Computing Research News

CRA Best Practices Memo on Evaluating Scholarship in Hiring, Tenure, and Promotion

CRA Computing Research Association

The CRA Board of Directors has recently released its latest Best Practices Memo, "Incentivizing Quality and Impact: Evaluating Scholarship in Hiring, Tenure, and Promotion." Distinguishing between quality and quantity is key to promoting the future growth of the computing and information field. The memo advocates adjustments to hiring, promotion, and tenure practices as well as to the publication culture. Below is a summary of the reports main points. Click here to download the full memo.

The recommendations in the report were developed over an 18-month period by the CRA Committee on Best Practices for Hiring, Promotion, and Scholarship, led by Fred B. Schneider (Chair) and Batya Friedman (Co-Chair). The committee conducted interviews in autumn 2013 with more than 75 academic and industry computing and information unit heads to understand the issues and gain insights from practice. Preliminary recommendations were vetted with department chairs and CRA Deans at the Snowbird Conference in July 2014.

> "Above all, quality and impact need to be incentivized over quantity…What ultimately should matter when it comes to hiring, tenure, and promotion is the quality of the research."

The memo provides recommendations for both hiring and tenure and promotion cases.

Hiring Recommendation. Evaluate candidates on the basis of the contributions in their top one or two publications, in concert with the research statement and the other standard material(e.g., letters of recommendation, full CV, teaching statement) generally read by hiring committees in determining whom to invite to campus for an interview and, ultimately, whom to hire. Candidates should identify publications where they have played a significant role.

Tenure and Promotion Recommendation. Evaluate candidates for tenure and promotion on the basis of the contributions in their most important *three* to *five* publications (where systems and other artifacts may be included).[1] Tenure and promotion committees should invite external reviewers to comment on impact, depth, and scholarship of these publications or artifacts as well as the standard material (e.g., full CV, research statement, teaching statement). Some institutions might ask a candidate to suggest which publications or artifacts be considered, other institutions might leave that determination to the external reviewers. Per standard practice, tenure and promotion committees should read the external letters and the standard material in determining tenure and promotion decisions.

Implementing these recommendations will require attention to the transition for young researchers. Annual or reappointment reviews (which often occur after three years of hiring) should reflect the emphasis on quality—not quantity—and should recognize that high caliber research activities may take two or three years to come to fruition (e.g., publication or artifact deployment) and even longer for the impact to become apparent. A corollary follows: Evaluation of senior faculty similarly should emphasize quality over quantity, with incentives for pursuing greater risk-taking in research activities.

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[1] For some disciplines represented in Information Schools (e.g., philosophy), the publication outcome is a book, with the expectation that one book would be in press or published at the time of evaluation for tenure.

Publication Culture. Systemic changes throughout the publication culture would help to support better scholarship. For example, publishers could remove page limits for reference lists and could allow appendices for data, methods, and proofs. Editors, as appropriate, could consider longer submissions with the understanding that, in such cases, a longer review period would be likely. In addition to conferences with published proceedings, other professional gatherings (that do not publish proceedings) might be held where work-in-progress could be presented.

"The field benefits when researchers build on each other's work…Certain publication formats and review processes, however, encourage practices inconsistent with these elements of good scholarship."

CRA Committee on Best Practices for Hiring, Promotion, and Scholarship

Members include: Lorenzo Alvisi (University of Texas, Austin), David Culler (University of California, Berkeley), Batya Friedman [Co-chair] (University of Washington), Eric Grimson (Massachusetts Institute of Technology), Mark D. Hill (University of Wisconsin), Julia Hirschberg (Columbia University), Benjamin Kuipers (University of Michigan), Keith Marzullo (National Science Foundation and University of California, San Diego), Tamer Ozsu (University of Waterloo), Frank Pfenning (Carnegie Mellon University), Jennifer Preece (University of Maryland), Fred B. Schneider [Chair] (Cornell University), Eva Tardos (Cornell University), Jennifer Widom (Stanford University), Jeannette Wing (Microsoft Research), and Ellen Zegura (Georgia Tech).

"There is of course a long road ahead to shifting the culture and traditions of an academic field, especially because here it would mean changes to the publication infrastructure as well as reforming the value system. But our's is a field that is used to quick response and there is every reason for optimism."

2015 CRA Board Election Results

CRA members have elected seven new members to its Board of Directors: Joel Emer, Stephanie Forrest, Michael Franklin, Greg Hager*, Farnam Jahanian and Vivek Sarkar. Five current board members were re-elected to the CRA Board: Sarita Adve, H.V. Jagadish, Margaret Martonosi, Greg Morrisett, and Kathryn McKinley. Their terms run from July 1, 2015 through June 30, 2018. Retiring from the Board as of June 30, 2015 are Corinna Cortes, Jeanne Ferrante, Lance Fortnow, Eric Grimson, and J Moore. CRA thanks them all for contributions during their service on the board.

* Hager is currently holding a non-elected position on the Board.

Joel Emer

Dr. Joel S. Emer is a Senior Distinguished Research Scientist in Nvidia's Architecture Research group. He is responsible for exploration of future architectures as well as modeling and analysis methodologies. In his spare time, he is a Professor of the Practice at MIT, where he teaches computer architecture and supervises graduate students. Prior to joining Nvidia he worked at Intel where he was an Intel Fellow and Director of Microarchitecture Research. Even earlier, he worked at Compaq and Digital Equipment Corporation.

Dr. Emer has held various research and advanced development positions investigating processor microarchitecture and developing performance modeling and evaluation techniques. He has made architectural contributions to a number of VAX, Alpha and X86 processors and is recognized as one of the developers of the widely employed quantitative approach to processor performance evaluation. More recently, he has been recognized for his contributions in the advancement of simultaneous multithreading technology, processor reliability analysis, cache organization and spatial architectures.

Dr. Emer received a bachelor's degree with highest honors in electrical engineering in 1974, and his master's degree in 1975 -- both from Purdue University. He earned a doctorate in electrical engineering from the University of Illinois in 1979. He has received numerous public recognitions, including being named a Fellow of both the ACM and IEEE, and he was the 2009 recipient of the Eckert-Mauchly award for lifetime contributions in computer architecture.

Stephanie Forrest

Stephanie Forrest is Regents Distinguished Professor of Computer Science at the University of New Mexico in Albuquerque, and a member of the Santa Fe Institute External Faculty. Her interdisciplinary research studies adaptive systems and includes biological modeling (immunology and evolutionary processes), computer security, and software engineering. Professor Forrest received M.S. and Ph.D. degrees in Computer and Communication Sciences from the University of Michigan and a B.A. from St. John's College. At UNM, she served as Dept. Chair 2006-2011, and at SFI she has served as Interim Vice President for Academic Affairs and Co-Chair of the Science Board. She has received several awards and honors, including: the Stanislaw Ulam Memorial Lectureship (2013), the ACM/AAAI Allen Newell Award (2011), and the Presidential Young Investigator Award (1991). She is a Fellow of the IEEE.

Michael Franklin

Michael Franklin is the Thomas M. Siebel Professor of Computer Science and Chair of Computer Science at UC Berkeley where he also serves as Director of the Algorithms, Machines and People Lab (AMPLab). The Berkeley AMPLab is integrating machine learning, scalable computing, and human computation to develop a next generation Big Data analytics platform. Components of this platform, including the Spark and Shark analytics frameworks and the Mesos virtualization

layer have become key parts of the emerging Big Data ecosystem. AMPLab is supported by more than two dozen leading companies including founding sponsors Amazon Web Services, Google, and SAP and received an NSF Expeditions in Computing award, which was announced by the White House in 2012. Franklin was founder and CTO of Truviso, a real-time data analytics company acquired by Cisco Systems. He is an ACM Fellow and two-time winner of the ACM SIGMOD Test of Time Award.
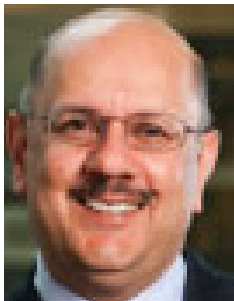
Farnam Jahanian

Farnam Jahanian is the Vice President for Research at Carnegie Mellon University (CMU) where he is responsible for nurturing excellence in research, scholarship and creative activities. Recently appointed as CMU's Provost, he will begin this position in June 2015. Prior to CMU, Jahanian led the National Science Foundation Directorate for the Computer and Information Science and Engineering (CISE) from 2011 to 2014. He guided CISE, with a budget of almost $900 million, in its mission to advance scientific discovery and engineering innovation through its support of fundamental research and transformative advances in cyberinfrastructure. Previously, Jahanian was the Edward S. Davidson Collegiate Professor at the University of Michigan where he served as Chair for Computer Science and Engineering from 2007 to 2011 and as Director of the Software Systems Laboratory from 1997 to 2000. His research on Internet infrastructure security formed the basis for the Internet security company Arbor Networks, which he co-founded in 2001 and where he served as Chairman until its acquisition in 2010. He has testified before Congress on a broad range of topics, including cybersecurity, next generation computing, and big data. Jahanian received his M.S. and Ph.D. in Computer Science from the University of Texas at Austin. He is a Fellow of the Association for Computing Machinery (ACM), the Institute of Electrical and Electronic Engineers (IEEE), and the American Association for the Advancement of Science (AAAS).

