Department of Electrical Engineering and Computer Science

In August 2005, leadership changed in the Department of Electrical Engineering and Computer Science (EECS). MIT president Susan Hockfield named Rafael Reif to be the next provost for MIT, and Tom Magnanti, dean of engineering, asked Eric Grimson to serve as acting department head while a search for a new department head was conducted. Effective November 2005, Professor Grimson assumed the role of department head. Duane Boning agreed to continue as associate department head, and George Verghese similarly agreed to remain as education officer. To complete the leadership team, Srini Devadas agreed to serve as the other associate head. Srini works in the areas of computer-aided design, computer architecture, and computer security. He has been on our faculty since 1988 and has spent time in the Research Laboratory of Electronics (RLE) as well as the Computer Science and Artificial Intelligence Laboratory (CSAIL).

Departmental activities over the past year, in addition to traditional strengths in research, teaching, and student supervision, include a range of efforts in outreach, in globalization, and a major initiative in undergraduate curriculum reform.

We continue to reach outside the department in a variety of ways. Our Women's Technology Program (http://wtp.mit.edu/) for high school women from across the country just completed its fifth summer. The number of young women passing through this program who choose to pursue engineering careers is remarkably high—in fact, of 40 students from the summer of 2005, 30 will be attending MIT this fall. We have several very active student groups at both the graduate and undergraduate level; many are actively involved in outreach endeavors, including a program in which some of our women undergraduates speak at middle schools around the country about the excitement and opportunity in EECS. These student groups include Eta Kappa Nu at the undergraduate level, the Graduate Students Association for graduate students, and Graduate Women in Course 6 for graduate women students. We are also actively engaged in developing opportunities for global experiences by our students and faculty; a committee chaired by Victor Zue is carefully examining options for student exchanges and outreach efforts around the globe. Ongoing activities include our students teaching EECS courses in China during the summer, student exchanges with Cambridge, Singapore, and Taiwan, and curricular outreach through OpenCourseWare. We are also working to expand our 6-A program to include an international element. The first pilot effort has placed a select number of students in internships in Asia.

The department continues to pursue several major initiatives. Our Curriculum Innovation Committee, chaired by Tomas Lozano-Perez, has continued their work reexamining and reinventing our undergraduate curriculum. The first new introductory course was piloted this past spring term and will be expanded for the coming fall term, when our second new introductory course will also be piloted. Design for a set of subsequent foundation courses is under way, and we continue to evaluate the effectiveness of these new courses as we move forward with our curriculum revamping.

EECS alumni continue to be generous to the department. Most recently, Mathworks has committed $400,000 to be used for EECS graduate student financial assistance, with

a preference for students in the fields of signal processing, image processing, video processing, control systems, simulation, and applied mathematics.

EECS research is carried out in the set of affiliated laboratories: CSAIL, RLE, Microsystems Technology Laboratories, the Laboratory for Information and Decision Systems, and the Laboratory for Electromagnetic and Electronic System. Graduate students working in one of these labs are further assigned to a departmental research area, which is responsible for monitoring their progress:

I   Systems, Communication, Control and Signal Processing, Greg Wornell, chair

II   Computer Science, Seth Teller, chair

III Electronics, Computers and Systems, Harry Lee, chair

IV Energy and Electromagnetic Systems, Leslie Kolodziejski, chair

V   Materials and Devices, Leslie Kolodziejski, chair

VII Bioelectrical Engineering, Louis Braida, chair

Service Awards

Claire Benoit and Amanda Cheng received the Richard J. Caloggero Award for distinguished service in EECS at the Annual EECS Spring Awards ceremony. Robert T. Morris, Dorothy Curtis, Joel Voldman, Agnes Chow, and the Graduate Students Association received Department Special Recognition Awards for outstanding service to the department, also at the Annual EECS Spring Awards ceremony.

