

PIPELINE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Being Smart: Innovative Monitoring Systems Help Researchers Look Inside Volcanoes

Modern science went to the mountain this summer. The mountain is the Tungurahua Volcano in Ecuador. CSE assistant professor Guoliang Xing, along with other U.S. and Ecuadorian collaborators, worked



Researchers hope to install 500 portable monitoring stations like this one around the volcano by 2015.

on installing low-cost seismic monitoring stations on the volcano, which has been in the eruption process since October 1999.

By deploying a large number of these portable stations it will be possible to reveal the internal structure of the volcano. "This is an intriguing research project," says Xing, who specializes in low-power sensor networks. "It must incorporate elements from signal processing, to mesh networks, to distributed algorithms into a small package that can reliably operate unattended for several months at a time."

Xing wants to use his expertise in sensor networking to help solve critical problems in various areas, including health care, energy, and

environmental challenges. He is also interested in working with people in different fields, like the volcanologists involved in this volcano project.

The trip in August 2012 to the volcano located near Baños, Ecuador, provided an opportunity to test the prototype monitoring stations under actual field conditions. It also gave the researchers firsthand knowledge of the issues that will be faced when deploying 500 stations around the entire volcano. The prototype monitoring stations deployed during the field study were developed by Xing, his postdoc Rui Tan, and CSE PhD students Mohammad-Mahdi Moazzami and Dennis Philips.

Each of these prototypes utilizes a seismic

continued on page 3

Opening Doors for Young Students through Computer Programming

Computer programming and art. Those are not two subjects generally thought of together. However, CSE doctoral student Caitlyn Pickens hopes that by showing young students how programming can help them with artistic, animated endeavors, it will also inspire students to pursue jobs in computer programming.

"Many young people don't know that there are careers in computer programming," says Pickens, who is pursuing a PhD under the tutelage of CSE professor Bill Punch. "If we reach out to young students and show them role models of people in computer programming, then I hope we can increase interest in engineering careers in general."

Pickens's doctoral research focuses on computer science education, specifically on new ways of teaching programming to college students. "We are looking into developing new environments for students to learn programming," says Pickens. "With software like the iPython Notebook, professors can deliver course materials in a nontraditional way, including using sound, music, and images."

However, in July 2012, she took a break from her PhD research and

went for a second time to the Pine Ridge Reservation in Porcupine, South Dakota, to teach computer animation, including the necessary art, math, creative writing, science, and computer skills to middle schoolers at the *Pahin Sinte Owayawa* or Porcupine Day School.

Pickens originally went to Pine Ridge in 2011 after she graduated with a bachelor's degree in computer science from Lake Forest College in Illinois. Pine Ridge is home to the Oglala Lakota Sioux Tribe, and Porcupine is a short distance from where the Wounded Knee massacre took place in 1890.

continued on page 3



Caitlyn Pickens (right) helps students understand algorithms by asking how to make a peanut butter sandwich.



We are pleased to report on our successful faculty recruiting activity this past year. Our search committee found strong candidates in the areas of computer vision and biometrics, and we are pleased that the offers made to Drs. Xiaoming Liu and Arun Ross were accepted. Dr. Xiaoming Liu joined our department this fall as an expert in computer vision after several years as a researcher at GE Global Research and after earning his PhD from Carnegie Mellon University. Dr. Arun Ross has been a successful researcher and faculty member at West Virginia University in the area

of biometrics, and will join the department in the coming spring semester. The new members of the department support the positive momentum that the department has been making in its mission of teaching, research, and service.

Following the nationwide trend for computer science majors, the department is seeing a significant increase in the number of undergraduate students. The enrollment of undergraduate majors in the computer science program has increased approximately 19 percent this academic year in comparison to the past year. The number of new freshmen declaring interest in computer science is up nearly 37 percent over last year. Recruitment of our computer science graduates has been very strong among companies. High school students are receiving the message that there are outstanding opportunities for college students who major in computer science. The enrollment increase presents challenges to the department to maintain its high quality and the

department is diligently working to meet this challenge.

