Computing
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Computing Research Association, Uniting Industry, Academia and Government to Advance Computing Research and Change the World.

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Cover Photo: Participants at CRA-W's 2017 Graduate Student Cohort Workshop in Washington, D.C.

Research Highlight: CRA Board Member Margaret Martonosi

By Margaret Martonosi

What do multiprocessors, zebras, and qubits have in common? The field of computer architecture sits at the hardware-software interface, and computer architects play the role of mediating between technology trends emanating "from below" and application trends influencing the field "from above." Over the 30 years since I began graduate school, my computer architecture research has explored many topics, but the ongoing theme has been attention to how technology and application trends and constraints influence hardware and system design, particularly at the hardware-software interface.

A technology trend of particular note today is the deceleration of Moore's Law and Dennard scaling. Previously semiconductor scaling enabled decades of exponential improvements in semiconductor density, performance, and power efficiency, but we are now reaching fundamental physical limits; one consequence has been the increasing importance of accounting for power constraints throughout the system design process. Today's computer systems' power challenges affect not only mobile devices (where battery life is a clear concern) but also all the way up to large-scale data centers that consume tens of megawatts of power, akin to a small city.

Over the years, my research has explored many different aspects of power-aware computer architecture, including both power-saving and power-measurement techniques, and widely disseminated software and tools. Our work on the Wattch architecture-level power simulator allowed many researchers to experiment with power-efficient architecture techniques. At a different level, other work from our group studied methods for optimizing the routing of internet requests to data centers in ways that could minimize total energy cost or maximize the exploitation of green energy

for a given global-scale internet service. One key aspect of all this work has been to establish the role of computer architects and early-stage design approaches in power issues that previously were mostly considered to be the domain of circuits and device-level work.

Another line of my work was motivated by the desire to do a top-to-bottom, application-to-hardware exploration of power-efficiency issues in mobile systems. Our collaboration with biologists interested in improving the state-of-the-art in wildlife tracking led my group to embark on researching mobile sensor networks. This work culminated in the design and real-world deployment of ZebraNet, a peer-to-peer mobile network of GPS-based tracking collars for zebras in the Laikipia region of Kenya. In addition to greatly improving the spatiotemporal detail of wildlife data available in that region, this work was noteworthy in establishing the use of mobile sensors and delay-tolerant networking (DTN) techniques for energy-efficient large-scale environmental sensing. As a related project in the following years, we adapted these ideas for other applications, including designing and deploying a vehicular DTN system for providing low-cost internet access to disconnected rural villages in northern Nicaragua. That work, in turn, led us, working with collaborators from Rutgers University and AT&T, to study broader techniques for mobile opportunistic sensing, including methods for using coarse-grained and differentially private cellphone usage data to characterize labor and commute patterns for large regions, and to compare major cities such as New York, Los Angeles, and San Francisco.

In my most recent work, the trends and goals continue to evolve, but the focus at the hardware-software interface remains. One aspect of my current work is building tools and techniques to automatically verify the correctness of memory consistency models (MCMs) in modern computer systems. MCMs specify the rules by which memory accesses can be reordered for performance purposes in parallel systems, and

today's complex, heterogeneously parallel systems make MCMs simultaneously crucially important, and also very hard to ascertain the correctness of. Our automatic verification tools mitigate the complexity of building correct hardware, and of mapping properly to that hardware from high-level languages through compiler and operating system layers.

Finally, a thread of my work looks beyond current CMOS-based classical computing approaches and toward a world where quantum computing (QC) might soon play an important role. With QC hardware rapidly improving, my QC work explores compilation, scheduling, and parallelization techniques that help optimize the path from high-level

QC algorithms to lower-level QC devices. In the process, our work allows designers to explore tradeoffs in how QC systems are organized and what error-correction methods make the most sense.

Overall, across these different threads of research, the fundamental vision remains one that recognizes the central role of computer architecture as a mediator of applications and technology trends. Taking this broad view of computer architecture and its role in overall hardware and software systems research, my work has given me a huge variety of topics and challenges to attack.

About the Author

Margaret Martonosi is the Hugh Trumbull Adams '35 Professor of Computer Science at Princeton University, where she has been a faculty member since 1994. Martonosi holds affiliated appointments in Princeton's Electrical Engineering Department, its Center for Information Technology Policy, its Environmental Institute, and its Andlinger Center for Energy and the Environment. From 2005-2007, she served as associate dean for academic affairs for the School of Engineering and Applied Science. In addition to her primary position at Princeton, she is an Andrew Dickson White Visiting Professor-At-Large at Cornell University. From 2015 to 2017, she did international technology policy as a Jefferson Science Fellow within the U. S. Department of State.

Martonosi is a fellow of both IEEE and ACM. Her major awards include Princeton University's 2010 Graduate Mentoring Award, the Anita Borg Institute's 2013 Technical Leadership Award, and test-of-time paper awards from ISCA and ACM SIGMOBILE. Martonosi co-chairs the NSF CISE Advisory Committee, has served on the board of directors of the Computing Research Association (CRA) since 2009, and will be co-chairing CRA-Women beginning in October, 2017.

Call for Nominations! – 2017 CCC Leadership in Science Policy Institute

By Peter Harsha, CRA Director of Government Affairs

As part of its mission to develop a next generation of leaders in the computing research community, the Computing Research Association's Computing Community Consortium (CCC) announces the fourth offering of the CCC Leadership in Science Policy Institute (LiSPI), intended to educate computing researchers on how science policy in the U.S. is formulated and how our government works. We seek nominations for participants.

LiSPI will be centered around a two day workshop to be held November 6 – 7, 2017, in Washington, DC. (Full details of LiSPI are available here.)

LiSPI will feature presentations and discussions with science policy experts, current and former Hill staff, and relevant agency and Administration personnel about mechanics of the legislative process, interacting with agencies, advisory committees, and the federal case for computing. A tentative agenda is viewable from the link above. LiSPI participants are expected to:

◗ Complete a reading assignment and a short written homework prior to attending the workshop, so that time spent at the workshop can focus on more advanced content,

◗ Attend the November 6 – 7th workshop, which includes breakfast both days, lunch, and a reception with the speakers and invited guests at the conclusion of the first day, and

◗ Complete an assignment afterwards that puts to use the workshop content on a policy problem that has significant projection onto computing and information.

LiSPI is not intended for individuals who wish to undertake research on science policy, become science policy fellows, or take permanent positions in Washington, DC. Rather, we are trying to reach work-a-day academics who appreciate that our field must be engaged in helping government.

The CCC will provide funds for hotel accommodations for two nights of local expenses (hotel, meals) for the November 6 – 7th workshop. Nominees are expected to pay their own travel expenses, though there will be a limited fund available for participants who cannot attend unless their travel is provided.

Eligibility and Nomination Process

LiSPI participants are expected to have the experience and flexibility in their current positions to engage with government. University faculty members should be from CS or IS departments and be post-tenure; industrial researchers should have comparable seniority. Participants should be adept at communicating. They must be nominated by their chair or department head and must have demonstrated an interest in science policy, especially as it relates to computer science (and closely allied fields).

Specifically, the nomination process is as follows:

◗ A chair or department head proposes a LiSPI candidate by visiting the nomination page and providing the name and institution of the nominee, along with a letter of recommendation.

◗ The candidate will then be contacted by the workshop organizers and asked to submit a CV, a short essay detailing their interests in science policy, and an indication of whether they would require financial aid to attend.

All nominations and material from nominators and nominees must be received by **JUNE 23, 2017.**

Selection Process

The LiSPI selection committee will evaluate each nomination based on record of accomplishment, proven ability to communicate, and promise. Selections will be announced by **July 15, 2017.** We plan to open the workshop to 35 participants.

Please discuss this opportunity with your colleagues, identify those you believe would be interested in participating, and submit nominations!

NSF-Funded IoT Security Research Excites Attendees at the 2017 CNSF Exhibition

By Brian Mosley, CRA Policy Analyst

On May 16, the Coalition for National Science Funding (CNSF) (http://www.cnsfweb.org/), an alliance of more than 140 professional organizations, universities, and businesses, held their 23rd Annual Capitol Hill Exhibition (http://www.cvent.com/events/cnsf-exhibition-reception/speakers-4f70b7f4caa64eb088acb87e65267497.aspx). CNSF supports the goal of increasing the federal investment in the National Science Foundation's research and education programs, and the exhibition itself is a great way to show members of Congress and their staff what research the American people have funded.

This year the Computing Research Association, a member of CNSF, sponsored Nick Feamster and his students from Princeton University (https://www.cs.princeton.edu/~feamster/). They demonstrated multiple pieces of technology for monitoring security of consumer Internet of Things (IoT) devices on a home network. Feamster's students, all undergraduates at Princeton, are Daniel Wood, Gudrun Jonsdottir, and Rohan Doshi.

AAAS CEO and former Congressman Rush Holt (far left), speaks with (from left to right) Gudrun Jonsdottir, Daniel Wood, and Rohan Doshi, all students from Princeton University

Each student presented a different piece of technology to the exhibition's attendees. Wood demonstrated an algorithm used to monitor IoT devices to determine what information is being transmitted and whether it poses a privacy risk to the consumer. Jonsdottir showed her program, which can check devices to determine if they have default passwords and automatically change them to be more secure. Doshi demoed his algorithm that monitors the internet traffic of devices to determine if they have been compromised by hackers and are being used in cyber attacks, similar to the 2016 Dyn cyber attack, or other malicious uses. Together the three students created an intuitive dashboard, which can present all this information to consumers and allow them to monitor their interconnected devices.