Vivek Sarkar

Vivek Sarkar is Professor and Chair of Computer Science at Rice University. He conducts research in multiple aspects of parallel software including programming languages, program analysis, compiler optimizations and runtimes for parallel and high performance computer systems. He currently leads the Habanero Extreme Scale Software Research Laboratory at Rice University, and serves as Associate Director of the NSF Expeditions Center for Domain-Specific Computing. Prior to joining Rice in July 2007, Vivek was Senior Manager of Programming Technologies at IBM Research. His responsibilities at IBM included leading IBM's research efforts in programming model, tools, and productivity in the PERCS project during 2002- 2007 as part of the DARPA High Productivity Computing System program. His prior research projects include the X10 programming language, the Jikes Research Virtual Machine for the Java language, the ASTI optimizer used in IBM's XL Fortran product compilers, the PTRAN automatic parallelization system, and profile-directed partitioning and scheduling of Sisal programs. In 1997, he was on sabbatical as a visiting associate professor at MIT, where he was a founding member of the MIT Raw multicore project. Vivek became a member of the IBM Academy of Technology in 1995, the E.D. Butcher Chair in Engineering at Rice University in 2007, and was inducted as an ACM Fellow in 2008. He holds a B.Tech. degree from the Indian Institute of Technology, Kanpur, an M.S. degree from University of Wisconsin-Madison, and a Ph.D. from Stanford University. Vivek has been serving as a member of the US Department of Energy's Advanced Scientific Computing Advisory Committee (ASCAC) since 2009.

President's Budget for Science Mixed, But Computing Research Does OK

by Peter Harsha, CRA Director of Government Affairs

The President's FY 2016 Federal budget request, released in early February, would present a bit of a mixed bag for Federal science agencies. While agencies like the National Science Foundation and Department of Energy would see some increases for their research investments — including investments in computing research — other agencies like the Department of Defense, NASA, and the Department of Homeland Security would endure cuts to their research budgets under the President's plan.

The President's request represents the first step in the annual appropriations process — a process this year, with Congress now completely in the hands of a Republican majority, likely to get reshaped around Republican priorities. But this does not mean that the President's request is "dead on arrival" in Congress. While it's likely that there will be significant differences of opinion over appropriate funding levels for the many programs in the budget, with their majority not "veto-proof,"[1] congressional Republicans will ultimately have to pass appropriations bills that the President will sign, or risk yet another government shutdown — something both parties are looking to avoid. The veto gives the President his leverage, and his budget represents his "marker" on the table in the negotiations.

The President's budget courts controversy in one of its central assumptions: that the sequestration regime enacted into law by the Budget Control Act (BCA) of 2011 and designed to enforce strict caps on discretionary spending is harmful to the Nation and ought to be abandoned. Designed to curb deficit spending and reduce the national debt, the BCA enacted a 10-year plan to cut nearly $1.2 trillion from Federal spending by capping defense and non-defense discretionary accounts — that is, money that Congress appropriates every year, as opposed to non-discretionary spending like that on Social Security, Medicare, Medicaid and interest on the National Debt. Should Congress exceed those caps in any year, automatic cuts would trigger, lopping off an equal percentage of money from every discretionary account in the budget to get the budget beneath the cap. While both Republicans and Democrats have both agreed that this is a pretty poor way to run a government, the sequestration regime has actually managed to curb discretionary spending.

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[1] The GOP lacks a large enough majority to override a presidential veto on a party-line vote.

In fact, discretionary spending is now nearly $200 billion less, in inflation adjusted dollars, than it was in FY 2010.

In his budget, the President proposes revising those caps. The BCA differentiates between defense and non-defense discretionary spending. The President's budget would require exceeding the defense caps by $38 billion in FY 2016, and the non-defense caps by $33 billion. Among congressional Republicans, there's little support for busting the non-defense spending caps by $33 billion. However, as this goes to press, the House Republican leadership is moving a budget resolution that would exceed the President's requested increase for defense discretionary spending. In fact, House Republicans would like to see the $38 billion increase grow to a $90 billion increase above the cap, though it appears they would fund that increase through the use of the "Overseas Contingency Operations" (OCO) account — money outside the normal budget accounting used to pay for U.S. war operations.

But on the non-defense discretionary side, there's little room for growth, and this will likely make for a tough year for Federal science agencies like NSF, National Institute of Standards and Technology, and the Department of Energy's Office of Science, when the appropriations process concludes at the end of the calendar year (hopefully).

The President has requested increases for all three of those agencies. For NSF, the President would like to see the agency grown by 5.2 percent in FY 2016, to $7.7 billion. Included in that increase is an increase to the Computing and Information Science and Engineering directorate of about 3.5 percent, or about $33 million more than FY 2015 funding. CISE would see increases across all of its divisions of about 3.8 percent under the President's plan, and CISE would play a role in nearly all of the agency's Foundation-wide initiatives including:

◗ $28.5 million in the Understanding the Brain initiative;

◗ $13.5 million in Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS);

◗ $8 million in Risk and Resilience;

◗ $1.8 million in the new Inclusion across the Nation of Communities of Learners that have been Underrepresented for Diversity in Engineering and Science (INCLUDES) initiative;

◗ $94 million in Cyber-Enabled Materials, Manufacturing and Smart Systems (CEMMSS);

◗ $84 million in Cyberinfrastructure Framework for 21st Century Science, Engineering, and Education (CIF21);

◗ $70 million for Secure and Trustworthy Cyberspace (SaTC);

◗ and $11.7 million for Innovation-Corps.

The Department of Energy's Office of Science (SCI) would also grow at a similar rate to NSF under the President's plan. SCI would see an increase of 5.4 percent, or $27 million, to $5.34 billion for the programs across the office. However, the Advanced Scientific Computing Research (ASCR) would see a disproportionate amount of growth under the President's budget. ASCR would increase $80 million, to $621 million, in FY 2016 — an increase of nearly 15 percent. The primary driver behind the increase is the agency's priority on its exascale computing efforts, for which it would spend $87 million in FY 2016. ASCR's Mathematical, Computational and CS Research account would grow a more modest $2.5 million under the President's plan, and the Computational Science Graduate Fellowship, a program for which CRA joined with the Society of Industry and Applied Mathematics (SIAM) in efforts to reverse cuts to the program proposed by the Administration in previous years, would be "fully-funded" at $10 million to fund a new cohort of fellows.

NIST would grow by nearly 30 percent in the President's budget, in large part due to a focus on advanced manufacturing programs. The Science and Technical Research Service of NIST, where most of NIST's core research efforts reside, would also grow by nearly 12 percent in FY 2016 under the President's plan. Included are research efforts focused on advanced communications, cybersecurity, urban cyber physical systems, and quantum information science.

One area of the research portfolio that does not fare particularly well under the President's plan and bears watching is funding for basic research (6.1) at the Department of Defense. The Administration would cut the basic research budget by 8.3 percent in this budget, a cut of $189 million to $2.09 billion in FY 2016. Applied research (6.2) and Advanced Technology Development (6.3) would grow — by 1.4 percent and 2.6 percent respectively — and DARPA would see an overall increase of about 3 percent to $3 billion in FY 2016. But the cut to the basic research account has some in the

science advocacy community, including those of us at CRA, concerned. In part, this is perhaps a bit of gamesmanship from the Administration. The Pentagon knows that the Congress is favorably disposed to defense spending and the basic research account in particular, and so it's often the case that they will propose cuts in one area like this, having some confidence that Congress will reverse the cut later, in order to "pay for" increases elsewhere in the agency that the Congress may be less inclined to support. But while it appears there is support for mitigating the cut to basic research in Congress again this year, the magnitude of the cut proposed in this budget may make it difficult to reverse completely. We will continue to watch and advocate for basic research and have more detail on this as the Defense Appropriations process moves forward later this year.

What is also not particularly clear at the moment to science funding advocates is how this will all play out in appropriations this year. What is clear is that it likely will not get done in "regular order" — having each of the 12 annual appropriations bills necessary to fund government passed by the September 30th end of the current fiscal year.

Congressional appropriations staff are already talking openly about a "continuing resolution" strategy: passing a stop-gap funding bill to give Congress time after the September 30th deadline to finish up appropriations.

Before then, given the current climate, it is likely that the Republican Congress may force the President to use his veto on these spending bills, if only for political posturing and symbolism. But in the end, the bills have to pass. Because they have to pass, many believe that the endgame will feature yet another mammoth "omnibus" appropriations bill that will bundle many, or all, of the unfinished appropriations bills into one, must-pass measure that will likely be full of compromises — compromises that would likely be unpalatable for either side if the bills were free-standing. But doing them as a bundle decreases somewhat the amount of attention paid to each one and perhaps paves the way to getting appropriations done.

However it works out, we will have all the details for you on the Computing Research Policy blog! (http://cra.org/blog).

That Was Then, This Is Now: 25 Years Ago in *CRN*

By Betsy Bizot, CRA Director of Statistics and Evaluation

A look through the back issues of *CRN* provides some interesting contrasts in what's changed and what hasn't. This is the second of a series of occasional articles looking back at the hot topics in *CRN* 25 years ago.

In Winter and Spring 1990, as reported in *CRN:*

The subcommittee on Investigations and Oversight of the House of Representatives Committee on Science, Space, and Technology held hearings to address problems of software system safety, reliability, and quality. The precipitating incident was several deaths that had occurred due to software errors in the control of a radiation therapy device. *Notably missing from the list of concerns, by our current view, is security. But the Internet age was just dawning. Another article in the same issue of CRN referred to "the current NSF-sponsored networks (commonly called the Internet)."*

The Taulbee Survey reported that in 1988-89, 807 PhDs were awarded in Computer Science and Computer Engineering. Thirteen percent went to women and one percent went to underrepresented minorities. Four percent of tenured and tenure-track faculty were female, and two percent were underrepresented minorities. *In 2013-2014, 1,940 PhDs were awarded in Computer Science, Computer Engineering, and Information. Eighteen percent went to women and three percent to underrepresented minorities. Seventeen percent of tenured and tenure-track faculty are female and four percent are underrepresented minorities.*

The Canadian government announced a large research funding program, Networks of Centres of Excellence, which included three groups working in computing research: the Institute for Robotic and Intelligent Systems (IRIS), the Institute for Telecommunication Research, and the Ultra Large Scale Integration network. *Both then and now, CRA's charter is all of North America.*

The January 1990 *CRN* included 25 job ads, all for North American academic positions. *The January 2015 CRN included 164 job ads. Twelve of the ads were for non-North American positions (primarily academic, some*

