Driven to Design

CSE professor Gary Meyer advances automobile design with graphic visualization software

By Pamela Vold

CSE faculty member Gary Meyer may have gotten up close to the newest cars at the Ford Motor Company during his recent sabbatical in Michigan, but the only thing he took for a test drive was his software.

Meyer had a chance to see his work tested in the real world during his sabbatical year when he brought it to design students at the College of Creative Studies and the automakers at Ford Motor Company. His work focuses on color synthesis and color reproduction techniques for computer graphics. Meyer and CSE student Clement Shimizu spent a semester working with auto design students at the College of Creative Studies (CCS) before taking their work to the Ford Motor Company. CCS is one of a select few schools in the country with a Transportation Design specialty.

Meyer worked with students undergoing intensive technical and creative training of the design development process. Though the course focused on traditional automotive design, drawing sketches of the car and then turning those sketches into physical models with sculpting clay, Meyer integrated his software into the process. Meyer and Shimizu also had the opportunity to see their software used by experienced automotive design professionals when they brought it to the Ford Motor Company. At Ford, they scheduled a special event where staff members tested the software on a sample color concept, and then took a panel of a car and painted it out, testing the resulting paint against the computer model.

Meyer’s computer graphics software and hardware make it possible to create computer graphics programs that can solve automotive paint engineering problems. His software creates surface reflection models that simulate the appearance of automotive paint, while also allowing the students and automakers to adjust the color, customizing the paint color to their specifications. The software generates a reading that the paint manufacturer, Dupont, can use to create that color.

(Story continued on page 14)
The Bay Area is a huge employer for our graduates and we wanted to connect people at this important industry hub. The Computer History Museum in Mountain View was the perfect backdrop for the event. We were pleased to have the Dean of the Institute of Technology, Steve Crouch in attendance supporting the event with 80 alumni and friends. The group gathered after work to unwind and connect locally with people they hadn’t seen in years.

The speaker at the event was CSE alumnus and Google Fellow Jeff Dean, the 2007 recipient of the CSE Distinguished Alumni Award. Dean’s contributions at Google range from low level libraries to high level components and services, all used extensively at Google as building blocks. Dean has helped design and implement five generations of the software to handle searches entered on Google.com. He delivered a spirited talk about his work at Google, their current systems and future directions.

Connecting with alumni is important to us. Without their help, the department could never achieve the level of success it has. All types of alumni participation are valuable, from attendance at local and national events to financial support for students through scholarships and fellowships. CSE alumni are necessary to provide industrial contacts and to help foster partnerships between the department and industry. Their feedback, their perspectives, their mentoring, and their faculty support through chairs and professorships, are all aspects that help us provide high quality public education.

We are always happy to hear from you about your career and interests, and we are pleased to involve you in any of our events. Please keep in touch. I look forward to hearing from you soon.

— Vipin Kumar, CSE Department Head and William Norris Professor
Local and national news

CSE Associate Department Head Joe Konstan was interviewed on WCCO 4 News at 10, on Tuesday, October 21st. Konstan was featured in an interview as part of the Good Question feature. The feature’s Good Question was about text messaging.

New CSE Assistant Professor Dan Keefe’s research was featured recently in an online interview for the Discovery Channel. The interview featured discussion about Keefe’s work turning X-rays and CT scans into 3D animations.

CSE Associate Department Head Joe Konstan’s work with Simon Rosser in epidemiology was featured in the September-October issue of the University of Minnesota Alumni Association magazine. The article highlighted Konstan and Rosser’s work on the world’s first online HIV risk-reduction intervention, called SexPulse. The system, five years in the making and made possible by a $3.5M federal grant, is currently in the testing phase.

Fox 9 news featured a story about Cyclopath, the geowiki for Twin Cities bicyclists created by Associate Professor Loren Terveen and Ph.D. student Reid Priedhorsky. The website features a comprehensive map of bike paths and streets in several counties in the Twin Cities metro area and allows users to edit the content of the map. Cyclopath enables bicyclists to build a comprehensive, up-to-date information resource by and for the community. Cyclopath has also been featured in the Star Tribune and in the Minnesota Daily.

