

ECE Connection

School of Electrical and Computer Engineering | Spring 2008

Computer Engineering Program Turns 20

The 2007-08 academic year marks the 20th anniversary of the first bachelor's degree in computer engineering awarded at Georgia Tech. Officially established as a degree program in 1986, computer engineering (CmpE)—both at Tech and the discipline as a whole—has changed dramatically.

Representing one of the fastest growing groups of professionals in the U.S., new CmpE bachelor degree graduates average a starting salary of \$59,500, among the highest of all engineering fields, according to the 2007 salary survey conducted by the National Association of Colleges and Employers. "Because our School has top 10 ranked computer engineering programs at both the undergraduate and graduate levels, our CmpE graduates are in high demand," said Douglas B. Williams, associate chair for ECE undergraduate affairs. "Our broad-based program, covering areas such as software and hardware design, embedded systems, and computer networking, attracts employers both nationally and globally."

In 1986, seven faculty members in the then School of Electrical Engineering were involved in the CmpE educational program, which included courses in computer architecture, digital system design, and some VLSI design, according to Joseph L.A. Hughes, ECE senior associate chair and CmpE faculty member. Today, over 30 ECE faculty members are involved in computer engineering, teaching more than 20 elective and graduate courses that now include topics like networking, information security, embedded systems, and computer-aided design. Many CmpE faculty members work diligently with industry to procure the latest computers,

software, and tools, so that students have the most current training in their courses and labs, preparing them well for the workforce or graduate school.

Research in CmpE has also accelerated over the last two decades. Until the mid 1980s, CmpE faculty mainly focused on education rather than major research initiatives, until ECE Professor Emeritus Cecil Alford received a multimillion dollar contract through the U.S. Army Space and Strategic Defense Command that supported work in parallel processing, VLSI design of special purpose processors, real-time simulation of physical systems, autonomous vehicles, and coordinated control of multiple industrial robot arms.

As the School began hiring more faculty in the late 1980s and early 1990s, computer engineering, especially the VLSI design and testing area and growing interactions with microelectronics, helped to fuel the success of activities like the Microsystems Packaging Research Center, said Dr. Hughes. In the late 1990s, more faculty members were added in computer-aided design and embedded systems, spawning additional long-standing, interdisciplinary projects and research centers with other engineering units, the College of Computing, and the Georgia Tech Research Institute.

"Over the past 20 years, computer engineering has clearly established itself as a vital component of the School of ECE and a compelling career option for our graduates," said Gary S. May, Steve W. Chaddick School Chair of ECE. "In the next 20 years, I expect this program to continue its significant collaborative role in the School's education and research activities." |

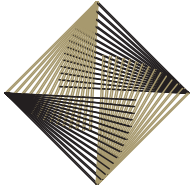
CmpE Then and Now

Faculty	7	31
Students Enrolled	89	426
Degrees Awarded	1	95
Total Degrees Awarded		1515
Funded Chairs or Professorships		7
NSF CAREER Award Winners		11

1991	CmpE degree received initial ABET accreditation
1993	School of Electrical Engineering name changed to the School of Electrical and Computer Engineering
1998	Georgia Tech Information Security Center founded (Henry L. Owen, associate director)
2000	First CmpE students enroll at Georgia Tech Regional Engineering Program at Georgia Tech Savannah campus
2001	Center for Experimental Research in Computer Systems founded (ECE co-directors, Sudhakar Yalamanchili and Douglas Blough) First CmpE degrees awarded at Savannah (3)
2003	CmpE Degree (Georgia Tech Regional Engineering Program) received initial ABET accreditation
2006	CmpE faculty move to Christopher Klaus Advanced Computing Building

**Georgia
Tech**





Joseph L.A. Hughes

Senior Associate Chair-ECE

IEEE Fellow

IEEE Education Society
President

ASEE Fellow

Looking Back on 20 Years of CmpE

I joined the School of Electrical Engineering in fall 1986 as an assistant professor – one of the first hired specifically to support the new computer engineering (CmpE) program. Although I had not helped create the CmpE program, within a couple of years I had become its de facto leader in student recruiting and advising, program development, and preparation for initial accreditation. From that time forward, my identity was linked in large part to that of CmpE.

The earliest computer engineering programs were created around 1970, with approximately 30 accredited programs by 1986. Computer engineering generally began as an outgrowth of, or specialty within, electrical engineering – computer engineering was about hardware, while computer science was about software. Georgia Tech's CmpE program began just as computer engineering was defining itself as a distinct discipline, dealt with huge enrollment surges in the 1990s, and is now one of more than 200 accredited programs with "computer engineering" in their title, roughly half accredited within the past decade.

I served as one of the core members of a task force established in 2000 by the IEEE Computer Society and the Association for Computing Machinery to define the body of knowledge and model curricula for computer engineering. We

looked at how the discipline had evolved, how it was defined, likely future needs, and various implementations in academic institutions both within and outside the United States. While each program's history is unique, there are several key developments that characterize the evolution of computer engineering over the past two decades, both as a discipline and at Georgia Tech:

- Scope and breadth – from designing hardware, to designing hardware plus software, to viewing computing hardware/software as building blocks of larger systems;
- Scale and complexity – advances in microelectronics technology now allow fabrication of devices containing millions of transistors on a single integrated circuit;
- Tools – designing larger and more complex systems depends on mathematical modeling and software tools for analysis, information management, and design automation;
- Integration with other disciplines – digital computing has fundamentally changed the design of telecommunications, controls, and signal processing systems;
- Ubiquity of computing devices – processors of various types are now embedded in such common applications as automobiles, home appliances, and entertainment systems.

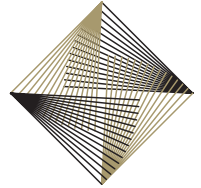
Twenty years ago, most CmpE majors wanted to design computers or integrated circuits. Today's graduates are far more likely to design or use computing systems to solve problems in other fields; the processors and ICs themselves are no longer considered special.

While talking recently to middle school students about science and engineering, I showed them a memory IC from about 20 years ago. Today, an IC of that size holds a thousand times as much data, along with enough processing capability to create a music player that holds hundreds of songs and costs less than \$100. Almost all students own one. Twenty years ago, who would have thought that computer engineering would lead to such things?

