

NETWORKS

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

Design in the Curriculum: Program Gives Grads an Advantage with Employers

There are advantages to learning by doing, and design projects are a good way to do that. Undergraduate students in the Department of Electrical and Computer Engineering (ECE) now find design is an integral part of their studies from Day 1 until Graduation Day. "Putting more design projects into the curriculum is a national trend. It is what employers want," says Erik Goodman, professor of electrical and computer engineering and the instructor for the ECE senior capstone design course. Now freshmen are getting a taste of what design is all about with cornerstone design projects.

Projects for both freshmen and seniors culminate with Design Days presentations held at the end of each semester. ECE began having its own design day in the International Center in 2003. The department teamed up with the mechanical engineering department in the fall of 2006 for a Design Days event that was held at the Student Union. This allowed a way to showcase the senior projects in an event open to the public. Since then the Design Days event has grown. Students from the Department of Computer Science and Engineering (CSE) joined ECE and ME in December 2007, and for the Spring 2008 Design Days students from the Department of Civil and Environmental Engineering (CEE) and from the Applied Engineering Sciences (AES) program were also involved.

"Students are proud and excited about their projects. Design Days gives them an opportunity to shine," says Maureen Blazer-Adams, College of

Engineering Design Days Coordinator. "The Design Days presentations give students a better understanding of what is needed to get ideas and projects approved when working in industry."

The cornerstone design program for freshmen is just getting started. The pilot class of Engineering 100 (Introduction to Engineering Design) was offered to selected freshmen in the fall of 2007; another group of freshmen took the class during the spring 2008 semester. By the fall of 2008 it will be a required class for all freshmen. Engineering 100 has two parts — a lecture that gives an overview of how engineers design products and processes, and a lab that offers hands-on projects geared toward team building. "This course gives students a chance to learn about the broad scope of engineering before focusing on a major," says Timothy Hinds, academic specialist in the Department of Mechanical

Industrial Sponsors Make Projects "Real"

Numerous companies sponsor student teams for the senior capstone design projects. For the spring semester 2008, those companies included:

- Bosch Automotive
- Gormley Systems Engineering
- Lear Corporation
- Lenovo Corporation
- Marathon Oil
- Midland Rotary
- MSU Resource Center for Persons with Disabilities and its Wochholz Endowment
- NASA Goddard Space Flight Center
- Norfolk Southern Corporation
- U.S. Air Force Research Laboratories

continued on page 3

The Sparty Tank T-Shirt Shooter drew lots of attention at Design Days. Some of the students who worked on this project were (from left) Chris Ballard, Danny Tran, Alex Lai, and Tim Tran.





from the Chair

TIMOTHY GROTJOHN

Greetings to all alumni, students, and friends of the Electrical and Computer Engineering Department. Both the undergraduate and graduate programs in electrical and computer engineering continue to thrive and improve. In the undergraduate program a biomedical concentration has been added. This concentration allows the students to take a focused group of biomedical engineering courses. This special option is then noted as a "biomedical concentration" on their electrical engineering or computer engineering program transcript. This has been added to respond to the strong interest of prospective and current students in the area of biomedical engineering.

The freshman and sophomore years of the undergraduate program are also seeing a number of improvements. For the freshmen,

a new first-year engineering program called Cornerstone Engineering was offered on a pilot basis this past year (2007-08) and will be taken by all freshmen interested in engineering this next academic year. This cornerstone engineering program consists of two courses that include lectures, hands-on design experiences, and engineering analysis using computer tools, especially simulation tools like MATLAB. A sophomore-level electrical circuits lab has also been added to the curriculum, so now the students have hands-on laboratory experience in each year of their program.

Over the past few years the department has put a strong emphasis on all the undergraduate students getting engineering experience outside the classroom by participating in cooperative education, internships, study abroad, and/or undergraduate research. In a recent survey of graduating seniors, more than 90 percent had had some type of engineering experience outside the classroom. Graduating seniors are also finding very good employment opportunities, because many companies' engineering

workforces are starting to retire and new engineers are being hired.

The electrical engineering graduate program graduated 18 PhD students in the past year. This is an all-time high. Also, over this past year the department's externally funded research expenditures reached an all-time high of \$7,500,000. Research work is being done in several important areas, including advanced technology for energy, manufacturing, health care, and communications systems.