MinnPost.com, a Twin Cities newspaper and online news source, posted the recent CSE newsletter story about CSE professor Dan Boley’s work on an ethanol project with chemical engineering professor Friedrich Srienc. The story also highlights the efforts of CSE graduate student Dimitrije Jevremovic, whose work is supported by a Traineeship Program award through the University of Minnesota’s Biomedical Informatics and Computational Biology program.

A story in the Wall Street Journal featured CSE professor John Riedl as an expert in personalization technology, focusing in on his evaluation of the use of recommender systems used by Web sites such as Netflix and Amazon. In the story, the benefits and perils of personalized computer recommender technology are debated. Riedl emphasized the need for people to rely on both computer recommendations and human wisdom to make judgments about things like what books to read or what movies to see.

GeoInformatica, a journal devoted to advances in Computer Sciences for GIS, was recently ranked in the top tier of journals in the interdisciplinary field of GISciences. A number of CSE faculty members, alumni and staff have nurtured the journal since the journal began 11 years ago. CSE professor Shashi Shekhari is Editor-in-Chief. See page eight for more.

CSE happenings

Richard Stallman visits University

Controversial free software advocate Richard Stallman spoke to an excited crowd on campus in October. Stallman presented a talk about the Free Software Movement, which campaigns for freedom so that computer users can cooperate to control their own computing activities.

CSE Faculty at the Minnesota State Fair

CSE Professor Nikos Papanikolopoulos and his students impressed the crowds with Scout robot demos at the Minnesota State Fair in August. Professor Maria Gini and graduate students Elizabeth Jensen, Maitreyi Nanjanathm and Laurel Lewis also did demos with the AIBO robot dogs. The exhibits displayed the impact of science, engineering and mathematics to people’s everyday lives.
Karen Swyter recently joined CSE department’s accounting group. Karen handles purchasing in the department. She came from the city county Federal Credit Union, where she was an IRA Specialist. She enjoys travelling and spending time with her new grandson.

Noel Phillips came to the CSE department from the University of Minnesota press. She keeps busy in the office with payroll, and when she’s not at her desk, she’s in the building taking C++ classes, or at home with her puppy Stitch.

Pamela Vold joined the CSE department in September as the new Communications Coordinator. Recently relocated from San Francisco, California, she enjoys hiking and exploring the metro area with her family.

Math/Science Fun Fair
Professors Maria Gini and Nikolaos Papanikolopoulos represented the CSE at the Institute of Technology’s Math/Science Fun Fair on Saturday, September 20, 2008. Gini, Papanikolopoulos and department students were on hand providing live robot demos for kids and parents in the Great Hall of Coffman Memorial Union. The fair provides a hands-on math and science experience and gives young people a chance to see the excitement that a career in science, engineering or mathematics provides.

CSE/DTC Host Kids Tech Camp
CSE and the DTC hosted the 4th annual University of Minnesota CSE/DTC Technology Day Camp in August. This five-day camp gets inner-city middle school girls and minority groups interested in science and technology while exposing them to the opportunities of higher education. These students are from demographics that are underrepresented in high-tech fields. We are always looking for sponsors for the program. For more information, send an e-mail to: industry_relations@cs.umn.edu.

CSE to Host Code Camp
CSE will host this year’s Code Camp. The camp is a biannual event held in the Twin Cities area which seeks to provide an off-hour forum for the development community to speak and share ideas for them to come and enjoy. Code Camp will be held in April 2009. More information can be found at www.twincitiescodecamp.com.

Faculty speaking engagements
CSE professor Jaideep Srivastava gave the keynote address in October at the International Conference on Computer and Information Systems (ISCIS) in Istanbul, Turkey.

CSE Bay Area Alumni Gathering
CSE alumni in the San Francisco Bay Area gathered together in August to meet and mingle. The group had a great time networking and catching up and Google Fellow and CSE alumnus Jeff Dean spoke to the crowd. The next gathering is scheduled for August 2009.
Volkan Isler joins CSE faculty

The CSE department is pleased to welcome Volkan Isler as an Assistant Professor. Isler joined the department in August 2008 from Rensselaer Polytechnic Institute in Troy, New York. He earned his doctorate in computer science at University of Pennsylvania and specializes in robotic sensor networks -- networks of robots equipped with communication, computation and sensing capabilities. In 2008, he received the National Science Foundation’s Young Investigator Award (CAREER).

