

RazorBytes®

Fall 2015

LETTER FROM CSCE DEPARTMENT HEAD

The Computer Science and Computer Engineering (CSCE) Department at the University of Arkansas, the flagship campus in the University of Arkansas system, offers high quality undergraduate and graduate computer science and computer engineering degree programs. CSCE has 17 faculty members, including four endowed chairs and two NSF CAREER awardees. Our programs are growing rapidly to meet our state's and society's needs for talented professionals in computing technology in both hardware and software. Our PhD programs grow at a very fast pace and CSCE PhD student enrollment has more than doubled from 19 in 2010 to 44 in 2015, representing a one hundred and thirty-two percent increase. Our undergraduate student population has also increased seventy percent from 257 in 2010 to 438 in 2015. The growth in our PhD program is especially encouraging. The growth of our PhD programs is supported by expanded sponsored research programs in the department. For example, CSCE received five NSF grants for the past two months. Several of our sponsored projects in the areas of big data, vision systems for autonomous vehicles, cyber manufacturing, and computer science education are featured later in this newsletter. In particular, I would like to share an exciting grant news that Prof. Dale Thompson at the Computer Science and Computer Engineering Department leads an effort on an almost \$1 million NSF grant entitled Training Arkansas Computing Teachers (TACT). This grant will be used to train approximately 50 high school teachers to teach computer science in Arkansas high schools. It received an excellent commendation from Arkansas Governor Asa Hutchinson. Governor Asa Hutchinson and the General Assembly of Arkansas made a commitment to expanding classes that teach technology and computer coding in high schools. Earlier this year the legislature in Arkansas approved Act 187, which requires all public high schools and charter schools in the state of Arkansas to offer classes in computer science. It will generate significant interests among high school students in Arkansas and lead to significant growth in undergraduate enrollment in computer science and computer engineering programs in the state of Arkansas in the future. Our department is excited about the growth prospect of our academic programs due to Act 187 and is well positioned for this growth opportunity as the computer science and computer engineering department in the flagship campus in the state of Arkansas. In addition, the University of Arkansas in Fayetteville is striving to become a top 50 public research University by 2021. College of Engineering (CoE) developed an aggressive strategic plan to achieve this goal. CSCE expects to grow its academic and research programs significantly and expand its faculty resources by 2021 under the CoE's strategic plan. We are going to add two faculty members starting in Fall 2016. Our students are excellent and they made many academic achievements for the past year. For example, several students, as co-authors, along with their advisors, won two best paper awards in two international conferences respectively. Let's work together to develop an excellent Computer Science and Computer Engineering Department in the University of Arkansas in Fayetteville.

CAMPUS AND DEPARTMENTAL AWARDS

JOHN L. IMHOFF OUTSTANDING TEACHING AWARD

John Gauch, professor of computer science and computer engineering, received the Imhoff award for teaching. Gauch uses innovative approaches to teach introductory programming courses, as well as other undergraduate and graduate classes. Gauch has developed an online version of Programming Foundations I to reach students at community college around the state, and he represented the U of A at the Arkansas STEM Coalition's "Think Tank for Computer Science Education" and serves on the Arkansas Department of Education's committee to develop computer science classes for high school and middle school students.

2015 CSCE DEPARTMENTAL AWARDS

- *Teaching Award: Michael Gashler*
- *Service to students Award: Wingning Li*
- *Research Award: Matthew Patitz*

STUDENT HIGHLIGHTS AND ACTIVITIES

OUTSTANDING SENIORS SPRING 2015



Taylor Martin Outstanding Senior in Computer Engineering - graduated with a minor in mathematics and a 3.8 GPA. She was a peer mentor for the College of Engineering for 3 years, has talked with prospective students at CSCE open houses and helped with High School Programming Competitions. Martin was recognized as a University of Arkansas Senior of Significance. She worked with a team on a

capstone project to create a service for students with food allergies to use in dining halls on campus. Martin interned with J.B. Hunt, GE Healthcare and Wal-Mart and joined Wal-Mart full-time after graduation.



Austin Brown Outstanding Senior in Computer Science - was a member of the National Society of Collegiate Scholars and achieved a 3.9 GPA. He was involved in the Association for Computing Machinery and the National Society of Professional Engineers. Brown received several competitive scholarships, including the George W. Swilley Memorial Scholarship. Last year, he worked on a semester long

project to produce a search engine based on a static document set. Brown interned with Cerner Corporation in Kansas City last summer and joined them full-time after graduation.