As mentioned in our previous newsletter, MSU is starting several programs at MSU-Dubai in the United Arab Emirates (UAE). One of four programs starting at the undergraduate level is computer engineering. The first class of students will start in August 2008.

The Department of Electrical and Computer Engineering is continuing to improve its programs to better prepare graduates for successful careers. I am always interested in hearing from alumni, friends, and students about ideas to further improve and advance our education and research programs. ❁

ECE Students Show Off Skills at Design Days

For students, the Design Days event is the fun finale of intensive work on projects. While all who completed projects and made presentations are winners, there are numerous specific awards. For spring 2008 the top ECE winners are:

ECE 480 Outstanding Poster Award

(judged by visiting high school students)

1st Place (split \$1,000): Team 3 – Solar-Powered Laptop, sponsored by Lenovo Corp.

Faculty Facilitator: Dean Aslam. Team Members: **Marquise Abbey, Matthew Jastrzebski, Ian McLaurin, Almir Mujkic, and Nicholas Tram.**

Prism VentureWorks Prizes: (Awards for best project team performance)

1st Place (split \$1,500): Team 9 – Electrical Conductivity Tester for Railroad Ties, sponsored by Norfolk Southern. Faculty Facilitator: Fathi Salem. Team Members: **Paul Anselmi, Bradley Graca, Ahmad Nashriu Mutalib, Julian Quick, and Vikram Singh.**

2nd Place (split \$1,000): Team 2 – Sip and Puff Interface to an All-In-One Controller, sponsored by Chrysler Foundation and MSU's Resource Center for Persons with Disabilities. Faculty Facilitator: John Deller. Team Members: **Richard Cantor, Borce Dilevski, Kenneth Kleszcz, Kelly Kleszcz, and Petar Jovanoski.**

3rd Place (split \$500): Team 6 – DigiDriveIV™ Platform Development, sponsored by Gormley Systems Engineering. Faculty Facilitator: Tongtong Li. Team Members: **Fred Fishbeck, Devin Looney, Nicholas Patino, Kyle Raeb, and Benjamin Urban.**

Professor's Choice Award: (For team judged to have done the most to achieve the objectives of the course.) **Team 4 (split \$1,000)** – Sparty Tank T-Shirt Shooter, sponsored by MSU. Faculty Facilitator: Cevat Gokcek. Team Members: **Christopher Ballard, Blake Gower, Bryan Grinnell, Kyle Koept, Alex Lai, Adam Sneller, Timothy Tran, and Danny Tran.**

For **EGR 291, Team 16 won.** The team included **Sung Lee, Khubaib Razzaq, and Ryan Tibbetts.** ❁



Winners of the Outstanding Poster Award were (from left) Nicholas Tram, Marquise Abbey, Matthew Jastrzebski, Ian McLaurin, and Almir Mujkic.



First-place winners of the Prism VentureWorks Prize were (from left) Bradley Graca, Paul Anselmi, Vikram Singh, Ahmad Nashriu Mutalib, and Julian Quick.

Design in the Curriculum: (continued from page 1)

Engineering and the lead instructor for Engineering 100.

On the first day of class, students are divided into teams and work throughout the semester on several projects. The first project has to be completed within two weeks at the start of the semester. "This develops team skills and lets students do trial and error without a lot of engineering knowledge. They have to be organized right away," says Hinds. The student response to the course is very positive. "It's the first time they are seeing engineering and it gives them an opportunity to determine if this is what they really want to do. In the past the first opportunity to work in a team was generally as a senior. Students need to develop these team-building skills at the freshman level to use throughout the rest of their education and in their careers," says Hinds.

Freshmen interested in ECE also take Engineering 291 (Introduction to Electrical and Computer Engineering), which is being renumbered to ECE 101. "Students are exposed to different aspects of engineering within ECE and beyond," says Robert McGough, associate professor of electrical and computer engineering, who teaches the course. The lecture part of the class teaches students how to write a resume and provides an incentive for them to interact with the College of Engineering career center. McGough also brings in industry speakers to talk about the life of an engineer in the working world, and faculty members to talk about research and the opportunities for engineers to do research. "It's exposure to applications and to the working world. It shows students what a day on the job is like," says McGough.