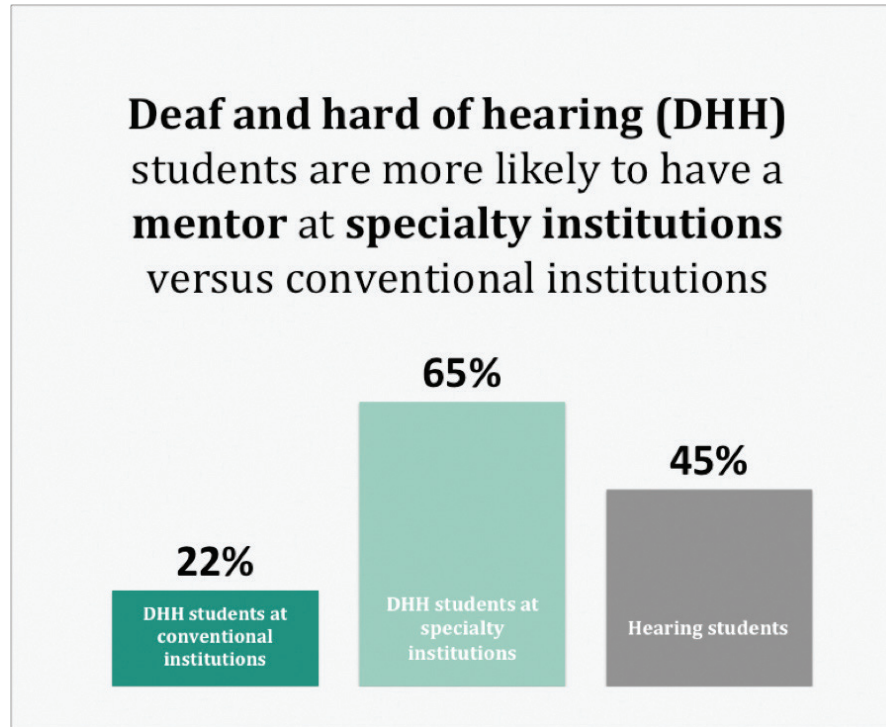*with overseas campuses of US institutions); three were for industry or government research labs.*

An analysis by the Computing Research Board (CRA's predecessor organization) reported that 60% of federal R&D expenditures in computer science and engineering came from the defense sector; the three largest sources of funds were, in decreasing order of funding, DARPA, NSF, and ONR. Most of the DOD funding supported applied research and development, but a significant fraction supported basic research. *The landscape for research funding has shifted considerably. In the most recent proposed FY16 budget, defense (DARPA, the service labs, and DOE nuclear stockpile stewardship) supports about 29% of all federal IT R&D (definitions of "IT R&D" can differ across agencies). NSF is expected to support about 89% of all fundamental CS research at universities.**

The article "Is Computing Research Isolated from Science?" emphasized the need for computer scientists to engage in interdisciplinary research. Research funding was likely to support work directed at solving societal problems, and computing research was expected to be the enabling technology for advances in many of these areas, but computing researchers needed to be directly involved in working with other areas. However, many researchers were more interested in, and more rewarded by their communities for achievements in, the core of computing. *Interdisciplinary research continues to be vital to solving societal problems. Computing researchers participate in interdisciplinary projects in health, education, transportation, and business. CRA's Computing Community Consortium helps organize workshops that bring together researchers from various disciplines to discuss how advances in computing could address societal issues such as Aging in Place, Brain research, and human computation.*

*Thanks to CRA's Director of Government Affairs Peter Harsha for providing the current figures for government funding.

1990-2015

April 2015 CERP Infographic

By: Jane Stout, CERP Director

Deaf and hard of hearing (DHH) students are more likely to have a mentor at specialty institutions versus conventional institutions

65%

45%

22%

DHH students at conventional institutions

DHH students at specialty institutions

Hearing students

Note: Thirty-five deaf and hard of hearing (DHH) and 20 hearing undergraduate computing majors reported who they went to most often for career advice and assistance. Seventeen DHH students were enrolled at institutions that specialize in providing support services for DHH students; 18 DHH and 20 hearing students were enrolled at conventional institutions. DHH students at specialized institutions were just as likely to have a mentor within their institution as hearing students. However, DHH students at conventional institutions were significantly less likely to have a mentor at their institution compared to (a) their DHH student counterparts who were at specialized institutions, $p < .50$, and (b) hearing students, $p < .05$. These data suggest that institutions with accessibility built into their institutional identity tend to also foster access to mentors for DHH students. Importantly, mentors provide information and guidance for successful career development.

CERP
Computing Research Association
Evaluation

This infographic 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 learn more about CERP, visit our website at http://cra.org/cerp/.

Expanding the Pipeline:

Solving the Equation: The Variables for Women's Success in Engineering and Computing

By Christianne Corbett

More than ever before in history, girls are studying and excelling in science and mathematics. Yet the dramatic increase in girls' educational achievements in scientific and mathematical subjects has not been matched by similar increases in the representation of women working as engineers and computing professionals. Women made up just 26 percent of computing professionals in 2013, a substantially smaller portion than the 35 percent women comprised in 1990 and about the same percentage as in 1960. In engineering, women are even less well represented, making up just 12 percent of working engineers in 2013.

With funding from the National Science Foundation, the American Association of University Women (AAUW) recently released *Solving the Equation: The Variables for Women's Success in Engineering and Computing,* which highlights recent research on the factors underlying the underrepresentation of women in these fields, including stereotypes and biases, college curriculum, and workplace environment, and makes evidence-based recommendations for change. Many of the recommendations are targeted toward employers as they play an especially important role in creating workplace environments that support women. Some specific recommendations include holding managers accountable for their hiring and promotion decisions so they're less likely to rely on stereotypes; removing gender information from job applications and evaluation scenarios when possible; making clear that a workplace with more technical women is a priority and a desired goal for an organization; and emphasizing the societal benefit of engineering and computing work.

COMBATING STEREOTYPES AND BIASES

We all hold gender biases, shaped by cultural stereotypes in the wider culture, that affect how we evaluate and treat one another. Several recent research findings shed light on the effects of stereotypes and gender bias as they relate to women in engineering and computing.

Many of you are likely familiar with the recent study by Dr. Corinne Moss-Racusin and colleagues which found that scientists were more likely to choose a male candidate over an identical female candidate for a hypothetical job opening at a lab. Both female and male scientists also offered a higher salary to the male candidate. Another recent study by Dr. Ernesto Reuben and colleagues found that potential employers systematically underestimated the mathematical performance of women compared with men, resulting in the hiring of lower-performing men over higher-performing women for mathematical work. Once objective past-performance information was introduced, however, the employers made less biased hiring decisions. Bias is prevalent, but its effects can be diminished with more comprehensive information.

Hundreds of studies have documented the power of stereotypes to influence performance through a phenomenon known as "stereotype threat" in many domains, including academic performance among black students, memory in older adults, girls' chess performance, and women's athletic performance. In every case even subtle reminders of negative stereotypes can have an impact on performance, sometimes in dramatic ways. For example, according to a recent meta-analysis, stereotype threat
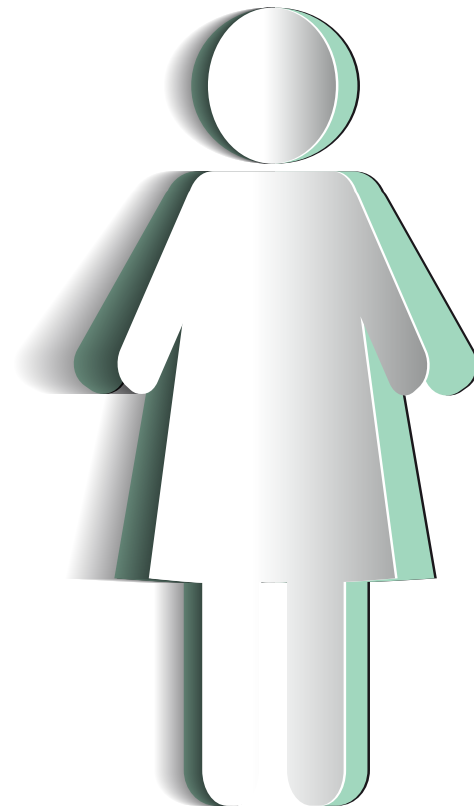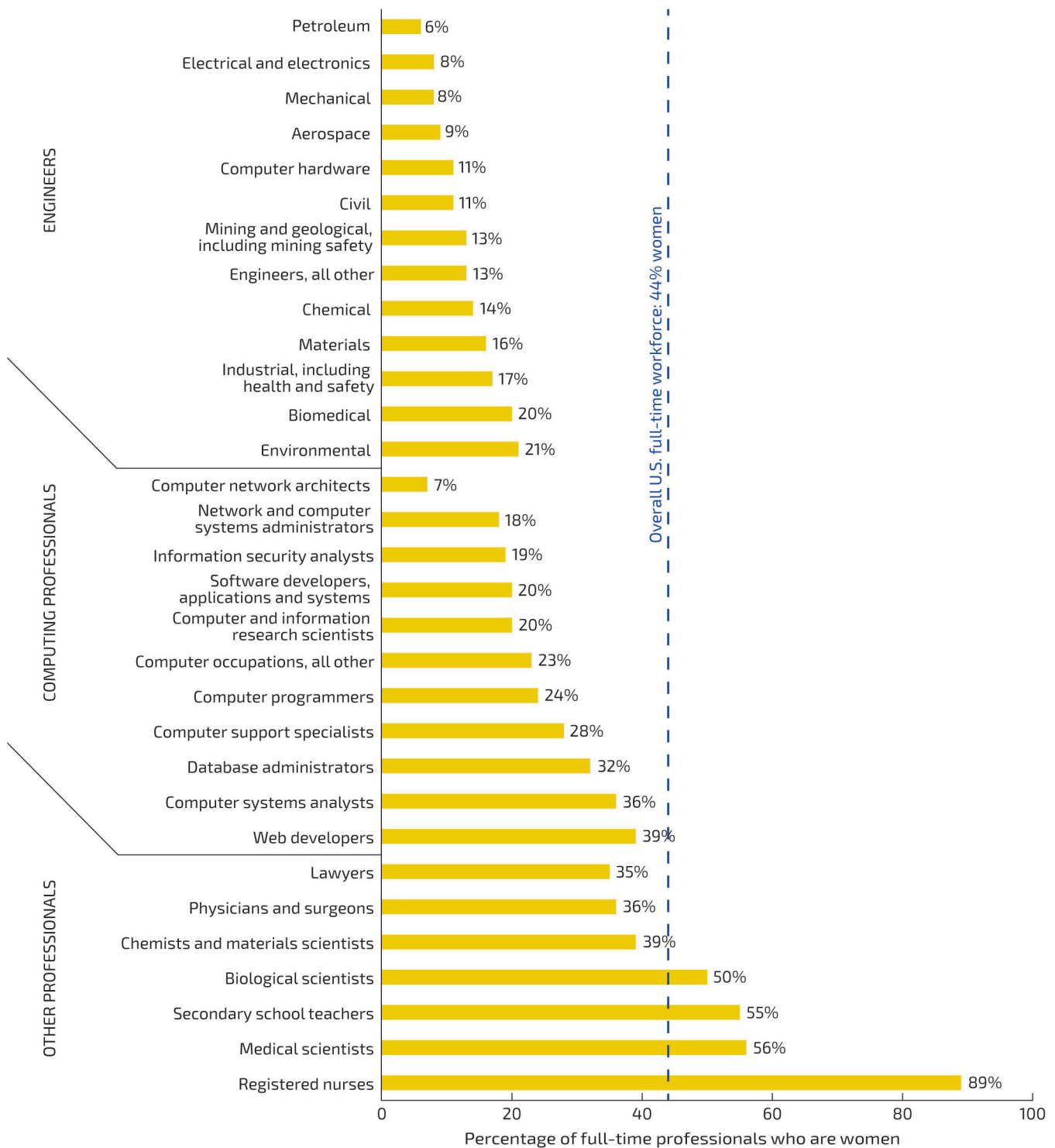
FIGURE 4. WOMEN IN ENGINEERING, COMPUTING, AND SELECTED OTHER OCCUPATIONS, 2013