ACM SECOND ANNUAL HACKATHON



On April 10 and 11, 2015, ACM hosted their Second Annual Hackathon. Over 30 students attended the event. A hackathon is an event in which computer programmers collaborate intensively on software projects.

J.B. Hunt presented the theme for this year's hackathon. Students had 22 hours to work on an web application or phone application that can help J.B. Hunt drivers, recruits, office and customers.

Students competed in teams of one to four, attempting to design a project. Teams' demos were judged by J.B. Hunt representatives on several criteria including creativity, usability, functionality, and presentation.

Team "And in second place is", consisting of Lucas Dorrough, Matthew Luther, and Cory McDonald, took home first place and a set of Raspberry Pis.

Team Warriors, consisting of Lei Shi and Ashvin Someshwar, took second place and a set of Google chromecasts.

Team Bruno, consisting of Tarcisio Bruno Carneiro Oliveira, took third place and a 32GB flash drive.

BEST PAPER AWARDS

Congratulations to Computer Science and Computer Engineering students Michael Metzner, Jesus A. Lizarraga, and associate professor Dr. Christophe Bobda for a best paper award at the 11th International Symposium on Applied Reconfigurable Computing to be held in Bohum, Germany from April 15 to 17, 2015.

The paper, Architecture Virtualization for Run-Time Hardware Multithreading on Field Programmable Gate Arrays, presents a novel virtualization architecture for FPGAs which allows for unrestricted communication among hardware tasks running on the device.

The architecture combines direct interconnection for high-performance at local level within a task's boundary, while using reduced overhead network-on-chip for global communication beyond component boundary. The architecture is based on a quadratic router access mechanism that drastically reduces the number of routers, thus leading to short communication paths and reduced resource overhead.

In this work, they address the inefficient resource usage with a novel class of routers than can be dynamically recycled as computing resource in modules in the boundary of which they are placed at run-time. The viability of their approach is demonstrated with benchmarks in signal and image processing, which shows a performance difference between applications running on raw FPGAs and the same applications running on the virtualization layer.

Congratulations also to assistant professor Matthew Patitz and graduate students Trent Rogers and Jacob Hendricks (who has now graduated and is working as an assistant professor at the University of Wisconsin-River Falls starting this fall) received the Best Paper award at the 7th International Conference on Machines, Computations, and Universality, hosted at the Eastern Mediterranean University in Famagusta, North Cyprus in September.

Their paper, titled "The Simulation Powers and Limitations of Higher Temperature Hierarchical Self-Assembly Systems", explored the relative powers of classes of hierarchical self-assembling systems and further refined several of their previous results related to intrinsic universality in such systems. This and related work by their Algorithmic Self-Assembly and Natural Computing group has begun to create a complexity hierarchy for self-assembly systems across a variety of theoretical models and has helped to give guidance to experimental collaborators implementing DNA-based self-assembling systems.

SPONSORED RESEARCH

NSF TACT PROJECT



Computer science and engineering researchers at the University of Arkansas will use a nearly \$1 million grant from the National Science Foundation to lead an interdisciplinary team of educators who will train and certify Arkansas school teachers in computer science education.

Over the next three years, Training Arkansas Computing Teachers, or TACT, will prepare 50 Arkansas teachers for licensure to teach the new advanced placement computer science principles course, introducing high school students to basic computer programming and applications. The program's goal is to increase student awareness and interest in computer-related professions.

"Until June of this year, fewer than one out of every 10 Arkansas public schools offered computer sciences courses, and the state had no process in place to certify teachers in this area," said Dale R. Thompson, associate professor of computer engineering. "This grant and program will make that happen and ensures that these courses will be taught in every Arkansas public high school and charter school."

Arkansas Gov. Asa Hutchinson signed Act 187 into law this year, requiring computer science courses to be taught at all Arkansas public high schools and charter schools. Arkansas is the first state to mandate computer science education.

"I applaud the University of Arkansas for leading in this effort and supporting my computer science initiative," Hutchinson said. "Over the next three years, Arkansas' schools will have 50 new teachers trained and licensed to prepare students for careers in computer-related fields. The National Science Foundation's \$1 million grant will provide valuable opportunities for our educators and our students. Thanks to the dedicated efforts the General Assembly and our educational communities, Arkansas continues to lead the national coding movement."