The following awards were presented at the Institute Awards Convocation: Marta Luczynska received the Priscilla King Gray Award for Public Service for an undergraduate exceptionally committed to public service; Professor Patrick H. Winston received a Graduate Student Council Graduate Teaching Award; Archana Venkatraman received the Association of MIT Alumnae Senior Academic Award for senior women who have demonstrated academic excellence through coursework and related activities at MIT; and Uzoma Orji received the Malcolm G. Kispert Award for the male and female senior scholar-athletes of the year.

At the MIT Excellence Awards, Marilyn Pierce was recognized for "fostering community—making MIT a great place to work" and Anne Hunter was commended for "serving the client—providing consistent and exceptional service."

Cheryl Charles, Charles E. Leiserson, and Tomas Lozano-Pérez were inducted into the Quarter Century Club.

Women's Technology Program

This summer marked the fifth year of the Women's Technology Program (WTP) in EECS. Forty students were selected from an applicant pool of 195 female high school juniors from across the country; participants hail from 19 states and Japan. For four weeks, these young women explore topics in electrical engineering (EE) and computer

science (CS), focusing on engaging hands-on projects. Dedicated MIT graduate and undergraduate women teach the WTP courses in EE, CS, and discrete math, where the high school students work hard to advance their knowledge of this complex college-level subject matter. WTP students are all top math and science performers who are not yet committed to pursuing engineering or computer science; WTP gives them an opportunity to learn more about their aptitude for these fields, shows them some of the exciting research being done here at MIT, and allows them to explore the MIT community. Collaboration with the Department of Mechanical Engineering (ME) also helped launch a new 20-student WTP–ME program this summer. Four of the MIT students working in WTP this summer are alumnae of the program who attended as high school students in 2002 and 2004. Of the 147 WTP alumnae from 2002 to 2005, 68 will be enrolled as MIT students as of September 2006; others are pursuing engineering and science majors at top colleges around the country.

VI-A Internship

The Department's VI-A Internship Program is in its 89th year. The VI-A program has broadened its scope with the addition of the VI-A International Internship Program. Analog Devices in Limerick, Ireland, selected one student for this new initiative for summer 2006. This year the VI-A program held two orientation and selection processes, one in the fall and one in the spring. There were 25 applicants for the fall recruitment and 43 for the spring recruitment. Thirty-six students were selected as members of the incoming VI-A class. Currently there are 38 undergraduates and 17 MEng students in the program. By comparison, 70 students applied in 2004 and 21 were selected; 129 students applied in 2003 and 27 were selected; and 144 students applied in 2002 and 26 were selected. Since the last report, approximately 12 students have withdrawn from the VI-A Internship Program, as they felt their needs were better matched with the opportunities available on campus or applied to other institutions for graduate studies. However, most VI-A students continue to find the program professionally rewarding. Participating companies continue to offer challenging and well-supervised assignments.

During the past year, many new companies joined the VI-A Program. Network Appliance of Sunnyvale, CA, has one student on her first assignment; Schlumberger in Sugar Land, TX, has two students on their first assignment; Texas Instruments of Dallas, TX, has rejoined the program with two students on their first assignment; Vmware of Cambridge and Palo Alto, CA, has four students on their first assignment; and the Xerox Corporation in Rochester, NY, has three students on their first assignment. There have been numerous inquiries from companies interested in the VI-A Program, and we hope that we can obtain new members in the near future.

Graduate Program

In September 2005 there were 897 graduate students enrolled in EECS. About 35 percent of the students were foreign nationals. The department supported 578 research assistants and 118 teaching assistants. In addition, there were 153 fellowships, including 45 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 2005, the department awarded 105 MS degrees and 70 PhD degrees.

EECS received 2,503 applications for AY2006, a slight decrease from AY2005. Of these, 191 were admitted for the year, which resulted in 106 new graduate students registering in September.

Undergraduate Program

Enrollment of undergraduates averaged 753 in AY2006, down 7 percent from AY2005, with 23 percent in the Electrical Engineering Program (6-1), 34 percent in the Computer Science Program (6-3), and 43 percent in the Electrical Engineering and Computer Science Program (6-2). From the Class of 2008, 240 students were enrolled in Course 6. About 184 students from the Class of 2009 have so far selected Course 6, a decrease of 30 percent.