Notes: Occupations are self-reported. All occupations designated as computer and engineering occupations by the U.S. Department of Labor, Bureau of Labor Statistics, that employed at least 500 men and 500 women in 2013 are shown. Occupations shown in "other professionals" are selected professions shown for reference.

Source: L.M. Frehill analysis of data from U.S. Department of Labor, Bureau of Labor Statistics (2014c) in *Solving the Equation: The Variables for Women's Success in Engineering and Computing,* AAUW (2015)

results in an underestimation of the intellectual ability of black and Latino students by approximately 40 points on the SAT math and reading tests.

Stereotype threat occurs when individuals fear that they will confirm a negative stereotype about a group to which they belong. One such group is "women." When negative stereotypes about women's mathematical abilities are brought to test-takers' attention during tests, women's performance drops. Stereotype threat has been theorized not only to influence women's mathematical performance but also to contribute to disengagement from fields in which women are negatively stereotyped, such as engineering and computing.

Much research has been done on how stereotype threat can affect academic performance, but researchers are only recently beginning to examine how stereotype threat affects women in the workplace. One finding in this area, from a study conducted by Dr. Shannon Holleran, Dr. Toni Schmader, and their colleagues, showed that the more often female STEM faculty had research-related conversations with their male colleagues, the less engaged they felt with their work. In contrast, the more social conversations female STEM faculty had with their male colleagues, the more engaged they reported being with their work. One possible explanation for this finding is that research-related conversations with male colleagues may generate stereotype threat for female scientists. Social conversations with male colleagues, on the other hand, may lessen the threat by increasing a feeling of belonging in their work environment. Research suggests that stereotypes are activated for women more frequently when few women work in an organization. The presence of women at all levels of an organization has the potential to create environments that are less threatening for women.

Gender biases affect not only how we view and treat others but also how we view ourselves and what actions we take as a result. As early as first grade, children have already developed implicit biases associating math with boys. Studies suggest that girls who more strongly associate math with boys and men are less likely to perceive themselves as being interested in or skilled at math and less likely to spend time studying or engaging with math concepts.

A recent study conducted by Dr. Frederick Smyth, Dr. Brian Nosek, and Dr. Anthony Greenwald, to be published in a forthcoming issue of *Frontiers in Psychology* finds that most men who major in engineering and computing have relatively strong implicit biases associating men with science, whereas their female counterparts tend to have relatively weak science-male implicit biases. Engineering and computing workplaces have a wider gap in gender-science bias among female and male employees relative to other fields. Exactly how this gender difference affects the work environment in engineering and computing is an area ripe for future research.

EMPHASIZING SOCIAL RELEVANCE

Another factor that may contribute to girls and women choosing to pursue fields other than engineering and computing is the small but well-documented gender difference in desire to work with and help other people. Although communal goals are widely valued by both women and men, research conducted by Dr. Amanda Diekman and colleagues finds that women are more likely than men to prioritize helping and working with other people over other career goals. Engineering and computing jobs clearly can provide opportunities for fulfilling communal goals, but jobs in these fields are not generally viewed that way. Rather, engineering and computing are often thought of as solitary occupations that offer few opportunities for social contribution. The perception and, in some cases, the reality that engineering and computing occupations lack opportunities to work with and help others may in part explain the underrepresentation of women in these fields. Incorporating communal aspects—both in messaging and in substance—into engineering and computing work will likely increase the appeal of these fields to communally oriented people, many of whom are women.

CULTIVATING A SENSE OF BELONGING

Perhaps because of this combination of stereotypes, biases, and values, women often report that they don't feel as if they belong in engineering and computing fields. A recent
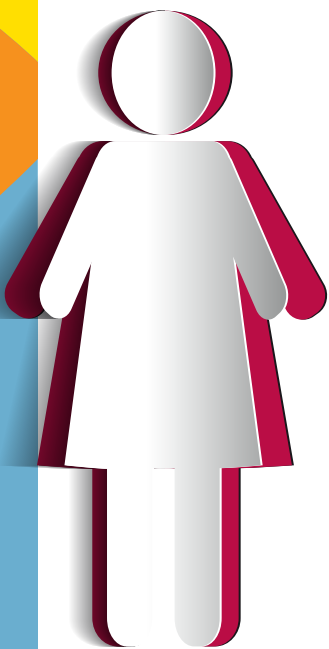
study by Dr. Erin Cech and colleagues found that female engineering students were less likely than their male counterparts to feel a strong sense of fit with the idea of "being an engineer" as early as their first year in college. This more tenuous sense of fit with the professional role of an engineer was found to be associated with a greater likelihood of leaving the field. By emphasizing the wide variety of expertise necessary to be a successful engineer or computing professional—including less stereotypically masculine skills such as writing, communicating, and organizing—college engineering and computing programs can help young women see engineering and computing as fields in which they belong.
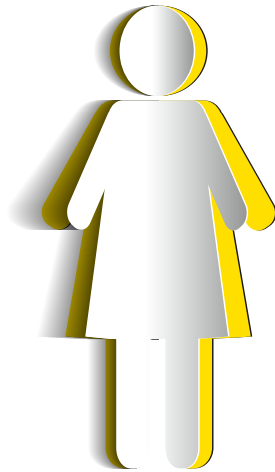
CHANGING THE ENVIRONMENT

Past decades have shown that simply trying to recruit girls and women into existing engineering and computing educational programs and workplaces has had limited success. Changing the environment in college and the workplace appears to be a prerequisite for fully integrating women into these fields.

COLLEGE

Harvey Mudd College is a prime example of how changing structures and environments can result in a dramatic increase in women's representation in computing. With leadership from the college president Maria Klawe, and college-wide support, Harvey Mudd increased the percentage of women graduating from its computing program from 12 percent to approximately 40 percent in five years. This dramatic increase was accomplished through three major changes: revising the introductory computing course and splitting it into two levels divided by experience, providing research opportunities for undergraduates after their first year in college, and taking female students to the Grace Hopper Celebration of Women in Computing conference. These changes can be modified and applied at other colleges and universities. Taken together, they provide a roadmap for

reversing the downward trend in women's representation among bachelor's degree recipients in computing.

THE WORKPLACE

Finally, while many studies have focused on factors contributing to women entering STEM occupations, far fewer have looked at the arguably equally important question of why women leave these fields, often after years of preparation, and what factors support them in staying. Recent research by Dr. Nadya Fouad and colleagues sheds light on why some women leave the engineering workforce and why others stay. Women who leave engineering are very similar to women who stay in engineering. The differences the researchers found were not in the women themselves but in their workplace environments.

Women who left engineering were less likely to have opportunities for training and development, support from co-workers or supervisors, and support for balancing work and non-work roles than were women who stayed in the profession. Female engineers who were most satisfied with their jobs, in contrast, worked for organizations that provided clear paths for advancement, gave employees challenging assignments that helped develop and strengthen new skills, and valued and recognized employees' contributions.

Stereotypes and biases lie at the core of the challenges facing women in engineering and computing. Educational and workplace environments are dissuading women who might otherwise succeed in these fields. Expanding women's representation in engineering and computing will require concerted effort by employers, educational institutions, policy makers, and individuals to create environments that are truly welcoming for women.

Christianne Corbett is a senior researcher at the American Association of University Women. Patty Lopez served as an advisor for Solving the Equation.

Theoretical Foundations for Social Computing

CCC
Computing Community
Consortium
Catalyst

The CCC Visioning Workshop Theoretical Foundations for Social Computing will be held in Washington, DC on June 29-30th.

Social computing encompasses the mechanisms through which people interact with computational systems — for instance, crowdsourcing platforms, ranking and recommendation systems, online prediction markets, or collaboratively edited wikis. It is blossoming into a rich research area of its own, with contributions from diverse disciplines spanning computer science, economics, sociology, systems research, and HCI, to name just a few.