Jim Kurose, Assistant Director of CISE at NSF, speaks with (from left to right) Rohan Doshi, Gudrun Jonsdottir, and Daniel Wood.

All of this work is supported from the CISE directorate at NSF. All three projects were well received by the attendees of the exhibition; in fact, the students fielded questions from congressional staffers; NSF program officers; the assistant director of CISE, Jim Kurose; and even the NSF director, France Córdova, and the president of AAAS, former congressman Rush Holt.

A number of other organizations had displays and were demonstrating NSF-funded research at the event. From the American Mathematical Society's "Berry Smart: Mathematics for Food and Water Security" to the Federation of Associations in Behavioral and Brain Sciences' "Neuroscience Discoveries in Reading and Dyslexia" to Vanderbilt University's "Nanoscale Manufacturing of Next-generation All-Carbon Materials," the exhibition was a great display of the different types of research being supported by NSF. Look here (http://www.cvent.com/events/cnsf-exhibition-reception/speakers-4f70b7f4caa64eb088acb87e65267497.aspx) to see a list of the participating organizations and what other exhibitors presented.


Gudrun Jonsdottir (left-center) presents her research to Jim Kurose, Assistant Director of CISE at NSF, as Rohan Doshi (far left) and Daniel Wood (far right) look on

NSF Director France Cordova (left) listens to Gudrun Jonsdottir (left), while Nick Feamster and Rush Holt (center) look on

Compared to Men And Women, Non-Binary Students Report Lower Levels of Peer Support

By Heather Wright, CERP Research Associate

Degree to which students feel supported by their peers in computing
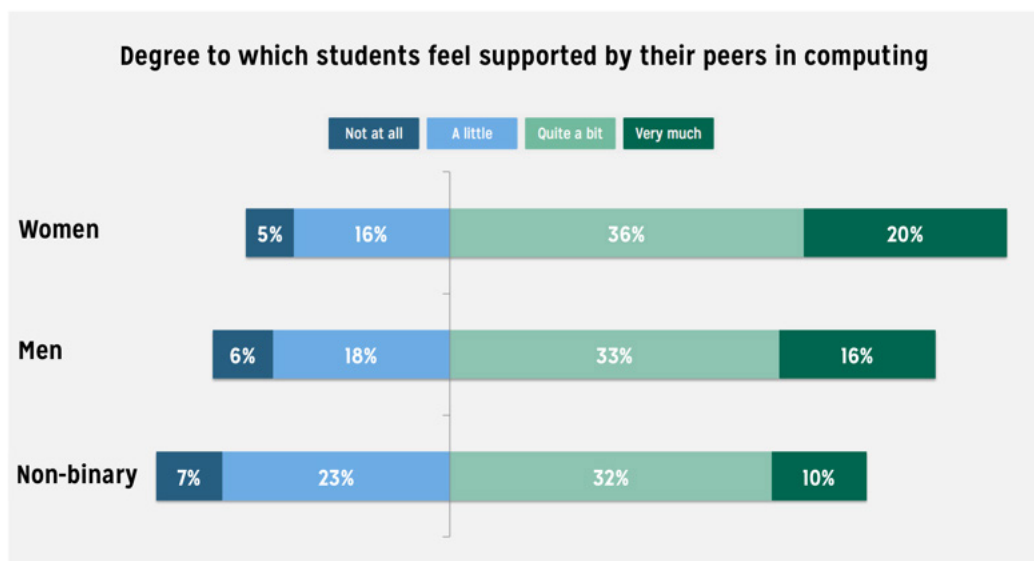
Gender identity is complex, and while the majority of people identify as either man or woman, others identify as a non-binary gender (also known as genderqueer or gender non-conforming). When one identifies as non-binary, this means they identify as something other than the traditional binary gender options (i.e., man or woman). Non-binary students may feel marginalized because they fall outside of the "parameters" set by society to act and exist in one way or another [1]. As such, these individuals may experience harassment, discrimination, or micro-aggressions [2] [3].

Using Data Buddies data, CERP explored non-binary computing students' levels of *peer support*, or the extent to which students feel they have peers who they can rely on for academic and social support in their undergraduate computing program. Analyses revealed non-binary students in our sample reported lower levels of peer support than men ($p < 0.05$) and women ($p < 0.01$). This finding is important, because peer support is linked with positive self-esteem and persistence [4] and retention in science fields [5]. While computing educators cannot force students to support one another, educators can set an example by creating a welcoming and safe environment through the recognition and support of students' differences. Educators can also encourage collaborative and team-based learning activities so that all students have the opportunity to develop their peer network in the department.

Notes. During the 2016 semester, CERP surveyed 5,923 undergraduate students majoring in a computing field from a sample of computing departments across the United States. Sixty-six percent of the sample identified as men, 33 percent as women, and 2 percent as non-binary genders. Students were asked the following question on a scale from [1] *Not at all* to [5] *Very much: To what extent is each of the following kinds of support available to you from other computing students if you need it:* (1) *someone to hang out with;* (2) *someone to confide in or talk to about your problems;* (3) *someone to get class assignments for you if you were sick;* (4) *someone to help you understand difficult homework problems.* Items were aggregated into a composite variable for the analysis above, Cronbach's alpha = .89. Students who responded "Somewhat" were not included in the graphic but were included while calculating the percentages within each group. An Analysis of Variance treating gender as an independent variable, and peer support as a dependent variable revealed a statistically significant difference between

groups, $F_{(2, 5,868)} = 18.50$, $p < .01$. A post hoc Dunnett's test revealed non-binary students reported weaker peer support (Mean [M] = 3.11, Standard Deviation [SD] = 1.18) compared to men (M = 3.39, SD = 1.09), $p < 0.05$ and women (M = 3.55, SD = 1.11), $p < 0.01$.

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This analysis is brought to you by the CRA's Center for Evaluating the Research Pipeline (CERP). CERP provides social science research and comparative evaluation for the computing community. To subscribe to the CERP newsletter, click here.

Expanding the Pipeline:

Simply Smarter: The 2017 Tapia Conference Celebrates Computing's Diversity

By Jerri Barrett, Director of social media for the Center for Minorities and People with Disabilities in IT

The 2017 ACM Richard Tapia Celebration of Diversity in Computing is being held September 20-23 in Atlanta, Georgia. This year's theme, Diversity: Simply Smarter, evokes the basic yet irrefutable concept that diversity is a winning choice. Research by social scientists has repeatedly shown that teams made up of diverse members have a greater potential for innovation than homogeneous teams. Whether we seek innovation, intelligence, creativity, strength, or beauty of ideas, the best outcomes come from a diverse set of perspectives, a diverse set of experiences, and a diverse set of people.

The overarching goal of the Tapia Conference is to bring together undergraduate and graduate students, faculty, researchers, and professionals in computing from all backgrounds and ethnicities. The attendees and presenters will celebrate the diversity that exists in computing; connect with others with common backgrounds, ethnicities, disabilities, and genders to create communities that extend beyond the conference; obtain advice from and connect with computing leaders in academia and industry; and be inspired by the presentations by and the conversations with leaders with backgrounds shared by the audience.

Keynote speakers at the Tapia conference are a highly diverse group and will provide both learning and inspirational opportunities to the attendees. The 2017 Tapia conference features five different keynote speakers:

▶ Edward Castillo, research scientist, Radiation Oncology Department, Beaumont Health Research Institute, will present *Making a Mathematical Diagnosis: How Combining Medical Imaging with Computational Science can Improve Patient Outcomes;*

▶ Adrienne P. Felt, Google, Chrome Metrics and Usable Security Team, will present *Building a Browser for Everyone;*

▶ James Mickens, associate professor of computer science, Harvard University, will present *Leveraging Fine-grained Data Flows in Web Applications;*

▶ Oyekunle Olukotun, professor, Electrical Engineering and Computer Science, Stanford University, will present *Making Parallelism Easy: A 25 Year Odyssey;*

▶ Avani Wildani, assistant professor, MathCS and Neuroscience, Emory University, will present *New Interfaces in Neural Computing.*

The Tapia conference will open on Wednesday, September 20. The first session is the CMD-IT Student Professional Development Workshop, which will provide undergraduate and master's level computer science students with the unique opportunity to receive coaching and development from industry professionals. Students will learn about best practices for resume writing and preparing for the rigors of the technical and behavioral sides of the interview process. Students can signup for this session when they register for the conference.

The conference will continue with a Fireside Chat on Future Visions of Artificial Intelligence and Machine Learning. The Fireside Chat will be followed by the Tapia conference's career fair. The career fair will feature more than 80 sponsoring organizations including leading technology companies, universities, national laboratories, and government agencies. Attendees interested in interviewing with these organizations may submit their resumes to the resume database. The Tapia conference provides the resume database for individuals who are looking for internships, industry and government jobs, graduate programs, faculty positions, or post doc positions. (Sponsors will begin accessing the database in June.)

Thursday and Friday of the conference will feature more than 50 breakout sessions with workshops and panels. The breakout sessions encompass a wide range of topics. The various types of technology highlighted will include cybersecurity, data science, virtual and augmented reality, Internet of Things, and artificial intelligence. Other sessions cover issues and best practices around broadening participation in computing such as "Addressing Diversity & Inclusion Issues in Computer Science Through Contributions to Free and Open Source Software." Birds of a feather sessions include "Disability: Celebrating a Face of Diversity," "Women of Color in Computing," "Hispanics in Computing Community,"

"Keras," "Deep Learning Made Easy," and "Things I Wish I Knew About High Performance Computing when I Started."

