

NETWORKS

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

Highly Coveted Center to Study Evolution in Action Funded at MSU ECE Department Plays Major Role

There was a rush of excitement this spring in the Department of Electrical and Computer Engineering as the National Science Foundation awarded a \$25 million grant to MSU to establish a center to study evolution in action in both natural and virtual settings. ECE professor Erik Goodman is the director of the center. BEACON, an NSF Science and Technology Center for the Study of Evolution in Action, will unite biologists who study natural evolutionary processes with computer scientists and engineers who are harnessing these processes to solve real-world problems.

"BEACON is multidisciplinary to its core, and in addition to making discoveries in basic science and applications, it will prepare a new generation of researchers with the insight that comes from first-hand experimentation with evolution in the lab and in the computer," says Goodman, principal investigator on the proposal and founding director. "Recognizing the commonality of evolutionary dynamics in both contexts will enable studies and applications that could not be done in isolation in either biology or engineering." The center is headquartered in



"New research in digital evolution can make evolutionary concepts more accessible to the public." — Erik Goodman, ECE professor and director of BEACON.

newly remodeled space in MSU's Biomedical and Physical Sciences Building, and was one of five highly coveted NSF Science and Technology Centers established in a national competition conducted every 3 to 5 years by the NSF. The activities of BEACON officially begin on August 1 and will continue for 5 years under the first \$25 million, extendable to 10 years with another \$25 million.

In contrast to evolutionary studies focusing on fossil records or comparison of DNA among species to discover common ancestry, BEACON will focus on evolution as an ongoing process, in organisms in the laboratory (like bacteria, yeast, and viruses), in the field, and with "digital organisms" undergoing evolution in the computer.

"MSU being selected to house one of these highly coveted Science and Technology Centers is a testament to the world-class, collaborative research in which our diverse group of faculty is routinely involved," says Satish Udpa, dean of MSU's College of Engineering. "This center will

further stimulate multidisciplinary work."

In all, more than 30 faculty researchers in MSU's College of Engineering, College of Natural Science, College of Agriculture & Natural Resources, and Lyman Briggs College are involved in the project. Co-principal investigators are Richard Lenski, Hannah Professor of microbiology and molecular genetics and member of the National Academy of Sciences; Charles Ofria, associate professor of computer

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Fast Facts

- NSF starts five science and technology centers every 3 to 5 years.
- Typically each center runs for 10 years, and is funded for \$50 million total.
- In order to get this center, MSU competed with a total of 247 pre-proposals and 43 full proposals; there were 11 site visits.
- Other winners were Massachusetts Institute of Technology, University of Southern California, Purdue University, and University of California at Berkeley. 🌟

What can biology do for computation and engineering?

- Organisms are diverse, complex, and fascinating.
- Their features can inspire "copycat" solutions, or biomimetics.
- However, rather than copying biological outcomes, BEACON researchers seek to employ evolutionary processes to evolve solutions, as is occurring in nature. 🌱





from the Chair

TIMOTHY GROTJOHN

It was an exciting spring semester with the announcement that a National Science Foundation Science and Technology Center called BEACON was awarded to MSU and partner institutions. ECE is particularly proud that that one of its faculty, Professor Erik Goodman, is the director of the new center. The competition for this center was very tough, and I want to congratulate the entire MSU team for their success in getting this NSF center.

As you read through this newsletter I think you will be very impressed with the accomplishments of the alumni, faculty, and students of the electrical and computer engineering department. Over the past couple months I had the opportunity to meet and talk to each of the three alumni spotlighted in this newsletter. I am very impressed by their accomplishments. They are truly role models for the students we are now educating and graduating.

I would like to thank all of you (alumni and friends) for gifts you have made to the ECE department over the past year. They are truly helping us to better educate and train the next generation of engineers. I wish you all a great summer. Please stay in contact with us. Your collective ideas and contributions can help to continue to build and strengthen the ECE department and its many activities. 🌻

Alumni Networks

Presidential Rank Award



From left: Michael B. Donley, secretary of the U.S. Air Force, presents the Presidential Rank Award to Brian Kent, while General Norton Schwartz, chief of staff of the U.S. Air Force, looks on.

