MICHIGAN STATE UNIVERSITY COLLEGE OF ENGINEERING • WINTER 2010/2011

PIPELINE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Young Computer Scientists Explore New Paths

Computer science engineering has seen an explosion of innovations in the last few years. Every day the horizon of what is possible with computers is expanded. This is having a positive effect on all scientific fields by fostering more interdisciplinary projects and making better use of computers, especially in research.

Now four CSE professors hope their research can expand computer science knowledge even further. Alex Liu, Yanni Sun, Yiying Tong, and Guoliang Xing have received CAREER grants, funded by the National Science Foundation, in this past year. These awards are given to junior-level faculty members to encourage them to integrate their research and education efforts early in their careers. Over the years the CSE Department has had its share of faculty members who received CAREER grants, but having four faculty members receiving awards during the same time period is very prestigious and points to the strengths of the department on a nationwide basis.

Making Network Security Faster and More Accurate

Alex Liu wants to conduct cutting-edge research and that's why he chose to become part of the CSE faculty in 2006 after completing his PhD at the University of Texas at Austin. "MSU's CSE is well known, the people are friendly, and the university encourages collaboration," says Liu. It is an opinion echoed by the other CAREER recipients.

Liu's major area of expertise is network security. He works on firewall policy design and analysis, which determines which packets can be permitted to go through a firewall, essentially making sure that firewalls run correctly. Another major part of his work is to research how to make networks run faster. "The firewall policy is the cornerstone of network security and it has to run correctly," Liu says. "But now we also want higher performance and faster hardware packet classification, so the firewall will run faster."

For his CAREER project, Liu is using his expertise in network security to increase the effectiveness and adoption of policy-based computing by designing high performance policy evaluation algorithms and search engines that can be adapted to support various policy languages. The primary focus is on the fast evaluation of security policy. "There has been little work on how to make these policies as efficient as possible and as fast as possible. I hope that my research shows a way to make it easier and more efficient to process a request."

Liu collaborates with people in computer-related industries, such as AT&T, Cisco, and Huawei. A company's problems often give Liu ideas for projects to submit for grants. He has been successful in getting numerous grants, primarily from the National Science Foundation, on different approaches and techniques related to network security. Liu is very interested in researching and solving practical problems. "I understand the problems that industry is facing, and I try to come up with solutions."

Using Computers to Expand Biological Knowledge

Yanni Sun joined the CSE faculty in 2008 shortly after completing her PhD at Washington University in St. Louis. Her area of expertise is computational biology, and she chose MSU not only for its computer science engineering program, but also for its strong biology program.

Sun designs algorithms and tools to solve problems from molecular biology. "Biologists do wet lab experiments that are time consuming and very expensive," says Sun. "With computational biology we can develop computer tools and generate results that guide biologists, so they can work on one specific part of the data."

One example of the type of work done by computational biologists might be comparing genomes. "For example the human and mouse genomes are very similar because we believe they came from the same ancestors," says Sun. "The problem is how to develop a tool to figure

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From left: Alex Liu, Yiying Tong, Guoliang Xing, and Yanni Sun.

from the Chair

MATT MUTKA

There is much good news from CSE over the past year. Student enrollment continues to increase and graduates find a favorable job market. We have experienced year-to-year increases in research activities and expenditures for the past several years, and evidence indicates that this trajectory will continue. Research expenditures support graduate and undergraduate research assistantships, and the products of this research are having major impacts on broader scholarly activities in the country as well as impacts on industry. Several publications from the department this past year have been honored with best-paper awards at their respective conferences. The new National Science Foundation (NSF) Science and Technology Center, named BEACON and discussed in our past newsletter, has recently begun operation.

CSE is very pleased with the excellent results from our newer faculty. It is highly significant that four CSE faculty (Drs. Alex Liu, Yanni Sun, Yiying Tong, and Guoliang Xing) have been honored this past year with the prestigious NSF CAREER award. This is a sign of the faculty members' significant accomplishments, and their exciting research and teaching plans in the years to come. When these new awards are added to previous NSF CAREER awards earned by many of our faculty, it is clear that the talent at CSE@MSU will continue to remain strong for years to come.