The Tapia technical student poster session, which takes place on Thursday evening, provides an opportunity for undergraduate and graduate students to present their latest research and methodologies to the conference audience. Winners of the top posters (1st, 2nd, and 3rd place) will be recognized at the conference banquet. The Tapia industry poster session provides an opportunity for conference participants to learn about career paths and/or diversity initiatives at the organizations of conference sponsors.

The Tapia conference banquet features the presentation of the Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Computing. The award is given yearly to an individual who demonstrates significant leadership, commitment, and contributions to diversifying computing. The banquet will also feature guest speaker Randal Pinkett, founder, chairman and CEO, BCT Partners. Pinkett has received numerous awards for business and technology excellence including the Information Technology Senior Management Forum's Beacon Award, the National Society of Black Engineers' Entrepreneur of the Year Award, and the National Urban League's Business Excellence Award. Pinkett was the first, and only, African-American to receive the prestigious Rhodes Scholarship at Rutgers University. He was also the winner of NBC's hit reality television show, "The Apprentice," having been selected as one of 18 candidates chosen from among 1 million applicants to compete for this opportunity.

Pinkett is the author of *Campus CEO: The Student Entrepreneur's Guide to Launching a Multimillion-Dollar Business* and *No-Money Down CEO: How to Start Your Dream Business with Little or No Cash*. His latest book, *Black Faces in White Places: 10 Game-Changing Strategies to Achieve Success and Find Greatness,* presents the strategies African-Americans and other emerging majorities use to successfully navigate today's rapidly changing professional landscape. *Black Faces in White Places* was named one of the "10 Best Books of 2010." Based on the book's "10 Game-Changing Strategies," Pinkett has launched the "Campaign to Redefine the Game," which represents a call to action for Americans to level the playing field in the 21st century workplace.

Activities available on Saturday will include CodeCon, a programming contest developed in-house at Bloomberg. Participants will be encouraged to push their programming and problem-solving skills to the limit in a race against the clock. Also on Saturday is the Doctoral Consortium, a one-day workshop that provides an opportunity for doctoral students to discuss and explore their research interests with a panel of experienced computing researchers.

The Tapia conference is sponsored by the Association for Computing Machinery and presented by the Center for Minorities and People with Disabilities in Information Technology (CMD-IT). Learn more about the ACM Richard Tapia Celebration of Diversity in Computing at www.tapiaconference.org.

About the author

Jerri Barrett is the director of social media for the Center for Minorities and People with Disabilities in IT (www.CMD-IT.org).

Borg Early Career Award Winner: Lydia Tapia

Lydia Tapia, an assistant professor in the Department of Computer Science at the University of New Mexico, was recently named the recipient of the 2017 CRA-W Borg Early Career Award (BECA). The award honors Anita Borg, who was an early member of CRA-W, and is inspired by her commitment to increasing the participation of women in computing research. The annual BECA is given to a woman in computer science or engineering who has made significant research contributions and contributed to her profession, especially in the outreach to women.

Tapia received her B.S. in computer science from Tulane University and her Ph.D. in computer science from Texas A&M University. Her research contributions are in the development of computationally efficient algorithms for the simulation and analysis of high-dimensional motions for robots and molecules. Specifically, she explores problems in computational structural biology, motion under stochastic uncertainty, and reinforcement learning. Her research has been supported with more than $5 million of funding from the National Science Foundation (NSF) and National Institutes of Health (NIH). It also has led to her filing two patents: one on a novel unmanned aerial vehicle design and another on a method to design allergen treatments.

Tapia is also the recipient of the 2016 Denice Denton Emerging Leader ABIE Award from the Anita Borg Institute for her high-quality research and a significant positive impact on diversity, and a 2016 NSF CAREER award for her work on simulating molecular assembly. As a Ph.D. student, she was awarded a NIH Molecular Biophysics Training Grant Fellowship, a Sloan Research Fellowship, and a P.E.O. scholarship.

She is most proud of the achievements of her students. Their accomplishments, to date, include a Popejoy Award for top Ph.D. dissertation at the University of New Mexico, being a finalist in the CRA Outstanding Undergraduate Researcher Award, and an honorable mention in the National Center for Women in Information Technology Aspirations Award for high-school students. When Tapia and her students are not toiling in the lab, you can often find them performing interactive robot demos at local schools, robotics competitions, and museums.

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A Rural Lens on a Research Agenda for Intelligent Infrastructure

By CCC Staff

We hear all about "smart cities" but what about smart rural communities? We cannot forget about our rural populations, which we depend on for agriculture, fishing, forestry, manufacturing, and mining.

Recently, the Computing Community Consortium (CCC) in collaboration with the Electrical and Computer Engineering Department Heads Association (ECEDHA) released white papers describing a collective research agenda for intelligent infrastructure. We will be blogging about each paper over the next few weeks.

Here, we highlight A Rural Lens on a Research Agenda for Intelligent Infrastructure paper. Sparse population densities drive many of the challenges facing rural areas; these are problems that differ from high-density urban areas. They often lack the range of services that a city can provide to residents, such as robust public transit, and diversity of options, such as choices for healthcare. In terms of intelligent infrastructure, rural areas also challenge the dominant modes of thinking about the future of what it means to be smart: inviting consideration of different traffic patterns, pollution causes and locations, agricultural monitoring, aging in place, support for veterans, and so forth.

Designing rural intelligent infrastructure that is robust in the face of power outages, works in the heat of the Mojave and the wetlands of the Atchafalaya swamp, and is located 100s of miles from any form of significant data processing capability or IT experts, presents important socio-technological challenges.

Rural communities today experience the same disadvantage with Internet access today as they did with electricity access in the 1930s. They benefited from the Rural Electrification Act (REA) that fueled the development of infrastructure. Government investment in a rural Internet based intelligent infrastructure would position American corporations to

partner in the development of applications and services, provide rural Americans with the same opportunities as their counterparts in the cities.

The paper outlines the next steps for rural intelligent infrastructure, which require basic computing research that can be applied to a rural community.

◗ Internet Access: Novel Networking Innovations

   ◗ To bring Internet access to rural areas, a number of wireless technologies have been trialed and failed, so more research is needed before this technology is ready for widespread utilization.

◗ Distributed and Localized Computing: Local Clouds

   ◗ To create rapid-response capabilities and resilience, rural areas will rely on a computation hierarchy that begins with highly localized computing and includes unlimited Internet-based cloud computation and storage as the top level of the hierarchy.

◗ Rural Testbeds: Engaging Rural Americans

   ◗ The rural United States has a staggering range of difficult terrain to support innovation in intelligent infrastructure. We need testbeds that will initially challenge our scientific and technological imaginations as we design solutions that can function in these environments and across these vast terrains.

◗ Education and Workforce Development: Employment Opportunities

   ◗ Americans need to be more than just consumers of a smart digital grid, they should be able to maintain and evolve it. In rural communities, this is even more important since it is the local population who may end up managing far more than just their own consumer needs

A National Agenda for Intelligent Infrastructure is not complete without explicit consideration of the needs of rural communities. And yet, Intelligent Infrastructure is often imagined as "smart cities" with bias towards urban needs. A Rural-focused Intelligent Infrastructure Act is proposed, where technological platforms and applications supported by the appropriate policy will empower rural communities.

Please read the paper for additional details on the research agenda on intelligent infrastructure for rural communities.

Stay tuned to learn more about the other intelligent infrastructure papers!

Research Agenda in Intelligent Infrastructure to Enhance Disaster Management, Community Resilience and Public Safety

By Michael Dunaway, Daniel Lopresti, and CCC Staff

What if a Category 5 hurricane were heading towards New Orleans right now? What would happen in 2017 that did not happen in 2005? We have learned a great deal from the lessons of Hurricane Katrina and other major incidents, and disaster prevention and recovery has dramatically improved in the last 12 years. Much of the improvement can be attributed to the integration of technology with a "whole of community" approach to emergency management that combines FEMA's National Incident Management System, with advanced data visualization, mapping, and decision systems, and a National Disaster Recovery Framework targeting community recovery and not simply emergency response.

Recently, the Computing Community Consortium (CCC) in collaboration with the Electrical and Computer Engineering Department Heads Association (ECEDHA) released white papers describing a collective research agenda for intelligent infrastructure. We will be blogging about each paper over the next few weeks.

Here, we highlight the Research Agenda in Intelligent Infrastructure to Enhance Disaster Management, Community Resilience and Public Safety paper.

As the nation becomes more connected, networked and technologically sophisticated, new challenges and opportunities arise that demand a rethinking of traditional approaches to public safety and emergency management. The design and integration of intelligent infrastructure—including embedded sensors, the Internet of Things (IoT), advanced wireless information technologies, real-time data capture and analysis (such as FEMA's National Incident Management System), and machine-learning-based decision support—holds the potential to greatly enhance public safety, emergency management, disaster recovery, and overall community resilience. At the same time, however, the integration of these systems will add increasing complexity, requiring continuing research to optimize the new technologies and manage potential vulnerabilities. The continuing challenges of current and future disasters will require that the U.S. engage in an ongoing program of research, technology development, and strategic planning.

Research in intelligent infrastructure will save lives, improve disaster resilience, and enhance the quality of life. It will also accelerate social and economic recovery and care for victims in disaster-affected regions and ensure continuity of governance and social stability. A roadmap would create a common ground for researchers and a broad portfolio of research grants managed through a network of regional university-based centers would support formative experimentation and evaluation of progress aligned with local environments and regional threats and vulnerabilities.

Below are some examples where priority should be placed in research on emerging intelligent infrastructure:

Sensing and Data Collection

◗ Research in computer vision to advance capabilities in environmental monitoring and interpretation of imagery from unmanned aerial, ground, or marine systems, and integration with personal mobile sensors embedded in smart phones--including the associated video feeds from social media networks.