Physicist Niels Bohr is quoted as saying, "Prediction is very difficult, especially if it's about the future." Nonetheless, it seems appropriate to at least consider the next 20 years of computer engineering. The greatest certainty seems to be that computing systems are not going away. The greatest uncertainty, perhaps, concerns the relationship among computer engineering, electrical engineering, and computer science. Will they evolve as increasingly separate disciplines, converge into a single discipline, or something in-between? Regardless of the answer, it should continue to be an interesting ride. |

CmpE's First 11 Graduates *Where are they now?*

Cecil Simpson	1987	┌──────────┐	Moises Abadi CEO Liberty Technologies, Panama City, Panama
Moises Abadi	1989		
Molham Aref	1989	┌──────────┐	Michael Barre Market Manager for Aerospace The Timken Company, Lebanon, N.H.
Michael Barre	1989		
Jeffrey Daniell	1988	┌──────────┐	Jeffrey Vetter (MS CS '94, PhD CS '98 GT) Group Leader Future Technologies Group, Computer Science and Mathematics Division Oak Ridge National Laboratory, Oak Ridge, Tenn.
Christopher Debellis	1989		
Kyle Hardin	1989		
Gerardo Holmann	1989		
Howard Schmerler	1989		
John Tyburski	1989		
Jeffrey Vetter	1989		



In Loving Memory of Bill Sayle: A Giant in Engineering Education

Georgia Tech, ECE, and the worldwide engineering community lost one of its great advocates and a loyal friend when William E. Sayle died on February 2. Dr. Sayle, who waged a long and courageous battle with pancreatic cancer, was 66 years old. A memorial service was held in his honor on February 10 at the Unitarian Universalist Congregation of Atlanta.

Dr. Sayle joined Georgia Tech when it was transitioning from primarily an undergraduate educational institution to a research university. Specializing in power electronics, he created one of the first comprehensive educational programs in this area. "Bill was a uniquely gifted teacher and extremely knowledgeable, dedicated to engineering as a profession, and, most of all, dedicated to the students," said Roger P. Webb, who retired as ECE school chair in 2004.

A founding member of the IEEE Power Electronics Society in the 1970s, Dr. Sayle held many leadership roles with the IEEE Power Electronics Specialists Conference. "William Sayle entered the field of power electronics long before it became a cornerstone of what has become the broad area of electric energy systems. He understood the interdisciplinary and multi-level nature of the field, starting from components to sub-systems, leading to entire power electronic systems," said Hans B. Püttgen, Dr. Sayle's longtime ECE and power electronics colleague.

Long before it became a national concern, Dr. Sayle worked hard to recruit underrepresented minorities and women to engineering and science. As a faculty consultant for SECME, Inc., he worked with over 60 K-12 schools in Georgia to increase the pool of students interested in engineering. Traveling many thousands of miles by car, Dr. Sayle spoke with students and teachers and demonstrated several innovative experiments. "Bill's contributions in enhancing the participation of women and minorities in engineering were groundbreaking," said Gary S. May, Steve W. Chaddick School Chair of

ECE and an international leader in minority engineering education. "In many ways, he inspired people like me to continue to champion this cause. We owe him a tremendous debt."

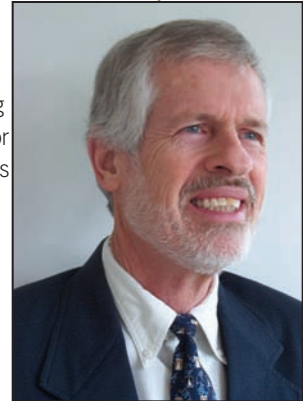
In 1988, Dr. Sayle became the associate chair for ECE undergraduate operations, which was—and still remains—one of the largest programs of its kind in the U.S.—and devoted countless late night and weekend hours to ensure the program's success. "Coordinating undergraduate operations in a program as large and complex as ECE is tough duty—people, policies, scheduling, and deploying—a perfect match for Bill's skill set and temperament," said Dr. Webb. "He knew the curricula intimately, understood both the letter and proper application of policies, and he knew intuitively how best to support the students. His service in that role created an enduring legacy."

Toward the end of his career, he taught during the summer undergraduate program at Georgia Tech Lorraine (GTL), the Institute's campus located in Metz, France. At the suggestion of Hans Püttgen, then GTL president and ECE associate chair, upon retiring from ECE in 2003, Dr. Sayle became director for undergraduate programs at GTL. "William Sayle and I worked closely together to develop the GTL undergraduate program," said Dr. Püttgen, now a professor with EPFL, Swiss Federal Institute of Technology in Lausanne. "Under his leadership, the program regularly enrolled 150 students each summer while providing what often were life-changing opportunities for Georgia Tech students. His leadership and overall reputation within Georgia Tech were crucial when building the program."

Not only concerned with ECE school and professional matters, Dr. Sayle was also involved in Georgia Tech faculty governance via Institute-level committees, the Academic Senate, and the Executive Board. He served as chief advisor for Tau Beta Pi, an engineering honor society that stresses both technical excellence in

the profession and concern for the community. In short, he was passionate about everything he did, according to J. Alvin Connelly, professor and associate chair emeritus of ECE.

"Bill was more than a professor—he was an educator. He freely gave of his time and talents to improve both the educational and personal opportunities of all those he encountered," said Dr. Connelly. "We have lost a true friend and crusader. He will be deeply missed by all of us at ECE and Georgia Tech and throughout the engineering community." |



For those wishing to honor Bill and his memory, donations may be made to the Pancreatic Cancer Society (www.pancan.org) or to the Bill Sayle Fellowship Fund, Georgia Institute of Technology, School of Electrical and Computer Engineering, Attention: Marci Reed, MS 0250, Atlanta, GA 30332-0250.

To date, the Bill Sayle Fellowship Fund has received over \$16,000 in donations. We in ECE thank you for your continued support!

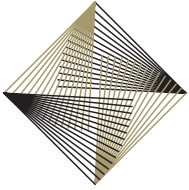


Bill Sayle gets ready to meet new students at the ECE Graduate Student Orientation in August 2002.

