EECS News

THE UNIVERSITY OF MICHIGAN

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Department of
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something new

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In This Issue

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A Message from the Chair

Greetings from Ann Arbor! As I finish my first year as chair of the EECS Department, the flowers and trees are in full bloom and our seniors are graduating -- new beginnings all around. For me, this has been a year of getting to know faculty, staff, students, alumni and department friends. This has been a busy year in terms of following up old initiatives and creating some new ones. We continued to spend time planning our new facilities. The Computer Science and Engineering Building is under construction. Excavation is complete and concrete is being poured. We hope to occupy this beautiful new facility by January 1, 2006. Planning for a major expansion of our cleanroom facility is still under way. Construction there will not begin for a while. In a new activity, we are planning a renovation of the EECS Building. In addition to general sprucing up and making better use of some of our current space, we hope to create a student-faculty lounge directly off the atrium, where students can meet faculty after class, have a cup of coffee, and work together on class projects. Our students are excited by this prospect.

Speaking of students, we've been listening to our undergrads. Not surprisingly, they tell us that EECS has a reputation of being tough and competitive, and perhaps a bit less less than welcoming. In a large department such as EECS, we must go the extra mile to offer a friendly, supportive environment. Our curricula are inherently challenging, and we don't plan to change that. However, we have created a new Undergraduate Committee that you can read about on p. 13. This committee is focusing on advising and on broader student life issues that affect our undergrads. Our Undergraduate Committee recently participated with our Curriculum Committee in a series of meetings with our undergrads. We learned a lot from those meetings, and we will be following up on many of the recommendations that were offered. We are committed to making this series of undergrad feedback meetings an annual event. Next come the graduate students!

I would be remiss in not commenting on our reduced State funding, which is a reflection of the budget woes of the State of Michigan. This past year both the College of Engineering and the EECS Department absorbed a new round of budget cuts. We did our best to hide many of these cuts from students and faculty, but we were forced to eliminate some classes or consolidate sections, and to cut positions for graduate teaching assistants and a small number of staff. These were difficult choices and we now are very much hoping for an improving economy.

Amidst the budget problems, we were able to create one new staff position by reassigning duties of our existing personnel. Catharine June is now serving as staff to our new EECS Alumni Society, and she also is interfacing between the department administration and our many student groups. In addition, she is serving as Editor of this newsletter and she will be heading up overall publicity efforts for EECS. In the future, we are planning a redesigned web site and a set of hard-copy materials that better showcase EECS to prospective students, parents, and the outside world.

We have many personnel changes on the horizon. On June 1, John Laird steps down as CSE Associate Chair to return to his regular full-time faculty duties. I have appreciated the counsel and advice I have received from John while learning my role in EECS at UM. I am very pleased to announce that Martha Pollack will be succeeding John. (See an article on Martha's research on pp. 7-9.) On July 1, Tony England will be stepping down as Associate Chair for ECE to become the Associate Dean for Academic Affairs of the College of Engineering. We are sorry to "lose" Tony, but now the entire College will benefit from his wisdom and friendly style. Rich Brown, who had served as EECS Interim Chair for two years prior to my arrival, will become Dean of Engineering at the University of Utah. This career move will bring Rich closer to his roots. I am thankful to Rich for the care he displayed in handing over the departmental reins. We recently have lost or soon will be losing other faculty to administrative positions: Linda Katehi (Dean of Engineering at Purdue), Fawwaz Ulaby (Vice President for Research at Purdue), and John Volakis (Director of the ElectroScience Lab at Ohio State). We wish all of these colleagues the very best in their new positions. We also have several upcoming retirements that we will report on in the future. Needless to say, EECS expects to be aggressively searching for outstanding new faculty during the 2004-2005 recruiting season. The face of your department is evolving!

As you will see elsewhere in this issue, the EECS faculty have been honored by numerous awards from the College of Engineering, the University, and outside professional organizations. We have a spectacular faculty, and I hope that you will enjoy reading samples of their research in the following pages. This year it has been a special privilege to welcome nine new faculty members into our department and to see them begin launching their UM careers. We will be hearing a lot from this talented group in the future, but for now you can see pp. 15-16 for brief introductions.

As I conclude my first year, I wish to thank all faculty and staff in EECS for their warm welcome and for their commitment to making EECS the best it can be. We have a special department and we have an exciting future before us.

Dave

David C. Munson, Jr.

Run, RABBIT, Run!

RABBIT with Solène[1]

There are more than a hundred biped robots being developed by research laboratories throughout the world. Though each one was designed for a unique purpose, they do share a common feature – they walk on their own two legs. But now, a new robot is giving all the others a run for their money. And researchers at the University of Michigan are in control.

The biped robot named RABBIT took its first steps in July 2002 after years of preparation, analysis, and work in control theory. Today, no other biped machine walks faster, is as stable, or varies its walking speed so adroitly. In fact, this biped walked on its first try—an unprecedented feat.

"RABBIT may be the first step toward the realization of bipedal walking robots that are mechanically simpler and less costly than existing robots," says EECS Prof. Jessy W. Grizzle, who developed the control theory for the robot. Based at the Laboratoire Automatique de Grenoble (LAG) in Grenoble, France, RABBIT is part of the French project, ROBEA. The project involves seven laboratories and multiple researchers in the areas of mechanics, robotics, and control theory. While on sabbatical in France in 1998, Grizzle met with the lead engineer, Gabriel Abba. At the time, their team didn't have extensive expertise in nonlinear control. That's where Jessy stepped in.

[1] See http://robot-rabbit.lag.ensieg.inpg.fr/English/rabbit_en.php

"Control is the discipline of modifying the behavior of an existing system on the basis of measuring how it evolves in time, and then adjusting the inputs that go into the system. A control algorithm closes the loop from the measurements to the inputs," said Grizzle. These closed-loop systems will determine how skillfully RABBIT walks in its environment.

It took almost 3 ½ years from the time Grizzle learned about the project, to when he could start the first experiments on the machine; during this time the robot was being constructed. "Fortunately, we had a lot of time to come up with new ideas," said Grizzle.

The most significant idea to come from this project was to propose a method that departed from a heuristic means of perfecting the robot's motion, which basically uses trial and error experiments until it walks smoothly – to an analytical method that can predict in advance how the robot will move.

"If you look at all the human-like robots out there," Grizzle explains, "they walk rather slowly, awkwardly. From the time a bipedal robot is built and takes its first steps, to the time it will walk as good as it's going to get, can take 6 months to a year because there have been too few scientific principles to work from. The robot's control algorithms are being adjusted in an ad hoc manner. We were able to come up with a design principle that allowed us to work directly from a mathematical model – using performance objectives such as the leg end not requiring a coefficient of friction greater than 0.6 in order to not slip, the motor torques being all less than 100 Newton-meters, the robot walking at 1.5 meters per second, and the available energy being used in the most efficient manner. We worked from desired characteristics of our walking cycle and then systematically produced the feedback actions that would induce the robot to walk in that manner."

"When we actually started experiments, after two days debugging the hardware, we turned on the controller and it performed exactly as the theory had predicted. It was just amazing. This had never, ever, been achieved in such a convincing manner. We published the theory about a year before we did the experiments; it's starting to garner a lot of recognition."

Vive la difference!

RABBIT was conceived to be the simplest mechanical structure that is representative of human walking. Other biped robots have feet, but feet add extra weight and complexity. Moreover, the heuristics used by other researchers completely

We turned on the controller and it performed exactly as the theory had predicted. It was just amazing.

break down when the foot is replaced by a point contact–imagine walking on stilts. Therefore, the French researchers gave RABBIT a point foot that acts like an ankle, is ergonomically sound, and makes RABBIT an elegant platform for developing new control principles for walking.

"The fact that the robot had no feet led us to completely rethink the control problem," says Grizzle. "Our feedback controller designs are very different from the traditionally used method of trajectory tracking." "We never compute a planned trajectory. If you push backward on other robots while they are walking, they will fall down. If you push RABBIT backward, it begins to walk backward without any change in the feedback controller. The gait we achieved in RABBIT is very human-like. "

These things are dreams, we're not there yet. But you need scientific principles to get there.