◗ Methods to enable resilient integration, operation, and security of next generation IoT devices and technologies, combining stationary sensors with mobile sensing deployed in the field.

Communication and Coordination

◗ Seamless integration of current and future communication infrastructures, legacy systems and advanced long-range wireless technologies and public safety networks to ensure reliable exchange of crisis-related information.

◗ Improved integration and coordination of multi-team systems of first responders (e.g., firefighters, law enforcement and emergency medical personnel, search and rescue teams, and emergency management).

Big Data Modeling frameworks, Analytics and Tools for Disaster Prediction and Management

◗ Probabilistic modeling of complex events to develop predictive analytics and enhance the capabilities for adaptive response, and to refine response planning.

Social Computing, Human Factors, and the Information Infrastructure

◗ Research into disaster resilient communications and data management strategies to manage uncertainty across disaster warning, response, and recovery.

◗ Natural interfaces and tools that enhance human capabilities to ask questions in a high-level manner that facilitate making decisions during extreme events.

Please read the paper for additional details on the research agenda for Intelligent Infrastructure to enhance community resilience, public safety, and disaster management.

Stay tuned to learn more about the other intelligent infrastructure papers!

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MOBILITY21: Strategic Investments for Transportation Infrastructure & Technology

By Rahul Mangharam and Gregory Hager

How should we invest in transportation infrastructure and technology to protect our national security and our country's economic growth?"

Recently, the Computing Community Consortium (CCC) in collaboration with the Electrical and Computer Engineering Department Heads Association (ECEDHA) released white papers describing a collective research agenda for intelligent infrastructure. We will be blogging about each paper over the next few weeks.

Here, we highlight the MOBILITY21: Strategic Investments for Transportation Infrastructure & Technology paper.

This paper outlines critical needs for our transportation infrastructure, identifies new technology drivers and proposes strategic investments for safe and efficient air, ground, rail and marine mobility of people and goods. As transportation technology evolves, the paper proposes an "Integrated Deployment" approach for performance-based regulations rather than the current prescriptive policy and planning. This approach includes the clustering of innovations within technology ecosystems. Such integrated deployments represent investments where the productivity gains produced are greater than the sum of their individual technology parts.

Some examples include:

◗ Ground Transportation: Smart Rebuild of the Interstate System

◗ This should bring the system up to modern highway and bridge design standards, which includes critical operational and safety improvements and advanced traffic management. The Smart Rebuild should be geared toward eliminating or reducing major commuter and freight bottlenecks and include connected and autonomous vehicle infrastructure necessary for the next generation of vehicles.

◗ Intercity Passenger and Freight Rail Service

◗ The nation needs a complement to our interstate system to carry passengers and freight. It is necessary to support the efforts of some states to improve Amtrak service or establish high-speed rail. Rail freight improvements, in partnership with Amtrak and the major railroads and seaports, would benefit the new on-demand national and international economy.

◗ Unmanned Aerial Systems

◗ Unmanned aerial systems also hold the potential to revolutionize urban and rural parcel delivery; medical device testing and drug delivery; the agricultural sector through precision farming; and the oil and gas industry through efficient pipeline inspections and infrastructure maintenance.

With the ultimate goal of "safe and efficient movement of people and goods", the recommendations in the Mobility21 article are to (a) maintain existing infrastructure to modern design standards, (b) develop integrated multi-modal transportation solutions, (c) provide regulatory pathways for adoption of new transportation technologies for shared and autonomous systems, (d) invest in technologies for real-time observation and response of transportation bottlenecks and catastrophes.

Please read the paper for additional details on strategic investments for transportation infrastructure & technology.

Stay tuned to learn more about the other intelligent infrastructure papers!

Maximizing Opportunity and Building Capacity: Computer Science and Engineering at the University of Washington

By Ed Lazowska, Bill & Melinda Gates Chair, and Hank Levy, director and Wissner-Slivka Chair, Paul G. Allen School of Computer Science & Engineering, University of Washington

Computer science has emerged as a cornerstone of the modern university and the modern world. The impact of computing innovation touches nearly every field—and has transformed entire industries beyond recognition from what they were 20, 10, or, in some cases, just a few years ago. Because of this, computer science has come to be viewed as one of the greatest engines of opportunity, whether for students seeking a degree with great job prospects (and even greater potential for real-world impact), or for the economic benefits that research activity and companies in this sector bring to a region. As students at Yale University wrote two years ago, "the best universities in the world are now judged by the quality of their computer science departments."

This article describes strategies we have employed at the University of Washington to increase the prominence and impact of our program. In the past few years we have been elevated from a department to the Paul G. Allen School of Computer Science & Engineering, we have begun construction on a second building that will double our space, and we have received legislative investments that will double our enrollment while preserving our ability to closely mentor students. While we have some important advantages (principal among them Seattle's emergence as a leading center of technology in multiple sectors) and some particular circumstances (such as our role as a public university, dependent upon legislative support and bearing regional responsibilities), we believe that many of these strategies will be usable by others.

Computer Science: From Smaller, Faster, Cheaper to Tackling Big Societal Challenges

Nearly a decade ago we decided to embrace the view that success in computer science in the next 50 years will be determined by our impact on societal challenges such as education, health care, energy efficiency, and transportation, and to seek a first-mover advantage in this space. This perspective has paid off in many ways. It's a differentiator. It's a stimulus for collaborations across the university and the region. It attracts diverse students. And it has broad appeal with external supporters such as citizens, civic leaders, prospective donors, and state legislators.

There is nothing magical about this particular view of the future. What *is* magical, though, is having *some* well-articulated view of the future that people can relate to and that can be used to guide investments.

Credit: Mark Stone/University of Washington

The authors, Hank Levy (left) and Ed Lazowska (right), with Paul Allen (center) in the building that bears his name.

Understanding Our True Value Proposition

We can – and we do! – talk about the importance of our research and about our value to our regional economy and to society in terms of the innovations we generate and the companies we spin out. But we know that for the vast majority of supporters, what they value most are the people we educate. For our elected leaders in the state capital, this is because we are a unit of the state's flagship public university and we educate Washington's students for Washington's leading-edge jobs. For employers, it's because our graduates power their companies. For prospective donors, it's often because they see how computing can change the world and recognize the role of well prepared, highly creative professionals in advancing that impact.

Recognizing that we are valued, first and foremost, for our graduates has enabled us to craft a compelling story.

Building a Base of External Support

We cultivate relationships with legislators, with trade and advocacy organizations, with tech industry leaders, and with members of the local media. We provide data on student demand, workforce demand, and the economic opportunity for our region, and we share stories of the impact our faculty, students, and alumni are having in the real world. We cultivate champions who are only too happy to deliver this message on our behalf, because they understand what's at stake. As an example, it is now well understood in our region that the workforce gap (the gap between degrees granted and jobs available) in computing is four times as great as the workforce gap in all other fields of engineering combined; that our program is by far the preferred source of graduates for leading tech employers in our region; and that computer science is the first-choice major of more incoming freshmen than any other field.

Taking our message to the broader community and getting everyone to sing from the same song sheet has been critical to securing the support of decision-makers on and off the campus.

Engaging Alumni Early and Often

We look for ways to make it easy for recent graduates to "give back" in the form of time, money, or both. One of the easiest mechanisms for alumni to amplify their support is through a corporate match. Each year, we identify our giving

Credit: Kristin Osborne/Paul G. Allen School of Computer Science & Engineering

On March 9th, faculty, students, alumni, and friends in the local community gathered to celebrate the creation of the Paul G. Allen School of Computer Science & Engineering at the University of Washington.

priorities and reach out to a handful of engaged alumni at companies with matching programs. They then lead the charge internally during their giving campaigns. We also set up our own matching program, backed by a $1 million gift from a longtime friend and donor interested in helping the younger generation engage philanthropically with their alma mater. Finally, we foster a virtuous cycle of mentorship by enlisting our alumni's help in student résumé workshops, mock technical interviews, and guest lectures.

Everyone enjoys social events like regional "all-calls" and company happy hours, but the opportunity to give back in a meaningful way is what builds enduring connections with our alumni community.

Substantive Relationships as the Heart of Stewardship

While alumni support is critical, many of our biggest donors and supporters are not former students. They are members of the community who understand our role in advancing discovery, solving real-world problems, and, most importantly, producing first-rate graduates. And many of those who are repeat donors became so through stewardship driven by faculty and students, not through the traditional development organization. Events and meetings are useful, but nothing captures people's imaginations or instills a sense of buy-in like the opportunity to spend quality time with our students and faculty through customized lab tours, hands-on demos, one-on-one interactions, and substantive personal relationships.

By making the human connection a centerpiece of our stewardship efforts, we have turned building donors into endowment donors, and modest scholarship donors into major benefactors.

Community Outreach and Inclusion

We have created a number of programs to engage members of the community. Many of these activities also help to create an environment that supports diversity and inclusiveness. Through our K-12 outreach program, DawgBytes, we organize summer day camps for K-12 students to explore computer science – which includes providing scholarships to students from low-income families – and host open houses and workshops for students, teachers, and parents throughout the year. We also emphasize accessibility through research and educational programs for people who are blind, deaf, or living with severe motor impairments. To make sure we walk the talk internally, we created a school diversity committee made up of faculty, staff, and students, and

Credit: LMN Architects

The Allen School assembled public and private support to construct a second building that will provide the space to double enrollment in response to skyrocketing student and employer demand.

appointed a director of diversity and outreach, backed by philanthropic support, to coordinate our internal and external-facing programs.