Bill Sayle on a visit to Heidelberg, Germany, while working at GTL in summer 2002.

Bill Sayle (L) and ECE Regents' Professor Thomas K. Gaylord get ready to start the 2006 Dean Griffin Pi Mile 5K Road Race on the Georgia Tech campus.



**2008 ECE Advisory Board**

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Szlam Joins Advisory Board

ECE welcomed a new advisory board member in fall 2007: Aleksander Szlam. Mr. Szlam is the chairman and CEO of Szlam Enterprises, Inc., an information technology and contact center services company. Previously, he was chairman of the board and CEO of Melita International, Inc., which he founded in 1983 and led from a single-employee garage venture into a publicly traded global leader of intelligent Customer Interaction Management solutions that approached \$100 million in revenues by 1999.



"It is a great honor to be part of such an elite group of board members," said Mr. Szlam. "Georgia Tech provided me with an outstanding education and the necessary tools to build a successful global technology company. Now it is time for me to help the future generation of entrepreneurs to make their mark."

Mr. Szlam earned both his undergraduate and master's degrees in electrical engineering at Tech. He holds more than 50 world patents for technological inventions and business solutions, including an auto dialing and receiving system that has become an industry standard.

For his efforts as an inventor and entrepreneur, Mr. Szlam received a Lifetime Achievement Award from Customer Interaction Solutions and TMC in 2006. He was named "Pioneer in the Industry" by *Call Center* magazine in August 1997. He was also named *Inc.* magazine's 1991 "Entrepreneur of the Year," Southern Region, while Melita International repeatedly made Atlanta's prestigious "Fast Tech 50" list of growing technology companies. Additionally, in 1996 Mr. Szlam co-authored *Predictive Dialing Fundamentals*, the definitive guide to the industry's technologies, their applications, and their usage. Mr. Szlam was inducted into the Academy of Distinguished Engineering Alumni in 1998. |

2007 College of Engineering Alumni Award Winners

The 2007 College of Engineering (CoE) Alumni Awards Ceremony was held on November 2. At this event, CoE Dean Don Giddens inducted new members, including seven ECE alumni, into the Engineering Hall of Fame, the Academy of Distinguished Engineering Alumni, and the Council of Outstanding Young Engineering Alumni.

Engineering Hall of Fame

Honors alumni who have made meritorious engineering and/or managerial contributions to the college during their careers.

H. Allen Ecker, BEE '57, MSEE '58

Executive Vice President, Scientific-Atlanta, Inc., Lawrenceville, Ga.

Academy of Distinguished Engineering Alumni

Recognizes alumni for contributions to their profession and to the Institute, and for their active involvement in engineering, management, and the community.

Kevin A. Eyl, MSEE '81

Retired, Schlumberger Limited, Lafayette, Calif.

Paul Freet, BEE '86

Technology Commercialization Catalyst, VentureLab, Atlanta, Ga.

Jeffrey V. Giglio, BEE '77

President, Inglett & Stubbs, Atlanta, Ga.

Gustavo R. Larrea, EE '59

Executive President, Electroquil, Duke Energy Company Guayaquil, Ecuador

Adriel Longo, BEE '58

Board Chairman, Bermúdez & Longo, S.E., Hato Rey, Puerto Rico

Council of Young Engineering Alumni

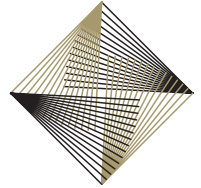
Recognizes alumni under age 40 who have demonstrated exemplary professional accomplishments within their profession, field, or organization.

Joseph W. Parks, Jr., MSEE '93, PhDEE '98

Logic Technology Development, Intel Corporation Beaverton, Ore.

College of Engineering Advisory Board Chair C. Dean Alford (far left) is pictured with ECE alumni award winners (L-R) Gustavo R. Larrea, Kevin A. Eyl, Adriel Longo, H. Allen Ecker, Jeffrey V. Giglio, and Paul Freet.





ECE Advisory Board Goes to GTL

The ECE Advisory Board traveled to Georgia Tech Lorraine (GTL) in April to meet with ECE faculty members and administrators who are permanently based at the campus, which is located in Metz, France. The Board learned about the latest educational and research programs, including a \$2 million program on high-speed quantum networks, the largest external research grant received at GTL to date. |



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Agilent's \$13 Million Donation Establishes New EDA Simulation Center

Agilent Technologies, Inc. has donated its electronic design automation (EDA) software, support, and training resources to a newly created center at Georgia Tech. This donation, valued at just over \$13 million, is one of the largest that Agilent has made to a single university.

Housed at the Georgia Electronic Design Center (GEDC), the Agilent EDA Simulation Center provides radio frequency (RF) and microwave system and circuit design instruction to Georgia Tech students, along with additional software design capabilities. It also provides licenses at no cost or at greatly discounted rates to start-ups in wireless communications design. The EDA Simulation Center, which opened in April 2008, also houses computers and 22-inch flat screens donated by Intel and IBM.

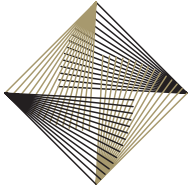
"Agilent's EDA tools are now helping us to advance our research and support our students—and also encourage and support commercial innovation," said Joy Laskar, director of GEDC and the Schlumberger Chair in Microelectronics in the School of ECE. "We also want to contribute to the success of other academic and non-profit institutions through sharing our experience in this partnership with Agilent, and we are making plans to release large portions of work using the Agilent EEsof EDA platforms for academic use."

The deal marks a significant expansion of the long-standing relationship between Georgia Tech and Agilent and is key to Agilent's strategy for developing extensive relationships with universities through the newly created Agilent EEsof EDA University Alliance program. It also includes a tailored, three-year custom license program to provide access to the complete line of Agilent EEsof EDA tools to start-up companies during their critical formative periods.

"This is one of the largest academic donations of Agilent EEsof products to a single institution to date," said Jim McGilivray, vice president and general manager with Agilent's EEsof EDA division. "We realize that universities and startup incubator programs play a crucial role in pushing the limits of EDA tools. They consistently ask for and expect Agilent to offer integrated and leading simulation technology in all areas, and we are pleased to support their efforts." |



Approximately 150 students will use the new Agilent EDA Simulation Center on a daily basis.



