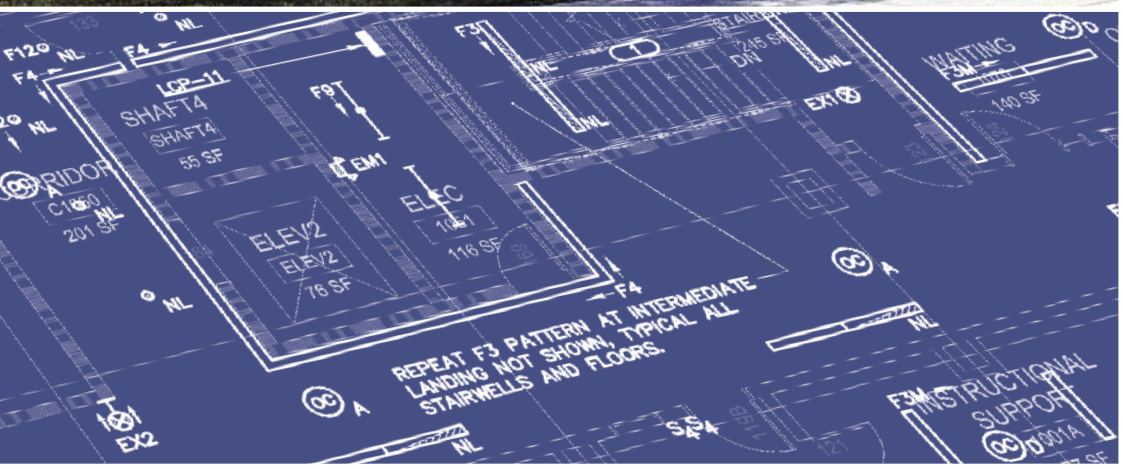
RESONANCE

NEWS FOR ECE ILLINOIS ALUMNI AND FRIENDS
FALL 2010



New ECE building design approved

Also in this issue:

ILLINOIS

Department of Electrical and Computer Engineering

Creating a hearth and home

Dear alumni,

I think you will find this to be an exciting issue as we share some of the newest developments of our ECE building campaign. In addition to an update of the latest information on the building, we have an interview with David King, the lead architect on the project, and some information on how our alumni can become more involved in the campaign.

As I contemplate what the new building will mean for our ECE community, the origins of the ancient Greek concept of the hearth come to mind. Hestia. In ancient Greece, Hestia was the goddess of the sacred fire and was considered the most important of the goddesses. The daily tribute to this goddess was simple, to keep the hearth alive, burning with warmth and all the promise of fire. The word also means "focus," both a point of convergence and a point of departure.

As we stand at the threshold of embarking on the revitalization of ECE with the construction of the new home building for our department, the anticipation of one central hearth—to shelter, to welcome, and to inspire—validates our endeavor.

As members of the ECE ILLINOIS family, we know the entity of our vibrant engineering community is sustained by us, wherever we are, because we cannot circumscribe the reach and impact of ECE ILLINOIS within the confines of a building. We can say, definitively, our Hestia, our focus, resides within our people because it is we who define who we are and what we can do. However, because we live, study, learn, compute, confer, and research together in our buildings, because who we become is enabled by the physical structures of our buildings, we can say that the hearth and home of ECE also reside in our buildings, that the people and the place together fulfill the expectations of our community.

For you, ECE ILLINOIS began as a place of convergence, became a point of departure, and remains as a tradition whose reputation you uphold with the sum of your achievements and commitment to the high standards of engineering you were trained in here at Illinois. Your successes inspire our students and faculty alike, and refuel pride in the identity of the ECE ILLINOIS engineer.

As you embody the fire of brilliance and innovation that continues to be the promise of ECE ILLINOIS, our new building will ignite a renewed sense of place for our department.

Let's make it happen! Together we will!

Best Regards,

Andreas C. Cangellaris
Department Head
M. E. Van Valkenburg Professor in Electrical and Computer Engineering

ECE ILLINOIS

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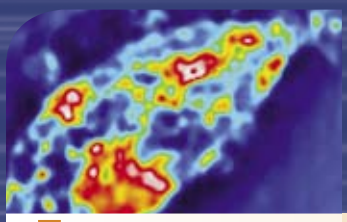

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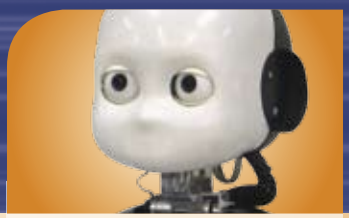

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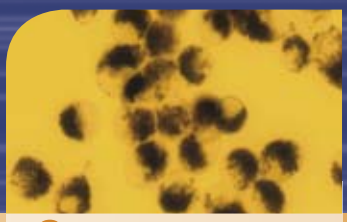

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RESONANCE is published twice a year by the Department of Electrical and Computer Engineering (ECE) at the University of Illinois at Urbana-Champaign. Comments and suggestions are welcome. Contact Tom Moone, editor, at moone@illinois.edu or mail to the address at left.

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Contributing Writers: Jenny Applequist, Information Trust Institute; Charlie Johnson, ECE ILLINOIS; Susan Kantor, ECE ILLINOIS; Megan Kelly, Coordinated Science Lab; Steve McGaughey, Beckman Institute

The Tesla Roadster stops by Urbana-Champaign

On the afternoon of January 5, representatives from Tesla Motors brought a Tesla Roadster, an electric sports car, to Everitt Lab and the College of Engineering. Tesla Motors was co-founded by ECE alumnus Martin Eberhard (BSCompE '83, MSEE '84). The Roadster was on a cross-country trip that began December 17 in Los Angeles and ended in Detroit on January 8. In all, the car travelled more than 2,700 miles.

Online version of ECE 110 developed for transfer students

ECE Lecturer and Chief Adviser Marie-Christine Brunet is developing ECE 109, an online version of 110, but without the lab component. The class will be geared toward potential transfer students. It will cover all the topics covered in the lecture component of ECE 110. Students will still need to take the lab component once they are on campus. This will help transfer students to reach a level comparable to students who have been here since freshman year.

Hwu co-authors ground-breaking textbook on parallel programming

ECE Professor Wen-Mei W. Hwu has co-authored what many in the industry believe will be an important new textbook that breaks down the complexities of parallel programming and the graphics processing unit (GPU) architecture to enable programmers to address the critical challenges of massive parallelism. *Programming Massively Parallel Processors: A Hands-on Approach* was co-authored by Hwu, principal investigator of Illinois' CUDA Center of Excellence, and David Kirk, an NVIDIA Fellow and former chief scientist.

ECE's Mark Smart performs with the Champaign-Urbana Symphony

When the Champaign-Urbana Symphony Orchestra celebrated its 50th anniversary on February 19, an atypical instrument joined the classical collection of strings, winds, and percussion: the Continuum Fingerboard. The Continuum Fingerboard, which was played by ECE Electronic Services Technician Mark Wayne Smart, is the invention of ECE Lecturer Lippold Haken. Smart played a piece written by Rudolf Haken, an associate professor of music at Illinois and brother to the instrument's inventor.

Students organize first Power and Energy Conference at Illinois

The first Power and Energy Conference at Illinois was hosted successfully February 12 and 13. The conference was organized by the IEEE Power & Energy Society and Power Electronics Society Joint Student Chapter at the University. More than 90 individuals from 10 universities participated in the conference. Industry support was received from companies such as SolarBridge Technologies, ComEd Exelon, and John Deere.

ECE researchers begin project to treat and prevent apple disease

ECE Professor Kyekyoon Kim and ECE Instructor/MNTL Research Professor Hyungsoo Choi are co-principal investigators on a three-year $1.95 million project from the USDA-Specialty Crop Research Initiative program to treat and eradicate fire blight. Kim and Choi will develop controlled delivery of biocontrol agents (i.e., bacterial antagonists) and chemical agents that are most effective in dealing with the bacterial disease using nano/microtechnology.

Major resilient Smart Grid program established at Illinois

By Jenny Applequist, Information Trust Institute

In recent months, the media have been buzzing with talk about the "Smart Grid," especially since then-President-Elect Barack Obama featured the need for new Smart Grid technology in a January 2009 speech on the economy. Now, the Information Trust Institute (ITI) at the University of Illinois at Urbana-Champaign and its partner institutions have been recruited to contribute toward the ongoing development of a resilient, secure Smart Grid in the United States. This follows the announcement of a major award of research support from the U.S. Department of Energy with contributions from the U.S. Department of Homeland Security.

The award of nearly $18.8 million over a five-year period to Illinois, Dartmouth College, the University of California at Davis, and Washington State University will fund an ambitious new research program called Trustworthy Cyber Infrastructure for the Power Grid (TCIPG). It reflects a strong consensus that cyber security and resilience will be critical to the realization of a modernized, reliable, and efficient power grid.

"Research and development of cyber security tools and technologies for critical controls systems, such as the power grid, are among our top priorities," said Dr. Douglas Maughan, program manager within the Command, Control, and Interoperability Division of the Department of Homeland Security's Science and Technology Directorate. "We're excited to continue working with the Department of Energy and the University of Illinois and its partners in this area of critical need for our nation's security."

Smart Grid refers to the integration of the existing physical infrastructure of the power grid with an advanced communication and control cyber infrastructure, with the ultimate goal of making energy transmission and distribution more efficient and, therefore, cheaper for consumers and less wasteful of resources.

However, Smart Grid technologies may themselves introduce new problems, such as higher vulnerability to cyber attack as power grid resources become increasingly linked to the Internet.

"Ultimately, the extent to which the Smart Grid vision is achieved is going to depend on how functional and robust the cyber infrastructure is," explained

Ilesanmi Adesida, dean of the College of Engineering at Illinois. "Smart Grid technologies should be able to offer us increased protection against accidents and against adversaries who might want to deliberately harm the power grid, who might include well-funded, highly motivated criminal organizations or even nation-states, not just casual hackers."

The new TCIPG research program will involve the development and integration of information technologies with the key properties of real-time availability, integrity, authentication, and confidentiality. More specifically, the objectives are to develop and evaluate technologies needed for realizing select Smart Grid applications, such as wide-area monitoring and control, demand response with controllable load, and plug-in hybrid electric vehicles. Ultimately, the project is expected to result in a secure and real-time communication system, an automated attack response system, and risk assessment and security validation techniques.

ECE Professor William H. Sanders will serve as the director of TCIPG, with Himanshu Khurana of ITI as the principal scientist and ECE Professor Pete Sauer as industry liaison. The rest of the TCIPG team consists of professors, research scientists, and students from the four participating universities.

Improving control of wind resources

By Charlie Johnson

ECE Assistant Professor Alejandro Dominguez-Garcia and ECE Professor George Gross are attempting to do the impossible—predict the weather.

Or, at least develop appropriate ways to manage wind intermittency.

Alejandro Dominguez-Garcia

George Gross

Unlike conventional methods of energy production, where output can be accurately evaluated out to the very last kilowatt-hour, wind, like any element of weather, is far less predictable. Dominguez-Garcia and Gross are the recent recipients of a three-year grant from the National Science Foundation to study and develop a methodology that can better handle the intermittent electricity production of wind-based power and integrate the resources into the existing power grid.

"The power system is a 'just-in-time' manufacturing process, since we do not have at present the ability to store large amounts of energy, and with wind, you really have no control over how much power you can generate," said Dominguez-Garcia, the principal investigator on the study.

"The ultimate problem is that the wind blows when it wants to and not when the system needs it," said Gross.

"The challenge is how to manage a resource which has no control knobs," continued Dominguez-Garcia.

The intermittent nature of wind energy raises logistical problems that Dominguez-Garcia and Gross will address in their investigations. For example, power system operators whose systems include wind energy currently need to compensate for the uncertainty of wind power by requiring higher power reserve levels. This frequently translates into committing additional generation capacity to ensure adequate power capacity should the wind fail to blow.

In other words, such a strategy may result in either "an issue of commission whenever too many controllable units are committed, which makes production uneconomic, or a risk of omission if the reserves are too low for the slow winds, resulting in the undesirable loss of load," said Gross.

To combat this problem, Dominguez-Garcia and Gross are developing a detailed statistical analysis to help create models of wind farm output, taking into account technology, location, wind variability, and potential for forecasting error on a given farm. In addition to aiding power system operators, the models will reduce the costs of building and maintaining a wind farm by better predicting the output of a given site or a group of sites.

Their research is especially timely as more and more states begin to set higher standards for sustainable energy and green technology in their energy portfolios. California recently enacted a target of 30 percent of energy to be generated via renewable resources by 2020. Currently, the United States has the largest wind-based generation capacity installed in the world, though not on a per capita basis.

"There's a huge hype about sustainable technology right now, obviously," said Dominguez-Garcia. "The National Science Foundation and others are putting a lot of resources into this research right now. Of course, it is just research right now, but we're confident that the technology will materialize."

Energy production modeling is just one aspect of the greater, nationwide push for sustainable technology. Issues of green energy storage, transport, and construction still loom. For instance, the best locations for wind generation typically lie in areas of low population density. Predicting wind production is the first half of the solution; transporting that sustainable energy to the New Yorks, Chicagos, and Champaign-Urbanas of the world is the other. Taking this into account, Dominguez-Garcia and Gross are specifically using graduate and undergraduate research assistants to get the next generation of green energy engineers off to a running start. "We have a key responsibility in educating and training the new generation of engineers to ensure the sustainability of the nation for the future," said Gross.

After all, when it comes to predicting the weather, we can use all the help we can get.

The cell whisperers

Gabriel Popescu and his Quantitative Light Imaging Lab take new approach to measuring cell dynamics and structure

By Steve McGaughey, Beckman Institute

ECE Assistant Professor Gabriel Popescu doesn't just want to know how cells communicate—he wants in on the conversation. To accomplish that, Popescu, a researcher in the Beckman Institute, takes advantage of the properties of light through truly original approaches to measuring cellular structure and dynamics.

Light scattering techniques, interferometry (bringing two waves together), and microscopy are combined in his research to address tissue interactions and make-up, both for basic science research and for applications. When asked about his research, Popescu says his approach is a form of eavesdropping.