Kent performs and directs research and development activities at

Engineering Alumni Association Board. The award honors high-performing senior career employees for sustained extraordinary accomplishment. Executives from across government are nominated by their agency heads, evaluated by citizen panels, and designated by the president. Winners of these awards are strong leaders, professionals, or scientists who achieve results and consistently demonstrate strength, integrity, industry, and a relentless commitment to excellence in public service.

Brian Kent (BS, '80) has been awarded the Presidential Rank Award. Kent is senior scientist for Low Observables and Electromagnetics, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio, and a member of the College of

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Highly Coveted (continued from page 1)

science and engineering; Kay Holekamp, professor of zoology; and Robert Pennock, professor of computer science and engineering. Other ECE faculty members involved besides Goodman include Subir Biswas, Barbara O'Kelly, Percy Pierre, and Xiaobo Tan. Undergrad Matthew Durak, who has served as Goodman's professorial assistant, will also be involved, as will several new graduate students joining the center in the fall.

MSU is also partnering with North Carolina A&T State University, the University of Idaho, the University of Texas at Austin, and the University of Washington. "Historically, biologists and evolutionary computation developers have had minimal interactions. New research in digital evolution can act as a conceptual glue to join these fields and make evolutionary concepts more accessible to the public," says Goodman.

The basic principles revealed by these investigations can be used to develop more robust computing systems, gain insights into biological organisms and their interactions, and help to solve important industrial design problems. BEACON will actively promote technology transfer of its findings to industry; BEACON's industrial affiliates will include several companies, large and small, with which center researchers have established or emerging collaborations.

The center will focus on research in three areas. The Evolution of Genomes, Networks, and Evolvability group will concentrate on mechanisms of genetic change, organization, encoding of information, and developmental processes. The Evolution of Behavior and Intelligence group will emphasize evolution of phenotypic traits of self-directed organisms including complex behaviors and early forms of intelligence. The Evolution of Communities and Collective Dynamics group will investigate evolution in large groups of organisms, focusing on issues related to the evolution of group structure and societal development, as well as emergent properties of ecological communities.

Other BEACON activities will include faculty and postdoc training and mentoring, novel curricula both at graduate and undergraduate levels, training programs for high-school and middle-school teachers, and an array of outreach programs to engage K-12 students and the general public. A typical example of BEACON outreach is a training program for high-school science instructors in applying novel software-based tools to teach basic evolutionary principles. Versions of this software will be made available in museums and on the Web.

In addition, BEACON should become a significant resource for industry, creating new technologies to solve real-world problems. "Members of our team have a rich history of partnering with industry on design problems," says Goodman. "We believe that new collaborations emerging in BEACON will generate yet more innovative design methods based on the challenges presented by industry."

Goodman is also excited about the possibilities of educating the public. "Promoting an understanding of the evolutionary process has important consequences for a public that remains skeptical of evolution, let alone aware of how it affects their lives." 🌻

Alumni Networks (continued from page 2)

the Multi-Spectral Measurement Facility, a National Center of Excellence within the Sensors Directorate. He has authored/co-authored more than 75 archival articles and technical reports and has written key sections of classified textbooks and design manuals. He developed a special Department of Defense (DOD) Low Observables Short Course that has been taught to over 2,000 DOD scientists since 1989. He is an international technical adviser for the DOD, has been an invited guest lecturer to the United Kingdom's Cranwell Air War College, and has served as thesis adviser at the Air Force Institute of Technology.

2010 John D. Ryder Alumni Award



Marvin Adams with his wife, Lynn.

Marvin W. Adams (BS '81) received the 2010 John D. Ryder Electrical and Computer Engineering Alumni Award at a College of Engineering banquet in May. Established in 2004, this award commemorates the outstanding professional contributions of John D. Ryder, former dean of the College of Engineering and a professor in the department.