GEORGIA TECH
HONORS

Seven ECE faculty members and students were honored at various Georgia Tech functions in spring 2008 for their outstanding achievements in teaching, research, service, and academics.

Outstanding Professional Education Award
Mark A. Richards

Outstanding Faculty Leadership for the Development of Graduate Research Assistants Award

Ali Adibi

Outstanding Achievement in Research Program Development Award

W. Alan Doolittle, Jr.

Henry Ford II Scholar Award

**Cody Jones
Josh Renner**

J.E. McDaniel Award

Reeve Ingle

Auxiliary Services IMPACT Scholarship

Edem Wornyo

Monetary awards for the Roger P. Webb Awards provided by:
¹Hitachi Telecom
²Areva NP

Graduate Student Awards
 (l-r): Zhensheng Jia, Seyed Payam Alipour Motaallem, Gary May, Thomas Hanley, Majid Badieirostami, and Chris Beall. >

2008 Roger P. Webb Awards

On April 23, the School of ECE held its seventh annual Roger P. Webb Awards Program. Hitachi Telecom CTO David Foote (BEE '80) and Georgia Power Vice President Leslie Sibert (BEE '85) hosted the event, which honors the students, staff, and faculty who have shown exceptional dedication to their professions and studies. Support for this event was provided by Hitachi Telecom, Areva NP, and Burns & McDonnell.

STUDENT AWARDS

Outstanding ECE Sophomore Award **Tian Kai Woon**
 Awarded by Eta Kappa Nu, the honor society for ECE, to the sophomore electrical or computer engineering student with the highest scholastic average.¹

ECE Junior Scholar Award **Mitch Costley**
 Presented to the student who has junior standing with the highest GPA in ECE.¹

ECE Undergraduate Research Award **Renaud Moussonda**
 Presented to an undergraduate student with an unusually strong aptitude for research.¹

Most Outstanding ECE Senior Co-op Award **David Fink**
 Awarded to the ECE senior co-op student considered of the highest caliber by his/her co-op employer.¹

Outstanding Service to Georgia's Community **Warren Rodgers**
 Awarded to the student who participates in and organizes community activities, while motivating others to do the same.

ECE Faculty Award **Thomas Hanley**
 Awarded to EE or CmpE student who, in the opinion of the ECE faculty, did the most to improve the educational environment within ECE or Georgia Tech and contributed significantly to both student welfare and student-faculty interactions.

Outstanding Electrical Engineering Senior Award **Reeve Ingle**
 Awarded by Eta Kappa Nu to the senior electrical engineering student with a very high scholastic average and with an active role in extracurricular activities.²

Outstanding Computer Engineering Senior Award **Jose Vidal, Jr.**
 Awarded by Eta Kappa Nu to the senior computer engineering student with a very high scholastic average and with an active role in extracurricular activities.²

ECE Senior Scholar Award **Michael Pierce, Navraj Singh, Mu-Hsin Wei**
 Presented to electrical or computer engineering seniors with the highest academic average.

Colonel Oscar P. Cleaver Awards **Jiaqi Liang, Seyed Payam Alipour Motaallem**
 Presented to the graduate students who scored the highest on the doctoral preliminary examinations during 2007-08.

ECE Graduate Teaching Assistant Excellence Award **Chris Beall**
 Presented to the graduate teaching assistant considered most outstanding in 2007-08.

ECE Graduate Research Assistant Excellence Award **Majid Badieirostami, Zhensheng Jia**
 Presented to the graduate research assistants who have demonstrated particular excellence in their fields.

Undergraduate Student Awards (l-r): Mitch Costley, David Fink, Reeve Ingle, Renaud Moussonda, Jose Vidal, Gary May, Hitachi's David Foote, Michael Pierce, Navraj Singh, and Mu-Hsin Wei.



STAFF AWARDS

Hats Off Performance Award **Linda Dillon, Rachel Ponder**
 Recognized classified staff members who have demonstrated exceptional job performance and/or service to ECE above and beyond the call of duty.

Research Spotlight Award **Babak Momeni**
 Presented to an employee who made significant contributions to research in ECE.

Academic Spotlight Award **W. Whitfield Smith**
 Awarded to an employee who made significant contributions to the ECE teaching or academic program.

Staff Awards (l-r): Judy Lorier, Linda Dillon, Gary May, Babak Momeni, and Rachel Ponder.



FACULTY AWARDS

Outstanding Junior Faculty Member Award **Ghassan AlRegib, Farrokh Ayazi**
 Recognized the most outstanding assistant and associate professors in ECE with less than 10 years since their initial faculty appointment.

ECE Outreach Award **Ayanna Howard**
 Presented to a faculty leader or participant in outreach activities to interest and involve K-12 students in engineering, to increase participation of women and underrepresented minorities in engineering, and/or to recruit such students to the School of ECE.

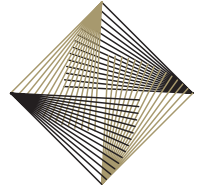
Richard M. Bass/Eta Kappa Nu Outstanding Teacher Awards **George Riley, John Dorsey**
 Awarded to the most outstanding classroom instructors as determined by the ECE senior class.

ECE Distinguished Mentor Award **Joy Laskar**
 Awarded to a faculty member whose mentoring of junior faculty—in connection with teaching or research activities over an extended period of time—was judged to be outstanding.

Distinguished Faculty Achievement Award **Russell Dupuis**
 Presented to the senior faculty member who has made significant contributions throughout his/her career.



Faculty Awards (L-R): Ayanna Howard, Farrokh Ayazi, Joy Laskar, John Dorsey, Gary May, George Riley, Ali Adibi, and Ghassan Al-Regib



Moore Honored with Presidential Award

Elliott Moore, II, ECE assistant professor at Georgia Tech-Savannah, has been recognized as one of the nation's top young scientists with a Presidential Early Career Award for Scientists and Engineers (PECASE). The PECASE program recognizes outstanding scientists and engineers who, early in their careers, show exceptional potential for leadership at the frontiers of knowledge. This award is the highest honor bestowed by the U.S. government on scientists and engineers beginning their independent careers.