CSE received good news regarding the recent rankings of the CSE doctoral programs in the United States. The National Research Council (NRC) released ranking information in September 2010 and placed CSE@MSU highly among a group of 126 computer science doctoral programs. The ranking used a data driven methodology, and ranked computer science at MSU within the top 10-25 percent of all computer science doctoral programs.

Recently, the department decided to undergo a review of accreditation by the Accreditation Board for Engineering and Technology (ABET) for its undergraduate computer science program. Preparation for this review is a lengthy process, which results with a site visit from ABET evaluators. While the final results of the review will not be provided until next summer, preliminary indications concerning the review are favorable. I would like to thank Professor Richard Enbody for providing excellent leadership during the review process.

Professor George Stockman has been a major force in shaping the CSE department for many years. He has made significant contributions to the research area of computer vision. He has been a valuable mentor for faculty and students, an excellent teacher, and has shown relentless energy for outreach to the community and engagement with students in elementary and middle schools. Although he will formally retire as a faculty member from the CSE department in December, we are pleased that he will remain engaged with students and faculty through projects for the university and the community. It has been an honor and pleasure to work with Dr. Stockman through the years and we look forward to his continued involvement with the department.

Student Pipeline

University Distinguished Scholar

CSE freshman **Adam Liter** from Eden Prairie, Minn., is one of the high school graduates from throughout the country who are Michigan State University's newest University Distinguished Scholars. These scholarships are considered to be among the most competitive in the country and cover full tuition, room and board, and books for up to eight semesters of study.

Liter currently has two declared majors—computer science and linguistics, largely due to his interest in the field of computation linguistics, which deals with computer comprehension of language and statistical modeling of language. In addition to his studies, Liter is involved with MSU Greenpeace and is an active member of MSU Amnesty International.

This past summer, Liter participated in a freshman seminar abroad and went to New Zealand where he studied sustainability with other incoming freshmen, under the direction of James M. Lucas, assistant to the dean, International Academic Student Life. "We learned a lot about sustainability, especially in the context of New Zealand culture," says Liter. He is the son of Jeff and Jackie Liter.

WIC

The MSU Women in Computing (WIC) is a nonprofit group that works to bring together women interested in computing technology to enrich their educational, personal, and professional development. One recent program included a talk by Tricia Brodrick, development director at Okemos-based Techsmith, on "What I Wish I Had Known."

The current officers are Dianna Kay, president; Caitlin Russ, vice president; Cassi Miller, secretary; Angela Mireau, treasurer; Kate Bonnen, webmaster; Devan Sayles, university relations. Teresa Vandersloot is the adviser to the group. More information is available at www.cse.msu.edu/msuwic.

More student news on page 8.

The current E-Board of WIC includes, top row, from left: Dianna Kay, Angela Mireau, and Kate Bonnen; bottom row from left: Caitlin Russ, Cassi Miller, and Devan Sayles.

Young Computer Scientists (continued from page 1)

out the similarities between the two genomes that have very long sequences. These similarities may indicate something important for biologists because the similarity is conserved in both species during evolution." Using specific computer tools it is possible to locate the similarities. "Sequence similarity search has become a part of computational biology and has had an important impact. The technology to do all of this has just evolved over the last few years," Sun says.

For her CAREER project, Sun is applying computational biology to a specific project. She plans to develop new algorithms and technologies for one kind of molecule called a noncoding RNA (ncRNA) in large-scale sequence databases. "The information carried in RNA or ribonucleic acid, which is similar to DNA, is generally transferred to protein, but some parts of the sequences will not code for protein. How do we find the ncRNAs in different species?" Although there have been numerous efforts for ncRNA detection, few approaches can be practically applied to whole genomes or large-scale databases.