Thompson and Bryan Hill, assistant dean for student recruitment and diversity, honors and international programs in the College of Engineering, will serve as administrators for the program. They will work closely with the Honors College's Advance Placement Summer Institute and UAteach, a program that combines in-depth science and mathematics education with teacher preparation. UAteach is a partnership between the J. William Fulbright College of Arts and Sciences and the College of Education and Health Professions, addresses the shortage of secondary mathematics and science teachers in Arkansas.

The Training Arkansas Computing Teachers program will offer in-service training for existing high school computer science teachers by expanding the Honors College Advanced Placement Summer Institute to include a new Computer Science Principles Course. Additional teachers interested in computer science licensure will attend a summer "boot camp" prior to joining the Advanced Placement Summer Institute. Pre-service training will be offered to students going through the UAteach program.

CHRISTOPHE BOBDA RECEIVES NSF AWARD ON VISION SYSTEMS FOR AUTONOMOUS VEHICLES



Christophe Bobda received an NSF award to conduct research in vision systems for autonomous vehicles. Vision systems are an essential part of industrial trucks, also known as Automated Guided Vehicles (AGVs). Dr. Bobda's research will enable AGVs to be controlled in indoor environments without centralized coordination.

AGVs have the potential to revolutionize operations in areas such as manufacturing, product distribution, health care, and military. For example, they can efficiently accomplish the mundane and often repetitive task of transporting materials in distribution centers. They could even be used in nursing homes to move disabled people around. Autonomous robot systems have recently been introduced with Amazon's Kiva and Seegrid in distribution centers to transport items.

Unfortunately, they are limited to specific and restrictive environments. Generic models, tools, and technologies are missing to actively capture the world with semantically labeled objects, actions and events, and to generate goals, priorities, and plans. Dr. Bobda's research will address these challenges.

The solutions that Dr. Bobda will investigate address the requirements of decentralized coordination and real-time environmental changes, as occurs in production facilities. The approach uses a set of distributed ceiling-mounted smart cameras with overlapping fields-of-view, and cameras mounted on AGVs. Multi-truck coordination is then framed as the problem of routing packets in a dynamic and hierarchical network where cameras represent routers and trucks represent packets. To address the complexity of image processing tasks, a hardware/software implementation is followed with an FPGA-based target platform from a previous NSF-Funded project.

This research will enable manufacturing and distribution companies to optimize indoor transportation activities in existing arrangements, without modification of available infrastructure, and reduce labor and operating costs by redeploying employees to value-added roles. In addition, AGVs will enable autonomous mobile robot applications in numerous other unstructured environments, including: hospitals, malls, retail stores, critical infrastructure, airports, schools, and sports venues. The project is conducted as a joint effort between the University of Arkansas in Fayetteville and R-DEX Systems in Atlanta, and will provide undergraduate and graduate students' opportunities to perform their work in academic and industrial environments.

SPONSORED RESEARCH

PROTECTING IDENTITIES IN A SEA OF BIG DATA



Recent studies have shown that statistics generated by genomic studies do not completely conceal their participants' identities.

Xintao Wu, a computer scientist at the University of Arkansas, is working to change that.

Wu will use two National Science Foundation grants totaling \$436,713 to build an education framework for genetic privacy protection, collaborating with Xinghua "Mindy" Shi, assistant professor of bioinformatics and genomics at the University of North Carolina, Charlotte.

"How we protect genetic privacy has become a very important and challenging topic as the era of personal genomics is quickly approaching," Wu said. "Genotype data with attached traits, for example diseases, are very sensitive."

Wu, a professor in the Department of Computer Science and Computer Engineering, has more than a decade of experience in research and teaching in the area of data mining, data privacy and security, and database application testing. His research group is developing solutions to protect the privacy of human subjects when mining tabular data, social network data, healthcare data and genetic data.

He will collaborate with Shi and with cancer and Alzheimer's disease researchers at two Houston-based medical facilities – Baylor College of Medicine and MD Anderson Cancer Center – to build a web-based tool to provide researchers secure, reliable and privacy-preserving access to anonymous genomic raw data and statistics.

Wu and Shi will also systematically evaluate potential privacy breaches due to released genomic statistics and analyses. They will design genetic privacy course modules and hands-on projects on privacy infringement and protection to enhance genetic privacy education in computer science, bioinformatics and genomics.