Computer science curricula continually need to offer updated elective opportunities for students to keep pace with technology changes. To highlight some recent examples, this spring semester Dr. Charles Owen offers a new software development course that focuses on Android-based mobile devices. Likewise, Dr. Pang-Ning Tan offers a new course on “Computational Techniques for Large-Scale Data Analysis,” which will consider techniques for dealing with “Big Data” challenges. This course is part of our department’s collaborative effort with the College of Business to start a new MS degree program in Business Analytics in the spring semester. New courses such as these, as well as continuous updates to our existing courses, position our graduates to meet the challenges they face when they join the workforce. 🌟

2012 Computer Science and Engineering Distinguished Alumni Award

Deepak Mohan Advani (BS '86) received the 2012 Computer Science and Engineering Distinguished Alumni Award at the annual College of Engineering Alumni Awards Banquet in May. Established in 2004, this award recognizes an alumnus or alumna who is a leader in the computer science and engineering profession through professional contributions, public service, and personal accomplishments.

Advani owns strategy and development for IBM’s Business Analytics products and solutions group. His portfolio includes products for business intelligence, predictive analytics, risk analytics, social media analytics, and financial performance management. He also owns the P&L responsibility for SPSS, which IBM recently acquired for \$1.2 billion.

From 2005 to 2009, Advani was the chief marketing officer and senior vice president of eCommerce for Lenovo. Along with advertising, he relied heavily on sports marketing (Olympics, Formula 1, NBA), social media, corporate philanthropy, and public relations to build brand awareness and generate demand. Under his leadership, Lenovo’s global brand awareness increased to 60 percent while maintaining high image and preference scores. He centralized the marketing operations in India, which reduced non-working expense by 65 percent over two years. As head of the global eCommerce business, he grew revenue by 45 percent to \$400 million, and profits by 300 percent. In 2008, the Asian Brand Congress recognized him as Marketer of the Year.

Before joining Lenovo, Advani worked at IBM for 13 years where he held several global executive positions. During his two-year tenure as vice president and business line executive at High End Intel Servers, he increased IBM’s market share from 14 percent to 42 percent. Revenues increased by 85 percent to \$1.1 billion, and gross profit increased by 170 percent. Advani provided direction to more than 1,000 developers, established a new solutions-oriented sales channel, and developed strategic alliances with

companies like VMware and Citrix.

As vice president of Linux Strategy, he helped craft the early strategies around Linux and open sources. He developed five key plays that drove more than \$1 billion of IBM revenue. As director of High Performance Computing, he was part of the startup team that built a \$1 billion business in four years. He led a development organization with more than 200 developers in five countries.

In addition to obtaining his bachelor’s degree in computer science from MSU, he earned his master’s degree in computer engineering from Wright State University and his MBA from the Wharton School of Business. He currently serves on advisory boards at Wharton, Yale, and Michigan State.

Advani and his wife, Pooja, live in Morrisville, North Carolina. They have two daughters—Serena and Sneha. 🌟



University Distinguished Professor Anil Jain (left) presents the 2012 CSE Distinguished Alumni Award to Deepak Mohan Advani.

Being Smart: Innovative Monitoring Systems (continued from page 1)

sensor and a smartphone embedded in a weather-proof case to collect and process seismic information of volcanoes. It has a backup power system that guarantees autonomy for several days. It also has a small GPS module inside that gives the exact position and time that will be recorded along with the seismic data. “By leveraging the built-in sensing, localization, and communication capabilities of off-the-shelf Smartphones, we were able to develop these prototypes in a timely manner and at low costs,” says Xing.