Since joining the department, Isler has been working on environmental and habitat monitoring applications where robotic sensor networks are utilized for collecting a wide variety of data.

Isler brings with him two Ph.D. students Nikhil Karnad and Onur Tekdas to help him set up his Robotic Sensor Networks Lab in the CSE department. This semester he is teaching a graduate course based on his research.

Dan Keefe joins CSE faculty

The CSE department welcomes Dan Keefe as an Assistant Professor. Keefe joined the department this summer. He earned his doctorate from Brown University where he was a member of the Brown University Scientific Visualization Lab. Keefe specialized in visualization, interactive techniques, and graphics for interdisciplinary applications in science. His academic record includes more than a dozen publications, including journal and conference papers. His work has also been published and exhibited within the digital art and design community. He was nominated for the ACM Doctoral Dissertation Award and Keefe is a member of the Association for Computing Machinery and IEEE.

Since joining the department, Keefe has worked to establish research collaborations around the university, including with faculty in mechanical engineering, physical therapy, and design. His active research projects include analysis, modeling, and visualization of human and animal biomechanics, and development and evaluation of techniques for data exploration using large-format computer displays.
Head Vipin Kumar on winning the ICDM 2008 Outstanding Service Award. The award is given to one individual or one group who has made major service contributions that have promoted data mining as a field and ICDM as the world’s premier research conference in data mining.

Out of several distinguished nominations this year, Kumar won with a nearly unanimous vote of the committee. The award will be presented at ICDM 2008 conference in Pisa, Italy, December 15-19, 2008.

We are pleased to announce that Yongdae Kim, Stergios Roumeliotis, and Eric Van Wyk have been promoted to Associate Professors this year.

The University honored inventors who have had a patent issued and/or a license signed between the 2005-2008 fiscal years in an awards ceremony on September 17 at the McNamara Alumni Center. Two CSE faculty members were involved in the software licensing recognition - George Karypis and Nikos Papanikolopoulos.

Venkatesan Packirisamy, Yangchun Luo, Wei-Lung Hung, Antonia Zhai, Pen-Chung Yew and Tin-Fook Ngai took the best paper award at the 26th IEEE International Conference for Computer Design (ICCD) for their paper “Efficiency of Thread-Level Speculation in SMT and CMP Architectures - Performance, Power and Thermal Perspective.” The conference was held at Lake Tahoe, CA on October 12-15, 2008.

ECE student Shuo Guo and CSE Assistant Professors Tian He with Mohamed Mokbel won a best paper award at the fifth IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2008) for the paper “On Accurate and Efficient Statistical Counting in Sensor-Based Surveillance Systems” by Shuo Guo, Tian He, Mohamed Mokbel, John A. Stankovic, and Tarek F. Abdelzaher. IEEE MASS had a 13% acceptance rate for regular papers this year. The paper was selected from over 250 submitted.

CSE professors John Collins and Maria Gini, along with CSE alumnus Wolf Ketter (Ph.D. ’07) at Erasmus University in Rotterdam, received a Best Paper Award for the paper entitled, “Flexible Decision Support in a Dynamic Business Network,” at the Smart Business Network conference in Beijing, China. The conference focused on issues surrounding the development of smart business networks.

In the paper, Collins, Gini, and Ketter describe the design of a service oriented architecture that facilitates flexible managerial decision making in dynamic business networks. They have tested this architecture in the MinneTAC trading agent, designed to compete in the Supply Chain Trading Agent Competition.

Professor Loren Terveen and student Reid Priedhorsky published a paper that was awarded an Honorable Mention at the highly selective ACM Conference on Computer Supported Cooperative Work (CSCW). The title of the paper is “The Computational Geowiki: What, Why, and How.”

Professors John Riedl, Joe Konstan, Loren Terveen, Mark Snyder (Psychology), Ching Ren (CSOM) and Bob Kraut (Carnegie-Mellon University) received official notification from the National Science Foundation that their $2.4M grant “Understanding Online volunteer Communities: Toward theory-Based Design” has been funded.