The Master of Engineering (MEng) program entered its 12th year with an average of 212 students.

Faculty Notes

Faculty on sabbatical:

Anant Agarwal	9/05–1/06
Krste Asanovic	9/05–5/06
Vincent Chan	1/06–5/06
Tommi Jaakkola	9/05–1/06
John Kassakian	9/05–1/06 (converted to medical leave)
Leslie Kolodziejski	9/05–1/06
Rajeev Ram	1/06–5/06
Peter Szolovits	9/05–5/06
John Tsitsiklis	1/06–5/06

Faculty on leave:

Anant Agarwal	1/06–5/06

Faculty on parental/family leave:

Hari Balakrishnan	1/06–5/06
Karl Berggren	9/05–1/06
Robert Miller	1/06–5/06
Lizhong Zheng	9/05–1/06

Faculty on junior research leave:

Erik Demaine	1/06–5/06
Michael Perrott	1/06–5/06

The department notes with sadness the passing of Alvin W. Drake, EECS professor emeritus.

Since July of 2005, three new members have joined the department.

Russ Tedrake is an assistant professor in the Department of Electrical Engineering and Computer Science at MIT and a member of the Computer Science and Artificial Intelligence Lab. He received his PhD in electrical engineering and computer science from MIT in 2004, working with Sebastian Seung. After graduation, he spent a year with the MIT Brain and Cognitive Sciences Department as a postdoctoral associate. Professor Tedrake's research group is interested in under-actuated motor control systems in animals and machines that are capable of executing dynamically dexterous tasks and interacting with uncertain environments.

Mehmet Fatih Yanik is an assistant professor in the Department of Electrical Engineering and Computer Science at MIT and a principal investigator in the Research Laboratory of Electronics. He received his PhD in applied physics from Stanford University in 2005. Professor Yanik's research group, the RLE Bio-imaging and Nano-manipulation Group, is working toward development and applications of technologies for studying cellular processes.

Tomás Palacios will be an assistant professor in the Department of Electrical Engineering and Computer Science at MIT and a principal investigator in the Microsystems Technology Laboratory, starting July 1, 2006. He received his PhD in electrical and computer engineering from the University of California–Santa Barbara in 2006. His research group is interested in nitride-based semiconductors, with particular attention to their role in electronic devices, as well as their application in biotechnology and nanotechnology.

EECS hosted one visiting faculty this year: Professor Vincent Blondel of Université Catholique de Louvain (Louvain-la-Neuve, Belgium).

Faculty Honors

Academic year 2006 was a stellar time for honors given to faculty, graduate, and undergraduate students. Below is a list of the awards (internal and external):

- Dimitri A. Antoniadis and M. Frans Kaashoek have been elected to membership in the National Academy of Engineering.

- Michael Athans, professor emeritus of electrical engineering and computer science, received a medal from the Polish Academy of Sciences on June 30 for his contributions to optimal control, following his plenary lecture at the 25th Polish Automation Conference in Warsaw. He was also elected a life fellow of the Institute of Electrical and Electronic Engineers, effective January 1, 2006.

- Regina Barzilay was awarded the Ross career development chair, which is focused on faculty with research strengths in software development and application.

- Regina Barzilay was also selected as a Microsoft 2006 faculty fellow.

- Regina Barzilay and Samuel Madden have been named by *Technology Review* as among the 35 top innovators worldwide for 2005.

- Sangeeta N. Bhatia (Dual EECS/Health Sciences and Technology [HST] appointment) was elected a fellow of the American Institute for Medical and Biological Engineering.

- Rod Brooks was named a fellow of the Association for Computing Machinery (ACM).

- Rod Brooks was also elected a corresponding member of the Australian Academy of Science.

- Anantha P. Chandrakasan was appointed as the chair holder of the Joseph F. and Nancy P. Keithley professorship in electrical engineering.