Foundational theoretical research has great potential to influence and shape the future of social computing. However, while there is a small amount of literature that uses theoretical models to analyze and propose design recommendations for social computing systems, there are several barriers that must be overcome and questions that must be answered before theory can have the same degree of impact on social computing that it has had in other fields:

◗ What are the fundamental social computing problems? Is it possible to identify problems that are general enough to capture the core challenges of social computing across a wide range of applications, yet capture real issues?

◗ What are the right models? A growing body of literature suggests that human behavior in many online settings often deviates from standard economic models of agent behavior, and that these deviations can have significant effects on how to optimally design social computing systems. Defining appropriate models requires a dialog between theory and experimental and empirical research.

◗ How should we measure success? When evaluating the progress of the field as a whole, the criteria for success are vague, especially given that the capabilities and uses of social computing systems are changing all the time.

This visioning workshop has three major goals:

◗ Identify core problems that the community believes are important to focus on in order to establish theoretical foundations of social computing.

◗ Identify ways in which the theory community can learn from existing, ongoing, and future empirical and experimental work.

◗ Identify effective ways for the theory community to have impact on social computing in practice.

For more information, please see the Theoretical Foundations for Social Computing website or contact Ann Drobnis.

Privacy by Design – Privacy Enabling Design

CCC
Computing Community Consortium
Catalyst

The second in a series of four CCC Visioning workshops on Privacy by Design, Privacy Enabling Design will be held in Atlanta, Georgia on May 7-8th.

Building on the first workshop, this workshop will explore in depth privacy design practice. The goals are to survey current research on privacy tools and motivations and consider the effect this research should have on real-world problems, regulatory frameworks, and design practices in the public and private sector.

Examples of topics to be explored include:

◗ How do designers and privacy professionals engage with privacy challenges in industry and research? What works today? What are the obstacles?

◗ How do designers and implementers of products make decisions about tradeoffs with respect to privacy? How explicitly are various criteria considered when decisions are made?

◗ What if any education, research, methods, policy, or organizational changes need to happen to empower designers?

◗ How do we know when a product design or research framework is effective in respecting users' privacy? What methods if any have proven themselves useful for privacy design or for evaluating privacy frameworks?

◗ How is designing for privacy similar to or different from designing for security? How does trust factor into this process?

◗ What privacy design challenges are posed by non-traditional technologies and interfaces, such as mobile devices, wearable computing, or the Internet of Things?

◗ What can academia do to support work by practitioners and policymakers?

◗ Does academic privacy research have any bearing on how privacy design is currently being addressed in industry? How can we improve the transfer of academic research into industrial practice?

For more information, please see the Privacy by Design website or contact Ann Drobnis.

Capitol Hill Presentation on **"Deconstructing Precision Agriculture"**

From the CCC Blog

Contributions to this post were made by Shashi Shekhar, Computing Community Consortium (CCC) Council member and Distinguished University Professor at the University of Minnesota.

CCC
Computing Community
Consortium
Catalyst

The Task Force on American Innovation held a Capitol Hill reception titled **"Deconstructing Precision Agriculture"** on Wednesday, March 4. The Computing Research Association was a co-sponsor of the event. It showcased U.S. farmers, leading agriculture technology companies, and scientists including Computing Community Consortium (CCC) Council member and University of Minnesota distinguished university professor Shashi Shekhar.

The event exhibited three essential technologies of precision agriculture that originated from a broad spectrum of federally funded science: Guidance Systems and GPS, Data & Mapping with GIS, and Sensors & Robotics.

Rajiv Khosla, Professor of Precision Agriculture at Colorado State University opened the reception by saying that "precision agriculture is not rocket science, but we use rocket science to do precision agriculture."

Shashi Shekhar explained that the geographic information system (GIS) based soil maps help farmers see that soil properties and fertilizer needs vary across locations in a large farm. GIS and complementary spatial computing technologies help farmers apply the right amount of fertilizer at each location within a large farm to increase yield while reducing waste and runoffs. If you apply the same amount of fertilizer everywhere you are over fertilizing in some places (which leads to increased runoff) and under fertilizing in others (which reduces

yield). To relate the need for this technology, William R. Raun, Professor at Oklahoma State University pointed out, you don't go to a gas station and put fifteen gallons of gas in a ten gallon tank, watching five gallons spill. GIS soil maps help tractor-based spatial decision support systems control for this and prevent excess runoff and conserve water, while increasing yield by location-aware rate of fertilization. Farmer Del Unger of Carlisle, Indiana, said that precision agriculture has dramatically increased yields and farm profitability. Farmer Rod Weimer, of Fagerberg Produce in Eaton, Colorado said it himself when he remarked that "Technologies like this makes farming more fun."

Shekhar added that agriculture is not only a compelling use case of but also the inspiration for many transformative spatial computing discoveries and inventions. Positioning methods, e. g, modern GPS, started with land surveying by Egyptian civilization to reestablish farm ownership boundaries periodically erased by Nile floods. Spatial statistics traces its roots to concern of agriculture census that agricultural samples violated central assumptions underlying sampling theory. Many new basic research challenges and opportunities including many in Computer Science, are arising from the societal need of dramatically increasing farm yields without degrading environment to address food security (as well as

the nexus of food, energy and water security) in face of growing population, increasing urbanization in developing world, and climate change.

This topic is of great interest right now. The National Science Foundation (NSF) released a Dear Colleague Letter (DCL) called SEES: Interactions of Food Systems with Water and Energy Systems that encompasses precision agriculture and more.

NSF established the Science, Engineering, and Education for Sustainability (SEES) investment area in 2010 to lay the research foundation for decision capabilities and technologies aimed at mitigating and adapting to environmental changes that threaten sustainability.

In this context, the importance of understanding the interconnected and interdependent systems involving food, energy, and water (FEW) has emerged. Through this Dear Colleague Letter (DCL), the NSF aims to accelerate fundamental understanding and stimulate basic research on systems that extend beyond the interests of the SEES Water Sustainability and Climate (WSC) program to include couplings to energy and food systems where the NSF already has established presence.

The NSF requests innovative proposals for (1) supplements, to build upon existing NSF-funded research activities; or (2) workshops of typically 30-80 attendees that stimulate debate, discussion, visioning and collaboration across research communities, and enable a higher appreciation, visualization and understanding of food systems and their couplings to energy and water systems.

This is a huge opportunity with tremendous impact potential for the computer science community. These workshops are to prepare for the transition to the **Innovations at the Nexus of Food, Energy and Water Systems** (INFEWS) Program under NSF's new FY 16 budget request. If you are interested, workshop proposals and supplement requests must be submitted by March 30, 2015 for consideration. For more information, please see the DCL.

Professional Opportunities

Amazon.com

Research Scientists in Machine Learning

The machine learning (ML) organization at Amazon has multiple positions available in Seattle, Palo Alto, Berlin, and Bangalore for ML experts at all career stages, from graduating doctoral students to internationally renowned researchers and practitioners.

We solve many of Amazon's most difficult and important problems, and in partnership with teams across Amazon, we build new services that surprise and delight customers. We have current and future projects in video recommendation, streaming data analysis, natural language processing, deep learning, bandit algorithms, computer security, social networks, and more.

ML at Amazon is a highly experimental activity, although theoretical analysis and innovation are also welcome. ML scientists work closely with software engineers to put algorithms into practice. They also work on cross-disciplinary efforts with social scientists, computer vision experts, and others.

Amazon is growing fast, and its range of businesses surpasses that of any other technology company. Initiative and leadership are expected and welcomed from everyone. For informal enquiries, contact Charles Elkan (Amazon Fellow) at elkanc@amazon.com.

To apply, contact Janney Jaxen at janneyj@amazon.com. Amazon is an equal-opportunity employer and values diversity.

Qualifications:
MS or PhD (preferred) in computer science or a related field.

3 to 20+ years of experience in ML, with a record of innovation and high-quality publication.

Successful leadership and hands-on work implementing applications of ML.

Business acumen and desire to serve users and consumers.

Bard College

Visiting Assistant Professor of Computer Science

Bard College's Computer Science program invites applications for a two-year Visiting Assistant Professor in Computer Science to begin Fall semester 2015. The area of specialization is open, and preference will be given to candidates who contribute to the program's connections with the arts, the lab sciences, or the Experimental Humanities or Mind, Brain, Behavior concentrations. Applicants will be expected to teach an introductory "computing in context" course, to complement the existing courses in simulation/modeling, natural language processing, interactive systems, and web informatics. Other courses must meet our curricular needs and will also be tailored to the candidate's interests and strengths. In addition, responsibilities include the supervision of undergraduate senior research projects, which are a cornerstone of Bard's curriculum. Applicants should have a demonstrated commitment to quality, innovative undergraduate liberal arts teaching, including working with academically-oriented undergraduates, and an active research agenda.

Applicants should send a cover letter, curriculum vitae, teaching and research statements, a description of teaching experience, including course syllabuses and, if available, student evaluations; and three letters of recommendation to Interfolio.com at http://apply.interfolio.com/29120. Screening of applications will begin immediately.

For more information on Bard, visit www.bard.edu.

Bard is an Equal Opportunity employer and encourages applications from women and members of minority groups.

Boise State University

Department of Computer Science

Tenure-Track Faculty Position (Assistant/Associate/Full Professor)

The Department of Computer Science at Boise State University invites applications for an open-rank, tenured/tenure-track position at the assistant, associate or full professor level. Applicants should have a commitment to excellence in teaching, a desire to make significant contributions in research, and experience in collaborating with faculty and local industry to develop and sustain funded research programs. Seeking an applicant with systems background, including but not limited to, operating systems, programming languages, compilers, computer architecture or high performance computing. Preference given to candidates with experience collaborating in the following areas: big data, information retrieval, security, machine learning or visualization. A Ph.D. in Computer Science or a closely related field is required by the date of hire.

The University and the State of Idaho have made significant investments in the department to satisfy the high demand for computer science graduates, driven by the vibrant software and high-tech industry of the Boise metropolitan area. The department has undergone a major expansion in the last two years with four new faculty and three new lecturers, additional office staff, sixteen new graduate and teaching assistant lines, a spacious tutoring center for computer science and substantially increased budget. A PhD program is currently under development.