CSE professor Nikos Papanikolopoulos was recently elected Vice President of the IEEE Robotics and Automation Society (RAS) for Conference Activities. The RAS Conference Board coordinates the scheduling, planning and technical and logistical organization of the conferences sponsored by the Society.
**CSE Undergraduate Grant Miller**, an Honors senior, has been awarded a Katherine E. Sullivan Scholarship for 2008-09. The University’s Sullivan Scholarship supports a fifth year of undergraduate study abroad for selected students from any University of Minnesota campus. The scholarship covers all or a portion of in-country educational expenses, room and board, essential daily expenses, and round-trip transportation to the study site.

Miller studied Japanese for three years at the University and he will spend the year at Sophia University in Tokyo as part of the Bilateral Exchange Program. The University Honors Program said that he expects to take advanced language courses and courses on Japanese culture, history, society, and religions. In 2007, Miller was also selected for Honorable Mention in the Computing Research Association’s (CRA) Outstanding Undergraduate Award competition for 2008.

**CSE graduate student, Rohit Gupta** received the 2008 ACG/Olympus Award and 2008 ACG Presidential Poster Award for the paper entitled “Colon Cancer Not Prevented By Colonoscopy” at the American College of Gastroenterology (ACG) annual scientific meeting, October 3-8, 2008. The awards are supported by a grant from Olympus and each award consists of a stipend in the amount of $1,000.

His work was done in collaboration with Dr. Michael Steinbach and CSE Department Head Vipin Kumar, Dr. Gavin Harewood from Beaumont Hospital, Dublin Ireland and Brian Brownlow, Robert Domnick and Dr. Piet de Groen from Mayo Clinic Rochester. In this work, electronic medical records of over 5 million patients from Mayo Clinic, Rochester have been used to estimate the miss rate for detection of colorectal cancer or advanced adenomas during colonoscopy. The paper also investigates the possible endoscopist- and patient-related risk factors for the development of colorectal cancer despite colonoscopy.

Gupta’s work is among the only four out of approximately 1200 total accepted papers that received two awards.

CSE graduate student **Brett Hemes** recently finished work on a new tumbling robot as a result of his work with CSE professor Nikos Papanikolopoulos. The robot serves as a tool to demonstrate and test his research, aimed at producing generalized methods for controlling and designing tumbling robots. He demonstrated the robot at a workshop with representatives for the National Science Foundation and members of industry, hosted in the Digital Technology Center.

**Max Harper** and **Reid Priedhorsky** were two of only nine students nationwide invited to present at IBM Research Watson HCI Symposium. Harper presented on the Design and Computation Issues in Q&A Sites, and Priedhorsky presented on the Use and Utility of Computational Geowikis.

**CSE Scholarship Awards for 2008-2009**

**Lando Scholarship:**
- Amirhsein Kiani
- Matthew Kokotovich
- Andrew Tran
- Jordan Focht
- Josh Mattila
- Justin Johnson
- Evan Long
- Alexander Lau

**Thomson West Scholarship:**
- Loren Fiore

**ESRI Scholarship:**
- Matt Bosio

**CSE Undergrad Honor Students for 2007-2008**

**Matthew Broten**
- Title: Using a neural network to filter comment spam
- Advisor: Dan Kersten

**Michael Levin**
- Title: CellWriter: grid-entry handwriting recognition
- Advisor: Nikos Papanikolopoulos

**James Parker**
- Title: Circuit learning with side information
- Advisor: Nick Hopper

**Adam Momsen**
- Title: Hybridization of feature matching and 3D model comparison for object recognition
- Advisor: Nikos Papanikolopoulos

**John T. Olds**
- Title: Predicting for Productivity: Folder Recommendation Strategies for Avid Bookmarks
- Advisor: John Riedl

**Zachary Snow**
- Title: Tac: An Adaptable and Generic Interactive Theorem Prover
- Advisor: Gopalan Nadathur
“Free software is a matter of freedom not price.” These were Richard Stallman’s opening words on October 21, 2008. Stallman elaborated on his philosophies for nearly two hours before taking questions from the audience.

The audience for the event, which was co-sponsored by the University of Minnesota Software Engineering Center (UMSEC) and the student Association of Computing and Machinery (ACM) group, filled Willey Hall.

