

# COMPUTER SCIENCE and SOFTWARE ENGINEERING

SAMUEL GINN COLLEGE OF ENGINEERING

## Message from the Chair



I am pleased to report that the Department of Computer Science and Software Engineering (CSSE) is moving forward, even while budget cutbacks have a major impact on our ability to provide services to students and constituents.

Our new home, the Shelby Center, provides students an excellent environment to study, experiment and conduct research. In every exit interview, graduating seniors praise our enhanced facilities. Almost all student-related activities can now be held in Shelby, and we are able to proudly showcase our impressive facilities to prospective students, parents and visitors. I am sure that this will be a key factor in attracting more top-quality students to our programs.

With the new facilities, we have also been able to attract two new high-caliber faculty members: Yan Gu and Weikuan Yu. Faculty research activities have also increased significantly, especially in National Science Foundation (NSF) grant competition. At this moment, almost all faculty members are actively involved in at least one NSF-sponsored grant. One standout example is the NSF CAREER Award received by Xiao Qin. Xiao came to CSSE in 2007 and has been successful in leveraging his new laboratory to compete for research grants. The NSF CAREER Award is an extremely competitive program and is only granted to the top junior faculty in the nation. His CAREER award supports his research in the area of multicore-based parallel disk systems for large-scale data-intensive computing for the next five years. Xiao joins Richard Chapman and Alvin Lim as the third CAREER award recipient in CSSE.

Following a national trend, we are seeing a steady increase in CSSE student enrollment. We hit our lowest numbers in fall 2006 with 326 undergraduate students and rebounded to 400 in fall 2008. The official number for fall 2009 is 395. The job market for CSSE related fields continues to be strong for the next 10 years, according to a U.S. Department of Labor report. In addition to attracting more students to CSSE, our industrial advisory board (IAB) set up a freshman scholarship endowment fund in 2007 to recruit top freshmen into our programs. This year, three outstanding students were awarded scholarship support and all chose to come to Auburn. Although each award is only \$500, it is an effective way to attract top students. Currently, we are about halfway to the \$25,000 endowment requirement for the full scholarship. Alumni and supporters are encouraged to contribute to this endowment. A donation envelope is attached in this newsletter.

Though challenges are ahead of us, CSSE faculty and staff are working hard to move our programs forward. I am sure that we will be able to continually report progress to you in the future. War Eagle!



Kai H. Chang, Department Chair

## Faculty Highlights

### New Faculty

The department is proud to introduce its two new hires: Yan (Janice) Gu and Weikuan Yu, who joined the department in spring 2009.

**Yan (Janice) Gu** received her doctorate from the Georgia Institute of Technology and a master's degree from Johns Hopkins University. Gu's research interests include parallel and distributed simulation; discrete event simulation; network modeling and simulation; and statistical data analysis and data mining. Her teaching interests include parallel distributed computing, discrete event simulation and artificial intelligence. She has served as a reviewer for various conferences and journals, including *PADS*, *Simulation* and *MASCOTS*. She has been on the program committees of ANSS, SIMU and SIMUTOOLS. She completed a summer internship at IBM Almaden Research Center in 2005.



Gu

**Weikuan Yu** joined the department from Oak Ridge National Laboratory, where he served two-and-a-half years as a research associate and scientist. Yu is also an adjunct assistant professor in the Department of Electrical Engineering and Computer Science at the University of Tennessee. His research interests include high-performance interconnects, parallel I/O, storage and file systems and system biology. Yu earned his doctorate in computer science and engineering from Ohio State University in 2006. At Auburn, he is actively initiating a laboratory on parallel architecture and systems to further his research interests in these areas. Yu has published more than 30 papers in international conferences and journals, encompassing computer science, biology and interdisciplinary domains. He is a member of ACM and IEEE.



Yu

### New Adjunct Faculty

The department recently welcomed two adjunct faculty members to its research groups: Dianne Hall from the College of Business and Robert Norton from the College of Agriculture.

**Dianne Hall** holds a doctorate in information and operations management from Texas A&M University. Her areas of interest include the use of technology to facilitate information use and decision-making; healthcare information technology; logistics; risk management; contingency planning and information assurance, particularly in the health care industry. Her current research includes user interaction with healthcare information technology, logistics under uncertainty, standardization for healthcare technology development, contingency planning, logistics effectiveness, decision-support effectiveness and educational technology.