Professor Jessy Grizzle

The most technologically advanced biped robots—Honda's Asimo, Sony's SDR-4X, and the University of Munich's Johnnie — use an unnatural flat-footed walking motion. It is anticipated that Grizzle's theory will lead to a new control theory for walking with feet.

"The direct contribution to machines is that our theoretical results make it now possible to design stable walking motions over a much higher range of walking speeds," Grizzle says. "Our designs are direct, and thus significantly cut down on development time. In addition, we have achieved very elegant walking gaits with a much simpler machine."

The Student Difference

Grizzle was assisted in the project by graduate student Eric Westervelt, who is now assistant professor of mechanical engineering at Ohio State University. Westervelt credits the interdisciplinary nature of his work on RABBIT and the accessibility of U-M faculty with his decision to become further involved with robotics. Westervelt felt that his graduate experience was an "eye opener. I came to realize that I could explore things on my own, and I came up with solutions that were unexpected. You need to develop your own intuition and gain your own experiences."

According to Grizzle, Eric was a rare student who had a burning desire to understand things at a fundamental level. "He took my mathematical theory and turned it into the most beautiful design technique that you could possibly imagine. He created new theory of his own to justify all of his design steps." This technique will be extended to working with feet, whether a normal actuated human foot, or a prosthetic foot.

Computer Science sophomore, Evan Leung, contributed to the project by writing MATLAB code that would convert symbolic representations of dynamic models and feedback loops into FORTRAN 77– the language of choice for numerical optimization. "This was my first real exposure to writing code to be used by a client," says Leung. "This kind of thinking is crucial, and something that isn't necessarily learned in coursework." Leung also created computer animations of the walking robot. "Evan's animations were absolutely helpful and crucial to our progress," said Grizzle. Leung is now an associate for Urban Science, a consulting firm for the automotive, financial, and retail industries, located in Detroit.

Future Applications

Grizzle's work has promising applications in designing human prosthetics. "Our analytic method was very effective in reducing the amount of experimental work that was required with the heuristic methods," explains Grizzle. "If you can take properties of a patient – their height, weight, how the valid leg functions – and combine this with the correct principles of walking, maybe you could more quickly have the prosthesis adapt its characteristics to the person, instead of the person adapting his or her gait to the prosthesis – which is what happens now. These things are dreams, we're not there yet. But you need scientific principles to get there."

Jessy is currently working with a team of U-M researchers to apply their expertise to the problem of rehabilitation of stroke and spinal injury patients. This team includes Prof. Dan Ferris in Kinesiology and Biomedical Engineering, Wayne Aldridge in Neurology, Brent Gillespie in Mechanical Engineering, and Dan Koditschek, a colleague in EECS. Grizzle reflects on this future application and work with patients, "working with people is thousands of times more difficult than working with machines, but it is very rewarding."

Why the title "Run, RABBIT, Run!"? Grizzle, Westervelt, and a French colleague, Christine Chevallereau, have just recently extended their theory of walking to encompass running. "On paper, the principles we have discovered for running look as solid as those we developed for walking," said Grizzle, "and the computer simulations seem convincing as well. But when we try it on the mechanism, I'm sure there will be surprises! That work is scheduled for summer 2004. I'll see you in Grenoble!"

Read—and see—more about it! Click on **www.eecs.umich.edu/~grizzle/papers/robotics.html** for publications on biped robots and videos of experiments on RABBIT.

autoMinder

Professor Martha Pollack

Autominder on the Move

The United Nations estimates that the percentage of people older than 60 will double by 2050, while those older than 80 will quadruple. As the world's population ages dramatically, Professor Martha Pollack is devising artificial-intelligence systems intended to make the lives of these older adults more manageable.

Pollack sees that the elderly face a range of challenges – including physical, social, emotional, and cognitive – and her work is designed to assist those who have suffered from cognitive decline, especially decreased memory. She is developing an intelligent cognitive orthotic system flexible enough not only to remind people of the tasks they need to perform, but also to schedule the reminders, cancel them, or change their nature, based on what a person actually does and how he or she responds to the reminders issued. The system is called Autominder.

Photo courtesy CMU Robotics Institute

Autominder is an outgrowth of the Initiative on Personal Robotic Assistants for the Elderly, a multi-university, multi-disciplinary research effort begun in 1998, while Pollack was Director of the Intelligent Systems Program at the University of Pittsburgh and a Professor in the Department of Computer Science. Pollack has continued this effort since joining the EECS faculty in September 2000. The project is funded by the National Science Foundation, in partnership with Carnegie Mellon University and the University of Pittsburgh. Pollack has received additional funding for this effort from the Intel Corporation.

Autominder has already been deployed on customized robots, or "Nursebots" (the first was named Flo, the second one Pearl), which were designed and built at Carnegie Mellon University, and have been sent on preliminary trials with residents of the Longwood Retirement Community in Oakmont, Pennsylvania. At nursing homes, getting seniors to and from their doctor's and other appointments becomes a major time-intensive activity, especially for the overworked and often understaffed personnel who would prefer to spend quality time with these individuals. The Nursebots are able to provide reminders, and help guide individuals from one location to another.

From Robots to Handhelds

"We are continuing to pursue this work at Michigan," says Pollack, "but we are exploring other platforms than mobile robots. We are now experimenting with handheld devices, which then communicate with sensors in the user's environment." Pollack notes that while there are "reminder systems" on the market, they are "simply glorified alarm clocks that tell users to do this at one time, and do that at another time. They're not flexible enough. With Autominder, we can track and monitor the plans of an older adult with memory impairment, and can do this in a flexible and adaptive way. Our goal is to help elders stay living in their own homes longer."

The technology is also useful for other people with memory or executive function disorder. In fact, It is currently being tested with patients who have suffered traumatic brain injuries. This work is being conducted in association with Dr. Ned Kirsch, a faculty member at the UM Medical School, Physical Medicine and Rehabilitation, and adjunct professor of Psychology.

"Caring for the traumatic brain injury patient is very hard on the caregiver," said Pollack, "so that any autonomy you can give the individual in their own home is precious. The caregiver doesn't have to be there constantly caring for the person, which is very good for the individual because they are doing it 'on their own' – with assistance from the

reminder system. We all need assistance in one way or another. A person who wears glasses gets assistance - we don't say "they can't see on their own" – they just need glasses. It's the same approach here."

Upgrading through Reinforcement Learning

The sophisticated Autominder architecture is essentially a three-part interactive structure. The Plan Manager stores the schedule of required tasks; much of the work here involves constraint-based temporal reasoning. The Client Modeler maintains a record of what the system believes has actually occurred. For example, explains Pollack, "if you go to the refrigerator, can it be inferred that you got breakfast? Well, it depends how long you stood in front of the refrigerator, what time it is, when you usually eat breakfast, how long you stayed in the kitchen. All these factors go into determining what you've done in the kitchen."

