

# CSE pipeline

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING | SPRING 2006 | COLLEGE OF ENGINEERING

## CSE Collaborative Design Students Help Boeing Look to the Future

Undergraduates in computer science and engineering are helping Boeing envision the future of flight ... literally. Since the fall of 2002, students in the CSE capstone design course have worked with the aerospace giant to develop and perfect a flight visualization program for the F/A-18 E/F Super Hornet. The program takes the raw data from the aircraft flight recorder and translates it into an on-screen image of the plane's flight, allowing pilots, flight instructors, and ground personnel to view and critique aircraft performance.

According to Don Akers, a Boeing associate technical fellow and systems software architect, applications like this one can be used in pilot training and incident/accident reconstruction. "We tried to offer students a project that could be useful to Boeing — one that has real-world impact, involving real-world data," says Akers. "This project has always proven to be a favorite."

The original requirements of the assignment have changed very little since the inception of the capstone class, but each new group of students has added to and refined the features and performance of the visualization program. Previous classes developed the graphic interface, allowed for three-dimensional, 360-degree views of the aircraft, and added a heads-up display (HUD)

for pilots. The fall 2005 team — including CSE seniors Brian Hasselbeck, Robert Rutherford, Chul Park, and Jayson Vincent — programmed visualization and movement of flight terrain, landing gear, wing flaps, tail flaps, and takeoff and landing maneuvers. "Students add a new twist each semester and the sophistication of the product has always advanced," says Akers.

Project sophistication is something that Wayne Dyksen, professor and capstone course instructor, appreciates about the Boeing assignment. "This is intended to be a real-world project for the students," says Dyksen. "They have almost total responsibility for the outcome. They are given purposely vague information and are required to deliver a finished product, manuals and all, by the end of the semester."

The class may be difficult for students, but the realistic nature of the course gives them priceless experience solving problems that practicing engineers face in the field. "It's the most valuable class I've taken at MSU," says Rutherford. "This is as real-life as you

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*Left to right: Brian Hasselbeck, Robert Rutherford, Chul Park, and Jayson Vincent are helping Boeing develop innovative software as part of the computer science and engineering capstone course project.*

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MICHIGAN STATE  
UNIVERSITY

# Chair's Message



Laura Dillon

By any account, the “IT revolution” is transforming our world in profound and fundamental ways, affecting every aspect of our lives and every segment of society, and leveling the playing field for new participants around the globe. While revolutionary times make looking into the future uncertain, a prediction by Carly Fiorina, a former

Hewlett-Packard CEO, is a sure bet. Fiorina describes the last 25 years as merely “the warm-up act” for the upcoming “main event,” which will “truly transform every aspect of business, of government, of society, of life.”

Unfortunately there is today a serious misunderstanding that the demand for computer science graduates is weak. An equally damaging myth is that computer science is only for “geeks” — individuals who prefer machines over people, thrive on coffee and donuts, and lack social graces and outside interests. These misperceptions could not be farther from the truth.

Alarming, these misperceptions have dissuaded young people from entering the field at a time when computing has become foundational to virtually all enterprises. American youth are losing interest in computer science just as foreign countries are ramping up rigorous math, science, and IT programs. To make matters worse, minority and female participation—already low—is declining at a disproportionate rate. With nearly 50 percent of the workforce made up of women and minorities, we simply cannot afford to ignore the contributions they can make. We must do a better job of attracting and retaining a diverse body of talented students for computer science.

Occupational employment projections for 2002-2012 from the U.S. Bureau of Labor Statistics forecast that growth rate, new jobs, and total job openings for IT professionals will far outstrip those for scientists, engineers, and mathematicians. Seven of the thirty occupations that are predicted to be the fastest growing are “computer-related,” and all seven of these rank in the top salary category. The number of computer-related jobs has already surpassed the previous peak in 2000.

Few disciplines provide the breadth of career opportunities that computing does. But today technical expertise is just one skill among many that employers seek. IT professionals must be versatile and flexible. They must innovate, strategize, and exercise excellent leadership and communication skills. They need to work equally well alongside domain experts — for instance, chemists, biologists, engineers, economists, medical doctors, business experts, and customers and other stakeholders — whether technical novices or experts, often bridging nations and cultures.

The Department of Computer Science and Engineering at MSU is advancing computing and information frontiers beyond the traditional disciplinary boundaries. The Department is leveraging internationally recognized achievements and expertise in foundational computing areas to create innovative research and educational programs in campus-wide multidisciplinary areas. Examples include biometrics, bioinformatics, digital evolution, health informatics, high-assurance computing systems, entertainment-driven computing, and the Center for Humane Arts, Letters, and Social Science On-Line.