Adams is executive vice president of technology and operations at TIAA-CREF, a fortune 100 financial services company and the leading retirement system for people who work in the academic, research, medical, and cultural fields. A member of the firm's 11-person executive management team, Adams is responsible for the organization's technology and operations strategy

and policy. He also oversees the company's continual upgrade of corporate systems and technology infrastructure and ensures an integrated approach between TIAA-CREF information technology and operations groups.

He joined TIAA-CREF in January 2010 from Fidelity Investments, where he was president of shared services. His responsibilities included oversight for IT, operations, real estate, and procurement functions. Prior to Fidelity, Adams served as chief information officer for Citigroup, Bank One Corporation, and Ford Motor Company, building a nearly 30-year career focused on leading information technology, corporate strategy and integration, and process-engineering initiatives.

In addition to his corporate responsibilities, Adams is currently a technology adviser to Warburg-Pincus, a global private equity firm. During the past 15 years, he has served on several corporate boards, been asked to advise the chief information officer of the United States Army, and participated in a variety of nonprofit organizations, including Focus Hope and the Leukemia & Lymphoma Society.

In addition to his BS degree from MSU, Adams has completed executive programs at Stanford University and Massachusetts Institute of Technology. Adams and his wife, Lynn, reside in Saline, Michigan. They have three daughters, a son-in-law, and one grandson. In his spare time, Marv enjoys downhill skiing, running, reading, and traveling.

2010 Claud R. Erickson Distinguished Alumni Award

Betty Shanahan (BS '78) received the 2010 Claud R. Erickson Distinguished Alumni Award at a College of Engineering banquet this spring. The award is given annually to a College of Engineering graduate with a minimum of 15 years' professional experience who has attained the highest level of professional accomplishment.

From the start of her career, Betty Shanahan has been a model engineer. Everything she does, she does with passion and intensity. She began work at Data General Corporation in 1978 as a



Dean Satish Udpa presents Betty Shanahan with the Claud R. Erickson Distinguished Alumni Award.

hardware engineer, designing and developing microcode for minicomputers. In her first major project, she worked within a team composed of a number of new graduates. Their assignment: to design a next generation computer. They were given an immense amount of responsibility and opportunity. Not only was that a great "jump start" for her career, notes Shanahan, but it also established her self-confidence in trying something new and trusting her skills. That project eventually became the subject of the book *Soul of a New Machine*, written by Tracy Kidder. Published in 1981, it won a Pulitzer Prize and an American Book Award.

The status of being the lone woman engineer, or one of just a few, has been a trend throughout her career. While she was a senior at MSU, she was elected as the first female president of the Student Engineering Council. When she took her first job, at Data General, she was the first woman engineer to be employed at the company's Westborough, Mass., development facility. However, that has not deterred her advancement. Shanahan has been on the forefront of electronic hardware and software technology. Her technical achievements include designing and developing hardware simulation and validation systems; introducing object-oriented software technology, which became the basis of several products; and managing the development of six application specific integrated circuits (ASICs), which were fully functional on the first production run.

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Faculty Networks

2010 Withrow Awards



Shanker Balasubramaniam, professor of electrical and computer engineering, received the **Withrow Distinguished**

Scholar – Senior Award at the college’s annual awards luncheon in March.

Balasubramaniam has established himself as an internationally acclaimed leader in the field of computational electromagnetics. He pioneered the development of the “Plane Wave Time Domain (PWTD)” algorithm, which allowed researchers to perform complex time domain electromagnetic simulations in a matter of a few hours, which would have otherwise taken years; for this contribution, he was elected as a fellow of the IEEE in 2009.

He came to MSU in 2002 as an associate professor, and rapidly distinguished himself as one of the department’s most prolific researchers and highly acclaimed teachers. In 2008, he was promoted to full professor in the ECE department, and was recently appointed as professor in MSU’s Department of Physics and Astronomy.