On a third project, the University of Oregon awarded Wu \$170,002 from a National Institutes of Health grant to establish privacy preservation techniques for mining individuals' sensitive biomarker data, physical activities and social activities. The project builds on a database of 500 individuals and develops data mining and big data analysis tools to help understanding the influence of healthcare social networks on sustained weight loss.

Wu holds the Charles D. Morgan/Axiom Endowed Graduate Research Chair in the College of Engineering.

FRANK LIU RECEIVES NSF GRANT ON CYBERMANUFACTURING



Prof. Xiaoqing "Frank" Liu, Department Head and Rodger S. Kline Endowed Leadership Chair in Computer Science and Computer Engineering (CSCE), was awarded a grant by the National Science Foundation (NSF) to conduct research on architecture and protocols for scalable cyber-physical manufacturing systems. Cyber-physical manufacturing systems have potential to transform manufacturing industry in a significant fashion by sharing manufacturing resources, operating manufacturing machines, and connecting customers with manufacturing resources over the Internet. It integrates networking, embedded computing, control, manufacturing, service and cloud computing technologies to increase manufacturing efficiency and resource utilization.

Despite its promising future, there are many significant challenging issues toward realization of its potentials and its wide adoption in manufacturing industry. One of them is scalability of cyber-physical manufacturing systems. Cyber physical manufacturing systems need to be highly scalable and can integrate capabilities and services of a large number of manufacturing machines and other resources, operate and control them, and make them available to customers worldwide over the Internet. Another issue is network protocols for communicating manufacturing services and controlling manufacturing machines in factory floors over Internet.

In this project, new architectures and protocols for scalable cyber-physical manufacturing systems will be explored to address the above challenging issues. The technology developed in this project is expected to help better connections between manufacturers and consumers, make easier to exchange manufacturing services across organization boundaries, and increase utilization of manufacturing resources and reduce their idling time.

The project is conducted as a joint effort between Prof. Frank Liu in the University of Arkansas in Fayetteville and Prof. Ming Leu and Prof. Maggie Cheng in the Missouri University of Science and Technology.

OUTREACH

HOUR OF CODE



Matthew Patitz, Assistant Professor of Computer Science and Computer Engineering, talks to students at Butterfield Trail Elementary School and gets them excited for the Hour of Code.

Throughout the week of Dec. 8 2014, 66 computer engineering and computer science students volunteered at elementary schools, teaching kids the basics of writing computer code. Happy Hollow Elementary School, Butterfield Trail Elementary School, and Vandergriff Elementary School participated in the Hour of Code program as part of Computer Science Education Week. Code.org, a national organization that promotes computer science, sponsors this program.

Sarah Stolze, one of the University of Arkansas volunteers, explained why she thought this program was necessary and why she participated. "It's important for kids to understand the basics of how computers work and how to tell computers what to do. Programming, at all levels of skill, is an important foundation for success in any career in the twenty-first century. Additionally, coding teaches kids valuable lessons in logical and analytic problem-solving, which they will use for the rest of their lives, whether or not they continue in the field of computer science and computer engineering."

"I very much enjoy helping to introduce young students to the science behind computers," Stolze said. "If I had I been exposed to the world of coding and computer science at an elementary age, I would probably be a much better programmer than I am now."

Matthew Patitz, assistant professor of computer science and computer engineering, explained the benefits of this program for college students. "Being able to help out with the Hour of Code not only provides excellent experience for the CSCE students, it is also a lot of fun for them. Watching as they figure out how to explain the basic concepts of programming to the kids, I can see them gain a new appreciation for what they've learned and also begin to understand programming in a broader context. "

HIGH SCHOOL PROGRAMMING CONTEST

The Computer Science and Computer Engineering Department, along with Axiom Corp. and the University of Arkansas Chapter of the Association for Computing Machinery (ACM), hosted the annual High School Programming Contest in March 2015. Dr. Wing Ning Li, a professor in the computer science and computer engineering department, led the group that organized and hosted the event.

Thirty teams from eleven schools made up the 123 students and teachers registered for the contest. Teams competed to solve as many programming problems as they could in three hours.