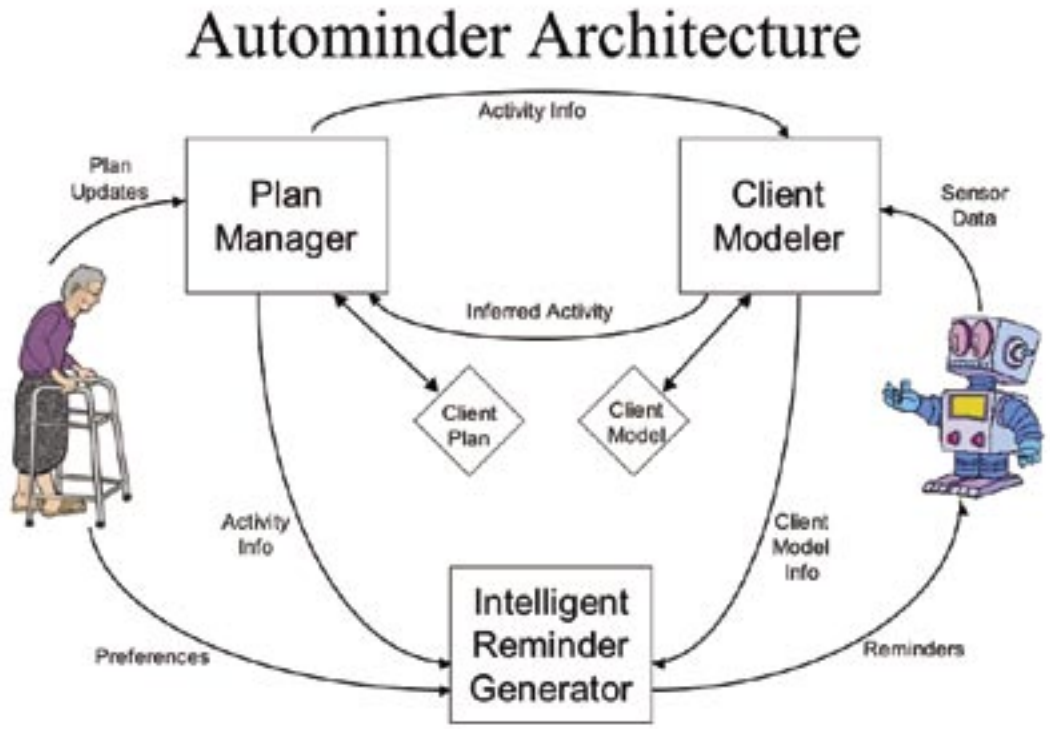
The third component is the Intelligent Reminder Generator. It compares the Plan Manager and Client Modeler data and decides whether, when, and how upcoming reminders should be presented. "Studies have shown that it's not good to 'over-remind.' If you do, people become overly dependent on the system. We want to allow people to initiate activities on their own whenever possible," said Pollack. For example, assume your grandfather needs to take out the trash no later than 8pm. Autominder would wait to see if he does this on his own. But if his plans change, so that he is going to visit a neighbor at 7pm, Autominder might determine that he needs a reminder to set out the trash before he goes.

Professor Pollack recently began collaborating with Professor Satinder Singh Baveja to find ways to improve the crucial reasoning function of the Intelligent Reminder Generator. Singh's main area of research is Reinforcement Learning (RL) – a machine-learning approach to adapting and thus improving automated decision-making through reinforcement techniques.

Though RL has not often been applied to the design of human-computer interaction systems such as Autominder, Singh says in this case it's a "natural fit" because Pollack's system is "a great application and a wonderful opportunity for a reinforcement learning researcher to make an impact with something that helps people." Together they have been building and testing the behaviors of a machine-simulated "person," customizing and adapting it to short term changes in activity schedules as well as long term effects such as increased memory deterioration. Professor Pollack says this will ultimately lead to a new and improved intelligent reminder module with "a different computational mechanism inside of it."

In addition, Singh explains that he wants the system "to adapt automatically – which is how an individual usually behaves--and to learn what an individual

Read—and see—more about it! Click on **www.eecs.umich.edu/~pollackm,** and click on **In The News.**



user's preferences are. Some people may be very forgetful about medicine, but may remember to eat. Others may have the reverse situation. Even depending on the time of day, they may remember to do some things, and not others. We would like to build a system that will learn over time, through repeated exposure, to actually modify its strategy to be most effective for that person."

Pollack adds, "What we'd like to do – what absolutely needs to be done, but is still in the lab – is to embed the Autominder system in a ubiquitous computing environment in the home, with motion detectors and contact sensors on the refrigerator and doors; pressure sensors in the bed; and flow sensors on the faucets. Then we will get it all hooked up wirelessly, which is fairly normal these days." Pollack envisions transmitting and receiving wireless signals in hearing aids, cell phones, television remotes, and other devices in the home or on one's person. Singh reinforced this goal, stating that the home sensors will "detect what it is that the user has already done, will have a sense of what they should be doing the remainder of the day, and in a context sensitive way, will remind them of what they should be doing. So if they are supposed to drink water 4 times a day, and it is the afternoon, you might want to remind them then, so they don't have to drink late in the evening which may cause them to need to get up in the middle of the night."

The Pull of AI for Student Researchers

When Joe Taylor was graduating from Notre Dame, he wanted to work in the area of AI; coming to UM and working with Prof. Pollack seemed to click. Joe enabled Autominder to be run on any system connected to the internet, while allowing for remote modules to be run on a variety of systems that would be more useful to patients. "It's good that the patient doesn't have to carry around an entire computer," said Joe. "We also hope to branch out into other types of interfaces, like a hearing aid – any other interface that will make it easier on the patient. While AI can't do everything, Joe feels that "the brain can really use help. And that's what we're trying to do for the elderly with cognitive impairment. We want them to be able to function on their own, and allow them to stay in their own homes."

Ph.D. candidate Bart Peintner was similarly drawn to the field of artificial intelligence – and to Professor Pollack's work in particular. "All of my background was in programming, but I took one of Martha's classes in which she explained her work, and I became interested and asked if I could do a summer project." Peintner has worked on Autominder ever since – and his Higher-Order Markovian Reasoner (HOMR) software is the key ingredient that enables Autominder not only to gather, but also to reformulate information obtained from sensors in such a way that it can act on that information and change its messages accordingly. "If the sensor data indicates they are already cooking breakfast," Peintner says, "we don't want to remind them to cook breakfast."

Peintner admits that while "a computer system can never be as complex as the human mind, for simple tasks it can be faster."

Boomers: New Age for Old Age

While most researchers have found that seniors are more likely to accept high-tech gadgetry if it is packaged in a familiar form – such a telephone, or even a robot – aging Baby Boomers will likely be more willing and able to accept nearly any form of technological assistance. The Baby Boom generation – whose youngest members turn 65 in 2011 – is not only familiar with technology; it is already highly dependent on it. Cell phones and personal digital assistants are ubiquitous – and so, Pollack expects, within 10 to 15 years, will be the practical, affordable, off-the-shelf memory aid products she and others are currently working to develop.

Prof. Pollack and graduate student Joe Taylor demonstrated the handheld, artificial-intelligence device at the largest aging services technology demonstration of its kind March 16, 2004, at the Dirksen Senate Office Building in Washington, D.C., organized by the Center for Aging Services Technologies (CAST) (see www.agingtech.org for information about CAST).

Prof. Pollack testified at a hearing of the U.S. Senate Committee on Aging April 27. (see www.agingtech.org/announcement.aspx?id=3)

Laser Power

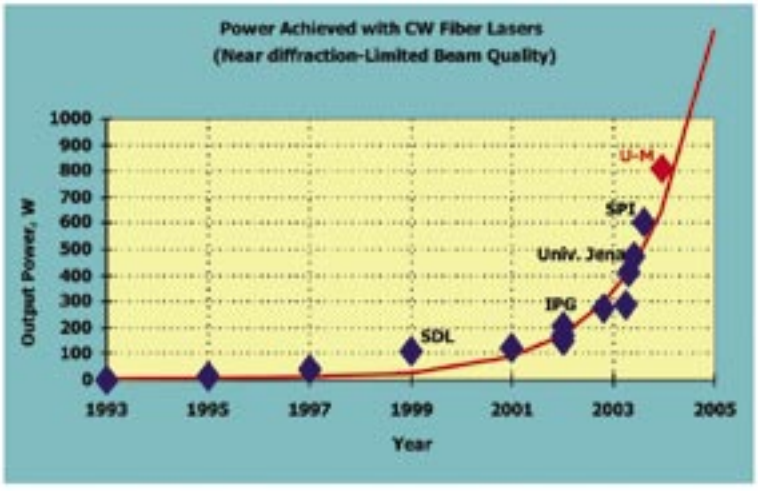
Professor Almantas Galvanauskas

Almantas Galvanauskas demonstrates a high power laser that portends a variety of new and practical applications

In the race for power and quality in a continuous wave laser beam, Prof. Almantas Galvanauskas is leading the way, achieving an 810W output in a single-transverse mode Yb-doped fiber laser. Galvanauskas, a member of the EECS Center for Ultrafast Optical Science (CUOS), dreamed of generating beams of this type and power even as a Ph.D. student in Sweden. "People wouldn't believe me, because this power level is very high." But he proved it could be done, and adds, "we can do even more!"