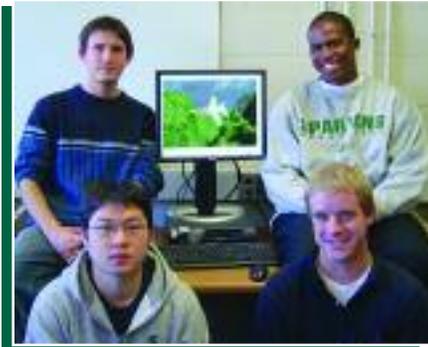
The department is recognized by employers for its design-oriented and hands-on courses, offered as integral components of undergraduate specializations in cognitive science, criminal justice, information technology, and game design, as well as a number of dual degree graduate programs and multidisciplinary graduate specializations. By taking bold strides to cross disciplinary boundaries, the CSE Department is helping to make computing truly ubiquitous.

Yes, change is inevitable, and those who keep pace with change are best suited to make an impact in the field. In CSE we are striving, not just to keep up, but to set the pace. Thank you to everyone who has helped us in our efforts.

~ **Laura Dillon**

Professor and Chairperson

Department of Computer Science and Engineering



The fall 2005 Boeing project group improved on previous flight visualization designs by adding terrain movement and landing gear capabilities.

can get in a classroom setting. The assignment has helped me learn how to work effectively in a team on a large-scale project.”

Delivering a product is one thing, but delivering a quality product is quite another, as Akers found out when Boeing

worked with other universities on similar projects. “We have seen some great products at other schools, but we’ve also experienced difficulties,” he says. “However, MSU has consistently been on top of what needed to be done, and is always able to handle the tasks associated with the project in a proficient manner. If they didn’t know what to do or how to do it, they asked the right questions and did the required research to find the answers.”

Dyksen agrees with Akers’s assessment of the talent at MSU. “In general these kids are just incredible,” says Dyksen. “You look at the products they deliver and wonder, ‘Could I do that?’ Their skill continually amazes me.”

In some cases, Boeing continues to reap the benefits of that skill after graduation. A few students from previous semesters, including Jayson Vincent (see sidebar, this page), have gone to work full-time at Boeing after their experience in the capstone course. According to Akers, “The ability to perform on this project, along with an excellent education, has given these students a head start in beginning a career with Boeing.”



CSE capstone design students worked with Boeing to develop a flight visualization program for the F/A-18 E/F Super Hornet.

## Vincent Trades in Shooting Hoops to Shoot for the Sky



Jayson Vincent gave up basketball but scored a career at Boeing.

Some might say Jayson Vincent was born to play basketball at Michigan State. His father, Jay Vincent, played on the 1979 MSU National Championship Team with hoops icon Magic Johnson, and his uncle, Sam Vincent, played with legend Scott Skiles. So it was no surprise that Jayson’s name was on the roster when he came to MSU as a freshman. The surprise came two years later when the shooting guard hung up his jersey to concentrate full-time on studying computer science.

“It was very hard to do both well,” explains Vincent. “There came a time when I had to decide what I wanted to do, and I saw a much brighter future in computer science.”

It looks like Jayson made the right choice. After graduation in December 2005, he headed to St. Louis, Missouri, to join the engineering team at Boeing as a full-time staff member. It’s an environment that Vincent is familiar with. He has completed two summer internships at Boeing already. During the first internship, Jayson worked on redesigning and upgrading the cockpit of the F/A-18 E/F flight simulator. For his second internship, he programmed mission data controls for an unmanned, full-scale military plane.

Vincent’s technical savvy and dedication did not go unnoticed by the people at Boeing. “Jayson is an extremely impressive candidate on all levels,” says Brian Bernsen, Boeing manager of software engineering and integrated defense systems. “He has tremendous potential at Boeing; he’s a very well-rounded person.”

# Faculty Pipeline

## Chai Receives NSF Grant to Improve Automated Spoken Language Interpretation



Joyce Chai

Joyce Chai, assistant professor, and Fernanda Ferreira, psychology professor, received a three-year, \$300,000 National Science Foundation grant through the Information and Intelligent Systems (IIS) program. The researchers will study the role that eye movement plays in human language production during interaction with a computer interface and how it can be used to improve computer speech recognition and understanding. Previous psycholinguistic studies have shown that directly before speaking a word, humans already move their eyes to the mentioned objects. The perceived visual context influences spoken word recognition and mediates syntactic processing. These findings suggest that a computer capable of monitoring eye movement in addition to speech would more accurately interpret spoken language. Chai says this research will benefit from the latest advances in eye-tracking technology. “It’s great,” she says. “We’re very glad to have the opportunity to work on this exciting project.”

## Cheng and Konrad Receive Award, Cheng Receives Gift



Betty Cheng

Betty Cheng, professor, and Sascha Konrad, PhD student and co-author, received the award for best paper at the MoDELS Workshop on Models Design and Validation. The title of the paper was “Automated Analysis of Natural Language Properties for UML Models.”

Cheng also received a gift from Siemens Corporate Research to support the project “Behavior-Oriented Assurance Patterns for Rigorously Developing Real-Time Embedded Systems.” The project will involve collaboration between Cheng and her students, Siemens Corporate Research, Siemens Dematic, and Siemens Critical Healthcare Systems group.

