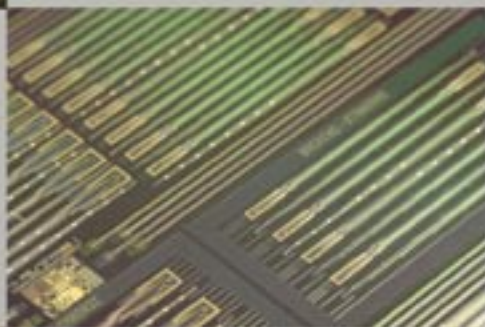


THE UNIVERSITY OF MICHIGAN

EECS News

Fall/Winter 2004
Department of
Electrical Engineering
and Computer Science



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A Message from the Chair



Our undergraduates are back and the crispness of fall is beginning to fill the air! Over the summer period, much was accomplished here in EECS. Our faculty and graduate students worked hard at their cutting-edge research, impacting the full spectrum of electrical engineering and computer science. Our new Computer Science and Engineering Building is taking shape, with the steelwork finished and full enclosure scheduled by winter. Plans for a \$30M expansion to our cleanroom facility are nearly finalized and are scheduled to go to the Regents this fall for approval. Tony England and his EECS Renovation Committee completed their preliminary plan for renovations to the existing building, and we now are in the process of selecting an architect for that project. The EECS Internal Review Committee, under the leadership of Farnam Jahanian, completed their report, in preparation for an external review of the department that will take place in November. In addition, our two new Associate Chairs, Martha Pollack (CSE) and Brian Gilchrist (ECE), are running at full speed. I am pleased to have such terrific colleagues. See page 8 for photos and brief bios of Martha and Brian. Overall, this has been a busy summer!

As I mentioned in our last Newsletter, EECS has lost quite a number of faculty due to retirements and moves of faculty to other institutions to accept administrative positions. As a result, we will be launching a larger than usual faculty recruiting effort this year. In Computer Science and Engineering we have an open search, but are emphasizing CS theory, programming languages, databases, security, and robotics. In Electrical and Computer Engineering we also have an open search, but with a focus on nanoscience and modern areas of electromagnetics. I am confident in our ability to recruit the “cream of the crop,” so a year from now we will be excited to tell you who has joined EECS at Michigan!

In this issue you are invited to read about the research of two of our most inspiring faculty: Tony England and Elliot Soloway. Tony works in

the area of microwave remote sensing, whereas Elliot is developing handheld computing as a new educational paradigm for the middle school classroom. You will also gain some flavor for our many active student groups, in particular Eta Kappa Nu, the ACM Programming Team, and our new Amateur Radio Club. You will notice that the Radio Club is soliciting your support. There also are other ways that you can give financially to the Department. The tear-out in this Newsletter will enable you to contribute to an area of your choice. You will be pleased to know that we are emphasizing student programs. For example, we are launching a major initiative to upgrade our instructional laboratories. If you are an employee of a company that produces test and measurement equipment, or computers, we invite you to contact us. The EECS Alumni Society also is eager to have your support for its worthwhile programs.

By the time you read this column, EECS will be in the midst of Homecoming Weekend, interacting with many alumni and friends of the department. We truly look forward to this time of year to welcome you back to Ann Arbor, become reacquainted, and spend an afternoon in the Big House. The enthusiasm is infectious. Go Blue!

A handwritten signature in black ink that reads "Dave".

David C. Munson, Jr.

“We are able to build better instruments than have been built before.”

Tony England: From Space to Earth and Back



If you watched the film Apollo 13, you have already seen Professor Tony England at work. England was the real-life NASA astronaut who wrote the procedure to build the CO₂ scrubber that enabled the astronauts to return safely to Earth. For their extraordinary

work, England and the rest of the team received the President’s Medal of Freedom in 1970—the same year England received his Ph.D. in Geophysics from the Massachusetts Institute of Technology (MIT). While Tony’s opportunity to fly to the Moon was lost when Apollos 18 through 20 were cancelled, he did fly on Space Shuttle Challenger in the summer of 1985. His mission focused upon solar astronomy and plasma physics.

Today, England heads U-M’s Microwave Geophysics Group, which does geophysical remote sensing. His research interests have included: ground probing radar; radar studies of temperate and polar glaciers in Alaska and Antarctica; and microwave studies of snow, ice, freezing soils, and planetary regoliths (layers of dust usually caused by meteor impact). His current research concerns the use of satellite microwave brightness as feedback for temporal models of land surface hydrology. England’s group generates land-surface models to illustrate the processes that are occurring in the soil, vegetation, or snow. The information contained in these models is then used by others to generate weather and climate models, which may ultimately predict patterns of global warming.

“Our group is one of the first to start generating land-surface process models that can be linked to satellite observations,” England says. “We also make the field instruments needed to calibrate and validate the models. The cost of having these instruments designed and built by industry is prohibitive, and, by incorporating new technology ourselves, we are able to build better instruments than have been built before.” England’s research group has built a set of instruments for the University of Florida and is now building a set for Iowa State University.

England recalls that the first instrument he used back in the ‘70s, an L-band radiometer (1.4 GHz), was the engineering prototype for an instrument that flew on Skylab. England says, “Radiometers back then were very large, close to 200 pounds, but now the entire receiver fits in the palm of my hand.”

“Back in the 1970s we began to understand that the earth sciences were linked together,” England says. “You couldn’t understand global climate—and the human effect on climate—without considering the atmosphere, the ocean, and the water cycle because they were all interrelated.” Yet England saw that hydrologists did not look at the water cycle in a global perspective, and he realized it was because they did not have the tools to do so. “If they had the tools to monitor the water cycle with a sensor, for example, then they could think more globally,” England explains.

England has long been interested in issues of hydrology, and in the 1970’s, when he was part of the US Geological Survey, he made his first trip to Alaska. Now, after 30 years of honing his instruments and techniques with remote sensing of the soil and vegetation in places like Michigan, North and South Dakota, and Oklahoma, England is back to focusing his attention on the arctic. Such work will improve our overall grasp of the hydrologic cycle and aid in determining whether the changes observed over the past century are part of the natural variability of the system or an indication of a changing climate.

“Not only is the arctic a more sensitive place, because it’s near the freezing or melting point, but global climate models often show that the arctic is where the warming would be the strongest, and where it will be most evident,” says Ed Kim, former Ph.D. student of Tony England, who is now with NASA Goddard Space Flight Center, Microwave Sensors & Hydrological Sciences Branches. Ed is continuing much of the same type of work he did at Michigan, microwave remote sensing, designing new microwave instruments, building prototypes, using them in field experiments, and analyzing the data from experiments.

England worked with two other graduate students doing research in land-surface sensing, and both have landed in non-EECS departments. He explains, “It has often been the way that technology moves on the feet of people that know the technology. As the



Radiometers on the boom of the truck viewing the Arctic shrub site to the west side of the lane. On the east side of the lane is the micrometeorological station at the nearby tussock tundra site. Brooks Range is in the background.

technology matures, it moves to the application side, and that's what's happening with remote sensing hydrology. With my group, we're advancing the technology of radiometry, but we're also developing the applications so that the technology has importance to agriculture and hydrology, and civil and environmental engineering. As a consequence, many of the people being trained in groups like mine are finding faculty positions in the applications departments."