Balasubramaniam seeks excellence in whatever he does. He doesn’t shy away from challenges. In fact, he continuously encourages all his students and anyone who consults him to “push the envelope,” be it in research or in a course. He encourages his students to continuously ask themselves “what is new” and to always be at the edge of research. He is a one-of-a-kind scholar whose broad background in applied mathematics, physics, and engineering permits him to tackle problems very few others dare to. He has produced a continuous stream of innovations in his field. His exemplary scholarly record includes five book chapters; more than 70 refereed journal articles; and his forthcoming book, *Time Domain Integral Equation Methods in Electromagnetics*, which is expected to have a significant and long-lasting impact in the field.

He dedicates an extraordinary amount of time to the success of his students. He has mentored both undergraduate and graduate students to many best student paper award nominations; five of his students’ papers have won awards in best student paper competitions in the IEEE Annual Symposium on Antennas and Propagation in the last five years.



Andrew J. Mason, associate professor of electrical and computer engineering, received the **Withrow Teaching**

Excellence Award. Mason teaches at both the undergraduate and graduate levels and his evaluations by the students are among the best in the department. He is passionate about the students’ learning and the material he teaches, and that enthusiasm carries over to his students.

“Dr. Mason is one of the best professors I’ve ever had. He genuinely cares for his students and strives to know each one. He teaches in a way that we understand the material clearly. And he is always very willing to help.” Mason has also played a pivotal role in revamping the computer engineering curriculum in an effort to produce

students who are well versed in VLSI design flow and industry standard design tools. Recently, he played a leadership role in establishing a biomedical specialization within the electrical engineering program and developed a new course in biomedical instrumentation. He is now leading the effort to prepare the computer engineering program for accreditation evaluation.

NSF CAREER Award



Shantanu Chakrabarty, associate professor of electrical and computer engineering and director of the Adaptive

Integrated Microsystems (AIM) Laboratory, has received an NSF CAREER Award for his research in energy harvesting sensors and processors. During the past four years, the AIM Laboratory has been working on a revolutionary sensing paradigm that could change the way engineers monitor the health of any mechanical structure.

This innovation, called piezoelectricity driven hot electron injection (p-IHEI), enables energy harvesting sensors to be miniaturized to the size of a micropebble, which can be embedded inside structures like wind turbines

New Faculty



Bingsen Wang recently joined the department as an assistant professor. He obtained his PhD in electrical engineering from the University of Wisconsin in 2006. Prior to coming to MSU, Wang was an assistant professor at Arizona State University in Tempe, Ariz. He also worked for the General Electric Global Research Center in Niskayuna, NY, and for Carrier Air Conditioning Co. in Shanghai, China. Wang is a senior member of IEEE and the associate editor of IEEE Transactions on Power Electronics and served as associate editor on a special issue of that magazine entitled “Modeling and Advanced Control in Power Electronics.” His current research

interests focus on modeling and control of power electronic systems, power converter topologies, application of power electronics in renewable energy generation, and vector control of AC electric drive systems. 🌟

or rotor blades. It can even be embedded inside the human body—for instance, in a knee implant or a heart valve. Without the aid of any external powering source, a network of these micropebbles can continuously monitor the health of the structure, allowing it to self-diagnose any catastrophic failure.

To learn more about the AIM Laboratory, visit <http://www.egr.msu.edu/aimlab>

University Awards



Fang Z. Peng, professor of electrical and computer engineering, was recognized with a **Distinguished Faculty Award** at the 2010 Awards

Convocation held in February.

Peng's expertise in power electronics for renewable energy, utility applications and hybrid electric vehicles and his innovative research contributions have brought distinction to Michigan State University. His pioneering research on multilevel converter technology has laid down the foundation for its widespread applications to utility power grids, high-voltage motor drives, and renewable energy sources.

He pioneered multilevel converter technology by solving the voltage unbalance problem, which was a major roadblock to implementation of this

technology. His original solution opened new areas in alternative energy power conversion, utility power systems and large motor drives for industry, transportation and military applications.

