FSU CS NEWSLETTER

Department of Computer Science

CHAIR'S MESSAGE

It is with great pleasure that I write this letter for our annual FSU CS newsletter. Our department is dedicated to the education of the next generation of computer scientists using our state-of-the-art teaching and research laboratories. The department has experienced significant expansion in the past several years thanks to the hard work of our faculty, staff, and students. Our student enrollment continues to set new records as new faculty members are hired. The students and faculty in the department contribute significantly to the community at the local, state, and national levels, conduct cutting-edge research, and are recognized with honors and awards. Faculty members have also been awarded a significant amount of research funding. I hope that you read the enclosed articles to learn more about the department and encourage you to explore the department through our new website and to visit us in person if you have the opportunity to do so.

Sharanya Jayaraman Earns Torchbearer Award

Congratulations to ACM's Sharanya Jayaraman for her induction into the prestigious Seminole Torchbearer's program here at Florid State University. Seminole Torchbearers is an organization founded 1986 to keep close bonds with alumni who were student leaders in their time on campus. Since then, over 5,500 alums have been inducted into this prestigious group. Each year approximately 200 junior and senior student leaders are invited to join this elite group.

Sharanya was nominated through department member Eleanor McNealy for her dedication to the CS department's ACM organization. Sharanya actively helped out advising students, helping them out with schedules, helping them find tutors for the harder classes, organizing workshops on topics that are not taught in courses, and helping to improve the overall student experience in the department. She also is a strong female voice for the ACM and its women's division. Once again congratulations on Sharanya for representing the leadership of the department on a university wide scale.

Inside Newsletter

Mrs. Eleanor McNealy Retires after More than 17 Years of Service

Most of you should remember Mrs. Eleanor McNealy, who has dedicated years of service to the Department of Computer Science. She has been a permanent fixture in LOV 203, diligently and patiently assisting students as well as the faculty members of the Department with various matters. On July 14th, 2016, she retired from the department to start a new career after more than 17 years of services. It is hard to put into words the amount of work that she has done over the years and how valued and appreciated she was. Her dedication and loyalty to the Department has meant a great deal to us and her presence here will be greatly missed. She will always hold a place here in the Department and will always be welcomed here. We wish her the best in her new career as an Educator and any endeavors she may pursue in the future.

NEWS & UPDATES

Sonia Haiduc Wins NSF Grant for Software Engineering Research

Computer Science Assistant Professor Sonia Haiduc recently won an NSF grant in the amount of $225,000 for her current research in the software engineering field. The grant comes from the Directorate for Computer Information Science & Engineering (CISE). She continues the growing list of recent faculty and staff to be funded for their various research efforts here at the university.

The title of her project is "Text Retrieval in Software Engineering," and the goal is to reshape the use of TR (text retrieval) aspects in software engineering. This project will encourage the use of more TR based techniques in the day to day task of software developers. Nowadays, there is simply too much textual information located in software artifacts for humans to process. With this work, the TR configuration in software engineering applications will be transformed to be able to perform queries that can in turn present the best TR configuration for each individual software engineering application.

Sonia received a Ph.D. from Wayne State University in Detroit, MI and before that, studied her undergraduate years at Babes-olyai University in Cluj-Napoca, Romania. She has numerous accolades including the ACM SIGSOFT CAPS travel award in 2012. Her most recent publications have landed her many presentations including the ACM Conference on Systems, Programming, Languages and Applications: Software for Humanity in Pittsburgh this year.

Congratulations to Sonia once again on her NSF grant and her continued pioneering for text retrieval information.

Computer Science Earns NSA Centers of Academic Excellence Award

The Computer Science Department was awarded a $291,000 grant through NSA's National Centers of Academic Excellence in Information Assurance / Cyber Defense (CAE/IAE) Research and Education program, to study the resilience of Electrical Grids (EG) based on vulnerability analysis for 2015/2016.

The PI's Dr. Burmester and Dr. Liu will be working together with Dr. Yu from the College of Engineering to analyze real time multi-layer vulnerabilities and threats of EG infrastructures resulting from untrusted or unexpected behavior. Testing will involve the real time digital simulator (RTDS) hosted by FSUs Center for Advance Power System for hardware-in-the-loop testing. The ultimate goal is to develop an architecture that integrates well established, trusted computing engines, trusted key management services, and cryptographic tools to support resiliency for critical infrastructure protection.