One of his students, Jasmeet Judge, is now an assistant professor at the University of Florida in the department of Agricultural and Biological Engineering. Another, Brian Hornbuckle, is assistant professor in the departments of Agronomy, and Electrical and Computer Engineering. Both are continuing the work of microwave remote sensing with highly interdisciplinary groups, and have high regard not only for their training under England, but also for his patient and compassionate mentoring.

Judge says, "I really appreciate Tony's tailored mentoring style. He tries to understand the person and see what that person really needs. He doesn't push people. Michigan attracts high-quality students, and this method is very good for them." Judge plans to pass on the excellent mentoring received from England by starting a mentoring program of her own. She said, "I've now realized that a student/faculty mentoring relationship is lifelong."

Hornbuckle said "Tony is a pure gentleman. One of the biggest impacts he's had on my career is that he does things the right way - he's always thinking of the other person, and is very accommodating. He has such high integrity and he won't compromise on things that matter.

England combines his love for science, his experiences at NASA, and his concern for teaching, with area K-12 children. He has given hundreds of speeches to school children about careers in science and education. "My message," says England, "is that science and engineering can be exciting, and that research universities even offer opportunities for students to work on instruments that could fly into space. They begin to see the university as a place to do things and experience things and not just as a place to go to read books. All science and engineering is a physical experience. It's an adventure."

Most recently, England has agreed to serve in the capacity of Associate Dean of Academic Affairs for the College of Engineering. Administrative life is not new to him, having already served as an Associate Dean at the Rackham Graduate School. "I'm finding the work in the College fascinating. You always hope you can make things better."

Space will be the next frontier for microwave remote sensing. In fact, NASA is currently building a new satellite called Hydros to be launched in 2011. European Space Agency (ESA) hopes to be first with such a system, their Soil Moisture Ocean Salinity (SMOS) mission to be launched in 2007. England and fellow researchers helped lay the groundwork for such a remote-sensing satellite systems several years ago through a project called HYDROSTAR, for which he was principal investigator. Through this project, England worked with others to coalesce the community of remote sensing researchers and the hydrologists, bringing him full circle with his life's work of bringing together all of the Earth Sciences, and bringing the future of his work back in space.

"All science and engineering is a physical experience. It's an adventure."

Taking the Future in Hand

With Digital Technology, Elliot Soloway Is Helping to Reshape K-12 Education



Teachers are continually amazed at the high level of learning—and enthusiasm—that occurs when handheld computers and Hi-CE software are introduced.

EECS Professor Elliot Soloway defies easy descriptions and simple categorization. To undergraduates, he is that rare specimen—a faculty person who encourages them to learn by doing. To graduate students, he is an inspiring mentor. To colleagues in the School of Education, he is a collaborator and innovator. To U-M technology transfer specialists, he is an entrepreneur. To classroom teachers, he is a champion of inquiry-based education and electronic learning tools. To K-12 students, he is the source of technology that makes learning both fun and exciting.

Although colleagues and students might be hard pressed to describe his multidimensional work in a simple phrase, Soloway himself is absolutely clear about his mission: “My challenge for the past 20 years has been to identify opportunities to give children the learning skills they need to succeed not only in science, but in life. Technology can help do that. Technology equals opportunity.”

The Synergy of Collaboration

In the early 1980s, as a junior faculty member at Yale University, Soloway focused intently on artificial intelligence. His move to the University of Michigan in 1988, which coincided with the birth of his second child, changed everything. Soloway had what he describes as an epiphany: “It dawned on me that I could focus my research on using technology to help make kids smarter. I became

interested in educational software, and knew I had to team up with someone in education.”

That someone turned out to be U-M Professor of Education Phyllis Blumenfeld. Gradually, the circle of research collaborators expanded to include Professors Joseph Krajcik, a specialist in science education, and Ronald Marx, an educational psychologist, along with other experts in public health, education and science. “I found a very open spirit for collaboration here at Michigan,” said Soloway. “We’ve really flourished in this environment.” Together, they founded the Center for Highly Interactive Computing and Education, also known as Hi-CE. Hi-CE began developing curriculum materials, software and teacher training modules designed to promote inquiry-based learning in the classroom. In the past 15 years, Hi-CE has generated over \$20 million in research funding.

According to Soloway, the power of the group lies in its synergy. “Together, we understand what needs to happen in the classroom,” he says. “Individually, we understand only a little piece of it. My part is trying to figure out the technology.”

Starting a Sea Change in Education

One of the most pressing questions for Hi-CE was how to provide K-12 students with broad access to technology. The solution was simple but radical: give each student a handheld computer and a suite of appropriate software, and provide their teachers with training, management tools and ongoing classroom support.

Soloway is a staunch advocate of what he calls the handheld-centric classroom. “Education underwent a sea change when every kid finally had access to paper books,” he asserts. “Education will change again when every kid has a computer. Handhelds can do 90 percent of what a computer can do for a fraction of the cost. One of the beautiful things about this technology is that it offers different learning opportunities for each child.”

The theory has been tested over time. Soloway and his students have developed more than half a dozen handheld software programs during the past ten years, for everything from word processing to concept mapping and off-line web page viewing, nearly all of them available as “freeware” downloads. Then, working closely with students and teachers in classroom settings, the U-M teams continue to refine the software.

“Technology equals opportunity.”



One of the people involved in this outreach is Ph.D. student Katy Luchini Colbry. After working with a team of undergraduates to develop several pieces of software, Luchini Colbry spent a year refining the products *in situ* with two eighth grade science classes. “One of the really unique things that drew me to Elliot’s group is that you have this interplay between building the software, educational psychology research from the School of Education, and then real classroom experience,” she says. “That was a combination I couldn’t get from any other graduate program.”

Recently graduated MS student Adam Wieczorek has also appreciated the opportunities that have come to him through working with Soloway. “The research I’ve done for the past three years is awesome. I’ve flown all over the country. I’ve given demos. I’ve done all sorts of great things that many graduate students don’t get to do – and that’s been wonderful.”

Teachers also benefit from ongoing collaboration and support, which includes workshops and one-on-one consulting. Some of them, like elementary school teacher Janine Kopera, have continued their working relationship with Soloway by co-authoring publications, contributing curriculum materials and serving as Hi-CE representatives at major conferences. Kopera believes that “Dr. Soloway’s true passion and vision for the future are remarkable gifts for computer science and education. His heart and soul go into his work. He puts his research into action each day as he communicates, creates and contributes to make a real difference in the world. He shows how science and technology are foundations for children to learn about the entire world around them.”

The Proof is in the Learning

Every week, Soloway and his student teams observe the fruits of their labors. Soloway himself spends a considerable amount of time in Detroit public schools. “We work with 28 middle schools

and about 10,000 kids,” he notes. “In Detroit, you see the pain, you see the challenges, you see the successes with great clarity. There is a tremendous digital divide. The kids in Detroit don’t have technology in the schools or at home.”

But all that changes when handheld computers are introduced. The students—“digital age kids,” as Soloway likes to refer to them—become eager learners. And teachers report that all students seem to benefit. Elementary school teacher Monique Shorr reports, “Using this technology has made my students very motivated to learn. By the end of our school year, most pupils are researching, reading and writing way above their grade level.” As a result of this technology, “students are better prepared for what lies ahead in college and in the business world.”