First place went to the team PidgetWidgetKidget from Bentonville High School. Team Ninja Turtles from Fayetteville High School was awarded second place and Team Byte Dat from Bryant High School took third place. ASMSA League of Dapper Gentlepersons received an award for Most Creative and Byte Me from Southside High School was awarded Most Improved. Newcomer awards were presented to Rogers Heritage High School and Rogers High School.

While the students were competing, the high school teacher coaches held a roundtable discussion, exchanging experiences and ideas about the future of computer science education in high schools.

ALUMNI NEWS

ALUMNI HIGHLIGHTS

Lynn Moore (BS CSEG 1994; MS CSEG 1996) will be inducted to the Arkansas Academy of Computing at the fall 2015 banquet. Lynn received the College of Engineering Young Alumni Award in 2005 and has served on the CSCE Advisory Board since 2004.

In 1999, he co-founded Focus Technologies, LLC with Lance Hankins. Moore serves as the CEO and his duties include client relationships, business development, company operations, and recruiting. He has steadfastly grown the company's clientele which includes an impressive roster of clients that includes JP Morgan Chase, Bloomberg, Tyson Foods, GMAC, AIMCO, Coca-Cola, Microsoft, Verizon, etc. Under the management of Mr. Moore, the company has obtained a reputation as being among the best software development firms in the country. For the past four years, under Mr. Moore's leadership, Motio has continued to excel in developing useful products aimed at streamlining Cognos software, aiding the Cognos user and increasing an organization's bottom line. Motio developed and brought to market four more products to their suite of software solutions: ReportCard (patent pending) - Cognos report analytics and documentation tool; MotioPI Pro - extension of the free tool that enables mass change capabilities; MotioVault - an archive for offloading Cognos content; PersonalA (patent pending) - enables Cognos to transition between multiple namespaces. Motio was recognized with the 2011 IBM ISV Achievement Award for their innovations in software development and in 2012 was awarded the IBM Partner Achievement Award for their contributions to the Cognos Community.

Joseph Roblee (BS CSEG 1990; MBA/TM 2008) will be inducted to the Arkansas Academy of Computing at the fall 2015 banquet. Joseph has built a very successful career, several companies, and several critical software applications that continue to save lives and streamline the workflow processes for a multitude of diverse companies. Since his graduation with a B.S. in Computer Science Engineering in 1990, Joseph has steadily progressed and has made critical improvements to many company's productivity and bottom line efficiency. Joseph's contribution to the healthcare space has actually saved lives and increased patient care effectiveness through technology utilization and bi-directional collaboration. Joseph has consulted with numerous state agencies and large health companies to assist with application migration practices regardless if the company or agency utilizes his systems or adapts their own applications. Joseph is driven to help people and companies have a better life through technology. Even though Joseph now lives in Texas, he proudly represents the University of Arkansas and frequently returns to the home office in Fayetteville.

Rebecca Wilson (BS CSEG 1992; MBA 1994) was honored as a College of Engineering Distinguished Alumna in April 2015. She has combined her strong technical background and business acumen to benefit local industry. After graduation, she went to work for Tyson foods. During her 19 year tenure there, she rose through the corporation's Information Technology ranks, managing three different groups, a testament to her broad expertise. After investing 2 decades in various IT roles at Tyson Foods, in 2012 she shifted gears to an entrepreneurial mode as a small business owner and Microsoft registered partner. In March 2013, her role as a Microsoft partner led to join Microsoft as an account team member aligned with the world's largest retailer. She now focuses on partnering with and supporting the largest companies in Arkansas. In addition to her success, Rebecca promotes STEM education for youth and also is a strong advocate for technology careers for women.

Jeremy Stobaugh (BS CSEG 2000; MBA 2010) was honored as a College of Engineering Early Career Award in April 2015. Jeremy has had a very successful career that has rapidly increased in responsibilities. He is applying his technical expertise to the benefit of companies within Arkansas. He began his career with Axiom in 2000 as a Software Engineer. He joined J.B. Hunt in 2007 as an Information Services Manager and he was promoted to Director of Information Services in 2009. Jeremy actively helps the CSCE department by providing input on recruiting, curriculum, and special projects, participating as an alumni in ABET visits, and speaking to student groups. He is also active in community service through his church, youth basketball, and Habitat for Humanity.

Two CSCE alumni, **Ben Onukwube** (BS Computer Engineering 2011) and **Arpita Barua** (BS Computer Engineering 2010) joined the College of Engineering's Young Alumni Advisory Council.

