Alumnus Poor honored with IEEE, Princeton awards

Alumnus H. Vincent Poor, the George Van Ness Lothrop Professor in Engineering at Princeton, continues to add awards and accolades to his already impressive body of career achievements by winning major Institute of Electrical and Electronics Engineers (IEEE) education awards in 2004 and 2005, and being named founding director of the Center for Innovation in Engineering Education (CIEE) at Princeton.

Poor is the recipient of the 2005 IEEE James H. Mulligan Jr. Education Medal. This prestigious honor, which recognizes a career of outstanding contributions to education, was given for his leadership in electrical engineering education through teaching, innovative curricular development, research, and the publication of a textbook which has been described as classic.

As founding director of CIEE, Poor is responsible for developing the center into a worldwide model for excellence in engineering education. His duties also include fund-raising efforts related to educational initiatives, recruiting top candidates for the center’s faculty, and establishing collaborations with other institutions. The CIEE is part of Princeton’s School of Engineering and Applied Science.

In 2004, Poor was the recipient of the IEEE Educational Activities Board (EAB) Major Educational Innovation Award for innovation and leadership in the teaching of technical, social, political and economic aspects of technology as integral subject matter to students from diverse academic backgrounds. The IEEE EAB established this award to recognize individuals who have distinguished themselves for outstanding educational innovation in a field of interest of the IEEE.

In July 2004 he became editor in chief of the IEEE Transactions on Information Theory, the leading scholarly publication in his field.

A native of Columbus, Ga., Poor holds four degrees in electrical engineering — a bachelor’s degree (1972) and master’s degree (1974) from Auburn, and a master’s degree (1976) and doctorate (1977) from Princeton.

He was a member of the electrical engineering faculty at the University of Illinois at Urbana-Champaign from 1977 through 1990, when he joined the Princeton faculty.
IEEE names ECE faculty as fellows

Three members of the electrical and computer engineering faculty have been named fellows of the IEEE. Charles (Chuck) Stroud, Yonhua (Tommy) Tzeng, and Mark Halpin, Alabama Power Distinguished Professor, were among 268 IEEE senior members named as fellows effective January 1. The IEEE has more than 365,000 members in approximately 150 countries.

According to its Web site, the IEEE grade of fellow “is conferred by the board of directors upon a person with an extraordinary record of accomplishment in any of the IEEE fields of interest. The total number selected in any one year does not exceed one-tenth of one percent of the total voting membership.”

Stroud, who came to AU from the University of North Carolina at Charlotte in 2003, was recognized for contributions to Built-In Self-Test (BIST) of integrated circuits. His professional involvement includes associate editor for BIST for the Journal of Electronic Testing: Theory and Applications, vice program chair of the IEEE North Atlantic Test Workshop, and member of the technical advisory board of DAFCA, Inc., an electronic design automation software company.

A researcher with more than a dozen patents to his credit, Stroud has garnered numerous awards for excellence in instruction. He teaches undergraduate classes in digital logic and digital system design and graduate classes in computer-aided designs of digital circuits, among other topics.

Tzeng, a 22-year veteran of Auburn’s Department of Electrical and Computer Engineering, was named IEEE fellow for contributions to diamond manufacturing processes.

Among his institutional and professional services are IES representative for the IEEE Nanotechnology Council, founder and organizer of the NanoCarbon Conference, and founder and organizer of the Applied Diamond Conference. His awards include the National Science Foundation Japan Fellowship in 1991 and an alumni professorship in 1989.

Tzeng teaches undergraduate classes in electronics and elective and graduate classes in plasma and nanotechnology. As a result of his research in applied diamond technology and related areas, he holds or co-holds at least eight patents.

Halpin, recognized as an IEEE fellow for contributions to remote power quality measurements and standards, joined the ECE faculty in 2002 and in 2003 was named the Alabama Power Company Distinguished Professor.

Among his professional services are vice president of the IEEE Industry Applications Society, vice chairman of the IEEE-PES Power Quality Subcommittee, vice chairman to the IEEE Standards Association SCC-22 (Power Quality), and chairman of the IEEE-IAS Power Systems Engineering Committee. His awards include the IEEE Millenium Medal and the IEEE Industry Applications Society Outstanding Young Member in 1997.

Halpin’s research interest is electric power systems. He teaches undergraduate, elective, graduate and outreach courses in power.
Johnson named editor of industry publication

R. Wayne Johnson, Samuel Ginn Distinguished Professor of Electrical and Computer Engineering and director of Auburn’s Information Technology Peak of Excellence, has been named editor in chief of *IEEE Transactions on Electronics Packaging Manufacturing* (TEPM).

TEPM is a refereed publication of the Components, Packaging and Manufacturing Society of IEEE. Articles in TEPM cover a range of topics related to the materials and processes used to manufacture electronic products.