Technology as Opportunity

In 1999, with the help of the U-M Office of Technology Transfer, Soloway and his Hi-CE colleagues launched GoKnow, Inc., a company whose mission is to provide teachers and students with effective, easy-to-use, scientifically validated curriculum materials and resources for handheld computers. “We’re not selling computers,” Soloway says, “we’re selling educational solutions that involve technology.” The word is spreading. Shorr states that “Elliot and his knowledgeable support staff at Hi-CE and GoKnow have paved the way for handheld users in the education arena. When I go to seminars and conferences across the nation I constantly hear about the programs we helped to develop, all of which originated through Elliot. Everyone is tapping into the handheld computer and the suite software programs developed by Elliot and Hi-CE.”

But despite the lure of commercialization, Soloway—an award-winning teacher—has no intention of trading academia for business. For him, the work will always be focused on students. “Technology isn’t about gadgets, it’s about opportunity,” he insists. “So when I see these handhelds, I don’t see technology. I see opportunity for all students. The opportunity to write, to think, to share, to learn, and to succeed.”

“Dr. Soloway’s true passion and vision for the future are remarkable gifts for computer science and education.”

As the Arthur F. Thurnau Professor of Electrical Engineering and Computer Science, Elliot Soloway is a computer scientist who has devoted his professional life to improving K-12 science education through the use of technology. One of the major distribution channels for his learning tools is GoKnow, Inc., a company he co-founded with colleagues from the School of Education.



New Faculty



Petar Momcilovic
Assistant Professor
B.S./M.S.,
Engineering, Moscow
Power Engineering
Institute
M.S. and Ph.D.,
Electrical Engineering,
Columbia University

Petar spent the past year in the Department of Mathematical Sciences at IBM T.J. Watson Research Center, Yorktown Heights, NY. Momcilovic's research interests are in the areas of communication networks and mathematical aspects of Information Technology; his interests span the systems area in the ECE division.



Martin J. Strauss
Assistant Professor
A.B., Mathematics,
Columbia University
Ph.D., Mathematics,
Rutgers University

Martin comes to Michigan from AT&T Laboratories, where he was a principal Technical Staff Member in the Internet and Network Systems Research Center. He has a dual appointment in EECS and Mathematics. Martin's research interests are in the areas of: randomized and approximation algorithms, especially for massive data sets and problems from harmonic analysis; cryptography and security; complexity theory. He joins the theory group in the CSE division.

Two New Associate Chairs

Martha E. Pollack
Associate Chair, CSE Division



Pollack is a member of the Artificial Intelligence Laboratory. She received her bachelor's degree in linguistics from Dartmouth College, and her MSE and PhD degrees in Computer and Information Science from the University of Pennsylvania.

Pollack came to the University of Michigan from the University of Pittsburgh, where she was Professor of Computer Science and Director of the Intelligent Systems Program. Prior to that, she was on the research staff at SRI International. She is a fellow of the American Association for Artificial Intelligence and editor-in-chief of the *Journal of Artificial Intelligence Research*.

Pollack conducts research in the areas of plan management and intelligent cognitive orthotics. She recently testified before the U.S. Senate Committee on Aging regarding her work in this area and its relevance to the aging population.

Pollack has been an advocate for improving diversity within the department, particularly through improving the recruitment and retention of women students and faculty. She is a member of the U-M Committee on Science and Technology Recruiting to Improve Diversity and Excellence (STRIDE), and is the faculty advisor to the newly-formed student society, Girls in EECS (GEECS).



Brian Gilchrist
Associate Chair, ECE
Division

Gilchrist is a member of the EECS Radiation Laboratory, the Space Physics Research Laboratory in the Atmospheric, Oceanic, and Space Sciences Department, and the Plasmadynamics & Electric Propulsion

Laboratory in the Department of Aerospace Engineering. He received his BS and MS degrees in electrical engineering from the University of Illinois, U-C, and his PhD degree in electrical engineering from Stanford University.

Gilchrist specializes in plasma electrodynamics and the development of associated sensor systems with emphasis on space plasmas and applications. He is in the forefront of efforts to develop space tether technology for scientific and applied purposes.

Gilchrist has been very involved in student directed projects within the department and the College of Engineering, including the Student Space Systems Fabrication Laboratory (S³FL) and the award-winning Solar Car group. Both student teams will typically involve numbers approaching 100 interdisciplinary students dedicated toward building and flying space hardware or racing high-tech solar cars in 2,000 mile long races in the U.S. and Australia. Gilchrist remarks that "these kinds of opportunities really help provide practical experience for the students and puts meaning behind their classroom work."

Honors and Awards

2004 U-M Faculty Recognition Award

Ted Norris

Recognition Award for Outstanding Research Mentorship in the Undergraduate Research Opportunity Program (UROP)

Tony England
Dragomir Radev

College Professorship

Scott A. Mahlke has been appointed the Morris Wellman Faculty Development Assistant Professor.

University Professorship



Pallab Bhattacharya has been appointed Charles M. Vest Distinguished University Professor of Electrical Engineering and Computer Science.

Optical Society of America Fellow

Stephen Rand, "For the invention of novel solid-state lasers, such as diamond lasers, mode-locked upconversion lasers and laser phosphors.

NAC

A meeting of the National Advisory Committee took place May 14, 2004, and was attended by Mark Abel (Intel), Nicolaos Alexopoulos (Dean, UC-Irvine), Bill Sanders (UIUC), Sandip Tiwari (Cornell), and U-M members Dave Munson (Chair), John Laird (CSE Assoc. Chair), Martha Pollack and Tony England (ECE Assoc. Chair). Three members were absent, and new members of the committee are still being added.

The committee made recommendations regarding proposed changes in the First Year Program for College of Engineering undergraduate students, discussed departmental priorities such as upgrading the instructional labs and how to fund such initiatives, and discussed alumni relations with the current President and Past President of the alumni society, Steve Schwartz and Bill Becher. An inventory of the current instructional labs is underway.

Amateur Radio Club is active again!



Left: Christopher Galbraith, Noah Liebman, Matthew Rever, Lora Schulwitz

With the enthusiastic work of a team of graduate and undergraduate EECS students, the University of Michigan Amateur Radio Club is once again up and running. The club was founded in 1914. Located on the fourth floor of the EECS building, the club is using its previous call sign, W8UM.

Recently, the club hosted an open house at the new club station. Several EECS (and club) alumni attended including Bill Becher, Jim Besancon, Steve Culp, and former club president Mark Travaglini. Bill, past Alumni Society president and retired adjunct EECS professor, has been one of the club's most passionate supporters. Jim, Steve, and Mark are all EECS alumni and have been very active club members ever since their undergraduate days. Also present was an enthusiastic group of current University students, faculty, staff, alumni, and local amateur radio club representatives. The happy group of radio men and women spent several hours admiring the new station, discussing plans for new antenna installations, and reminiscing about all the fun the club has provided throughout the years.

"We've been making some early evening 40m contacts lately and the station is getting good signal and audio reports," says graduate student Chris Galbraith, club president, "But there's much more to do, including antenna work and the acquisition of some good modern equipment." Near-future plans include installation of a short tower and a rotatable antenna for 20m through 10m, the search for a more modern VHF rig, a membership drive, and an FCC license course for new hams.

Note: If you would like to donate equipment to the club, please contact Catharine June at cmsj@umich.edu, or (734) 936-2965.

New and Notable

CS Program Receives ABET Accreditation

We now have ABET accreditation for both the CS-ENG and the CS-LS&A programs, making all four of our undergraduate programs fully accredited.

