Computing Research News

COMPUTING RESEARCH ASSOCIATION, CELEBRATING 40 YEARS OF SERVICE TO THE COMPUTING RESEARCH COMMUNITY

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Announcements

Ideas Lab Fostering Transformative Approaches to Teaching and Learning: Data-Intensive Research to Improve Teaching and Learning

NSF has announced a new funding opportunity to explore using large data sets to improve STEM teaching and learning environments (RFP 13-565) that will be of interest to many CRN readers.

But this new activity includes a radically different funding mechanism — participation in an Ideas Lab workshop which is designed to foster novel, transformative, multidisciplinary approaches (and proposals). Participants in the Ideas Lab workshop will build interdisciplinary teams solely eligible to submit proposals for a majority of program funds.

The Ideas Lab workshop will be held October 7-11, 2013. Applications for the workshop are due August 19, 2013. Workshop participants will develop multidisciplinary collaborative proposals through a real-time and iterative review process, and be eligible to submit full proposals.

The goal of the Ideas Lab is to foster novel, transformative, multidisciplinary approaches that address the use of large data sets to create actionable knowledge for improving STEM teaching and learning environments (formal and informal) in the medium term, and to revolutionize learning in the longer term.

CRA will be organizing the Ideas Lab.

For more information visit: http://www.nsf.gov/pubs/2013/nsf13565/nsf13565.htm

Tisdale Fellows Lunch

On July 18, CRA hosted a luncheon for the 2013 Eben Tisdale Public Policy Fellows. The Fellowship has two components: a full-time 8 week public policy internship with a high-tech company, firm or trade association, and weekly issues seminar lunches hosted by Tisdale sponsors. CRA has the pleasure of hosting Fellow Andrei Santalo.

Left to Right: Joe Tasker, Isaac Lara, Andrei Santalo, Alison Goodrum, Bobby Jenkins, Scott Garfing. Not pictured: William Ryan, Zoe Stanley-Lockman

Note to Department Chairs:

Taulbee Survey 2012-13 Coming Soon!

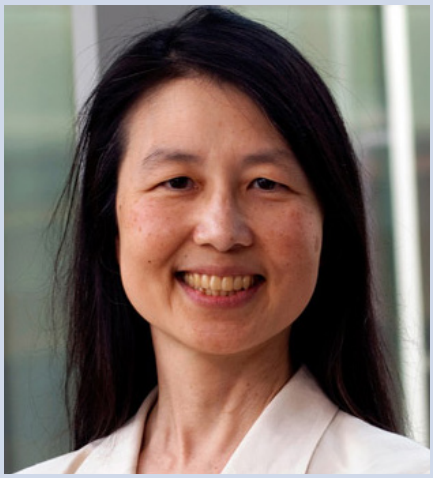
If you have a new chair, please advise membership [at] cra.org to ensure the survey is properly addressed.

Honors

Congratulations to Peter Lee, former CRA Board Chair, on his new position at Microsoft Research. Lee is now Corporate Vice President and head of Microsoft Research USA. Lee is also a former chair of the Government Affairs Committee, a past member of the CCC Council, and the PI of the first CIFellows program.

To thank him for his service as Board Chair, Lee received a Washington Capitals jersey from CRA. Lee is also a Pittsburgh Penguins fan.

CRA also congratulates Jeanette Wing, former CRA Board Member, on her new position as Vice President, Head of Microsoft Research International. Wing received the CRA Distinguished Service Award in 2011.



Jeanette Wing, Microsoft Research

The Computing Community Consortium (CCC) recognized Ed Lazowska and Lance Fortnow for their service to the CCC at its Council meeting in July.

Founding Chair of the Computing Community Consortium (2007-13), Ed Lazowska received a model steamroller in recognition for his service.

"If you're not part of the steamroller, you're part of the road" — Ed Lazowska

Lance Fortnow received a plaque for his contributions as a member on the CCC Council (2010-2013), where he led the CCC Visioning subcommittee.

Lance Fortnow, Georgia Institute of Technology with Susan Graham, Chair of the Computing Community Consortium.