Dr. Moore's research involves using digital speech processing theory and analysis in the classification of human vocal patterns for determining speaker demographics, characteristics, and emotional state. He is currently analyzing vocal affect as it relates to the mental condition of the speaker. His research will

be helpful in analyzing speech for emotion and stress, detecting deception, improving human-computer interaction in dialogue applications, and in developing clinical applications related to emotional and vocal disorders.

Dr. Moore joined the faculty in 2004 after completing his bachelor's, master's, and Ph.D. degrees in ECE at Georgia Tech. In 2005, he received the National Science Foundation's CAREER Award. Dr. Moore is a member of IEEE's Signal Processing Society and Engineering in Medicine and Biology Society; he is also a member of the Acoustical Society of America. |



Mersereau to Retire

Russell M. Mersereau, Joseph M. Pettit Chair Professor and Regents' Professor, retired May 1 after 33 distinguished years of service in ECE.

"I have enjoyed being a part of the progress that ECE has made in the last 33 years," said Dr. Mersereau. "I hope that my connections with the school will continue."



An international leader in two-dimensional signal processing, Dr. Mersereau played a prominent role at Tech in establishing the digital signal processing group as one of the best in the world. His teaching and research contributions have been widely recognized with many awards over the years, including the 1976 Browder J. Thompson Memorial Prize of the IEEE for Best Technical Paper by a Young Author, the 1995 W. Roane Beard Outstanding Teacher Award, and the 1990 Society Award of the IEEE Signal Processing Society.

Dr. Mersereau attended the Massachusetts Institute of Technology as both an undergraduate and graduate student, and he joined the ECE faculty in 1975. A Fellow of the IEEE, Dr. Mersereau is an editorial board member for *Proceedings of the IEEE* and associate editor of both *IEEE Transactions on Acoustics, Speech and Signal Processing* and *IEEE Signal Processing Letters*. He is also the vice president for Awards and Membership for the IEEE Signal Processing Society.

Dr. Mersereau and his wife, Martha, plan to move to Chapel Hill, N.C., later this year to be closer to his son, daughter-in-law, and granddaughter. He looks forward to spending time with his other son and daughter-in-law on Amelia Island, Fla. In addition to traveling and relaxing, Dr. Mersereau will be involved with consulting. |

Professional Organizations Name 2008 Fellows

Robert J. Butera, Jr., associate professor, was one of four College of Engineering faculty members named as Fellows of the American Institute for Medical and Biological Engineering.

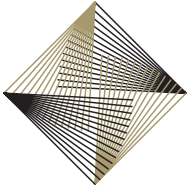
Andrew F. Peterson has been named to the first class of Fellows for the Applied Computational Electromagnetics Society. He is one of six people named to this inaugural class.

The Institute of Electrical and Electronics Engineers (IEEE) has elected three ECE faculty members to the 2008 class of IEEE Fellows: **J. Stevenson Kenney**, **Vijay K. Madiseti**, and **Waymond R. Scott**. **Bill Melvin**, an ECE adjunct faculty member affiliated with the Georgia Tech Research Institute, and ECE Professor Emeritus **Hans B. Püttgen** were also elected as Fellows.

Bernard Kippelen has been named a Fellow of SPIE, an international society advancing an interdisciplinary approach to the science and application of light.

Ian F. Akyildiz, ECE Byers Professor, has been named an IEEE Communications Society Distinguished Lecturer for 2008-09. During his two-year tenure in this role, Dr. Akyildiz will present lectures on cognitive radio networks, sensor networks, and nano-communication networks at various IEEE meetings.

George F. Riley and **Sung-Kyu Lim** will participate in the Hesburgh Award Teaching Fellows Program, which is run by Georgia Tech's Center for the Enhancement of Teaching and Learning. Both Drs. Lim and Riley are associate professors in computer engineering. Participation in the program is an honor reserved for tenured faculty with successful careers who have the potential to provide leadership in teaching and learning to their colleagues. |



Research in the News

Visit www.ece.gatech.edu/media/news to learn more about these research projects. Stories are courtesy of John Toon and Abby Vogel of the Georgia Tech Research News and Publications Office.

RFID Testbed Measures Multiple Tags at Once

An ECE research team led by Assistant Professor Gregory D. Durgin has designed a system that can simultaneously measure hundreds of radio frequency identification (RFID) tags and rapidly test new RFID tag prototypes without actually constructing new tags for each experiment.

Researchers designed the testbed for measurements at 915 MHz, a common ultra-high frequency for backscatter RFID applications. They are currently expanding the system to test antennas at higher frequencies—up to 5.7 GHz.

Sensor Necklace Aims to Increase Drug Compliance

ECE Assistant Professor Maysam Ghovanloo and graduate student Xueliang Huo have designed a sensor necklace, called MagneTrace, to help people remember to take their prescribed medicines. The necklace records the date and time when specially-designed pills are swallowed, and it can notify the patient and the doctor if the prescribed dosage is not taken at the proper time. This technology could also help researchers and pharmaceutical companies conduct more accurate clinical trials on new drugs.

High Performance Transistors Created with Carbon 60

Using room-temperature processing, ECE Professor Bernard Kippelen and his research team have fabricated high-performance field effect transistors with thin films of Carbon 60, or fullerene. Producing devices with such performance with an organic semiconductor represents another milestone toward practical applications for large area, low-cost electronic circuits on flexible organic substrates.

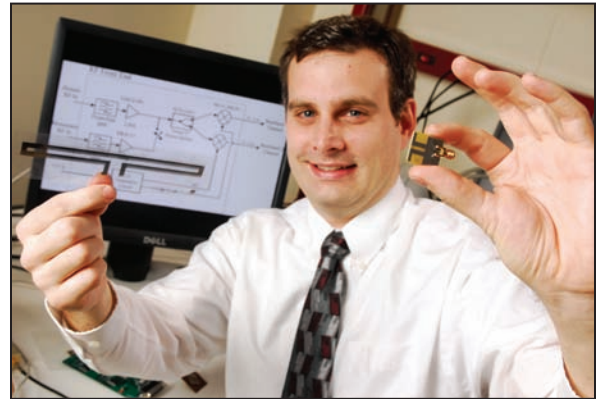
The new devices could encourage more designers to begin working on such circuitry for displays, active electronic billboards, RFID tags, and other applications that use flexible substrates.

