TEXAS TECH UNIVERSITY
Department *of* Electrical & Computer Engineering™

Fall 2013 Texas Tech University - Edward E. Whitacre Jr. College of Engineering

Message from the Chair

Dear Friends, Colleagues & Alumni:


Giesselmann

I am pleased to share with you some exciting news from the Department of Electrical and Computer Engineering (ECE) at Texas Tech.

The department is currently home to about 500 undergraduate students — growing each year — and 155 graduate students, representing the college's highest number of graduate students.

In the department, graduate students pursuing the master of science degree can choose a thesis or a non-thesis option requiring 24 or 36 hours of class work, respectively. A 150-hour program serves as a feeder for undergraduates into our graduate program as well. Under this program, seniors can take up to nine hours of graduate credit before graduating with a bachelor's degree in electrical or computer engineering and graduate with a master of science with about 150 hours using the thesis option.

We currently have 23 full time faculty, nine emeritus faculty, four full time instructors and five full time staff members. Joining the ECE faculty in September 2013 is Dr. Miao He, who received a Ph.D. from Arizona State University in the field of power systems. Dr. He is formally trained in power systems and information technology, which is an excellent combination for studying emerging smart grid applications associated with the continuing integration of renewable generation with large variability. Despite a slow economy and the effects of sequestration on federal funding, the faculty were able to substantially increase research funding in fiscal year 2013, as compared to fiscal year 2012. Faculty members in the department received 46 grants totaling $5.9 million in fiscal year 2013.

For current updates on the department and our students, please visit our Web site at www.ece.ttu.edu often, and of course, you are always welcome to visit in person.

Dr. Michael Giesselmann, P.E.
Professor & Department Chair

Recently a 1MW / 1MW-hr battery system was installed at the Reese Technology Center to be able to better manage the variability of wind power generation from the wind turbines installed at the Reese Technology Center. The battery system was manufactured by Xtreme Power in Kyle (Austin area), Texas and was installed as part of a research grant to the department.

Kristiansen and Krompholz Retire, Leave Lasting Legacy

At the end of May 2013 Drs. Magne Kristiansen and Hermann Krompholz retired from the department.


Kristiansen

Kristiansen founded the Pulsed Power Laboratory when he arrived at Texas Tech and built it into one of the finest pulsed power centers in the world during 47 years of distinguished service to Texas Tech University.


Krompholz

Krompholz was a lead scientist at the pulsed power center for more than 25 years.

Current and former faculty members, staff, and colleagues from around the country and the world attended receptions in Lubbock, as well as at the 2013 Pulsed Power Conference in San Francisco in June 2013, to recognize these men for their service to Texas Tech and pulsed power research and education.

ECE Students Win MEMS Design Competition

Semaphore Man

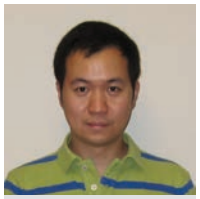
Texas Tech electrical and computer engineering students won the "Educational Design" Category at the 2013 Sandia National Laboratories MEMS University Alliance Design Competition. Led by lead designer Bryan Kahler, team members Courtney Pinnell, Steve Mani, and Philip Henry designed the Semaphore Man, an interactive educational tool that teaches STEM concepts. The group was advised by Dr. Tim Dallas, associate professor of electrical and computer engineering.

Semaphore Man is a micro-scale base 25, 1 bit discrete time-variant analog signaling device developed using the SUMMiT V fabrication process. The device can be used to teach number systems, variable bit rates, and the transmission of unique signals via multiple signaling schemas. The Semaphore Man is 687 μm tall and has a wingspan of 903 μm. The entire device is only 1.7 mm wide and 1.8 mm tall.

Texas Tech students have won the contest in seven of the last nine years. Nine other schools participated in the Educational Design Category of the competition this year.

Student News

Electrical Engineering Graduate Student News


Gu

Changzhan Gu, a doctoral student, has been granted the 2012 Chinese Government Award for Outstanding Self-Financed Students Abroad. He received $6,000 plus travel support to receive the award in 2013. Gu has also been named a recipient of the Horn Professors Graduate Achievement Award. This award recognizes and rewards outstanding research or creative activity performed by graduate students while at Texas Tech.

Gu also received the IEEE Microwave Theory and Techniques Society (MTT-S) Graduate Fellowship for 2013, which is awarded worldwide to graduate students who show promise and have significant contributions in the applications of microwave engineering. In addition, he won the Best Student Paper Award at the 2013 IEEE BioWireleSS.


Beeson

Sterling Beeson, a doctoral student, has received the 2013 IEEE NPSS Graduate Scholarship Award. This award is presented annually to up to four graduate students worldwide that show outstanding contributions to the field of nuclear and plasma sciences. The award includes a $1,500 monetary award along with a one-year membership to the IEEE NPSS.