For application and other information, please visit: http://coen.boisestate.edu/cs/jobs

Boise State University is strongly committed to achieving excellence through cultural diversity. The University actively encourages applications and nominations of women, persons of color, and members of other

Professional Opportunities

underrepresented groups. EEO/AA Institution, Veterans preference may be applicable.

Boston College
Computer Science Department
Visiting Lecturer

The Department of Computer Science at Boston College invites applications for a full-time Visiting Lecturer position, beginning Fall 2015. This is a one-year, non-tenure track position, with a 3/3 teaching load and a possibility of renewal.

Applications will be accepted at: http://apply.interfolio.com/28646

Broad Institute
Postdoc- Computational Biology

The long term goal of our group is to find better therapies for inflammatory and autoimmune diseases. We are seeking a postdoctoral associate who will play a key role in computational method development to elucidate the cellular components and regulatory networks that interact dynamically in human health and disease states.

For a complete description: Req 1368,

http://www.broadinstitute.org/careers/job-openings/job-openings-0

D-Wave Systems
Machine Learning Researcher

D-Wave Systems is looking for experienced machine learning researchers to develop algorithms to exploit our unique adiabatic quantum computer.

To for more information and to apply visit http://www.dwavesys.com/careers/machine-learning-researcher

Haverford College
Department of Computer Science
Visiting Assistant Professor

Haverford College seeks to hire a candidate for a full- time visiting position in the Department of Computer Science. This is a two year appointment contingent upon a successful performance review with the potential to be extended for a third year. The position is at the Visiting Assistant Professor level and will begin in Fall 2015.

See http://cs.haverford.edu/visiting2015.html for details.

The Henry M. Jackson Foundation (HJF)
Junior and Senior Scientists

The Henry M. Jackson Foundation (HJF) is looking for junior and senior scientists to join the U.S. Army Medical Research and Materiel Command's Biotechnology High Performance Computing Software Applications Institute (BHSAI) [http://bhsai.org] HJF provides scientific, technical, and programmatic support services to the BHSAI.

This opening is for dynamic scientists interested in working in an interdisciplinary environment focused on the development and the application of computational solutions to biomedical problems, involving signal processing of time series physiological data, data mining, data-driven and physiological-based models, and artificial intelligence. The candidate should have a Ph.D. in a related discipline, extensive computational experience, and a strong publication record. The candidate is expected to simultaneously work on multiple projects, involving a diverse and interdisciplinary team of scientists across multiple laboratories.

Foreign nationals are welcome to apply. U.S. citizenship or permanent resident status is not required. This position is located in Frederick, Maryland.

Please apply on-line at careers.hjf.org click "Advanced Search" and enter job number *208839* in the Job Opening ID box.

Professional Opportunities

HJF is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability, protected veteran status or other status protected by law.

The Hong Kong University of Science and Technology

Faculty Positions in Data Science (http://www.ust.hk)

Founded in 1991, the Hong Kong University of Science and Technology (HKUST) is a world renowned international research university in Asia's most vibrant city. The University comprises more than 500 faculty members whose research ranges from science to engineering, business, humanities and social sciences. It promotes interdisciplinary studies, dedicated to educating all-rounded students to acquire a strong entrepreneurial spirit and innovative thinking with a global outlook. HKUST has been ranked among the top universities in Asia by QS Asian University Rankings. It ranks 16th in the latest Global Employability University Survey reported by the New York Times, and remains No. 1 in Greater China area. English is the medium of teaching, research and administration.

With the approaching of its 25th anniversary, the University will conduct a clustered hiring campaign aimed at advancing the University's academic strengths in selected cross-disciplinary areas that are strategically important to HKUST's future development. We are seeking renowned scholars, academics, leaders or potential leaders in the core cross-disciplinary area in Data Science.

Successful candidates should have a PhD degree and have demonstrated a solid research track-record in data science or a related field. Outstanding researchers in all areas of data science are welcome to apply, and applicants in Smart Cities or Health and Biomedical related areas are especially encouraged. Preferences will be given to applicants with the ability to build systems and developing techniques that facilitate scalable data-driven discovery or whose expertise lies in the discovery of new knowledge through multidisciplinary work.

Apart from having an exceptional research record, successful candidates should demonstrate strong potential as excellent teachers and advisers. Evaluation criteria include also the ability and willingness in leading and building an interdisciplinary group of researchers across the university, actively working with outside industry and organizations on data science problems, and involvement in the development and delivery of undergraduate and graduate training in data science. A good ability in communicating data science related problems well beyond one's own research area, especially to data rich organizations and industry partners, is considered a plus.

Applications are invited for a number of substantiation-track faculty positions at all ranks of Professor/Associate Professor/Assistant Professor in the above areas. Joint appointments in more than one academic department in the University are expected.

Appointments can start as early as on 1 September 2015. Salary is highly competitive and will be commensurate with qualifications and experience. Fringe benefits include medical/dental benefits, annual leave, and housing benefits where applicable. For appointment at the rank of Assistant Professor, initial appointment will normally be on a three-year contract. A gratuity will be payable upon completion of contract.

Application Procedure
Applicants are encouraged to apply directly on mathjobs.org under **Hong Kong University of Science and Technology > Data Science.** Applications should include a cover letter, a CV, names of three referees, a research/teaching statement as well as other evidence of excellence. The recruitment will be open year long, but applications received before **15 April 2015** will be given priority consideration. Please email to: datasci@ust.hk for any inquiries.

Hunter College of the City University of New York (CUNY)

Assistant Professor in Cybersecurity

The Department of Computer Science at Hunter College invites applications for an assistant professor position to begin in Fall 2015. The Department specifically seeks applicants with an independent research record in an area of cybersecurity, broadly defined, including, but not limited to, network security, software security, secure operating systems, and cybersecurity software engineering.

Located on the 68th Street campus on the upper east side of Manhattan, the small but diverse faculty of the Computer Science Department at Hunter works closely with students and each other in an open and collegial atmosphere.

The successful candidate is expected to develop a strong research program and a commitment to obtain external grants, be able to teach core undergraduate computer science courses as well as electives and graduate courses in various areas of cybersecurity.

For details and to apply, visit www.cuny.edu/employment.html and log in or create a new account then search for Job Opening ID: 12340.

Professional Opportunities

McDaniel College

Department of Mathematics and Computer Science

Assistant or Associate Professor of Computer Science

McDaniel College invites applications for a tenure-track Assistant or Associate Professor position in Computer Science, beginning in August 2015. The particular field of specialization is open.

To apply and for more details, please visit http://www2.mcdaniel.edu/apply/CS.

McDaniel College is an AA/EEO and ADA employer and welcomes applications from diverse candidates and candidates who support diversity.

NEC Laboratories America

Researcher – Machine Learning

NEC Laboratories America (http://www.nec-labs.com/) conducts research in support of NEC's US and global business. Our lab has a broad research program that covers many areas and maintains a balance of fundamental and applied research. The Machine Learning Department in Princeton, NJ, has an opening for a researcher with a passion for developing the next generation of machine intelligence. Expertise in machine learning with an excellent track record of original research as well as a keen sense for developing practical applications are prerequisites for this position.

Our group's research (http://www.nec-labs.com/research-departments/machine-learning/machine-learning-home) is focusing on data analytics, handling a variety of data types, such as video, text, sensor data, and machine generated data. Besides algorithm development, mostly in the area of kernel methods and deep learning, the group also implements large-scale distributed systems. This technology has contributed to various products and services of NEC, such as systems for recruiting, surveillance, sonar detection, and digital pathology. In addition to contributing to NEC's business, our research is published in premier venues. Among the challenges we are tackling now is, how to move machine learning to more abstract reasoning, and how this can enable new applications in such areas as traffic safety and human resource management.

Requirements:
- PhD in computer science, statistics, electrical engineering, or equivalent.
- Research experience in machine learning with strong publication record.
- Strong algorithm and numeric computation background.
- Experience in text analysis is a plus

For more information about NEC labs, access http://www.nec-labs.com/, and submit your CV and research statement through our career center at https://www.appone.com/MainInfoReq.asp?R_ID=1011223

EOE-M/F/Vets/Disabled

Rhodes College

Department of Mathematics and Computer Science

Visiting Assistant Professor of Computer Science

The Department of Mathematics and Computer Science at Rhodes College invites applications for a one-year position as a visiting assistant professor of computer science beginning in August 2015.

جامعة قطر
QATAR UNIVERSITY

Assistant/Associate/Full Research Professor in Bioinformatics

Qatar University invites applications for research faculty positions at the level of associate or full professor to begin on September 2015.
Candidates will cultivate and lead large-scale research projects at the KINDI Center for Computing Research in the areas bioinformatics or health informatics.
Qatar University offers competitive benefits package including a 3-year renewable contract, tax free salary, free furnished accommodation, and more.
Apply by posting your application on the QU online recruitment system at http://careers.qu.edu.qa under "College of Engineering".

Professional Opportunities

The successful applicant must possess a firm commitment to teaching at a liberal arts college. Duties of the position include teaching courses at all levels of the undergraduate computer science curriculum; the teaching load is 3-3. Applicants should hold or expect to receive a Ph.D. in computer science or a closely allied discipline by August 2015. We welcome candidates from all areas of scholarly specialization within computer science.

Please see the full ad and apply online at jobs.rhodes.edu; only online applications will be accepted. A complete application includes a cover letter, a CV, a statement of teaching philosophy, and three letters of recommendation. Background checks are required before candidates can be brought to campus for interviews. Review of completed applications will begin immediately and will continue until the position is filled.

Rutgers, The State University of New Jersey

Office of the New Brunswick Chancellor Henry Rutgers Data Science Professorship

Rutgers University invites applications for the Henry Rutgers Data Science Professorship, a tenured faculty position at the rank of Distinguished Professor. The anticipated appointment start date is September 2015, but is negotiable.