Sensor Hears Cancer's Call

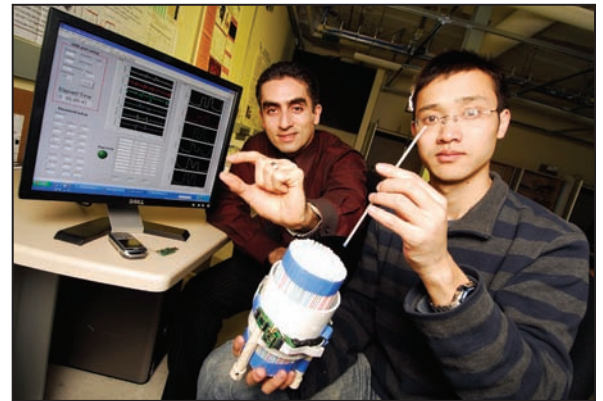
ECE Professor William D. Hunt and his graduate students have invented a pinpoint-size sensor that can “hear” cancer-linked molecules in a drop of blood serum.

Dubbed the ACuRay chip, this array of electrodes, which has man-made antibodies on it, hums at a specific pitch when an electric current is applied. When these cancer markers stick to

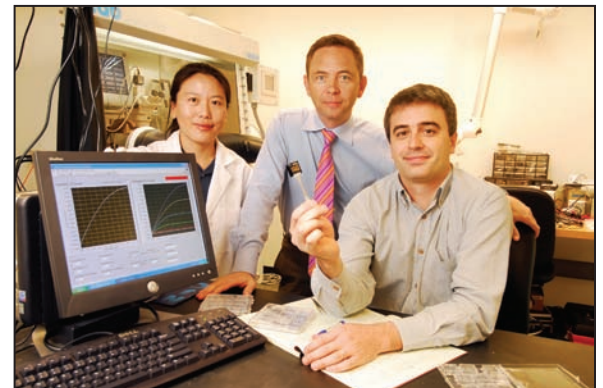
the antibodies, they weigh down the electrodes beneath them, changing the pitch at which the array hums—so the device “hears” the presence of cancer markers. |



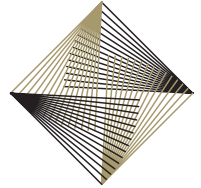
Gregory Durgin displays two different types of RFID antennas. He has developed a testbed to rapidly test new RFID tag prototypes.



Maysam Ghovanloo (left) and graduate student Xueliang Huo test their drug compliance monitoring system on an artificial neck.



Xiao-Hong Zhang, Bernard Kippelen, and Benoit Domercq (l-r) show samples of transistors fabricated with thin films of Carbon 60.



Georgia Tech and Top Italian Universities Launch Dual Master's Degree Programs

Georgia Tech is partnering with two leading Italian universities, the Politecnico di Torino and the University of Trento, to offer dual master's degrees in electrical and computer engineering and computer science. The new degrees, which will begin in the fall of 2008, represent the first dual graduate programs in these disciplines between American and Italian universities.

ECE is partnering with the School of Information Technologies at the Politecnico di Torino in Torino, Italy. "Georgia Tech has long worked with key industry partners in Italy," said Gary S. May, Steve W. Chaddick School Chair in ECE. "This new affiliation will afford students the opportunity to experience competitive and complementary approaches to engineering solutions in a cross-cultural environment."

A dual graduate degree is also available through a partnership with Tech's School of Computer Science and the School of Informatics at the University of Trento in Trento, Italy.

"Not only will students have the opportunity to complete two graduate degrees in two years, but also they will have the possibility of obtaining an internship with a multinational firm in Italy as well as scholarship support," said Anthony Yezzi, ECE



associate professor and program director for the new dual degrees. "These programs are appealing because students can obtain two degrees in considerably less time than pursuing them individually, as well as jump-start their career in the global market."

More information can be found about these programs at www.ece.gatech.edu/academic/polito/DualProgramUSA.htm and at www.cc.gatech.edu/education/study-abroad/trento. |

Tech Offers First Interdisciplinary Robotics Ph.D.

The Georgia Tech Colleges of Computing and Engineering announced the nation's first interdisciplinary doctoral degree in robotics in February. The program, which starts in fall 2008, was developed through Tech's Center for Robotics and Intelligent Machines (RIM@Georgia Tech), a collaborative research center that draws on the strengths of both colleges as well as at the Georgia Tech Research Institute. The robotics doctoral degree is designed to prepare a new generation of multidisciplinary researchers for charting a new course in robotics in the United States.

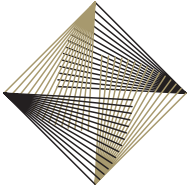
"We are pleased to offer the first truly interdisciplinary robotics Ph.D. program in the country," said Henrik Christensen, KUKA Chair of Robotics for Tech's College of Computing. "Exposing our students to course work from multiple disciplines early on prepares them to think about robotics from a holistic approach once they enter the workforce. True to our mission in robotics at Georgia Tech, our program will recruit and educate outstanding students who will provide leadership in a world that is increasingly dependent on technology."

With a focus on personal and everyday robotics, as well as on the future of automation, RIM@Georgia Tech faculty developed the new program to enable students to help understand and drive the future role



of robotics in society and industry. Approximately 15 candidates per year will be admitted, gradually building the program to 60 enrolled students. Students in the new program must first be admitted to one of the participating academic units, subsequently designated as the student's home unit.