Spotlight on HKN: 100 Years of Excellence, Service, and Fun



Officers for Fall 2004

Back(photo left to right): Andrew Myrick, Scott Hanson (President), Nick Salciccioli, Cody Hartwig, Joe Fairchild, Adam Knapp.
Front: Aaron Meyers, Qing Shen, Andy Brown

The EECS Department is fortunate to have its own chapter of Eta Kappa Nu, and proud of its recent award for excellence in chapter activities. Founded in 1904, this International Honor Society was established not merely to reward academic excellence, but to train its members to be better professionals, and to contribute to the society in which they work and live. Our own Beta Epsilon chapter, founded in 1937, continues this tradition of excellence and service to others.

One of the regular activities of HKN are the biweekly meetings, to which corporate speakers are invited. Many different companies are represented, including Microsoft, AMD, Lockheed Martin, Micron, Apple, IBM, Daimler-Chrysler, Whirlpool, Convergys, National Instruments, Cummins, NSA, Keithley Instruments, and MIT Lincoln Labs. Students get the opportunity not only to learn about these companies, but to be recruited by them. With so many of our HKN students going to work for these companies, the relationship is very tight. Several of these companies are also financial sponsors of HKN.

Some of the projects HKN members can participate in include cooking dinner at Ronald McDonald House, building a house with Habitat for Humanity, maintaining the arboretum, tutoring, and neighborhood senior services. Individual members reach out and help in a wide variety of projects in the community, particularly on North Campus Service Day. Andy Brown, Projects Chair, said the students participate "at almost any volunteering opportunity you can think of in Ann Arbor and the surrounding area. There is even one member whose band played at several charity

fundraisers." Members also keep the donut stand staffed, to the delight of fellow students, faculty, and staff.

HKN members have fun in their service activities, and have fun overall! They get together socially for euchre tournaments, video game night, rock 'n bowl night, Superbowl, intramural sports, and other activities.

Prof. Dennis Sylvester, faculty advisor to HKN, and an officer himself when he was a student at U-M, said he "built long-lasting friendships (many to this day)," while a member of HKN. "Being an officer helped me get used to public speaking and gave me experience taking on leadership roles."

Scott Hanson, president for the Fall term, appreciates the small community atmosphere of HKN. It has been "a really good way for me to focus my efforts on something that will help the university community. Without HKN, it would have been difficult to become involved or take a leadership role."

Cody Hartwig agrees with the sense of community that HKN fosters. He said before he joined HKN, "walking through the EECS building was like being in a room full of strangers. However, since joining HKN, I can scarcely walk across campus without seeing people I know." Cody has found HKN members to be very helpful to him, and says "I hope that I am helpful to other members in the same way."

Programming Contest

U-M Programming Team Competes in Prague



From Left: Andrew Nierman, Jarrod Roy, Nuttapong Chentanez, Galen Elias, Professor Kevin Compton, Jim McCann

Three EECS students earned the right to compete in the 28th Annual ACM [Association for Computing Machinery] International Collegiate Programming Contest World Finals. 3,150 teams from 1,411 universities in 75 countries competed at 127 sites around the world to earn the right to participate in the competition.

The team that participated in the World Finals consisted of Nuttapong Chentanez, Galen Elias, and Jim McCann. Two assistant coaches, graduate students Andrew Nierman and Jarrod Roy, also made the trip with faculty coach Kevin Compton, an associate professor specializing in Theory of Computation. U-M ranked 27th out of 73 international teams.

The same team, along with other students, are already gearing up for the next regional competition, which will be held November 12-13, 2004. Jarrod Roy wrote a system to help the students prepare for the competition. It contains a database, emails the results to the students, and has a web page similar to the one used for the regionals, but its best feature is that it will automatically score the programs in real time. Compton said, "it is a beautiful system, and is a huge advantage to us." For Roy, the best part of coaching was "seeing the team do well and knowing I helped somewhere along the line." He feels that, aside from the talent of the team members, the team's success came from additional time devoted to practice, and said he is "glad that my grading programs have made practicing easier and more feasible."

To give you an idea of the complexity of the problems, in the regional competition, more than half the teams did not do any of the problems. According to the organizers of the event, students are challenged "to tackle a semester's worth of computer programming in one morning in a battle of logic, strategy, and mental endurance."

Compton states that the competition is great training for the students, but that the expectation for students coming out of Michigan is for them to eventually move into system design and management positions. Michigan trains its students not only to be expert programmers, but to work in teams. Compton credits part of the success of Chentanez, Elias, and McCann to their ability to work together as they prepared for the competition.

Next year's finals will be held April 3-7, 2005 in Shanghai. The competition is sponsored by IBM, who stated that they are "dedicated to developing the next generation of IT leaders." Proctor & Gamble and Cisco supported the EECS ACM student chapter this past year, and some of these funds were used to finance expenses related to the regional and world competitions.

Stay on top of the competition at <http://icpc.baylor.edu/icpc/regionals/default.html>, where we are told that "awards, prizes, scholarships, and bragging rights will be at stake for some of the world's finest university students of the computing sciences and engineering."

Student Awards

Intel Foundation PhD Fellowship Award

Aseem Agarwal
Kevin Buell
Sunghyun Park
Ashish Srivastava

EECS Outstanding Graduate Student Instructor

Mike Geiger
Doug MacKay

EECS Outstanding Instructional Aide

(awarded to undergraduate students)

Travis Hobrla
Andrew Gastwirth

University of Michigan Distinguished Dissertation Award

Victor Perlin

Rackham School of Graduate Studies, Barbour Scholarship

Sahika Genc

Rackham School of Graduate Studies, Predoctoral Fellowships

Bryan (Juo-Jung) Hung
Himanshu Kaul
Eng Swee Siah
Jose Costa

Focus on our Alumni: Avi Rubin (BS, CS '89; MSE, CSE '91; PhD, CSE '94)

Rubin Votes NO on E-voting machines



But will his vote be accurately counted, and can it be verified? These are the issues that have led Avi, a professor at Johns Hopkins University, and technical director of the Information Security Institute, to give much of his time this past year to researching and publicizing his work on electronic voting machines.

It seems to take most of his time. Avi gets a minimum of 4-5 press calls daily, and often many more than that. In one recent 4-week period, he was on national TV each week, and on CSpan twice with congressional hearings. He also gets frequent newspaper and radio attention. With an estimated 30% of all votes being tallied with these machines in the next election, this attention is well-placed.

The media blitz began July 2003, when Avi began to express his reservations about the security of the electronic voting system in a paper he published with three colleagues, called, "Analysis of an Electronic Voting System" (subsequently published in *IEEE Symposium on Security and Privacy*, May 2004). The paper states that "this voting system is far below even the most minimal security standards applicable in other contexts. We identify several problems including unauthorized privilege escalation, incorrect use of cryptography, vulnerabilities to network threats, and poor software development processes. We show that voters, without any insider privileges, can cast unlimited votes without being detected by any mechanisms within the voting terminal software." The weakness of the system didn't end there. "The insider threat is also quite considerable, showing that not only can an insider, such as a poll worker, modify the votes, but that insiders can also violate voter privacy and match votes with the voters who cast them."

Avi feels that the only reasonable option is to have a verifiable audit trail, so that in the case of any questions, the individual votes can be retrieved and tallied by hand. Some states, such as Missouri, require this safeguard, but many do not. And with the election coming up so quickly, there is little likelihood of major changes or improvements in the systems by the time voters will cast their votes for the next President of the United States. Unfortunately, the most widespread electronic voting machines are also those with the most basic flaws.