The research is part of a \$1.8 million grant from the National Science Foundation to develop a new way to perform four-dimensional tomographic imaging of an active volcano in real time. Xing is working with WenZhan Song, an associate professor in the Department of Computer Science at Georgia State University; Jonathan Lees, a professor in the Department of Geologi-

cal Sciences at University of North Carolina at Chapel Hill; and Mario Ruiz at the Ecuadorian Geophysical Institute.

The goal by 2015 is to install 500 portable monitoring stations that are all networked together, putting Tungurahua in the forefront of research of volcanoes. The monitors that were tested on the trip to Ecuador this summer responded well to tests and recorded the seismic signals of real earthquakes that occurred on Tungurahua during the period.

One of the keys to this project is the cost. A conventional station to monitor volcano activity costs more than \$20,000. Using the new technology the monitors will cost less than \$500 per station. “By installing hundreds of such inexpensive stations, we can increase the seismic monitoring resolution by an order of magnitude or more and visualize three-dimensional fluid dynamics of a volcano conduit system in real-

time, enabling new scientific discoveries on the geology and physics of active volcanism, and the implementation of new early warning systems,” explains Xing.

In the future, volcanologists will not have to visit the stations to collect data. The seismic data will be automatically collected and processed by a network of sensors and, finally, useful information will be transmitted to a gateway for further analysis. Currently, many of the most threatening, active volcanoes are monitored only by fewer than 20 stations, limiting scientists’ ability to understand complex volcano dynamics.

Xing is enthusiastic about the results so far. “This project is exciting, and it has a high impact because it will help to develop inexpensive, portable sensor network technologies that can be deployed in many hazardous volcanoes for real-time, long-term monitoring.” 🌱

Opening Doors (continued from page 1)

“Tracy Taylor, an assistant professor of art and the chair of the digital media design minor at Lake Forest, had worked for several years to gain the trust of the people who live on the reservation, which is one of the poorest areas in the United States,” says Pickens. “Another student and I went with Professor Taylor. It was a transformative experience for me. The students are bright and very interested in what we have to teach them. Despite the rampant alcohol abuse and drug addiction in the community, our students are motivated to create a better life for themselves and their families.”

This year Pickens decided to return to Pine Ridge. Because Taylor could not go, Pickens teamed up with another MSU CSE doctoral student, Jorden

(Jory) Schossau.

“Jory is a natural educator. He is so patient with the students,” says Pickens.

This was not a glamorous vacation for Pickens and Schossau. They stayed at the school, sleeping on cots in the

classroom, using the school restrooms, and preparing meals in a makeshift kitchen. The CSE department provided a fellowship for the project that allowed Pickens and Schossau to rent a car and travel to South Dakota. MSU’s Spartan Bookstore also supplied T-shirts, key chains, and other items that were used as prizes for the students.

“This is a small project that makes a huge impact on the lives of 15 kids,” explains Pickens. “It doesn’t cost a lot of money—about \$2,000—to get two or three people out to Pine Ridge. However, it is very tough to find funding for such a small project. There are a lot of big money grants, but not much for something small and specific like this. CSE was really gracious to support this project.”

One of the key programs used during the summer camp was Alice, a free, 3-D programming environment developed by researchers at Carnegie Mellon University. Students using the program learn the basics of computer animation and video game development.

“The students really got excited when they realized that they could develop their own video games by using Alice and the skills they had learned,” says Pickens. “Video games go a step further into engineering principles. You have to prompt the user for input. The students created very simple games, but they were very motivated to learn how to do it.”

Some of the lessons did not involve a computer at all. For example, Pickens and Schossau used the steps needed to make a peanut butter sandwich to teach them about algorithms, step-by-step procedures often used in computer programming.



Students at the Porcupine Day School liked to show each other their animations.

continued on page 7

Faculty and Staff Pipeline

NSF Grants



Assistant professor **Guoliang Xing** and Xiaorui Wang, associate professor of computer engineering at Ohio State University, have been awarded a grant by the National Science Foundation. The project is titled "Integrated Control of Fidelity and Real-Time Performance in Networked Sensing Systems."