Laser evolution – from dye to solid-state to fibers

As Professor Galvanauskas explained in his paper in the July/August 2001 issue of the *IEEE Journal on Selected Topics in Quantum Electronics*, the "revolutionary change from mode-locked dye lasers to mode-locked solid-state lasers, which occurred in the field of ultrashort pulse generation approximately a decade ago, initiated a rapid development in all areas of ultrafast technology." The newer solid-state lasers offered "significantly higher powers, pulse energies, and shorter durations from more robust systems." This led to the current quest to develop a new generation of ultrashort-pulse lasers using optical fibers. Professor Galvanauskas has long been at the forefront of these trends, beginning as a Ph.D. candidate in Sweden, when, he says – because of his idea to use a pure pulse amplification approach with fiber to achieve ultra-high amounts of energy – "people thought I was crazy."



Nobody thinks so anymore. By 2001, Galvanauskas and a team of researchers at IMRA America, Inc. won the Laser Focus World Commercial Technology Achievement Award for having developed the first commercial fiber chirped pulse amplifier (FCPA-2). "Usually the products that win this award never make it to the big market because they are too pioneering. This was the first demonstration that you could build such a system practically," stated Galvanauskas, who worked for IMRA prior to coming to U-M.

Professor Galvanauskas' successful challenges to traditional peak-power limitations in fiber optics have broadened the uses of ultrafast technology, and led to his latest creation: a continuous wave (cw) laser that reported the highest-ever single-transverse mode output. Galvanauskas' fiber laser system demonstrated an 810 watt fundamental mode beam at 1092 nm – completely eclipsing the previous high. "A year ago it was 500 watts," Galvanauskas says, "which started the whole race." This advancement is an important step in the development of other types of fiber-based laser systems, with the goal being high average power with short pulse femtosecond lasers.

Collaboration the Key

On this particular project, Galvanauskas has been collaborating with two other organizations to bring his ideas to reality. Two years ago, he began working with the Center for Laser Technology of Fraunhofer USA; this Center provides a link between industry in academia by emphasizing applied research that leads to prototype development. "They have their own diode lasers that they developed," explained Galvanauskas. "This was a perfect match since they are located right here in Plymouth. Then a year ago I connected again with NUFERN, which is a custom fiber manufacturer." The combination of Galvanauskas' expertise in fiber lasers with their material and equipment led to the leap in power level to 810W that can be seen in the graph (left).

The current joke in the fiber laser community is that if this same rate of increase in power were to continue, by the year 2010, fiber lasers would produce more power than the sun. "We won't get

that far!" said Galvanauskas. "However, the real limits are not yet known for individual fibers. We do know that combining fiber lasers would allow us to go beyond the limits of a single fiber. Imagine: since each fiber is as thin as a fishing line, they can be weaved into a strand and produce light which can slice through steel!"

Emerging Applications

Pushing technological frontiers by dramatically increasing fiber laser power is exciting itself, however, the real practical significance comes from the anticipated impact on a number of already existing, as well as emerging, applications. The primary applications are military, semiconductor industry, and medical. "Future breakthroughs will come from laser technology that is very practical," Galvanauskas says. For example, Galvanauskas is currently working on future applications of short wave generation with Prof. Gérard Mourou, and on teraherz wave generation with Prof. Ted Norris. In addition, Steven Yalisove, a professor in Materials Science and Engineering, is interested in Galvanauskas' work for material processing applications.

Yet another project involves Prof. Yogesh Gianchandani, and concerns the marriage of fiber and MEMS technology. "We came up with the idea to integrate fiber grating with a MEMS actuator" so that it performs the same function of a larger device, but on a small chip that will actually do more," Galvanauskas explains. "We already made the chip, and showed that we could integrate the fiber. Now we're planning to integrate the fiber grating. It's completely different from high power; it's more subtle."

This high-power technology is so new, said Galvanauskas, "it's not even completely clear what these powers can do, because the lasers that had high power before did not have good beam quality. This new laser technology is practical, efficient, and compact. The real breakthrough comes in that it is diffraction limited, it is basically a single transverse mode – in other words, we created a very high quality beam, and that makes all the difference in the world."

SSEL Selected as a Member of the National Nanotechnology Infrastructure Network (NNIN)

The **Solid-State Electronics Laboratory (SSEL)** is part of a newly-funded NSF initiative to support research and education in nanoscale science, engineering and technology. The University of Michigan is one of 13 universities joining this National Nanotechnology Infrastructure Network (NNIN). Funded currently for 5 years, at $70M (U-M's share is approx. $1.2M annually), it continues and expands upon the five institution, 10-year National Nanofabrication Users Network (NNUN), which recently ended in 2003.

"Our lab will enter a new era by becoming part of NNIN. We will be engaged in many new programs and activities, all of which will further enhance the quality of our programs and expand the base of our users," said Prof. Khalil Najafi, co-PI of the project, Director of the Solid State Electronics Laborabory, and Deputy Director of the Center for Wireless Integrated Microsystems (WIMS).

"We're ready," said Dr. Dennis Grimard, SSEL lab manager and co-PI on the project. "We've been preparing for this since we were approached a few years back to be part of the original NNUN." Many lab operating procedures have been automated in anticipation of the NNIN.

"Right now I can go on the web and tell you who's in the lab, what tools they're using, and how much time they've accumulated in the lab. In addition, we track tool and lab utilization so users can better plan their use of any given tool at any given time. We have online order forms that allow all users to order items 24/7 and pick them up the next day just like a store. The faculty and external users can now look at statistics on the accounts, tools, time, and materials they use. Access to the lab, the tools, and the materials is integrated and available on the web."

Having a nationwide network of laboratory facilities will allow for the highly specialized and expensive equipment of the SSEL to be utilized by a broad spectrum of individuals. To facilitate the work, and ensure proper use of the equipment, skilled staff will be available to train users on the equipment. There will be a summer program for undergraduate students to come and work in the SSEL. It is expected that researchers will go to a laboratory in their general vicinity for most purposes, and travel to one of the other sites for their unique capabilities.

"Researchers will come here for the complex work," said Prof. Fred Terry, co-PI of the project. "We are probably the leading institution for doing integrated microsystems. If you want to build a CMOS chip that does electrical functions, and then tie it in to something else, like microsensors, we're the leaders in doing that. As we get into the realm of nanotechnology, somehow you have to communicate from the nano world out into the larger scale world. You may have an electronic chip that has more conventional microelectronics making connections to the nanoscale devices. This is an obvious extension of what we've been doing in MEMS since Prof. Ken Wise came here. For that level of complexity, people will come to UM."

In addition to the pure research happening in the SSEL, "NSF wants us to be a vehicle of change, not just for research and technology, but for people. They want to us to actively deal with the social and ethical implications of technology, all of which are pretty new for engineers," said Dr. Grimard. Again, U-M is ready. Prof. Wise, Director of WIMS, has already created the course, "Societal Impact of Microsystems," for the M.Eng. degree in Microsystems, first offered in 2002. This course discusses topics ranging from clean air/water to nanotechnology, medical implants, and food production.

5th William Gould Dow Lecture

NASA's Dr. Charles Elachi Speaks on Space Exploration

Professors Kamal Sarabandi, George Haddad, Dr. Charles Elachi, Dr. David Dow, Professor David Munson

Dr. Charles Elachi, Director of the NASA Jet Propulsion Laboratory (JPL), and long time advocate for space exploration, delivered the talk, "Space Exploration in the Next Decade: Challenges and Opportunities," Thursday, March 11, 2004, to a standing-room-only audience at the Chesebrough Auditorium, Chrysler Center.