ALUMNI NEWS

NEW CHAPTER OF ARKANSAS ACADEMY OF COMPUTING DEDICATED TO CSCE



Arkansas Academy of Computing

Making a Difference in Computing and Information Technology

This past spring, as the daffodils were popping out of the ground, a new chapter of the AAoC was springing to life. The University of Arkansas Chapter of the AAoC sprouted with the efforts of a committed inaugural team and the help of U of A CSCE Department staff. After a few months of work, the organization came together in time to hold its first annual meeting and banquet in Fayetteville on April 24th and 25th.

2015 Chapter Inductees:

Inaugural Members: Tracy Black, Charles Blackstock, Steve Brothers, Kim Clower, Gary Dowdy, Rex Eads, Lang Zimmerman

Academic Members: Dr. Bob Crisp, Dr. Craig Thompson

The Chapter's Purpose:

The chapter was formed to recognize the achievements of University of Arkansas Computer Science and Computer Engineering graduates and to provide continuing guidance and support to the CSCE Department of the University of Arkansas, and the needs of its students, while maintaining the integrity of the AAoC, upholding its principles, and contributing to its success.

FACULTY HIGHLIGHT

JIA DI NAMED TO ENDOWED CHAIR



Dr. Jia Di now holds a Twenty-First Century Research Leadership Chair, which includes a \$1.5 million endowment. Dr. Di, who joined the College of Engineering in 2004, researches delay-insensitive asynchronous digital integrated circuit design. His work has drawn strong interest from a variety of government agencies and industry organizations. His projects include fundamental research supported by the National Science Foundation and the National Aeronautics and Space Administration, transferrable technologies funded by industry, and national security-related innovations supported by the Department of Defense.

"Retaining our most talented faculty members and providing them with the resources they need is an important part of educating Arkansans to be the next generation of engineering leaders," said John English, dean of engineering.

The chair is endowed by funds from the historic \$300 million gift from the Walton Family Charitable Support Foundation.

CSCE FACULTY



David Andrews
Professor, Thomas
Clinton Mullins
Endowed Chair in
Engineering

Embedded systems
architectures



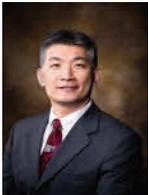
Gordon Beavers
Associate Professor,
Associate Head

Logic, Theory of
Computation, and
graph algorithms



Christophe Bobda
Associate Professor

System on Chip design,
embedded systems,
computer architecture,
distributed smart
cameras



Jia Di, Professor, 21st
Century Research
Leadership Chair

Digital Integrated Circuit
Design and Analysis,
Asynchronous Circuit
Design, Extreme
environment Electronics,
hardware security



Michael Gashler
Assistant Professor

Machine learning,
neural networks,
dimensionality
reduction, predictive
modeling, data mining,
manifold learning



John Gauch
Professor

Digital Image
Processing, Digital
Video Processing,
Computer Vision



Susan Gauch
Professor

Personalized Search,
Ontologies, Recommender
Systems, Social Networks



Miaoqing Huang
Assistant Professor

Heterogeneous many-
core architecture, High
performance computing,
hardware-oriented
security, hardware
design



Qinghua Li
Assistant Professor

Security and privacy,
mobile computing,
smart grid, big data,
access control



Wing Ning Li
Professor

Design automation, design
and analysis of algorithms,
combinatorial
optimization, software
reuse, parallel computing



Frank Liu, Professor,
Dept. Head, Rodger S.
Kline Leadership Chair

Software engineering,
service computing,
collective intelligence,
web-based
argumentation,
intelligent systems,
software applications



Brajendra Panda
Professor

Database Systems,
computer security,
computer forensics,
information assurance



Pat Parkerson
Associate Professor

IC and ASIC design, design
methodologies, integrated
passive components,
electronic packaging
design, electronic circuits
for aerospace applications



Matthew Patitz
Assistant Professor

Nanoscale, algorithmic
self-assembly,
biomolecular computing,
theoretical computer
science



Dale Thompson
Associate Professor

Security and privacy,
computer networking,
mobile security



Xintao Wu, Professor
Charles D. Morgan Acxiom
Graduate Research Chair

Privacy preserving data
mining, fraud detection,
anti-discrimination
learning, spectral graph
analysis