These efforts are valuable in their own right, but it turns out they are also attractive to donors and our friends in industry.

Under-Promise and Over-Deliver

The people you ask for support will view past results as an indicator of future behavior, so you can't go wrong if you under-promise and over-deliver. When Paul Allen made his first significant investment in our program – the naming gift for the Paul G. Allen Center for Computer Science & Engineering – we used it as a springboard for tripling our research activity and strengthening our expertise in emerging areas of the field; now we have become the Paul G. Allen School of Computer Science & Engineering. When the state legislature directed additional funds to our program to increase capacity, we immediately implemented that directive; now we have received multiple years of funding for growth. Our "zero-BS" relationships with Microsoft, Amazon, Google, Zillow, the state, and many individual supporters have resulted in the funding for our second building. Microsoft,

in particular, has been a truly extraordinary supporter through its direct support, and through its influence with others, such as University of Washington leadership, civic organizations, other companies, and the legislature.

Making a habit out of not only meeting but exceeding people's expectations is one of the reasons that we have been so successful at securing support for new initiatives.

In Summary

None of this is rocket science. Establish a vision. Understand your value proposition. Build a base of support. Engage your alums. Take responsibility for building substantive relationships. Reach out and be inclusive. Do what you say you're going to do, and more.

At the March 9 celebration of the establishment of the Paul G. Allen School of Computer Science & Engineering, Mr. Allen said that we are entering "a new golden age of innovation in computer science." We all need to work to ensure that the role of computer science and the role of our programs are appreciated. It will pay off for each of us, for the entire field, and for the world.

About the Authors

Ed Lazowska is the Bill & Melinda Gates Chair in the Paul G. Allen School of Computer Science & Engineering at the University of Washington, where he also serves as director of the University of Washington eScience Institute. His research and teaching concern the design, implementation, and analysis of high-performance computing systems, and the techniques and technologies of data-intensive discovery. He is a member of the National Academy of Engineering and a fellow of the American Academy of Arts & Sciences. Ed is a former chair of the CRA board of directors and the inaugural chair of the Computing Community Consortium.

Hank Levy is the director of the Paul G. Allen School and Wissner-Slivka Chair in Computer Science & Engineering at the University of Washington. He is the author of two books and more than 100 papers on computer systems design and computer architecture, including more than a dozen best paper and test of time awards. Hank is a member of the National Academy of Engineering and a fellow of the Association for Computing Machinery and the Institute for Electrical and Electronics Engineers.

The President's FY2018 Budget Request for CISE

By Jim Kurose, Assistant Director of the National Science Foundation for Computer & Information Science & Engineering

On May 23, 2017, President Trump delivered his Fiscal Year (FY) 2018 Budget Request to Congress. The Request proposes $6.6 billion for NSF (a decrease of 11.1% from the actual FY 2016 NSF budget), including a proposal of $839 million for the Directorate for Computer and Information Science and Engineering (CISE; a decrease of 10.3% from the actual FY 2016 budget). The President's FY 2018 Budget Request for NSF can be found at https://www.nsf.gov/about/budget/fy2018/index.jsp.

The submission of the President's Budget Request to Congress is just the beginning of the FY 2018 budget process. As many of you know, the President proposes a budget, while Congress ultimately appropriates funds. The next phase of the FY 2018 budget will include conversations with Congressional members as they push forward through subsequent phases of the budget process, ensuring that the many different public policy and competing resource demands are carefully considered and balanced.

The FY 2018 Budget Request for CISE is shaped by the belief that, despite constrained funding, it is critical that CISE sustain investments in fundamental research, education, and research infrastructure, including in cross-cutting activities led by CISE that support national priorities. These principles are reflected in the budget request in the following ways:

Investments in CISE's core research programs are maintained. Core investments push forward the fundamental knowledge base of our discipline and build a foundation to support a thriving information technology innovation ecosystem. These investments also support the researchers who are at the heart of our community.

Commitments to national priorities continue. CISE continues to lead programs that support national priorities, such as Critical Techniques, Technologies, and Methodologies for Advancing Foundations and Applications of Big Data Sciences and Engineering (BIGDATA); Computer Science for

All (CSforAll); Cyber-Physical Systems (CPS); the National Robotics Initiative 2.0 (NRI): Ubiquitous Collaborative Robots; the National Strategic Computing Initiative (NSCI); Platforms for Advanced Wireless Research (PAWR); and Smart & Connected Communities (S&CC). Some emerging opportunities demand new investments, even in the face of constrained budgets. For example, the FY 2018 Budget Request includes increases in support of CISE's leadership of S&CC; NSCI; the Harnessing the Data Revolution (HDR) Big Idea, including the Transdisciplinary Research in Principles of Data Science (TRIPODS); and CS+X, furthering undergraduate education at the intersection of computer science and other disciplines.

Investments across the breadth of the research cyberinfrastructure ecosystem continue. The Office of Advanced Cyberinfrastructure (OAC) continues its broad and critical investments in high-performance computing (e.g., Towards a New Leadership-Class Computing Facility), high-performance networking research infrastructure and security [e.g., through Campus Cyberinfrastructure (CC*) and Cybersecurity Innovation for Cyberinfrastructure

(CICI)], software [e.g., through Software Infrastructure for Sustained Innovation (SI2)], data [e.g., through Data Infrastructure Building Blocks (DIBBs)], and workforce [e.g., through Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining) program].

Partnerships are enduring. CISE remains committed to building and nurturing partnerships with industry, with other agencies, and internationally to address research challenges, leverage resources and build capacity.

Some cross-cutting programs in research areas supported by other programs are reduced. Cross-cutting programs often help to jumpstart research that eventually becomes part of core research or other programs. For example, CISE's focused investments in Innovations at the Nexus of Food, Energy and Water Systems (INFEWS) and Risk and Resilience (R&R) will be reduced; CISE will continue to support related research through investments in other areas including CPS and S&CC.

CISE will also continue to participate in seeding NSF's "Big Ideas." The CISE community has a crucial role in these bold,

long-term research ideas that will advance the frontiers of science and engineering. In addition to our role in the HDR Big Idea, CISE research advances are also particularly vital to Work at the Human Technology Frontier (W-HTF); Quantum Leap; Navigating the New Arctic; Rules of Life; and Convergence. The CISE community will also have opportunities in other Big Ideas, including Mid-scale Research Infrastructure and NSF Inclusion across the Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES).

Investments in CISE research, education, and research infrastructure have returned exceptional dividends to our Nation – driving economic growth and competitiveness. In constrained budget times like these, it's crucial for us to come together as a community, continuing our mission and work. Together, we can ensure that our work continues to profoundly impact the world in which we live. We invite you to work with us to grow the knowledge base and the future generation to catalyze innovations that will further transform our society in the decades ahead.

CRA
Computing Research Association

Announcements

Jennifer Rexford Announced as the 2017 NCWIT Harrold and Notkin Award Recipient

By Helen Wright, CCC senior program associate

Computing Community Consortium (CCC) council member Dr. Jennifer Rexford, Professor and Computer Science Department Chair at Princeton University, has been named the recipient of the 2017 Harrold and Notkin Research and Graduate Mentoring Award.

The award, sponsored by the NCWIT Board of Directors, recognizes faculty members from non-profit institutions who distinguish themselves with outstanding research and excellent graduate mentoring, as well as those who recruit, encourage, and promote women and minorities in computing fields. It is bestowed in memory of Mary Jean Harrold and David Notkin, in honor of their outstanding research, graduate mentoring, and diversity contributions. Harrold and Notkin were both CRA board members.

Rexford spent eight years as a researcher at AT&T Labs Research before joining the faculty at Princeton, from which she received her undergraduate degree, in 2005. From a research standpoint, she is best known for her advances in the field of computer networking, including her earlier work in network routing stability and more recent research that is commonly viewed as having played a central role in launching the field of software-defined networking (SDN).

Dr. Rexford will be honored at the 2017 NCWIT Summit on Women and IT, and her institution will be gifted $5,000 from NCWIT.

See the full NCWIT blog post here.

Professional Opportunities

ACM

Deputy to the Editor-in-Chief, Communications of the ACM (CACM)

The Deputy will work closely with the Editor-in-Chief, Editorial Staff and production team to ensure CACM's leadership as the leading print and online publication for the computing and information technology fields. Position includes focus to define, plan, and realize:

· Strategic Content Initiatives
· Targeted Content Initiatives
· Initiatives in "new media"
· New Reader EngagementPrograms

See cacm.acm.org or email cacm.editor.in.chief@gmail.com for more information.

Apply at: https://jobopportunities.uchicago.edu/applicants/jsp/shared/position/JobDetails_css.jsp?postingId=672448

The University of Chicago is an Affirmative Action/Equal Opportunity/Disabled/Veterans Employer and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national or ethnic origin, age, status as an individual with a disability, protected veteran status, genetic information, or other protected classes under the law. For additional information please see the University's Notice of Nondiscrimination (http://www.uchicago.edu/about/non_discrimination_statement/).

Argonne National Laboratory

Assistant Computer Scientist – Machine Learning

The Argonne Leadership Computing Facility's (ALCF) mission is to accelerate major scientific discoveries and engineering breakthroughs for humanity by designing and providing world-leading computing facilities in partnership with the computational science community. We help researchers solve some of the world's largest and most complex problems with our unique combination of supercomputing resources and computational science expertise.

We invite you to apply for an Assistant Computer Scientist position with the ALCF. You will join the data sciences group and provide technology vision, research, development and support in machine learning to glean insights from large-scale datasets being produced by computational simulations, experiments and observations in domains including material science, genomics, neuroscience, engineering, and high energy physics. You will work in a highly collaborative environment involving science application teams, academia, industry as well as other national labs and agencies. The selected candidate must have advanced knowledge of machine learning, data mining, and/or statistics and a possess a strong background in mathematical optimization or linear.

