Department of Electrical Engineering and Computer Science

This past year was a productive one in the Department of Electrical Engineering and Computer Science (EECS). Our strategic plan continues to be twofold: continuing to hire and retain the best faculty possible—including hiring faculty jointly with other units at MIT, an ongoing process—and looking for innovative ways to use technology. This year, two faculty were hired jointly by EECS and Health Sciences and Technology: Dr. Elfar Adalsteinsson and Dr. Collin Stultz.

EECS staff continue to achieve and maintain high standards. At this year's School of Engineering's Infinite Mile Awards ceremony, several of our colleagues were recognized for continued excellence and service to the department: Wanda Cook, Susan Kaufman, Lourenço Pires, and Cynthia Skier. In addition, the Richard J. Caloggero Award was presented to Elizabeth Cooper, EECS administrative officer, at the annual Spring Awards event.

After much anticipation, we finally saw the opening of the long-awaited Stata Center. The underground garage opened in June 2003 and students and faculty began moving in during March 2004. The official dedication and related community-wide celebratory events took place May 7 and 8, 2004, preceded by a Media Day on May 6.

The celebration began with numerous speeches and comments by dignitaries, including President Charles M. Vest, Ray Stata '57, Architect Frank Gehry, Provost Robert Brown, Alex Dreyfoos '54, for whom one tower of the center is named, Somerville mayor Michael Sullivan, and distinguished EECS faculty. Bill Gates, for whom another tower of the center is named, participated via videotape. Interest was so high that there wasn't enough room in the Kirsch Auditorium to accommodate everyone. As a result, the remarks were broadcast by MIT cable and shown in all four classrooms on the Student Street; video monitors near much of the fixed seating along the Student Street and Café also showed the program.

Following the remarks was a gala day, beginning with a reception along Student Street, lab tours, demos, and open houses within the facility. Over 800 guests were in attendance. The festivities continued the next day with more community-wide celebrations and a symposium on architecture, including Frank Gehry as guest speaker.

This summer marked the third year of the Women's Technology Program (WTP). Over 750 applications were received from high school juniors from 46 states and 18 countries to fill only 40 spots. For four weeks, these young women explored topics in electrical engineering and computer science, focusing on engaging hands-on experiments and projects interspersed with lectures in EE, CS, and math. They also took advantage of the opportunity to explore the MIT community and the surrounding areas in their free time. With the help of dedicated instructors from the MIT community, these young women worked hard and advanced their knowledge of complex college-level subject matter. In 2004, for the first time, WTP alumnae from 2002 who are now MIT students worked as

residential assistants. They lived in the dorm with this summer's WTP students, and focused on evening and weekend activities and fun projects.

Graduate Program

In September 2003, there were 925 graduate students enrolled in the department. About 31 percent of the total were foreign nationals. The department supported 582 research assistants and 124 teaching assistants. In addition, there were 140 fellowships including 31 National Science Foundation fellows and 24 Department of Defense fellows. The remaining students had industrial or foreign support or were using their own funds.

During 2003, the department awarded 81 master of science degrees and 64 doctoral degrees.

The department received 2,798 applications for AY2004, a slight decrease from 2002. The applications continue to be generally excellent, and 226 were admitted for 2003—February, June, and September—of whom 132 registered in September.

The following awards were made to graduate students for excellence:

- The Carlton E. Tucker Teaching Award was won by Matthew Notowidigdo.

- The Harold L. Hazen Teaching Award was won by Petro Boufounos.

- The Frederick C. Hennie III Teaching Award was shared by Nathan Srebro and Edwin Olson.

- The George M. Sprowls Scholarship Fund was shared by Dina Katabi and Manolis Kamvysselis, with honorable mention to Alex C. Snoeren.

- The Morris Joseph Levin Award for best masterworks oral thesis presentation was shared by Jung-Won Kim, Ali Shoeb, Watcharapan Suwansantisuk, Ashish Khisti, Vijay Divi, Frank O'Sullivan, Glenn Tournier, and Jim Warren.

- The Charles and Jennifer Johnson Thesis Prize was shared by Paul Youn and Ali Shoeb.

- The William A. Martin Memorial Thesis Prize was won by Andrew Hogue.

- The David Adler Memorial Thesis Prize was won by Jonathan Sheffi, with 2nd prize to Chen-Wen Huang and third prize to Jennifer Yu.

- The Ernst A. Guillemin Thesis Award was won by Ethan Crain, with 2nd prize to Adam Granich-Unikowsky and 3rd prize to Sourav Raj Dey.

- The Northern Telecom/BNR Project Award spring term 2004 was shared by Adam Champy and Kevin Emery.