This research will design a novel Networked Sensing Systems control framework that integrates data fusion, calibration, and real-time performance control into a solution that balances requirements for fidelity and real-time assurance.

This project has broad implications for future Networked Sensing Systems in multiple application domains that require high-fidelity processing of dynamic and complex physical information within stringent timeliness constraints.

Xing also recently received a University Cooperation Award from Nokia. The award will support his research on localization of Smart-phone systems.

In addition, Xing has been named to the editorial board of the *ACM Transactions on Sensor Networks* and the *IEEE Transactions on Wireless Communications*. *Transactions on Sensor Networks* focuses on research and applications of distributed, wireless, or wireline sensor and actuator networks. *Transactions on Wireless Communications* publishes peer-reviewed, original papers that advance the state of the art and applications of wireless communications.



Assistant professor **Yiyong Tong**, with colleagues Shanker Balasubramaniam and Naveen Nair, in the Department of Electrical and Computer Engineering, and Carlo

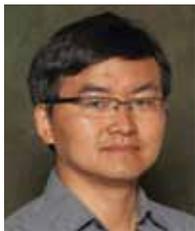
Piermarocchi, in the MSU Department of Physics and Astronomy, have also received a National Science Foundation (NSF) award for the project entitled "An Adaptive and Robust Discrete Geometry Based Helmholtz Solver and Applications to Device Design." The award is for

more than \$630,000.

The objective of this project is the development of mathematics and algorithms that facilitate design and optimization of physical systems that are governed by the Helmholtz equation.

While the research results are broadly applicable, the focus of this effort will be restricted to acoustic and electromagnetic systems. To highlight their broad applicability, the tools developed will be tested in different types of applications ranging from biomimetic displays to solar cells to microbubbles to inverse problems in imaging.

New Faculty



Xiaoming Liu has joined the Department of Computer Science and Engineering as an assistant professor. He most recently worked as a research scientist

at General Electric (GE) Global Research in Schenectady, N.Y. Liu received a BS degree in computer science in 1997 from Beijing Information Technology Institute, China, and an MS also in computer science in 2000 from Zhejiang University, China. He earned a PhD in Electrical and Computer Engineering from Carnegie Mellon University in 2004.

Liu's research interests include computer vision, pattern recognition, machine learning, biometrics, and medical image analysis. At GE, he performed research and led a team of researchers on projects sponsored by various government agencies and GE businesses, aimed at developing computer vision algorithms to support facial and body analysis, multi-camera video surveillance systems, and medical imaging. He has actively directed a number of government-sponsored research programs totaling more than \$2 million as project leader and principal investigator. He delivered an array of technologies to GE businesses, including an emotion analysis system for NBCU, a biometrics ID kiosk for GE Security, and an ultrasound scan plane identification for GE Healthcare. Liu is the author

of more than 60 scientific publications and has submitted 21 U.S. patent applications. Liu is a member of IEEE.

At MSU, Liu will work on various research topics in the computer vision area, a field of computer science concerning extracting information from visual contents, such as images or videos. In particular, the diversity of research activities at MSU will likely provide opportunities where Liu can apply his visual content analysis expertise to interdisciplinary applications and research. This fall, Liu is teaching a computer vision course (CSE 803).



Arun Ross will join the CSE faculty in January. He is currently the Robert C. Byrd associate professor in the Lane Department of Computer Science and Electrical Engineering at

West Virginia University, and the assistant site director of the NSF Center for Identification Technology Research.

Ross received his bachelor's degree in computer science from the Birla Institute of Technology and Science, Pilani, India, in 1996, and MS and PhD degrees in computer science and engineering from MSU in 1999 and 2003, respectively. His current research work is funded by numerous organizations, including the National Science Foundation, the FBI, the Office of Naval Research, the Department of Homeland Security, and the National Institute of Standards and Technology.