Stephens

Jacob Stephens, a doctoral student, is the recipient of the 2013 IEEE Arthur H. Guenther Pulsed Power Student Award. He received a monetary prize of $1,000.


Laity

George Laity, a doctoral student, was awarded the Tom R. Burkes Award at the 2012 IEEE International Power Modulator and High Voltage Conference in San Diego, Calif.


Estermann

Nadine Estermann, a master of science in electrical engineering student, has been recognized as the top female student at her undergraduate institution, the University of Applied Science of Landshut (Hochschule Landshut) in Germany.

Estermann received the Mathematics, Informatics, Natural Sciences and Engineering (MINT) Award, which is given to the best female bachelor's degree-level graduate in a technical degree program at the university. She was recognized for her thesis and received € 750.

Undergraduate Student News


Clark

Alexander W. Clark, a senior electrical engineering major, won first place in the Best Technical Award category at the 2013 Hewlett-Packard (HP) intern Project Fair for his poster and presentation. The competition featured 50 intern presentations that were selected for judging.


Teo Hall, Thomas Bernens, Taylor Denison, and Dr. Richard Gale

Teo Hall and Thomas Bernens, senior ECE majors, and Taylor Denison, a junior CS major, competed in the IEEE International Xtreme Programming Competition and won first place in Region 5 and sixth place in the U.S. Professor Dr. Richard Gale, advised and proctored the team.


Llano Estacado RoboRaiders

The FIRST Robotics Team 1817, the Llano Estacado RoboRaiders, which consists of high school students from several Lubbock-area high schools and is mentored by Texas Tech undergraduate students, competed at the First Robotics Competition Dallas Regional competition in March 2013. The team received the Underwriters' Laboratories Industrial Safety Award for instilling and maintaining a culture of safety throughout the organization and competition.


Liles

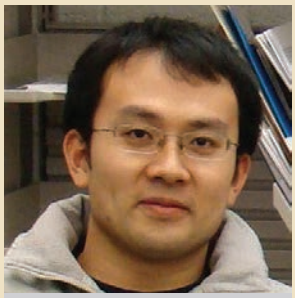
Jeff Liles, a senior, won second place at the IEEE Region 5 Student Paper Competition held in Denver, Colo. in April.


Juan Rodriguez, TJ Rosson, Courtney Pinnell, and Teo Hall

Texas Tech students took second place and won a $7,000 scholarship in the second annual Power Across Texas Energy Innovation Challenge, developing a comprehensive plan to bring electric power to the colonias of south Texas. The team included Courtney Pinnell, Juan Rodriguez, Teo Hall, and TJ Rosson. Mentoring was provided by Dr. Stephen Bayne, associate professor of electrical and computer engineering, Dr. Richard Gale, professor of electrical and computer engineering, Dr. Tim Dallas, professor of electrical and computer engineering, Dr. Mukaddes Darwish, associate professor of construction engineering and engineering technology, lecturer Marina Martinez, and graduate student Neha Marathe.

Faculty News

Li Receives $400,000 NSF CAREER Award for Work on Smart Radar Sensors


Li

Dr. Changzhi Li, assistant professor of electrical and computer engineering, has received a $400,000 CAREER Award from the National Science Foundation.

Recently, scientists and healthcare providers have developed new advances in tracking a patient's physiological motions such as respiration and heartbeat by using small portable Doppler radars. These advances, specifically devices that employ microwave Doppler radar phase modulation, can be monitored remotely by healthcare providers without anything attached to a patient.

This technology is ideal for health monitoring over extended periods of time because it does not confine or inhibit a patient and it does not cause discomfort or skin irritation as other devices, like electrodes and straps. Additionally, it may achieve what other devices can not through fast and remote identification of vital signs in patients. In this way, the technology could be used in remote diagnosis, search and rescue of victims after a natural disaster, or even remote monitoring and surveillance. Recent integration of this technology with radiation oncology imaging processing by Li's research group has offered a very promising solution in tracking mobile tumors in lung cancer patient during radiotherapy.

This technology has the potential to replace cheststrap or fingertip monitors, but random body motion could cause problems for accurate readings. Li's group aims to resolve the problem of motion detection by using a 'smart' portable biomedical radar sensor that combines radar and camera solutions. In this way, the system could 'ignore' random motions that are observed by the camera. If successful, this research can be directly used for the monitoring and treatment of conditions like sleep apnea or even incidents like sudden infant death syndrome. This project will benefit from collaboration with National Instruments on both research and education.

Sari-Sarraf Receives Fulbright U.S. Scholar Grant


Sari-Sarraf

Dr. Hamed Sari-Sarraf, a professor of electrical and computer engineering, is the recipient of a 2013-2014 Fulbright U.S. Scholar Grant. He will conduct research and teach on applied computer vision at Baku State University in Baku, Azerbaijan.