Sun already has some preliminary results, which she used to help secure the CAREER award. "This is an important problem. The study of noncoding RNA is relatively new; we have not realized its importance, so this is a new research area and we need new tools and algorithms to tackle the problem."

The developed tools will impact numerous genome-scale annotation projects. Her work will be particularly important with the next generation of human genome sequencing as new platforms for sequencing technology are developed. "Some day in the future everybody's genome can be sequenced at a reasonable cost. We just need to develop tools to figure out all the data."

Mastering the Next Phase of Computer Graphics

Yiying Tong specializes in computer simulation and animation and these have become more and more sophisticated and life-like. "It's more than just reproducing a nice picture. We are trying to create images and videos that communicate scientific information better," Tong says. "We don't really see how the air flows, but through graphics, such as arrows, we can visualize it." He came to MSU in 2007 and has a PhD from the University of Southern California.

Now Tong hopes that through his CAREER project he can develop a format so that certain simulations can be done better. He is trying to combine Lagrangian and Eulerian methods for simulation into a novel framework. While Lagrangian and Eulerian methods are common representations of motion, they are rarely combined. "I would like to take the best from each of these methods and combine them into a whole new system."

Typically, the Eulerian method deals best with topological change, such as a splash of water. The Lagrangian method is often used to keep the energy or momentum the same, meaning that something solid is easier to represent with the Lagrangian method.

Tong is looking for a way to interface the two and combine the two representation methods so that certain simulations can be done better. "The ultimate goal is to make the simulation fast, stable, and more accurate. Sometimes you have to sacrifice accuracy for speed because it takes time to run accurate simulations, but you don't want to sacrifice the most important structures in the dynamics, like energy preservation," says Tong. "In many cases we need to compute a physical simulation, which is close to the real world, but computational resources may be limited and that is the problem I need to tackle."

Enabling Low-Power Sensors to Work Together

Guoliang Xing researches low-power wireless sensor networks. "They are like tiny computers," says Xing. "The sensors can work together to collect fine-grain information about the physical world." He just returned from Japan where he received a Best Paper Award from the 18th IEEE International Conference on Network Protocols.

The paper addressed the interference between sensors and WiFi networks. "WiFi networks have more and more deployments, and they have higher power so they can easily destroy the information transmitted by low-power wireless sensors," says Xing. The paper offers a new approach to dealing with the interference. "We found that there are gaps between user packets; sometimes there is a lot of traffic, sometimes it is almost silent. We are suggesting ways to make use of this white space for sensors to communicate with each other."

Xing came to MSU in 2008 after receiving his PhD from Washington University in St. Louis, Mo., in 2006 and working for a couple of years at the City University of Hong Kong as an assistant professor.

For his CAREER project, Xing will focus on new approaches to enabling low-power sensors to work together. A single sensor has limited processing power and a short range of transmission. In addition, the single sensor is not always reliable and the information it gathers may not be accurate. By networking several sensors, the data gathered by them can be processed together leading to more accurate information.

Xing will look at ways to gather data from multiple sensors and will study a signal processing technique called data fusion, thereby improving the performance of large-scale sensor systems. "Data fusion is an advanced information processing technique to enable resource-limited sensors to efficiently collaborate in delivering predictable sensing performance. We will develop new analytical tools and communication protocols that will allow multiple sensors to collaborate with each other more effectively during the data fusion process."

Xing is particularly interested in applying these to energy and environmental problems. "We want to develop high-performance sensor systems at low costs. Traditionally, complex and expensive instruments were necessary for some of these applications, such as with power grids and bridges or with volcanoes and earthquake detection. "With a large number of low-power sensors, we can realize a variety of complex sensing systems with orders of magnitude lower manufacturing and deployment cost."

He is very complimentary of the students working with him on this and other research projects. "I am fortunate to work with excellent students," says Xing. "And they like the research because it is cutting edge and relevant to using new technology to solve some of the critical problems we face today like energy and environment."