## Dillon Serves as Panelist and Receives Multiple Honors



Laura Dillon

Laura Dillon, CSE chairperson, recently served as a panelist during the Computing Research Association’s Committee on the Status of Women in Computing Research (CRA-W) Graduate Cohort Workshop. The annual CRA-W workshop brought 220 female graduate students together with 26 women successful in the computing research field. The CRA-W Graduate Cohort Program strives to build peer support networks for female students in a male-dominated field in order to bolster retention and post-gradu-

ate success. Dillon shared her experiences and offered advice on the question: “To Continue for a PhD or Not?”

Dillon was also named a 2005-2006 Committee on Institutional Cooperation Academic Leadership (CIC-ALP) fellow. She is one of 60 professors selected from 12 Committee on Institutional Cooperation (CIC) research universities. The fellows will take part in programs aimed at providing a greater awareness and understanding of the complex nature of the research university.

In addition, Dillon was recently elected to serve a third term on the executive board of the Association for Computing Machinery Special Interest Group on Software Engineering.

## In Memory of Professor Moon Jung Chung



Moon Jung Chung  
(1950 – 2005)

With deep regret and sense of loss, we report the untimely death of our colleague, Professor Moon Jung Chung on October 27, 2005. He was only 55 years old. Diagnosed with cancer in the spring of 2005, Chung was in Korea pursuing a special treatment and was with family and friends at the time of his death.

Chung was an internationally renowned scholar, teacher, and mentor who cared deeply about his students. His work on design automation in general and in process management in particular has had a transformational effect on the field and on industry. His former work on parallel algorithms had a similar impact.

Chung received his PhD at Northwestern University in 1981 and joined the MSU Department of Computer Science in 1987 after serving on the faculty of Rensselaer Polytechnic Institute for six years. He advised 12 PhD students — 8 completed and 4 in progress — and has mentored 6 MS thesis students and several undergraduate research assistants. Chung published 30 journal papers during his career. Just this year he was associate editor of the International Journal of Agile Manufacturing and the International Journal of CAD/CAM. He was also president of Korean Computer Scientists and Engineers. Chung taught courses in computational theory, parallel systems, algorithms, and data structures. His research impact in the manufacturing area had blossomed in the last three years.

Chung was the beloved husband of wife SeJin, and father of son Heesoo and daughter Catherine. He was an avid downhill skier and hiked 100 miles of the Appalachian Trail with his son last fall. As he leaves us behind on the trail, we miss his steps and mourn our loss.

~ George Stockman, Professor

## Jain Publishes Two Books and Receives Multiple Honors



Anil Jain

Anil Jain, university distinguished professor, edited two books published in 2005: *Handbook of Face Recognition*, co-editor S.Z. Li, Springer, 2005; and *Biometric Systems: Technology, Design and Performance Evaluation*, co-editors J.L. Wayman, D. Maltoni, and D. Maio, Springer, 2005. In addition, Jain's survey paper, "Data Clustering: A Review," co-authored by

Murty and Flynn and published in the November 1999 issue of *ACM Computing Surveys*, was ranked second for December and third overall among all publications downloaded in 2004 from the Association for Computing Machinery electronic archives.

Jain was also elected a fellow of the American Association for the Advancement of Science (AAAS). He received the fellowship in recognition of his significant contributions to pattern recognition and data clustering with applications in biometrics. In addition, Jain has been appointed a member of the National Academies Committee on Determining Basic Research Needs to Interrupt the Improvised Explosive Device (IED) Delivery Chain. He is already serving on the National Academies Committee on Whither Biometrics.

## Ofria Receives Teachers-Scholar Award, NSF Research Award



Charles Ofria

Charles Ofria, assistant professor, was given the Teacher-Scholar Award at the All-University Award Ceremony on February 9 at the Pasant Theatre, Wharton Center. Ofria is one of only six faculty members university-wide to receive the award. The Teacher-Scholar award is presented to faculty members who have earned the respect of students and colleagues for their devotion to and skill

in teaching. The essential purpose of the award is to provide recognition to the best teachers who have served at MSU for seven years or less.

The National Science Foundation also recently granted Ofria and Hannah Professor of Microbial Ecology Richard Lenski a three-year award to study the dynamics of evolving populations. The project is entitled "Reimagining Evolutionary Computation" and will attempt to design new problem-solving techniques that are more grounded in the natural world than traditional evolutionary computation approaches.

## Owen Promoted to Associate Professor

Charles Owen's promotion to associate professor with tenure was recently approved by the MSU Board of Trustees. Owen received his PhD from Dartmouth University in 1998, and is currently the director of the Media and Entertainment Technologies Laboratory at MSU. His areas of research include augmented reality and multimedia systems.

## Hughes Receives Sigma Xi Meritorious Faculty Award

Herman Hughes, professor emeritus, received the Senior Meritorious Faculty Award from Sigma Xi Honorary Scientific Society at the annual awards dinner April 28, 2005.