Left to Right: Dr. Burmester, Dr. Liu, Dr. Yu

David Whalley Wins NSF Grant for Research in Computer Architecture and Compilers

FSU Department of Computer Science Professor David Whalley has been awarded a new NSF grant for his project "Sphinx: Combining Data and Instruction Level Parallelism through Demand Driven Execution of Imperative Programs." The project is a collaborative effort between FSU, and a colleague from Michigan Technological University. The aim of this project is to develop an alternative execution model, namely, demand-driven execution of imperative programs. As Professor Whalley explained, "In our model, a program that is compiled from a contemporary language is executed in a demand-driven fashion in such a way that both instruction and data-level parallelism can be harvested through compiler-architecture collaboration." The award includes funding for FSU in the amount of $315,000.

Professor Yu Receives a Research Grant from Oak Ridge National Lab

Dr. Weikuan Yu from the Department of Computer Science at Florida State University is awarded a grant of $100K from Oak Ridge National Laboratory for his most recent project on big data analytics research. Yu's project, titled "Design and Development of Big Data Analytics on Shared Memory Programming Models" will conduct research and development activities to develop an integrated framework for enabling big data analytics on high-performance computing platforms. By enabling the efficient use of shared memory programming models, this new project will enable the use of HPC computer systems for scalable and efficient data-intensive applications on leadership computing facilities. The resulting prototype will be incorporated to large-scale file systems at DOE computing facilities hosted at Oak Ridge

Weikuan Yu Receives a Research Grant from Lawrence Livermore National Lab for Research in Data-intensive Systems

Dr. Weikuan Yu, from the Department of Computer Science at Florida State University, was awarded a grant of $72K from Lawrence Livermore National Laboratory for his most recent project on data-intensive systems research.

Yu's project, titled "A Distributed File System for Burst Buffers on HPC Systems" will conduct research and development activities to develop a distributed file system for burst buffers. Burst buffers are being introduced into high performance computing (HPC) storage architectures as a mechanism for solving the scalability problems associated with I/O from large-scale runs. By enabling the efficient use of burst buffers, this new project will address the needs of scalable performance and reliability across distributed burst buffers for data-intensive applications on leadership computing facilities. The resulting prototype will be incorporated to large-scale file systems at DOE computing facilities hosted at LLNL.
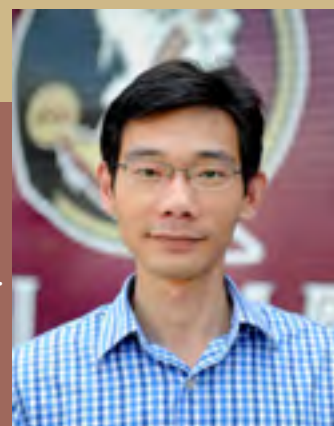
Once again, congratulations to Dr. Yu on his recent accomplishments. The development of more efficient distribution of burst buffers will do wonders in the field of large-scale file systems.

Xin Yuan Receives Grant from Department of Energy for Research in Software Defined Networking

The Department of Energy (DoE) recently awarded a 3-year $450,000 research grant to Prof. Xin Yuan for his research in Software Defined Networking (SDN).The project is titled "Software Defined Networking for HPC Interconnects and its Extension across Domains."

SDN is an emerging networking technology that allows software innovation in network control. It has been widely deployed in campus networks and data centers. This project will investigate the techniques and benefits of introducing Openflow-style SDN capability in the high performance computing (HPC) environment. The researchers also plan to develop software systems to provide Openflow-style SDN capability in InfiniBand, the current dominating interconnection network technology for HPC clusters, and to support SDN capability across multiple SDN domains by leveraging an existing inter-domain SDN framework such as the OSCARS system on ESnet.

NSF/ARO Awards: Jie Yang

Jie Yang, assistant professor in the Department of Computer Science, has been granted a four-year, $200,000 National Science Foundation Award for his project, "Exploiting Fine-grained WiFi Signals for Wellbeing Monitoring." He was also granted with a one year ARO/Stevens grant for his project entitled, "Making Inferences of Physical Properties to Enhance Wireless Security."

The NSF continuously grants awards to deserving faculty members at prominent universities in support of various research efforts. The ARO is the Army Research Office which grants awards for innovative research on mobile wireless security.

For his first project, Professor Yang will seek to exploit the capabilities of WiFi technology in order to capture changes in the environment and human beings. These capabilities open the door for a range of monitoring including things such as human breathing, heart rates, and daily activities. This is research that can have a substantial impact in healthcare, as it frees the individual from active monitoring by a license professional or other forms of wearable monitoring systems. Something as complicated as detecting the onslaught of a disease can be as simple as a few innovations to existing WiFi infrastructures.

The 2nd award is to finish the third year of a three year project to find new ways to deliver securable data across hostile military environments. This all to prevent eavesdropping from oppositional forces in combat along with other potential uses.