Faculty and Staff Pipeline

New Staff

Kevin Ohl (BS CSE '78; MBA '81) has joined the department as an academic teaching specialist. This brings Ohl full circle from an actively involved student and alumnus to part of the CSE staff and returns him to a role in which he was involved as a graduate student.

Between leaving and returning to MSU, Ohl served in various capacities while working for a large consulting firm for nearly 30 years. Since much of his work during that time involved assisting clients with developing, implementing, and managing business and technology strategies, he has significant experience and understanding of the usage of technology in the business, governmental, and nonprofit world.

Ohl was heavily involved with the computer science department even before becoming an active alumnus. He served in a number of roles as an undergraduate, beginning as a teaching assistant during his sophomore year and eventually becoming a course administrator for the entry-level computer science courses. Upon entering his MBA program, Ohl assumed instructional responsibility for these entry-level courses and also taught COBOL Programming. Finally, Ohl served as a non-faculty representative on the Computer Science Department's Curriculum Committee.

Ohl received the first Department of Computer Science and Engineering Distinguished Alumni Award in 2004. He has served on the Alumni Association Board of the College of Engineering, and currently serves on the CSE department's Strategic Partners Council and on the External Advisory Board for MSU's Department of Accounting and Information Systems. He has worked with the CSE department to sponsor class projects and extracurricular events, led the judging panel for the CSE projects at Design Day, and has been a key participant in the department's semi-annual graduation receptions with his remarks from an alumni perspective. Kevin and his wife, Sue, have given financial support to the university and college, and they are the founding donors of the CSE Horizon Fund.

This semester Ohl is teaching CSE 101, Computing Concepts and Competencies. "I'm excited about getting involved with this course as I view it as an important foundational piece of the MSU student's curriculum," Ohl says. "I'm inheriting a solid foundation, starting with Don Weinshank and Mark Urban-Lurain's work and continuing with Jo Smith. My primary objective at this time is to make sure I am carrying the current level of delivery on the course forward. Once I learn all the 'moving parts,' I then look forward to reaching out to the course stakeholders (e.g., departments using the course) to ensure we are delivering relevant content and providing students with the foundation they need to capably use technology both before and after they leave MSU."

TSE Associate Editor

Professor **Betty H. C. Cheng** is now an associate editor of IEEE *Transactions on Software Engineering* (TSE). The publication is an archival journal published bimonthly and includes well-defined theoretical results and empirical studies that have potential impact on the construction, analysis, or management of software.

Cheng's research and teaching interests include requirements engineering, model-driven software development, autonomic computing, automated software engineering, and embedded systems development, all in the context of high assurance systems.

Recently, she has embarked on an exciting new area of interdisciplinary research exploring how digital evolution can be harnessed to support the modeling and development of adaptive and autonomic computing systems. She is the industrial affiliates manager for BEACON, the newly established NSF Science and Technology Center focusing on evolution in action. She is co-founder of the Software and Engineering and Network Systems Laboratory that currently supports five CSE faculty members and their graduate students.

Bioinformatics Seminar

Assistant professor **Titus Brown** developed an intensive two-week program to train scientists in bioinformatics. "Sequencing technology has exceeded the prediction termed as Moore's Law with the amount of data produced more than doubling every 18 months, thereby creating new headaches for scientists as they work with massive data sets," says Brown. This is especially a problem for biologists who are working with data from genomic sequencers.

The program, held in June at the Kellogg Biological Station, was supported by the College of Natural Science with the George E. Leroi Strategic Visioning Fund endowment. The program attracted scientists from academia and business. Ten participants were from MSU, while others came from companies like Monsanto and Pioneer and one researcher came from Italy.

Brown used an efficient and cost-effective method by partnering with Amazon Web services. The short burst of cloud computing allowed participants to use large amounts of processing power without investing time and money in computing resources. All the materials and components of the course along with the data sets are available at ged.msu.edu/angus.