With Spirit and Opportunity now roving the surface of Mars, Dr. Elachi's appearance was very exciting. To quote Elachi, "We have six wheels in the dirt. Mars is now our sandbox, and we are ready to play and learn."

A highlight of his talk was a video of Spirit and Opportunity landing on Mars, which showed the reactions of some of the staff as Spirit and Opportunity landed on Mars. As we witnessed the transformation in the face of a young staff member from breathless anticipation to joy, awe, and thankfulness upon the successful landing, Dr. Elachi remarked, "and this could be her first job." 700-800 individuals spent the past several years working 70-80 hours per week on every detail of this mission. Dr. Elachi invited students to apply to come work at JPL during the summer, and see if they have the passion for this work that will sustain them during the long hours.

Prof. Kamal Sarabandi, Director of the Radiation Laboratory, places Dr. Elachi, "among the pioneers in the field of radar remote sensing. He has had significant technical and leadership contributions in the advancement of this field."

In his 30-year career at JPL, Dr. Elachi has played the lead role in developing the field of spaceborne imaging radar from a small research area to a major field of scientific research and application. During the late 80s and 90s, as the Director of Space and Earth Science programs, Dr. Elachi was responsible for the definition and development of JPL flight instruments and missions for Solar System Exploration, the Origins program, Earth Observation and Astrophysics. During this period more than 45 flight missions and instruments were conceived, developed and flown.

In the mid to late 90s, Dr. Elachi chaired a number of national and international committees which developed NASA roadmaps for the exploration of neighboring Solar Systems (1995), our Solar System (1997), and Mars (1998). In recognition of his contributions to planetary exploration, the name of Asteroid 1982 SU was changed to 4116 Elachi in 1989. Dr. Elachi was one of the youngest members elected to the National Academy of Engineering, and in 2001, was appointed Director of the Jet Propulsion Laboratory and Vice President of Caltech.

Prof. George Haddad, former student of Prof. Dow's at U-M, said "It is particularly appropriate that Dr. Elachi was the Dow Lecturer this year because Prof. Dow himself was an early pioneer in the field of space exploration." William Gould Dow's son and EECS alumnus Dr. David Dow, and his wife Figes, and emeritus faculty member Louis Kazda, made special trips to UM for the lecture.

Focus on our Undergraduates

Showing its commitment to the entire experience of our undergraduate students, the department has created a new committee dedicated to improving the undergraduate life in EECS. The committee, comprising faculty, staff, and students from the Department, spent this first academic year of its existence gathering information, and trying new initiatives.

"Our first goal was to understand the atmosphere and the climate that students experience in EECS," said committee chair Prof. David Blaauw. "We want to enrich the undergraduate experience for students, so they have the ability to make friends, meet faculty, and be guided in all aspects of their life in EECS."

Hearing what the students had to say was key for the committee. "The three students on the committee were able to give us their immediate feedback on some of the issues that we discussed," said Blaauw. They also contributed their ideas and effort. With more than 900 declared undergraduate students, it can be difficult to find a smaller environment in which students can study together and get to know each other. To address this, one member of the committee, Ankur Khandelwal, undergraduate Computer Engineering major, reserved rooms throughout EECS and elsewhere each evening of the week so that students could come together and study in groups in an informal setting. Ankur said of her involvement in the committee, "I thought it was great to be able to help my fellow students. I felt this was my way of giving back. Plus, I feel that if you really want something to change, you can't just wish it, you have to get involved and do something about it."

The committee heard many ideas and concerns through their discussions with student leaders from a variety of student organizations (Eta Kappa Nu, Girls in EECS, IEEE, National Society of Black Engineers, Society of Women Engineers, and Special Interest Group on Computer Graphics). They also participated in a student/faculty roundtable discussion, "where we heard from the breadth of the student population, and discussed issues that seemed to be on the front burner," said Blaauw. One of those hot issues included student advising. The committee, anticipating this concern, already experimented with a pilot program to test a new advising model, and enjoyed meeting the students in a different type of setting.

The good news is EECS students want to get to know the faculty better, and not only through advising. There was repeated talk of the need for a student/faculty lounge, and there are plans being developed for a lounge off the EECS atrium once the new CSE building is completed. In the meantime, the committee will search for ways to facilitate communication between students, faculty, and the administration, will revamp the advising model, and will look for ways to provide purely social activities that involve students and faculty.

With commitment from both faculty and students, Blaauw is confident that sustained effort from this committee will show positive results over time as it reaches into many areas of student and faculty life. Khandelwal agrees, "If people are sincere and put in the effort, they can accomplish anything."

Progress and Promise

Computer Science and Engineering Building Groundbreaking

The dirt movers are in full force, making piles and smooth surfaces, and keeping us on track to complete the $40M CSE building in 2006. Construction of the new CSE building officially began November 21, 2003, with a groundbreaking ceremony. Both faculty and students are looking forward to the new facility, which promises an environment full of natural light, learning, and communication.

Donald Schmitt (Diamond and Schmitt Architects, Inc.), Stephen W. Director (Dean of Engineering), Kevin O'Connor (Chairman, Double Cick, BSE, EE '83), Jerry Levin (BSE, EE, '66), Mary Sue Coleman (President, University of Michigan), John Laird, (Associate Chair, EECS)

For details on the building, please see the 2003 issue of EECS News, and http://www.eecs.umich.edu/eecs/eecs_info/csebldg/

Faculty Awards

Departmental Awards

2003 EECS Outstanding Achievement Award
Stéphane Lafortune
Khalil Najafi
Karem Sakallah

College Awards

Stephen S. Attwood Award
Kang Shin

1938E Award
Dennis Sylvester

Research Excellence Award
Kamal Sarabandi

Education Excellence Award
Todd Austin

Team Excellence Award
Pallab Bhattacharya, Ted Norris, Jasprit Singh (with Rachel Goldman of MSE)

Ruth and Joel Spira Outstanding Teaching Award
Brian Noble

University Awards

Elizabeth Caroline Crosby Research Award
Mingyan Liu

Ching-Yune C. Sylvester, Program Evaluation Manager, NSF-ADVANCE, Professor Mingyan Liu

2004 Henry Russel Award
Todd Austin

2003 Faculty Recognition Award
Michael Wellman

National Awards

NSF CAREER Award
Achilleas Anastasopoulos
Jason Flinn
Michael Flynn
Mingyan Liu
Scott Mahlke
Yaoyun Shi

2003 ACM SIGDA Outstanding New Faculty Award
Dennis Sylvester

IEEE Society Fellows

Edmund Durfee
"For contributions to distributed artificial intelligence, multiagent systems, and real-time intelligent control."

Daniel E. Koditschek
"For contributions to the theory and practice of robotics and intelligent systems."

ACM Fellow

H.V. Jagadish
"For contributions to database technology."

2004 IEEE/LEOS Quantum Electronics Award
Gérard Mourou

2004 IEEE Judith A. Resnick Award
Anthony England

2003 IEEE Signal Processing Society Award
David Munson

2003 IEEE Computer Society Technical Achievement Award
Kang Shin

2003 IEEE Control Systems Technology Award
Jessy Grizzle

2003 Quantum Devices Award
Pallab Bhattacharya

Information Science Award (Assoc. for Intelligent Machinery, Inc.)
Emmett N. Leith

Humboldt Research Award for Senior U.S. Scientists
John Hayes

Staff Awards

Distinguished Research Administrator Award
Beth Lawson, 2003
Betty Cummings, 2004

College of Engineering Staff Excellence Awards
Denise DuPrie, Administrative Assistant II, 2003
Dennis Grimard, Laboratory Manager, 2003
Linda Cox, Student Services Associate, 2004

Student Society Awards

Eta Kappa Nu Professor of the Year
Elliot Soloway

Tau Beta Pi Engineering Professor of the Year
Jessy Grizzle

Society of Women Engineers Teaching Award
David Chesney

New Faculty

Valeria Bertacco
Assistant Professor, CSE Division
BS, CE, U. Padua, Italy
MS, PhD, EE, Stanford University, '98 and '03

Research interests: Verification of digital systems, electronic design automation.