**Robert A. Norton** is a professor in the College of Agriculture and has been with Auburn University since 1995. A veterinary microbiologist by training, he was educated at Southern Illinois University, where he received his bachelor's and master's degrees, and the University of Arkansas, where he received his doctorate. Norton served in the U.S. Army Chemical Corps and later with the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) at Fort Detrick, Md. In addition to an active research career studying public health and infectious diseases, he serves as director of the Auburn University Homeland Security Education Initiative (AHSEI) and the SOG-06 OSINT group, teaching both undergraduate and graduate level classes in basic and advanced level intelligence analysis. His research interests include science and technology assessment, weapons of mass destruction detection and defense, large format dataset mining and the dark web.

### Faculty Promotions

**John (Drew) Hamilton** has been promoted to professor starting in fall 2009. Hamilton came to Auburn in 2001 as an associate professor after retiring from the Army. He received his doctorate in computer science from Texas A&M University in 1996. His research expertise



Hamilton

includes information assurance, computer security, network modeling and simulation and software engineering. He is the director of Auburn's Information Assurance Center.

**Cheryl Seals** has been promoted to associate professor with tenure starting in fall 2009. Seals came to Auburn in 2003 and received her doctorate in computer science from Virginia Tech in 2004. Her expertise is in the areas of human computer interaction (HCI), human centric computing, visual programming environments, software engineering and empirical studies of programmers. She has been successful in obtaining funding to promote science and engineering education to female and minority students.



Seals

## Student Highlights

### CSSE IAB scholarship winners named

The department is proud to announce the three recipients of the 2009-2010 Industrial Advisory Board (IAB) scholarships.

**Brian C. Agalsoff** is a 2009 graduate of Bob Jones High School in Madison, Ala. In high school, he was active on the computer science team and with the state technology fair, where he placed first in project programming. He served as the Alabama Council for Technology in Education (ACTE) project leader and was the winner of an Algebra II tournament. In high school he served as a computer science tutor and was active in his church. He took honors and advanced placement (AP) courses in high school, including AP Computer Science, and was on his school's honor roll all four years. Agalsoff said that he heard about the scholarship when he attended Auburn's War Eagle Day. After college, he hopes to get a job with an established company working as a computer scientist or software engineer in research and development. His dream is to eventually start a company of his own. He is a freshman in pre-computer science.

**Chelsea D. Harrison** is a 2009 graduate of Virgil I. Grissom High School in Huntsville, Ala. She was active in community activities,

such as being a student coach for local elementary and middle school math teams and the Algebra I and Geometry level test coordinator for the Rocket City junior math league, sponsored by Mu Alpha Theta. She served as a volunteer for elementary and middle school math enrichment programs and took many honors and AP courses during high school. Harrison heard about the scholarship when she attended TALONS Day at Auburn. Computer and software consulting is one of her long range goals. She would also like to explore elective coursework in wireless technology and potential career possibilities. Harrison is a freshman in pre-software engineering.

**Mallory L. Mims** is a 2009 graduate of Opp High School in Opp, Ala., where she was class valedictorian. She was active in student government and as an officer in many community service organizations. She was a member of the National Beta Club and Mu Alpha Theta, serving as president of both organizations. She was also busy with cheerleading and the tennis team. Mims heard about the scholarship when she attended TALONS Day at Auburn. She has always enjoyed all math and math-related subjects, and while exploring her career options, she interviewed someone with a degree in software engineering. She realized she was interested in many aspects of the curriculum and decided to pursue a career in software engineering. Mims is a freshman in pre-software engineering.

### CSSE student receives research fellowship

**Patrick Carpenter**, junior in computer science and software engineering, was awarded a year-long fellowship by the Undergraduate Research Fellowship Program (URFP) in 2009. URFP, sponsored by Auburn's provost and vice president for research, is a competitive program open to students of sophomore standing or higher. Twenty year-long fellowships and two one-semester fellowships are awarded annually. Carpenter, together with his mentor Weikuan Yu, will look into enhancing the efficiency of large-scale scientific



Carpenter

ic simulation programs for global climate modeling. He receives a total award of \$6,200 in stipend and project funds to assist with this research.

## Summer Internship in Germany

Computer science junior **Charles Polk** participated in the summer 2009 DAAD RISE program, established by the German government to bring talented undergraduates from the U.S., Canada and England to Germany for a summer to assist doctoral students in a field similar to their majors. The undergraduates receive a stipend to cover expenses while in Germany. The following is Polk's description of this experience:



Polk

“After being accepted and paired with a doctoral student in the program, I decided to accept an internship in Heidelberg, working at the German Cancer Research Center on a medical imaging toolkit known as MITK. During my stay there, I met 12 other interns from universities all over the world such as Harvard, Yale, Brown, Bristol (England) and Queen’s University (Toronto).