- Mildred Dresselhaus received the Harold Pender Award from the faculty of the Moore School of Electrical Engineering at the University of Pennsylvania.

- Frédo Durand, Erik Demaine, and Dina Katabi were awarded Alfred P. Sloan research fellowships.

- Erik Demaine was also awarded the Edgerton professorship.

- Jesus del Alamo was elected a fellow of the Institute of Electrical and Electronics Engineers (IEEE).

- Denny Freeman was named a MacVicar Faculty Fellow.

- James G. Fujimoto was elected to membership in the National Academy of Sciences.

- Qing Hu has been selected as a fellow of the Optical Society of America.

- Dina Katabi was awarded the NBX career development chair.

- Barbara Liskov was awarded an honorary doctorate by the Department of Computer Science at the Swiss Federal Institute of Technology, Zürich.

- Nancy Lynch was one of two recipients of the inaugural Van Wijngaarden Prize, awarded by the Centrum voor Wiskunde en Informatica, the national institute for research in mathematics and computer science in the Netherlands.

- Rob Miller and coauthors received the Best Paper Award at the ACM User Interface Software and Technology conference, October 2005.

- Alan V. Oppenheim was the 2005 recipient of the Signal Processing Education Award of the IEEE Signal Processing Society.

- Asu Ozdaglar was awarded the Class of 1943 Career Development Professorship, which is focused on faculty with exceptional strengths in both teaching and research.

- Pablo Parrilo was awarded the Society for Industrial and Applied Mathematics (SIAM) Activity Group/Control and Systems Theory (SIAG/CST) Prize at the SIAM Annual Meeting.

- Vladimir Stojanovic was appointed to the Doherty professorship in ocean utilization, MIT Sea Grant College Program.

- Collin Stultz (Dual EECS/HST appointment) received the Irving M. London Teaching Award (HST) for 2005–2006.

- Gerry Sussman's appointment as Panasonic professor was extended five years to June 2011.

- Devavrat Shah was a cowinner of the George B. Dantzig Dissertation Award, given by the Institute for Operations Research and the Management Sciences.

- Peter Szolovits has been elected to the Institute of Medicine.

- L. Rafael Reif was selected as the new provost of MIT.

- Michael Stonebraker was the 2005 recipient of the IEEE John von Neumann Medal.

- Jacob White was appointed chair holder of the Cecil H. Green professorship.

- John M. Wozencraft, professor emeritus of electrical engineering, was the 2006 recipient of the Alexander Graham Bell Medal of the IEEE.

- Lizhong Zheng was awarded the Kokusai Denshin Denwa Career Development chair, which has focused on faculty with research strengths in communications.

The following faculty awards were presented at the annual EECS Spring Awards ceremony:

- George C. Verghese: MIT's ACM IEEE Best Academic Advisor Award

- Vladimir Bulovic: the Ruth and Joel Spira Award

- Joel L. Dawson: the Saltzer Award

- Al Oppenheim: the GSA Counselor Award

Student Awards

The following awards were presented to EECS students at the annual EECS Spring Awards ceremony:

Award	Recipient	Citation/Date
Carlton E. Tucker Teaching Award	Antony J. Accardi	EECS Spring Awards, 5/21/06
Harold L. Hazen Teaching Award	Adam A. Kumpf	EECS Spring Awards, 5/21/06
Frederick C. Hennie III Teaching	Ola Ayaso	EECS Spring Awards, 5/21/06
Frederick C. Hennie III Teaching	Asfandyar Qureshi	EECS Spring Awards, 5/21/06
Raymie Stata Award	Hubert V. Pham	EECS Spring Awards, 5/21/06
Raymie Stata Award	Justin M. Paluska	EECS Spring Awards, 5/21/06
Raymie Stata Award	Saikat Guha	EECS Spring Awards, 5/21/06
George M. Sprowls Scholarship Fund	David G. Andersen	Improving end-to-end availability using overlay networks
George M. Sprowls Scholarship Fund—Honorable Mention	Nissanka B. Priyantha	The cricket indoor location system
George M. Sprowls Scholarship Fund—Honorable Mention	Emin Martinian	Dynamic information and constraints in source and channel coding