The design connection comes in the lab. Students learn how to program a BASIC Stamp microcontroller. By the end of the lab, students are learning how to control small robots, using the microcontrollers, to traverse a maze. They take their work to Design Days and are challenged to see whose robot can get through a special maze the fastest. "Students in engineering like lab classes. They can see things in action," says McGough. "At the Design Days event, students are energized. It's a great experience for them." Chris Finley, an ECE freshman, could not agree more. He and Andrew



Robert McGough (center), ECE associate professor and instructor for Engineering 291, helps students keep their robots on track at the Design Days competition.

Hickel were one of 11 teams that participated in racing their robots on Friday of Design Days. "It's a very fun class. I like the hands-on lab work, but even the lectures are fun," says Finley. The course has convinced him that ECE is the right major for him.

Several years ago, Goodman started recruiting industrial sponsors for ECE 480 (senior capstone design), so the design projects would be more realistic. "The students feel like the industrial sponsor is their customer," says Goodman. There are also advantages for companies being involved as sponsors. They have an opportunity to look at students as possible employees with the company and it gives students experience with the company. "It's also a chance for companies to explore something that they are not able to do in their normal work schedules, but something that might be worthwhile in the long-term," says Goodman. "Sometimes the capstone projects prove to be something that the company decides to pursue further."

The capstone design course includes both lab work and a lecture. Students have to keep an engineering laboratory notebook on their projects, write a proposal for doing the project, give progress reports, and write financial reports. Each design team gives three presentations. "The writing is not the students' favorite part, but later they say that the three things they appreciate the most are working in

a team, doing the technical writing, and making oral presentations," says Goodman.

The result of each team's work is showcased at Design Days. "Our project was a real team effort," say Tim Tran, who worked with seven other students to develop a tank capable of shooting t-shirts into the crowd at MSU sporting events. "We had to work on timelines and budgeting to get it done." Nick Tram and Marquise Abbey were part of a five-member team that developed a solar-powered laptop with a satellite link for rural African use. "In many areas of Africa, the people have not had Internet access," says Tram. "This laptop can give four to eight hours of continuous use, so people can access economic, agricultural, and health information." Abbey points out that this design project gave him and members of the team a good idea "about what it will be like to work in a professional environment and how to accomplish something in a team."

Design in the curriculum is an important aspect for students in finding employment after graduation. "We want our graduates to come out of the College of Engineering at MSU ready to go into employment. Employers want graduates who are ready to work," says Hinds. "Companies do not train graduates anymore on how to be engineers." 🌱

– Jane L. DePriest

Faculty and Staff Networks

2008 Distinguished Faculty Award



Ning Xi, the John D. Ryder Professor in the Department of Electrical and Computer Engineering and director of the Robotics and Automation Laboratory at MSU,

was recognized at the annual university-wide Awards Convocation in February. He received the Distinguished Faculty Award, which is given to individuals who have demonstrated sustained scholarly excellence in research, instruction, and outreach and have made widely recognized contributions to their field. Only 10 faculty members university-wide received this honor.

Xi's pioneering work on Internet-based telerobotics has laid the foundation for integrating robotics with information technology. He was named an IEEE fellow in 2007 for his contributions to the field of nano-robotic manipulation and assembly. He received the SPIE Nano Engineering Award (2007) and the Best Paper Award of *IEEE Transactions on Automation Science and Engineering* (2007). Past honors include best paper awards at the IEEE International Conference on Electro/Information Technology (2003), the Japan-USA Symposium on Flexible Automation (1998), and the IEEE/RSJ International Conference on Intelligent Robots and Systems (1995). He was awarded the first Early Academic Career Award by the IEEE Robotics and Automation Society in 1999 and is a recipient of a National Science Foundation CAREER Award.

His research interests include robotics, manufacturing automation, micro/nano systems, and intelligent control and systems. Since coming to MSU, he has attracted more than \$7 million in external research funding. His publications include more than 300 technical papers in reviewed archival professional journals and conference proceedings. He holds eight patents.

He is a consummate educator, providing students with an education that extends beyond the curriculum. He has mentored 10 doctoral students who are enjoying successful careers in academia and industry, and he played a major role in establishing the College of Engineering's manufacturing program.

2008 Teacher-Scholar Award



Ramakrishna Mukkamala, associate professor of electrical and computer engineering, was recognized at the annual university-wide Awards Convoca-

tion in February. He received the Teacher-Scholar Award, which is presented to faculty who early in their careers have earned the respect of students and colleagues for their devotion to and skill in teaching and who have shown scholarly promise.