Stallman pioneered the concept of “copyleft,” the practice of using copyright law to remove restrictions on distributing copies and modified versions of a work for others and requiring that the same freedoms be preserved in modified versions. Stallman is the main author of the most widely used free software license, the GNU General Public License (often erroneously referred to as Linux). He has been described as the Napster of free software.

Yet in his talk, “The Free Software Movement and the GNU/Linux Operating System,” Stallman tried to make a distinction. He explained the beliefs of the Free Software Movement, which campaigns for the freedom of computer users to cooperate and control their own computing activities.

Stallman asked the audience to consider the Free Software Movement’s freedoms like the freedom of speech, as opposed to free pizza.

Stallman outlined what he considers the four freedoms as software users: the freedom to run the program, for any purpose (freedom 0), The freedom to study how the program works, and adapt it to your needs (freedom 1), the freedom to redistribute copies so you can help your neighbor (freedom 2), and the freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3).

He gave a compelling argument, informing an already savvy audience on the ways many programs spy on their users, with features that report back to the company the users’ actions.

Stallman urged his audience to never tolerate Digital Restrictions Management (DRM), which refers to access control technologies used by hardware manufacturers, publishers and copyright holders to limit usage of digital media or devices. He cited the most popular example of this as DVD players, making the case that because of the restrictions there has been no competition in DVD players and no progress in DVD player in the 20
The crowd was encouraged to protest with Stallman in front of Borders bookstores, which sell the Sony Reader. He claimed that “publishers can gain unprecedented power by compelling readers to pay, every time they read a book, listen to a song, or watch a video.”

If anyone in Willey Hall had hoped for some vocal protesters of Stallman and the Free Software movement, they were disappointed. The audience remained quiet and attentive, even when urged to give up their cell phones, ipods and DVD players.

“Programmers cannot be perfect, but they can respect your freedom,” he said. He likened the idea of free software to car mechanics, carpenters and plumbers. Like those professionals, in a free software society, programmers would be highly necessary as an industry to help users maintain and customize their software.

Stallman said, “We started the GNU Project with a specific overall goal: to create a free software operating system.” The scope of GNU seeks to do any job that computer users want to do via free software.

The GNU operating system was created nearly 25 years ago as a Unix-like operating system. GNU’s kernel isn’t finished, so GNU is used with the kernel Linux. The combination of GNU and Linux is the GNU/Linux operating system, now used by millions.

Stallman ended his lecture with an auction of his gnu stuffed toys as a fundraiser. Before taking questions from the audience he issued the audience an invitation: “Everyone is welcome in the free world.”

Neal Ford, Software Architect and Meme Wrangler at ThoughtWorks, will provide this year’s keynote address on the frustrations of modern knowledge workers in their quest to actually get some work done, and solutions for how to gird yourself against all those distractions.

Code Freeze is an annual winter symposium focused on best practices in software engineering and development. Software engineering professionals and academics will join together to discuss business and technology innovations.

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Thursday January 15, 2009
8 a.m. - 5 p.m.

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Hubert H Humphrey Center
301 19th Avenue South, Minneapolis
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CSE professor Rui Kuang’s work is providing an important step towards successful cancer treatment. He is advancing personalized medicine by creating graph-based machine learning algorithms and models to both better predict cancer outcomes and identify causative cancer genes.

When the Human Genome Project set the task of learning the order of the 3 billion units of DNA that make up the human genome, it hoped to someday pinpoint specific genes that, when malfunctioning, cause diseases like cancer. The project gave birth to personalized medicine, a field that takes into account each person’s unique information to create individualized treatments for that person.

Using biological indicators to predict cancer prognoses is accelerating in importance in cancer research. Genomic information can inform us on the molecular mechanisms that underlie cancer development and progression. Kuang notes “this is data that is helpful in giving a patient’s prognosis, whether they need to undergo an aggressive treatment like chemotherapy, or if they need something less aggressive.”

Yet personalized medicine has faced many setbacks. One of the main barriers to progress has been identifying the biomarkers for disease. With 3 billion units of DNA in the human genome, finding biomarkers can be like finding a needle in a haystack. Diseases like cancer don’t have a single biomarker, but can have many, with complex correlations.