Tingxin Yan
Assistant Professor

Mobile and embedded
systems, cloud-based
mobile services,
crowdsourcing

RECENT PUBLICATIONS

Books

Christophe Bobda and Senem Velipasalar (Editors), Distributed Embedded Smart Cameras: Architectures, Design and Applications Hardcover – June 30, 2014 Edition: 2014

Book Chapters

Christophe Bobda and Michael Mefenza and Franck Yonga and Ali Akbar Zarezadeh Reconfigurable Architectures for Distributed Smart Cameras in Distributed Embedded Smart Cameras: Architectures, Design and Applications Hardcover – June 30, 2014 by Christophe Bobda (Editor), Senem Velipasalar (Editor), ISBN-13: 978-1461477044 ISBN-10: 1461477042, Springer Verlag 2014, PP 41 - 65

Michael Mefenza, Franck Yonga, and Christophe Bobda, Design and Verification Environment for High-Performance Video-Based Embedded Systems Distributed Embedded Smart Cameras: Architectures, Design and Applications Hardcover – June 30, 2014 by Christophe Bobda (Editor), Senem Velipasalar (Editor), ISBN-13: 978-1461477044 ISBN-10: 1461477042, Springer Verlag 2014, PP 67 - 87

Narcisse Talla Tankam, Albert Dipanda, Christophe Bobda, Janvier Fotsing, and Emmanuel Tonyé, A parallel approach for statistical texture parameter calculation in Distributed Embedded Smart Cameras: Architectures, Design and Applications Hardcover – June 30, 2014 by Christophe Bobda (Editor), Senem Velipasalar (Editor), ISBN-13: 978-1461477044 ISBN-10: 1461477042, Springer Verlag 2014, PP 235 – 258,

Amol Deshpande, Mahbubur Rahman, Nilanjan Banerjee, Christophe Bobda, Ryan Robucci, Multi-modal Sensing for Distracted Driving Mitigation Using Cameras and Crowdsourcing in Distributed Embedded Smart Cameras: Architectures, Design and Applications Hardcover – June 30, 2014 by Christophe Bobda (Editor), Senem Velipasalar (Editor), ISBN-13: 978-1461477044 ISBN-10: 1461477042, Springer Verlag 2014.

Journal Papers

David Andrews “Operating Systems Research for Reconfigurable Computing”, IEEE Micro, vol.34, no. 1, pp. 54-58, Jan.-Feb. 2014

L. Men and J. Di, “Asynchronous Parallel Platforms with Balanced Performance and Energy,” Journal of Low Power Electronics, Vol. 10, No. 4, pp. 566-579, 2014

D. Thompson, J. Di, and M. Daugherty, “Teaching RFID Information Systems Security,” IEEE Transaction of Education, Vol. 57, Issue 1, pp. 42-47, 2014

Gashler, Michael S., Smith, Michael R., Morris, Richard and Martinez, Tony., “Missing Value Imputation With Unsupervised Backpropagation”, Computational Intelligence. 2014

P. Gogineni, J. Yan, J. Paden, C. Leuschen, J. Li, F. Morales, D. Braaten, K. Purdon, Z. Wang, W. Liu, J. Gauch, “Bed Topology of Jakobshavn Isbrae, Greenland and Byrd Glasier, Antarctica”, Journal of Glaciology, Vol. 60, No. 223, pp. 813-833, 2014

Qinghua Li and Guohong Cao, “Privacy-Preserving Participatory Sensing,” IEEE Communications Magazine, accepted. (Impact Factor: 4.46)

Wei Gao, Qinghua Li, and Guohong Cao, "Forwarding Redundancy in Opportunistic Mobile Networks: Investigation, Elimination and Exploitation," IEEE Transactions on Mobile Computing (TMC), accepted. (Impact Factor: 2.912)

Ben Niu, Xiaoyan Zhu, Qinghua Li, Jie Chen and Hui Li, "A Novel Attack to Spatial Cloaking Schemes in Location-Based Services," Future Generation Computer Systems (FGCS), Elsevier, accepted. (Impact Factor: 2.639)

W. Johnston, N. Banerjee, J. Cothren, J. P. Parkerson, “Information-rich GIS Dissemination in Disconnected Environments,” Transactions in GIS, volume 18, issue 4, pp 555-573, Aug. 2014

Jon C. Hammer, Tingxin Yan, "Your Logical Status can be Revealed by Mobile Phone Usage Statistics", to appear in IEEE Computer, special issue on wearable computing, June 2015. (Impact factor: 1.438, Influence Score: 1.172)