"One way," Popescu said, "to describe our cell imaging work is that we're trying to listen to cells as opposed to just seeing them, which microscopy has been doing for centuries. Now we are actually accurately measuring their motion at the nanoscale. So that, in many ways, with all of these vibrations, is very close to listening to something."

Popescu's grand vision for his research line, however, goes beyond just listening to those cells. "What we really want to do in the end is to be cell whisperers, to talk back to them, and understand their language."

For Popescu and the students and postdocs in his lab, their work to quantify the structure and dynamics of cells and tissues has three components: research that serves both basic and translational purposes and that is highly collaborative.

"We cannot solve the problems by ourselves," Popescu said. "At the same time we think that the cell biology labs cannot do certain things without our help. This is the trend in the whole biomedical field, to apply understanding from non-living science back to cells, via collaborations across disciplines."

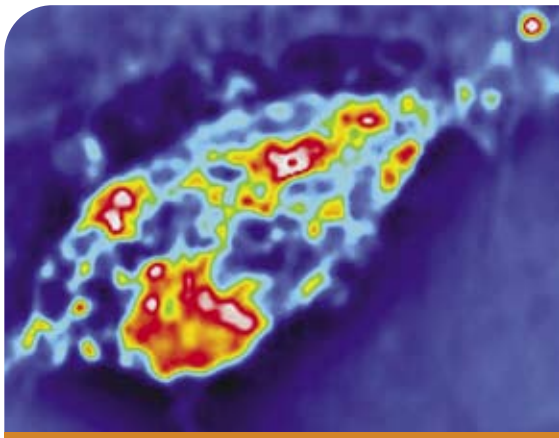
Popescu's Quantitative Light Imaging (QLI) Laboratory at Beckman works, as stated on its website, to develop "novel optical methods based on light scattering, interferometry and microscopy to quantify structure and dynamics of cells and tissues" toward performing "highly interdisciplinary research at the interface between technology development, basic biological studies, and clinical applications."

The group includes students from physics, electrical engineering, and mechanical engineering, with collaborations that touch on topics in fields such as medicine, neuroscience, computer science, and biochemistry. Technology development using their optical methods is central to their efforts, especially for the technology's potential use in the biomedical field. When asked about their research, Popescu and members of his lab say potential applications of the work are just as important as the science behind those applications.

Gabriel Popescu

"We're not only toolmakers but we also use them to do our own science while we hope to impact other research," Popescu said. "At this stage we are exploring many of the applications of our technology.

"I usually separate them into structures, saying we are imaging the structures and then the dynamics. Both of these parts of the research are basic; we are trying to understand phenomena in cells, and how light interacts with tissues. But we also have a component that goes all the way to clinical applications in that we are looking mainly at blood screening and cancer detection."



Hippocampal neuron imaged by Spatial Light Interference Microscopy (SLIM) developed at the QLI Lab (http://light.ece.uiuc.edu/).

The lab is collaborating on projects with Provena Hospital in Urbana to develop methods for clinical settings.

"What we are seeing in the biomedical field is more of an engineering and physics approach to cell functioning," Popescu said. "What's missing are the proper tools to measure all these signals in live cells. How do you measure interactions between cells, these small vibrations that are always there, but very hard to measure. I think we're contributing to that with the tools."

Popescu and his lab members say that their leading-edge research makes coming to the lab a fun experience.

"I think when you are excited about what's going on in the lab it doesn't feel like work," said Popescu. "Nobody can work effectively for 12 hours a day but everybody can have fun for 12 hours a day."

Hasegawa-Johnson finding ways to improve speech recognition

By Susan Kantor

ECE Assistant Professor Mark Hasegawa-Johnson is working to put words into peoples' mouths—with the help of a computer, of course. His research focuses on speech recognition, the ability of a computer to recognize and convert human words into code.

"Speech recognition now works very well if you're willing to wear a head-mounted microphone, and if you're speaking in a dialect that the speech recognizer has been trained to recognize," Hasegawa-Johnson said. "Otherwise, it doesn't work."

One of the areas Hasegawa-Johnson is investigating is the use of prosody, the stress and rhythm pattern of naturally spoken language. In speech recognition, two levels of language structure are typically recognized: words and the individual consonants and vowels that make up words, known as phonemes. Higher levels of language structure, like syntactic phrases, or lower levels of structure, like how the movements of the tongue and lips are planned, are not considered.

"What we've been doing is gradually adding some of the representations of some of those other levels of structure to the probabilistic models we use to build speech recognition," Hasegawa-Johnson said.

Speech recognizers do not work as well when there is speech variability. Hasegawa-Johnson has been working to correctly recognize spontaneous speech, despite the disfluencies ("ums," "uhs," and word fragments) that are a normal part of spontaneous speech. In a person's speech planning process, words that have some relationship are grouped together. The planning mechanism puts those into a queue and those words are said. But while those words are being said, the next group of words should be ready to go in the queue. When that doesn't happen, speech becomes disfluent. Every truncated word causes two speech recognition errors.

"Most of what we do here is to build better probabilistic models of the ways in which the audio is related to the things the person was trying to say," Hasegawa-Johnson said. "We try to use probability theory to describe all of the audio in the world."

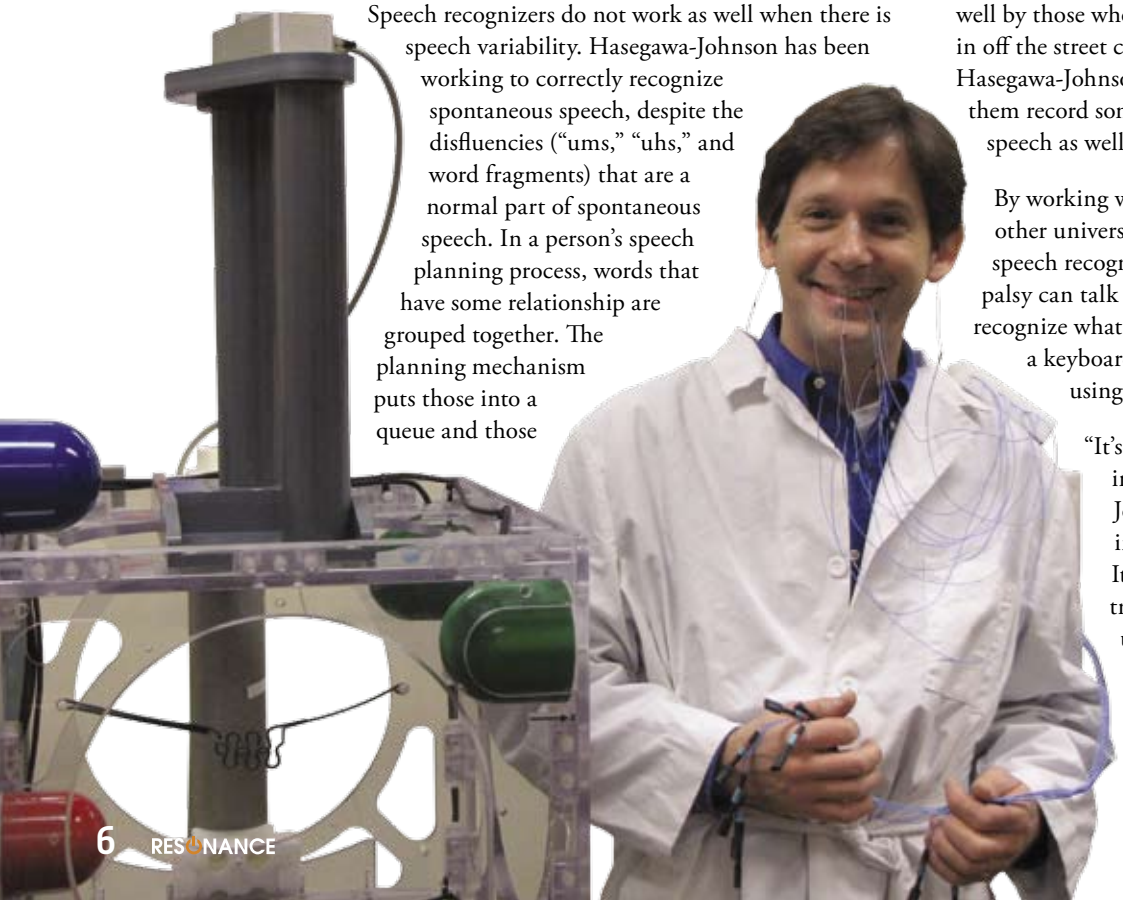
Graduate students use between 3,000 and 4,000 hours of recorded English speech to test the codes they write. Hasegawa-Johnson and his research team are trying to learn the probability of the overlapping of certain phonemes in speech, like when a "K" sound is softened when it is preceded by a vowel.

This research is related to a three-year project on speech recognition for people with cerebral palsy that Hasegawa-Johnson recently completed (and is hoping to continue). He hopes to develop ways for speech recognition to be used for accessing the Internet, writing documents, and finding work.

"A lot of people with speech disorders can be understood well by those who know them well, but someone walking in off the street can't understand what they're saying," Hasegawa-Johnson said. "We can get over that by having them record some speech and then trying to model their speech as well as we can."

By working with students both on campus and at other universities, Hasegawa-Johnson developed a speech recognizer game in which people with cerebral palsy can talk to the computer and it will try to recognize what they've said. He is also trying to make a keyboard interface that can type documents by using a limited vocabulary.

"It's satisfying to do something that you can immediately see the effect," Hasegawa-Johnson said. "We're working with individual students here and elsewhere. It's quite motivating to see someone trying to use a keyboard, and he just can't use a keyboard, and then put a speech recognizer in front of him. Quite frankly, our speech recognizers are not good enough yet to replace a keyboard for him, but you see what that could mean to him."



Levinson works to create artificially intelligent robots

By Charlie Johnson

There is no shortage of films depicting a not-too-distant future in which artificially intelligent machines rise up to overthrow their human creators. Usually the machines get close, even dangerously close, before a perfectly made-up Will Smith or Keanu Reeves steps in to save the day, get the girl, and remind those killer robots who's boss. It makes for great entertainment, even if the scenario can seem frighteningly realistic at times.

Stephen Levinson

But ask ECE Professor Stephen Levinson and he will tell you he is looking forward to the days of robot/human combat. "We certainly hope that will happen someday," said Levinson. "If I knew how to create robots like that, I would absolutely do it in a heartbeat."

He's kidding, of course—we hope.

If one wonders why Levinson is looking forward to the robot apocalypse, it's because for the last 12 years, he's been working on developing those robots. Levinson's most recent research focuses on creating a robot that can learn through experience—that is, a robot that doesn't require specific programming to perform a task but can process inputs from the outside world and use those inputs to carry out previously unknown functions. In essence, a robot that learns in the same way that a human child learns—a sentient robot.

"We've been at this for a while," said Levinson. "This project has been going on for around 12 years, and the ultimate goal has always been to build an artificial, cognitively aware machine."

Levinson's latest project on the road to a robot-dominant/human-subservient world is the iCub, a fully anthropomorphic, highly advanced robot that is constructed like a small human. The iCub is built by a European consortium of 30 companies and universities supported with grant money from the European Union.

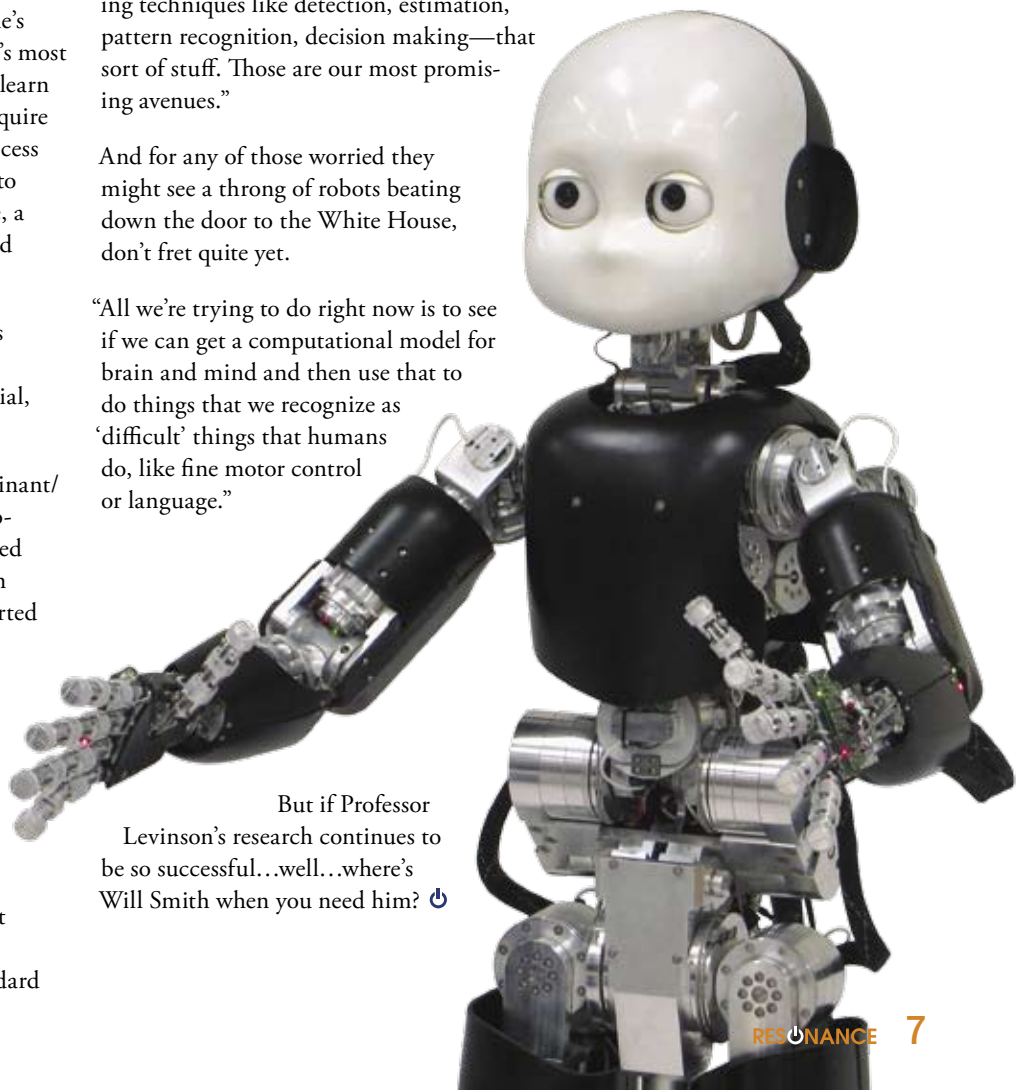
The iCub received its finishing touches at the University of Genoa in Genoa, Italy, before making its way to Levinson's lab at the Beckman Institute. Several of Levinson's graduate students visited the iCub in Europe to begin training on it before its arrival.