George M. Sprowls Scholarship Fund—Honorable Mention	Simson Garfinkel	Design principles and patterns for computer systems that are simultaneously secure and usable
Northern Telecom/BNR Project Award—Spring 2006	Ravi Palakodety	Recognition of hand-drawn circuits
Northern Telecom/BNR Project Award—Spring 2006	Vijay Shah	Recognition of hand-drawn circuits
Northern Telecom/BNR Project Award—Spring 2005	Shi Ling Seow	Music composition for dummies
Northern Telecom/BNR Project Award—Spring 2005	Yun Wu	Music composition for dummies
Morris Joseph Levin Award—Best MasterWorks Oral Thesis Presentation	Thomas A. Baran	Design and implementation of discrete-time filters for efficient sampling rate conversion
George C. Newton UG Lab Prize	David W. Rush	Virtual jogging
George C. Newton UG Lab Prize	Christopher A. Wilkens	Virtual jogging
David A. Chanen Writing Award	Tamara Stern	MEMFiS: a fast memory-backed file system
Charles & Jennifer Johnson MEng Prize	Michael F. Lin	Comparative gene identification in mammalian, fly and fungal genomes
Charles & Jennifer Johnson MEng Prize	Philip J. Guo	A scalable mixed-level approach to dynamic analysis of C and C++ programs
David Adler Memorial MEng Thesis Prize	Michael Scott Bradley	EECS Annual Spring Awards
David Adler Memorial MEng Thesis Prize	Christopher J. Emig	EECS Annual Spring Awards
William A. Martin Memorial SM Thesis Prize	Matthew D. Rasmussen	Probabilistic framework for genome-wide phylogeny and ortholog determination
Ernst A. Guillemin Thesis SM Award	Lav Varshney	EECS Spring Awards, 5/21/06
Robert Fano UROP Award	Surasak Chunsrivirot	EECS Spring Awards, 5/21/06
Licklider UROP Prize	David Moore-Pitman	EECS Spring Awards, 5/21/06
Anna Pogosyants UROP Award	Beckett W. Sterner	EECS Spring Awards, 5/21/06

The following non–EECS awards were presented to EECS students:

Award	Recipient	Citation/Date
Henry Ford II Award	Eva Enns	Presented to a senior engineering student who has maintained a cumulative average of 5.0 at the end of the 7th term
Ragnar and Margaret Naess Award	Sherman (Xiaoming) Jia	Presented to an exceptional string player
Ragnar and Margaret Naess Award	Sinit Vitavasiri	Presented to an exceptional pianist
Ragnar and Margaret Naess Award	Elisabeth Hon	Presented to an exceptional vocalist
Ragnar and Margaret Naess Award	Crystal Chao	In recognition of exceptional talent and commitment to private performance study as an Emerson scholar

Ragnar and Margaret Naess Award	Elisabeth Hon	In recognition of exceptional talent and commitment to private performance study as an Emerson scholar
Ragnar and Margaret Naess Award	Ole Nielsen	In recognition of exceptional talent and commitment to private performance study as an Emerson scholar
Ragnar and Margaret Naess Award	Crystal Chao	In recognition of commitment to and excellence in performance as members of the piano trio that presented "An Afternoon of Russian Legends"
Laya Wiesner Community Award	Raja H. R. Bobbili	Presented at the Institute Awards Convocation
Fiekowsky Award	Adam Seering	Presented for outstanding contributions to the Experimental Study Group (ESG) community
Todd Anderson Award	Austin Clements	Presented for excellence in teaching at ESG
MIT Goodwin Medal	Stephen Hou	Institute Awards, 5/9/06

W. Eric L. Grimson
Department Head
Bernard Gordon Chair of Medical Engineering
Professor of Computer Science and Engineering

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