“The work I conducted at the German Cancer Research Center was much more interesting than I had originally thought. During the first portion of my three month stay, I updated and made additions to a path planning module for surgery. Those updates and additions have now been uploaded to the server so they will officially be utilized by everyone using the new version of MITK. When I finished that module, I began working directly on my doctoral student’s project for lung compensation during surgery to remove tumors. I began using MITK to make segmentations of the internal envelope, visceral envelope and diaphragmatical envelope so that later measurements could be made for the distance of shifting during breathing. I also became part of a “bug squashing” team which met every Wednesday to address reported bugs for our medical imaging toolkit.

“During my stay, I attended a meeting concerning the gathering of all of the directors of open source medical imaging toolkits from around the world. They met to collaborate and create the most robust toolkit possible for medical imaging. This was a unique opportunity to see Germans, French, Italians and Americans join together to attempt to create this toolkit.

“Towards the end of my stay, I was able to write a class for MITK that allowed for a device known as a Time of Flight (ToF) camera, which uses camera and the projection of infrared rays to create a 3-D rendering of what the camera sees. It displays each 3-D coordinate point observed by the camera and then create a mesh surface over these. The end product was quite spectacular as far as being able to see everything working, not to mention that my code was going to be used to render the surface of patients’ abdomens during surgery, rather than taking a CT scan – which takes around 20 times as long as using ToF. The whole experience was great on many different levels, whether it be the work experience I gained, being able to immerse myself in a foreign culture or the many friends I made from many different parts of the world.”

## Honors and Awards

At the Spring 2009 College of Engineering Faculty/Student Awards and Recognition Reception, CSSE recognized the following:

### Pumphrey Outstanding Pre-Engineering Students: 4.0 GPA

Matthew Henderson, Software Engineering  
Justin W. Perry, Software Engineering  
Dusten J. Doggett, Wireless Engineering – Software

### Outstanding Students

Noah Larsen, Computer Science  
Timothy Georgeson, Software Engineering  
Joe Davis, Wireless Engineering

### Outstanding Faculty

Juan E. Gilbert

### Outstanding Alumnus

Gerald (Jerry) W. Carter

Carter is widely known as a member of the Samba ([www.samba.org](http://www.samba.org)) development team. He received a bachelor's degree in 1994 and a master's degree in 1997, both in computer science at Auburn University. He is a member of Phi Kappa Phi, Golden Key national honor society and Upsilon Pi Epsilon. After graduation he worked with Auburn's College of Engineering Network Services, VA Linux Systems, HP and currently Likewise Software. He has also worked as an independent consultant. He is the author of "LDAP System Administration" and co-author of "Teach Yourself Samba in 24 Hours" and "Using Samba."



Carter (second from left) and family

## "Auburn's Eye on Technology" painting now hanging in main office

The painting "Auburn's Eye on Technology," by artist Darlene Rouse, now hangs in the Department of Computer Science and Software Engineering front office on the third floor of the Shelby Center. The painting, depicting the eye of a tiger with a computer chip bearing the label "AU" in binary notation on the pupil, was painted expressly for the department by Darlene, who is also the wife of instructor and doctoral student **Ken Rouse**. Acquisition of the painting for the department was made possible by a donation from faculty member **Richard Chapman** and his wife Mary. The painting will be on permanent display in the main office.



Rouse and Chapman shake hands in front of the painting "Auburn's Eye on Technology" which now hangs in the CSSE main office

## Qin wins NSF CAREER Award

Faculty member **Xiao Qin** has been recognized as the university's latest National Science Foundation (NSF) Faculty Early Development CAREER award winner. NSF CAREER awards recognize young faculty who are international leaders through outstanding research, excellent education and the integration of education and research within the context of the mission of their institutions.

Qin has been awarded \$400,000 for his research, "Multicore-Based Parallel Disk Systems for Large-Scale Data-Intensive Computing."

This research will provide the first parallel disk system in which large parts of data and input/output processing are offloaded to multicore processors embedded in disk drives.

Qin will bridge the technology gap between multicore computing and parallel disk systems by addressing fundamental issues of multicore computing, data processing and performance analysis for data-intensive computing systems. He will also address design issues from low-level disk architecture all the way up to data processing algorithms, thereby gaining new experience in how low-level disk facilities affect high-level application programming interfaces. Qin plans to implement a toolkit to design and analyze hardware and software components for multicore-based parallel disk systems.

“We are so pleased to have Xiao’s early accomplishments recognized by NSF with the CAREER award,” said Kai Chang, Alumni professor and chair of the department. “This five-year award will allow Xiao and his research group at Auburn to develop novel architectures for parallel disk systems where significant multicore processing power and memory are integrated into parallel disk drives.”

As part of his CAREER award, Qin will establish a storage systems laboratory to design real-world data-intensive systems. In addition, he will develop courses on the subjects of multicore programming, storage systems and data-intensive computing.