— Mike Steger

New Research on Altruism

CSE researchers took the spotlight in an article in *U.S. News and World Report* this fall that featured their work with digital evolution techniques. This research helps to shed new light on what it is that makes species altruistic.

Their work was originally published online in the journal *Proceedings of the Royal Society*. This study marked the first time that scientists have been able to test such generalizations of kin selection theory. Understanding why altruism evolves is one of the fundamental challenges in evolutionary theory.

Members of the team included CSE professors **Charles Ofria, Robert Pennock**, and PhD student **Heather Goldsby**, all of whom are currently affiliated with MSU's BEACON Center

From left: CSE professor Charles Ofria and PhD student Heather Goldsby were part of a team of researchers who recently published work on understanding why altruism evolves.

for the Study of Evolution in Action. Jeff Clune, a postdoctoral fellow at Cornell University who recently earned his doctorate in computer science from MSU, was also involved in the research.

"The ability to conduct research in digital systems enabled us to learn nuances of kin selection theory that may have been difficult to discover via evolutionary experiments in natural systems," says Ofria. Using digital evolution technology the team learned how altruism evolves by setting up different experimental situations. Through this, the researchers found that genes were more likely to help others that were physically similar to them, as opposed to strictly helping those who are related to them.

More information about the research is available at www.beacon.msu.edu.

NSF Grants

Several CSE faculty members have recently received funding from the National Science Foundation for various research projects.

CSE assistant professor **Guoliang Xing** and Xiaobo Tan, associate professor of electrical and computer engineering, have received an NSF grant for their project entitled "Exploiting Mobility-Assisted Collaboration for Adaptive Aquatic Sensor Networks." The three-year project aims to establish a principled framework for the design and operation of aquatic sensor networks consisting of resource-limited nodes, by exploiting adaptation and collaboration among nodes to holistically deal with or even leverage uncertainties in sensing, communication, and mobility. The proposed methodology will be validated in detection and tracking of harmful algal blooms at the MSU Kellogg Biological Station using networks of robotic fish.

The project could bring aquatic sensor networks much closer to their envisioned applications, and bear impact on monitoring of lakes and other ecosystems, tracking of oil spills and pollutants, and surveillance of ports and rivers. It will also enrich several courses offered in the CSE and ECE departments, and provide opportunities to reach out to K-12 students and schools through interactive lectures and participation in a teacher training program at MSU.

Alex Liu, assistant professor, and colleagues have been awarded a research grant from the NSF for a multidisciplinary project titled "Signal Processing and Information Theoretic Approaches to Denoising and Demystifying Social Network Services". This project is a joint collaboration with Hayder Radha (Electrical and Computer Engineering) and Cliff Lampe (Telecommunication & Media).

The objective of this project is to develop an in-depth understanding of the nature, underlying models, and dynamics of Social Network Services (SNS) with millions and even billions of users. Methods for the analysis of massive SNS graphs using signal processing and information-theoretic techniques are being designed to answer fundamental questions regarding SNS.

The Trustworthy Computing Program of the NSF has also awarded Liu funding for a project titled "An Algorithmic Framework for Distributed Network Security Policies Management." This project employs proactive approaches to reachability management and helps operators to design, verify, analyze, troubleshoot, and optimize distributed network security policies.

In addition, Liu and **Eric Torng**, associate professor, are working on a project titled "Grammar Aware High-Speed Application Protocol Parsing for Deep Flow Inspection" with funding from NSF. The objective of this project is to develop a comprehensive framework for high-speed application protocol parsing and field extraction that is grounded in formal language theory models.

DURIP Grant

Matt Mutka, professor and chairperson of computer science and engineering, and Ning Xi, professor of electrical and computer engineering, have been awarded a grant from the Army Research Office Defense University Research Instrumentation Program (DURIP) for a project entitled "Acquisition of an All-Terrain Mobile Manipulator." This project investigates coordinated control and teleoperation of multi-robot systems.

