

ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT

ANNUAL REPORT SUMMARY

2015-2016

UNDERGRADUATE EDUCATION

The Electrical & Computer Engineering (ECE) department offers undergraduate degrees in Electrical Engineering (EE), Computer Engineering (CompE, offered jointly with the Computer Science & Engineering Department), and Engineering Physics (EGPHY, offered jointly with the College of Liberal Arts and Sciences). Fall 2015 undergraduate enrollments were: 246 students in the EE program, 79 students in the CompE program, and 11 students in the EGPHY program. During the academic year 2015-2016, we awarded 54 B.S.E. degrees in EE, 4 in CompE, and one in EGPHY.

RESEARCH AND SCHOLARSHIP

The ECE faculty conducts funded research in fields including systems and energy, communications and signal/image processing, biomedical engineering, microelectronics, photonics and optoelectronics, electromagnetics, nanotechnology, VLSI, computer engineering, and security. Scholarly productivity stimulated by research is strong. The faculty publications included approximately 131 refereed journal articles, 159 full conference proceedings, and 58 short conference proceedings/presentations. ECE faculty members developed many new courses/innovations, were keynote speakers at 2 international conferences, and delivered 32 invited talks. The faculty worked on 118 sponsored grants with annual expenditures of \$6.9 million. During the year, the ECE faculty advised 125 graduate students; of these, 15 successfully completed their Ph.D. degrees and 36 students (including those in Clinical Engineering advised by John Enderle) garnered their M.S. degrees. Faquir Jain was awarded three patents, Bahram Javidi secured two, and Yang Cao received one.

FACULTY HONORS

ECE faculty members received several prestigious awards. Krishna Pattipati has been selected as a Board of Trustees Distinguished Professor. The Department has two other Board of Trustees Distinguished Professors: Yaakov Bar-Shalom and Bahram Javidi.

Marten van Dijk was selected as the Charles H. Knapp (endowed) Associate Professor in Electrical Engineering.

Ali Bazzi was appointed the UTC Professor of Engineering Innovation

Quing Zhu was selected to receive a 2015 Inspiring Women in STEM Award from the *INSIGHT Into Diversity* magazine. She also was recently elected a Fellow of the Optical Society of America (OSA).

Yaakov Bar-Shalom received the International Society of Information Fusion (ISIF) Award for a Lifetime of Excellence in Information Fusion. He also was recognized as an IEEE Aerospace and Electronic Systems Society (AESS) Distinguished Lecturer for 2015-2016.

Bahram Javidi has been awarded the prestigious Quantum Electronics and Optics Prize for Applied Aspects (2015) by the European Physical Society. He also received The 2015 OSA Outstanding Reviewer Recognition selected by the Editors-in-Chief of all the Optical Society (OSA) core publications and journals.

Our endowed chairs include Yaakov Bar-Shalom, who is the Marianne E. Klewin Endowed Professor in Engineering, Peter Luh, who is the SNET Professor of Communications & Information Technologies and Krishna Pattipati, who is the United Technologies Corporation Chair in Systems Engineering. Lei Wang is the Castleman Term Associate Professor in Engineering Innovation.

ECE faculty members are also leaders in many professional societies/organizations. Anthony DeMaria, Eric Donkor, Faquir Jain, Bahram Javidi and Quing Zhu are SPIE Fellows; Yaakov Bar-Shalom, Anthony DeMaria, John Enderle, Bahram Javidi, Peter Luh, Krishna Pattipati, Geoffrey Taylor and Peter Willett are IEEE Fellows; John Enderle and Bahram Javidi are American Institute for Medical and Biological Engineering Fellows; Anthony DeMaria and Bahram Javidi are Optical Society of America Fellows; John Enderle is an American Society of Engineering Education Fellow; Rajeev Bansal is a Fellow of the Electromagnetics Academy; and Dr. Anthony DeMaria is a Fellow of the American Physical Society as well as a member of the prestigious National Academy of Engineers. Mehdi Anwar, Rajeev Bansal, Yaakov Bar-Shalom, Anthony DeMaria (who is a co-founding member), Eric Donkor, John Enderle, Monty Escabi, Faquir Jain, Bahram Javidi, Peter Luh, Krishna Pattipati, Geoffrey Taylor, Shengli Zhou and Quing are all members of the Connecticut Academy of Science and Engineering (CASE). During 2015-2016, ECE faculty members held several conference chair posts and numerous positions on the editorial boards of journals.