For Kuang, “the data is very noisy. It has been hard to distinguish usable information from within the noisy data.”

It has been difficult for researchers to consistently find these biomarkers. Two studies to find biomarkers in 2002 and 2005 found 70 and 76 biomarkers for breast cancer, with only 3 shared biomarkers between them. “The problem worsens when the consistency of the independent studies has been called into question in cross-platform validation.”

Additionally, scientists now realize that many diseases like cancer are the result of the interactions of more than one gene. Building reliable predictive models from multiple complementary genomic data has not been easy.

To find more consistent biomarkers from independent datasets, Kuang’s group decided to utilize both difference in patient phenotypes and modular structures among genes.

From there, Kuang’s research team proposed to use graph-based machine learning techniques to implicitly model the hidden structures in heterogeneous biological data to form consistent discoveries across independent datasets. Other complementary genomic information such as pathway information and protein-protein interactions can also be used to aid model-building and biomarker discovery in their algorithms.

Kuang said that “We wanted to show that our new algorithms and models can result in more consistent discoveries across independent datasets and better prediction performance when complementary genomic information is used.”

Kuang and his group used five independent large-scale breast cancer datasets which were generated for studying breast cancer metastasis by different research groups. They measured the classification...
Alumni

CSE Alumnus Arvind Accepts Outstanding Achievement Award

CSE alumnus Arvind accepted the Outstanding Achievement Award in a special ceremony held in Walter Library. The award is the highest nondegree award conferred upon distinguished alumni by the University. Following the ceremony, he presented his talk Mobile Phones and Multicores: Programming Nightmare or Architectural Renaissance to a packed room.

Alumni achievements

Brian Bailey (M.S. 1997, Ph.D. 2002) received tenure at the University of Illinois-Urbana, where he is an associate professor in computer science.

Mark Claypool (M.S. 1993, Ph.D. 1997) was promoted to full professor in computer science at Worcester Polytechnic Institute.

Jonathan Herlocker (M.S. 1998, Ph.D. 2000) was promoted to Associate Professor with tenure at Oregon State University within the School of Electrical Engineering and Computer Science.

Bosco Tjan (Ph.D. 1997) recently received tenure at the University of Southern California, where he is a professor in psychology.

Amit Verma (M.S. 1998) is now Principal Product Manager at Oracle.

Luis Ortiz (B.S. 1995) has joined the Department of Computer Science at Stony Brook University (SUNY) as an Assistant Professor.

Hui Xiong (Ph.D. 2005) recently received the 2008 Junior Faculty Research Award at Rutgers Business School where he is an Assistant professor in the Management Science and Information Systems Department.

Justin Chapweske is the Founder and CEO of Onion Networks, Inc., a company based in Minneapolis, Minnesota that provides file transfer acceleration and network infrastructure software for enterprise applications.

Chris O’Malley (B. S. 1983) was recently named Executive Vice President and General Manager of CA’s Mainframe Business Unit.

In Memoriam

Patrick Coleman Saunders (M.S. 2006) passed away in an accident in September at age 30. He graduated from Macalester College in St. Paul, MN, before coming to the University of Minnesota. Saunders’ study focused on graphics and visualization, with Victoria Interrante. Saunders’ work in the department included a virtual paint palette application for artists to select colors out of an existing picture.
**Alumni Spotlight:**

**Mark Coyle**

This January, Mark Coyle will begin another phase of his career. Coyle, who has worked at Oracle and its since-acquired company Siebel Systems for 13 years, is leaving his position as Vice-President to move to PIX System (http://www.pixsystem.com), a company that provides a platform for collaborating and managing all stages of entertainment production. The move is a transition from a multi-national corporation with 90,000 employees to one with a current staff of around 35.

It’s a major change in corporate environment, and one which Coyle looks forward to with excitement. “I think it’s important to change every decade, to take on new challenges and to take what you’ve learned in life to a new application.” Coyle will apply his knowledge when he takes on the role of Vice-President, managing research and development, product management, and quality assurance. The position builds on his years of work in the San Francisco Bay Area, where he has worked for Oracle, Siebel Systems and Hewlett Packard.