Mukkamala is internationally recognized for his recent innovations in cardiovascular monitoring by signal processing. He received an NSF CAREER Award in March 2007 for his project: "Integrated Research and Education in Cardiovascular Signal Processing for Automated and Less Invasive Monitoring of Central Hemodynamics." He earned a PhD in electrical engineering and computer science at the Massachusetts Institute of Technology. He then spent two years conducting post-doctoral research at the Harvard-MIT Division of Health Sciences and Technology.

Passionate about teaching, he emphasizes the understanding of major concepts, rather than rote memorization, and provides students with a means to apply the theory through real-world computer assignments. Students remark that his highly interactive lectures "provoke critical thought" and "develop the problem solvers and inventors of tomorrow". He and his research team of students have garnered over a million dollars in funding from prestigious federal agencies, as well as being published in prominent journals and honored by international conferences.

2008 Withrow Distinguished Scholar Award



Robert J. McGough, associate professor of electrical and computer engineering, received the Withrow Distinguished Scholar – Junior Award at the annual engineering

awards luncheon held in March. This award is given to an instructor, assistant professor, or associate professor in the College of Engineering

who has been in service to the university for not more than seven years.

McGough has made significant contributions to biomedical engineering, particularly in the area of hyperthermic cancer therapy. He is internationally recognized for his development of hybrid devices that combine ultrasound and radio frequency (RF) modalities for the treatment of large, deep-seated tumors, providing an improved application of thermal energy to the tumor. A colleague says, "These systems could revolutionize thermal therapy of tumors of the breast." He has also formulated a new approach for the calculation of acoustic pressure fields. An eminent peer says, "Dr. McGough is arguably the world's best academic engineer involved in developing phased array ultrasonic devices for medical applications." He led the field by creating the first 3-D treatment planning system for ultrasound phased arrays.

Another of his peers says, "He has become a functional biologist/physiologist and has established strong collaborations to shore up any shortcomings he may have in these fields. Most exciting is his collaboration with the MSU Comparative Oncology Center in the College of Veterinary Medicine, where he will be able to test and refine his ultrasound technology on veterinary oncology patients."

His contributions to the biomedical profession include service on the advisory board for the Great Lakes Cancer Institute and his 2005-2007 tenure as Physics/Engineering Councilor for the Society of Thermal Medicine. "His track record in research, teaching, publication, and professional service is internationally competitive," says another colleague.

McGough has also developed two new graduate courses in acoustics and medical imaging and one new undergraduate course in biomedical imaging, and started a biomedical graduate seminar. He also established the Biomedical Ultrasonics and Electromagnetics Laboratory at MSU.

2008 Withrow Teaching Excellence Award

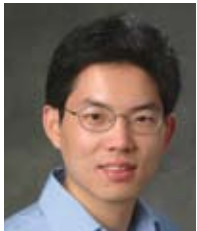


Gregory M. Wierzba, associate professor of electrical and computer engineering, received the Withrow Teaching Excellence Award at the annual engineering awards luncheon in March.

This award recognizes faculty and staff who have demonstrated excellence in instructional and scholarly activities and rendered distinguished service to the university and the student body. Selection of recipient is based primarily on nominations from students.

Wierzba teaches at nearly all levels each year. While his course levels vary, the student response is consistently positive. He is a fifth-time recipient of this award. Students cite his preparedness, organization, fairness, and availability. They say, "He provides many examples and exercises to explore the concepts and methods essential to electrical and computer engineers." Students in the introductory courses comment that he has sparked their interest in electrical engineering. The readiness of his students in follow-on courses is impressive. One student says, "His classes are the best that I have had. His ability to stimulate interest and explain concepts makes students come back for his other classes."

Robotic Fish Making Waves



Xiaobo Tan, assistant professor of electrical and computer engineering, received an award worth nearly \$380,000 from the Office of Naval Research. The award will be used

to develop highly maneuverable "biomimetic" robotic fish. These robots are based on biological principles and incorporate biomimetic electroactive polymers.

"In particular, we will pursue fundamental studies on the development of novel electroactive polymer hairs as artificial lateral lines for flow sensing," says Tan. The research is expected to advance the performance of robotic fish toward

that of their biological counterparts and also to provide a controlled platform for investigating the locomotor and sensory mechanisms of real fish. "Our research on robotic fish benefited greatly from my National Science Foundation (NSF) CAREER project which provided us with a sound knowledge base in electroactive polymers," says Tan.