Levinson and his team are pursuing several different methods of engineering the robot to be artificially intelligent. Most of the team's research follows standard engineering techniques, but they are also looking into the innovative technique of cortical modeling, trying to model the cortex of a human brain. This extremely complex technique requires Levinson and his team to create a nonlinear, entirely dynamic system to mimic the way humans process memories and use those memories to control future actions. In a nutshell, the aim is to create a robot's brain to learn like a human's, except instead of neurons and gray matter, the robot would have circuits and resistors to process its thoughts.

"In one sense, this sort of method had to be the right way. But, in the other sense, there is so much knowledge missing right now that it would be easy for this conceptually good idea to go astray," said Levinson. "These sorts of methods are highly speculative. Our preferred methods, right now, are based on very classical electrical engineering techniques like detection, estimation, pattern recognition, decision making—that sort of stuff. Those are our most promising avenues."

And for any of those worried they might see a throng of robots beating down the door to the White House, don't fret quite yet.

"All we're trying to do right now is to see if we can get a computational model for brain and mind and then use that to do things that we recognize as 'difficult' things that humans do, like fine motor control or language."



But if Professor Levinson's research continues to be so successful…well…where's Will Smith when you need him?

Three ECE faculty named IEEE Fellows

By Megan Kelly, Coordinated Science Lab

ECE Professors Jennifer Bernhard, Andrew Singer, and Nitin Vaidya were named IEEE Fellows for the class of 2010. These faculty members are also researchers in the Coordinated Science Lab.

This honor, the highest in the IEEE, is given to IEEE Senior Members with "an extraordinary record of accomplishments in any of the IEEE fields of interest," according to the IEEE website. This year, 309 IEEE Senior Members worldwide received this title.

Jennifer Bernhard

Jennifer Bernhard

The IEEE Board of Directors named Bernhard an IEEE Fellow for her development of multifunctional, reconfigurable, and integrated antennas. Bernhard received her PhD in electrical engineering from Duke University.

Her research interests include reconfigurable active and passive antennas, electromagnetics and antennas for wireless communication, wireless sensor systems, multifunction antennas, and antenna systems.

Bernhard also was a U.S. Defense Science Study Group member, sponsored by DARPA, from 2008 to 2009. In addition, she served as president of the IEEE Antennas and Propagation Society in 2008, won the Xerox Award for Faculty Research in 2006, and was a Willett Faculty Scholar from 2005 to 2009, among other honors.

Andrew Singer

Andrew Singer

Singer was named an IEEE Fellow for his contributions to signal processing techniques for digital communication. He serves as the director of the Technology Entrepreneur Center for the College of Engineering. He received his PhD from the Massachusetts Institute of Technology.

Singer's research interests include signal processing; wired, wireless, and optical communications; and financial modeling.

He has received many honors for research, including best paper awards from the IEEE and the Xerox Award for Faculty Research. He was also named a Willett Faculty Scholar. For his work in the Technology Entrepreneur Center, he has received the Pride of CASE V Gold Award for Best Student Alumni Programming from the Council for Advancement and Support of Education District V for TEC's Silicon Valley Alumni Workshop.

Nitin Vaidya

Nitin Vaidya

Vaidya was named an IEEE Fellow for contributions to wireless networking protocols and mobile communications. Vaidya previously served as the director of the Illinois Center for Wireless Systems. He received his PhD from the University of Massachusetts at Amherst.

His research interests include wireless networking, mobile computing, and distributed algorithms. Among his achievements, he was named a distinguished lecturer by the IEEE Communications Society in 2006–2007 and was recipient of best paper awards from several conferences. He has also served as editor in chief of *IEEE Transactions on Mobile Computing* and *ACM Mobile Computing & Communications Review*.

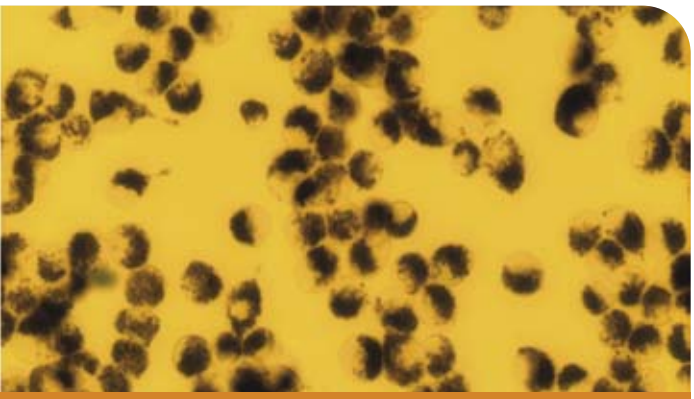
To be considered for IEEE Fellow, the nominee must have contributed significantly to the advancement or application of engineering, science, and technology; hold IEEE Senior Member or IEEE Life Senior Member grade at the time of the nomination; and have been a good standing member for at least five years, according to the IEEE website. In addition, the total number of fellows selected cannot exceed one-tenth of 1 percent of the total voting institute membership.

Boppart receives NIH grant to study mechanics of cancerous cells

By Susan Kantor

Of more than 20,000 proposals, ECE Professor Stephen Boppart's was one of approximately 4 percent chosen to receive $1 million under the NIH Research Challenge grant program.

The project, "Investigating Tumor Growth Dynamics Using Multimodal Contrast Agents and Optical Coherence Elastography," is a collaboration with Alex Wei, a chemist at Purdue University who specializes in fabricating nanoparticles.



Cells with internalized magnetic particles.

The proposal combined Boppart's research group's optical imaging techniques and ability to measure mechanical properties on the micron scale with Wei's expertise on making specific magnetic nanoparticles. Together, they will examine the biomechanics of cells and tissues in normal and cancerous states as well as the transition that occurs in between.

"This research opens up many new directions," Boppart said. "Even from the most basic science level, can we understand how the mechanical properties of cells change in cancer? That may help us understand how cancer spreads."

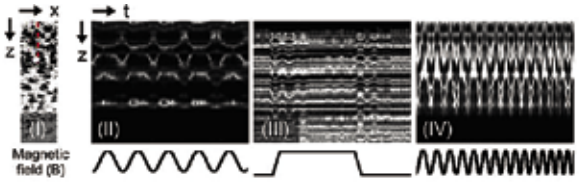
The mechanical properties of a normal cell are different from those of a tumor cell. When normal cells become tumor cells, they often become less stiff, squeeze through different channels, and spread. But the tumor itself is stiff.

"Can we measure the mechanical properties of cells, tissues, and tumors during this whole process and try to understand when the mechanical properties change?" Boppart asked.

Boppart's research team has to use unique tools to tackle this question. One technique is magnetomotive optical coherence elastography.

Magnetic nanoparticles can be distributed to tissue, and when a magnetic field is applied to the tissue and switched on and off, the particles will move. That magnetomotive aspect is coupled with optical coherence tomography, which is used to measure the small magnetically induced motions. Depending on the mechanical properties of the cell or tissue, they will move more or less easily.

"We can measure how much these particles move, and how they move will determine what are the biomechanical properties of that environment they're in," Boppart said.



Applied external magnetic fields modulate nanoparticles, which modulate optical scattering of cells/tissues with detection by optical coherence tomography (OCT).

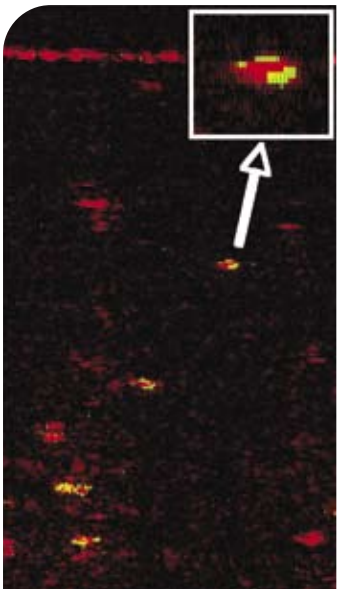
If a cell is very flexible, it will move easily when a magnetic field is applied. But if the cell begins to stiffen, or if the particles are bound in the cell, a magnetic field force will not move the nanoparticles and cell much.

If cells that are about to change into tumor cells become more or less stiff, this technique may be usable as a diagnostic technique.

Boppart and his research team have shown that magnetomotive imaging can be used to target or identify tumors by attaching antibodies to particles and injecting those into pre-clinical tumor models. These will stick to tumors, which will light up when imaging is used.

"We envision that there's a way of detecting tumors, perhaps measuring their responses, and then treating them all with the same type of nanoparticles," Boppart said.

This technique may also be used as therapy. If the magnetic field is switched on and off so quickly that the particles only heat up instead of move, the cell will be killed.



Magnetomotive optical coherence tomography of cells with magnetic nanoparticles.

"The whole motivation for this particular grant program is for projects that offer research challenges," Boppart said. "Even I see this as really a significant challenge. This is a hard problem. But if we can work on this and answer some key questions, I think it will have a long-range impact."


Stephen Boppart


Deming Chen

TANGÜL BAŞAR was named the recipient of the ECE Ronald W. Pratt Faculty Outstanding Teaching Award.

JENNIFER BERNHARD was recently selected to serve as editor for Artech House's Antennas and Propagation series.

STEPHEN BOPPART's proposal, "Investigating Tumor Growth Dynamics Using Multimodal Contrast Agents and Optical Coherence Elastography," was chosen to receive $1 million under the NIH Research Challenge grant program. Boppart is also the 2009 recipient of the Paul F. Forman Engineering Excellence Award.

NIKITA BORISOV, ALEJANDRO DOMINGUEZ-GARCIA, YIH-CHUN HU, ERIC POP, and **SHOBHA VASUDEVAN** were named recipients of 2010 Faculty Early Career Development (CAREER) Awards from the National Science Foundation (NSF). These awards are among the most prestigious given to young faculty.

DEMING CHEN and ECE Professor **WEN-MEI W. HWU** have received the best paper award at the IEEE Symposium on Application Specific Processors 2009.


George Gross

GEORGE GROSS was recently awarded the IEEE Power Engineering Society Technical Committee Prize Paper Award for his paper titled "A General Formulation for LMP Evaluation."

The Defense Advanced Research Projects Agency (DARPA) has invited **TODD COLEMAN** to join its Information Science and Technology (ISAT) study group for a three-year term beginning this fall. The group carries about 30 people and only invites the brightest new scientists and engineers to be members.


Todd Coleman

JEAN-PIERRE LEBURTON, the Gregory E. Stillman Professor of Electrical and Computer Engineering, was selected to serve as an IEEE Nanotechnology Council Distinguished Lecturer through the end of 2011.

ZHI-PEI LIANG received an International Society of Magnetic Resonance in Medicine (ISMRM) Fellow Award for his outstanding contributions to constrained image reconstruction and processing.


Richard M. Brown

Professor Emeritus Richard M. Brown, 1924–2009

ECE Professor Emeritus **RICHARD M. BROWN** died Saturday, August 22, 2009, at the Meadowbrook Health Center in Urbana. He was 85.

Born on May 17, 1924, in Cambridge, Massachusetts, Brown received his bachelor's, master's, and doctorate degrees from Harvard College and then worked as an assistant professor at Washington State University. He joined the University of Illinois in 1952. After a brief return to Washington State, Brown spent the rest of his career at Illinois and retired in 1984.

Brown worked in the Control Systems Laboratory when it was new to campus, helping to set a foundation for digital computer research. He was involved in the creation of such ground-breaking computers as the CSX-1 and ILLIAC IV, the first supercomputer. PLATO, the first computer-assisted instruction system, which helped to develop Internet concepts such as chat rooms and online testing, was helped by Brown's research on teaching machines.

He was also instrumental in integrating the computer engineering curriculum into what was then the Department of Electrical Engineering, paving the way for what is now ECE.

Brown was involved with the High Energy Physics Group. Mike Haney, now a research engineer in the Department of Physics, was a teaching assistant for Brown in 1978 for what is now ECE 290: Computer Engineering. Haney worked with Brown in the summer of 1980, developing the FASTBUS data acquisition architecture, later to become IEEE Std 960. Haney said all his memories of Brown are fond.

Eric Pop

Gabriel Popescu

YI MA, graduate students Shankar Rao and Hossein Mobahi and 2006 PhD ECE alumnus Allen Yang won the 2009 Best Student Paper Award (Sang Uk Lee Award) at the Asian Conference on Computer Vision.

ERIC POP is a 2010 recipient of the Air Force Young Investigator Research Award, chosen from among more than 200 applicants for their ideas and research potential.

GABRIEL POPESCU has been recently elected by the Optical Society of America's Editorial Board as associate editor for *Optics Express*, an all-electronic journal.

JOHN ROGERS, the Lee J. Flory-Founder Chair in Engineering Innovation in the Department of Materials Science and Engineering and an affiliate of ECE, has been named a 2009 MacArthur Fellow by the John D. and Catherine T. MacArthur Foundation.

Venugopal Veeravalli

Martin D. F. Wong

VENUGOPAL VEERAVALLI has been selected as a 2010 Distinguished Lecturer from the IEEE Signal Processing Society. Veeravalli, who was nominated for the honor, will serve from January 1, 2010, until December 31, 2011.

ECE Professor **MARTIN D. F. WONG** and graduate students Lijuan Luo, Tan Yan, and Qiang Ma received the Best Paper Award at the 2010 ACM International Symposium on Physical Design (ISPD).