CS WELCOMES NEW FACULTY MEMBERS

As a post-doc at UC San Diego, University of Maryland, and UC Santa Barbara Dr. Viet Tung Hoang focused his research in the area of cryptography, with an emphasis in practical application. More specifically, by bridging the gap between the theory and practice, he aims to produce new methods that exceed current heuristic standards. For example, he developed a new authenticated encryption scheme "AEZ" which improves both the security and speed of standardized schemes underlying Internet protocols such as HTTPS, IPSec, and WPA2. AEZ is currently a second-round candidate in the standardization competition CAESAR.

Dr. Hoang's research papers earned the Best Honorable Mention at EUROCRYPT 2015 and Best Paper Award at CCS 2015.

Formerly an assistant professor at Chapman University, Dr. AdrianNistor has done extensive research in the field of software engineering with a focus on bug detection. His detection techniques have met with great success and have found over 190 previously unknown bugs in high-profile software such as Google Chrome, Google Core Libraries, and the compiler GCC.

Dr. Nistor has published in several major journals including ICSE, MICRO, ISSTA, MSR, and JDPC and has also won an ACM SIGSOFT Distinguished Paper award at ICSE 2015. He is currently looking for students at FSU to perform research with and highly encourages all who are interested to inquire!

FSU FOUNDATION
www.foundation.fsu.edu
Computer Science Fund

HOW TO CONTRIBUTE
If you would like the opportunity to reconnect with Florida State and the Department of Computer Science, you can make contributions by check, credit card, or bank draft through the FSU Foundation. One-time gifts or donations are extremely beneficial and make a tremendous difference in our efforts.

For online gifts, go to
https://one.fsu.edu/foundation/donate/give-online.
Under "Designation" click on "More Designations". In the 'Fund Description' box, enter 'Computer Science Fund' (without quote), and/or in the 'Fund #' box, enter F00008, then click Search. In the Search results, click on 'Computer Science Fund'.

To mail a contribution and pay by check, money order, or credit card, go to https://one.fsu.edu/foundation/donate/give-online and print the form.

For more information on how you can donate to the Department of Computer Science please contact Nancy Smilowitz or Jeff Ercekson in the College of Arts and Sciences.

Mail your gift along with the form to:
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FSU CS Department: CS Expo 2015

On November 12th, 2015 the Computer Science Department held its fourth annual CS Expo in The Center for Global Engagement here on FSU's main campus. The CS Expo is one of the department's key annual events for both student and alumni, that takes place to showcase emerging technological projects, encourage innovative dialogue, and lets everyone exchange experiences in the world of tech.

The most important part of this year's event included two talks from keynote speaker Dr. Prasad Kulkarni from University of Kansas, and an invited talk from the David Lawson of NewSci.

Dr. Kulkarni is currently an Associate Professor in the EECS department at the University of Kansas and is well known for being a Ph.D. recipient from FSU in 2007. He went into detail of his graduate experiences here at the university and how it has carried over in his professional field.

Lawson is well known around Tallahassee's community of tech startups for being a partner at Domi Ventures, and for advising several companies including Return on Mission, Agile Equity, Small Act, and HG Data. During his talk he went into the new innovations in Big Data and the things NewSci is doing in regards to the field.

The event also featured several student talks from students here in the department.

Javier Escobar presented his research project entitled: *Automatic Categorization of Software Libraries Using Bytecode,* where his proposed techniques could potentially help software developers use more efficient search methods for large repositories.

Yue Chen held a talk based on his project entitled *Harvesting Developer Credentials in Android Apps.* His efforts explored the challenges of credentials in third party apps and safer ways to recover such information.

Shiva Krishna Imminni presented research on a more Python focused search engine project entitled *PyQuery: A Search Engine for Python Packages and Modules.*

Martin Brown delivered an exceptional talk on open-source benchmark suites designed to expose the complex interactions between components of the Android software stack in his presentation entitled *Agave: a Benchmark Suite Addressing Android System Complexity.*

Peyman Faizian delivered a talk on *The Performance of Random Regular Topologies.*

STUDENT AWARDS
CS Department Programming Contest Winners

The ACM Programming contest is held every year in the CS department. ACM is of course the most prestigious computing society in the world. With over 100 members at our FSU chapter, we are proud to announce the winners for the Fall 2015 and Spring 2016 programming contest.