New Book

Chad Meiners, postdoctoral researcher, **Alex Liu**, assistant professor, and **Eric Torng**, associate professor, all within the Department of Computer Science and Engineering, have released a new book entitled *Hardware Based Packet Classification for High Speed Internet Routers*, published by Springer, 2010.

Packet classification is the core component of routers, firewalls, and other networking devices that enables many networking services such as packet filtering and traffic accounting. Using Ternary Content Addressable Memories (TCAMs) to perform high-speed packet classification has become the standard in industry today. While some gain in TCAM performance is expected from improved hardware, the demands on TCAM performance (measured by the number of rules in packet classifiers) increase far more rapidly due to the explosive growth of Internet services and threats. This book presents the most recent developments in hardware-based packet classification algorithms and architectures.

Smartphone Apps for People with Disabilities

Motorola and Google have donated Android smartphones for development of applications for people with disabilities. Four MSU Computer Science undergraduate students, **Nic Speeter, Paul Fritschen, Christine Varley**, and **David Markachev**, are working with associate professor **Richard Enbody** and MSU's Resource Center for Persons with Disabilites (RCPD).

The first app assists blind people in knowing who is at a meeting. This research is part of a larger MSU team that includes Michael Shanblatt of electrical and computer engineering, Michael Hudson, director of RCPD, and Dr. John Gerlach of the Biomedical Laboratory Diagnostics Program.

Alumni Pipeline

CSE Alum Plays Major Role in India's Unique Identity (UID) Project

Salil Prabhakar (PhD, CSE, 2001) has become a leading expert in biometric recognition and is playing a major role in a massive project in India that is considered the largest biometric project ever attempted. India is collecting face, fingerprint, and iris scans from each of its 1.2 billion people and assigning them a unique 12-digit ID number. In the past, millions of Indians could not access services, such as opening bank accounts or getting ration cards, because they had no proof of identity.

In order to plan and execute the project, India recruited technological experts of Indian origin from around the world, including Prabhakar, who was the biometrics specialist of the elite group. The Unique Identification Authority of India was established in August 2009.

At MSU while obtaining his PhD, Prabhakar was mentored by University Distinguished Professor Anil Jain and along with Jain and two other authors wrote the *Handbook of Fingerprint Recognition* in 2003 (the second edition of the book was printed in 2009). According to Jain, "Salil showed a deep understanding and interest in fingerprint matching during his four years in our PhD program. The most popular method of fingerprint matching is based on minutiae points. Salil proposed an alternative representation scheme for fingerprint classification and matching based on *fingercode.* His two journal papers on this topic, published in 2002, have close to 1,000 citations. Other significant problems that Salil addressed during his stay at MSU included 'uniqueness of fingerprints' and 'similarity of fingerprints of identical twins.' Salil is internationally recognized as an expert in fingerprint matching, and he brings substantial visibility to Michigan State University."

Prabhakar is currently the chief scientist of DigitalPersona, Inc. in Redwood City, Calif. His research interests include pattern recognition, image processing, computer vision, machine learning, biometrics, data mining, and multimedia applications. He is co-author of 35 plus technical publications and has two patents. Prabhakar took periodic leaves from his company to help with the Indian project. Prabhakar also scouted other major ID and biometric projects around the world to provide input for the Indian project.

"It is gratifying to put what I have learned from MSU and DigitalPersona Inc. into practice on a national project with such wide and deep social impact," says Prabhakar. He and the other techno gurus worked from a rented apartment in Bangalore and put together the first designs of the entire system there. Indian Prime Minister Manmohan Singh kicked off the nationwide enrollment in late September 2010, and the government hopes to issue the first 100 million unique ID numbers by March 2011 and 600 million within four years.

Publication Award

Tim Newman (MS '89, PhD '93), a professor at the University of Alabama in Huntsville, received an award from the Elsevier Journal of Computers and Graphics for Top Cited Article 2005-2010 for "A Survey of the Marching Cubes Algorithm," by T. Newman and Y. Hong.