Donna Brown

Donna Brown retires

Associate Professor in ECE and Research Associate Professor in CSL **DONNA BROWN** has retired. Professor Brown has done extensive research in the areas of VLSI layout, combinatorial algorithms, and parallel and distributed algorithms. She also served as director and co-developer of Mallard, an online learning environment used by many departments across the University.

During her time at Illinois, Brown was on the College of Engineering's Adviser's List for advising excellence twice and received the 1999 Campus Award for Innovation in Undergraduate Instruction Using Educational Technologies for her development of Mallard. She was also the recipient of the 1999 IEEE Major Educational Innovation Award.

Janak Patel retires

Janak Patel

ECE Professor **JANAK PATEL** recently retired, but he remains connected with ECE through his current work as a research professor in the Coordinated Science Laboratory.

Patel joined ECE in 1980. With Professor Ravi Iyer, Patel formed the Center for Reliable and High Performance Computing and served as its co-director.

His research includes pipeline scheduling, cache coherence, cache simulation, interconnection networks, on-line error detection, reliability analysis of memories with ECC and scrubbing, design for testability, built-in self-test, fault simulation, and automatic test generation.

Patel was a founding technical adviser to Nexgen Microsystems, which gave rise to the entire lineup of microprocessors from AMD. He was also a founder of a successful startup, Sunrise Test, a CAD company for chip testing, now owned by Synopsys.

Course provides inside scoop on graduate school experience

By Susan Kantor

When ECE Assistant Professor Lynford Goddard attended his first conference in graduate school, he didn't know he had to first submit an abstract. So he put up his poster "unofficially" on an empty board.

ECE Assistant Professor Lynford Goddard (left) listens as ECE student Christyn Collum explains her project during a poster session for students in ECE 498LG: Principles of Experimental Research.

"I figured that everyone just attends conferences," Goddard said. "I didn't realize that advisers typically don't let their students travel unless they're presenting."

That experience is one of the reasons Goddard created ECE 498LG: Principles of Experimental Research, which aims to expose students to graduate school.

"My idea behind creating the class was it took me six and a half years to get through grad school," Goddard said. "Over that time, there are certain skills I picked up that, if I had at the very beginning, would have been very useful in compressing the amount of time."

Undergraduates who have taken ECE 313: Probability with Engineering Applications or graduate students in science or engineering can register for the class.

"If students know more about what grad school is about, they'll be able to more easily get into the mode of doing research and being able to present their ideas to the public," Goddard said.

In the beginning of the semester, students write a brief abstract about what they would like to do for their independent projects. Students then write a proposal with a detailed statement of work and a budget. They have about five weeks to carry out their experiment.

Students choose their own projects, which can relate to their research group work if they are part of one. They construct experiments in which they study at least three different factors and figure out which factors are important in a minimal number of runs.

The students then present their research at a poster session, which, this semester, was held in the first-floor atrium of the Micro and Nanotechnology Laboratory in early November. Each student made a 24"x36" poster and wrote a two-page IEEE-formatted paper. Conference proceedings are available online at https://wiki.engr.illinois.edu/display/ece498LGFA09/.

"The posters were really good," Goddard said. "The students put together posters that I would say are conference-level quality."

Christyn Collum, a first-year graduate student, decided to perform introductory laser calculations to find the quality of a Fabry-Perot cavity. She sent a helium-neon laser into the cavity that tests its quality. She changed the mirror, the index-refraction in the cavity, and the intensity of the incoming beam for the changing factors in the experiment's design.

"I'm taking the ECE 455 [Optical Electronics] class with Professor Eden, and it's my first time ever doing anything with lasers," Collum said. "It was pretty interesting, and it was something I could do since I don't have a research project yet. It helped better cement what we learned in that class, so it was useful."

Although Collum felt a little nervous at the session, she said it was nice to present the information and talk to people about it.

"It was my first poster session ever, and I didn't really know what was supposed to be on a poster," Collum said. "It was nice to get the experience without having the pressure of being with colleagues in industry."

In addition to preparing students for graduate school, "the class is good preparation for senior design," Goddard said. It is also an ECE lab elective course, and although the coursework can be heavy at times, the results can be very beneficial.

"Once they get through the first assignment and the first lab, the students who stick with it really enjoy it," Goddard said.

Liao receives SRC NRI Hans J. Coufal Fellowship

By Charlie Johnson

ECE graduate student Albert Liao (BS PHYS '07, MS ECE '08) was recently awarded the Semiconductor Research Corporation (SRC) Nanoelectronics Research Initiative (NRI) Hans J. Coufal Fellowship to continue his current research at Illinois. Liao, working under ECE Assistant Professor Eric Pop, is only the second recipient of the Coufal Fellowship, which is presented to a graduate student working under an NRI-sponsored faculty member. The Fellowship was created to honor the memory of Dr. Hans Coufal, who founded the NRI, and was first awarded in 2007. Included in the award are expenses for Liao's tuition and fees, a cash stipend, and a $2,000 annual award given to the department.

Albert Liao

> "Albert is doing excellent work. This is exactly the kind of extensive research study we need on these structures to enable us to use them for future devices."
>
> –Dr. Jeff Welser, NRI director

"As a graduate student, it's always great to win an award like this because it gives you more academic freedom now that you're—to some extent—self-funded. There's also the prestige that goes along with having a fellowship. They always look really good on a résumé," said Liao. "This one is really nice because it basically takes me all the way to my graduation, and the little bit of extra cash is good too."

Under Pop, Liao has been researching the behavior of carbon nanotubes under high stress and Joule breakdown, and he is currently working on a method of measuring the energy dissipation between a single carbon nanotube and its supporting substrate. Liao hopes to continue studying the role of various substrates on both heat and electrical transport in carbon nanotubes.

"Albert is doing excellent work. This is exactly the kind of extensive research study we need on these structures to enable us to use them for future devices," said Dr. Jeff Welser, NRI director.

After only two years as a graduate student at Illinois, Liao has contributed to four journal papers and five conference presentations in only two years of graduate school. He also spent the summer of 2009 with the IBM Front End of the Line (FEOL) processing group in Hopewell Junction, New York.

"Importantly, he has also mentored two undergraduate students during this time and participated in a collaboration with the National Institute of Standards and Technology," said Pop.

Originally from the Bay area, Liao decided to choose Illinois to complete his PhD over several California schools.

"When I finished my undergraduate here, I thought there's no way I'm staying for another five years of Illinois weather. But, the situation here, the professor and the project I would be working on, convinced me that this was the ideal scenario. And pretty much from the start until now it's been a great situation," said Liao. "I definitely miss fresh seafood, though."

Given his knack for research, it should come as no surprise that after his graduation, Liao hopes to remain in research, whether it's in academia or industry.

"I don't know specifically what I want to do. All I know is that I want to stay in research," said Liao. "I could continue doing nanotube research, but where I think I'd really like to make my mark is in energy consumption and production and try to help the energy crisis."

And if the place where Liao winds up has good seafood, well, that would be all right too.

Anh Van selected for National Institutes of Health research festival

By Charlie Johnson

ECE graduate student Anh Van stands in front of the MRI machine she used for her research on increasing image resolution in order to study nerve bundles.

ECE PhD candidate Anh Van was recently selected to participate in the prestigious fourth annual National Graduate Student Research Festival sponsored by the National Institutes of Health (NIH). The festival, held in Bethesda, Maryland, in November, was designed by the NIH as an opportunity for PhD candidates to present their research to NIH researchers and to explore opportunities for post-doctoral research with the nation's premier biomedical research agency.

"I'm excited. It's a great chance to interact with the professional community, and it's a fantastic job opportunity," said Van. She was one of only 200 PhD candidates selected from a field of applicants to participate in the 2009 festival. In 2008, 819 applications for participation were received.

To be selected for the festival, students had to have graduated or plan to graduate between June 2009 and October 2010. Applicants submitted an abstract detailing their area of research, curriculum vitae, a cover letter, and a letter of recommendation from the applicant's dissertation adviser, in this case, bioengineering Assistant Professor Brad Sutton.

"The festival is a great opportunity for the NIH to get an idea of what people are working on and to meet PhD graduates before they start looking for post-docs to see if there is a mutual interest they can pursue," said Sutton. "I have been very pleased with Anh's progress in my lab. It's a great opportunity for her."

The research that Van took to the festival was on the development of high-resolution diffusion tensor imaging. This type of imaging allows neurologists with the use of an MRI machine to non-invasively study the integrity of nerves in the human brain. Degenerative nerve diseases degrade these nerve bundles, which is what causes loss of memory and other brain functions in those suffering from degenerative neurological diseases. Van worked on increasing the resolution of this imaging technique to allow researchers and doctors to be able to study small nerve bundles, like the ones responsible for Alzheimer's disease, in detail.

Current imaging technology using diffusion-weighted imaging tracks the random movement of water in the brain in order to form images of nerve bundles. As the nerves begin to degrade, the movement of water inside the bundles changes. For instance, if membranes are still present on specific nerves, water is forced to move along these membranes. But, if the membrane is degraded, the water can be tracked moving through and around the degrading nerve fibers. Van's research attempts to focus this imaging technique into a small special scale to allow researchers to see individual pathways in specific parts of the brain that some feel may be responsible for the onset of Alzheimer's symptoms.

"When Anh's method is up and running fully, we'd like to be able to interrogate specific pathways, like ones involved in memory formation in the hippocampus, and we hope to be able to see structural changes that will predict the functional changes in those with neurological diseases," said Sutton.

What makes Van's research even more intriguing is that the entire study has been carried out on volunteer human subjects, meaning that when the technique is properly perfected, it should be very easy to parlay in a real-world clinical setting.

"I think once the method is developed, which I expect it to be by the time I graduate, the method will be available to researchers," said Van.

For Van, and potentially the NIH, the next step after graduation will be to validate that the changes being observed under this high-resolution technique are actually a result of Alzheimer's disease.

"In essence, we are providing a tool, validating a tool, and hopefully people will be using it in years to come," said Sutton.

ECE graduate students tie for Best Paper Award

By Susan Kantor

Something exciting and unusual happened at the 2009 IEEE International Conference on Nanotechnology. There was a tie for the Best Paper Award. Even more distinctive was the fact that the winners, Justin Koepke and Joshua Wood, are both graduate students in ECE Professor Joe Lyding's research group.

Koepke and Wood proofread each other's papers and presented their papers separately at the conference, held in Genoa, Italy. Before the banquet, Stephen Goodnick, the conference's program chair, approached Wood to congratulate him on a well-written paper. Goodnick also told Wood that the vote for the Best Paper Award ended in a tie, so both papers would be awarded.

"I was very taken aback. I didn't expect that," Wood said. "I'm very enthusiastic about receiving the award as well."

Koepke didn't know he had won before the banquet, so for him, the announcement was a surprise.

"When I arrived at the banquet, Josh told me that somebody had congratulated him on his paper," Koepke said. "I assumed Josh had won and I hadn't. So I was surprised when they actually called my name."

Lyding is proud of the students in his group.

"I am very pleased that Justin and Joshua were selected as co-recipients of the Best Paper Award," Lyding said. "Graphene and carbon nanotubes are the hottest topics in nanotechnology today, and there were many outstanding papers on these subjects at the conference."

Koepke's paper, "Scanning Tunneling Microscopy and Spectroscopy Studies of Nanometer-Sized Graphene on the Si(111)-7x7 Surface," discusses the use of scanning tunneling microscopy (STM) to study the electronic properties of graphene on silicon surfaces. Graphene is a single atomic layer of carbon atoms arranged in a two-dimensional, honeycomb lattice, which is a potential material for use in electronics or nanoelectromechanical systems (NEMS). The Si(111)-7X7 surface has a complex, periodic surface structure that allows for interesting interactions with graphene. Koepke is studying the interactions between graphene and different semiconductor surfaces.

"The STM allows us to study graphene's behavior on the atomic level, which is important for determining if it is suitable for electronic material use and how it interacts with different surfaces," Koepke said.

From left: Joshua Wood and Justin Koepke

Wood's paper, "Carbon Nanotube Alignment Using Meniscus Action," investigates using carbon as a faster replacement for silicon as the main component in nanoelectronics.

"What I'm trying to do is develop a new technique for fabricating the next transistor," Wood said. "Motivation for my whole PhD work is to try to develop a new technique for wafer-scale deposition and placement of these carbon-based technologies."

Wood is investigating carbon nanotubes, which are rolled cylinders of graphene. Currently, only a small number of carbon nanotube devices can be made at a time, and the quantities are not enough to make it a feasible industrial technology. If the placement, electronic characteristics, and alignment of the carbon nanotubes can be controlled, then manufacturing thousands of the devices will be possible.

"The award gives me confidence that what I'm researching is important," Wood said. "I was a bit skeptical about my results. That's just being a diligent researcher. You don't want to be allured by your results. You want to try to look at them with a grain of salt."

Wood was happy to share the award with Koepke because it brings more prestige to their entire group.

"It's coincidental, and I'm sure that it helps our group quite a bit," Wood said. "If there is anybody I would like to share the award with, Justin is a great choice."

New ECE building design approved

BY TOM MOONE

On March 10, the University of Illinois Board of Trustees approved the design of a new ECE building. David King of SmithGroup, the architectural firm designing the new building, presented an overview of the new building. Following that presentation, University of Illinois Interim President Stanley O. Ikenberry said, "This is a very important building for an extremely important program and department. And that aspect alone means that it deserves a lot of attention."

After months of preliminary work, progress on the new ECE building now moves to center stage at the University.

New student spaces

A major focus for this building will be on student study and collaboration spaces. Nearly 8 percent of the completed building will be dedicated to such spaces, which will include offices for student groups, as well as lounges and other areas where students can interact with one another and with faculty.

With these student spaces, the department will be able to take advantage of the education that occurs outside of the classroom, facilitating the ability of faculty to meet with students in a more informal setting and enabling students to learn from each other as they work and meet every day.