Coyle is not intimidated by the changes in store, “I’m being entrusted with a great responsibility, with the payoff of watching something expand and grow.” Coyle has seen rapid expansion and growth before, at Siebel Systems, in San Mateo. During his tenure Coyle watched that company grow from 400 employees to 7500.

PIX System, based in San Francisco, seeks to close the time and distance gap between movie-making professionals with an on-demand, on-line collaboration and project management system. Coyle says, “The movie industry has been working with old technology of actually sending CDs, DVDs and actual film to professionals who may not be close by. [PIX System] helps directors make better movies, by allowing them to collaborate more widely.”

Coyle credits his Ph.D. studies in CSE with giving him the framework to learn and research, where he worked with Shashi Shekhar and John Riedl. Since then, he has diversified his background with an MBA at UC Berkeley as well. “It’s a different side of things, learning how to decide what to build. It’s not enough to have the best technology; it’s about building what will work in a business sense.”

Coyle’s business savvy will be of use in growing a small company. While he’s greatly anticipating this new challenge, he says of Oracle, “I’ve had a really great mentor for the past seven years and been lucky to work in a place with a vast research center.”

His network at Oracle will be succeeded by the opportunity to have a huge impact in the success of PIX System. Coyle looks forward to it, “It’s a dynamic, fun place.”

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**Alumni Spotlight:**

**Bonnie Holub**

When Bonnie Holub (formerly Bennett) entered the University of St. Thomas in the 70s, Holub then thought that she would be studying business. As a required course for that major, Holub took a computer science course. Three decades later, she has a successful career and an impressive resume that includes industry, academia and non-profit research and development on her resume.

Holub credits a terrific professor, Dr. Bernice Folz for bringing out the computer scientist in her and has wonderful memories of her time at the University of Minnesota, where she pursued her MS and PhD. “I was surrounded by wonderful professors like Dr. Maria Gini, and Dr. Vipin Kumar who really took an interest in the work that graduate students were doing.” She was lucky enough to be able to work while she went to school, taking courses in the morning and then applying that knowledge in the afternoons at her work at Honeywell as Research Scientist.

As much as Holub thinks she is a computer scientist, she is a teacher as well. She spent almost 20 years at the University of St. Thomas. “I loved the interactions with students and building relationships with them.” Holub founded and directed the Artificial Intelligence/High Performance and Parallel Computing Lab in the Graduate Programs in Software (GPS) at the University of St. Thomas in St. Paul, Minnesota.

Her current project is Adventium Labs, a non-profit research and development lab, focusing on the development of advanced software applications for complex systems. The group’s core areas include security...
While most CSE alumni with Ph.D.s go on to work in academia or the corporate environment, Ajay Pandey has taken a different course. After completing his PhD in Computer Science, Pandey returned to India and resumed his career with the Indian government. “I felt that India, being an emerging economy, had great opportunities for applying my knowledge and skills.”

Today Pandey is the Managing Director and Chief Executive Officer of the Maharashtra State Electricity Distribution Company Ltd (MSEDCL), the largest electricity distribution utility in India. With over 14 million consumers, and 70,000 employees, the task of managing this utility would be daunting enough for any person, what is really astonishing is that Pandey took on that role when there was little consumer satisfaction, employee morale was at an all time low, and transmission and distribution losses were high.

Yet Pandey felt he could turn the tide, “I wanted to make significant contributions in the government sector, and I knew I could try with my knowledge of electrical engineering and computer science.” In 18 months Pandey reduced distribution loss of electricity from 32% to 22% and raised annual revenue from $3.5 billion to $5 billion.

“My exposure to the systems and technology at the University of Minnesota motivated me to work in the Indian power sector where there is a lot of work being done in energy accounting, automatic meter reading, technical loss reduction and other systems.”

Pandey came to CSE on sabbatical from his 14 years of work in the Indian government. “I chose computer science because in 1998 I believed that it would play a major role in developing economies around the globe.” Few would disagree with his assessment. It’s that kind of foresight that shaped his career.