Promotion

Greg Buzzard (BS Computer Science '89; BS Music '89; MS Mathematics '91) was recently promoted to full professor in the Department of Mathematics at Purdue University (West Lafayette, Ind.). His research in pure math has been primarily in several complex variables and dynamical systems. Most recently Buzzard has been working in mathematical biology with an emphasis on analyzing dynamical systems and developing algorithms to better understand physiological processes with ongoing projects in cardiac modeling, immune system signaling, and embryo development. He plays the violin in the Lafayette Symphony Orchestra and likes to swing dance. "However, chasing two small kids keeps me on my toes enough that I don't do this as much as I once did," says Buzzard.

Best papers

Numerous CSE faculty and students have received best paper awards recently.

PhD student **Brendan Klare** and his adviser, **Anil K. Jain**, University Distinguished Professor of computer science and engineering, were honored with the Best Student Paper Award sponsored by Honeywell at the IEEE Fourth International Conference on Biometrics: Theory, Applications and Systems (BTAS) in Washington, D.C. for the paper entitled, "On a Taxonomy of Facial Features."

PhD student **Matthew Gerber** and **Joyce Chai**, associate professor, received the Best Long Paper Award at the 48th Annual Meeting of the Association for Computational Linguistics (ACL), held in Uppsala, Sweden, July 11-16, 2010. Their paper, titled "Beyond Nombank: A Study of Implicit Arguments for Nominal Predicates," examines a novel problem of recovering implicit arguments for nominal predicates from textual discourse. Matthew Gerber gave the plenary presentation at the conference. ACL is the premier conference for research on computational linguistics and natural language processing.

Brian Connelly and **Benjamin Beckmann**, CSE graduate students, and professor **Philip McKinley** received the Best Paper Award in the Artificial Life Track at the 2010 ACM Genetic and Evolutionary Computation Conference, held in Portland, Ore. in July 2010. Their paper, "Resource Abundance Promotes the Evolution of Public Goods Cooperation," identifies environmental conditions that lead to cooperation among digital organisms. In turn, these computational results have inspired new wet bench experiments with pathogenic bacteria, conducted in the Waters Lab at MSU.

2010 CSE Distinguished Alumni Award

Vandy Johnson, left, receives the 2010 CSE Distinguished Alumni Award from Matt Mutka, chair of the CSE department.

Vandy Johnson (BS '82, Computer Science) received the 2010 Computer Science and Engineering Distinguished Alumni Award at the annual College of Engineering Alumni Awards Banquet in May 2010. The award recognizes an alumnus or alumna who has distinguished himself/herself as a leader in the computer science and engineering profession through professional contributions, public service, and personal accomplishments.

Johnson is vice president of global IT infrastructure operations and support at Medtronic, a leader in medical technology based in Plymouth, Minn. He is responsible for leading the development, implementation, and support of a global IT infrastructure that supports and sustains the company's business strategy.

Last year, Johnson's global infrastructure team won the SNW / Computerworld award for Best Practices in Virtualization and Cloud Computing and Nemertes Research PilotHouse innovation awards in three categories: Best Overall IT Innovator, Best Innovator for Sustainable Data Center, and Best Innovator for WAN/ ACS/ Branch Office. Also in 2009, Medtronic IT was named one of Computerworld's 100 best places to work and was cited as a member of the InformationWeek 500.

During his time at MSU, Johnson worked as a programmer analyst for the state of Michigan's Department of Natural Resources. Upon graduation, he joined General Mills, where he held numerous roles of increasing responsibility in IT, most recently as the senior director of information systems operations. In this role, he was responsible for worldwide IT infrastructure and system operations, including voice and data networks, security, enterprise data, computer operations, and technical services. In other roles at General Mills, he was responsible for company-wide SAP implementation; led corporate IT system development; was on the startup team for a new General Mills business—home delivery of restaurant-quality food; and led General Mills syndicated market research, International IT, and IT infrastructure and operations. After more than 25 years at General Mills, he left to become vice president of global IT infrastructure at Medtronic.