## Stirewalt Chosen to Chair IEEE/ACM Conference



Kurt Stirewalt

Kurt Stirewalt, associate professor, has been chosen to organize and chair the 22nd Institute of Electrical and Electronics Engineers (IEEE)/Association for Computing Machinery (ACM) International Conference on Automated Software Engineering. The conference will be held in Atlanta, Georgia, in November 2007.

## VanderSloot and Radford Talk "Soft Skills" at the NACADA Conference



Teresa VanderSloot (left) and Amy Radford-Popp

Computer science and engineering undergraduate advisers Teresa VanderSloot and Amy Radford-Popp offered a presentation entitled "Employers Call for 'Soft Skills' From Technical Majors: How is Your Campus Answering?" at the National Academic Advising

Association conference in Toronto March 17–19. The program was designed to help educators and advisers encourage leadership, problem-solving, communication, and interpersonal skills to promote workforce marketability among students in technical fields.

## Wojcik Takes on Assistant Vice President Position



Anthony Wojcik

Anthony Wojcik, professor, joined the Office of the Vice President of Research and Graduate Studies as assistant vice president for research planning. As part of his assignment he will oversee internal grant programs at MSU. Wojcik remains half-time in CSE where he continues to serve students and faculty as the graduate director.

## Xiao Receives NSF Research Grant



Li Xiao

Li Xiao, assistant professor, and Gang Bao, mathematics professor, received a three-year NSF grant through the Division of Computer and Communication Foundations. The proposal was titled "Foundations of Solving Large Direct and Inverse Scattering Problems — Algorithm Analysis and System Support." The project will develop both computational methods and system solutions for large data-intensive applications on cluster-based high-end systems.

# Department Establishes New High-Assurance Systems Curriculum



Project leaders Philip McKinley, professor, (left) and Betty Cheng, professor, (right) work with lifelong learning student Stephane Kamdoum in the SENS lab.

A university-wide initiative to establish a high-assurance systems curriculum is underway. High-assurance systems are designed to tolerate failures, and even direct attacks, in order to continue system operation and preserve system integrity.

In an age where advanced computing technology touches all aspects of our lives, high-assurance systems are a necessity. The frequency of identity theft and database breaches, the widespread power outage of 2003, and incidents such as the cell phone service failure that occurred on September 11, 2001, are a few examples of the critical need for dependable systems in our increasingly technology-based society. It is imperative that systems are able to adapt to problems such as sudden surges in the number of users, hardware failures, network outages, software faults, and security attacks.

“Many important aspects of society depend on computing technology: business, patient care, transportation, power grids, and so on,” says Philip McKinley, professor. “However, today’s cyber infrastructure is very brittle and insecure, due in large part to the quality of the underlying software. This project is intended to help train a new generation of developers to build systems that are more robust and better protected against cyber attack.”

The aim of the high-assurance systems initiative is to build undergraduate and graduate curricula, foster multidisciplinary research, and create a “laboratory chassis” infrastructure that gives students hands-on experience designing and building high-assurance systems. The eventual goal for this innovative program is to establish a center for high-assurance systems. The center could serve as a resource for students and faculty and will provide extension services to local industry and state government.

Initial efforts toward this endeavor recently received financial support through Michigan State University’s Quality Fund. The fund

is a component of President Lou Anna K. Simon’s Boldness by Design initiative, a strategic positioning process that aspires to have MSU recognized worldwide as the country’s leading land-grant institution by 2012. Funds for this project will support both undergraduate and graduate assistantships in this multidisciplinary collaboration between the College of Engineering, the College of Agriculture and Natural Resources, the Eli Broad College of Business, and the College of Natural Science.

In its early stages, the project will target four application domains:

- Embedded control systems for manufacturing and transportation systems
- Sensor networks and related technologies for homeland security
- Information assurance technologies for e-commerce and supply-chain management
- Computing technologies for monitoring and assessing the quality of ecosystems

Betty Cheng, professor, stresses the importance of a collaborative effort that includes a diverse group of researchers and educators. “High-assurance systems transcend a broad spectrum of applications and technology,” she says. “It is essential to have a multidisciplinary team, including industrial partners, working together to effectively address the complexity and the changing needs of these systems.”

Ten faculty members from four colleges across campus are involved in the initiative. Led by Cheng and McKinley, the project includes Subir Biswas, electrical and computer engineering associate professor; Laura Dillon, CSE professor and chairperson; Stuart Gage, entomology professor; Sandeep Kulkarni, CSE assistant professor; Brian Pentland, accounting professor; Clark Radcliffe, mechanical engineering professor; Kurt Stirewalt, CSE associate professor; and Xiaobo Tan, electrical and computer engineering assistant professor.

The high-assurance systems project is the first of its kind in Michigan. The program’s unique approach seeks to give students experience developing and implementing systems that benefit a wide range of commercial and environmental applications, medical technology, and social infrastructures. The laboratory chassis will include programming assignments, data analysis experiments, and term projects in each application domain. Strong communication and outreach efforts with industrial partners will ensure the success of the program by providing students with relevant applications for the cutting-edge technologies they will develop.