Pandey has an impressive government resume, including Secretary of the Department of Information Technology, and Director of the Ministry of Labour, and his work is not done yet. An Indian Administrative Service officer is required to work at different positions as well as in different areas during his or her career. With an average tenure of three years at any one assignment, that means Pandey will soon be moving on to his next challenge.

He has fond memories of the department and words of wisdom for current students: “Enjoy your stay there, and always remember that you CAN make a difference!”
Design continued

Because of the unique reflective properties of metallic paint, a flat paint card doesn’t illustrate the effect of light on the contours of an automobile. Meyer’s software simulates a three-dimensional object with automobile-like contours in natural and incandescent light.

The software also allows designers to play with the color wheel, creating and changing color tones and accents. The final selection can then be provided to paint shops for a unique, custom-designed color.

The software has already been successful. DuPont, the leading automotive paint manufacturer has already purchased a license for Meyer’s software from the University. Yet, when the software was introduced to the students and designers in Michigan, Meyer and Shimizu were a bit surprised at the response.

“We thought of the people at Ford as engineers,” Shimizu said, “but we were surprised to find most of them have backgrounds in fashion design and interior design.”

Though the new software was met with excitement by the designers and students, it was initially awkward for them. “We needed to adjust our work to make it a tool that would be more comfortable for them to use.”

With access to watch the designer’s progress, Meyer had time to make changes to the interface. “I realized that we had created an engineers tool. It was successful for DuPont, where it is used by chemists. Here, the designers work is very visual, and they would have responded better to an interface that had more visual inputs.”

The team found that the students and designers were not only inspired by color chips, but that images and artifacts were brought together in mood boards to use as inspiration. Meyer’s interface has evolved to include an image database, with selectable colors to respond to designer needs.

With access to some of the inner workings at Ford, Meyer was astounded by how labor-intensive the car design process is, “there are computer graphics and tools that they use, but there is also an enormous amount of labor and skill, that requires a lot of time.”

Meyer’s software could help shorten the amount of time from concept to product, in an industry where time is of the essence. “There is definitely pressure on the American automotive industry to perform well, as there has been for several years,” said Meyer. “Being there, we definitely felt the tension at Ford to perform well and to perform quickly.”

“I think it’s good for faculty members to go out in the real world to see day to day operations with limited opportunity for analysis.” Meyer pointed out, “It’s easy for us to get a set of data that we don’t like and then go back to the lab. There isn’t that kind of time in the auto industry.”

With that in mind, Meyer and Shimizu continue to refine their work in an effort to ease the work load on auto designers. Far from finishing their work, they are intent on making it better. Working with the Ford Motor Company, Meyer says, “underscores just how much work there is to be done. My work is a specific step in a huge process.”

results on the test samples and tested the classification performance of their graph-based learning algorithm on the datasets in several different experiment setups.

Their progress is very encouraging. Their classifiers, built from gene expression data and a protein-protein interaction network, achieve competitive classification performance. They also validated that their algorithms can identify highly reproducible marker genes and enriched functions from the independent datasets.

CSE graduate students TaeHyun Hwang, Ze Tian and Ba Ryun Hwang have been working with Kuang on the research.

“We have gotten a lot of support on this research and it’s very exciting,” noted Hwang. The group’s most recent work has been a collaboration with the Mayo Clinic and the University of Minnesota School of Public Health.

Kuang and his students are now moving on to apply their algorithms to lung cancer studies. The lung cancer data will have its own patterns that will differ from the breast cancer studies, but the group is confident that their algorithms will be able to make more interesting discoveries in this new study.

Hwang says, “It feels like we are really contributing to the bettering of society. Knowing that we can help with cancer treatment and prognosis is a great motivator to keep going.”

Eventually, the group hopes to move on to study other cancers and see if the can capture common underlying biological principals across different cancers. “We have been lucky to have a wonderful collaboration,” said Hwang, “and working with others not in the field of computer science has helped us look at the problem with more perspective. It feels like we are helping people.”
We would like to express our sincere gratitude to the following companies, alumni, and friends of CSE who have provided generous financial support for our work. We look forward to continuing this partnership.

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Soundbyte is produced twice yearly by the University of Minnesota’s Department of Computer Science and Engineering. All photos and content are produced and edited by Pamela Vold, unless otherwise noted.

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