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Message from the Department Head



Dr. Susan Gauch

I hope that you enjoy the 2009 University of Arkansas Computer Science and Computer Engineering newsletter. I became Head of the CSCE department in August 2007, and producing this newsletter was a top priority to me. The fact that it took almost 2 years to complete this task is a sign of how many other top priorities there are as a new department head! I am very happy to have joined the department, and it is an exciting time in Fayetteville.

Our department has increased its emphasis on research, and we have made tremendous progress in a short time. Our research volume has tripled to nearly \$3,000,000 and we now have almost 20 Ph.D. students in progress. I am very proud of our entire faculty who build their research programs while maintaining a high standard of excellence in the undergraduate program.

New CSCE Faculty

Nilanjan Banerjee received his Ph.D. from the University of Massachusetts and will join the department for the 2009-2010 academic year. His research interests include embedded and distributed systems for mobile computing, energy management in mobile and sensor systems, mobile networking, and disruption/delay tolerant networking.

To highlight a few changes at the undergraduate level, we have revamped the BA in Computer Science to include more hands-on courses and added a new introductory course, Explorations in Computing, to try to attract students from the Fulbright College of Arts and Science into the BA. We completed a curriculum review and overhaul of both our hardware and software sequences in the BS degrees. In a fast-moving field like computing, curriculum review is a continuing, and continual, process. Finally, we added an accelerated MS option for both Computer Science and Computer Engineering that allows our top students to take graduate classes in their senior year and to use them for undergraduate technical electives and also as a head start towards a graduate degree. This has worked out well, and many of our undergraduates are choosing to stay for graduate studies. Although I suspect that the poor job market may also be contributing to this trend, we are happy to be able to convince some of our very best to stay at the University of Arkansas. There have been some changes in the faculty, in August 2008, Dr. David Andrews and Dr. John Gauch joined the department. Dr. Ron Skeith, the inaugural head of Computer Engineering, retired in May 2009 after a long and dedicated career at the University of Arkansas. We will miss Ron's focus on our students and his Linux expertise.

Faculty Retirements

Ron Skeith retired after 44 years of service to the University of Arkansas. Dr. Skeith served as Department Head of CSEG from 1985 to 1999.

Unlike many universities who are dealing with steep budget cuts, we are lucky to be facing a flat budget next year. So, although times are tight everywhere, we are able to continue our mission and even hire a new Assistant Professor to start fall 2009. I sincerely hope that we are able to continue to grow and believe that, even in a recession, an education in computing is an investment in the future.

Faculty Accomplishments

Recent Grants

"Detection of Insider Threats at Application Levels," AFOSR, \$401,011, B. Panda (PI)

"DIMLOG: Ultra-Low Power Electronics Delay-Insensitive Asynchronous Circuits," DARPA, \$306,982, J. Di (PI), A. Mantooth (EE, co-PI), S. Smith (EE, co-PI)

"Collaborative Automated Planning Environment for Reconstruction/Stabilization," Industry, \$113,000, S. Gauch (PI)

"MILS Hardware and its Formal Methods-Based Security," NRL, \$66,143, D. Andrews (PI)

Faculty Awards

Departmental Awards:

Outstanding Researcher - Brajendra Panda

Outstanding Teacher - Dale R. Thompson

Outstanding Service to Students - Craig Thompson

College Awards:

Amy Apon - Imhoff Research Award

Dale R. Thompson - Imhoff Teaching Award

Student Honors

Outstanding Senior in Computer Engineering 2009 - Jordan Yust

Outstanding Senior in Computer Science 2009- Keith Perkins

Student Spotlights

Sree Malladi, MS Computer Science, Spring 2009

Hometown: Hyderabad, India

What made you choose the University of Arkansas?

I liked the work and the research that was going on at the university as well as the opportunity to get an assistantship and be funded.

What is your area of study?

My undergrad work was mainly dealing with artificial intelligence, but since I have been at the UA I have been working with Amy Apon who deals with distributed computer systems and networks.

When did you become interested in A.I.?

I was just a kid. My brother and I used to play a lot of computer games back home and watch Sci-Fi movies. My father and uncle encouraged me to pursue it in my studies.

What would you like to do after graduation?

Software development, I would like to work on developing intelligent systems and programming languages used for developing A.I. I would also like to return at some point and maybe work on my PhD in Artificial Intelligence.



Anthony Lofton, Ph.D. Computer Engineering, expected Fall 2009

Hometown: Little Rock, Arkansas

What is your main area of study?

I'm into information security, specifically RFID tags. This technology allows information to pass through radio waves and can carry the same data a bar code currently does. I'm working on the security aspect of what RFID has to offer.

When did you become interested in this field?

I've pretty much always wanted to be a computer engineer! I think it was mostly because I played a lot of video games. I was also always attracted to computers. Any time my dad would bring home a new computer I would beg to put it together and figure it out.

What would you like to do after graduation?

I've always had the desire to start my own business. I plan to work for an established company when I leave here in order to build some financial resources and then start a couple of companies of my own and see where it goes from there.

Eric Specking, BS Computer Engineering, expected Fall 2009

Hometown: Wynne, Arkansas

How did you become interested in this field?