He received the West Virginia University Foundation Award for Outstanding Teaching in 2011 and the Benedum Distinguished Scholar Award in 2012. He is the co-author of the textbook *Introduction to Biometrics* and the monograph *Handbook of Multibiometrics*, and the co-editor of the *Handbook of Biometrics*.

Ross is a recipient of a National Science Foundation CAREER Award and was designated a Kavli Frontier Fellow by the National Academy of Sciences in 2006. He serves as an associate editor of the *IEEE Transactions on Image Processing* and the *IEEE Transactions on Information Forensics and Security*.

2012 Walter Adams Advisor of the Year



Undergraduate student advisor **Teresa VanderSloot** was named the 2012 Walter Adams Advisor of the Year for her long history of serving students at MSU. The award is presented to an MSU graduate

student, faculty, or staff member who has displayed an exemplary level of commitment and dedication to the organization where he or she has advised for more than one academic year.

VanderSloot has devoted herself to academic, personal, and career counseling of CSE majors since the summer of 2004. Prior to joining CSE, she was an academic specialist for the Eli Broad College of Business for five years. She previously served two years as the complex director with Residence Life at MSU. Among her many accomplishments since joining CSE, her mentorship of women students stands out.

The MSU Women in Computing organization nominated VanderSloot for this award. 🌱

MSU Hosts Workshop for Computer Science Teachers



MSU's CSE department teamed up with Oakland University's CSE department to offer a Tapestry Workshop for high school and middle school computer science teachers. The goal of the workshop, held August 1-3, 2012, on the MSU campus, was to help teachers attract and engage a larger number of girls to computer science. Thirty teachers participated. Funding for the workshop came from the National Science Foundation, the National Center for Women & Information Technology, the Computer Science Teachers Association, TechSmith, the University of Virginia, and the two offering universities.

Massive Data for Miniscule Communities

It's relatively easy to collect massive amounts of data on microbes. But the files are so large that it takes days to simply transmit them to other researchers, and months to analyze once they are received.

Assistant professor C. Titus Brown and other MSU researchers have developed a new computational technique, which was featured in a recent issue of the *Proceedings of the National Academy of Sciences*, that relieves the logjam that these "big data" issues create.

Microbial communities living in soil or the ocean are quite complicated. Their genomic data is easy enough to collect, but their data sets are so big that they actually overwhelm today's computers. Brown demonstrated a general technique that can be applied on most microbial communities.

The interesting twist is that the research team created a solution using small computers, a novel approach considering most bioinformatics research focuses on supercomputers, Brown said.

"To thoroughly examine a gram of soil, we need to generate about 50 terabases of genomic

sequence, about 1,000 times more data than generated for the initial human genome project," said Brown, who co-authored the paper with James Tiedje, University Distinguished Professor of microbiology and molecular genetics. "That would take about 50 laptops to store that much data. Our paper shows the way to make it work on a much smaller scale."

Analyzing DNA data using traditional computing methods is like trying to eat a large pizza in a single bite. The huge influx of data bogs down the computers' memory and causes them to choke. The new method employs a filter that "folds the pizza up" compactly using a special data structure. This allows computers to nibble at slices of the data and eventually digest the entire sequence. This technique creates a 40-fold decrease in memory requirements, allowing scientists to plow through reams of data without using a supercomputer.

Brown and Tiedje will continue to pursue this line of research, and they are encouraging others to improve upon it as well. The researchers made the complete source code and the ancillary software available to the public to



C. Titus Brown, assistant professor of computer science and engineering, has found a way to sift and analyze massive amounts of data on microbial communities. Photo courtesy of MSU.

encourage extension.

"We want this program to continue to evolve and improve," Brown said. "In fact, it already has. Other researchers have taken our approach in a new direction and made a better genome assembler." 🌱

Student Pipeline

International Corporate Tour



Five College of Engineering students participated in the first International Corporate Tour in May 2012.