"The process of counting votes should be independent from the process of voters making their choices, and they should be done on different machines," said Rubin. With the simple alteration of having the voting machine print out a voter's ballot when the choices have been made, to be counted either optically or by hand, Rubin would feel comfortable having these new e-voting machines in place.

The public likes these machines. Avi explains, "as a voter, it's a more pleasant experience than using the paper ballots. Also, I think people who don't know much about computers have an inherent trust in a machine, thinking that because it's a computer it's not going to make a mistake. That's the opposite intuition to those people who work a lot with computers."

Avi spoke before the House Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, and more recently has spoken to the House Committee on Government Reform. He is able to point to three additional major studies by computer security experts who support his findings, and demonstrate additional problems, yet he still finds himself being attacked by companies and individuals who don't want to hear of the problems. The public is interested, however. When Avi wrote an article about his experience as an election judge (poll worker), using an e-voting machine, he received more than 40,000 hits on the web page that included the article.

We can be sure that the machines in use will be safer, and more tamper-proof than they would have been without Avi's steady and impassioned efforts to reveal their weaknesses.

One might expect that on the heels of e-voting would come voting over the internet. It's an attractive thought for busy professionals and homemakers - but that seems to be a ways off. Rubin was asked by the Pentagon to be part of a team to evaluate a \$22M project that would have enabled voting over the internet. On the basis of the team's recommendation, the project was shut down.

Avi received all of his undergraduate and graduate degrees at U-M, and left Ann Arbor with his new wife, Ann Wolok Rubin, who received her undergraduate degree from U-M in Communications before getting her law degree. Rubin is true blue. When he graduated and went

into industry, he positioned himself to be the PhD recruiter for U-M at AT&T Labs. This allowed him to come back to U-M from time to time and go to football games. "I have three children and they all wear Michigan stuff at the games. I like to dress up my young twins in identical U-M garb and go to the ESPN zone – and run into all the other Michigan fans."

For a selection of photographs taken at the event, please go to: <https://www.eecs.umich.edu/eecs/alumnisociety/MTT-EECS-Alumni-OnTheWeb/index.htm>

EECS Alums Gather at IMS'04



EECS faculty and alumni had a great time gathering at the IEEE International Microwave Symposium (IMS) in Fort Worth, TX this past June 8, 2004. This year's conference was called, "Microwave Frontiers," and many of those at the meeting have been at the frontier of microwave research for years.

"The EECS Department has had a great influence on the MTT [IEEE Microwave Theory and Techniques] Society for many years," said U-M professor George Haddad, who enjoyed seeing many of his colleagues and past students at the event. From administrative positions in MTT, to receiving MTT awards, EECS has been very well represented from the perspective of both faculty and students. Some of those who attended the event included U-M faculty: George Haddad, Gabriel Rebeiz, Linda Katehi (now Dean at Purdue), Jack East, Amir Mortazawi, and U-M alumni who are now faculty at several other institutions. Others came for the reunion alone – just to visit with everyone. Paul Bauhahn traveled with his wife from Minnesota, and Bill Schroeder came from the east coast. Several alumni from Korea and Taiwan attended.

Chuck Krumm, previously at Hughes, Raytheon, and Conexant, will have his hand in organizing the next reunion. He said it was a "great pleasure to be reunited with so many former friends, students and colleagues. While the success of the individuals in this group was truly impressive, their collective success is clearly attributable to the outstanding education they received during their years at Michigan. It was exciting as well to meet the more recent EECS graduates

and to learn that they are fully prepared to carry on the tradition of Michigan engineering accomplishments."

Bob Trew, ECE Department Chair at North Carolina State University and current MTT president, enjoyed seeing not only his past graduate students, including Mike Golio and Alf Riddle, but the new U-M grads. "U-M must have, by far, the single largest contingent of people attend the IMS, which is really saying something about the quality of the EECS program," said Trew.

One of these newer grads mentioned by Bob and Chuck is Rhonda Franklin Drayton, assistant professor at the University of Minnesota. "I had a great time seeing old classmates and catching up with them and their lives," said Rhonda. "I feel that Michigan did a good job preparing me for a faculty job, especially in the areas of research and supervision of others."

Including spouses, friends, and special guests, there were approximately 80 individuals at the reunion. Trew, one of the on-site organizers, gives special thanks to Dr. Jack East, and others, who had their hand in organizing the event. The EECS Alumni Society is fortunate to have Trew and Krumm continuing their great contributions to the department in their roles as board members on the EECS Alumni Society.

The event was so successful, it has been made into an annual MTT event. If you are in Long Beach, CA next June, be sure to stop by!

Alumni Society President's Message

Every generation of Michigan Engineers has something to say about how the campus has changed. During my time at Michigan, we had freshman classes on Central Campus, only to soon move into the Dow building on the rapidly growing North Campus. For those graduates who took the tour during homecoming, I'm sure you were surprised at how things continue to change. Our department will soon have a new addition on the northwest corner of the 'North Diag'. Surely this will become a source of fond memories for EECS graduates of the future.

Over the 109 years that we've had a department, in one form or another, a lot has changed. I'm always surprised at how we've grown. Most know that EECS is the largest department of Michigan's College of Engineering, but the numbers are truly impressive.

Did you know that this past year nearly 500 hundred new undergraduate and 288 graduates students matriculated? It hasn't always been this many, but over the years it adds up. More than 20,000 EECS graduates have passed through halls of the department, and most are still helping shape society today! I run into them every day. And in a way that's become a problem, and a challenge, for me.

Don't get me wrong, I love meeting new and old EECS grads. The problem is that every time I hear a friend or acquaintance had graduated with a degree in EECS I ask them if they're a member of the EECS Department Alumni Society. Often the answer is "no". Then I ask if they've even heard of the society, and again it's often "no".

There are a lot of grads and the society is young so this isn't too surprising. But we need to change the secret nature of this society! When I told my wife, an EECS grad from '89, about my new role as president of the society, she was surprised to hear there even was something just for us EECS grads! (OK, that one was my fault.)



Steven R. Schwartz
EECS Alumni
Society President

So the real challenge is changing that "no" into "YES." And here's my challenge for you – First of all, if you are reading this, are you a member? It's simple to join and stay connected and find old friends. Simply visit: <https://www.eecs.umich.edu/eecs/alumnisociety/membership.html>.

Or better yet, show off our Michigan leadership and type "EECS Alumni Society" on Google and click "I'm feeling Lucky". (Larry Page, Google's Co-founder and President, is a U-M EECS grad...so maybe it's more than luck.)

Now try a test: see if you can find three friends whom you know are EECS grads. Have they heard of the society? Are they members? Point them in the right direction! Let's make sure everyone stays connected both to the school and to each other. After all, some of the best years of our life were here, and by staying involved, we'll ensure that those just beginning their journey through EECS see that it doesn't end after four (or more!) years in Ann Arbor.

The mission of the EECS Alumni Society is to build a sense of community among all EECS grads, present and future. There are many ways you can help, whether through contributing your time or your financial support. Please contact Steve Schwartz, society president, to discuss opportunities (stevschw@umich.edu, 734-717-6224).

Join the EECS Alumni Society, and let it work for you!