We invite you to apply for LCF Requisition #401071 by visiting Argonne's Career Page.

Job posting direct link: http://bit.ly/2nmTXtM

Argonne National Laboratory

Joint Hire: Assistant Computer Scientist – Argonne & Tenure Track Assistant Professor – NIU

Argonne National Laboratory and Northern Illinois University (NIU) seek a joint hire between the two institutions focused on data sciences and machine learning. Laboratory appointment will be at the Assistant Scientist level in the Argonne Leadership Computing Facility (ALCF) at Argonne National Laboratory and the faculty appointment will be at the tenure-track Assistant Professor level in the Department of Computer Science at Northern Illinois University.

ALCF's mission is to accelerate major scientific discoveries and engineering breakthroughs for humanity by designing and providing world-leading computing facilities in partnership with the computational science community. We help researchers solve some of the world's largest and most complex problems with our unique combination of supercomputing resources and computational science expertise.

At ALCF, you will join the data sciences group and provide technology, vision, research, development, and support in machine learning to glean insights from large-scale scientific datasets being produced by computational simulations, experiments, and observations; in domains such as material science, genomics, neuroscience, engineering, and high energy physics. You will work in a highly collaborative environment involving science application teams, academia, industry, as well as other national laboratories and agencies.

NIU's Department of Computer Science has provided students access to the breadth and depth of computer science for over thirty years. You will have a joint appointment as a tenure-track assistant professor in the computer science department at NIU. Responsibilities include teaching, scholarship, grantsmanship, and service.

We invite you to apply for LCF Requisition # 402000 by visiting Argonne's Career Page.

Job posting direct web address: http://bit.ly/2oQAgay.

Binghamton University

Image & Acoustic Signals Analysis Research Assistant Professor

The Freshman Research Immersion program seeks a Research Assistant Professor with research background in Image & Acoustic Signals Analysis (IASA). This full-time three-year position is open to PhD's with computer science and engineering

Professional Opportunities

background on research in one or more of these areas: human-computer interaction; developing bio-acoustics, data compression and visual speech technology; developing and testing computer vision technology; machine learning and data mining in context of image analysis of ecological data.

Additional information: https://binghamton.interviewexchange.com/jobofferdetails.jsp?JOBID=83892

Boston University

Senior Lecturer or Lecturer in Computer Science

The Department of Computer Science in the College of Arts and Sciences at Boston University invites applications for a full-time lecturer position beginning July 1, 2017. There is the possibility of initial appointment at the Senior Lecturer level, depending on candidate qualifications. The position entails teaching undergraduate courses that may include introduction to computer science for majors or non-majors, and other background undergraduate courses in computer science. The position may also involve teaching advanced undergraduate/early graduate courses if the expertise of an applicant matches departmental needs. The position also involves supervision of graduate student teaching fellows, graders, and undergraduate course assistants.

Candidates should be strongly committed to excellence in teaching. Applicants are expected to have a PhD or Masters degree in Computer Science or a related field. Applicants should submit a cover letter outlining teaching experience, curriculum vitae, sample of recent teaching evaluations, and three letters of reference to https://academicjobsonline.org/ajo/jobs/9112. Application reviews will begin immediately and continue until the position is filled.

We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law. We are a VEVRAA Federal Contractor.

EPFL
ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Postdoctoral Researcher

Applications are invited for a postdoctoral position in the EPFL Data Science Lab **in Switzerland, headed by Prof. Robert West. We seek a candidate who will lead innovative research projects at the crossroads of** social and information network analysis, machine learning, computational social science, data mining, and natural language processing. **The position will be for a period of one to two years.**

Benefits include a competitive salary (around CHF 82,000 p.a.), an extremely well funded national research system, an office next to a stunning lake and even more stunning mountains, and generous travel support (in order to see something less stunning once in a while).

More details (including application instructions) are available at https://dlab.epfl.ch/2017-03-29-postdoc-position/

The review of applications will begin immediately and will continue until the position is filled.

Professional Opportunities

Florida International University is classified by Carnegie as a "R1: Doctoral Universities - Highest Research Activity" and recognized as a Carnegie Community Engaged university. It is a public research university with colleges and schools that offers bachelor's, master's and doctoral programs in fields such as business, engineering, computer science, international relations, architecture, law and medicine. As one of South Florida's anchor institutions, FIU contributes almost $9 billion each year to the local economy and is ranked second in Florida in Forbes Magazine's "America's Best Employers" list. FIU graduates are consistently among the highest paid college graduates in Florida and are among the leaders of public and private organizations throughout South Florida. FIU is Worlds Ahead in finding solutions to the most challenging problems of our time. FIU emphasizes research as a major component of its mission with multiple state-of-the-art research facilities including the Wall of Wind Research and Testing Facility, FIU's Medina Aquarius Program and the Advanced Materials Engineering Research Institute. FIU has awarded more than 220,000 degrees and enrolls more than 54,000 students in two campuses and centers including FIU Downtown on Brickell, FIU@I-75, the Miami Beach Urban Studios, and Tianjin, China. FIU also supports artistic and cultural engagement through its three museums: Patricia & Phillip Frost Art Museum, the Wolfsonian-FIU, and the Jewish Museum of Florida-FIU. FIU is a member of Conference USA and more than 400 student-athletes participating in 18 sports. For more information about FIU, visit http://www.fiu.edu/.

Florida International University in Miami, FL is seeking a Research Associate to perform collaborative research on Database and Internet Visualization Systems, particularly the Terrafly project sponsored by the National Science Foundation and in other aspects of research; teach advanced undergraduate Computer Science courses as designated; conduct research on prototype software development and advance research on high performance geospatial data management systems; write any required progress reports and present research findings to supervisor(s) or administrators, as required; and participate in any departmental activities or meetings. Position requires a Master's Degree in Computer Science, Software Engineering or a closely related field.

Qualified candidates are encouraged to apply to Job Opening ID (**Job Opening 513285**) at facultycareers.fiu.edu and attach cover letter, curriculum vitae, etc as individual attachments. Candidates will be requested to provide names and contact information for at least three references who will be contacted as determined by the search committee. To receive full consideration, applications and required materials should be received by June 30, 2017. Review will continue until position is filled.

FIU is a member of the State University System of Florida and an Equal Opportunity, Equal Access Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, or any other characteristic protected by law.

Professional Opportunities

Kansas State University

Faculty Position
Department of Computer Science

The department of Computer Science (CS) at Kansas State University invites applications for tenure-track positions in computer science at all levels (Assistant, Associate, or Full Professor) starting as early as Fall 2017. Outstanding candidates will be considered for open endowed positions. While the department is accepting applications in all areas of computer science, applicants with expertise in or intersecting our strength areas (cyber-physical systems, data science, high-assurance software, and security) are preferred. Women and members of under-represented groups are highly encouraged to apply. Successful applicants will demonstrate commitment to both teaching and research. A doctorate degree in computer science or related disciplines is required; salary will be commensurate with qualifications.

For details: http://careers.k-state.edu/cw/en-us/job/501239/assistant-professor-associate-professor-or-professor-in-computer-sciences

Kansas State University actively seeks diversity among its employees. Kansas State University is an EOE of individuals with disabilities and protected veterans. Background check required.

Lake Superior State University

Term Assistant Professor of
Computer Science

Lake Superior State University seeks applicants for an open-rank, term faculty position in Computer Science/Computer Networking. This is a full-time position to begin in the fall semester, 2017. A term position carries a contract of up to three years and requires teaching 12 credit hours per semester. The School offers Bachelor's degrees in Computer Science, Computer Networking, and Computer Networking – Web Development Concentration.

For a complete job posting and application visit us online at https://jobs.lssu.edu/

Lawrence Berkeley National Laboratory

NERSC Exascale Science Applications
Postdoctoral Fellow for Data (NESAP)

Berkeley Lab's NERSC Division has an opening for an Exascale Science Applications Postdoctoral Fellow for Data (NESAP). We are looking for highly motivated postdocs to join the NERSC ExaScale Application Readiness Program (NESAP), funded by the US Department of Energy Office of Science. These postdocs will participate in "NESAP for Data," collaborating with scientific teams to enable the solution of deep, meaningful problems in data-intensive experimental/observational sciences like cosmology, high-energy physics, neuroscience, and imaging.

For the full posting: http://50.73.55.13/counter.php?id=99561

Michigan Technological University

Department of Computer Science
Lecturer Position

Applications are invited for Lecturer positions beginning August 2017 or Spring 2018. An applicant for a Lecturer position must have a master's or doctoral degree in Computer Science or Computer Engineering, or equivalent, and is expected to demonstrate potential for excellence in teaching and the ability to contribute to the departmental service needs. The candidate should be able to teach across the CS curriculum, particularly second and third-year computer systems courses. ABET experience is a significant plus. Lecturers are appointed for two-year, renewable terms, and there is opportunity for promotion to Senior and Principal

Lecturer. Review of applications will begin immediately and continue until the position is filled. The Department has 19 faculty, 450 undergraduate students in two degree programs (Computer Science and Software Engineering) and 48 M.S. and Ph.D. students. Please visit http://www.mtu.edu/cs/ for more information.