For these contributions to multilevel power converter technology and its application, he was elected one of the youngest fellows of the Institute of Electrical and Electronics Engineers. His inventions have resulted in more than 10 patents. Recent innovation from his research at MSU has created a new power conversion technology, the Z-source converter, which has been studied worldwide by his peers.



Xiaobo Tan receives the **Teacher-Scholar Award** from MSU president Lou Anna K. Simon.

Associate Professor **Xiaobo Tan** received one of six **Teacher-Scholar Awards** at the 2010 Awards Convocation. The award is given to instructors, assistant professors, and associate professors who early in their careers have earned



MSU President Lou Anna K. Simon presents **Quaiser H. Malik** with the **Excellence-In-Teaching Citation**.

the respect of students and colleagues for their devotion to and skill in teaching. The purpose of the award is to recognize the best teachers who have served at MSU for seven years or less.

Quaiser H. Malik, an ECE PhD student, received an **Excellence-In-Teaching Citation** at the 2010 Award Convocation. This award is given to graduate teaching assistants who have distinguished themselves by the care they have given and the skill that they have shown in meeting their classroom responsibilities. Malik had been working with the ECE 345 (Electronic Instrumentation and Systems) course for the past four years as part of his research related to engineering education. He also was the instructor for ECE 476 (Electro-Optics). Malik hopes to complete the research for his PhD by the end of this summer; ECE professor Michael Shanblatt is his adviser.

USDA Grant



Subir Biswas, associate professor, is working with a team of animal science researchers to explore the use of new wireless

technology to determine its effectiveness in monitoring the welfare of egg-laying chickens. With a grant from the U.S. Department of Agriculture, the researchers will test wearable

sensors that will monitor how hens use space and resources in non-cage environments.

The team has developed a hen-mountable wireless sensor system for tracking a hen's activity profile, including its movement with respect to other hens and fixed items such as nest-boxes, perches, and water station. The sensor weighs less than one ounce. "Wearable and networked wireless sensor technology is currently being explored in academia and in the industry primarily for human health monitoring," says Biswas.

Using such a wearable system for bird

monitoring will require a number of key engineering innovations, including low-power wireless network protocols, on-body and off-body data fusion models, smart software middleware, and runtime actuation of infrastructure control based on the monitored data.

The information will serve as an important basis for how to provide hens with key resources and how much space they really need. Such information will provide a scientific basis for designing non-cage housing systems for laying hens that provide the best possible welfare for the animals. 🌱

Student Networks

2010 Outstanding ECE Graduate Student



Professor Shanker Balasubramaniam congratulates Naveen Nair (right).

Naveen Nair, a doctoral student working on a degree in electrical engineering, under the guidance of ECE professor Shanker Balasubramaniam, was named the 2010 ECE Outstanding Graduate Research Award winner by the MSU Engineering Graduate Studies committee.

"Naveen is one of the brightest students that

I have encountered during the past decade," says Balasubramaniam. Nair first came to MSU to work with Professor Satish Udpa on non-destructive evaluation, as he had a background in inverse heat conduction problems as applied to NDE. His thesis is on developing the Generalized Method of Moments with specific application to problems in electromagnetics.

"This is an integral equation analogue of the generalized finite element method developed by Babuska for elliptic differential equation," says Balasubramaniam. "Development of such methods for integral equations was not on the radar screen of researchers, at least in the electromagnetic community. The key idea is to develop a framework wherein the space of basic functions used for integral equations can be enlarged. Naveen has pretty much solved each of these problems. He has extended this method to discretize transient integral equations and integral equations to analyze scattering from dielectric bodies. These features have been tested on complex geometric topologies."

Engineering Excellence Service Award



Jacob Scott (left) was nominated by Andrew Kappler.

Jacob Scott, an EE senior, received an Engineering Excellence Service Award for 2009-1020 for distinguished

service to the ECE department, the college, and MSU this spring. He was nominated by Andrew Kappler, a mechanical engineering student. "I hadn't been exposed to the concepts of ECE before. Jacob is the teaching assistant for ECE 345 (Electronic Instrumentation and Systems), and he went beyond the call of his job on a weekly basis. I was thinking I might not do well in the course, but I have been consistently above the class average, which I absolutely attribute to Jacob's skill in the subject, and his willingness to meet students whenever they need help in addition to normal office hours."