Many of your friends and colleagues have already signed up on our Alumni Membership pages. Find out where they are, and what they're doing at www.eecs.umich.edu/eecs/alumnisociety. Just click on Membership, and search by Year Graduated, State, Last Name, or a variety of other ways.

Stay tuned as we finalize our new on-line Mentoring service, where alumni will be able to help and advise current EECS students, and students can interact with EECS alumni who are working in fields that interest them.

1940's

Russ Youngdahl (BS, EE '45) retired as Executive Vice President of Consumers Energy and later as President and COO of the Long Island Lighting Company. Currently, he serves as Supervisor of Jackson's Summit Township and enjoys this foray into grass roots politics. He and his wife, Mary (BA '46), live in Jackson, MI. Email: ryoungdahl@aol.com



Ernest S. Kuh (BS, EE '49), received his SM in EE from MIT in 1950, and his PhD in EE from Stanford University in 1952. He worked for Bell Telephone before returning to California as a faculty member at UC-Berkeley. He went on to serve as Chair of the EECS department, Dean of the College of Engineering,

and is currently the William S. Floyd Emeritus Professor in Engineering. He is a member of the National Academy of Engineering, and has served on many significant academic and professional committees. He was president of the IEEE Circuits and Systems Society, is co-author or co-editor of 6 books, and has authored over 200 papers in circuits, electronics, networks, systems, and computer-aided design. Dr. Kuh is the recipient of the IEEE Education Medal, ASEE Lamme Medal, and the EDA Consortium Kaufman Award, as well as numerous other awards and high honors. He was a member of a visiting review committee for the U-M EECS department in 1985, and is currently preparing an Oral History for the Bancroft Library of UC-Berkeley.

1950's

Robert N. Clark (BSE, EE '50, MSE, EE '51)



joined Honeywell, Inc., Aeronautical Division, in Minneapolis as a Research Engineer. In 1957 he joined the Electrical Engineering faculty at the U of

Washington and developed courses in automatic control engineering and nonlinear systems. His first text book, *Introduction to Automatic Control*, (Wiley, 1962), was adopted by many leading universities. Following his promotion to full professor in 1966, Professor Clark spent two years at Stanford University where he wrote his Ph.D. dissertation on the stability of limit cycle oscillations in satellite attitude control systems. Since 1987, he has had a joint appointment with the Aeronautics and Astronautics department. This joint appointment has facilitated the development of inter-departmental courses in automatic control theory, design, and laboratory facilities. His second text book, *Control System Dynamics*, (Cambridge University Press), was published in 1996. In 2003 he completed his autobiography, *An American Family*.

1960's

Conrad L. Macina (BSE, EE '69) says, "after stints in telecom, banking, brokerage and retail, I've landed in pharmaceuticals. I'm working for Pfizer in Morris Plains, NJ, where I'm responsible for the Data Protection Team. We handle backups, restores and disaster recovery for about 3,000 computer systems in the NY Metro area and Memphis, TN. Our greatest challenge is probably optimization: If we optimize backup performance, restore performance suffers, and when a restore is required it's required NOW! On the other hand, if we optimize for restores our "daily" backups would take 48 hours."

1980's

Julia Jackson (BSE, CE 1986) is a senior programmer/analyst at the Rackham Graduate School, U-M. Prior to this, she was a technical specialist at the Ann Arbor Public Schools. She has traveled to almost all 50 states, including a long driving trip to Alaska this past summer.



Brian Long, (MSE, CE '88) is a Staff Software Engineer at Johnson Controls Inc., Building Controls Group, Milwaukee, WI. He is currently acting in a senior systems analyst/designer role in HVAC engineering, installation, and commissioning tools. He is also the Treasurer and former President of the University of Michigan Club of Milwaukee. He is enjoying his career and family - including wife Kathy, daughters

Editor's Note:

Prof. Clark has written remembrances of his time at Michigan. Please go to: www.eecs.umich.edu/eecs/alumnisociety and click on Stories.

Read what it was like for an engineering student at U-M during the years 1946-51.

Madeleine (9) and Carolyn (7), and collie Logan. If visiting the Milwaukee area, he invites you look them up - or contact our Alumni Club at <http://umclubs.com/milwaukee/>.

1990's

Tom Montgomery (MS, CICE '85; PhD, CSE '93)

enjoyed Ann Arbor so much, he kept returning for additional degrees after his B.S. in Physics. His PhD research was in distributed artificial intelligence. He settled in Plymouth with his wife and 2 kids, conveniently located between Ann Arbor and Dearborn, and is a Technical Expert at Ford Research. Tom's research at Ford has included model-based diagnostics, agent-based personalization, and data mining from text. Given the size of Ford and the amount of information available to mine, there is never a shortage of interesting problems. The biggest highlights of the year, however, were his weekend camping trips with his son Matthew (Boy Scouts), and his daughter Jessica (YMCA Adventure Guides).

Amy Raudenbush (MSE, EE '97) lives in New Bedford, MA with her husband. After 7 months teaching high school and middle school math, she returned to engineering, and currently works at MIT Lincoln Labs in the Optical Systems Engineering group. She designs and builds optical systems.

2000's

Rami Debouk (PhD, EE (Systems) '00) has a new position as Staff Research Engineer with the Electrical and Controls Integration Lab., GM R&D and Planning. He conducts research in the areas of fault tolerant architecture design and system safety. He was the recipient of a Best Paper Award at the 22nd International System Safety Conference, held this past August.

Nikiforos Stamatakis (BSE, CE '00) moved to Austin, TX upon graduation, where he worked as a software engineer in the Product Development Group for Dell. He developed patent-pending software used to manage the product testing process for all Dell hardware and software products. After two and a half years in Austin, he moved to New York City to work for the NFL as a software engineer. He has designed and developed a wide range of software, including a web application for NFL Officials, and credentialing software for Super Bowl 38.

Wyatt Galen Houtz (BSE, CE '02) currently works at Jackson National Life as a software engineer in the IT-Curian department, Lansing,



MI. He was an assistant photographer for the New York Times last year, and has just completed a Literary Fiction novel, titled "One Wing," which he hopes to publish in the near future.

In Memoriam

Class of 1930-39

Aiden M. Highley, Jr., '31, May 1, 2002
Mr. Sylvester F. Leahy, '31, June 27, 2003
William S. Thomas, '31, Oct. 1, 2003
Mr. Manuel Davis, '33, August 14, 2004
August B. Mundel, '34, Aug. 1, 2003
Mr. Allen E. Cleveland, '35, Oct. 16, 2003
Carlyle V. Parker, '36, Aug. 19, 2003
Guy Kleis, '37, Sept. 16, 2003
Otto R. Boll, '38, Aug. 25, 2003
Frederick S. Neumann, '38, Jan. 4, 2004
Carl C. Lehmann, '39, Dec. 19, 2003
J. Russell Pratt, '39, July 27, 2003
Frank Vandenberg, '39, April 25, 2004