Candidates appropriate for shared affiliations with more than one department/school/institute and who can contribute leadership to campus-wide data science initiatives at Rutgers are strongly encouraged to apply.

Applicants for this research/teaching position must have a distinguished record of achievement in Data Science (broadly defined), a vibrant, externally-funded research program, and a commitment to quality advising and teaching at both the graduate and undergraduate levels.

Rutgers University offers an exciting, multidisciplinary research environment, with a host of research institutes and divisions that encompass the physical, mathematical, computational, engineering, environmental, and life sciences, disaster preparedness, homeland security, public health, transportation, urban planning, two medical schools, and an NCI-designated comprehensive cancer center (see http://nbchancellor.rutgers.edu/campus-initiatives/henry-rutgers-data-science-professorship for further details).

Applicants should submit their curriculum vitae, a research statement addressing past work and future plans, a list of past and present external grant support, and a teaching statement to datasci@rci.rutgers.edu or to: Alexis Biedermann at 83 Somerset Street, Suite 101, New Brunswick, NJ 08901.

Review of applications will begin April 2015 and will continue until the position is filled.

All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity or expression, national origin, disability, protected veteran status or any other classification protected by law.

Professional Opportunities

The State University of New York at Buffalo

Department of Computer Science and Engineering

Lecturer Position Available

The State University of New York at Buffalo Department of Computer Science and Engineering invites candidates to apply for a non-tenure track lecturer position beginning in the 2015-2016 academic year. We invite candidates from all areas of computer science and computer engineering who have a passion for teaching to apply.

The department has a strong commitment to hiring and retaining a lecturer for this career-oriented position, renewable for an unlimited number of 3-year terms. Lecturers are eligible for the in-house titles of Teaching Assistant Professor, Teaching Associate Professor and Teaching Professor.

Applicants should have a PhD degree in computer science, computer engineering, or a related field, by August 15, 2015. The ability to teach at all levels of the undergraduate curriculum is essential, as is a potential for excellence in teaching, service and mentoring. A background in computer science education, a commitment to K-12 outreach, and addressing the recruitment and retention of underrepresented students are definite assets.

Duties include teaching and development of undergraduate Computer Science and Computer Engineering courses (with an emphasis on lower-division), advising undergraduate students, as well as participation in department and university governance (service). Contribution to research is encouraged but not required.

Review of applications will begin immediately and will continue until the position is filled. Applications must be submitted electronically via http://www. ubjobs.buffalo.edu/. Please use posting number 1400806 to apply. The University at Buffalo is an Equal Opportunity Employer.

The Department, School and University
Housed in the School of Engineering and Applied Sciences, the Computer Science and Engineering department offers both BA and BS degrees in Computer Science and a BS in Computer Engineering (accredited by the Engineering Accreditation Commission of ABET), a combined 5-year BS/MS program, a minor in Computer Science, and two joint programs (BA/MBA and Computational Physics).

The department has 34 tenured and tenure-track faculty and 4 teaching faculty, approximately 640 undergraduate majors, 570 masters students, and 150 PhD students. Fifteen faculty have been hired in the last five years. Eight faculty are NSF CAREER award recipients. Our faculty are active in interdisciplinary programs and centers devoted to biometrics, bioinformatics, biomedical computing, cognitive science, document analysis and recognition, high performance computing, information assurance and cyber security, and computational and data science and engineering.

The State University of New York at Buffalo (UB) is New York's largest and most comprehensive public university, with approximately 20,000 undergraduate students and 10,000 graduate students.

Trinity University, San Antonio, Texas

Department of Computer Science
Postdoctoral Research Associate

Start Date: Summer or Fall 2015

Duration: 1 to 2 years

Contact: Albert Xin Jiang, Ph.D., Assistant Professor. http://www.cs.trinity. edu/~xjiang/

Job Description:
The successful candidate will be working with Dr. Jiang on topics at the interface of artificial intelligence and game theory. You would ideally have research background on at least one of the following: computational game theory/multi-agent systems, machine learning, graphical models, and optimization. Experience with and/or willingness to do interdisciplinary research is desired.

Interested applicants may send their CV and reference letters to xjiang@trinity.edu

University of California, Riverside

Assistant Project Scientist

The Assistant Project Scientist will be responsible for conducting research on recommendation systems and personalization in the mobile context and/ or data mining of spatial temporal, textual, or multi-media data. A strong background in machine learning is required and knowledge of cognitive science or human-computer interaction is preferred. Strong programming skills and familiarity with experimental evaluation of data mining algorithms are required. Full consideration will be given to applications submitted by February 27, 2015. Applications will continue to be accepted until the position is filled.

Interested individuals should apply by registering via: https://aprecruit.ucr.edu/ apply/JPF00290

The University of California is an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, age, disability, protected veteran status, or any other characteristic protected by law.

Professional Opportunities

University of Delaware

Lerner College of Business & Economics and College of Engineering

Senior Faculty and JPMorgan Chase Faculty Fellow

Deadline: April 1, 2015 and remains open until the position is filled.

An innovative leader in research and teaching, the University of Delaware combines a rich historic legacy with a commitment to undergraduate education and the latest in advanced technology. With external funding exceeding $200 million, the University ranks among the top 100 universities in federal R&D support.

Enhanced by state-of-the-art facilities, research is conducted across all seven colleges and numerous interdisciplinary institutes and centers. The main campus in Newark, Delaware, provides the amenities of a vibrant college town with convenient access to the major cities of the East Coast.

The Alfred Lerner College of Business and Economics (Lerner) and the College of Engineering (COE) at the University of Delaware invite applications for a tenured senior faculty position in the broad area of Big Data analytics beginning September 2015. Candidates with expertise in Big Data management, large scale machine learning, data mining, financial services analytics, social media, and security are especially encouraged to apply.

Successful candidates will demonstrate an outstanding scholarly record of achievements, evidence of leadership potential, outstanding teaching abilities, and a record of professional outreach. We also highly value candidates with experience in building interdisciplinary research teams and those with a strong record of externally funded research.

Qualified candidates will hold a Ph.D. in Data and Information Sciences, Computer Science and Engineering, or a related field. Candidates will also have published in high-quality academic journals, successfully taught data science/analytics classes, and demonstrated evidence of the ability to build relationships with business partners.

The selected candidate will receive a full professor or senior associate professor primary appointment in one of the departments of Lerner, a secondary appointment in one of the departments of COE, be assigned as affiliated faculty with the Institute for Financial Services Analytics, and be appointed as a JPMC faculty fellow. He/she will be expected to teach in the Ph.D. program in Financial Services Analytics, work with and supervise students in the

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State Center Community College District | Fresno, CA

Computer Science Instructor

Closing Date: 4/6/2015

Essential Functions:

Include primarily teaching the Computer Science courses of discrete mathematics for computer science, programing concepts and methodologies (C++), programing concepts and methodology II, computer organization and assembly language programing, and other computer science courses as assigned. Desirable to have a secondary teaching assignment in Engineering or Mathematics. Other functions include teaching assigned courses in a variety of modes (face-to-face and on-line; day and evening hours) and teaching off-site at nearby facilities; developing and maintaining curriculum and a transfer degree program in Computer Science; cooperating with colleagues in regard to scheduling courses; participating in curriculum and program development and/or revision, program review; participating in the development of student learning outcomes for courses and programs and collecting data, assessing, and writing reports on student learning outcomes; communicating effectively and working cooperatively with students, staff, and campus and community organizations, including advising students, participating in student recruitment activities; participating in the accreditation process; evaluation of adjunct instructors; serving on department, college and district committees; and otherwise fulfilling all of the duties and responsibilities of instructional staff as required by Administrative Regulation 7122.

Minimum Qualifications:

Include an earned master's degree in computer science or computer engineering; OR bachelor's degree in either of the above and master's degree in mathematices, cybernetics, business administration, accounting or engineering; OR bachelor's degree in engineering and master's degree in cybernetics, engineering mathematics, or business administration; OR bachelor's degree in mathematics and master's degree in cybernetics, engineering mathematics, or business administration; OR bachelor's degree in any of the above and master's degree in information science, computer information systems, or information systems; OR a valid California Community College Credential; OR the equivalent education and/or experience (requires an equivalency); AND demonstrated sensitivity to and understanding of the diverse academic, socioeconomic, cultural, disability, gender identity, sexual orientation, and ethnic backgrounds of community college students.

Salary and Benefits:

Starting salary is $53,483 – $80,521 based on education and experience. A doctoral stipend of $2,001 is available.

To view the full job description, visit: **http://apptrkr.com/584480**

Equal Opportunity Employer

Professional Opportunities

program, collaborate with industry partners, and serve as an academic leader in this interdisciplinary area.

The Lerner College of Business and Economics serves approximately 2,900 undergraduate majors and over 850 graduate students. The College supports a full- and part-time on-campus MBA program, a full- and part-time on-campus MS in Accounting, and other MS programs. All degree programs are fully accredited by the AACSB. The College has state-of-the-art computing and teaching facilities.

The College of Engineering is home to six academic departments and three degree programs devoted to building a community of problem-solvers focused on challenges associated with sustainability, energy, health care, the environment, and national security. World-renowned initiatives led by college faculty include 14 college-based research centers and six university-based research centers, all of which provide a fertile training ground for future engineers. The Interdisciplinary Science and Engineering Laboratory (ISE Lab) brings 200,000 sq. ft. of new research and teaching space to our campus. Additionally, the University's planned Science and Technology Campus will expand university-based research and shared research undertaken with corporate partners.

Salary for the position will be competitive and commensurate with experience and qualifications. Those interested should apply online at http://apply. interfolio.com/28779 and upload a letter of application, resume, and names and contact information for three professional references. We will fully consider all applications received by April 1, 2015.

Information about the University of Delaware is available at: http://www.udel.edu.

Equal Employment Opportunity
The University of Delaware is an Equal Opportunity Employer which encourages applications from minority group members, women,

individuals with a disability and veterans. The University's Notice of Non-Discrimination can be found at http://www.udel.edu/ aboutus/legalnotices.html. Employment offers will be conditioned upon successful completion of a criminal background check. A conviction will not necessarily exclude you from employment.