Lab spaces

With the new building, many of the lab groups that had been dispersed across the engineering campus will be brought under one roof. Course labs that have been such an important educational component in the ECE program will also be maintained and enhanced. The Fabrication Lab will have nearly 3,900 square feet of instructional space. The labs for ECE 110 will also be a major part of the new

building. Both of these student labs will be showcased in the new building.

No lab facility will be left in Everitt. All labs essential to research and instruction will be moving to the new building.

Extremely high efficiency

The University of Illinois has mandated that new campus buildings achieve a Leadership in Energy and Environmental Design (LEED) silver certification. In fact, the new building will strive for even greater achievements.

ECE Professor Philip Krein, chair of the New Building Committee, said, "When we saw the numbers we were looking at for this building's energy use, we realized that we were very close to net-zero consumption. If we can achieve that, the new building will be the nation's largest net-zero energy project."

That efficiency will come from a number of innovative design elements that will reduce the power requirements of the building. A chilled beam system will provide cooling for the building.

And an integrated array of solar cells will provide a significant percentage of the power needed for the building on a day-to-day basis.

Home of a new research center

Though the new, higher efficiency building will be important enough, this new facility will add new opportunities for the department. When the facility opens, it will include a new center: The Center for Light and Plasma Science (CLPS).

Currently, ECE faculty who study plasma and its uses in displays, lighting, space weather, power, antennas, atmospheric research, and lasers are spread among a number of buildings. ECE Assistant Professor Jonathan Makela, who is one of the organizers for the new center, said, "Collocating all ECE plasma researchers in the new ECE building [with this new center] would go a long way in jump-starting some of the cutting-edge research ideas. … It's the intellectual collisions of meeting people in the hallway and having our grad students sitting in the same rooms and attending the same seminars where these ideas can rapidly develop."

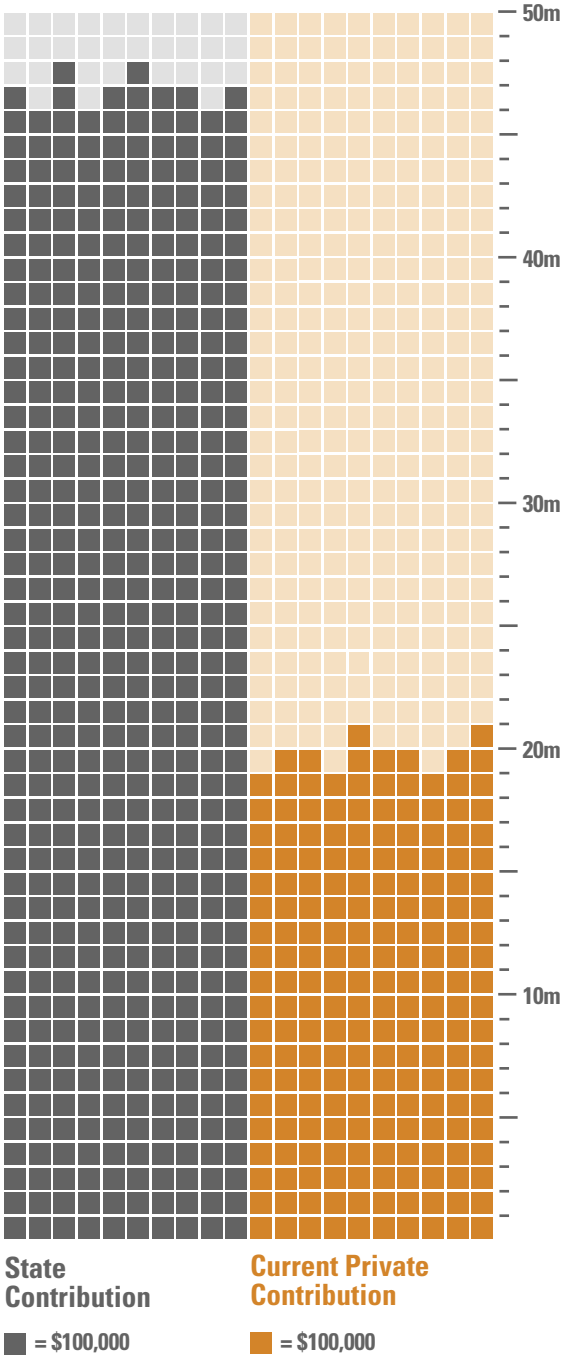
Topics that will be tackled by the research in CLPS include creating efficient microplasma lighting devices, using plasma for energy conversion and filtering, studying the plasma environment that comprises the Earth's ionosphere, and using plasma to reconfigure the proprieties of antennas.

"This new center will really take advantage of the wide area of talent that we have in ECE," said Andreas Cangellaris. "Future discoveries that enhance our knowledge and innovations that drive our economy will be made in this center."

Now is the time for contributing to this project

Attention on the project now shifts to gathering the funds to complete the building. The State of Illinois has already signed into law its commitment to fund half of the total $95 million project plan. Donors are now actively being sought to help close the gap between what the state has provided and what is needed to complete the project.

"As beneficiaries of the skills and discipline gained at ECE, our alumni are key players in getting the project to its completion," said Cangellaris. "While not everyone can provide large donations, we urge all alumni and friends to become involved in this project to create a home for ECE that will take its strong history and launch it into the future."



Contributions so far: The gray bitmap on the left represents the contribution from the State of Illinois. The orange represents contributions and pledges received by the University of Illinois for the new ECE building as of July 30, 2010.

An interview with David King, lead architect

We talked recently with David King of SmithGroup about the new ECE building project.

David King

Resonance: How long have you been with SmithGroup?

KING: My roots at SmithGroup date back to 1981. SmithGroup's overall success is the result of great talent and strategic mergers made over the course of many decades. My firm in Washington, D.C., was one of those firms.

R: Do you have a design philosophy or general approach?

K: My motivations are centered upon what I believe to be the key topics of our time. First and foremost, architecture is a contributor to wonderful places and a supporter of institutional missions. In a way, buildings become a core part of the business of education, and they are instrumental in attracting and maintaining great researchers, great students, faculty, and administration. We try to fundamentally understand the institution's goals, values, and mission to motivate each design.

SMITHGROUP
architecture engineering interiors planning

The other topic that motivates me personally and SmithGroup [is] the environmental crisis we find ourselves in and the role of buildings as promoters of good practices for energy and resource conservation. I look very hard at the philosophy behind what we do in terms of resource management and being efficient in a very smart way.

R: What is your role as lead architect?

K: To your questions, consider this scenario. Major surgery at a hospital is not undertaken without a team of experienced people working together with one goal in mind. There is a surgeon, obviously, but there are also associated surgeons, anesthesiologists, nurses, and lots of equipment, and on and on. The successful surgery is the culmination of the team's collective actions.

Simplistically, I see myself as a team leader who guides, shapes, sometimes nags, and cajoles a whole group of very smart people to get to the finish line and build the building.

R: Where do you find inspiration?

K: In the case of ECE, the department itself is inspirational—an incredibly fascinating group of people at an institution recognized for decades of notable work and leadership. At the very beginning of the process we did a lot of research, interviewed department members, read articles about their ideas and inventions. We tried to understand their ethic and values, and how they view innovation, invention, and creativity.

We walked the campus extensively and completed photo surveys in order to understand the campus. For me, the biggest challenge was how to be a sympathetic building for the Champaign campus without being nostalgic or old-fashioned, because ECE has always been very much about the future. The inspiration I was searching for was a combination that honored the values and culture of the home base, but also celebrated the future.

R: What has been the most fun about this project?

K: The people are great. I've had some terrific and fun conversations with the department building committee and the [University's] facilities group. They're a very smart group of folks that very much care about the institution. That ultimately makes it fun for us. … These team members were in the middle of the dialog and highly supportive. Sure, we had our usual kind of tough moments, but they were consistent and supportive of doing the right thing. The people have been the most fun.

R: What makes this project recognizable as a SmithGroup design or a David King design?

K: That's a fascinating question. I have shared with people, for many decades now, that my goal was never to do the same building twice or to have any sort of signature style. Intellectually, it makes no sense to me to do a building in Phoenix or Champaign or New York City and have all three buildings look alike. This approach strikes me as fairly vacuous. I like the specificity of buildings. I love the notion that the final design that we ended up with could have happened only in Champaign-Urbana, only for ECE, in this day and age.

For a complete transcript of our interview with David King, go to **www.ece.illinois.edu/buildingcampaign/david_king.html**.

ECE alumni express support for new building

Since his graduation from Illinois, Lalit Bahl (MSEE '66, PhD '69) has gone on to a stellar 30-year career with IBM, where he was part of a group researching speech recognition. In 1997, he received the Distinguished Alumni Award from ECE ILLINOIS.

Lalit Bahl

"Alumni have always been a big part of the support for the University in general," Bahl said. "I think that for this particular project, the new ECE building, certainly the alumni who can contribute should do it because it is just a great, great project."

Daniel W. Dobberpuhl (BSEE '67) was first exposed to semiconductor circuits at Illinois. His curiosity and love for electronics led him to a career that included the founding of SiByte, a microprocessor company, and, most recently, the founding of P.A. Semi, a fabless semiconductor company that he sold to Apple in 2008.

Daniel W. Dobberpuhl

"It's pretty clear that the department has outgrown the space it has," Dobberpuhl said. "This new building has a tremendous amount of merit, and I'm happy to support it, and I hope other alumni will support it as well."

As an engineer with Lockheed Martin Space Systems, Phillip Lachman (BSEE '04) sees his ECE ILLINOIS career as enabling him to hone his critical thinking and become involved in innovations that change the world.

Phillip Lachman

"I strongly believe in continuing to nurture and grow the next generation of engineering leaders," Lachman said. "There is no better lasting contribution I can think of than to directly invest in the infrastructure, laboratories, and classrooms that will enable ECE ILLINOIS students to lead well into the 21st century."

Please join these and other enthusiastic alumni by contributing a gift to the ECE building campaign. If you are interested in making a lead gift to this project, contact Beth Katsinas, director of advancement, at (217) 265-6285, or katsinas@illinois.edu.

do your bit

A new vision of our future is taking shape. An exceptional building will soon take its rightful place among the great engineering centers at the University of Illinois. Bold and magnificent, the new ECE ILLINOIS building will honor our past, energize our future, and provide coming generations with the tools they need to imagine, to build, and to lead. The only question is—how will you be involved?

If you believe an exceptional department requires an exceptional home, join the students, staff, faculty, and alumni around the world who are doing their bit to help us build the future—one brick at a time. To contribute to the Building Campaign for ECE ILLINOIS, mail your contribution along with the enclosed reply card today or donate online now at **www.ece.illinois.edu/buildingcampaign**.

Show off a bit. Enjoy a lapel pin illustrating your support for this project. See our website for more information.

Donor Honor Roll January through December 2009

ECE ILLINOIS is grateful to the alumni, friends, and partners who have made contributions to the department. This list includes financial donations, but we are just as grateful for the ongoing support you lend in other ways. ECE could not maintain its position as a great educational and research institution without you.

The following list includes charitable gifts designated for ECE and received between January 1, 2009, and December 31, 2009. Gifts to other campus units may be recognized in other campus publications.

We strive to make this list as accurate as possible. If your name has been listed incorrectly or omitted, please accept our apologies. To report an error or omission, or for information about making a gift, please contact Jonathan Hill, director of development, at (217) 265-6567 or **jonahill@uiuc.edu**.

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Alumni Wang and Chung celebrate their productive student days

By Charlie Johnson

Getting a PhD in the Department of Electrical and Computer Engineering is challenging.

Now imagine doing it in another country.

While your spouse is also working on her own PhD.

And you have a three-year-old to care for.

And you're expecting another baby any day.

From left: Jeffrey Wang, Yi-Min Wang, Pi-Yu Chung, Andrew Wang

Maybe, *challenging* is no longer the right word. *Masochistic*, maybe?

For Yi-Min Wang (MSCompE '90, PhD '93) and Pi-Yu Chung (MSCompE '90, PhD '93), this hypothetical was reality during their time at Illinois.

"I always joke that we were the most productive couple from Illinois because we got two PhDs and two kids in five years in Urbana-Champaign," said Wang.

After leaving Illinois in 1993, both Wang and Chung joined AT&T Bell Labs until AT&T and Bell split in the mid-1990s. Wang stayed with AT&T, and Chung went with the newly formed Lucent Technologies. They each remained at their positions until 1998, when Wang accepted a job with Microsoft Research in Redmond, Washington. Chung joined her husband in Washington and telecommuted with Lucent until joining Siebel Systems. The software company was founded by computer science alumnus Thomas Siebel and later acquired by Oracle, where Chung remains today.

Today, Wang is director of the Internet Services Research Center at Microsoft Research, where he leads research in the field of dependable computing and web security. He has also worked extensively on improving the search quality of Microsoft's Bing search engine, developing the Automated Relevance Diagnosis System, which takes user dissatisfaction reports and analyzes them to determine what caused an unsatisfactory search. He was elected an IEEE Fellow in 2010.

Chung is a consulting member of the technical staff at Oracle. She works in the Server Technologies group developing fusion technology for future enterprise applications. She also started a parenting blog—OverParenting.com—just over five years ago where users come to share parenting tips and anecdotes.

Wang and Chung didn't just bring their education and memories of their time at Illinois to Washington; they also, of course, brought their children. Jeffrey Wang currently attends Stanford University, where he is studying computer science, and 17-year-old Andrew is a high school junior beginning his college search.

No word yet on whether Illinois is in the running.

And while classes, research, and child care never left much free time for Wang and Chung while they were studying at Illinois, they still have extremely fond memories of their time in orange and blue.

"Urbana-Champaign is where our careers and our family started. U of I has always been a special place for us, and we want to get back and make a difference and do something special for the students," said Chung.

And doing something they are. A recipient of the Robert T. Chien Research Award while a doctoral candidate, Wang was disappointed with the number of available research awards for graduate students. Wang and Chung recently began the Yi-Min Wang and Pi-Yu Chung Research Award, which is presented, along with a cash grant, to a doctoral graduate student who has demonstrated excellence in the field of computer engineering.