~ Kim Thompson

# Undergraduates Get an Early Start on Research in the College of Engineering

Think it's only professors and graduate students who perform university research? Think again. More and more undergraduates at MSU are putting on the lab coat and pitching in on engineering projects as part of the school's Undergraduate Research Intern Program. The program started over 10 years ago as a way to get juniors and seniors thinking about graduate school, and has expanded through the years to provide paid research employment for approximately 32 students per summer.

According to Thomas F. Wolff, associate dean of undergraduate studies, the goal is to connect students with faculty members and foster an understanding of graduate school. "Undergraduate curricula are prescriptive and aimed at integrating knowledge," says Wolff. "Graduate programs are custom-designed; they are much more focused on a specific topic. This experience helps students understand what that's like."

The undergraduate research program is extremely valuable, but also highly competitive. According to Wolff, the college receives more than 100 applications for the 32 available slots, and most interns have a 3.4 grade point average or better. Successful students will have the opportunity to work with faculty members on their projects, and perhaps even present their findings at conference. Regardless of whether they take their research to a conference, all summer interns participate in a fall college-wide luncheon and public poster session to showcase their work.

Thanks to the Quality Fund Initiative, the College of Engineering will be able to offer even more paid research positions to undergraduates in summer 2006. The quality fund is the one percent of student tuition set

aside to finance proposals to benefit students at MSU. The college submitted a successful proposal to sponsor additional undergraduate interns. They will add a number of paid positions to the pro-

**"The skills I've learned have prepared me for graduate school and the job market."**

**– Ee Foong Lee, CSE senior**

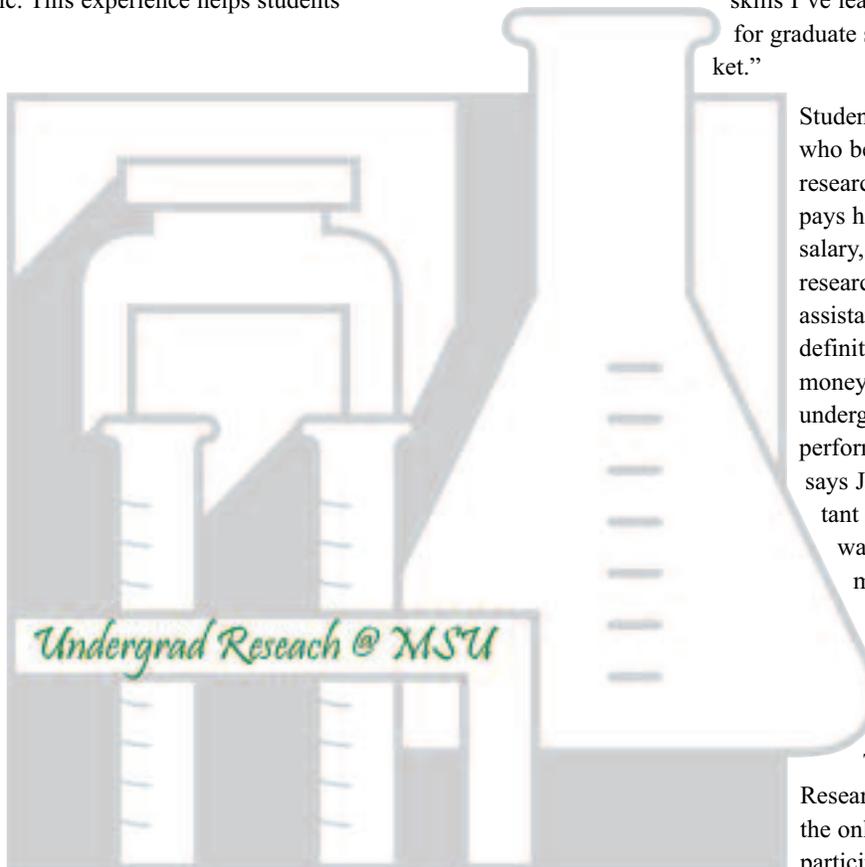
gram, and are considering offering employment during spring and fall semesters.

This is great news for students, according to computer science and engineering senior Ee Foong Lee, who worked with Li Xiao, assistant professor, in summer 2005 studying radio signals and ultrasound. "This experience will definitely help me in the future," says Lee. "The skills I've learned have prepared me for graduate school and the job market."

Students aren't the only ones who benefit from the summer research program. The college pays half of the student's salary, meaning that faculty researchers can get full-time assistants for half the cost — a definite perk when grant money is spread thin. "My undergraduate research intern performed extremely well," says Jonathan Shapiro, assistant professor. "Our project was not something that most undergrads could do, and the quality of his systems skills brought immeasurable value to our work."

The Undergraduate Research Intern Program is not the only way that students can participate in faculty projects.