Class of 1940-49

Vernon B. Honsinger, '40, June 8, 2003
George Ellis Gray, '42, Jan. 1, 2004
Floyd Duane Harrison, '42, June 11, 2002
Robert A. Edwards, '43, Sept. 19, 2003
Julian E. Bulley, '44, July 28, 2004
Mr. Alexander Kohan, '44, June 22, 2003
Richard C. Boyd, '47, Dec. 27, 2003
Mark Royal Fisher, Jr., '47, March 9, 2004
Herbert A. Martens, '47, May 24, 2003
William C. Meyer, '47, June 19, 2003
Neith James Pollard, '47, Oct. 29, 2003
William Davis Hooper III, '48, Sept. 17, 2002
Edward K. Kraybill, Ph.D., '48, June 22, 2004
John E. Wunch, '48, June 8, 2004
Mr. Kenneth H. Beaudry, '49, May 9, 2004
Mr. James R. Burroughs, '49, July 9, 2004
John O. G. Darrow, '49, March 10, 2004
Col. Edwin H. Halliwell, '49, May 22, 2002
Col. Joseph G. Perry, '49, Dec. 20, 2002
George H. Schroeder, '49, Jan. 21, 2004
Earl R. Velie, '49, June 4, 2004

Class of 1950-59

Edward G. Babiracki, '50, July 22, 2003
Mr. Michael S. Dayton, '50, July 8, 2003

We welcome our current EECS students to the alumni society! Please sign up now, and become a full-fledged alum in the near future!
www.eecs.umich.edu/eecs/alumnisociety/membership.html

Mr. M. James Fink, '50, April 20, 2004
 John Marion Hart, '50, Feb. 7, 2004
 Mr. Taketo Kawabata, '50, Nov. 26, 2003
 Walter E. Teska, '50, July 11, 2003
 Walter Dean Warstler, '50, Sept. 30, 2003
 Bruce R. Weinert, '50, June 23, 2003
 William R. Hoffmeyer, '51, March 29, 2004
 George N. Malina, '52, May 1, 2003
 Jose Fiesta Asuncion, '53, Feb. 12, 2004
 John W. Douglas, '54, July 22, 2004
 Kenneth L. Pekarek, '54, Feb. 28, 2003
 Edgar Glenn Swift, '54, Aug. 2, 2003
 David A. King, '56, July 1, 2003
 Dr. Jack E. Boers, '57, Oct. 8, 2003
 Oren L. Herring, Jr., '57, Oct. 28, 2002
 Mr. William D. Colmer, '58, Aug. 22, 2003
 Walter J. Sattler, '58, Dec. 7, 2003
 Robert A. Meyer, '59, Feb. 9, 2004
 Jay S. Millman, '59, Dec. 23, 2002

Class of 1960-69

Dr. Thomas A. Demassa, '60, Nov. 14, 2003
 Dr. Robert F. Rosin, '60, Feb. 11, 2003
 Mr. Arthur B. Carroll, '62, Dec. 13, 2003
 Joseph H. Webb, '62, April 29, 2004
 Dr. Alphonse A. Toppeto, '63, Oct. 25, 2003
 Dr. Vijai Kumar Tripathi, '64, May 1, 2004
 Joseph Mudar, '65, Dec. 8, 2003
 James E. Fenton, '66, Jan. 11, 2004
 Mr. Norman P. Hummon, '66, Aug. 17, 2002
 James T. Roy, '66, June 22, 2003

Class of 1970-79

Robert S. Nolan, '74, June 14, 2004
 Jorge M. Calle, '76, Feb. 23, 2004
 Gordon Thomas Spencer, '78, Jan. 26, 2004

Class of 1980-89

John L. Caton, '82, March 9, 2004
 James L. Mercado, '87, Aug. 15, 2003
 Kristin S. Yu, '88, May 1, 2004
 Marcus A. Torkelson, '89, June 11, 2003

Faculty Memorials

Charles W. McMullen (“Chuck”), Professor Emeritus of the Department of Electrical Engineering and Computer Science, died peacefully in Ann Arbor, Michigan on January 22, 2004. He became Associate Professor of Electrical Engineering at U-M in 1960, was promoted to the rank of full professor in 1963, and retired in 1986. During his years as a faculty member in the Department, he taught numerous courses in the areas of power systems and computer engineering. Professor McMullen received the Eta Kappa Nu Outstanding Teaching Award in 1971, and served as an undergraduate program advisor for many years. Professor McMullen’s professional career included positions at General Electric and Northwestern University.

He is survived by his wife, Dagny; by his daughter, Cherie Ann McMullen and her husband Michael DeLeeuw of Ann Arbor; and by his son, David of Flagstaff, Arizona. He is also survived by a brother Richard, and a sister Ceil, of Pennsylvania.



Chen-To Tai, one of the world’s most respected and influential scientists in electromagnetics and antenna theory, passed away peacefully at his home in Ann Arbor on 30 July 2004, at the age of 88. Born in Soochow China, he received his MS degree in Communication

Engineering in 1944 and the Doctor of Science degree in 1947 from Harvard University. Tai came to U-M as a professor in 1964, and became emeritus professor in 1986.

Professor Tai is recognized throughout the world for his research on antennas and electromagnetics. His contributions to antenna theory include work on coupled antennas, and biconical and cylindrical antennas.

Professor Tai was elected Fellow of the IEEE in 1962 and served as President of the AP-S Administrative Committee in 1971. He received the AP-S Distinguished Achievement Award in 1986 and the IEEE Centennial Medal in 1985. He also received outstanding faculty and teaching awards from the Ohio State University and the University of Michigan and was awarded several honorary professorships. He was appointed a member of the National Academy of Engineering in 1987 and received the IEEE Heinrich Hertz Medal in 1998.

All who knew Chen-To will remember him as a kind gentleman and scholar who contributed magnificently to science and engineering and gave generously of his knowledge. He was a dedicated teacher known for the clarity of his lectures and loved and respected by his students and colleagues. He is survived by his wife, Ming, five children and ten grandchildren.

NOTE: For a more complete memorial for Charles McMullen, and for the complete memorial of Chen-To Tai by Thomas B.A. Senior and Dipak L. Sengupta, please see: www.eecs.umich.edu/alumnisociety/memorials.html

Thank You

Thanks to our Donors

We would like to thank the following companies and individuals for their recent support of the Department through gifts of money and equipment. These gifts have enabled us to further the educational mission of the Department in a variety of ways, including: scholarships and fellowships to students; outstanding speakers featured at a variety of seminar series; faculty research; donated equipment and software that has been used for courses and research; outreach to the K-12 community, and our new CSE building and Solid-State Electronics Laboratory expansion.

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Fuss Foundation
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Bernard and Enid Galler
Surandra and Gayatri Garg
Joseph Giachino
Clifford E. Granger
Jessy Grizzle and Laurie McCauley
George and Mary Haddad
Linda and Skip Harrington
Verl J. Hawks
Medhat A. H. Ibrahim
Keki B. and Alice D. Irani
Catharine and Robert June
Changhyun and Eunyong Kim
Michael E. Korybalski
John Laird and Ann Alpern
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Patricia Lipert
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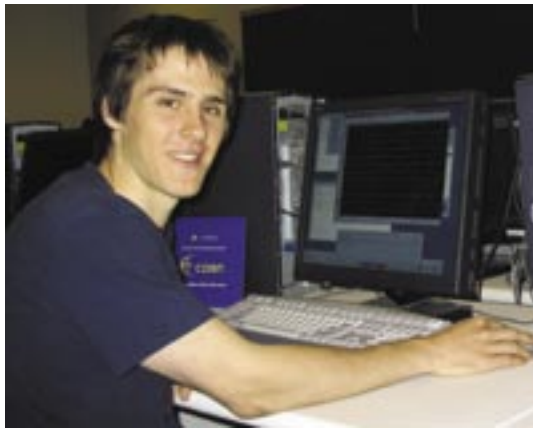
Focus on our Industrial Friends: Intel

Active industry involvement is one of the things that makes the University of Michigan Department of Electrical Engineering and Computer Science a leader in engineering research and education. This year, we would like to highlight the myriad contributions that Intel Corporation has made to the intellectual life of the department through the Intel® Higher Education Program.