University of Michigan
CSE Lecturer I

Responsibilities*
Teach introductory and advanced courses in Computer Science and Engineering including programming, data structures, databases, operating systems, networking, security and distributed systems. The instructor will be responsible for developing course materials, lecturing, holding office hours, preparing and grading exams, managing and grading class projects, managing assigned class staff.

Required Qualifications*
  · The instructor must have demonstrated knowledge of Computer Science
  · Master's degree in a related field
  · Strong oral presentation and communication skills

Selection criteria based on resume with supplemental materials, in-person interview and oral presentation to be given to CSE faculty.

Desired Qualifications*
PhD in related field, prior experience teaching a computer science class.

Additional Information
Department: Computer Science & Engineering
Hours: 32 (80%)
Appointment period: Sept-April (8 months)
Duration of appointment: Sept. 1, 2015 through April 30, 2016
Sept. 2, 2016 through April 30, 2017

Salary range: $56,000 to $72,000 FTE (100%), dependent upon experience and credentials.
# of Openings: 1-5 for the coming 2015-2016 academic year.

Union Affiliation
This position is covered under the collective bargaining agreement between the U-M and the Lecturers Employee Organization, AFL-CIO, which contains and settles all matters with respect to wages, benefits, hours and other terms and conditions of employment.

Application Deadline
Application deadline is March 31, 2015
Decisions will be made by June 30, 2015.
Final hiring approval is subject to UM higher administrative approval.
Applications are accepted through the University of Michigan's job posting site:
umjobs.org
Posting #: 107035
This is 1 of 5 openings posted.

U-M EEO/AA Statement
The University of Michigan is an equal opportun

University of Michigan
CSE Lecturer III

Teach introductory and advanced courses in Computer Science and Engineering including programming, data structures, databases, operating systems, networking, security and distributed systems. The instructor will be responsible for developing course materials, lecturing, holding office hours, preparing and grading exams, managing and grading class projects, managing assigned class staff.

Additional administrative duties, as needed, include; mentoring and advising students and student groups, participating on departmental, College and University committees in support of Computer Science & Engineering initiatives.

Professional Opportunities

Required Qualifications*
- PhD degree in Computer Science, Computer Engineering, or related discipline or equivalent years college teaching experience of computer science courses.
- Previous effective teaching experience as evidenced by evaluations.
- Demonstrated support of academic programs and student success.
- Strong oral presentation and communication skills.

Selection criteria based on resume with supplemental materials, in-person interview and oral presentation to be given to CSE faculty.

Desired Qualifications*
Ability to teach advanced level courses in computer science and engineering. EECS course descriptions can be found at: http://www.engin.umich.edu/college/academics/bulletin/courses/eecs

Additional Information
Department: Computer Science & Engineering
Hours: 40 (100%)
Appointment period: Sept-May (U-YR)

Duration of appointment: Sept. 1, 2015 through May 31, 2018
Salary range: $75,000 to $90,000, for the 9 months, dependent upon experience and credentials.
# of Openings: 1-5 for the coming 2015-2016 academic year.

Union Affiliation
This position is covered under the collective bargaining agreement between the U-M and the Lecturers Employee Organization, AFL-CIO, which contains and settles all matters with respect to wages, benefits, hours and other terms and conditions of employment.

Application Deadline
Application deadline is March 31, 2015. Decisions will be made by June 30, 2015. Final hiring approval is subject to higher UM administrative approval.
Applications are accepted through the University of Michigan's job posting site: umjobs.org
Posting #: 107041
This is 1 of 5 openings posted.

U-M EEO/AA Statement

The University of Michigan is an equal opportunity/affirmative action employer.

The University of Virginia
Systems and Information Engineering Postdoctoral Research Associate

The Barnes Research Group in the System and Information Engineering (SIE) Department at the University of Virginia seeks candidates for a three-year postdoctoral position in data science, human-centered computing, and mobile health with a focus on research and teaching. This position is under the direction of Laura Barnes, Ph.D. from the SIE Department and Bethany Teachman, Ph.D. from the Department of Psychology [Program for Anxiety, Cognition and Treatment (PACT) psychology lab]. The goal of this position is to catalyze data science efforts in the dynamic monitoring of health.

Application Instructions
For a complete job description and application information, please go to https://jobs.virginia.edu and search by Posting Number 0615728.

Cybersecurity Research Positions in Singapore

The University of Illinois **Advanced Digital Sciences Center (ADSC)** in Singapore is seeking full-time research staff (Research Scientist, Postdoctoral Researcher) for the following projects under its Cybersecurity program:

- A Cyber-Physical Approach to Securing Urban Transportation Systems (www.secuts.net)
- Power Plant Security by Advanced Sensing and Computing (www.illinois.adsc.com.sg/opening/popseco.htm)
- Securing Last-Mile Communication Systems for Smart Grid (www.illinois.adsc.com.sg/opening/sec-grid.htm)

Applicants should possess a PhD in computer engineering, computer science, electrical engineering, or a related field. We seek candidates with expertise in one or more of the following areas: (i) computer and network security, (ii) embedded systems, (iii) control theory and systems, (iv) wireless and mobile communications, (v) formal methods, (vi) signal processing and sensor networks. Multiple positions are available immediately and will remain open until filled. Interested candidates should submit their curriculum vitae, cover letter, and three references. Further information is available at **http://adsc.illinois.edu/opportunities/adsc-employment-opportunities**

About ADSC: Based in Singapore's science and engineering research complex in Fusionopolis, ADSC is led by outstanding faculty from the College of Engineering at the University of Illinois at Urbana-Champaign, with core funding provided by Singapore's Agency for Science, Technology and Research (A*STAR). More information is available at **http://adsc.illinois.edu/**

Engineer positions are also available for applicants with a Bachelor's or Master's degree

Professional Opportunities

Wesleyan University

Department of Mathematics and Computer Science

Postdoctoral fellow; visiting assistant professor

We invite applications for two positions that start in Fall 2015.

Please see our full description on **AcademicJobsOnline.org** at **http://academicjobsonline.org/ajo/jobs/5315** (postdoctoral position) and **http://academicjobsonline.org/ajo/jobs/5316** (visiting assistant professorship).

We will review applications until the positions are filled; to guarantee consideration, please submit an application by 27 Feb. 2015.

University of Washington Bothell
Division of Computing and Software Systems, School of STEM
Assistant, Associate, or Full Professor, Cybersecurity (AA10311)

The Computing and Software Systems (CSS) Division of the School of Science, Technology, Engineering and Mathematics (STEM) at the University of Washington Bothell (UWB) is seeking candidates for a tenured or tenure track faculty position (open rank) on a full-time, nine-month academic year basis effective Autumn 2015. The position requires teaching interest in the general area of cybersecurity with demonstrated research ability (at the tenured Associate or Full Professor level) or promise (at the Assistant Professor level) in a relevant subfield. Successful candidates are expected to develop externally sponsored research programs, supervise graduate students, and teach and provide academic advising to students at all levels. In particular, successful candidates at the Associate or Full Professor level are expected to provide cybersecurity curriculum leadership within the institution and engage with security professionals in industry and government.

CSS is among the largest and fastest growing computer science departments in the Pacific Northwest. We currently offer or collaborate in the offering of six degrees — a Bachelor of Science in Computer Engineering (joint with the Engineering and Mathematics Division), a Bachelor of Science in Computer Science and Software Engineering, a Bachelor of Arts in Applied Computing, a Bachelor of Arts in Interactive Media Design, a Master of Science in Computer Science and Software Engineering, and a Master of Science in Cyber Security Engineering — and a graduate certificate in Software Design and Development. All of our curricula are broadly-based in computer science and software engineering.

The 16 full-time CSS faculty members are excellent interdisciplinary teachers and scholars. CSS faculty are actively conducting research in Computational Biology, Computer Graphics, Computer Science Education, Computer Vision, Cybersecurity, Digital Humanities, Embedded Systems, Human-Computer Interaction, Mobile Computing, Multimedia Database Systems, Parallel and Distributed Computing, Scientific Computing, Social Computing, Software Engineering, and Wireless Networks. All University faculty are expected to engage in teaching, research, and service.

Required qualifications for the position include:
- an earned doctorate in computer science or another relevant technical field,
- for appointment at the Assistant Professor level, a body of teaching and scholarship, or demonstrated promise for future work, that warrants UWB appointment at that rank,
- for appointment at the Associate Professor level, superior teaching and research ability and a relevant body of scholarship that warrants UWB appointment at that rank,
- for appointment at the Professor level, a significant record of publications, research funding, and academic leadership that warrants UWB appointment at that rank,
- commitment to excellence in undergraduate and graduate education, and
- commitment to working with and enhancing learning for diverse student and community populations.

How to apply: Only complete applications will be considered. Please submit a single electronic file to CSS-search@uwb.edu with the subject line "**AA10311 Cybersecurity CEd**" The file should contain the following: (1) a cover letter, (2) a curriculum vitae, (3) a list of a minimum of three professional references including contact information, (4) a research plan, (5) a statement of teaching philosophy, and (6) evidence of teaching effectiveness. Review of applications will begin on April 1, 2015; the position will remain open until filled.

For additional information, please see our website at http://www.uwb.edu/CSS/.
The University of Washington is an affirmative action and equal opportunity employer. All qualified applicants will receive consideration for employment without regard to, among other things, race, religion, color, national origin, sex, age, status as protected veterans, or status as qualified individuals with disabilities. The University of Washington Bothell is dedicated to the goal of building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities, individuals with disabilities and other eligible veterans. We are particularly interested in faculty who contribute to diversifying the undergraduate and graduate curricula.

If you have a question about the details of this search/position please contact the hiring unit directly. For questions regarding potential disability accommodations, please contact Annie Brelsford at abrelsford@uwb.edu. Thank you for your interest in this position at the University of Washington.