Chandrasekhar Boyapati
Assistant Professor, CSE Division
B. Tech. CSE, Indian Institute of Technology
S.M., PhD, EECS, MIT

Research interests: Software reliability, programming languages.

Ranjit Gharpurey
Assistant Professor, ECE Division
B. Tech., EE, Indian Institute of Technology
M.S., Ph.D., EE, UC- Berkeley

Research interests: RF and high frequency analog design for wireless applications.

Michel M. Maharbiz
Assistant Professor,
ECE Division
B.S., EE, Cornell University
Ph.D., EE, UC-Berkeley

Research interests: MEMS, with a focus on biomolecular applications.

Zhuoqing Morley Mao
Assistant Professor,
CSE Division
B.S., EECS,
UC- Berkeley
M.S., Ph.D., CS,
UC-Berkeley

Research interests: Wide area networks and distributed systems.

Lee Markosian
Assistant Professor,
ECE Division
B.A., English, U. of Rochester
M.Sc., Ph.D., CS,
Brown University

Research interests: Computer graphics, non-photorealistic rendering.

Mahta Moghaddam
Associate Professor,
ECE Division
B.S., EE, U. Kansas
M.S., Ph.D., EE, UIUC

Research interests: Applied electromagnetics, radar remote sensing.

Serap Savari
Associate Professor,
ECE Division
B.S., EE, MIT
M.S., Ph.D., EECS, MIT

Research interests: Data compression, information theory, computer and communication systems, data networks.

Victor Solo
Professor,
ECE Division
B.S., Math, U. Queensland
B.E., ME, and B.Sc., Statistics, U. New South Wales
Ph.D., Statistics, Australian National University

Research interests: Bio-electric sciences, control systems, signal processing.

HKN Recognized in Outstanding Chapter-Activities Award Program

Brett Wilson, Chie Kawahara

The University of Michigan's Eta Kappa Nu college chapter has been recognized in the Outstanding Chapter Activities Award program for 2002-2003, and received a Certificate of Merit.

One of the service activities for HKN is their work at McDonald's House. Brett stated, "I have proudly represented HKN on many occasions."

GEECS – New Undergraduate Society

GEECS officers: Jill Dimond (VP), Kange Kaneene (Treasurer), Katherine Maher (Secretary), Joanna Borders (President)

Girls in Electrical Engineering and Computer Science (GEECS) have come together to form their own society to provide a social and academic support network. Organized Fall term, 2003, GEECS encourages women to participate in computer related studies.

Awards

Student Design Contest of the DAC/ISSCC

EECS students Kamran A. Kashef and Matt P. Hardy have won First Place in the Conceptual Design category of the Design Automation Conference/International Solid State Circuits Design Conference. The title of their paper is "The Economical Aphotic Sieving Engine."

Ping-Cheng Yeh Receives UM 2003 Outstanding Graduate Student Instructor (GSI) Award

Ping-Cheng Yeh said, "It is my dream to be a great professor, just like my dad. Winning the award tells me that as long as I work hard and teach with my full passion, I can teach well even as a foreign instructor." Yeh is a past recipient of a 2002 ASEE Outstanding GSI Honorable Mention Award, and a 2002 EECS Outstanding GSI Award.

UM Programming Teams Advance to World Finals

Two undergraduate student teams will compete in the World Finals of the 28th ACM International Collegiate Programming Contest to be held in Prague, Czech Republic from March 28 to April 1, 2004. The contest, organized by the Association for Computing Machinery (ACM) and sponsored by IBM, will bring together 72 teams selected from regional competitions among 1300 colleges and universities in 68 countries. The UM team consisting of Nuttapong Chentanez, Galen Elias and James McCann placed fourth in a field of 127 teams at the East Central North America (ECNA) Regional Programming Contest on November 8. The second UM team consisting of William Cheng, Yuan-Min Tang, and Arthur Tomlin placed fifth. Prof. Kevin Compton and graduate students Andrew Nierman and Jarrod Roy coached both teams.

NSF Fellowships

Amelia Buerkle
Robert Franklin
Leilah Lyons
Lora Schulwitz

EECS Alumni Awards

Computer Science and Engineering

Michael Stonebraker (MSE '66, PhD '71)

Thomas A. Douglas (Eng. Alumni, Society Board of Governors), Stephen W. Director, Michael Stonebraker, David C. Munson

Dr. Stonebraker is world renowned in the area of relational database research and technology. "Shortly after graduating from Michigan," reflects Prof. Jagadish, "Mike Stonebraker built two of the earliest relational databases, Ingres and System R. These two systems are the progenitors of a billion dollar industry, and commercial databases today are still quite similar in their basic structure to these first systems."

Stonebraker joined the Computer Science faculty at the University of California at Berkeley upon graduating from U-M. Based on his research on databases, he founded INGRES Corp., which was later sold to Computer Associates. Dr. Stonebraker improved on the database model of INGRES with POSTGRES (post-ingres), and went on to form the company Illustra Information Technologies, based on this new technology. Illustra was purchased by Informix, who used Stonebraker's code as the basis of their product. Stonebraker also founded Cohera Corporation. He was awarded the ACM System Software Award in 1992 for his work on INGRES, and is a member of the National Academy of Engineering. Stonebraker retired from UC Berkeley in 2000, and currently teaches at MIT as an adjunct professor.

Stonebraker said, "Computer science is among the most intellectually stimulating, fast-moving, complicated areas. I think it's ground zero right now. I think we will look back in 20 years to right now as the golden age of computer science because the Web is just completely changing everything. It's a really exciting time to be contributing to the field."[1]

[1](see http://www.crn.com/sections/Special/HOF/hof00.asp?ArticleID=21432)

Electrical and Computer Engineering

Robert J. Trew (MSE '69, PhD '75)
Alton and Mildred Lancaster Distinguished Professor and Department Head, Electrical and Computer Engineering, North Carolina State University

Dr. Trew has led a varied and distinguished life as a professor, administrator, and public servant. As a member of the faculty at NCSU, his research was in the areas of semiconductors and microwave computer-aided design. He holds four patents, and has received numerous awards in his field, including the Harry Diamond Memorial Award "for his technical contributions to the theory and design of microwave power devices using wide bandgap semiconductors, and leadership in managing DoD's (U.S. Department of Defense) basic research program." Dr. Trew served from 1997-2001 as Director of Research for the Department of Defense, overseeing a $1.3 billion annual budget. Before this, he spent five years as a Program Manager in the Electronics Division for the U.S. Army Research Office.

Trew says, "I remember my days in Ann Arbor with great fondness.I worked with a great group of students and we had some very nice times. In those days IMPATT and Gunn devices were the hot devices for research and there were opportunities in both device modeling and fabrication and testing. I did a little of both. The TRAPATT diode turned out to be a very good educational tool and was ideal for learning about various physical electronic and circuit phenomena affecting solid state device operation. The knowledge later proved invaluable. Life in Ann Arbor wasn't all work, and I fondly recall football Saturdays (I was in the stadium the day Woody Hays tore up the yard marker), the Ann Arbor Street Art Fair (right outside East Engineering), the Dexter cider mill, and Pizza Bob's. I can't imagine a better educational experience."