Women and under-represented minorities are particularly encouraged to apply. Applications should be submitted online at www.jobs.mtu.edu. To learn more about the opportunity, please visit https://www.jobs.mtu.edu/postings/5265 or contact the Department Chair, Dr. Min Song, at mins@mtu.edu or (906) 487-2209. Michigan Tech is an ADVANCE institution, one of a limited number of universities in receipt of NSF funds in support of our commitment to increase diversity and the participation and advancement of women in STEM. Michigan Tech is a member of the AGEP network of universities dedicated to increasing the number of underrepresented minorities obtaining graduate degrees in STEM fields. Michigan Tech acknowledges the importance of supporting dual career partners and retaining a quality workforce.

Michigan Tech is an EOE which includes protected veterans and individuals with disabilities.

Monash University

Software Engineering Positions (Prof/AProf/Senior Lecturer/Lecturer)

The Opportunity
Under the leadership of the new Dean, Professor Jon Whittle, the Faculty of Information Technology at Monash University is seeking to expand its existing expertise in the area of Software Engineering with at least three new academic appointments, including at least one at the Professorial level.

Professional Opportunities

We are seeking:

- An established academic leader, at the Professor/Associate Professor level*, with a demonstrated track record of excellence in research and teaching to lead our software engineering research, teaching and industry engagement.
- At least two academics at the Lecturer/Senior Lecturer* level, to contribute to our software engineering research, teaching and industry engagement.

* Note: Australian Lecturer is equivalent to US Assistant Professor; Australian Senior Lecturer is equivalent to US Associate Professor; Australian Associate Professor is equivalent to UK "Reader"; Australian Professor is equivalent to UK/US Professor.

Exceptional candidates in any area of software engineering research are encouraged to apply. The faculty is in a growth phase and is investing in areas of strategic and cross-disciplinary research such as our Centre for Data Science, our Centre for Organisational and Social Informatics, the recently established Oceania Cybersecurity Centre and our innovation labs such as SensiLab and Immersive Analytics. The new appointees in software engineering will be encouraged and supported to collaborate with colleagues from these centres and across the faculty, the University and with our external industry partners.

The faculty offers a generous start-up package including start-up research funds, scholarships for PhD students and a reduced teaching load for the first two years.

A member of the prestigious Australian Group of Eight Universities, and ranked in the top 80 in the world across all four major University rankings, Monash University is the only Australian university with a dedicated Faculty of Information Technology. Our research and education programs cover the full span of IT, from Computer Science and Software Engineering, through Networks and Security, to Business Information Systems and the Digital Humanities.

These positions will be based at our Clayton campus (located in Melbourne's south eastern suburbs), where we offer a 4 year Bachelor of Software Engineering (Honours) degree, accredited by both Engineers Australia and the Australian Computer Society and a Software Development major in the 3 year Bachelor of Information Technology.

These positions are full-time continuing positions (i.e. permanent, subject to meeting probationary objectives, as per UK system); however, flexible working arrangements may be negotiated. Monash is participating in the Athena Swan Charter to enhance gender equality in Science, Technology, Engineering, Mathematics and Medicine (STEMM) disciplines, and we particularly encourage female candidates to apply.

Your application must address the selection criteria. Please refer to "How to apply for Monash Jobs"

Enquiries
Professor Ann Nicholson, Deputy Dean, Faculty of IT. email: ann.nicholson@monash.edu

Applications
To view a detailed Position Description and to submit an application, please visit: http://www.monash.edu/jobs

Enter '562113' in Job Search and click enter.

Closing date
Friday 9 June 2017, 11:55pm AEST

Northeastern University

Lecturer, Assistant Teaching Professor, Associate Teaching Professor, Full Teaching Professor – MS in IA

Location: Boston Main Campus or Online

Position Summary: The College of Computer and Information Science (CCIS) at Northeastern University invites applications for one or more positions at the rank of Lecturer/Assistant Teaching Professor/Associate Teaching Professor/Full Teaching Professor beginning in September 2017 or

January 2018 at our campus in Boston or online. We are seeking highly-motivated individuals committed to excellence in teaching. Full-time appointments are renewable, career-focused non-tenure-track positions with responsibilities in teaching and service. Primary responsibilities include teaching and developing graduate courses. We are seeking faculty who can teach in one or more of the following areas: Cybersecurity (Foundations), Cryptography, Network Security, Computer System Security, Software Security, Cyberlaw, Information System Forensics, Risk Management, or Cybersecurity Data Mining/Machine Learning, Forensics Management of Critical Infrastructure, and other relevant topics in Cyber Security. The successful candidate will create course content and materials and collaborate with colleagues to develop new academic relationships within the university and the business community. Student advising and service to the college and university are an integral component of the position. Opportunities for research and scholarship are possible on the teaching track and several of our faculty are research active within the field of Computer Science and within the area of Education Research in Computer Science.

Northeastern University is a global university recognized by our renowned co-op program and our focus on experiential learning. We are experiencing dramatic growth in enrollment and academic innovation. The College of Computer and Information Science is one of the fastest growing colleges in the university. It is home to over 1200+ undergraduate students and 1000+ graduate students. We have three undergraduate majors (Computer, Data and Information Science) and over 26 combined majors (CS+X). In the graduate program we offer masters in CS, Data Science, Information Assurance and Cyber Security, Health Informatics and Health Data Analytics. Many of our programs are

Professional Opportunities

interdisciplinary programs with other colleges here at Northeastern.

Qualifications: Candidates must hold a PhD in Computer and/or Information Science or a related field from an accredited institution by the start date. Teaching experience at either the undergraduate or graduate level is strongly preferred. Rank of appointment at either the Lecturer, Assistant Teaching Professor, Associate Teaching Professor, or Full Teaching Professor level will be determined on prior teaching experience and will be discussed with candidates during the interview process. Successful candidates will have demonstrated an expert grasp of knowledge of the field at all levels and be creative in their approach to teaching in an environment of cooperative, interdisciplinary and experiential education. Strong written, oral and interpersonal skills are required in order to communicate effectively with students in person and online.

For more information about the College, please visit http://www.ccs.neu.edu.

Additional Information: Please submit a cover letter of interest highlighting teaching accomplishments and relevant professional experience, a curriculum vitae, and the names and contact information of at least three references.

Boston Campus Online

Compensation is commensurate with qualifications and includes an outstanding benefits package.

Northeastern University is an Equal Opportunity, Affirmative Action Educational Institution and Employer, Title IX University. Northeastern University particularly welcomes applications from minorities, women and persons with disabilities. Northeastern University is an E-Verify Employer.

Simon Fraser University

Tenure-track faculty position in Computer Engineering

The School of Engineering Science at Simon Fraser University, British Columbia, Canada, invites applications for a tenure-track faculty position in Computer Engineering, mainly at the Assistant Professor level, starting as early as Fall 2017. Outstanding candidates at Associate and Full Professor levels may also be considered. Exceptional candidates may also be considered for a Canada Research Chair at an appropriate tier. Strategically important research expertise that builds on or complements existing strengths is sought.

Candidates at the Assistant Professor level are expected to demonstrate a commitment to excellence in research, graduate student supervision, and teaching in computer engineering at the undergraduate and graduate levels. Senior applicants will have already demonstrated such excellence. The ability to bridge disciplines is desirable. A Ph.D. in Electrical and Computer Engineering or related areas by the date of appointment is required. Candidates should have P.Eng. accreditation or at a minimum secure such qualification as soon as possible after appointment.

Simon Fraser University is located in metropolitan Vancouver, one of the most livable cities in the world and has been ranked by Maclean's Magazine as the top comprehensive university in Canada for 14 times in the last 25 years. The School of Engineering Science currently has 29 faculty members, 120 graduate students, and more than 1000 undergraduate students. The school prides itself in its excellent researchers and facilities, as well as high-quality engaged students. The School of Engineering Science is home to the current Natural Sciences and Engineering Research Council (NSERC) Chair for Women in Science and Engineering.

The review of applications will begin May 29, 2017 and will continue until the position is filled. The position is subject to availability of funding and approval by the SFU Board of Governors.

To apply, please submit your curriculum vitae, research and teaching statement, plus the names and email addresses of three referees to our online application system located at https://confs.precisionconference.com/~enscl7a/apply

All qualified candidates are encouraged to apply. However, Canadian citizens and permanent residents will be given priority. Simon Fraser University is committed to employment equity and encourages applications from all qualified women and men, including visible minorities, aboriginal people, and persons with disabilities. Under the authority of the University Act, personal information that is required by the University for academic appointment competitions will be collected. For further details see the Collection Notice: http://www.sfu.ca/vpacademic/faculty_openings/collection_notice.html

Two Sigma

University Relations Manager – Quantitative Research

The Quantitative Research University Relations Manager is responsible for creating and executing Two Sigma's University Relations strategy, including determining core schools and students to target, developing branding campaigns for Two Sigma's campus presence, and maintaining relationships with key universities and professors. This role reports to the Head of Modeling & Trading Recruiting and will work closely with senior leaders in the Quantitative Research organization as well as with the Quantitative Research Recruiting team.