NSF Fellowship

Andrew Temme, an ECE student who graduated this spring, received a National Science Foundation Graduate Research Fellowship, which provides tuition and living expenses for three of the next five years. He will pursue his master's and PhD degrees at MSU while conducting research under ECE professor Edward Rothwell as part of the electromagnetic research group. "I am very excited about this fellowship because it allows me to follow my interests and develop my own research project," says Temme, who is from Casper, Wyo. He is the son of Kenneth and Miriam Temme.

This spring, Temme nominated Franklin Stofflet who received the Green Apple Teaching Award at a College of Engineering banquet. The award honors a K-12 teacher who has inspired students to study math, science, and engineering. Stofflet, now retired, taught chemistry and physics at Natrona County High School in Casper, Wyo., for 40 years. Temme was one of his students.

Honorable Mention Goldwater Scholar



Matt Durak

Matt Durak, an ECE and Honors College student who just completed his second year, received an honorable mention as a Goldwater Scholar. The Barry M. Goldwater Scholarship and Excellence

in Education Foundation awarded 278 scholarships from a field of more than 1,100, so an honorable mention is an accomplishment. MSU had one student who received a Goldwater Scholarship this year.

Durak has been a professorial assistant to ECE professor Erik Goodman and will be involved in the BEACON project. (See article on page 1.) He also serves as the webmaster for MSU's branch of the IEEE. This summer he is working for Okemos-based TechSmith as a software engineering intern. He is from Canton, Mich., and is the son of Tom and Lisa Durak.



Andrew Temme with Franklin Stofflet at the College of Engineering alumni awards banquet in May.

"Components. Vectors have commpooonentsss. As an electrical engineer I have been using vectors almost daily since Mr. Stofflet introduced them in my AP physics class during my sophomore year of high school," says Temme in his nomination letter. "This mantra helped me to understand the new concept of vectors, and to this day vectors still have 'commpooonentsss' – the word still drawn out by the voice of an old Wyoming cowboy as if he was speaking to the rookies on this year's cattle drive."

Trustees Honor Graduates

Graduating seniors **Matthew Guibord** and **Arslan Qaiser** were among 23 MSU students honored April 16 by the MSU Board of Trustees for their academic achievements. Board of Trustees awards are granted at each commencement to graduating seniors having the highest cumulative grade point averages at the close of the semester prior to graduation.

Matthew Guibord of Livonia is a computer engineering major. He is the son of Laura and Joseph Guibord. Guibord has a 4.0 GPA and is a graduate of Winston Churchill High School in Livonia.

Arslan Qaiser is an electrical engineering major. He is the son of Qaiser Malik who is a PhD student in the ECE department, and Meena Qaiser. He has a 4.0 GPA and is a graduate of F.G. Sir Syed Collegiate High School in Rawalpindi, Pakistan.

High-Achieving Student Recognition

At an awards banquet in February, computer students from various engineering departments were recognized for their academic efforts. For the ECE department this included:

Michael Carpenter, computer engineering

Mathew Durak, computer engineering
Ivan Gallardo, computer engineering
Matthew Guibord, computer engineering
Eleazar Gutierrez, computer engineering
Mark Hozhauer, computer engineering
Christopher Sigler, computer engineering

2010 Spring Design Day

Five teams received monetary prizes for their capstone projects during the 2010 Design Day. They are:

First Place (\$300 each): Dong-Ho Kang, Eric Otte, Arslan Qaiser, Ishaan Sandhu, and Anuar Tazabekov for a project on capacitive rain sensors for automatic wiper control. The project was sponsored by Hyundai Kia America Technical Center.