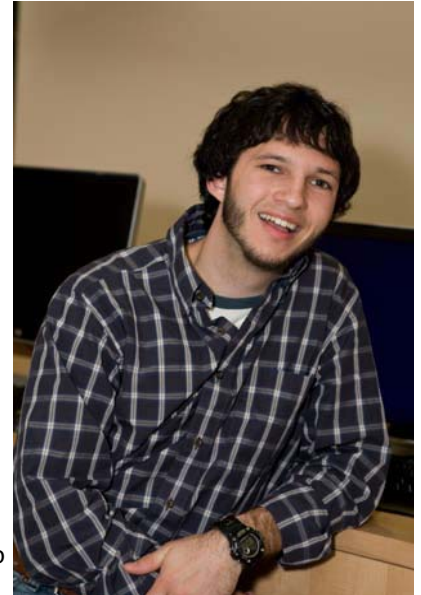
I was a network administrator at my high school. There I learned about computer repair and networking and thought I might be interested in pursuing a degree in the field. From there I did some programming, but realized I was much more interested in the hardware, which is why I'm in engineering.

How would your professors describe you?

Hopefully entertaining! I consider myself the type of person to stick with something until I get it done, so I hope they would say hard working, I really want to excel in what I do.

What tips would you give students thinking about getting into this field?

Take the ACT as many times as you can while you're in high school. You also need to do your research on the schools you have to choose from so you can get your application in before the early deadline, since 70% or more of the available scholarships are awarded to those who beat the deadline.



Faculty Spotlights



Dr. David Andrews

Ph.D. Syracuse, University, Computer Engineering, 1992

Returned to the UofA in 2008

Research Areas: Embedded Systems, Computer Architecture, Multiprocessor Systems on Chip

What brought you back to the University of Arkansas?

I spoke with Susan Gauch about the new building being built, the new faculty coming in and how they were becoming a more research-active department, which really piqued my interest. My wife and I have always loved Fayetteville and decided this sounded like a great opportunity to return.

What are you currently teaching?

Last fall I taught a graduate class called Multiprocessor Systems on Chip, a process that allows us to place a bunch of parallel processor on a single chip. When we were still working with what we called "Moore's Law" we were working on doubling CPU clock frequency every 18 months. Now, the focus is on doubling the number of processors within a single chip, such as Dual Core and Quad Core machines. This is changing the way software and operating systems are being written to take advantage of the new technology. This past spring I taught the undergraduate computer architecture course and I'm looking forward to working with more undergraduate students.



Dr. John Gauch

Ph.D. University of North Carolina, Computer Science, 1992

Joined the CSCE Department in 2008

Research Areas: Computer Graphics, Digital Image Processing, Computer Vision, Multimedia Applications

What has been your research focus?

My research began in medical image processing, we were trying to find and measure the size and shape of things in medical images, such as the dimensions of a tumor in a CAT scan image. From there I worked on tracking the motion of biological things, like a cell moving across a slide under a microscope. I also worked on a non-medical project developing software that could examine video clips and determine the content from the commercials and divide them up accordingly, which was cutting edge technology in 1995.

What do you teach at the UofA?

I teach courses on computer graphics and image processing and plan to do some on video in the future. I also teach programming intro courses.

CSCE Faculty

David Andrews, Professor
Thomas C. Mullins Endowed
Chair
PhD Syracuse University



Embedded Systems, Computer Architecture.
Reconfigurable Computing, Multiprocessor
Systems on Chip

Amy Apon, Professor
PhD Vanderbilt
Queueing Networks, Real-
time Systems, Cluster
Computing, Distributed
Computer Systems



Nilanjan Banerjee, Assistant Professor
PhD University of Massachusetts

Gordon Beavers,
Associate Professor
Associate Head
PhD Indiana University



Computability Theory
Algorithms

Bob Crisp, Professor
PhD University of Texas
Licensed Professional
Engineer



E-Commerce
Senior Design
Database

Russell Deaton, Professor
PhD Duke University



Biomolecular Computing,
Network Programming,
Nanotechnology, Embedded
Internet Devices for Remote Data Acquisition

Jia Di, Associate Professor
PhD University of
Central Florida



Embedded Systems, Digital
Hardware Design & Analysis,
Low Power Digital Circuit/System Design,
Power/Energy Estimation and Analysis

John Gauch, Professor
PhD University of
North Carolina, Chapel Hill



Computer Graphics, Digital
Image Processing, Computer Vision,
Multimedia Applications

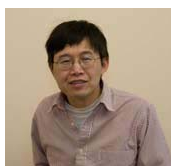
Susan Gauch, Professor
Department Head
Rodger S. Kline Chair



PhD University of North
Carolina, Chapel Hill

Information Retrieval,
Programming Language Paradigms

Wing Ning Li, Professor
PhD University of Minnesota



Design Automation, Software
Reuse, Parallel Computing,
Combinatorial Optimization,
Design and Analysis of Algorithms

Brajendra Panda, Professor
PhD North Dakota State



Computer Security,
Computer Forensics,
Information Assurance,
Database Management Systems