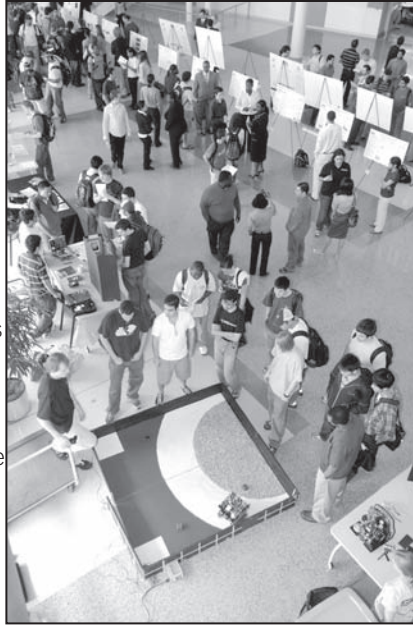
More than 30 faculty members from the Schools of Interactive Computing, Mechanical Engineering, Aerospace Engineering, Electrical and Computer Engineering, and Biomedical Engineering are affiliated with this new Ph.D. program. Faculty involved in the program's development include Dr. Christensen (Computing), Frank Dellaert (Computing), Eric Johnson (Aerospace Engineering), Ayanna Howard (ECE), Steve DeWeerth (Biomedical Engineering), and Harvey Lipkin (Mechanical Engineering). |



SFC Presents ECE Student Research Competition and Fair

On April 11, the ECE Student Faculty Committee (SFC) held its fourth annual ECE Fair in the Klaus Building Atrium. Student organizations were present, including Eta Kappa Nu, Women in Electrical and Computer Engineering, SFC, and Tech's IEEE Hardware Competition team, which conducted a robot demonstration.

Other booths displayed information about study abroad, the Microelectronics Research Center, the Undergraduate Research Opportunity Program, and information about ECE's 10 technical interest groups. ECE judges awarded prizes to the top three undergraduate and top three graduate posters at the annual student research poster competition. The event concluded with a launch party for ECE's multimedia Webzine, *ecesis*, featuring art, writing, music, and film by students, faculty, and staff. |



Students watch robotic displays, view research posters, and talk with student organizations and faculty at the fourth annual ECE Fair.

Ingle Named 2007 Co-Op Student of the Year by ASEE

Richard "Reeve" Ingle was named 2007 Student of the Year by the Cooperative Education Division of the American Society of Engineering Education. A spring 2008 BSEE graduate with a minor in Spanish, Reeve completed his time at Georgia Tech with a 4.0 GPA, and starting this fall, he will pursue PhD studies in EE at Stanford.

Reeve completed four co-op work terms with NASA Johnson Space Center in Houston and an internship with the U.S. Department of Defense in Ft. Meade, Md. As a co-op student at NASA, he worked on many projects, including the design of a dashboard display unit, developing an RF spectrum map for the SCOUT Project (NASA's "moon-buggy" robot rover), developing electrical systems drawings for the International Space Station Japanese Experiment Module, and investigating methods of cleaning cloth-

continued on page 12

Students Engineer Ways to Help Others at I2P4SE

Twelve student teams combined technological know-how with their desire to help others at the National Idea to Product Competition for Social Entrepreneurship on April 4-5. The event, also known as I2P4SE, took place on the Georgia Tech campus at the College of Management Building.

Hailing from 10 universities, the teams presented their original products that benefit local communities or address larger global issues. Using an evaluation process similar to what venture capitalists employ, the competition judges compared product feasibility plans to determine those most likely to succeed.

Coordinated by the Social Entrepreneurship Initiative (SEI) at Purdue University, I2P4SE requires students to identify and work with a non-profit partner or a community to address a specific need. They must also explain how their product will help provide relief since the markets

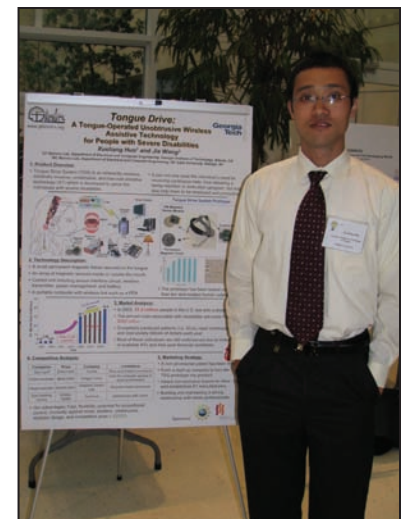
for these products are often for the disabled, marginalized, or poor.

Xueliang Huo, an ECE Ph.D. student from the third place Georgia Tech team, appreciated the encouragement that he received from Ed Coyle and his advisor, Maysam Ghovanloo, to take part in this competition. "As an engineering student, I always believe that my work is not limited to within the lab, but will eventually benefit society," Xueliang said. "I learned how to think about the wider implications of my research and how to present my work, not only in terms of technology, but also in addressing the commercial part and the real needs of society. During the competition, I got to know a lot of smart students from different areas who are working hard and trying to resolve some real problems."

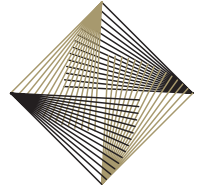
Each year, I2P4SE is hosted at a different university, and in 2009, it will be held at Purdue. For more details about the

competition and the Social Entrepreneurship Initiative, visit <http://innovate.ecn.purdue.edu/>. |

The Tongue Drive System, a wireless, minimally invasive assistive technology that could substitute some arm and hand functions for people with severe disabilities won third place honors for Xueliang Huo.



"Social entrepreneurship can be defined in many different ways," said ECE Professor Edward J. Coyle, who served as the SEI director at Purdue before coming to Georgia Tech in January. "In this program, we focus on addressing the double bottom line, encouraging students to create economically sustainable products that also improve communities and individual lives."



Alumni News

Bruce D. Smith (BEE '51) is retired from Digital Equipment Corporation and resides in Hancock, N.H. Last year, New Hampshire Governor John Lynch appointed Bruce to a Pre-Engineering Technical Advisory Council, where he works with the New Hampshire Department of Education, the University of New Hampshire College of Physical Sciences, and industry leaders to foster programs for pre-college students in science, technology, engineering, and math.

Jim Carreker (BEE '69) and his wife, Helen, and their staff were recognized with one of Australia's top hospitality industry awards for their 15-suite property, The Louise, and its restaurant Appellation. Located in the Barossa Valley of South Australia, the property was named as Australia's top Luxury Accommodation by the National Tourism Alliance, the country's top tourism body. This most recent honor, given in March, follows their selection as the category award winner for top Luxury Accommodation in South Australia this past November.

Christopher Johnston (BEE '70) is the vice president of Syska Hennessy Group in Atlanta. He is also chief engineer-critical facilities for Syska Hennessy Group, a national consulting engineering firm headquartered in New York City.