CSE undergraduate **Erin Hoffman** participated in an intensive two-week international tour held in May 2012. The tour gave Hoffman and nine other MSU College of Engineering and Eli Broad College of Business students a firsthand look at international corporations and the global marketplace. Stops on the International Corporate Tour (ICT) included BP (Sunbury, UK), Alcoa (Birmingham, UK), Whirlpool (Comerio, Italy), Alpine Convention (Bolzano-Bozen, Italy), Bosch Corporation (Stuttgart, Germany), Eaton Corporation (Rastatt, Germany), and Rampa (Hamburg, Germany).

Along with unique perspectives into their organizations, host employers engaged students in project simulations. Examples included “The Trading Game,” presented by BP in Sunbury, England; lunch on the factory floor at Rampa (an MSU alumni-owned engineering firm) that manufactures screws, inserts and other fasteners; and problem solving with representatives of the Alpine Convention, which is an agreement between various countries for the protection and sustainable development of the Alpine Region.

“The students embraced the opportunity to understand other cultures both from a social perspective as well as a corporate perspective,” says Bernadette Friedrich, director of student engagement for the college’s Center for Spartan Engineering. “They saw companies that they are familiar with in an unfamiliar environment and learned that even large corporations have to

prepare for and react to local culture while having a global presence.”

For Hoffman, the tour offered insights into Europe as not only a history-rich region with a broad variety of cultures, but also a hub of economic activity. “It will help me to remember to broaden the scope of my internship searches, rather than focusing too narrowly on a handful of companies and locations,” says Hoffman, who is originally from Okemos, Mich., but attended high school in Plainfield, Ind.

Not only did the students benefit from the tour, which is in its first year, but several companies on the tour expressed an interest in working with the College of Engineering and Eli Broad College of Business to provide internship opportunities for MSU students, both domestically and internationally.

Hoffman decided to major in engineering because she loves the idea of applying knowledge to practical solutions. “Engineering provides a creative outlet with tangible benefits,” says Hoffman, who chose MSU because of its extensive resources and opportunities. MSU is also a family tradition; her father, mother, grandmother, and great-grand mother all attended MSU. She is the daughter of David and April Hoffman, both of whom received their doctorates in osteopathic medicine from MSU. David Hoffman has a BS in electrical engineering. April has a BS in zoology and an MS in microbiology.

Participants were selected based on not having been abroad before; having a solid GPA (at least a 3.0); being involved in extracurricular activities; and balancing a work/school schedule. There were four other College of Engineering students on the tour in addition to Hoffman: Brittney Heatherington, mechanical engineering; Alexa Jones, biosystems engineering; Angelica Minisalle, electrical engineering; and Sara Mozdrzech, civil engineering.

The ICT was coordinated and led by the Center for Spartan Engineering and the Lear Career Center.

2012-13 Von Ehr Scholars



CSE freshman **Kyle Swinkin** is one of three incoming students selected to receive Von Ehr Scholarships for the 2012-13 academic year.

Swinkin is from Livonia, Mich. The other recipients are: Kathleen Haynes of Dimondale, Mich. (environmental engineering) and Caron Laurenz of Midland, Mich. (chemical engineering).

A \$1 million endowed scholarship fund was established in 2006 by James R. Von Ehr II, a 1972 computer science graduate and successful entrepreneur who has long demonstrated his commitment to MSU and the college through service and philanthropy. The intent of the scholarships is “to provide financial assistance to outstanding undergraduate students who come from humble backgrounds, as I did,” says Von Ehr.

Qualified prospective students—those scoring in the 90th percentile and above on national placement exams and who have a proven financial need—are invited to apply for the scholarships, which are renewable for four years. Incoming freshman applicants are required to write a brief essay that describes their idea of the meaning of “free enterprise,” “liberty,” and “open world markets,” and relate how these principles help to promote creativity and the transmission of technological benefits to different world cultures and society in general. 🌱

Opening Doors (continued from page 3)

"We asked the students what was the first step in making the sandwich," says Pickens. "They all said 'Open the bag of bread,' so Jory ripped open the bag and the bread slices flew everywhere. It was a way of showing them that they have to be very specific about the steps needed because a computer will take the information literally. It was a fun way of getting them involved in a more complex computer process."