"I didn't know the significance of the award when I won it, but later in life I realized it was very significant," said Wang. "If a student can have a research award on his résumé, it gives that student a much better chance to interview at top places and jumpstart their career."

Wang and Chung plan to contribute regularly to their endowed fund, for which the Illinois Foundation manages the investment and uses the interest to sponsor the annual research award.

"I wanted to start an endowed fund early and keep contributing to build the award. I think if more alumni do the same it would be very good for the University," said Wang.

Dear fellow ECE alumni,

My journey with this department began on October 17, 1983. This is the date on the letter that I received confirming that I had been admitted to the University of Illinois. ECE ILLINOIS was my first choice, and I gathered information about the department's prestige and costs to get my parents' support. It was a very short discussion—the ECE statistics were stellar. I accepted the offer to study immediately. How lucky I felt to be a high school student in Illinois with a talent for engineering!

Now, more than 25 years later, my term as your Alumni Board president nears its end. I will continue my journey by serving with the Board as past president while Chris George assumes the helm. We share a commitment to excellence and outreach and will continue to encourage your involvement in our department. We hope to play a larger role in encouraging young people to pursue an engineering education, to provide the best collaborative, educational environment in John Bardeen Hall, and to honor and promote the brightest among us. While many things have changed in the last quarter-century—especially the technology that our department prepares us to advance—ECE at Illinois is still one of the best schools and one of the best values.

During the ECE Admitted Student Event at the Engineering Open House this spring, we had the opportunity to meet with many of the freshmen who had not yet accepted their admittance offers. We discussed many issues, with scholarships available at other schools and fear of the big department being two of the most prevalent. Luckily, both of these are areas where alumni can have an impact. Establishing a scholarship is a great way to honor someone and positively impact a young scholar struggling with education costs. In many cases, the honoree becomes involved in the recipients' lives as a mentor. It is just this type of involvement that can make a large department seem small. It is also the great benefit of a large department that there are so many alumni who can participate.

I still have my admittance letter. It means a lot more to me now that I can see the opportunities that have come my way as a result of studying at Illinois and the support of the ECE alumni and department. If I had the chance to do it all over again, ECE at Illinois would be my first choice.

Sincerely,

Denise Turic

Denise Turic (BSEE '88)
ECE Alumni Association
Board of Directors Past President

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2009 Distinguished Alumni Awards

By Tom Moone

On September 11, 2009, ECE ILLINOIS honored the accomplishments of several of its alumni at the annual Distinguished Alumni Awards Banquet. The awards recognize contributions of ECE ILLINOIS alumni in academic and industrial fields. Service to the University of Illinois is also recognized.

Distinguished Alumni Award

The Distinguished Alumni Award honors Department of Electrical and Computer Engineering alumni who have made professional and technical contributions that bring distinction to themselves, the department, and the University.

Receiving recognition at the ECE Distinguished Alumni Awards Banquet were (from left): Michael McCorquodale, Vern Schlie, Dirk Meyer, Carl Panasik, John Whitecar, Hao Ling, and Kurt Hollenbeck. *Photo by Thompson McClellan.*

HAO LING (MSEE '83, PhD '86) was recognized for his pioneering research in radar signature analysis and outstanding teaching in electromagnetics.

While at Illinois, he pioneered the shooting and bouncing ray (SBR) technique for predicting electromagnetic returns from complex radar targets. Now the L.B. Meaders Professor in Engineering at the University of Texas at Austin, his principal areas of research are in radar signature prediction and radar feature extraction.

He is an IEEE Fellow and has received the National Science Foundation Presidential Young Investigator Award in 1987, the NASA Certificate of Appreciation in 1991, and several teaching awards from the University of Texas.

DIRK MEYER (BSCompE '83) was honored for semiconductor innovation as one of the world's leading microprocessor design engineers and for business leadership as CEO of Advanced Micro Devices.

Meyer joined AMD in 1995 and led engineering for the AMD Athlon™ microprocessor. Since 1999 he has served in a number of key positions before being named CEO in 2008.

As one of the world's leading microprocessor design innovators, Meyer received the prestigious Association for Computing Machinery (ACM) Maurice Wilkes Award. Meyer is a named inventor on 47 patents and patent applications.

CARL PANASIK (MSEE '77, PhD '80) was recognized for research and development of wireless technologies and intellectual property protection. Panasik joined Texas Instruments in 1980 and has served in several engineering-management positions in four divisions. During his 29-year tenure, he has authored 36 granted patents with six pending. He presently serves as a patent

Alumni banquet

The alumni banquet provides an opportunity for outstanding alumni to interact with current students and faculty.

associate, prosecuting patent applications with the U.S. Patent and Trademark Office.

Panasik co-invented a wide area network communications system for advanced cellular, which enables wireless data in the white-spaces recently opened by the digital transition of broadcast television. He has been granted several patents on the system.

LAVERNE A. (VERN) SCHLIE (BSEE '65, MSEE '66, PhD '70) was acknowledged for leadership in and contributions to the research and development of high-power gas and solid-state lasers for the military applications of directed energy.

Schlie worked for 38 years at the Air Force Research Laboratory, Directed Energy Directorate, Kirtland AFB, New Mexico. He is widely recognized in the laser community and has led many important governmental committees on laser technology, applications, and effects.

Since retiring in January 2009, he has been serving as a consultant on high-energy laser technology. He is a Fellow of OSA, DEPS, and AFRL.

JOHN WHITECAR (BSEE '81) received his award for contributions in DSP technology applied to automotive software radio and infotainment technology, and service to those with need. At Texas Instruments, Whitecar leads the architecture and system development for new integrated circuits and systems targeting the automotive infotainment and digital radio markets.

Prior to joining TI, Whitecar was a Technical Fellow at Ford Motor Company and subsequently at Visteon Corporation, where he developed system architectures for a number of telematics, infotainment, and radio products.

Whitecar holds 33 patents and is a Senior Member of the IEEE, Audio Engineering Society, and Acoustical Society of America.

Young Alumni Achievement Award

The Young Alumni Achievement Award recognizes young alumni (less than 40 years old) who have made outstanding professional contributions to their field since graduating from the Department of Electrical and Computer Engineering.

MICHAEL MCCORQUODALE (BSEE '97) was recognized for technical innovation in precision analog circuits for frequency generation, entrepreneurial leadership in technology commercialization, and academic and community service. He is chief technical officer and founder of Mobius Microsystems, an analog semiconductor device company based in Silicon Valley. Mobius was founded based on Michael's pioneering research at the University of Michigan in precision analog integrated circuits for frequency generation and quartz replacement. He has published more than 25 technical articles and holds inventorship on more than 30 issued and pending U.S. patents.

Marcia Peterman Award

The Marcia Peterman Award was established by the Electrical and Computer Engineering Alumni Association to honor the memory of Marcia Peterman. This award is presented annually to a former ECE ILLINOIS Alumni Board Member for dedicated service as a member of the Board.

KURT S. HOLLENBECK (BSEE '78) received this award for his dedicated service to the University of Illinois and the Alumni Association. Kurt was an ECE ILLINOIS Alumni Board member for six years and Board treasurer for an additional three years. Following completion of his bachelor's degree, Hollenbeck joined Texas Instruments Defense Systems Antenna Department (later purchased by Raytheon), where he worked for 22 years. He then spent six years at Perot Systems as a senior program/product manager. He joined Mustang Technology Group, LP, as a senior program manager in 2007.

ECE welcomes new Alumni Board members

By Charlie Johnson and Susan Kantor

The ECE Alumni Board welcomed five new members in 2009: Jonathan Ashbrook, Michael Hattendorf, Srinivas Kuchipudi, Mark Laufenberg, and Bradley McCredie.

Jonathan Ashbrook

JONATHAN ASHBROOK (BSEE '98 MSEE '00) was flattered when he was asked to join the ECE Alumni Board. "I'm in town, so I'm always looking for things to do to give back to the ECE Department," Ashbrook said.

Ashbrook has worked in Champaign for eight years. He began working at Intersymbol Communications, a startup founded by ECE faculty. In 2007, Intersymbol was acquired by Finisar. Today, Ashbrook creates high-end optical networking chips for Finisar.

As a member of the Alumni Board, Ashbrook hopes to interact with other electrical engineering alumni and create ECE groups for the Champaign-Urbana area.

"I hope that I can drum up some more ECE alumni interest locally," he said.

Michael Hattendorf

MICHAEL HATTENDORF (BSEE '97, MSEE '00, PhD '02) spent nine years as an ECE student, but one particularly difficult undergraduate semester stands out from the rest. He took three core ECE courses on signals, physical electronics, and electromagnetics.

"Looking back on that semester, I recall being amazed at the tremendous diversity of technical problems," Hattendorf said. "I thought it was all very difficult yet rewarding. … I think that description could apply to my entire career at ECE."

Hattendorf, now a process integration engineer for Intel Corporation in Hillsboro, Oregon, works to make smaller and faster transistors for Intel's microprocessors.

Srinivas Kuchipudi

SRINIVAS KUCHIPUDI (BSEE '90) may not have a traditional career as an electrical or computer engineer, but his ECE degree still helped him get where he is today.

After graduating from Illinois, he received his MBA from Northwestern University. Kuchipudi is now a vice president at Honeywell Aerospace and oversees all aspects of the Boeing account.

"In my current role, I don't use my ECE degree day in and day out," Kuchipudi said. "I thought I could enlighten students about what an ECE degree can allow you to do."

Mark Laufenberg

MARK LAUFENBERG (BSEE '92, MSEE '93, PhD '97) is president of PowerWorld Corporation, an industry leader in power system analysis and visualization. PowerWorld grew out of technology developed in ECE in the mid-1990s by ECE Professor Tom Overbye.

"It's a power flow solution tool. It takes a large model of a high-voltage electric power grid and it allows the user to do 'what if' scenarios with it. What if you have a transmission line that goes down? What if you build a new generator? How does that change the grid?" said Laufenberg.

"I've always had pretty close ties to the University. I still work with Professor Overbye, and a lot of our employees are Illinois students," said Laufenberg. "We like to continue those ties as much as we can. The Alumni Board is a good way to do that."

Bradley McCredie

BRADLEY McCREDIE (BSCompE '85, MSCompE '87, PhD '91) is a vice president and IBM Fellow at IBM's Austin, Texas, facility, where he has been since completing his studies at Illinois. At IBM, McCredie leads the development of all power system processors and chip sets. He has been involved in the development of IBM's microprocessors Power 2 through Power 7, which are the heart of IBM's Unix product line.

"A nice connection to Illinois is that Power 7, which we just announced…is the microprocessor going into the Blue Waters project at Illinois," said McCredie.

When he was named an IBM Fellow, McCredie was the youngest person in company history to hold the title of IBM Fellow, the highest technical rank in the company. He is one of 60 IBM Fellows in a corporation of about 400,000.

Seeing the world as a photograph

By Susan Kantor

Out of all his skills as a photographer, Ben Halpern (MSEE '82) values his training as an engineer the most.

"I wouldn't trade my engineering knowledge for anything," Halpern said. "Making a photograph work is far more complex than just clicking a shutter. Making it work means that I have to understand both the interaction of the subject with light, and I have to understand the interaction of the medium I use with light."

Halpern was introduced to photography in high school, working with a teacher to shoot photographic studies of railroad sites near his hometown of Livingston Manor in upstate New York.

Today, that hobby has evolved into a career with a much broader scope of work.

Halpern completed his undergraduate degree from Rensselaer Polytechnic Institute in electromagnetics and antennas, and was drawn to ECE ILLINOIS for its reputation in the same area.

After completing his master's, he began his career as an electrical engineer and worked briefly in the Department of Physics. During this time, he maintained his interest in photography by shooting projects of railroads and agriculture in central Illinois.

In 1988, an embolism to Halpern's optic nerve caused a sudden and permanent loss of vision to his right eye.

"I decided pretty much right then and there that photography had really become more than a passion," Halpern said. "It had become something I really wanted to do with my life."

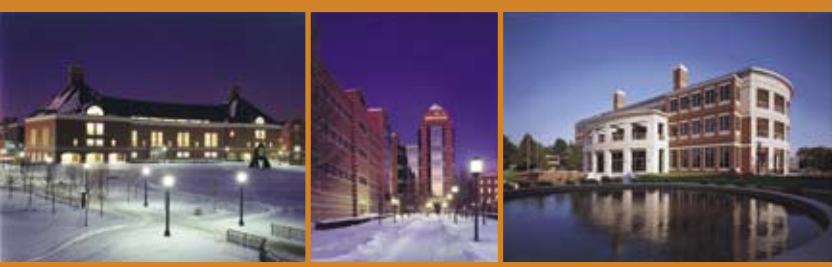
Halpern began shooting photos for architectural firms, engineering firms, construction companies, and the government. He travels throughout Illinois and the Northeast for work, but calls Champaign home with his wife Olga and their son and daughter.

"I would hope to give people a chance to look at what's around them, take the time to understand it, and take the time to put the pieces together, and understand where things are going," Halpern said.

Ben Halpern

"My knowledge of electrical engineering has proven invaluable, both in understanding the subject I'm photographing and in being able to communicate with other engineers."

The Illinois Terminal in Champaign. *Photos by Ben Halpern.*



A series of images of the Illinois campus.

In the more than 20 years Halpern has been a professional photographer, he has shot everything from private residences to large industrial complexes. But photographing the University of Illinois Alumni Center holds a special place for him.

"The building has been a great one to work with, not only because it's a great building, but because of what it represents. To have been hired to photograph this was really as much an honor as it was a great professional opportunity," he said.

Halpern is now finishing a project for the Historic American Engineering Record of the Bagnell Dam and Osage Power Plant in Missouri. The facility is 80 years old, and as part of its relicensing procedure, the Federal Energy Regulatory Commission required that the facility be documented.

"I never look at [loss of vision in one eye] as a disability," Halpern said. "I look at it as the hand I was dealt and just have to move forward using it."

See more photos by Ben Halpern at **www.ece.illinois.edu/mediacenter/resonance**.