Tan also is actively exploring the use of schools of robotic fish as mobile sensing platforms in aquatic environments. In collaboration with Professor Lihong Xu, director of the Institute of Modern Agriculture Science and Engineering at Tongji University in Shanghai, China, Tan is planning to use robotic fish to address growing environmental problems associated with the aquaculture industry.

In collaboration with Drew Kim, assistant to the dean for recruitment and K-12 outreach, Tan developed a robotic fish-based educational kit for middle and high school students. The kit is being piloted at local schools, and student teams raced their robotic fish prototypes at the spring 2008 Design Days.

NSF CAREER Awards



Selin Aviyente, assistant professor of electrical and computer engineering, has received an NSF CAREER Award for her project "Integrated Research and Education in Functional

Brain Networks." Aviyente's research develops three major signal processing methods to improve the current understanding of the brain as an integrated information processing system.



Tongtong Li, assistant professor of electrical and computer engineering, has received an NSF CAREER Award for her project "On Highly Efficient and Reliable Wireless Networks." Li's

project is devoted to the fundamental research of highly efficient and reliable wireless networks through advanced multilayer methodologies.

Bob Schlueter Retires



Robert A. Schlueter, professor of electrical and computer engineering, recently retired from the department. Schlueter is nationally and internationally recognized for his

contributions in the electrical power system engineering field. His work is considered to have a broad impact on academia as well as the power industry. In his early work at MSU on wind energy, he and his students were the first group to perform a systematic analysis of wind farms. Subsequently he did extensive investigations of power system stability and voltage collapse. Voltage collapse is a slow progressive voltage decline that spreads uncontrollably through a utility system causing blackouts.

Schlueter is recognized as an internationally leading expert on system planning, operation planning, prediction, and on-line control to minimize voltage collapse problems. In 1998 Schlueter was named a fellow of the Institute of Electrical and Electronics Engineers (IEEE) for contributions to the theoretical and practical understanding of power system voltage instability. He has graduated 22 PhD students who are in major educational, research, and industrial positions around the world. He has also made major contributions to the electrical engineering curriculum in the power area with the initiation of eight courses during his career at MSU.

Schlueter received his BEE and MEE from Rensselaer Polytechnic Institute and his PhD from Polytechnic Institute of Brooklyn. In 1971 he joined the faculty of the Department of Electrical Engineering and Systems Science at MSU.

In retirement, Bob will work for his company, Intellicon, and spend time with his wife, Karen, and his children and grandchildren. 🌿

Student Networks

2008 Academic Awards

Congratulations to the following students from the Department of Electrical and Computer Engineering who were recognized at a College of Engineering reception in March for academic excellence and service to the community.

Outstanding Graduate Student Award:
Jiangbo Zhang.

Service Award: **Jordan Cohen**, Computer Engineering, and **Natalie Hannon**, Electrical Engineering.

Undergraduate Academic Achievement Awards for Computer Engineering: **Matthew Borton**, **Michael Carpenter**, **Matthew Guibord**, and **Paul Suchyta.**

Undergraduate Academic Achievement Awards for Electrical Engineering: **Ahmad Al-Quahaihi**, **Arslan Qaiser**, **Andrew Temmi**, **Donald VanderLaan**, **Michael Volz**, and **Muhammad Zaheer.**

Fitch Beach Graduate Research Awards



Zheng Chen, an ECE graduate student, received honorable mention in the 2008 Fitch Beach Outstanding Graduate Research Awards. Awards were determined on the

basis of a technical presentation and outstanding research in a PhD program in the College of Engineering. The MSU Engineering Research and Graduate Studies Committee determines the winners of this award. Xiaobo Tan, ECE assistant professor, is the faculty adviser.

Society of Women Engineers Award



Kristen Pace, an ECE senior, received an outstanding senior award at the Women in Engineering awards banquet in February. The award is based on extracurricular

and community involvement and academic excellence and is given to one senior from each major. The Electrical Engineering Award is sponsored by Chrysler LLC.

Trustees Honor ECE Graduating Senior



At its spring 2008 meeting, the MSU Board of Trustees recognized graduating senior **Paul J. Suchyta** of Shelby Township, a computer engineering major and a member of

the Honors College. He was among 22 students to receive this honor, all of whom had achieved a perfect 4.0 grade point average. Suchyta is the son of Edward and Linda Suchyta. He is a 2004 graduate of Notre Dame Preparatory High School in Pontiac.