Qin joined the Auburn Engineering faculty in 2007. He holds bachelor’s and master’s degrees in computer science from



Huazhong University of Science and Technology in China, and received his doctorate in computer science from the University of Nebraska-Lincoln in 2004. His research interests include reliability modeling, performance evaluation, fault tolerance, storage systems and real-time computing, as well as parallel and distributed systems.

### Narayanan studies new ways to teach computing concepts to undergraduates under NSF grant

Faculty member **N. Hari Narayanan** is collaborating with colleagues at Washington State University and the University of Hawaii to study a way of teaching computing concepts to undergraduates called studio-based learning (SBL). The project is supported by a two-year grant from the National Science Foundation (NSF) to the three universities totaling almost \$550,000.

Studio-based instruction is adapted from design oriented disciplines, such as architecture and is aimed at empowering students to learn collaboratively.

At Auburn, Narayanan worked with Margaret Ross in educational foundations, leadership and technology and **Dean Hendrix** in computer science and software engineering to test the efficacy of studio-based learning in undergraduate courses over the past two years.



Preliminary analyses of data collected from these courses indicate that not only do students learn more, but also that their self-reported sense of community, self-regulation, motivation and critical thinking skills increase significantly.

Encouraged by these results, the investigators have submitted a proposal to the NSF to support the implementation and evaluation of SBL on a national scale.

They have secured the participation of faculty from 15 colleges and universities in 10 states and are awaiting the results of NSF review of their proposal.



**Rose-Gaëlle Belinga**, '09, student in the department, center, received this year’s recognition for On-Campus Student Employee of the Year through Auburn University’s Career Development Services. She is the information technology student assistant at the School of Forestry and Wildlife Sciences. Belinga is pictured with AUBIE and Auburn provost Mary Ellen Masey.

## IAB sponsored workshop for students

The CSSE Industrial Advisory Board (IAB) sponsored a workshop on March 26 to provide students advice on the job market and resume writing. Before the workshop, the board also provided a barbeque picnic for students, faculty and staff. Due to a severe

weather warning, the picnic was moved to the CSSE study room in the Shelby Center. In addition to the five present IAB members, approximately 40 students and 10 faculty members attended the picnic.



Students and IAB members enjoy barbeque in the study room



Board members present industrial experience and offer advice to students

**AUBURN UNIVERSITY**  
**Samuel Ginn College of Engineering**

Department of Computer Science and Software Engineering  
3101 Shelby Center  
Auburn, AL 36849-5347

[www.auburn.edu](http://www.auburn.edu)

Auburn University is an equal opportunity educational institution/employer.

ENNO811CS1

Nonprofit Org.  
U.S. Postage  
PAID  
Permit #530  
Montgomery, AL

E A G L E

## Engineering Eagles Society

The Engineering Eagles Society consists of loyal alumni and friends who support the Samuel Ginn College of Engineering with financial gifts of \$1,000 or more each year. These gifts provide vital resources for enhancing programs in which our faculty and students thrive. With three giving levels – Executive Eagle, Eagle and Associate Eagle – this society recognizes those whose gifts elevate Auburn Engineering to new heights and help continue our pursuit of excellence.

### Strengthening Auburn Engineering

Our Eagles Society members provide funding that can be designated for a particular department, program or project, or they can remain unrestricted to be used at the discretion of the dean. Eagles Society contributions have helped provide:

- Student scholarships
- Funding to attract world-class faculty
- Renovation of Wilmore Laboratories and Ross Hall, as well as construction of the state-of-the-art Shelby Center
- Cutting-edge laboratory and research equipment
- Hands-on learning experiences for senior design projects and competition teams such as the SAE Baja, Formula SAE Racing and ASCE Concrete Canoe

### How to Join

Make a gift of \$1,000 or more to Auburn Engineering, which can include a corporate match, in the form of:

- Check (monthly, quarterly or total amount)
- Bank draft
- Credit card
- Stocks or mutual fund shares
- Combined annual gifts totaling \$1,000 or more given by a couple
- A pledge of \$1,000 or more paid within one calendar year

For more information, contact Heather Crozier at 334.844.1138 or [vannhea@auburn.edu](mailto:vannhea@auburn.edu) or visit [www.eng.auburn.edu/eagles](http://www.eng.auburn.edu/eagles).



**AUBURN**  
UNIVERSITY

The CSSE Newsletter is published by the Department of Computer Science and Software Engineering. Mailing and e-mail address changes, news items and suggestions should be sent to CSSE, 3101 Shelby Center, Auburn, AL 36849-5347

[www.eng.auburn.edu/csse](http://www.eng.auburn.edu/csse)