Many contract directly with instructors to perform research for pay or credit. The Honors College also funds paid research opportunities for the top five percent of incoming freshmen. According to Wolff, the emphasis on participation in faculty research is all part of the presidential expectation that 95 percent of faculty interact with undergraduates in a meaningful way. "Undergraduate student research is real in the College of Engineering," says Wolff. "There are opportunities at all levels."



**"Undergraduate research is real in the College of Engineering. There are opportunities at all levels."**

**– Thomas F. Wolff, associate dean of undergraduate studies**

# Student Pipeline

## CSE Student Spends Spring Break Helping Others



Chad Meiners

It's no surprise that PhD student Chad Meiners wanted to go somewhere warm for spring break. It's what he did when he got there that broke all the college spring break rules. Meiners and other students spent their week of freedom in New Mexico visiting Bandelier National Park, Petroglyph National Park, San Ildefonso Pueblo and San Juan Pueblo. There

the students met with Pueblo elders and leaders to learn about their culture and the challenges that the people face. Meiners and the others helped the San Ildefonso prepare some of their woodlands for a controlled burn to restore the habitat.

## Sascha Konrad is Honored as 2005 Most Outstanding Graduate Student in CSE



Sascha Konrad

For his superb academic and publication record, work in the Software Engineering and Network Systems (SENS) Laboratory and leadership in the International Student Association (ISA), the Department of Computer Science and Engineering named Sascha Konrad the Most Outstanding Graduate Student for 2005. Konrad received his intermediate diploma at the University of Kaiserslautern, Germany in 2001.

He earned a master's degree at MSU in 2003 and is currently working on his PhD with Professor Betty Cheng. Konrad maintains a 4.0 graduate school grade point average and serves as the ISA financial officer. His research has centered on safety-critical industrial applications and he was recently awarded a summer internship at Siemens to apply his research to their automations and control systems areas.

## Annual CSE Poster Workshop: An Impressive Display

The annual CSE Poster Workshop on April 8 chronicled recent discoveries and advancements in research. A total of 62 teams took part in the workshop. Each team was made up of one or more students and a faculty adviser. Entrants competed for prizes donated by the CSE Strategic Partners Council, including software packages and Notebook computers. Eighteen posters were selected by a panel of judges to be recognized for outstanding presentation and research contribution.

### Algorithms and Theory Category

**First Place:** "Optimizing Hydrogen-bond Networks in Protein-Ligand Interfaces" (Sameer Arora; Phillip Dunsbury, Leslie Kuhn; Bill Punch, associate professor; )

**Second Place:** "UR-A-MESS: Uniform Resource Allocation with Multiple Edge-Sharing" (Abishek Patil; Abdol Esfahanian, associate professor)

## CSE Student Volunteers Get High School Students SET to be MSU Engineers



Current engineering students showcase the MSU program for prospective students and their parents.

Computer science and engineering students helped pave the way for the next generation of MSU engineers February 26, 2005, at the annual Science, Engineering, and Technology (SET) Day. The open house gave prospective students and their parents an opportunity to visit the engineering building, tour the research

labs, and talk to faculty and current students. Visitors got to see demonstrations in the Embodied Intelligence Laboratory, the Genetic Algorithms Research and Applications Laboratory, the Media and Entertainment Laboratory, and the Pattern Recognition and Image Processing Laboratory.

## Bierlein Receives Scholarship from Ann Arbor Association for Women in Computing



Randeel Bierlein

Senior Randeel Bierlein was recently awarded a scholarship from the Ann Arbor Association for Women in Computing (AWC-AA). The association's scholarship program recognizes outstanding women pursuing careers in computer-related fields. Bierlein was honored at AWC-AA's Top Michigan Women in Computing Gala held in November. The Association for Women in Computing selects scholarship recipients based on motivation,

passion, thoughtfulness, creativity, skillful communication, and participation in the computing community.

**Third Place:** "Average Case Analysis of a Load Balancing Algorithm" (Christopher Osborn; Eric Torng, associate professor)

### Software Engineering Category

**First Place:** "UAF - A Distributed Adaptation Framework for Service-Oriented Overlay Streaming" (Farshad Samimi; Chipin Tang; Phillip McKinley, professor)

**Second Place:** "SzumoC++: Extending C++ with Improved Support for Concurrency" (Scott Fleming; Kurt Stirewalt, associate professor)

**Third Place:** "Metrics- and Patterns-Based Analysis of UML Designs" (Ryan Stephenson; Betty Cheng, professor)

### Intelligent Systems 1 Category

**First Place:** "Multimodal Biometric Systems" (Karthik Nandakumar; Anil Jain, professor)

**Second Place:** "FFV: Fingerprint-based Fuzzy Vault" (Umut Uludag; Anil Jain, professor)

# Computer Engineers Play Games with Their Education



Senior Scott Brodie specializes in games.

Computer science and engineering students now have the chance to turn a favorite pastime into a career opportunity through a new specialization in game design and development. The area of concentration will prepare

undergraduates for jobs in the inherently multidisciplinary computer game industry by teaming up students from CSE, telecommunications, information studies and media (TISM), and studio art.