ECE Student Wins Honorable Mention in Goldwater Scholarship Program



Donald VanderLaan, a junior majoring in electrical engineering, received honorable mention in the 2008 Goldwater Scholarship Program. Sponsored by the Goldwater Founda-

tion, the program is one of the most competitive undergraduate scholarships in the nation. Goldwater Scholars and Honorable Mentions are selected on the basis of academic merit from a field of more than 1,000 mathematics, science, and engineering students who are nominated by the faculties of colleges and universities nationwide. The scholarship program, which honors the late Senator Barry M. Goldwater, is designed to encourage outstanding students to pursue careers in mathematics, the natural sciences, and engineering.

VanderLaan is an Honors College member from Grand Rapids, Mich. A Butler Scholar, Yates Scholar, General Motors Scholar, and Walker Memorial Scholar, VanderLaan is a member of Tau Beta Pi Engineering Honors Society and the Eta Kappa Nu Honors Society. VanderLaan is a project consultant for the Electronics Circuits and Systems Laboratory and serves as a researcher with ECE professor Robert McGough in the electromagnetics laboratory. He also volunteered at an orphanage in Kenya where he built and wired a barn and chicken coop. VanderLaan plans to pursue a PhD in electrical engineering so that

he can conduct research on and teach electromagnetic theory at the university level.

ECE Design Team Wins Award in International Competition

A senior capstone design team in electrical and computer engineering, working jointly with a team from Huazhong University of Science and Technology (HUST), Wuhan, China, and a student from the University of Bologna, Italy, won honorable mention in the Mondialogo Engineering Competition. "This is an excellent accomplishment for our MSU team. There were hundreds of teams in this international competition," says Erik Goodman, professor of electrical and computer engineering and the coordinator of ECE capstone design projects. "As part of the contest, teams from developed countries were paired with teams from developing countries to design something that would be useful in the developing country." The worldwide contest was established by Daimler Chrysler and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The MSU team was awarded 5,000 Euros (about \$7,500) and a medal, which was presented to two team members (**Wa-Jiw Casey** from MSU and **Li Ji** from HUST) in Mumbai, India, in December 2007. The team developed and prototyped a system capable of taking a standard set of medical diagnostic measurements as a screening process to determine the need for immediate medical care for persons in areas without access to regular medical care.

The MSU team members were **Kevin Scheel**, **Joseph Hines**, **Kurtis Hessler**, **Janelle Shane**, and **Wa-Jiw (Thomas) Casey**. These team members graduated in May 2007. The team's faculty facilitator was ECE professor Tongtong Li. A second team worked on improving the prototype during the 2007 fall semester as part of a second capstone design project. Goodman visited China in May and discussed the possibilities of putting together another team in partnership with HUST to explore the next step in the project. "It would not be part of a contest, but we can see if we could bring the project closer to implementation," says Goodman. 🌟

Audio Enthusiasts Hone Skills with Projects

Professors are used to students knocking on their office doors wanting help. Usually that means help with a course or even a career.

However, in the summer of 2006, the students at Greg Wierzba's door wanted help starting a student-run organization specializing in audio engineering. Wierzba, an associate professor of electrical and computer engineering and a music and audio buff, was glad to help. "These students were passionate about music, and they wanted to work on audio projects," says Wierzba, who serves as the faculty adviser for the group, now officially called the Audio Enthusiasts and Engineers (AEE). Members of the group come from all over the MSU campus; some of them are not engineering students.

Each semester AEE members select a project and sometimes those projects carry over from semester to semester. The group shows off projects at Design Days each semester. The first project was Revolution Audio, a module that rotates speakers as needed. So, if you were listening to something, let's say on a computer, as you turned to listen to something on the television, for example, the speakers would rotate to maximize sound. That project is still a work in progress, but that's also part of the fun. This semester the group started work on a synthesizer, which they displayed at the spring 2008 Design Days. Students also work on individual projects and students train other students. In the labs or working at home, the emphasis is always on safety.

"The group is great. It is close to a professional audio engineering environment," says Borce Dilevski, a senior ECE student who is vice president of the group and was one of the original members. "You could not do these

projects in a class. They are too big, they span semesters." Eric Tarkleson, also an ECE student, is president of the group, and he enjoys the hands-on learning experiences. He says, "There is only so much you can be taught. We have to assemble and test projects. It's more fun to touch the concept."