Computing Researchers Get 'Schooled' on Science Policy at LiSPI 2013

By Peter Harsha, CRA Director of Government Affairs, and Fred Schneider, Cornell University

As part of its mission to develop a next generation of leaders in the computing research community, the Computing Research Association's Computing Community Consortium recently held its second Leadership in Science Policy Institute (LiSPI). This one and a half-day workshop was intended to educate a cadre of computing researchers on how science policy in the U.S. is formulated and how our government works. Participants heard candid and "off the record" views from people who do it or have done it. Fifty-three computer scientists and engineers from forty-eight different universities and research organizations attended the April 11-12th workshop.

The workshop built on the success of CRA's first CCC LiSPI in November 2011, and in response to the very positive feedback from LiSPI 2011 participants, added a half-day to the workshop to allow more time for discussions and the addition of two new panels, as well as increased the number of participants (up from 34 in 2011).

The workshop offered sessions on: interacting with Federal science agencies, how new initiatives are created within agencies, the role of Federal advisory committees, the Federal budget process, embedding scientists in non-science agencies, the arguments for supporting research in computing, how to talk to policymakers, and a rather candid discussion from two staffers on the House Science, Space and Technology committee. LiSPI participants were required to complete both pre- and post-workshop homework assignments.

LiSPI co-organizer Fred Schneider started the day by laying out goals of the workshop and workshop co-organizer Peter Harsha followed by laying out the "case" for computing research investments in Washington. Participants then

heard from representatives of three key science agencies: Jeannette Wing, former Assistant Director for Computer and Information Science and Engineering at the National Science Foundation, Milton Corn, from the National Institutes of Health; and Howard Shrobe, from the Defense Advanced Research Projects Agency. This panel explained that influencing policy decisions at a Federal agency involves a somewhat different skill set and somewhat different approach than influencing faculty peers, the Congress, or the White House. The panelists also discussed how agencies provide opportunities for researchers to shape federal policy in their fields — by serving on advisory committees and by taking rotations as program managers, division directors or office directors. The three panelists also discussed how new agency initiatives get started, focusing on the culture and traditions that create the lens through which agencies view themselves and are viewed by others.

In the next session, Edward Lazowksa, Chair of CCC, Annie Antón, from Georgia Tech, and Kevin Fu, from the University of Michigan, described the role and dynamics of advisory committees that are found at nearly every level of the Federal government. The speakers discussed how those committees work (in theory and practice), why they sometimes do not work, how members are chosen, and who they are intended to influence (as well as who they actually influence). All three panelists have served on a variety of Federal advisory committees, so these speakers were particularly well qualified to discuss how issues get raised and vetted, how outcomes get finalized and disseminated, how committees do their jobs, and how members of the community can be effective when serving on these committees.

LiSPI participants then heard a primer on the Federal budget process by R&D budget "guru" (and Assistant Director for Federal Research and Development for the White House's Office of Science and Technology Policy) Kei Koizumi.

Koizumi walked the audience through the mechanics of the Federal budget process, including key milestones and inflection points in the process. He also explained impacts of the budget sequestration and the new budget environment on Federal science budgets in the future.

Practical advice on "Having the Conversation" with policymakers was offered by a former congressional staffer and current member of the Microsoft Technology Policy Group, Elizabeth Grossman. Grossman described how policymakers approach meetings with researchers and how researchers might be best prepared to provide useful input. Grossman also charged the attendees with coming up with a pitch — a 3-5 minute introduction to a hypothetical policymaker or answering a tough question a policymaker might pose — honing it as "homework" during the first night of the workshop and then presenting it to a "murder board" of public policy professionals (Grossman, Cameron Wilson of ACM, and Harsha of CRA — all former congressional committee professional staff) for constructive advice on the second day of the workshop. This practicum session was perhaps the best liked of the workshop, as participants got a good sense of how a conversation might go, and how it could be most productive.

Ending the first day's sessions, current congressional staff members Julia Warner, from the House Science, Space and Technology committee majority, and Dahlia Sokolov, from the committee's minority staff, took to the podium to describe the unique difficulties of communicating the value of research to our elected officials and the difficulties of prioritizing science investments in the current political and fiscal climate. Both Warner and Sokolov spoke candidly about challenges they face in an increasingly polarized Congress, noting that the Science committee is not immune from the increasing partisanship.