Second Place (\$200 each): Andrew Bruinsma, Bret Charboneau, Tim Haynie, William Mattingly, and David Wilson for a project on a time-sharing computer system with audio integration, which will be used by schools in Tanzania. Michigan State University with support from George and Vickie Rock and a matching grant from the Dow Chemical Company supported this project that included a team visit to Tanzania in May 2010.

Third Place (\$100 each): Louis Garcia, Eric Hatch, Joseph Paul Larsen, Michael Moulton, Rodney Singleton II, and Rafael Ocampo for a connect-on-demand satellite link for Tanzanian Schools. This project focused on building a more powerful Internet connection for rural Tanzanian schools. This project also was supported by George and Vickie Rock with a matching grant from Dow Chemical Company.

Professor's Choice Award (\$300 each): Dilo Benjamin, Marcelo Pereira Castro, Abdulaziz Najm, Saurav Shrestha, and Tia Twigg for their Roadrailer air brake fault locator project, which was sponsored by Triple Crown Services. The professor's choice award is given each semester by the faculty member teaching ECE 480, Senior Capstone Design, to the team judged by the instructor to have done the most to achieve the objectives of the course and the sponsor.

Poster Award (\$200 each): Temika Cage, Justin Erksine, Benjamin P. Guild, Timothy Ross, and Kunal Verma for a project sponsored by the Air Force Research Laboratory on small, lightweight speed/distance sensors for skiers and snowboarders. ❁

2010 Claud R. Erickson Distinguished Alumni Award (continued from page 3)

Most recently Shanahan was the vice president of product management and marketing for the Software Components Division of Stellant, Inc. After 24 years in industry, she moved on to become the executive director and CEO of the Society of Women Engineers (SWE), a 20,000-member not-for-profit educational and service organization founded in 1950. Under her leadership SWE has increased membership by 37 percent; doubled their operational income; increased their public policy profile; and developed a strong headquarters staff, a respected professional development program, and a diversity and inclusion strategy. Due to Shanahan's passion and leadership, SWE is recognized as a "go to" group for STEM education issues and Title IX.

Shanahan has been involved with SWE since her days as a student at MSU and was awarded

Fellow Grade in 2002. She served on the board of directors of Women in Engineering Program Advocates Network (WEPAN) from 2002 to 2004, and is currently a board member of the Council of Engineering and Scientific Society Executives (CESSE). Most recently, she was selected to serve on the MSU College of Engineering Alumni Association Board. She is a member of the Institute of Electrical and Electronics Engineers, the Association for Computing Machinery, and the American Society of Association Executives. With her Certified Association Executive designation, Shanahan is also recognized as a leader in the association management community.

As a life member of MSU's Alumni Association, she has financially supported the college, been a speaker at MSU's Society of Women Engineers events, and has been

involved with activities and fundraising events with the Chicago Spartans. In addition to her BS degree from MSU, Shanahan earned a master of software engineering degree from the Wang Institute of Graduate Studies (now part of Boston University) in 1984 and an MBA from the University of Chicago Booth School of Business in 2000.

Shanahan currently resides in Chicago. She met her husband, Bob Nuber, during their first term at MSU in a calculus class. Nuber earned his BS in computer science from MSU. Shanahan is a dedicated Chicago White Sox fan who attends as many Sox home games as her schedule allows. She is a little bit of a "foodie," enjoying the creations of talented chefs and playing amateur chef. ❁

KEEPING IN TOUCH

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News of recent accomplishments, awards, or promotions (Use separate sheet if needed):

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Design Day Spring 2010

As usual Design Day presents unique opportunities for students and faculty to collaborate with industrial sponsors through posters, project displays, and presentations for graduating seniors and their capstone design projects. Below, students demonstrate a Synchronized Audio indexed Note Taker (SAiNT), which was designed to assist persons with disabilities with class work and note taking during lectures. The project was sponsored by the MSU Resource Center for Persons with Disabilities.



Stephen Blosser (left), assistive technology specialist in MSU's Resource Center for Persons with Disabilities, hears about the project from students Li-Shian Chen, Trieu Nguyen, Christopher Johnson, and Huan Lin. See Design Day story on page 7.