ECE alumnus Horst develops novel robotic knee

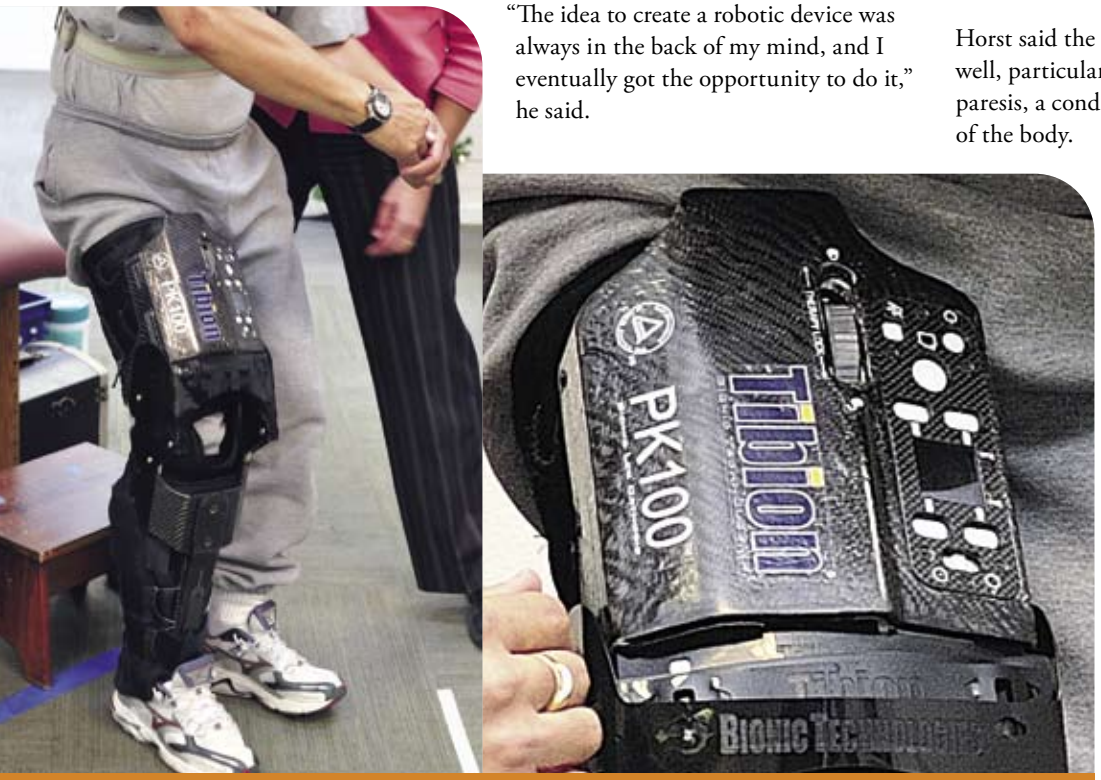
By Megan Kelly, Coordinated Science Lab

Robert Horst

When ECE ILLINOIS alumnus Robert Horst (MSEE '78) was in high school, he suffered a knee injury that required three surgeries to fix. He endured a long healing process, and the primitive rehabilitation technology used frustrated him. So he decided to do something about it.

Horst, who also received a PhD in computer science from Illinois in 1991, envisioned a company that developed sophisticated, robotic medical devices and therapies to help patients with musculoskeletal and neuromuscular deficiencies. After working more than 30 years in computer design, he decided it was time to make his vision a reality.

"The idea to create a robotic device was always in the back of my mind, and I eventually got the opportunity to do it," he said.



The Tibion PK100 is a powered, assistive leg device that enhances knee rehabilitation therapy. *Photo courtesy of Robert Horst.*

Horst, who is an IEEE Fellow and holder of 71 patents, cofounded Tibion Bionic Technologies with Kern Bhugra in 2002, and immediately began creating and marketing the PK100 Bionic Leg Orthosis, a powered, assistive leg device that enhances knee rehabilitation therapy.

The PK100 is a battery-powered device with sensors to detect what the person using it is doing. It reacts to those sensors and acts as an amplifier for the person's muscle movement.

"That's important, especially in stroke rehab, because recent research in neuroplasticity has shown that the neural pathways can be retrained, but it requires the patient to be actively involved," Horst said. "With our device, they can walk with a much more normal gait, and when they do that, they're retraining the neural pathways to produce the right muscle forces."

Tibion received capital funding in 2006 and a medical device license for its product in 2008. This allowed the company to begin testing with actual patients at several different physical therapy facilities.

Horst said the company found the device to work very well, particularly with stroke patients who had hemiparesis, a condition that creates a weakness on one side of the body.

"Using our device helped correct several problems and taught the patients to walk better," Horst said. "Even people who experienced a stroke several years before learned to walk better after only a few sessions."

The product also shows promise for people recovering from traumatic brain injuries and incomplete spinal cord injuries, patients with Parkinson's disease and MS, and those with mobility problems due to total knee replacement surgery or arthritis.

After seeing positive results with the first patients, Horst said three clinics have begun therapy programs based on the product, with several more showing interest and serious consideration. In addition, Tibion has won two awards for the PK100. And while its present focus is on the PK100, Tibion has plans to expand its product line.

"I think there's a huge future for robotic therapy and assistance devices. Our PK100 is really the first commercial device in this field," he said. "We can imagine devices that assist other joints and devices that would be more affordable so that a larger population of people can use them."

ECE alumnus Donald Wuebbles: Weathering the storm of atmospheric science

By Charlie Johnson

Many who graduate from ECE ILLINOIS and go on to a career in academia deal with the very tiny. They deal in chips and circuits, "micros" and "nanos."

For Donald Wuebbles (BSEE '70, MSEE '72), it's exactly the opposite.

Instead of a career studying the small in size, he turned his sights upward (literally) to the field of atmospheric sciences.

"When I graduated, my plan was originally to go for a PhD in electrical engineering, as my wife was still a sophomore here and had a ways to go. I needed a summer job to help us get by and I got one at a company owned by the professor in electrical engineering who ran the aeronomy laboratory," said Wuebbles. "When it came time to go to graduate school, I thought, 'Geez, I really like this study of the atmosphere thing,' and I started studying in the aeronomy lab."

After finishing his master's degree, Wuebbles opted against going for a PhD after losing his mother at age 47 to breast cancer and instead took a position modeling the chemical and physical characteristics of the atmosphere in Boulder, Colorado, and then at Lawrence Livermore National Laboratory in Livermore, California. Eventually, Wuebbles would complete his PhD in atmospheric sciences from the University of California at Davis and spend 21 years at the Livermore Lab developing models of the atmosphere and researching human effects on the ozone layer, air quality, and eventually the concerns about climate change.

Looking for a change of pace after two decades at Livermore, Wuebbles decided to move back to the University of Illinois, where he is the Harry E. Preble Endowed Professor in the Department of Atmospheric Sciences. He served as department head from 1994 through 2006. He also served as the first director of the Environmental Council at Illinois from 1996 until August of 1999 and was responsible for the development of educational and research programs relating to the study of the environment, including the creation of the undergraduate atmospheric sciences major at Illinois.

In addition to his administrative accomplishments, Wuebbles has lately worked to increase public understanding of the science of a changing climate. He recently helped coordinate the Midwest Climate Impacts Workshop that was held in late February in Chicago.

This workshop was designed to update the people of the Midwest on the understanding of the concerns about climate change, to impress upon them why they should be concerned about potential impacts, and to get their help on determining additional impacts and resulting options for adaptation and mitigation.

"I listen to the local station WDWS to get my Illini sports, of course, and I will occasionally—usually by accident—hear Rush Limbaugh lambasting climate change and the scientists who say it's changing, and a lot of people believe that," said Wuebbles. "In this workshop, we wanted to assess what is important to getting everyday people to understand climate change and to get them involved in responding to this very important issue."

The conference also addressed the practice of downscaling the effects of climate change to a specific city or community. For example, if the city of Chicago gets more than a few inches of rainfall on a spring day, how will that affect the sewer system? By downscaling the nearly unfathomably large effects of climate change to a real-world scale, Wuebbles and his colleagues hope to encourage climate change awareness and preparation by everyday people.

"My electrical engineering education prepared me extremely well for my career in atmospheric sciences. My knowledge of physics, math, and systems analysis are all invaluable. I'm a very broad thinker who always leans toward big-picture science," said Wuebbles. "Now I'm trying to take that big picture and make it more easily visible for a lot of people."

Large, complex concepts made smaller?

Sounds like an ECE grad after all.

"My electrical engineering education prepared me extremely well for my career in atmospheric sciences. My knowledge of physics, math, and systems analysis are all invaluable. I'm a very broad thinker who always leans toward big-picture science."

–Donald Wuebbles

Do you have a photo of yourself at work or at play that you'd like to share?

If so, please send these photos along to Tom Moone, editor, at ***moone@illinois.edu***. Though we'll only be able to print a few in each issue, you can see these and other submissions from our alumni at **www.ece.illinois.edu/news/resonance**.

You can also mail your photos to:

Tom Moone
55 Everitt Laboratory
1406 W. Green St.
Urbana, IL 61801

1950s

ROBERT WALKER (BSEE '56) spends his retirement from the University of Phoenix Southern California Campus faculty concentrating on model railroading. He has been published in more than 15 national magazine articles about advanced electronic control systems for model railroads.

1960s

J.K. AGGARWAL (MSEE '61, PhD '64) is the recipient of the 2007 Okawa Prize, which is intended to pay tribute to those who have made outstanding international contributions to the information and telecommunication fields.

CALVIN EVANS (BSEE '63) is now semiretired in South Carolina. He founded Micro Sales, Inc. in 1976 after an early career with Honeywell and Fairchild Semiconductor.

STEVEN SAMPLE (BSEE '62, MSEE '63, PhD '65) is retiring as president of USC. He has been USC's president for 19 years.

DONALD SCHROCK (BSEE '68) was elected a member of the board of directors for MaxLinear, Inc., a provider of radio frequency and mixed-signal IC solutions. He is also on the board of directors of Integrated Technologies, Inc. and Patriot Scientific Corporation.

DARYOUSH BATMANGHELIDJ (BSEE '69) was hired as the senior project manager for Cannon Design, an architectural, engineering, and planning firm.

1970s

WALTER ATKINS, JR. (MSEE '71, PhD '77) is retired and living in Honolulu.

JOHN SHARKEY (BSEE '72) is chair of Committee 36—Highway-Rail Grade Crossing Warning Systems for the American Railway Engineering and Maintenance-of-Way Association.

MARWAN SIMAAN (PhD '72) has been named dean of the College of Engineering and Computer Science at the University of Central Florida. He was elected to the National Academy of Engineering in 2000 and received the University of Illinois College of Engineering award for distinguished service in engineering in 2008.

JOHN ALLEMONG (BSEE '73, MSEE '74, PhD '78) retired from American Electric Power in February after 31 years. He is now studying meteorology, a lifelong interest.

PAUL TURCZYN (BSEE '73) celebrated 25 years of service at Hanson Professional Services, Inc.'s headquarters. As a senior electrical engineer, he designs power, lighting, and communications-related electrical systems.

LOUIS ALLOCCO (BSEE '75) has been working as an engineer for Astronautics Corporation of America in Phoenix, Arizona. He was an engineer for Honeywell in Arizona from 1984 to 2005.

JOE BEYERS (BSCompE '74, MSEE '75) was named chairman and CEO of Ambature, a company that focuses on efficient electricity generation. He was previously spent 34 years at Hewlett-Packard and was most recently vice president of Intellectual Property Licensing.

RONALD J. RHOADES (BSEE '77) was appointed to the board of directors of the Horsemen's Council of Illinois. He operates White Horse Farm, which is 10 minutes west of Champaign-Urbana, with his wife, Sara.

RICHARD N. SUHADOLC (BSEE '77) received the 2009 Distinguished Service Award from the Illinois Society of Professional Engineers. He is the chair of the Professional Engineers Board for the State of Illinois Department of Financial and Professional Regulation.

JOHN CIOFFI (BSEE '78) received the IEEE Alexander Graham Bell Medal "for pioneering discrete multitone modern technology as the foundation of the global DSL industry." He is the Hitachi America Professor of Electrical Engineering at Stanford University.

GREGORY TIMP (BSEE '77) has been named the Keough-Hesburgh Professor of Electrical Engineering and Biological Sciences at the University of Notre Dame.

1980s

BEN TSAI (MSEE '82, PhD '84) has been appointed a member of Ultratech, Inc.'s board of directors. Tsai is executive vice president chief technology officer and corporate alliances for KLA-Tencor Corporation.

THANH TRAN (BSEE '84) is the author of High-Speed DSP and Analog System Design (Springer), the book based on Tran's 25-plus years of experience in high-speed DSP and computer and analog system design. He also received the Entrepreneur/Innovation Award from the Cullen College of Engineering at the University of Houston.

PAUL TURNER (BSEE '87) was appointed chief executive officer of NACEL Energy Corporation.

JEFF HUBER (BSCompE '89) was appointed to the board of directors of Electronic Arts, Inc., an entertainment software company. He is senior vice president of engineering at Google.

1990s

GREGORY M. WILKINS (PhD '92) had a son, Logan Staten, on October 1. Wilkins is in his 16th year as faculty in the ECE Department at Morgan State University.

GREG KROLL (BSEE '94) was hired as engineering manager for KZCO, Inc., in Ashland, Nebraska. He has 14 years of experience and was previously a nuclear submarine officer in the U.S. Navy.

TRACIE SCHIRTZINGER (MSEE '94) ran her fourth marathon at the ING New York City Marathon on November 1. She was in the top 3 percent of women and in the top 10 percent of 44,000 runners overall.

MARK LAUFENBERG (BSCompE '92, MSEE '93, PhD '97) is the president of the Champaign-based PowerWorld Corp. The company has more than 600 customers in at least 57 countries. PowerWorld creates software that helps people visualize the flow of power across the electrical grid.

JUNPENG GUO (PhD '98) became an associate professor of electrical engineering and optics at the University of Alabama in Huntsville. He previously worked at Rockwell International in California and the Sandia National Labs in New Mexico.

ZHI CHEN (PhD '99) has been promoted to Kentucky Utilities Professor of Electrical Engineering at the University of Kentucky.