Her favorite thing about working on the reservation is getting to know the students. "They live very different lives than I did. We had a lot of young men this year—12 to 15 years old. They told us about dancing the *Wi-wan-yang-wa-ci-pi* – Sun Dance, which is a ritual summer solstice event, where

they dance from dawn to dusk. It is a kind of prayer, usually for some family member who has a problem. They reflect on what they want to do and train for it for the better part of a year. It's a huge spiritual commitment."

Pickens believes that she has learned as much from her students on the reservation as they have learned from her. "They teach me about centering myself, the importance of family, tradition, and community; perseverance in the face of many obstacles; inner strength of spirit; and what the Lakota call *mitakuye oyasin*—how we are all connected in some way; how we influence the world around us and how it influences us in return. We just need to open our eyes and see it." 🌸

MSU Women Recognized at 2012 Grace Hopper Celebration of Women in Computing

The largest and most diverse convening of technical women in the world—the 2012 Grace Hopper Celebration of Women in Computing (GHC 2012)—took place October 3-6 at the Baltimore Convention Center. The more than 3,600 attendees at this year's conference hailed from 42 countries and included students, faculty, researchers, and industry professionals from early career through senior leaders.

Laura Dillon, MSU professor of computer science and engineering, was recognized at the welcome ceremony for her roles as a conference co-chair and a member of the conference's academic advisory board.

MSU junior and current president of MSU Women in Computing (WIC), Mairin Chesney, took first place in the GHC 2012 Undergraduate Student Research Competition (SRC) for her poster and presentation, "Does Coevolution between Digital Parasites and Hosts Promote Sexual Recombination in Evolutionary Computation?" Chesney now advances to the Association for Computing Machinery (ACM) Undergraduate SRC Grand Finals competition. Three winners of the Grand Finals will be recognized at the annual ACM Awards Banquet in June.

Past MSU WIC president and recent alumna, Devan Sayles, participated on the GHC 2012 panel on Student WIC Organizations, which was proposed and moderated by Dillon. Sayles highlighted successful strategies MSU WIC pursued to build an active student organization that benefits not just its members, but all students in computing at MSU. Sayles is currently a programmer/analyst at General Mills.

MSU WIC executive board members Taylor Jones, Chelsea Carr, and Chesney received scholarships to attend GHC 2012, sponsored by the National Science Foundation, Xerox, and Google, respectively. In addition, MSU graduate student Kayra Hopkins received a scholarship sponsored by ThoughtWorks.

In addition to the above-named individuals, other representatives of MSU attending the conference included undergraduate students Sana Siddique, Danielle Guir, Caitlin McDonald, Madalyn Parker, and Erin Hoffman; graduate students Michelle Vogel, Anya Johnson, Rosemary Dutka, Neem Serra, and Caitlyn Pickens; recent alumna Marie Buckner; and academic specialist Teresa VanderSloot.

"According to predictions by the U.S. Bureau of Labor Statistics, by 2020 the United States will be able to fill only 30 percent of its nearly 1.4 million

job openings for computer specialists with computing graduates. Yet these jobs will be crucial to the country's long-term economic competitiveness and national security," says Dillon. "What do such predictions have to do with women in computing? In the United States in 2011, women made up 57 percent of employees working in professional occupations, but only 25 percent of those working in computing professions.

"GHC provides a welcoming environment for diverse technical women and men in which to learn, network, and socialize."

"Grace Hopper is absolutely amazing!" said one undergraduate attendee. "Even beyond the sessions and career fair, the networking opportunities are enormous. Big, important people go and care about women in computer science."