Lin Elected Fellow of the American Physical Society


Lin

Dr. Jingyu Lin, Linda F. Whitacre Chair in Electrical and Computer Engineering and professor of electrical and computer engineering, has been elected as fellow of the American Physical Society.

She was elected for for her seminal contributions to our fundamental understanding of the electronic and optical properties of the group III-nitride semiconductors and her significant impact on the use of these materials for nanophotonic devices.

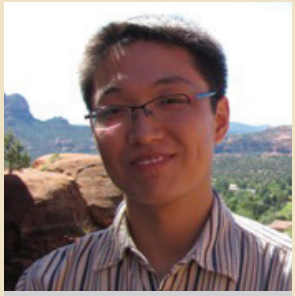
Jiang Named Paul Whitfield Horn Professor


Jiang

Dr. Hongxing Jiang, Edward E. Whitacre Jr. Chair in Electrical and Computer Engineering and professor of electrical and computer engineering, has been named a Paul Whitfield Horn Professor.

This is the highest honor given to faculty members at Texas Tech. Jiang is one of six Horn Professors in the Whitacre College of Engineering. There are currently only 36 Horn Professors listed at Texas Tech. Drs. Magne Kristiansen and Sunanda Mitra are also Horn Professors in the department.

He Hired as an Assistant Professor


He

Dr. Miao He has been hired in the department as an assistant professor, as of September 2013. His area of research expertise includes the analysis of power systems. With a mixed research background and training in power systems and information and communication technologies, he has worked to bring the smart grid community to a more comprehensive and deeper understanding of the multi-scale dynamics and multilateral interactions of cyber-physical power systems

He comes to Texas Tech from Arizona State University.

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Alumni News

Prabhakar Serving as Director of DARPA, the Defense Advanced Research Projects Agency


Prabhakar

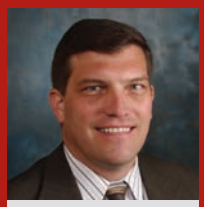
Dr. Arati Prabhakar, a 1979 Texas Tech graduate with a bachelor of science in electrical engineering, is serving as the director of the United States Defense Advanced Research Projects Agency.

Her first service to national security started in 1986 when she joined DARPA as a program manager. She initiated and managed programs in advanced semiconductor technology and flexible manufacturing, as well as demonstration projects to insert new semiconductor technologies into military systems. As the founding director of DARPA's Microelectronics Technology Office, she led a team of program managers whose efforts spanned these areas, as well as optoelectronics, infrared imaging and nanoelectronics.

In 1993, President William Clinton appointed Prabhakar director of the National Institute of Standards and Technology, where she led the 3,000-person organization in its work with companies across multiple industries. Prabhakar moved to Silicon Valley in 1997, first as chief technology officer and senior vice president at Raychem, and later vice president and then president of Interval Research. From 2001 to 2011, she was a partner with U.S. Venture Partners.

Prabhakar has served in recent years on the National Academies' Science Technology and Economic Policy Board, the College of Engineering Advisory Board at the University of California, Berkeley, and the red team of DARPA's Defense Sciences Research Council. In addition, she chaired the Efficiency and Renewables Advisory Committee for the U.S. Department of Energy. Dr. Prabhakar is a Fellow of the Institute of Electrical and Electronics Engineers, a Texas Tech Distinguished Engineer, and a Caltech Distinguished Alumna.

Moore and Thompson Named Distinguished Engineers


Moore

Moore graduated in 1982 with a bachelor of science in electrical engineering. He has worked for American Electric Power for more than 30 years, beginning as a substation engineer in Abilene, and working his way up to vice president in 2007. His leadership and drive led to the development of innovative engineering solutions, most notably standardized and prefabricated substations and modular control buildings. Moore is vice president of transmission engineering and project services for AEP Transmission, a part of American Electric Power. He directs the capital service function for AEP Transmission, the nation's largest electricity transmission system, comprising more than 39,000 miles of transmission line and 3,500 substations in 11 states.


Thompson

Thompson attended Texas Tech and received a bachelor of science in 1968, a master of science in 1970, and a doctorate in 1974, all in electrical engineering. He has worked in academia as a faculty member and most recently as an engineering administrator. His areas of technical specialization include high voltage, electro-optics, electrical breakdown phenomena, pulsed power systems and devices, lasers, fast electrical and optical diagnostics, high power switches and dielectric materials. As an administrator, he has initiated and grown college programs to increase engineering enrollment, student graduation rates, improving classroom success and learning. Thompson is the dean of the University of Missouri College of Engineering, and has served in that capacity since 1994. He was previously the dean of the College of Engineering at the University of New Mexico.

Keeping in Touch

The Texas Tech Department of Electrical and Computer Engineering would like to know what is happening in your professional life. Visit the following website to update your information or let us know about your accomplishments: **www.coe.ttu.edu/info**