A member of IEEE since 1977, Johnson was elected fellow of IEEE in 2004 “for contributions to electronics that must operate in harsh environments.” IEEE has a worldwide membership of more than 350,000.

Kirkici elected to IEEE technical activities post

Hulya Kirkici, associate professor of electrical and computer engineering, has been elected vice president of technical activities of the IEEE Dielectrics and Electrical Insulation Society. The IEEE-DEI Society activities involve the study and application of dielectric phenomena and behavior and the development, characterization and application of all gaseous, liquid and solid electrical insulation materials and systems utilized in electrical and electronic equipment. The society sponsors technical conferences and workshops in these areas.

Kirkici’s activities at Auburn include faculty advisor to the Society of Women Engineers (SWE), whose AU chapter was established in 1978 and has approximately 100 student members and more than 100 non-members. The chapter sponsored the 2005 Region-D Conference at the Auburn University Hotel and Dixon Conference Center in March. The two-day conference, addressing technical and student related activities, was predominantly organized and managed by students.

Kirkici teaches and conducts research in pulsed power engineering, power conditioning in space environment, vacuum breakdown, hollow cathode discharge applications, plasma physics, optical diagnostics, and lasers fields.

She is also active in the American Physical Society, Sigma Xi Scientific honor society, Eta Kappa Nu electrical engineering honor society, the American Association of University Women, and the Society of Women Engineers.

Students, faculty develop technologies in BIST lab

The basic idea of Built-In Self-Test (BIST) is to design circuits to test themselves. This technique was first proposed 25 years ago and has become one of the most important testing techniques for integrated circuits and systems.

The faculty and students of the Auburn University Built-In Self-Test (AUBIST) Laboratory have been doing groundbreaking work in BIST for relatively new but difficult-to-test technologies — Field Programmable Gate Arrays (FPGAs) and System-on-Chip (SoC) devices. FPGAs are prefabricated integrated circuits that can be reprogrammed in the system to perform any digital logic function. SoCs typically contain FPGA cores along with embedded memory and microprocessor cores.
In BIST for FPGAs, the device is reprogrammed to test itself such that no extra or dedicated circuitry is needed for testing. The results of the BIST are then used not only to determine whether these devices are faulty, but also to identify the faulty components within the device. The intended system function can then be reprogrammed to avoid the faulty components within the device to facilitate fault and defect tolerant applications.

In the past year, researchers in the AUBIST lab have moved the BIST reconfiguration and diagnostic functions into the embedded processor in SoCs such that all test and diagnosis is performed on-chip. This technique is not only self contained on the SoC for on-demand in-system test and diagnosis, but provides a 30-fold acceleration in testing over the previous approach to BIST for FPGAs.

Graduate and undergraduate students in the AUBIST have also designed and constructed a printed circuit board (see photo) for developing and demonstrating their BIST and BIST-based diagnostic approaches for FPGAs and SoCs. The printed circuit boards contain two different SoCs, each consisting of an embedded processor with program and data memories along with different size FPGA cores. This research is sponsored by a contract from the National Security Agency and a grant from the U.S. Army Space and Missile Defense Command.

The research effort is directed by Chuck Stroud, who joined the ECE faculty in 2003. A graduate of the University of Kentucky (BSEE 1976, MSEE 1977) and the University of Illinois at Chicago (PhD EE and CS 1991), Stroud spent 15 years in industry as a distinguished member of the technical staff at Bell Labs, where in 1981 he became one of the first people to work in the area of BIST.

Stroud developed the first BIST for RAMs, the first completely self-testing integrated circuit, the first BIST for mixed-signal systems, and the first BIST for FPGAs. He holds 13 U.S. patents in the area of BIST and is author of a recent book entitled “A Designer’s Guide to Built-In Self-Test.” He was named fellow of IEEE in 2005 “for contributions to built-in self-test of integrated circuits.”

**Palmer rewarded for spirit of excellence**

Each month, Auburn University presents Spirit of Excellence Awards to four employees recognized for exceptional performance. Mike Palmer, engineering associate and manager of the Laboratory for Electronic Assembly and Packaging in the Center for Advanced Vehicle Electronics, received the award in January.

**Papers presented at international conferences**

In addition to the numerous papers authored and presented by faculty, some members of the ECE staff are also very active in research resulting in published works. Robert Dean, a doctoral candidate and research associate with the Center for Advanced Vehicle Electronics, had two papers presented in March. The papers resulted from research sponsored by NSF through Morgan Research Corporation in Huntsville.

“Active Micromachined Vibration Isolation Filters using Electrostatic Actuation to Enhance Packaging for Mechanically Harsh Environments” by Robert Dean; George Flowers, Ken MacAllister and Roland Horvath (mechanical engineering); Wayne Johnson, A. Scotteward Hodel and Nicole...