The Intel® Higher Education Program supports EECS graduate students through fellowships, and indirectly through supporting individual faculty research. Whether through monetary gifts, or gifts in kind, the faculty highly value their relationship with Intel. Intel has particularly strong ties with EECS faculty in the Advanced Computer Architecture Lab (ACAL), the Artificial Intelligence Lab (AI), and the Solid-State Electronics Laboratory (SSEL), where research is conducted in a variety of areas, including: computer security, digital systems, networking architecture, global signaling strategies, technology for K12 students, and technology for senior citizens.

Prof. Martha Pollack, AI professor and Associate Chair for the CSE Division said, "The funding I have received from Intel has made it possible for us to explore novel approaches to improving the systems we are developing for supporting people with cognitive impairment. My hope is that this research will lead to systems that really make a difference in people's lives." Intel is supporting research in computer security in a project led by Prof. Peter Chen. Chen stated, "Intel's support for the CoVirt project goes even beyond the financial aspect; it extends to technical, intellectual, and even moral support. Intel has helped us understand and use advanced architectural features of the Intel Pentium® 4 processor, provided a summer internship at the Microprocessor Technology Lab, and helped us stay abreast with new industrial developments on virtualization technology."

Individual relationships with faculty have led to fruitful research collaborations, and with more than 200 known EECS grads working at Intel, we trust it is a happy mutual relationship. Mark Abel, one of these EECS grads, is Director of Solutions Architecture and Initiatives at Intel. He also chairs the EECS National Advisory Committee for the Department and sits on the Board of Directors for the EECS Alumni Society. When he's not visiting for one of these reasons, he may be in town reviewing Intel's sponsored research and teaching labs.



The Intel Higher Education Program has fostered the intellectual life on campus and nationwide through a variety of ways. Supporting our students' need for computing power, they have equipped engineering computing labs with the new Intel Pentium® 4 processors with Hyper-Threading Technology. Our students can take advantage of the advanced processing capabilities more than most. Intel has also worked with our VLSI faculty this past year to document our world-class VLSI program, offering it on the web to any who are interested. This work garnered much attention at the recent conference of the American Society for Engineering Education (ASEE).

Finally, many of our faculty and students were present to hear Craig Barrett, the chief executive officer for Intel, present a lecture this past April. Barrett was on campus as the recipient and presenter of the 2003-04 College of Engineering Goff Smith Prize and Lecture.

Thank you Intel – Go Blue!

Matthew Stampis, graduate student majoring in VLSI, working on a chip design in a CAEN (Computer Aided Engineering Network) lab in the EECS Building.

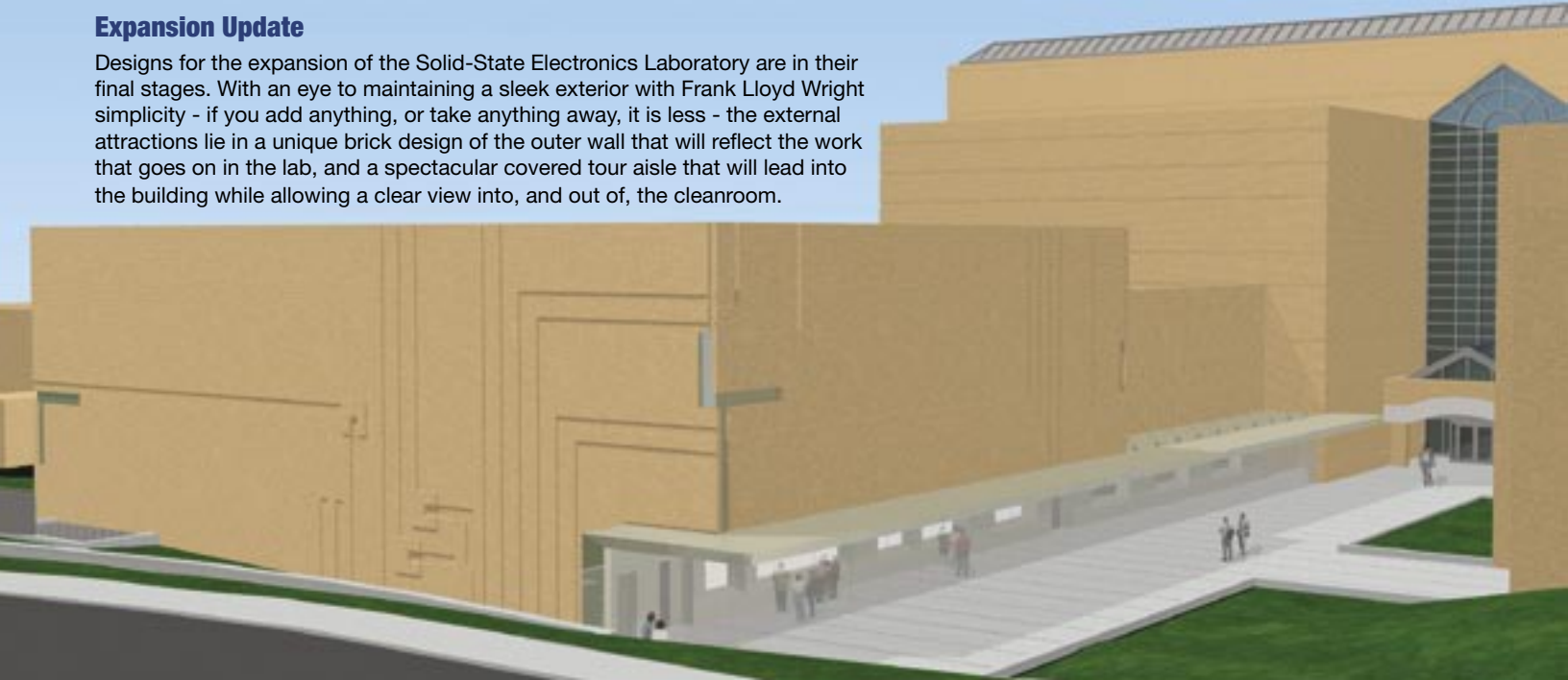
A NEW UNDERGRADUATE SCHOLARSHIP

We would like to offer special thanks to the **Otto F. and Jenny H. Krauss Charitable Foundation** for establishing the Otto F. and Jenny H. Krauss Outstanding Systems Student Fund. This fund will be used for a merit-based tuition scholarship for an outstanding undergraduate student in EECS.

This gift was given in memory of Otto F. Krauss, grandfather of Alan F. Krauss (BSE, EE '94) and father of Frederick G. Krauss.

Expansion Update

Designs for the expansion of the Solid-State Electronics Laboratory are in their final stages. With an eye to maintaining a sleek exterior with Frank Lloyd Wright simplicity - if you add anything, or take anything away, it is less - the external attractions lie in a unique brick design of the outer wall that will reflect the work that goes on in the lab, and a spectacular covered tour aisle that will lead into the building while allowing a clear view into, and out of, the cleanroom.



Electrical Engineering and Computer Science

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