(Fall 2015)
First Place: Team Merpity Derp: James Bach
Second Place: Team Apr-odigy:
Abhishek Patel
Third Place: Team You Down With .cpp:
Kara Harwas, Will Hadden

(Spring 2016)
First Place: Team eam_name: Chase Warrington
Second Place: Team KungFu:
Yuchuan Tao, Tao Wang, Bolong Zhang
Third Place: Team Advertise Here! 20% Off!:
Shuanglong Zhang, Yilin Wang, Yue Chen

CS Students Receive Harris Corp. Awards

Several students received Harris Corporation awards this past year. Each student gets an award of $4,000 annually if they can receive a US security clearance. Summer internships at Harris Corporation are available and encouraged for awardees. This year's recipients of the award are Rebecca James: Graduate Fellowship, Luis Penagos: Undergraduate Scholarship, Dillon Hall-Rodriguez: Undergraduate Scholarship, and Ian Terry: Undergraduate Scholarship.

CS TA Selected for PIE Position

Computer Science Ph.D., Student Gokila Dorai was selected to be a PIE (Program for Instructional Excellence) Teaching Associate for the term 2016-17. A PIE Teaching Associate is an experienced graduate student teaching assistant (TA) nominated by the academic department and trained by the PIE. Through this assistantship, she will serve as a mentor for other TAs in the department and assist PIE with university workshops, conferences, teaching awards, and other events. PIE Teaching Associates serve for one year and earn a stipend for one year.

FSU PBK New Inductees

The mission of The Phi Beta Kappa Society is to champion education in the liberal arts and sciences, to foster freedom of thought, and to recognize academic excellence.

The Florida State Chapter of Phi Beta Kappa welcomes: Christian Patino, Michael Black, Sean Koji Tilley, Andrew Lindsay, and Phalguna Rupanagudi. Congratulations!

NSF S-STEM Scholarship Recipients

Funded through grants from the National Science Foundation, S-STEM scholarships are offered to academically-talented students to address the shortage of labor and women and under-represented groups in computing.

Current recipients include:
Richard Allen, Grace Bunch, Peter Connolly, Biing-Jium Charles, Ariana Maria Davis, Tatiana Joseph, Nicholas Kelton, Bayan Kharazmi, Miguel Mejia, Zachary Pell, Alexander Petrov, James Picker, Ashley Roberts, Taylor Shields, Remington Trettin, Timonthy Barao, Jared Bennett, Connor Christian, Emilio Figueroa, Raidel Hernandez, Midenlex Joseph, Matthew O'Hagan, Michael Mulling, Luis Penagos, Dillon Hall-Rodriguez, David Scher-Arazi, Iman Taylor, and Jennifer Yarboro. Congratulations!

FSU UPE New Inductees

The mission of Upsilon Pi Epsilon is to recognize academic excellence at both the undergraduate and graduate levels in the Computing and Information Disciplines.

The Florida State Chapter warmly welcomes:
Jordan T. Baker, Monica Lambrano, Christopher Cassion, Hannah McLaughlin, Nikhil Lloyd Cordeiro, Taylor Shields, Dan Diamond, Caleb Tidwell, Gokila Dorai, Sean Koji Tilley, Dominic Fezzie, and William Ulrich. Congratulations!

STUDENT AWARDS

FSU Students Invited to Present at Conference

Computer Science students Aranya Ajith and Rebecca Powell were invited to give a 5 min Lighting talk at the 2016 Women in Cyber Security (WiCyS) Conference that will be held in Dallas, TX from March 31st to April 2nd. Aranya and Rebecca are in the NSF Scholarship for Service (SFS) program, directed by Dr. Mike Burmester. WiCyS is sponsored by National Science Foundation (NSF), federal agencies and academic partners. WiCyS continues to recruit, retrain and advance women in cybersecurity from academia, research, and industry all in the name of sharing knowledge, experience, networking, and mentoring other women.

Aranya Ajith and Rebecca Powell talked about what reverse engineering is used for and the difference between static and dynamic reverse engineering.

An excerpt from their talk:

"Reverse Engineering disassembles code to analyze its features, and understand weaknesses and exploits. It is a powerful tool for the programmer, the security analyst, but also for the adversary. For the programmer, to design better code; for the analyst, to understand its structure and potential malicious traits; and for the adversary, to take control of the application.

"Dynamic analysis allows for the inspection of the behavior of the code as it runs: what processes it starts, what locations it attempts to access, while static program analysis is another semi-easy practical way of learning x86 and how it plays into malware analysis without having any risk of infecting the machine while still being able to learn vital strings, host-based indicators, network-based indicators, etc.

"Understanding how to use these tools, and how to interpret the pseudocode is the real challenge: it is hands-on and involves most of the effort. Understanding the theory is far less challenging."

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