J. Patrick Parkerson,
Associate Professor



PhD University of Arkansas

IC & ASIC Design, Design
Methodologies, Electronic Packaging Design,
Integrated Passive Components, Electronic
Circuits for Aerospace Applications

Craig W. Thompson,
Professor, Charles D. Morgan
Axiom Database Chair
PhD University of Texas



Data Engineering, Database Systems, Software
Architecture, Multiagent Systems, Distributed
Object Middleware, Natural Language
Interface

Dale R. Thompson,
Associate Professor
PhD North Carolina State
Licensed Professional
Engineer



Telecommunications, Genetic Algorithms,
Wireless Networks, Network Security,
Optimization of Telecommunications

Department News

The department hosted talks from three distinguished speakers: Jun Zhu from the Royal Institute of Technology – Stockholm, Sweden; Lee Giles from Penn State; and Charles Nicholas from the University of Maryland, Baltimore County.

Jointly with the Walton College of Business's ISYS department, the CSCE department hosted a delegation from Vietnam interested in setting up educational collaborations. A Memorandum of Understanding between Vietnam National University and the University of Arkansas to set up a joint Master's degree in Computer Science was drafted and that program should begin in Spring 2010.

The department completed a thorough review and updating of the undergraduate curriculum for all three programs (BS Computer Engineering, BS Computer Science, BA Computer Science). Ad hoc faculty committees reviewed and updated the hardware and software sequences, coordinating the content of all courses throughout the degree. This resulted in a major overhaul of the courses and their contents.

A new BA program was designed and approved by the faculty, including a new introductory course. The new BA is more focused on practice and interdisciplinary work, rather than theory. It is pending approval, and should be effective Fall 2010. The new course, 1013 Explorations in Computing, will be taught beginning Fall 2009.

Six CSCE faculty (Andrews, Apon, Deaton, Di, S. Gauch, Panda) received eight new awards totaling \$987,729 from seven different funding sources. The department was very active in nationally and regionally funded research, resulting in over \$1.3 million in research expenditures for the year.

Russell Deaton organized and hosted the 15th International Meeting on DNA Computing and Molecular Programming, June 8 -11, <http://dna15.uark.edu/>. Past conferences have been held at Princeton (1995 & 1996), MIT (1999), and other locations around the US and the world. The Program Committee contained faculty from Stanford, Duke, Caltech, Oxford, Tokyo Institute of Technology, and other major international research universities.



Dale Thompson continues to establish himself as an RFID security expert in both research and education. He was a Guest Researcher at National Institute of Standards and Technology (NIST) at Boulder in summer 2008. Both his PhD student and he collaborated with NIST on methods for preventing counterfeiting of RFID tags. NIST may set the standards for fingerprinting RFID tags and they continue to collaborate. Because of this activity, the IEEE Technical Activities Board approved the formation of the IEEE TAB Technical Committee on RFID (CRFID) in November 2008. Finally, he is leveraging his NSF grant on RFID INFOSEC to establish himself in RFID security education. He taught the course the first time in fall 2008. He was invited to speak at the IEEE Wireless and Microwave Technology

conference (WAMICON) (<http://www.wamicon.org>) held April 2009 on the future of wireless education. The class website (<http://rfidsecurity.uark.edu>) is popular and he has had several contacts with other Universities and organizations. The publicity of Globecom 2008 resulted in a discussion with a publisher to write a book on RFID Security.

Jia Di was successful in attaining tenure and, effective with the 2009-2010 academic year, will be promoted to associate professor.

Student News

Ross Urban, a senior in computer engineering, was selected as the University of Arkansas nominee for a scholarship offered through the Chinese Consulate General in Houston and the Chinese Ministry of Education for study at a Chinese university in 2009-2010.

Two programming teams attended the ACM Programming Completion in Searcy October 31 and the Acxiom TresNet 2009 Collegiate Programming Contest in Conway February 2009. Team one members were Adam Higgins, Khanh Nguyen, and Anthony Rosequist; team two members were Tyler Murray, Ben Rowse and Danny Cassimatis.



Acxiom representatives: George Knight and Allison Nicholas and CSCE representative George Holmes preparing for the High School Programming Contest

Members of the department's ACM student organization and Dr. Wing Ning Li coordinated the annual Acxiom High School Programming Contest on March 7, 2009. This year the participants were from six high schools, with twelve teams and a total of 41 students. The results of the competition: first place - the *LRCH1* team from Little Rock Central High School, second place - the *Better Than Team ORANGE* team from Arkansas School for Mathematics, Sciences and the Arts, and third place - the *Spartans A* team from White Station High School. The "Most Creative" award was given to the *Kott* team from Springdale High School for solving a very challenging problem, the "Most Improved" award went to *Team[10]* from Bentonville High School, and the "Best Newcomer" award went to the *Mathmagicians* team from Har-Ber High School.

The "Best Newcomer" award being presented to the *Mathmagicians* team from Har-Ber High School

Team members - Anthony Montoto, Zac Hill, Mark Bush and Craig Morgan

Acxiom representative - Allison Nicholas

CSCE Faculty advisor - Wing Ning Li