The program's unique courses provide intensive specialized instruction in game design and development and give students hands-on experience working on a collaborative project with industry-based clients. Students learn design fundamentals, principles, and theory, but they also learn about the history of digital games and explore issues involving the benefits and controversies games have brought to our society.

Although the traditional focus of the industry has been entertainment, there are a number of companies that develop games for education, military training, and advertising. The game design field is a dynamic industry that fluctuates to meet the demands of increasing consumer sophistication, but CSE senior Scott Brodie feels that MSU's fledgling curriculum is ready to rise to the challenge.

"I've been extremely impressed with all of the professors and faculty involved with the program, and the relevancy of the material they cover," he says. "It would be very easy to focus on the current

technology for making games, but those setting up the program do a great job in helping students prepare for the reality of a rapidly changing industry."

Brodie is the president of Spartasoft, an MSU student organization devoted to all aspects of game design and development. The group's membership is largely composed of CSE majors, but includes other talented students from a diverse range of backgrounds. Spartasoft's most recent project, Ballistic, was demonstrated at the Future Play 2005 International Conference on the Future of Gaming held at MSU October 13 – 15. The challenge of the game is to guide a ball through a maze-like level by manipulating the surrounding environment. Overall reactions to the game were positive, and the group received some useful feedback on ways to improve their project.

Brodie says his involvement with the specialization will allow him to demonstrate to game studios that he takes the profession seriously. "I think the fact that I now have a class that I can dedicate to building up a solid game portfolio is extremely beneficial," he says. "Whereas students in Spartasoft have had to organize projects on their own, the specialization offers a lot of helpful structure and built-in milestones to make sure that students will actually complete something that they can show off at a future interview."

Designing games is fun and rewarding work, according to Brodie, but it can be difficult. As for his plans after graduation — well, that's easy: "Hopefully I'll land a job at a major game studio, and help it create the next big hit."

Additional information about Spartasoft, including game demos, can be found at <http://www.spartasoft.msu.edu>.

~ Kim Thompson

**Third Place:** "Non-homogeneous Poisson Point Process Models for Fingerprint Individuality" (Yong Fang Zhu; Anil Jain, professor)

**Fourth Place:** "Regularized Parameter Estimation for Facial View Synthesis" (Miguel A. Figueroa-Villanueva; George Stockman, professor)

**Fifth Place:** "A Computational Framework for the Motor Cortex and Its Development" (Matt Luciw; John Weng, professor)

## Intelligent Systems 2 Category

**First Place:** "A Maximum Coherence Model for Dictionary-Based Cross Language Information Retrieval" (Yi Liu; Rong Jin, assistant professor)

**Second Place:** "A Quasi-Optimally Efficient Algorithm for Independent Component Analysis" (Nan Zhang; John Weng, professor)

**Third Place:** "Efficient Detection of Arbitrary Shaped Clusters in Data Streams" (Jing Gao; Pang-Ning Tan, assistant professor)

**Fourth Place:** "A Statistical Model of Context Question Answering" (Shaojun Zhao; Joyce Chai, assistant professor)

## Systems Category

**First Place:** "TDMA Based Reliable and Energy-Efficient Communication Services for Sensor Networks" (Mahesh Arumugam; Sandeep Kulkarni, assistant professor)

**Second Place:** "QoS Management of Supermedia Enhanced Teleoperation via Overlay Networks" (Zhiwei Cen; Yang Liu; Amit Goradia; Matt Mutka, associate professor; Ning Xi, professor)

**Third Place:** "Sensor Localization in an Obstructed Environment" (Chen Wang; Li Xiao, assistant professor; Rong Jin, assistant professor)

# Alumni Pipeline

**James Avery** (BS '72) is an associate professor in electrical and computer engineering at the University of Colorado, Boulder, where he teaches computer engineering and freshman design and conducts research on atmospheric remote sensing and radar development. He earned his PhD in analytical chemistry at the University of Illinois in 1978, and he was a member of the chemistry faculty there for four years.



Julie Louis-Benaglio

**Julie Louis-Benaglio** (BS '79) received the Department of Computer Science and Engineering Distinguished Alumni award during the Alumni Awards Banquet May 7 at Kellogg Hotel and Conference Center. The Distinguished Alumni award recognizes an alumnus who has distinguished himself/herself as a leader in the computer science and engineering field through profes-

sional contributions, public service, and personal accomplishments. Louis-Benaglio recently celebrated her 25th anniversary with Hewlett-Packard in Livonia, Michigan. She has provided technical consulting to HP customers across the United States, and overseen numerous customer computer system implementations. Over the years HP management has honored her with Most Valuable Player and Top Performer awards for outstanding customer support.

Julie has encouraged females in technical fields through her participation in the Society of Women Engineers (SWE) and her mentoring activities in local schools. She has judged science fair experiments and spoken at several career day assemblies to encourage girls to pursue technical studies. She has also served for more than 10 years as professional field counselor to MSU's student chapter of SWE.