Six students from AEEMSU went to the Audio Engineering Society worldwide meeting in New York in 2007. MSU had one of the biggest delegations at the meeting. "You get to meet and talk to professionals working in the audio world," says Dilevski. While some members of the group would like to find a career in audio engineering, for most it will be a lifelong hobby. "AEE is a social experience," says Dilevski. "You make friends, and it gets people involved."

For more information about AEE, visit www.aeemsu.com. 🌱



Members of the Audio Enthusiasts and Engineers had fun showing off their projects at Design Days. From left: Jakub Mazur, Albert Alexander, Eric Tarkleson, Mike Varnei, and Brandon Boozer.

Alumni Networks

Santiago Receives Distinguished Engineer Award

Nayda Grisel Santiago (PhD EE '03) recently received the Distinguished Engineer Award from the Colegio de Ingenieros y Agrimensores de Puerto Rico (CIAPR), the professional engineering society of Puerto Rico, and she was honored at a "gala" event on May 17. Santiago is an assistant professor in the Department of Electrical and Computer Engineering at the University of Puerto Rico (UPR) at Mayaguez, where she obtained her undergraduate degree. She teaches a capstone design course in computer engineering and computer architecture, and a graduate course in high performance computing. She collaborates with the Engineering Research Center for Wireless Integrated MicroSystems (WIMS ERC) where her research involves developing software for embedded systems with low power constraints.

She is also part of The Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems (CenSSIS Engineering Research Center) where she works in mapping spectral unmixing algorithms for hyperspectral imaging to diverse architectures to improve their performance.

Over the past few years, Santiago has been instrumental in developing the student chapter of the Institute of Computer Engineers at the UPR Mayaguez campus. She also has worked to maintain the ABET accreditation of the computer engineering curriculum of UPRM. Her work has helped to convert the UPR Mayaguez campus into a model for other Caribbean universities in establishing high-quality computer engineering programs. Santiago is a member of the Institute of Electrical and Electronics Engineers and the

Association for Computing Machinery.

Santiago is married to **Manuel Jimenez**, also an MSU alumnus who received his PhD in EE in 2000. She has a daughter, Diana, 5 years old, and a son, Victor, 10 years old. 🌱



From left, Santiago's husband, Manuel Jimenez, Zaira Vallenilla, Nayda Santiago, Ramphis Castro, and Jose Pabon. Vallenilla and Castro are directors on the board of the Institute of Computer Engineers of the CIAPR, which gave the award. Pabon is president of the same board.

KEEPING IN TOUCH

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CHAIRPERSON **Tim Grotjohn**

TEL (517) 355-5066
E-MAIL ECE_Mailbox@egr.msu.edu
WEB www.egr.msu.edu/ece

EDITOR **Jane L. DePriest**

PUBLICATIONS DIRECTOR
Laura Luptowski Seeley

PHOTOGRAPHERS
Harley J. Seeley
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College Launches "Women in Engineering" Program

Nationally, the number of women enrolling in engineering programs is dropping. It's a trend that the MSU College of Engineering would like to reverse. To that end, the college recently launched a new Women in Engineering (WIE) program. "Women are underrepresented in the field of engineering and the numbers are dropping," says Judy Cordes, coordinator of the new program. "If we don't recruit women into engineering, we won't have enough engineers to fill the need in the future."

Fewer women across the nation are choosing careers in engineering today. At the K-12 level, girls usually don't consider engineering as a career choice simply because they aren't familiar with what an engineer really does.

In some engineering disciplines — such as chemical engineering and the biomedical area — women are better represented. "But if you look at the classical disciplines of engineering, we have done a lousy job of communicating to women that it's a good profession," says Satish Udpa, dean of the College of Engineering.

The mission of WIE is to encourage women of all backgrounds to pursue careers in engineering, and to provide opportunities for academic, personal, and professional growth. WIE plans to reach pre-college students, women who have been admitted to the college, and women currently enrolled. "It's about getting women into engineering majors — hopefully at MSU — retaining them through graduation, and getting them working in the field of engineering or into graduate school," says Cordes.

While WIE targets women, the program is open to everyone — men and women.

For more information, visit <http://www.egr.msu.edu/wie>.