Thomas A. Douglas (Eng. Alumni Society Board of Governors), Stephen W. Director, Robert J. Trew, David C. Munson

2003 College of Engineering Alumni Society Medal

Eric M. Aupperle (BSE EE '57, BSE EM '57, MSE '58, InstrmE '64)
Research Scientist Emeritus, University of Michigan

Dr. Eric Aupperle has a long and distinguished record of education and service with the University of Michigan, and the State of Michigan. After receiving four degrees in the areas of engineering and mathematics, he was hired as an engineer in the Cooley Electronics Laboratory in 1957, and joined Merit Computer Network in 1969 as project leader. Merit originally linked U-M through a network with Michigan State University and Wayne State University, and by 1987 was considered one of the best networking organizations in the United States. In 1987, Dr. Aupperle was principle investigator on a research project that was responsible for developing and operating NSFnet (National Science Foundation Network). He worked with MCI and IBM in this effort. NSFnet, which operated between 1987 and 1995, is recognized today for being the foundation of today's Internet. Says Aupperle, "Given that most people's awareness of the Internet dates back only about a decade, Merit is, by any measure, a prehistoric Internet entity and a true pioneer."

Eric M. Aupperle, Stephen W. Director

Eric was appointed director of Merit in 1974, became president in 1988, and retired 2001. Aupperle received the IEEE Third Millenium Medal in 2000 for long term service and contributions. Speculating about the future, Aupperle stated, "My opportunity to participate actively in the Internet's development from its beginning both through our statewide Merit activities and nationally during the NSFNET era was a rewarding experience I cherish. It's gratifying to witness the fruits of our efforts having such a lasting impact."

ANNOUNCING

EECS Alumni Society Gathering and Reception
Thursday, June 17, 2004
7:00pm - 9:00pm
Lurie Engineering Center, 3rd Floor (Johnson Rooms)
1221 Beal Avenue
North Campus, Ann Arbor, MI

Light refreshments will be served

The University of Michigan Electrical Engineering and Computer Science alumni are having their first local Alumni gathering and you are invited.

We all have great memories of our time at Michigan and now we can reconnect with fellow alumni and learn about what's been happening in the department at the same time.

Hosted by the EECS Alumni Society, this event is an opportunity to meet in an informal atmosphere with friends and fellow EECS grads. Our new Department Chair, Prof. David Munson, will tell us what's on the horizon. For example, did you know that there is a new CSE building being constructed on North Campus right now?

We will also hear from EECS professor and astronaut, Tony England. Prof. England has recently been appointed Associate Dean for Academic Affairs in the College of Engineering.

Please respond quickly as we need to know how many will attend. Please RSVP and send questions to:

Catharine June
e-mail: cmsj@umich.edu

If you can't make it this time, but still want to stay connected with the department, there are plenty of ways to stay in touch. Just visit the EECS Alumni Society web site at:
http:/www.eecs.umich.edu/eecs/alumnisociety/

Hope to see you soon!

Steve Schwartz (BSE '89)
stevschw@umich.edu
U of M EECS Alumni Society

Maps and directions: http://www.umich.edu/~info/visiting.html

Campus Memories and How You Can Help Memorialize Them

William D. Becher
EECS Alumni Society President

From the little spark may burst a mighty flame - Dante

Sitting at my desk trying to decide what I should say about the EECS Alumni Society, old memories began to pop into my mind, random images of my days as a student in what was then called the Electrical Engineering Department. Simple things, seemingly unrelated things, things such as the East Engineering Building (now East Hall) on main campus; the machinery labs in the basement with their giant armatures and huge electromagnets; the office of Professor Lewis N. Holland, advisor and friend to so many of us undergraduate and graduate students; of A. D. Moore's Heat Transfer and EM Fields lab and how everyone dreaded drawing those precise heat transfer charts and his, what seemed so unfair, method of relentlessly drilling each of us in front of our classmates and, afterwards, when we had successfully completed the course and we realized how much we had learned, how we conveniently chose to ignore those charts and humiliating drills and enthusiastically encouraged everyone to elect A.D's course as soon as possible.

The North Campus was mostly a vacant field back in those days with only a scattering of buildings including the Cooley Lab, which housed some of the major research connected to the department. The department was involved in an impressive array of research and had wonderful facilities back then, but it all pales in comparison to the impressive current research projects and facilities.

In those days Thermodynamics, Fluid Mechanics, Engineering Mechanics and two machinery courses were required of all undergraduate E.E. students; vacuum tubes were still the major active devices with transistor theory only an elective; integrated circuits were unheard of; computers were accessed via IBM cards, and the Michigan Terminal System was just beginning to offer an alternative to the usual three-day turn around time between job submission and pickup at the always crowded Computing Center; research on the MERIT computer network, a precursor to the Internet, was just starting with the hopes of someday interconnecting the Michigan, Michigan State and Wayne State computer systems to create a "giant" computer facility; the analog computer was the major method of modeling physical systems; feedback control systems, Fourier series, digital logic and digital computers were graduate level courses.

Graduate programs and topics were different, too. I had hoped to use the digital computer as the central focus of my dissertation but there were only a few (two if I recall correctly) electrical engineering professors knowledgeable in computer hardware, Professors Norman S. Scott and Harvey Gardner, and neither was available to serve as chairperson so instead I chose non-uniform transmission lines as my topic. The Ph.D. program required reading proficiency in two foreign languages and a dreaded oral qualifying exam. Both requirements were major impediments to obtaining an advanced degree and nearly made me forget any thought of graduate school.

Living was different then, as well. University students were not permitted to have autos on campus; Ann Arbor was dry east of Division Street and the Pretzel Bell was the local place where rowdy, beer drinking students gathered to chug-a-lug on their twenty-first birthday; football tickets were free to students; the only local movie houses were the State, Michigan and Campus theaters; the town was nearly deserted after 10 p.m.; on-street parking was almost always available; the Stadium was hardly ever filled--Minnesota was the Big Ten power; and kissing a girl under the Engineering Arch had certain whispered connotations.

But it wasn't all fun and games in those days. We had long and difficult class assignments, just as the present day students still do. And the much publicized difficulty made us proud to be engineering students, and especially electrical engineering students. We wore our slide rules on our belts with a great deal of pride and challenged our professors to make the courses harder and the problem sets longer and more difficult. (Well maybe I'm getting a little carried away here.)

Call me a romantic, but all these memories and so many more are what make me so nostalgic whenever I become involved with the Electrical Engineering and Computer Science Department nowadays. They're just a few of the many things that compelled me to accept the challenges of charting the course of the EECS Alumni Society as its first president. In doing so, I've tried to guide the organization in a direction that would keep these memories alive while emphasizing service to the Society members and to the students and faculty of the department. Admittedly, I've only made a small dent in this goal and would not have gotten this far without the help of the officers and board members of the Society.

But then again, perhaps nostalgia is not where our focus should be. Perhaps we should be emphasizing the conventional goals of an alumni organization; collecting donations and supporting various departmental activities--all admirable and much needed efforts. That's where you, the members, friends and potential members of the Society can contribute. Join the Society if not already a member; work with the incoming officers; give them input; tell them where the Society should be going; provide suggestions of things they should be doing, efforts such as: establishing regional chapters, creating scholarships and grants, planning special events on Homecoming Weekend and other times throughout the year, serving on committees, volunteering to become a Society officer, … You get the idea.

With your support, this Society can become the premier alumni group of the College of Engineering and a model for other departments across the campus and the nation to emulate. I look forward to seeing the results of everyone's input, enthusiasm and hard work. And, of course, I'll still be in office until this summer, drop me a line when you get a few moments. And above all,

Go Blue!
Bill Becher, MSE'61, Ph.D. '68

1950's

Hsien W. Chang (MSE, EE, '57) is a retired software development manager at IBM. Hsien joined IBM Research upon graduation, and worked in the following areas: Automatic Language translation, OS/MVS design and development, the IBM Displaywriter word processor, Asia Pacific Operations, China workstation business development, and OS/2 software development. He retired from IBM in 1992, and then worked for the Applied Science Fiction Corp. in Austin. He retired from the work force for good in 2002.