Elisabeth Pickens-Kerns (BEE '79) is an advisory technology consultant with EMC in Oldsmar, Fla.

Bill Newhouse (BEE '90) and his wife, Kay, welcomed the birth of their second child, Esther Lucille, on December 21, 2007. He is a member of the technical staff focused on R&D in the Defense-Wide Information Assurance Program in the Office of the Assistant Secretary of Defense for Networks and Information Integration and DoD Chief Information

Officer. He is also co-chair of the National Coordination Office for Networking and Information Technology Research and Development Cyber Security and Information Assurance Interagency Working Group.

Kelvin C. Hawkins (MSEE '92) has been promoted to vice president for power systems development at IBM in Research Triangle Park, N.C., where he also serves as technical leader to Georgia Tech.

Alisa Gilmore (BSEE '95, MSEE '01) is a senior lecturer at the University of Nebraska at Lincoln in the Department of Computer and Electronics Engineering.

Raymond Garcia (PhD '01) is the founder of Shadowband Systems, Inc., located in Norcross, Ga. After only five years of operation, Shadowband received an "Administrator's Award of Excellence" from the Small Business Administration. The company provides business and security solutions that involve technologies such as modeling, soft-computing, inference, prediction, and data mining for both the private and public sectors.

Muhammad Ikram (PhD '01) is a technical staff member at Texas Instruments in Dallas, Tex.

Chau Nguyen (BSCmpE '04) is an economic services coordinator with MEAG Power in Atlanta.

William Anton (BSCmpE '05) is a technical support analyst with Aspect Software in Chelmsford, Mass.

Salman Mohagheghi (PhD '06) is a senior R&D engineer with ABB, Inc. in Raleigh, N.C.

Hiren Thacker (PhD '06) is a MEMS design engineer at NanoNexus in San Jose, Calif. He and ECE Professor James D. Meindl co-authored a paper titled "Prospects

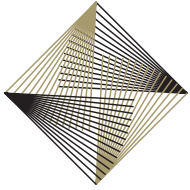
for Wafer-Level Testing of Gigascale Chips with Electrical and Optical I/O Interconnects," which received the Best Paper Honorable Mention Award at the 2006 International Test Conference, held in San Jose, Calif.

Rajbabu Velmurugan (PhD '07) is an assistant professor at the Indian Institute of Technology Bombay in the Department of Electrical Engineering. |



Evelynn Hammonds (BEE '76) has been appointed dean of Harvard College, effective June 1. Dr. Hammonds will be responsible for overseeing academic affairs, admissions, student life, housing, finance, and administration for the college. She joined Harvard in 2002, and she had been Harvard's senior vice provost for faculty development and diversity as well as a professor of the history of science and of African and African-American studies.

To submit your information and news, visit www.ece.gatech.edu



ECE Alum Named as IEEE/IEEE-USA's "New Face of Engineering"



Rajarshi Mukhopadhyay (PhD ECE '06), a mixed-signal design engineer with Texas Instruments in Dallas, is the IEEE/IEEE-USA's 2008 "New Face of Engineering." He is one of 14 young engineers recognized for this international honor.

The New Faces of Engineering is sponsored by the National Engineers Week Foundation, a coalition of engineering

societies, major corporations, and government agencies. The program highlights the vitality, diversity, and contributions of engineers under 30 years of age. Each engineering society's top choice must hold an engineering degree, be employed as an engineer from two to five years, and have worked with projects that significantly affect public welfare or further professional development and growth.

Dr. Mukhopadhyay pioneered the development of ultra-high-data-rate wireless systems that can transfer data at greater than five gigabits per second. Using current wireless data transfer rates of around 100 megabits per second, it takes minutes to download music or video onto an iPod. By comparison, using Dr. Mukhopadhyay's innovations, a 17-gigabit DVD can be downloaded in less than three seconds.

He is presently helping to expand Texas Instruments' business in disk drive technology to develop the industry's fastest read/write speeds, error-free data transfer, and improved energy efficiency.

Dr. Mukhopadhyay earned his bachelor of technology degree with honors from the Indian Institute of Technology in Kharagpur and earned his master's and doctorate from Georgia Tech in ECE under the guidance of Joy Laskar, the Schlumberger Chair in Microelectronics and director of the Georgia Electronic Design Center.

A member of the IEEE Solid-State Circuits Society and the IEEE Microwave Theory and Techniques Society, Dr. Mukhopadhyay has published more than 20 technical papers in IEEE journals and conferences and holds eight patents (issued and pending). His picture and bio appeared with the other New Faces of Engineering honorees in a full-page ad in *USA Today* on February 18.

Away from work, Dr. Mukhopadhyay is a painter, musician, active member of the IEEE Dallas-MTT chapter, and a volunteer for United Way. His art has received honors at Texas Instruments' art shows, and he has served as director of the IIT Music Society. |

Ingle | continued from page 10

ing in space. He also trained to be a back-room flight controller in Mission Control Center and was the only co-op student selected to support NASA robotics field testing at Meteor Crater, Ariz. in fall 2006.

Reeve was a strong and consistent advocate for the Georgia Tech and NASA co-op programs. A co-op ambassador for the Georgia Tech Division of Professional Practice, he was also a mentor for the NASA Explorer Schools Reduced Gravity Program and a Texas Aerospace Scholars Volunteer Leader for a rover design program for college students.

While at Tech, Reeve worked on campus beautification projects and tutored disabled students, and he was involved in several engineering societies, Christian Campus Fellowship, and intramural sports. He studied in Mexico City, where he worked as a teaching assistant, as well as Madrid, Spain.

"Reeve exemplifies the very best that Georgia Tech and ECE have to offer," said Gary S. May, Steve W. Chaddick School Chair of ECE. "The breadth and depth of his contributions have greatly enriched us and will touch many others in the years to come. We wish him every success for his future." |

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Editor: Jackie Nemeth
Editorial Staff: Jennifer Greene, Marci Reed

Designer: Diana Fouts
Photography: Harvard University Media Relations, LeShelle May, Gary Meek Photography, Nancy Clement, Jill Parks, Rick Robinson



School of Electrical and Computer Engineering
Georgia Institute of Technology
777 Atlantic Drive NW
Atlanta, GA 30332-0250 USA

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