Refereed Conference Papers

Cartwright, Eugene; Sadeghian, Alborz; Ma, Sen; Andrews, David, "Achieving Portability and Efficiency over Chip Heterogeneous Multiprocessor Systems," Proceedings of the 24th International Conference on Field Programmable Logic and Applications (FPL), 2014 24th International Conference on, pp.1-4, 2-4 Sept. 2014

F. Yonga, A. Junior, M. Mefenza, L. Saldanha, C. Bobda, and S. Velipassalar. Self-coordinated Target Assignment and Camera Handoff in Distributed Network of Embedded Smart cameras. In Proceedings of the International Conference on Distributed Smart cameras (ICDSC), Nov 2014, Venezia, Italy

M. Mefenza, F. U. Yonga, L. B. Saldanha and C. Bobda. A Framework for Rapid Prototyping of Embedded Vision Applications. In Proceedings of the Conference on Design & Architectures for Signal and Image Processing (DASIP), Oct 2014, Madrid, Spain

Ahmed Saeed, Ali Ahmadinia, Mike Just, Christophe Bobda: An ID and Address Protection Unit for NoC based Communication Architectures. Proceedings of the 7th International Conference on Security of Information and Networks, Glasgow, Scotland, UK, September 9-11, 2014

Q. Li, C. Ross, J. Yang, J. Di, J. C. Balda, and H. A. Mantooth, "The Effects of Flooding Attacks on Time-Critical Communications in the Smart Grid," accepted by the IEEE PES Conference on Innovative Smart Grid Technologies (ISGT), 2015

N. Kuhns, L. Caley, A. Rahman, S. Ahmed, J. Di, H. A. Mantooth, A. M. Francis, and J. Holmes, "High Temperature Testing Results of Synchronous and Asynchronous Digital Silicon Carbide Integrated Circuits," accepted by Government Microcircuit Applications & Critical Technology Conference (GOMACTech), 2015

J. Brady, A. M. Francis, J. Holmes, J. Di, and H. A. Mantooth, "An Asynchronous Cell Library for Operation in Wide-Temperature & Ionizing-Radiation Environments," accepted by 2015 IEEE Aerospace Conference

B. Sissons, A. M. Francis, J. Holmes, H. A. Mantooth, and J. Di, "SiGe BiCMOS Comparator for Extreme Environment Applications," accepted by 2015 IEEE Aerospace Conference

L. Men, B. Hollosi, and J. Di, "Framework of an Adaptive Delay-Insensitive Asynchronous Platform for Energy Efficiency," IEEE International Symposium on VLSI, July 2014

L. Caley, C. Lo, F. Sabado, and Jia Di, "A Comparative Analysis of 3D-IC Partitioning Schemes for Asynchronous Circuits," International Conference on IC Design and Technology, May 2014

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CSCE DEPARTMENT HEAD ANNOUNCED



The College of Engineering selected Xiaoqing "Frank" Liu to head the Department of Computer Science and Computer Engineering. Liu began July 1. He also holds the Rodger S. Kline Chair in Computer Science and Computer Engineering.

"I am very excited to welcome Dr. Liu to our faculty and to this important leadership position," said John English, Dean of the College of Engineering. "Computer science and computer engineering is a vital and dynamic field and Dr. Liu brings the skills we need to excel in this area."

Liu comes to Arkansas from the Missouri University of Science and Technology, where he served as professor of computer science and associate chair for graduate studies and external affairs in the computer science department. He was interim computer science department chair in 2013. He holds a bachelor's degree in computer science from the National University of Defense Technology in Changsha, China; a master's degree in computer science from Southeast University in Nanjing, China; and a doctorate in computer science from Texas A&M University in College Station.

Liu's research and teaching interests include software engineering, service computing, collective intelligence, web-based argumentation, intelligent systems and software applications. Liu published 128 refereed journal and conference papers and book chapters. He served as principal or co-principal investigator on 26 sponsored research projects and an industrial partnership. He made notable contributions in the areas of on-line argumentation based collaborative decision support, web service discovery and recommendation, software modeling, and software quality and process management.

Liu explained that his objective is "to build and grow a high quality department with an excellent reputation in both teaching and research" by leveraging the support, involvement, and collaboration of the faculty, staff, students, and alumni in the department.

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