David G. Marckini (BSE EE, '58) retired from a career in Information Systems, working for General Motors and EDS. "I grew up in Grand Rapids, went to the University of Michigan, graduating with degrees in EE and Eng. Math, then moved to Detroit to work. We recently moved back to the west side of the state, living on Lake Michigan just north of Holland. I'm currently writing poetry, short stories, and have set aside a novel that I started as my Master's thesis. I have been running for about 22 years. Do about 10 –15 races a year, from 5K to marathon. Love to read, write, solve problems (which I see as a game), play bridge, sail, travel. We don't go south yet, rather stay and ski. Life is good." See more about David Marckini on the web at https://www.eecs.umich.edu/eecs/alumnisociety/stories.html

Kurt E. Richter (BS, EE, '58) graduated from the University of Michigan Law School in 1964, "after returning from three fun years as a globe-hopping engineer with Link Division of General Precision, Inc. After law school I settled into the practice of law in New York City, and I am a senior partner in the New York firm of Morgan & Finnegan, a 100+ attorney law firm specializing in intellectual property law. As you might surmise, it is an invaluable asset in my legal practice area to have the ability to understand and assimilate technology advances, and my engineering education at Michigan gave me just that. I have had a wonderfully interesting and stimulating career, with the opportunity to participate in several trend-setting, as well as routine, patent and trademark litigations and other matters. My wife Winnifred and I have four daughters (three grandchildren), all married and making their own ways in the world."

1960's

Wesley W. Bushman (MSE, EE, '63), is a retired Executive Engineer from Chrysler. He has also worked at the Space Physics Research Lab, at U-M, and for American Motors. He has three sons, all U-M graduates, and 4 grandchildren. Wesley and his wife Jean have recently moved to Tampa Bay, and says "the weather's great, but still we sometimes find ourselves missing Michigan."

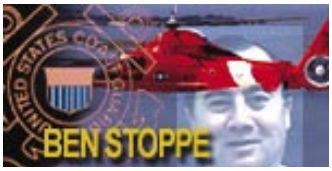
1970's

Kathryn M. Dombrowski [Walsh], (BS, EE, '79), has worked for Ford Motor Company for more than 20 years in a variety of positions, including systems engineering, engineering supervision, project management, and business planning. She received an MBA in 1987, and is a professional engineer. She is married with 4 children.

Benjamin J. Stoppe, Jr (MSE, EE, '79), came to study at the department while a member of the Coast Guard. He knew several friends who studied here, and heard good things. He studied hard, going to school year round to get his specially-molded degree, which combined electrical engineering and math courses. A favorite outlet was the football games, back when Bo Schembechler was fighting Woody Hayes at Ohio State. Ben performed many search and rescue missions for the Coast Guard, including one "tour" transporting premature infants to better medical facilities. He retired from the Coast Guard at the age of 44, but went right back to work, this time in the field of Information Technology. He currently works for MITRE, a not-for-profit company that works for the public good. He works in the Center for Advanced Aviation Systems Development (CAASD), which primarily works for the FAA to improve the air traffic system.

Ben has been the treasurer of the M Club of Washington DC for the past seven years, and has returned to attend the leadership classes sponsored by the UM Alumni Society.

To read more of Ben's Coast Guard search and rescue missions, view the helicopters he flew, and learn of his work in the realm of Information Technology, please read his story at: https://www.eecs.umich.edu/eecs/alumnisociety/stories.html.



1980's

Charles J. Antonelli (PhD, CE, '89) is Assistant Research Scientist in the Information Technology Division and Assistant Director of Research Management at the Center for Information Technology Integration (CITI) at the University of Michigan. Dr. Antonelli's recent efforts at CITI include the secure packet vault and the AFS over ATM AAL5 projects. He has taught courses in operating systems and distributed file systems in EECS.

Bennett S. Dubin (BSEE, BSCE, '85), tells us, "I received my BSEE and BSCompE from Michigan in 1985. After working in the mid-80's for Lockheed and Sun Microsystems, I started an open source software company and then a software security company. We sold the security company and I then went on to get my MBA at Harvard. Afterwards I headed up the Enterprise Software portion of Java at Sun's Javasoft. I have been a partner at Asset Management Company, the oldest venture capital firm in the west coast, for the past 6 years, and head up the IT investment portion of our fund. I received my MBA from Harvard."

Go Blue!

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

Ben Dubin in Samoa

1990s

Patrick Alphonso (BS CE, '94) is President of Swamiware LLC, in Ann Arbor, MI. Swamiware has recently completed software development on the highly anticipated Dragon Ball Z: Taiketsu for Game Boy Advance. Patrick is the author of *The Game Fanatic's Guide to PC Cheats* published by Avon Books New York. He served as an editor for The Internet Encyclopedia (John Wiley & Sons). (http://www.swamiware.com)

Amir A. Amini (PhD, EE-Systems, '90) is Associate Professor at Washington University, MO, and Director of the Cardiovascular Image Analysis Laboratory at the School of Medicine. Prof. Amini is the general chair of SPIE Medical Imaging Conference on Physiology, Function, and Structure from Medical Images, and is on the editorial board of IEEE Transactions on Medical Imaging. He is co-author of the book, *Measurement of Cardiac Deformations from MRI: Physical and Mathematical Models.* (http://www-cv.wustl.edu/amini.html)

Christopher William Angove (BS, CS '98) is a software engineer with OPNET Technologies, MD. He has gained experience in software ranging from pure coding, training customers, and working with clients to solve their current problems.

Anurag Bajaj (MS, CSE, '96) is an Associate with the Information Technology Group of Booz Allen Hamilton. Upon graduation from U-M, Anurag joined Hewlett Packard's System Interconnect Solutions lab as a software design engineer. He left HP in 1999 to pursue an MBA at the Wharton School of Management, Univ. of Pennsylvania. He joined Booz Allen and Hamilton's London office in their Information Technology Group in 2001.

Donna Christine Belville [Wolfe] (MS, EE-Systems'99) is the very happy mother of Julianna Brooke, born January 6, 2004. She does consulting work for Veridian Systems (now General Dynamics) as a research scientist and software developer. Donna and her husband Roy live in Indianapolis, IN.

John C. Cowles (PhD, EE, '94) is a design engineer with Analog Devices, Inc., responsible for RF/IF product design. From 1994-98, he was Senior Member of Technical Staff at TRW in Redondo Beach, Ca., and was responsible for advanced GaAs & InP HBT development for high speed ICs.

2000s

Joshua P. Carroll (MSE, EE Systems, '02), is a project engineer in the Dryer Global Product Development section of Whirlpool Corporation. He recently completed a 3 year technical excellence program, and spent a 6 month assignment in Italy. He married his undergraduate sweetheart, Julie Harrison, Nov. 10th, 2001.

Joy Chatterjee (BSE, EE, 2002) is working for Intel Corporation at the Washington site. She is a circuit board and logic design engineer.

2000 continued

Kinjal Ashok Gandhi (BS, CS, 2003)
Ashok started his degree in Fall 2000, and after completing a coop at Convergys for his final term, graduated Summer 2003. He was hired Fall 2003 at Convergys, the youngest person ever hired at that company. He is an associate programmer/ analyst for the Information Management Group (IMG).

Kinjal Gandhi

Julie Anne Mayfield (BS, CS, '01), tells us, "I'm working on Shark Tale for Dreamworks SKG as a software technical director, and 3D lighting artist. The movie is a 3D animated comedy about a little fish, his big white lie, and mobster sharks starring Will Smith and Robert DeNiro. It will release in October this year. I am also currently producing a short, animated film with a diverse group of people gathered from all the different studios in town. This short will be submitted to festivals around the world by the end of this year. It has given me incredible insight to the producing world, as well as complimenting my technical side with my co-role as a character technical director." For more on the film, see http://www.sharktale.com/

Nicholas Savo (BSE, EE, 2001) says that after graduation, "I was hired by Intel Corporation and moved to Sacramento California to join Intel's Sales and Marketing Rotation Program. During the rotational program I moved from California to Oregon and held several different jobs within Intel's core business units. I completed the rotation program in April of 2003 and was placed in Austin, Texas." Nick manages all desktop and server Intel motherboard sales to Dell.

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