- The Department Special Award was shared by Nathan Ickes and Rodrigo Rodrigues.

Undergraduate Program

Enrollment of undergraduates averaged 865 in AY2004, close to that of AY2003, with 17% in the Electrical Engineering Program (6-1), 30% in the Computer Science Program (6-3), and 53% in the Electrical Engineering and Computer Science Program (6-2). From the Class of 2006, 229 students were enrolled in Course VI. About 195 students from the Class of 2007 have so far selected Course VI, with 20% choosing 6-1, 60% choosing 6-2, and 20% choosing 6-3.

The Master of Engineering (MEng) program entered its ninth year with 217 students.

The following prizes and awards were won by our students:

- The George C. Newton UG Lab Prize was won by Eric Syu.

- The Northern Telecom/BNR Project Award spring term 2004 was won by Sameera Ponda.

- The Northern Telecom/BNR Project Award fall term 2003 was shared by Philip Guo and Ji Zhang.

- The David A. Chanen Writing Award was won by Waseem Bakr.

- The Robert A. Fano UROP Award was won by Robert Speer.

- The Anna Pogosyants UROP Award was presented to Adam Smith.

6-A Internship Program

The department's 6-A Internship Program is in its 87th year. Last year, substantial changes in the 6-A requirements were made to maximize flexibility for students by allowing easy entrance and exit at any time. In addition, there was a new fall 6-A recruitment for seniors who wanted an industry-based master of engineering thesis. This year, 70 students applied to the 6-A Program during the annual orientation and selection process, and 21 were selected as members of the incoming 6-A class. Currently there are 28 undergraduates and 18 MEng students in the program. In comparison, 129 students applied and 27 were selected in 2003, while 144 students applied and 26 were selected in 2002 and 108 students applied and 42 were selected in 2001. Since the last report, approximately 12 students have withdrawn from the 6-A Internship Program, as they felt their needs were better matched with the opportunities available on campus. However, most 6-A students continue to find the program professionally rewarding and a source of satisfaction. Participating companies continue to offer challenging and well-supervised assignments.

Silicon Laboratories of Austin, Texas, has joined the 6-A Program. Silicon Laboratories has one student on his first assignment. Many companies did not participate in the annual orientation and selection process. However, these companies are continuing with the students already in the program and many of them have indicated an interest in resuming their active participation in the future. There have been numerous inquires from companies interested in the 6-A Program.

Nicholas R. Nestle '04 (Draper Laboratory) received the Howard W. Johnson Award for the male senior athlete of the year. First prize in the Boit Manuscript Prize for friction was awarded to Arthur Musah '04 (Texas Instruments). Arthur also won 2nd prize in the Boit Manuscript Prize for poetry.

At the annual Department Social and Awards Ceremony, the following 6-A students were honored: Philip Guo '05 (Teradyne) was a team member receiving the Northern Telecom/BNR Project Award for the fall term 2003 for the best 6.111 laboratory project, "Infrared Instant Messenger." Adam Granich-Unikowski '04 (IBM, Burlington, VT) placed second for the Ernest A. Guillemin Award for the best electrical engineering master's thesis. Team member Eric Syu '05 (Qualcomm) was awarded the George C. Newton Undergraduate Laboratory Prize for the best undergraduate laboratory project, "Virtual Golf."

Faculty Notes

The following fourteen new faculty joined the department this year:

- Dr. Elfar Adalsteinsson, assistant professor electrical engineering and computer science and health sciences and technology and a member of the Research Lab of Electronics, who received his PhD from Stanford University

- Dr. Collin Stultz, assistant professor electrical engineering and computer science and health sciences and technology and a member of the Research Lab of Electronics, who received his PhD from Harvard University

- Regina Barzilay, assistant professor of electrical engineering and computer science and a member of the Computer Science and Artificial Intelligence Laboratory, who received her PhD from Columbia University

- Karl Berggren, assistant professor of electrical engineering and computer science, a member of the Research Lab of Electronics and associate director of the Nanostructures Laboratory, who received his PhD from Harvard University

- Joel Dawson, assistant professor of electrical engineering and computer science and a member of the Microsystems Technology Laboratories, who received his PhD from Stanford University

- Polina Golland, assistant professor of electrical engineering and computer science and a member of the Computer Science and Artificial Intelligence Laboratory, who received her PhD from MIT

- Vivek Goyal, assistant professor of electrical engineering and a member of the Research Laboratory of Electronics, who received his PhD from University of California–Berkeley

- Manolis Kellis, assistant professor of electrical engineering and computer science and a member of the Computer Science and Artificial Intelligence Laboratory, who received his PhD from MIT