Having some fun, the attendees also got to share the dance floor with the senior vice president of knowledge at Google (Alan Eustace) and the president and CEO of the Anita Borg Institute (Telle Whitney).

The MSU College of Engineering was a Bronze Sponsor of GHC 2012. Additional funding for MSU students attending GHC 2012 came from a multitude of sources, including: Atomic Object, Crowe Horwath, IBM, TechSmith, USAA, Union Pacific, and Vertafore. The MSU Women in Engineering program and the Julie Benaglio Fund also provided funding. 🌸



Mairin Chesney (second from left in photo), MSU junior and current president of MSU Women in Computing (WIC), took first place in the GHC 2012 Undergraduate Student Research Competition (SRC) for her poster and presentation. Second place went to Jillian E. Kramer, Villanova University; and third place went to Kaleigh A. Clary, Hendrix College. The SRC is run by the Association for Computing Machinery (ACM). The awards were presented by Laura Dillon (far left), MSU professor and conference co-chair; and Valerie Barr (far right), chair, ACM's Committee on Women in Computing (ACM-W).

KEEPING IN TOUCH

NAME _____

STREET ADDRESS _____

CITY / STATE / ZIP _____ IS THIS A NEW ADDRESS? YES NO

OFFICE TELEPHONE _____ HOME TELEPHONE _____

E-MAIL _____

GRADUATION YEAR _____ DEGREE _____

CURRENT OCCUPATION _____

EMPLOYER _____ LOCATION _____

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

We want to know what's happening with you! Update us by mail at Attn: Publications, MSU, 3412 Engineering Bldg., East Lansing, MI 48824-1226; by e-mail at editor@egr.msu.edu; or by fax at 517.355.2288.

GIFT INFORMATION

I/we wish to make a gift/pledge in the amount of \$ _____ designated for: _____

My/our total gift will be paid as indicated:

- Check payable to "Michigan State University"
- Credit card charge to: MasterCard Visa Discover AmEx

CARD NUMBER _____ EXP. DATE _____

NAME AS IT APPEARS ON CARD _____

SIGNATURE _____

A pledge of the following duration (maximum 5 years): _____
 Enclosed is my first payment of \$ _____
 Please send pledge reminders: Annually Quarterly Semiannually
 beginning: _____ MONTH _____ YEAR

This pledge replaces all other outstanding pledges.
 This is a joint gift with my spouse: _____ SPOUSE'S NAME

I or my spouse (check one) works for a matching gift company:

EMPLOYER(S) _____

Please return to: Engineering Development, MSU, 3536 Engineering Building, East Lansing, MI 48824-1226, or make your gift online at www.givingtomsu.edu

**Department of Computer
 Science & Engineering**
 Michigan State University
 3115 Engineering Building
 East Lansing, MI 48824

Nonprofit Org.
 U.S. Postage
PAID
 East Lansing, MI
 Permit #21

CHAIRPERSON **Matt Mutka**

TEL (517) 353-3148
 E-MAIL cse@egr.msu.edu
 WEB www.cse.msu.edu

EDITOR **Jane L. DePriest**

PUBLICATIONS DIRECTOR
Laura Luptowski Seeley

MSU is an affirmative-action, equal-opportunity employer.

♻️ Printed on recycled 10% post-consumer fiber paper using environmentally friendly inks.

Tour of Boeing Factory

Representatives of the College of Engineering, including CSE professor Wayne Dyksen, recently visited the Boeing Company's 737 factory in Renton, Wash. Bob Feldmann, a Boeing vice president and general manager of the plant, gave the group a tour of the flight line where the 737 aircraft are assembled. Boeing employs engineers in many different fields and also has sponsored projects for MSU's College of Engineering Design Day. 🌱



CSE professor Wayne Dyksen (right) with Bob Feldmann, vice president and general manager of the Boeing Company's 737 factory.