Key Responsibilities
- Partner with Quantitative Research business leaders to develop Quantitative

Professional Opportunities

Research University Relations strategy and focus
- Develop creative ways to increase the company's brand and profile on campus
- Work with the Campus Recruiting team to determine intern and full-time campus hiring goals and source and close candidates
- Create a talent pipeline of entry level campus talent by attending career fairs and info sessions, meeting with professors, attending conferences, and directly sourcing Quantitative Research talent
- Manage the full-cycle campus recruiting process including sourcing and identifying students, extending offers, and closing candidates
- Visit universities year-round to create new and strengthen existing university relations by meeting with chairs and professors of various academic departments and partnering with student organizations
- Attract tenured or assistant professors to Two Sigma for either full-time or consulting engagements
- Partner with Talent Analytics to establish and maintain a suite of reports to track

success of campus efforts and make recommendations for improvements through metrics-based evaluation

Experience
- 10+ years of experience, with at least 5 years of university relations and campus recruiting experience
- Previous human resources, program management or recruiting experience for a Quantitative Research population
- Deep knowledge of tech and financial industries
- An interest in Mathematics/Statistics or a STEM degree preferred
- Ability to communicate and forge strong relationships with professors and industry experts
- Experience executing a full lifecycle campus strategy
- Willingness to travel significantly and attend events/conferences
- Excellent planning, organizational, and facilitation skills

Please apply directly through this URL: https://careers.twosigma.com/careers/JobDetail/New-York-New-York-United-States-University-Relations-Manager-Quantitative-Research/2677

University of Chicago

Lecturer

The Department of Computer Science at the University of Chicago invites applications for the position of Lecturer. Subject to the availability of funding, this would be a two year position with the possibility of renewal. This position involves teaching in the fall, winter and spring quarters. The successful candidate will have competence in teaching and superior academic credentials, and will carry responsibility for teaching computer science courses and laboratories. Completion of all requirements for a Ph.D. in Computer Science or a related field is required at the time of appointment and candidates must have experience teaching Computer Science at the College level.

The Chicago metropolitan area provides a diverse and exciting environment. The local economy is vigorous, with international stature in banking, trade, commerce, manufacturing, and transportation, while the cultural scene includes diverse cultures, vibrant theater, world-renowned symphony, opera, jazz and blues. The University is located in Hyde Park, a Chicago neighborhood on the Lake Michigan shore just a few minutes from downtown.

Applicants must apply on line at the University of Chicago Academic Careers website at http://tinyurl.com/kps37nl.

To be considered an applicant, the following materials are required:
- Curriculum vitae with a list of publications
- One page teaching statement
- Three reference letters, one of which must address the candidate's teaching ability

Reference letter submission information will be provided during the application process.

Review of complete applications, including reference letters, will begin June 9, 2017, and continue until the position is filled.

The University of Chicago is an Affirmative Action/Equal Opportunity/Disabled/Veterans

Professional Opportunities

Employer and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national or ethnic origin, age, status as an individual with a disability, protected veteran status, genetic information, or other protected classes under the law. For additional information please see the University's Notice of Nondiscrimination at http://www.uchicago.edu/about/non_discrimination_statement/. Job seekers in need of a reasonable accommodation to complete the application process should call 773-702-0287 or email ACOppAdministrator@uchicago.edu with their request.

University of Maryland, College Park

Postdoctoral Researcher
Category: Computer Graphics, Computer Vision, Machine Learning

Description: We are looking for candidates for a postdoc position at the University of Maryland (UMD), College Park. The successful candidate will work with Prof. Matthias Zwicker, who recently joined UMD as the "Reginald Allan Hahne Endowed Professor" in Computer Science.

The intended research topic for this position is at the intersection of 3D geometry processing and deep learning. Strong candidates with an interest in other areas in Computer Graphics or Computer Vision, however, are also encouraged to apply.

The position is initially for one year, with an option to extend it to two years. The start date is planned for September 2017, but it can be negotiated if necessary.

Required qualifications include a PhD in Computer Science with a specialization in Computer Graphics or Computer Vision, a thorough background on mathematical techniques for graphics and vision, excellent programming skills, and an outstanding record of academic publications.

How to Apply: Please send your application including CV, academic transcripts, and names of at least three references via e-mail to zwicker@cs.umd.edu.

University of Memphis

Assistant Professor

The Department of Computer Science at the University of Memphis is seeking candidates for Assistant Professor position beginning Fall 2017. Exceptionally qualified candidates in all areas of computer science are invited while candidates with core expertise in systems, data science, security & privacy, and software engineering and an interest in emerging and interdisciplinary applications such as smart health, smart vehicles, smart transportation, smart energy, and CS education are particularly encouraged to apply. The successful candidate is expected to develop externally sponsored research programs, teach both undergraduate and graduate courses and provide academic advising to students at all levels.

Applicant should hold a PhD in Computer Science, or related discipline, and be committed to excellence in both research and teaching. Salary is highly competitive and dependent upon qualifications. The Department of Computer Science (www.cs.memphis.edu) offers B.S., M.S., and Ph.D. programs as well as graduate certificates in Data Science and Information Assurance, and an M.S. program in Bioinformatics (through the College of Arts and Sciences). The Department has been ranked 55th among CS departments with federally funded research. The Department regularly engages in large-scale multi-university collaborations across the nation. For example, CS faculty lead the NIH-funded Big Data "Center of Excellence for Mobile Sensor Data-to-Knowledge (MD2K)" and the "Center for Information Assurance (CFIA)". In addition, CS faculty work closely with multidisciplinary centers at the university such as the "Institute for Intelligent Systems (IIS)".

Screening of applications will continue until the position is filled. To apply, please visit https://workforum.memphis.edu/. Include a cover letter, curriculum vitae, statement of teaching philosophy, research statement, and a list of three references. Direct all inquiries to Kendra Tillis (ktillis@memphis.edu).

A background check will be required for employment. The University of Memphis is an Equal Opportunity/Equal Access/Affirmative Action employer committed to achieving a diverse workforce.

University of Memphis

Instructor

Applications are invited for an instructor position in the Department of Computer Science at the University of Memphis beginning Fall 2017, pending availability of funds. An M.S. or PhD degree in computer science or a related field and University level teaching experience is required. The instructor will teach undergraduate/graduate courses, participate in curriculum development and improvement, and advise students. Screening will begin on May 1, 2017 and may continue until position is filled, subject to budgetary approvals.

The Department of Computer Science (www.cs.memphis.edu) offers B.S., M.S., and PhD programs, as well as two graduate certificates, one in Cyber Security and Information Assurance and the other in Data Science. The Department has been ranked 55th in the nation among CS departments with federally funded research. Full information about the Department can be found at http://www.cs.memphis.edu/.

Submit applications at https://workforum.memphis.edu. Include a cover letter, vitae, a statement of teaching philosophy and a list of references. Direct inquiries to Kendra Tillis (ktillis@memphis.edu).

A background check will be required for employment. The University of Memphis is an Equal Opportunity/Equal Access/Affirmative Action employer committed to achieving a diverse workforce.

Professional Opportunities

The University of Sydney

Senior Lecturer / Associate Professor in Security

About the opportunity
The School of Information Technologies at the University of Sydney has outstanding opportunities for accomplished academics from all areas of computer security with an interest and passion for excellence in research and teaching for continuing positions, to start immediately. We are seeking team players who would help bring together current University efforts in cyber security targeting areas such as IoT and physical and cyber infrastructure. As the ideal candidate, you will have a strong research background in one or more of the following areas: computer and communication security; theoretical foundations of security; usable security; and application and software security. The level of appointment will be commensurate with qualifications and experience.

About you
To be successful, you will have a PhD in computer science, or a closely related discipline. You must show evidence of excellent research achievements in one of more areas of computer security and the ability to publish your research in highly-ranked outlets. A strong commitment to teaching and learning is required as well as evidence of ability to lecture and prepare new teaching material. You will be expected to teach a range of computer science and security related courses.

All applications must be submitted via the University of Sydney careers website. Visit http://sydney.edu.au/recruitment and search by the reference number 653/0417 for more information and to apply.

Closing date: 11:30pm 14 May 2017 (Sydney Time)

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University of Texas at Austin

Dean of the School of Information

The University of Texas at Austin invites nominations and applications for the position of Dean of the School of Information. The Texas iSchool is seeking an accomplished, innovative, and transformational leader to further develop the school during this time of rapid change in the management and delivery of information. An exceptional research record and international reputation of scholarly distinction in the information field commensurate with appointment at the rank of full professor at the University is required.

To access the position profile: https://www.ischool.utexas.edu/dean_search

To submit confidential applications, inquiries, and nominations: http://www.imsearch.com/6202

University of Texas at San Antonio

Faculty Positions in Computer Science

The Department of Computer Science at The University of Texas at San Antonio invites applications for two full-time, non-tenure track faculty positions, starting in Fall 2017. Interested candidates may apply to one or both positions indicated below. Depending on the qualifications and experience, the successful candidates may be considered at the level of Lecturer III, Senior Lecturer, or Assistant/Associate Professor in Practice.

- **A non-tenure track faculty position** focused on teaching software engineering, application programming, web technologies, data structures, and related courses.
- **A non-tenure track faculty position** focused on teaching systems programming, operating systems, computer organization, cyber security with hands-on practices, programming languages, and related courses.

See http://www.cs.utsa.edu/nttsearch for information on the Department and application instructions. Screening of applications will begin immediately. Full consideration will be given to applications received by May 21, 2017, and the search will continue until the positions are filled or the search is closed. The University of Texas at San Antonio is an Affirmative Action/Equal Opportunity Employer.

Department of Computer Science
RE: Non-Tenure Faculty Search
The University of Texas at San Antonio
One UTSA Circle
San Antonio, TX 78249-0667
Phone: 210-458-4436

University of Washington Bothell

Post-doc - Software Engineering

The University of Washington Bothell has one open Postdoc Position in Software Engineering. The successful applicant will engage in research in software engineering (e.g., architecture recovery/reverse engineering, software evolution, etc.) to assist domain scientists with understanding and managing their software and data.

Initial appointment will be for one year, and will be renewable, pending review of performance in the first year. Opportunities for career advancement also available.

Review of applications will begin upon receipt however complete applications received prior to June 30, 2017 will receive priority consideration. The position will remain open until filled.

For more information, see http://ap.washington.edu/ahr/academic-jobs/position/nn18643/