INDUSTRIAL CONNECTIONS

The Department has an engaged Industrial Advisory Board (IAB), providing vital input on our curricula, research, and future plans. Industrial feedback is essential in maintaining high-quality, relevant programs and is a major link in the ABET accreditation process. Additionally, the affiliated companies participate in collaborative research, sponsor senior design projects, provide internship opportunities for our students, and often hire them permanently. The companies represented on the IAB this year are Aptima, ARRIS Access and Transport, Cigna, Coherent, Comcast, GE Consumer & Industrial Technology, Hamilton Sundstrand, ISO New England, Lumentum, Naval Undersea Warfare Center, Eversource Energy, Phonon Corporation, Pratt & Whitney, SAVANT, Sikorsky Aircraft Corporation, and Silicon DFX. The Department is also active in collaborative research and development projects with many other companies.

The second CyberSEED Cybersecurity, Education & Diversity Challenge, an event that combined expert speakers and three cybersecurity competitions was held October 29th and 30th. It was organized by the Center of Excellence for Security Innovation (CSI), a partnership between Comcast and the Center for Hardware Assurance, Security, and Engineering (CHASE).

Krishna Pattipati and Shalabh Gupta led the organization of a two-day international conference on complex systems engineering (ICCSE 2015) on November 9-10, 2015. It was part of an initiative by the UTC Institute for Advanced Systems Engineering (UTC-IASE).

GRADUATE STUDENT AWARDS

Paul Wortman was awarded one of four scholarships given to members of the Student Association of Graduate Engineers (SAGE). Harish Ravichandar received the Best Student Paper award in the Robotic track at the 2015 ASME Dynamics, Systems and Controls Conference. Weiqiang Chen received the Fall 2015 ECE Teaching Assistant Award. Zhiyang Jia and Abdiel Rivera received the award for Spring 2016.

STUDENT ACTIVITIES

The UConn student honor society Eta Kappa Nu (HKN), advised by Prof. Monty Escabi, has continued to be very active and increased its membership significantly. They have expanded the content of their channel, YouTube, which has 26 tutoring videos with over 20,000 total views. They also improved the ECE Curriculum flow chart that is provided with the plan of study and started HKN course evaluations for ECE classes. These provided some insightful feedback for professors. The Institute of Electrical and Electronics Engineers (IEEE) student chapter had a busy year starting off with a series of workshops to teach new engineers several valuable skills. They have also expanded their member base and outreach. A new officer position was created to reach out to alumni and companies and coordinate events. The chapter is advised by Prof. Ali Gokirmak. The SPIE UConn chapter sponsored several seminars throughout the academic year. They were co-sponsored with the Optical Society of America (OSA). Speakers hosted were from Zygo Corporation, University of La Laguna, and Nanyang Technological University. The chapter is co-advised by Profs. Faquir Jain and Quing Zhu.

ECE PERSONNEL CHANGES

John Enderle retired at the end of 2015 after twenty years of service. Quing Zhu will be joining Washington University in the Fall. Jonathan Rarey joined the ECE department staff to provide IT and technical support. Ebad Jahangir joined the department as a Visiting Professor and Director of Operations for the UTC-Institute for Advance Systems Engineering (UTC-IASE).

IN MEMORIAM

Robert S. Lynch Jr., adjunct faculty of electrical and computer engineering, died August 14, 2015, after a long illness. He was 55. Dr. Lynch received his Ph.D. from UConn in 1999. He began his career with IBM Corp and then joined the Naval Undersea Warfare Center (NUWC). Dr. Lynch published over fifty papers and was an internationally recognized expert in data fusion. He held five U.S. patents. He had been teaching undergraduate and graduate courses at Uconn since 2005.