- Jing Kong, assistant professor of electrical engineering and computer science and a member of the Research Lab of Electronics, who received her PhD from Stanford University

- Sam Madden, assistant professor of electrical engineering and computer science and a member of the Computer Science and Artificial Intelligence Laboratory, who received his PhD from University of California–Berkeley

- Pablo Parrilo, assistant professor of electrical engineering and computer science, who received his PhD from the California Institute of Technology

- Ronitt Rubinfeld, professor of electrical engineering and computer science and a member of the Computer Science and Artificial Intelligence Laboratory, who received her PhD from University of California–Berkeley

- Daniela Rus, associate professor of electrical engineering and computer science, who received her PhD from Cornell University

- Vladimir Stojanovic, assistant professor of electrical engineering and computer science and a member of the Research Lab for Electronics, who received his PhD from Stanford University

There were ten promotions within the faculty. Vladimir Bulovi, David Perreault, and Piotr Indyk were promoted to associate professor without tenure; Judy Hoyt and David Karger were promoted to full professor, and Saman Amarasinghe, William Freeman, Tommi Jaakkola, Daniela Rus, and Ronitt Rubinfeld were awarded tenure.

The department hosted the following four visiting faculty this year: professors Michael J. Kelly, Harry Lewis, Demetri Psaltis, and Daniela Rus.

Professors Kong, Lozano-Pérez, Mitter, Sudan, del Alamo, Jackson, Teller, Rubinfeld, Amarasinghe, W.T. Freeman, Sarpeshkar, Han, and Indyk were on leave or sabbatical for all of part of the year.

James Bruce retired from the faculty.

Faculty Awards and Honors

EECS faculty continue to receive numerous awards for excellence. This year's awards follow:

Mildred Dresselhaus was awarded the IEEE Founders Medal for "leadership across many fields of science and engineering through research and education, and for exceptional and unique contributions to the profession."

Barbara Liskov was the recipient of the IEEE John von Neumann Medal for "fundamental contributions to programming languages, programming methodology, and distributed systems."

The following members of the EECS faculty were named as 2004 IEEE fellows:

- Anantha Chandrakasan was cited for "contributions to the design of energy efficient integrated circuits and systems."

- Eric Grimson was cited for "contributions to surface reconstruction, object-recognition, image database indexing and medical applications."

- Martin Schmidt was cited for "contributions to design and fabrication of microelectromechanical systems."

- Greg Wornell was cited for "contributions to efficient signal processing algorithms for wireless communications."

Ken Stevens was the corecipient (with Gunnar Fant of KTH in Stockholm) of the 2004 IEEE James L. Flanagan Speech and Audio Processing Award. Ken was cited for "fundamental contributions to the theory and practice of acoustic phonetics and speech perception."

Alan Willsky received the 2004 IEEE Donald G. Fink Paper Award.

Jeffrey Shapiro has been named a fellow of the American Physical Society. The citation reads, "For pioneering contributions to the theory of the generation, detection and applications of novel quantum states of light, particularly the squeezed states of light."

Dimitri Antoniadis received the Semiconductor Industry Association's University Research Award for his career contributions to the semiconductor industry.

Muriel Medard was named cowinner of the 2004 Harold E. Edgerton Faculty Achievement Award, which honors junior faculty members for "distinction in research, teaching and service to the MIT community."

Professor Henry I. Smith received the 2003 Bacus Prize of the International Society for Optical Engineering jointly with Dr. Mark L. Schattenburg (staff member, MIT Center for Space Research), Dr. Erik H. Anderson (Lawrence Berkeley Laboratory) and Dr. Yao-Ching Ku (Taiwan Semiconductor Manufacturing Company, Taiwan, ROC) for the invention and demonstration of the attenuated phase-shift mask technology, based on work done at MIT in 1988.

Shafi Goldwasser and Ron Rivest were elected to the National Academy of Sciences.

Michael Perrott was appointed Carl Richard Soderberg professor of power engineering.

Robert Morris was awarded the ITT development chair.

Jovan Popovic was awarded the Jamieson career development chair.

The following awards were presented to faculty at the EECS Spring Awards event:

- Gerry Sussman was the first recipient of the Saltzer Award.

- Erik Demaine was recipient of the Ruth and Joel Spira Award.

- David Perreault was the winner of the Junior Boise Award.

- Frans Kaashoek, Duane Boning, and Srinivas Devadas were all recognized with the Departmental Special Award.

John V. Guttag
Department Head
Professor of Computer Science and Engineering

More information about the Department of Electrical Engineering and Computer Science can be found on the web at *http://www.eecs.mit.edu/*.