placed first.

McDougall graduated magna cum laude from Texas A&M University in May 1997 with her Bachelor of Science in Electrical Engineering. She received a National Science Foundation Graduate Research Fellowship and continued to Johns Hopkins University for graduate work where she graduated in May 1999 with her Master of Science in Engineering in Electrical and Computer Engineering. She returned to Texas A&M University for her doctoral studies.

At present, she is concluding her doctoral research at Texas A&M. She currently resides with her husband and five children in College Station, Texas and expects to continue her work in academia, with research interests focused on magnetic resonance imaging technology and applications.

With more than one-fourth of its approximately 8,000 members residing outside of the United States, the IEEE EMBS is the largest international society of Biomedical Engineers in terms of the number of individual members. EMBS has been serving the needs of Biomedical Engineers throughout the world since the early 1950s and through its leadership is striving to develop new ways to serve its members with workshops, publications, and distinguished lecture series.

The field of interest of the Society is the application of the concepts and methods of the physical and engineering sciences in biology and medicine. This covers a very broad spectrum ranging from formalized mathematical theory through experimental science and technological development to practical clinical applications. It includes support of scientific, technological and educational activities.

Gift and Endowment Information

Gifts and endowments help in attracting and educating top quality students, rewarding and retaining top quality faculty and promoting the growth of the department. We would be delighted to discuss further with you how to make a gift or establish an endowment in your own name or the name of a loved one. Endowments may also take the form of naming a laboratory or the department. Gifts of any size may also be made to the Electrical Engineering Development Fund to help the growth of the department.

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