Julie has served on the alumni board of directors for the College of Engineering and various advisory committees for the CSE department. She recently established the Julie Louis-Benaglio Endowed Excellence Fund, which supports the Department of Computer Science and Engineering and the MSU student chapter of SWE. With this endowment, which includes HP matching funds, Julie's intent is to provide scholarship funds for female students pursuing a degree in comput-

er science and engineering and to support SWE activities such as attendance at national conferences.

Julie's husband, Jim, is an electrical engineer and University of Michigan graduate. Their mutual love of music and guitar playing brought them together in a church folk group. Their school rivalry is obvious only on MSU vs. U of M game days. Jim and Julie have two daughters, Jessie and Jamie, both of whom demonstrate strengths in math, music, and sports. Their collegiate preferences are undetermined, but Julie has made clear her allegiance to the green and white.

**Dustin H. Bettendorf** (BS '01) joined Warner Norcross & Judd LLP, a Michigan law firm, in November 2005. As an associate in the firm's technology and intellectual property group, Bettendorf concentrates his practice on patent law, including patent prosecution, infringement, and other issues. He received his JD from DePaul College of Law in 2004.



Molly Brennan

**Molly Brennan** (BS '82) was awarded the MSU Alumni Association (MSUAA) Service Award on October 20 during the Grand Awards ceremony at the Kellogg Hotel and Conference Center. Brennan lives and works in Farmington Hills as an engineering group manager for the Truck and Bus Division of General Motors Corporation. After a brilliant career at MSU, during which she was a two-time

All-American in track and MSU Sportswoman of the Year in 1982, as well as one of the top two students academically, Brennan won a Rhodes Scholarship to Oxford University, England. She later joined General Motors and won the first World Solar Challenge, setting four solar and electric land speed records in the *Guinness Book of World Records*. She became Tau Beta Pi's first National Laureate recipient and has served in a wide range of community positions.

As an alum, Brennan has been involved in both MSU athletic and academic activities. She served on MSU's Capital Campaign 2000 and on committees for the Campaign for MSU. Brennan was also a keynote speaker at MSU's 1990 fall commencement ceremonies. She has been a member of the MSUAA's

National Alumni Board. She is currently the president of the Honors College Alumni Board. She and her husband, William Derlin, have made many donations to MSU and endowed a joint Honors College/College of Engineering student scholarship. She served as a national committee chairperson for the MSU Student-Athlete Academic Center campaign. She has won numerous awards, including the 1996 Nell Jackson Outstanding Alumna Award and induction into MSU's Athletics Hall of Fame.



*Niharika Joglekar*

**Niharika Joglekar** (BS '05) was awarded a fellowship to attend the Richard Tapia Celebration of Diversity in Computing Conference October 19–22, 2005, in Albuquerque, New Mexico. Joglekar, who served as the co-president of the MSU chapter of Women in Computing (WIC), was selected from a pool of hundreds of applicants to attend this year's program. The annual conference celebrates the

technical contributions and career interests of women and ethnically diverse people in computing fields.

Niharika, who was born in Mumbai, India, came to the United States in 2000 and enrolled at MSU in 2001. After graduation from MSU, she joined IBM in Rochester, Minnesota as a software engineer. Joglekar says the most important thing she took away from the conference was confidence to continue her education in a male-dominated field.

“There are so many women who drop out or don't go to graduate school because they don't like the culture,” says Joglekar. “There are more and more jobs in computer science and fewer and fewer diverse people. We need to remedy that — to say ‘Hey, there are successful people in this field who look like you.’”

The Tapia conference was sponsored by the Association for Computing Machinery (ACM), IEEE Computer Society, and the Computing Research Association (CRA). Additional supporting organizations included the National Science Foundation, the Rice-Houston Alliance for Graduate Education and the Professoriate, IBM, Google, and Microsoft.

**Christopher Krupiarz** (BS '89) is a senior professional staff member at The Johns Hopkins University Applied Physics Laboratory. He wrote software for the Mercury Messenger spacecraft and is currently working on designing and testing communications protocols for the telecommunications and navigation division of NASA's Mars Exploration Program.

**Tony Lewis** (BS '81) is a senior information security analyst with Intuit, the company that produces Quicken and Turbo Tax software. He coordinates the security awareness program, maintains information security policies, and conducts security assessments of Intuit applications.

**Alan Russell** (BS '69, MS '71) is a senior account manager for global information technology at Air Products & Chemicals, Inc. In this position he is a liaison between their 900-person IT department and the many users of IT services, including users in nearly 40 countries, many of which he has had the opportunity to visit.



*James Von Ehr II*

**James Von Ehr II** (BS '73) was recently appointed to the board of directors for Foresight Nanotech Institute. Foresight is the leading think tank and public interest organization focused on nanotechnology. Von Ehr is the founder and CEO of Zyvex Corporation, the world's first nanotechnology company.



**MSU DEPARTMENT OF  
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