2000s

PETER KALOGIANNIS (BSCompE '00) is a Tier1B avionics project engineer for Scaled Composites. He recently flew as copilot on several test flights of WhiteKnightTwo, the jet-engined carrier aircraft that will lift SpaceShipTwo to launch altitude.

TANSU ALPCAN (MSEE '01, PhD '06) has been appointed to a post in the area of Autonomous Security at TU Berlin and Deutsche Telekom Laboratories. He develops mathematical models to improve IT network protection.

ROBERT A. MCKENZIE (BSEE '03) was hired as an associate in the Bankruptcy and Creditors' Rights, Business Organizations and

Transactions, and Litigation practice groups of the Arnstein & Lehr, LLP, law firm in Chicago.

DAVID LYTLE II (BSEE '03, MSEE '04) and his wife, Kelly (BS Special Education '06) had their first child, David Robert III. He was born January 7.

ROBERT SLAVICEK (BSEE '05) married Jessica Barry (Finance and Marketing '05). Slavicek works at Northwestern Memorial Hospital in Chicago.

HAMED OKHRAVI (MSCompE '07) accepted a research staff position at MIT. He married Asal Rahimi on March 20.

MOMEI QU (BSCompE '08) joined a startup venture capital firm in Chicago focusing on sustainable technologies. Qu is also involved with a Chicago-based angel investing group and will launch an Illini angel network that focuses on student businesses.

PUNEET GUPTA (BSEE '09) is a hardware engineer for Research in Motion. He was corresponding secretary for HKN in fall 2009 and recording secretary in spring 2009.

KWANWOO LEE (BSEE '09) was hired as systems integration analyst at Accenture in Chicago.

In Memoriam

ELIES ELVOVE (MSEE '40) died November 3. He served in England, North Africa, and the Pacific during World War II. He was part of an Electronic Training Group that pioneered the use of radar. He was also involved in some of the largest mass transit projects in the U.S. and electrical distribution in Egypt.

GENE ALT (BSEE '47) died January 29. He served as an Army captain in World War II. He was a retired district engineer for AT&T, where he worked for 34 years.

LEWELLYN BOATWRIGHT, JR. (MSEE '47, PhD '55) died January 23. He was commissioned a 2nd lieutenant in the U.S. Army Air Corps and served as a B-17 "Flying Fortress" pilot and squadron commander in the 99th Bombardment Group in World War II. He was a professor of electrical engineering at the University of New Mexico until his retirement in 1982.

ROBERT ELLIOTT (MSEE '47, PhD '52) died September 24. He was on the faculty of the University of Illinois. He was the first chair of the Electrical Engineering Department at UCLA. He retired from UCLA in 1991.

MARK SHEPERD, JR. (MSEE '47) died February 4, 2009. He was a retired Texas Instruments executive, engineer, and business leader.

STEPHEN TEHON (MSEE '47, PhD '58) died November 27. He was the principal staff scientist for the General Electric Co. Electronics "E" Lab and retired in 1987. He was a consultant to the Tecumseh Products Co., the Toshiba Co., and the University of Michigan. He had many patents and was recognized in the field of ultrasound.

GEORGE BAILEY (BSEE '48) died February 10. He served in the Navy during World War II and worked for Foxboro Company and Honeywell and Whitehall Co, LTD.

WILLIAM BARRICK (MSEE '48) died May 8. He served in the U.S. Army in the South Pacific in World War II. He was a retired electrical engineer for General Electric and the USAF.

RUSSELL DICKINSON (BSEE '48) died January 21. He was a retired vice president for manufacturing from Alcan Cable Corp. in Atlanta.

EMMETT REYNOLDS (MSEE '48) died November 18. He retired from the U.S. Army after 30 years of service.

GEORGE CRAWFORD (BSEE '49) died January 13. He was a retired nuclear engineer.

DANIEL DAUGHERTY (BSEE '49, MSEE '50) died May 27. He was on the design team for some of the earliest computers, one of which is on display at the Smithsonian.

DELMAR DIEL (BSEE '49) died January 3. He served in the U.S. Army during World War II.

ROBERT TATE (BSEE '50) died November 18. He served in the U.S. Army Air Force in World War II and returned home after his 50th mission. He worked for General Motors for 25 years.

HUGH MARSHALL (BSEE '50) died April 22, 2009. He served in the U.S. Navy during World War II. He was a retired aerospace engineer for the U.S. Government.

GORDON BONVALLET (BSEE '50) died January 3, 2009. He worked for Illinois Power Company, Corning Glass Works and ETL-SEMCO. He held several patents, including the design of Reflex markers that line the center of highways.

CHARLES GREEN JR. (BSEE '50) died October 28. He worked for General Electric for 36 years and retired at age 60.

GENE RHODES (BSEE '51) died November 27. He served in the U.S. Navy in World War II and Korea. He retired from his job as an engineer at Caterpillar, Inc., in 1985 and then worked as a senior tax preparer at H&R Block.

RALPH WESTERN (MSEE '51) died January 26, 2009. He was an engineer at Rockwell Collins for 32 years

WILLIAM BLACKWELL (MSEE '52) died March 12. He worked for General Electric and the Convair division of General Dynamics. He joined the faculty of Virginia Tech in 1966 and served as department head until 1981. He was a lifetime Fellow of IEEE and a regional Outstanding Educator. He received the Distinguished Alumni Award from ECE ILLINOIS in 1979.

JOHN (JACK) HINDE (MSEE '53) died January 10, 2009. He worked for Sandia National Labs for 32 years and continued to work for the Department of Energy after retiring.

DON JESCHKE (BSEE '55) died January 7. He was a retired engineer section manager for Motorola in Schaumburg, Illinois.

ROBERT KUDLICH (PhD '55) died January 4.

GARRAH MURET (BSEE '56) died December 27. He was an electrical engineer for Rockwell Collins for 35 years and was a lifetime member of IEEE.

DONALD SEAMAN (BSEE '56) died February 5, 2009. He purchased two McDonald's restaurants in Salem, Oregon in 1971. Over his 37 years of work with McDonald's, his business grew to 14 locations.

FRANCIS SPOKAS (BSEE '58) died January 8. He was a sergeant in the 1st Battalion, 7th Marines stationed in Korea from 1950 to 1953 and was awarded two Purple Hearts. He worked for Nuclear Data in Schaumburg, Illinois, until his retirement in 1988.

JERRY THORNTON (BSEE '59) died May 21, 2009. He worked for the Bendix Corporation for 37 years as a senior project engineer, designing guidance systems for surface-to-air missiles.

MICHAEL MYERS (BSEE '63) died July 1. His career was spent in investment banking and helping develop several startup companies.

DANIEL DORTH (BSEE '64) died January 27. He worked in the aerospace, calculator, and power generation industries.

STUART MELZER (MSEE '67, PhD '70) died May 2. He was an elite engineer with The Aerospace Corporation for 37 years.

JAMES ATHERTON (BSEE '72) died January 6. He most recently worked as senior director of IC technology at Alien Technology in Morgan Hill, California.

PETER GILBERT (BSCompE '76) died January 10. He worked for Digital in Nashua and Merrimack.

BARRY GALLAGHER (BSEE '83) died in January.

ALAN HODEL (BSCompE '84, MSEE '86, PhD '89) died January 9, 2009. He was an associate professor in the Department of Electrical and Computer Engineering at Auburn University.

ERICA SCIANCE (BSEE '87) died May 16. She worked as an engineer and supercomputer policy specialist for the Department of Defense.

JOHN DUFF (BSEE '89) died December 23. He was an electrical engineer for Commonwealth Edison for 10 years and was most recently employed with Dominion Power Company.

ECE alumni honored by College of Engineering

By Tom Moone

On April 30, two ECE alumni—John Cioffi and Leopoldo Yau—were among those University alumni honored by the College of Engineering at the Student and Alumni Honor Awards Convocation. Both received the Alumni Award for Distinguished Service.

John Cioffi

Leo Yau

JOHN CIOFFI (BSEE '78) was recognized for "contributions to multicarrier communications and high-speed digital subscriber line technology." Much of Cioffi's career has been associated with DSL technology.

After completing his undergraduate degree, Cioffi started working at Bell Labs near Chicago. Bell Labs sponsored Cioffi to get a graduate degree at Stanford, and in 1979, he completed that master's degree and returned to Bell Labs, this time to the facility in Holmdel, New Jersey. There he worked on modem technology. He later returned to Stanford, again under the sponsorship of Bell Labs, to complete a PhD, which he did in 1984. As he was finishing his degree, Bell Labs was in the process of being divested, so Cioffi then joined IBM Research in San Jose, California.

In 1986, Cioffi moved from industry back to academia when he joined Stanford's faculty. During his time at Stanford, he was involved in a number of startups. In 1991 he founded Amati Communications Corporation and served as its chief technology officer until the company was acquired by Texas Instruments in 1997.

In 2003, he founded ASSIA Inc., which provides software and services for dynamic spectrum management of DSL networks. As ASSIA became more successful, Cioffi found the balance of overseeing that company while fulfilling his obligations at Stanford to be more and more difficult to manage. He retired from Stanford in 2009 to a professor emeritus position and assumed full-time chief executive officer and chairman of the board responsibilities of ASSIA, a rapidly growing company now with more than 100 employees.

Cioffi finds his work at ASSIA rewarding. "I'm pretty excited about that, about as excited as I've been about anything I've done in my life," he said. "It's a lot of effort. It's keeping me busy."

Cioffi received the ECE Distinguished Alumni Award in 1999. In 2006 he was named a Marconi Fellow. He received the IEEE Alexander Graham Bell Award in 2010.

LEO YAU (PhD '69) was recognized for "outstanding technical innovations in manufacturing processes for the production of DRAMs and microprocessors." During a lengthy career with Intel, he made innovations that were critical to the success of the Intel DRAMs, the 386 microprocessor, and the first Pentium microprocessor, which revolutionized computer systems.

While at Illinois, Yau worked in a group under C.T. Sah. That experience "was the best semiconductor education I could get," he said. After completing his doctoral degree, Yau had a postdoctoral position at Illinois for two years before joining Bell Labs.

"Bell Labs at that time was a playland paradise," said Yau. "We didn't have to make money. We just had to do transistor technology development works and publish our findings."

That is not to say that Yau was not making technological advances. Work that Yau published in a Bell Labs journal got him noticed by Intel, particularly his work on what is known as the "Yau model," a theory that predicts the threshold voltage of short-channel MOS transistors with remarkable accuracy. "When they [Intel] read that publication, they wanted me to join their staff," he said. "That was probably my key to being recruited by Intel."

Yau joined Intel in 1978. There, he worked in lithography and dielectrics for transistors. His innovations were critical to the success of Intel's DRAM products and were subsequently extended to Intel's logic chips. In addition, Yau was the first to introduce the dual-frequency, plasma-enhanced chemical vapor deposition to the deposition of intermetal dielectrics, for which he received an award from ASM America. He was named an Intel Fellow in 1986, the highest technical honor Intel bestows on its employees. At the time of his retirement from Intel in 2000, Yau was the director of Innovative Technology Modules.

Yau credits his training at Illinois for his career success: "The PhD program discipline that I acquired in those days would become very useful at Bell Labs and Intel. I was very lucky that I got that background."

Yau received the ECE Distinguished Alumni Award in 1996.

University announces Michael Hogan as 18th president

Michael J. Hogan is the new president of the University of Illinois. His tenure began July 1. Hogan had served as president of the University of Connecticut until his selection for the Illinois post. Board of Trustees Chairman Christopher G. Kennedy announced the appointment to the Urbana campus community May 12 at the Illini Union. At the ceremony, Kennedy praised Hogan for his remarkable combination of experience that includes renowned scholarship, as well as administrative positions at Ohio State University and the University of Iowa.

E-waste design competition at Illinois expanding to international event

Creative and environmentally conscious thinkers will have the opportunity to showcase their ideas for recycling e-waste during the International E-Waste Design Competition hosted by the School of Art and Design and the Illinois Sustainability Technology Center at U of I.

This is the second year of the competition, which is being expanded from a campus event to an international event. A total of $16,000 in prize money will be awarded to six winning teams.

Journalism website focuses on local low-income issues

Thanks to a new website that went live December 15, Champaign County residents have a place to focus on poverty and related issues.

Called CU-Citizen Access, the site is overseen by U of I journalism professors Brant Houston and Rich Martin. *The News-Gazette* is a collaborator on the project, with its staff supplying stories and content for the site, along with faculty members and students from the U of I Journalism Department.

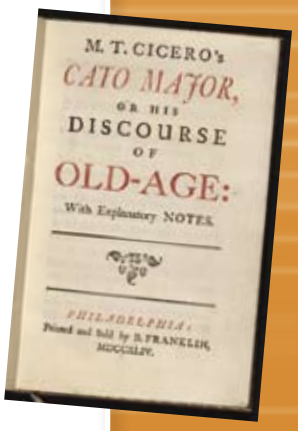
First draft of the pig: Researchers sequence swine genome

A global collaborative has produced a first draft of the genome of a domesticated pig, an achievement that will lead to insights in agriculture, medicine, conservation, and evolution. A red-haired Duroc pig from a farm at the University of Illinois will now be among the growing list of domesticated animals that have had their genomes sequenced.

Nathan Gunn's "Billy Budd" wins Grammy

Nathan Gunn, Illinois professor of voice and an alumnus of the University of Illinois School of Music and Opera Program, has won another Grammy. The award for best opera recording went to Benjamin Britten's "Billy Budd," which has become Gunn's signature role.

Library acquires 11-millionth volume



The University of Illinois at Urbana-Champaign Library has acquired its 11-millionth volume: Benjamin Franklin's edition of M.T. Cicero's *Cato Major, or his Discourse of Old-Age*. This was the first English translation of classical literature printed in the new world. Cicero's essay on aging was printed and sold by Benjamin Franklin in Philadelphia in 1744. Many consider Franklin's edition the finest example of American Colonial printing. It now resides in The Rare Book & Manuscript Library at the University of Illinois.

To read campus news as it happens, visit UI Now at *www.illinois.edu/uiNow*.

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