In addition to the practicum session, day two of the workshop featured a panel of current and former chief technology officers at the Federal Communications Commission and Federal Trade Commission, as well a current White House Office of Science and Technology Policy detailee talking about the importance of finding scientists from the computing research community to serve Federal non-science agencies. Steve Bellovin, current CTO at FTC, Henning Schulzrinne, current CTO at FCC, Ed Felten, former CTO at FTC, and Vijay Kumar, currently at OSTP, all spoke about their experiences incorporating technical expertise in regulatory agencies and the White House, and how important it is that these non-science mission-orientated agencies establish a good connection to the research community.

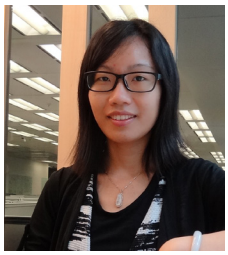
Schneider wrapped-up the workshop with a session about serving as a witness at a congressional hearing. He played video-taped highlights from a recent hearing on the Federal Networking and Information Technology R&D (NITRD) program. To start, participants viewed the opening five-minute statements from CCC's Lazowska and Bob Sproull (formerly director of research at of Oracle Labs) — each presenting a "case for funding computing research." Schneider then played two questions put to the hearing witnesses by Members of Congress during the hearing. Chairman Mo Brooks (R-AL) asked how to justify increased NITRD funding given today's budget climate, and Rep. Roscoe Bartlett (R-MD) asked how to justify increased IT investment given its small effect on balance of trade. Participants were asked to craft 30 second answers to both questions as their "final exam" for the day.

The feedback from all of the participants was quite positive. Slides from the speakers are posted on the web (http://www.cra.org/ccc/leadership/leadership-in-science-policy-institute) for CRN readers thirsting for details about what was presented. Moreover, chances are quite good that CRA will seek to put on similar programs in the future, since there in acute need to develop a community of computer scientists who can participate in science policy, If you would like to be considered for participation in those programs, keep an eye on the Computing Research Policy Blog (http://cra.org/blog) and the CCC Blog (http://cccblog.org) for the next announcement.

Reflections from a CIFellows Alumna

By Xiaojuan Ma, Noah's Ark Lab — Hong Kong

During the economic downturn in 2009, Xiaojuan Ma was one of the many new PhDs in computing who considered delaying or abandoning a research career because of insufficient funding. From 2009-12, the Computing Community Consortium (CCC) developed and administered the Computing Innovation Fellows (CIFellows) project, a short-term initiative that addressed this problem by providing funding for 127 postdoctoral positions throughout academia and industry.

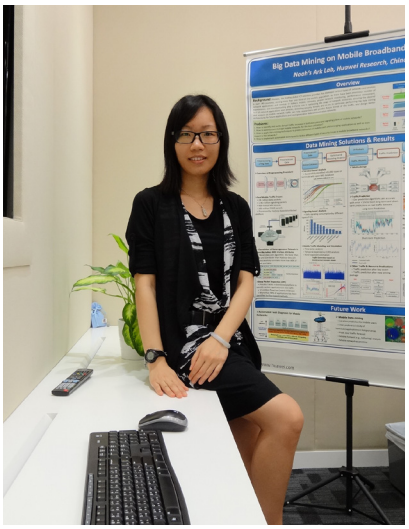


I still remember the great joy and excitement that the acceptance letter from the CIFellows Project brought me in the summer of 2010. Surrounded by bad news about an economic downturn and hiring freeze in both academia and industrial research, I was a fresh doctoral graduate at the time and not sure if I was ready for the highly competitive job market. Because my Ph.D. thesis was not on a mainstream research topic in Human-Computer Interaction (HCI), I was concerned that I would have to compromise my research interests for job openings. Receiving the CIFellows award was an honor, but more importantly, an opportunity for me to shape, sharpen and better package my research expertise. My two-year experiences as a post-doc in the Human-Computer Interaction Institute (HCII) at Carnegie Mellon University enhanced my credentials as a researcher, preparing me for the challenges of the real world.

"I was concerned that I would have to compromise my research interests for job openings. Receiving the CIFellows award was an honor, but more importantly, an opportunity for me to shape, sharpen and better package my research expertise."