He is a life member of the MSU Alumni Association and a member of the MSU Jonathan L. Snyder Society. He currently serves on the Michigan State University College of Engineering Alumni Association Board; the MSU Department of Computer Science and Engineering Strategic Partners Council; the University of Minnesota, Carlson School of Business, Executive Advisory Board on Curriculum; and the Minnesota State University-Moorhead Computer Science & Information Systems Advisory Board. He also serves on advisory councils for Microsoft, Dell, and IBM.

Johnson is a senior member of the Association for Computing Machinery as well as a member of the Institute of Electrical and Electronics Engineers (IEEE), the computer society of the IEEE, and the communications society of the IEEE. He was a member of the review team for the IEEE Guide to the Software Engineering Body of Knowledge. He is also a Certified Data Processor (CDP), a Certified Systems Professional (CSP), and a Certified Computing Professional (CCP).

Vandy and his wife, DeAnne, a senior IT manager for General Mills, have two children—Skip and Summer. They reside in Plymouth, Minn.

Vandy Johnson with his father, Marty Johnson (far right), and Jackie Inglett, a friend of Marty Johnson, at the awards banquet.

PhD student **Alessandra Paulino**, Anil Jain, and Jianjiang Feng received the best paper award at the 23rd Conference on Graphics, Patterns and Images (SIBGRAPI) in Bramado, Brazil, for the paper "Latent Fingerprint Matching: Fusion of Manually Marked and Derived Minutiae."

PRIP Lab researchers **Young-Beom Lee**, **Unsang Pak,** and **Anil K. Jain** received Best Scientific Paper Award (Track II: Pattern recognition and Machine learning for "PILL-ID: Matching and Retrieval of Drug Pill Imprint Images at the 20th International conference on Pattern Recognition. In addition, **Kien Nguyen**, **Anil Jain,** and **Ron Allen** received an IBM Best Student Paper Award (Track VI: Bioinformatics and Biomedical Applications) for "Automated Gland Segmentation and Classification for Gleason Grading of Prostate Tissue Images" at the same conference.

Assistant professor **Guoliang Xing** along with PhD students **Jun Huang** and **Ruogu Zhou** and, Gang Zhou, an assistant professor at William and Mary College, received the Best Paper Award at the eighteenth IEEE International Conference on Network Protocols (ICNP), Kyoto, Japan, October 5-8, 2010. The paper is entitled "Beyond Co-existence: Exploiting WiFi White Space for ZigBee Performance Assurance." ICNP is a highly selective, single-track premier conference covering all aspects of computer network protocols. ICNP received 170 submissions in 2010. The Best Paper Award was chosen from the 31 papers that were accepted for presentation at the conference.

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Student Pipeline (continued from page 2)

Trustees Award

Roy Dong, a CSE student from Rochester Hills, Mich., was one of six students honored by the MSU Board of Trustees for academic achievements. The awards are granted at each commencement to graduating seniors having the highest cumulative grade point averages. Dong is the son of Yibing and Karen Dong.

ACM

The MSU chapter of the Association for Computing Machinery (ACM) offered an active schedule of programs for the fall semester, including info about programming the android, summer internships, and interviewing tips as well as talks by alumni.

The 2010 officers for ACM are Scott Buffa, president; Steven Garske, vice president; Kris Micinski, secretary; and Matt Durak, treasurer. More information about ACM is available at www.acm.cse.msu.edu.

Computer Science Doctoral Program Highly Ranked

The Computer Science Doctoral Program at Michigan State University placed in the top 17 percent in the United States according to the recently released National Research Council's (NRC) ranking.

Of the 126 programs assessed, one ranking (R-ranking) places MSU's computer science doctoral program within the top 10 to 25 percent in the United States, and the other ranking (S-ranking) places MSU in the top 8 to 35 percent in the U.S. When program scores are sorted according to the rankings, MSU's computer science doctoral program falls within the top 17 percent of all the programs in the United States.