I really appreciated the flexible and supportive research environment that the CIFellows Project secured in such a difficult economy. The project provided sufficient funds for research-related activities, so I was able to conduct independent post-doctoral research on problems that actually interested me. In addition, the project connected me to HCII, a strong HCI program with a different culture and setting from my graduate institution, something I might not have had access to otherwise. At the Institute, I was exposed to diverse areas in HCI and worked with talented faculties, researchers, and students with diverse backgrounds.

With the guidance and help from my CIFellows mentor Professor Jodi Forlizzi, I extended my Ph.D. research in both breadth and depth, and explored new directions. My dissertation was on developing visual and auditory communication support for people with language disabilities. Professor Forlizzi, who is an expert on interaction and service design, introduced me to new communities that may benefit from our work on visual communication systems. For example, I worked with the Patient and Family Centered Care (PFCC) group at the Magee Women's Hospital of University of Pittsburgh Medical Center (UPMC) to design better discharge instructions for patients with low health literacy. It was exciting to learn that my research could have a broader impact in the community. Not only was my research output employed to convey different types of information



"With the guidance and help from my CIFellows mentor Prof. Jodi Forlizzi, I extended my Ph.D. research in both breadth and depth, and explored new directions."

— from everyday concepts, to domain-specific expressions, to complex scenarios, but also the methods I developed can be easily adapted and applied to the design process in other domains.

Coming from a computer science background, I used to work mainly on the system perspective of creating an effective visual and auditory communication support. Professor Forlizzi taught me how to address the problem from a designer's point of view. I received training and great practice in producing and evaluating design alternatives, such as using grounded theory to discover valuable information from interviews with artists and expert designers, coding features in design examples to identify conventions and overlooked issues, as well as using eye tracking technologies to analyze people's attention and reaction to a given design. Furthermore, I have been experimenting with ways to combine traditional design methods with new approaches, including building

computational models to measure the utility of a visual design, and crowd computing, i.e. harnessing crowds out in the web to generate ideas and feedback on designs.

During my time as a CIFellow, I identified my main research interest in leveraging online crowds to design multimedia-mediated communication support, and actively expanded my knowledge and strengthened my skills around this topic. I have also received great help from my mentor and collaborators to improve my marketability, e.g. how to advise students, write papers and grants, and promote my research in and outside of the HCI community.

The CIFellows Project also provided me with great opportunities for networking. Through the project, I met Cindy L. Bethel, a 2009 CIFellow and now an assistant professor at Mississippi State University, and got introduced to the Human-Robot Interaction community. I have been involved in the program community of the International Conference on Collaboration Technologies and Systems Workshop on Collaborative Robots and Human Robot Interaction ever since. In May 2012, I attended the ACM SIGCHI Conference on Human Factors in Computing Systems with travel support from the project, where I learned about the newly founded Noah's Ark Lab in Hong Kong.

"It has been rewarding see how my experience gained as a CIFellow is now making a difference in computing research."

One of the visions of the Noah's Ark Lab is to develop innovations that will facilitate the next generation of human-computer interaction which should be natural, accessible, adaptive / adaptable, context-sensitive, mobile, and usable. The key approach - lifelong user modeling based on crowd data - aligns well with my research direction. Although I had few experiences with industrial research, the professional skills I have gained over my Ph.D. and post-doctoral studies built my confidence. I have been working in the Noah's Ark Lab for half a year, and I view it as an opportunity to establish HCI research in Hong Kong and make further impact on the community in both China and Asia.

The great efforts made by the CIFellows Project allowed me to continue to grow to my full potential when the funding situation was difficult, and to pursue a career in research in a tough job market. I really appreciated my time as a CIFellow, when I led research projects, supervised interns, and reached out for collaborations. It has been rewarding to see how my experience gained as a CIFellow is now making a difference in computing research.

Expanding the Pipeline
Center for Evaluating the Research Pipeline (CERP):

Providing a New Way to Evaluate Diversity Initiatives in Computing Research

Jane Stout, Ph.D., Director of CERP

It is now well established that the field of computing research is lacking in demographic diversity, both in the academy and in industry. To address this issue, many computing-related mentorship and training programs with diversity goals have been established. But do they really work? And how, exactly, do we determine whether they do? In this article, I discuss the lack of diversity that exists in computing, examples of programs that have been developed to address the lack of diversity, and a new evaluation center at the CRA headquarters that offers rigorous, comparative evaluation of how participants in a given program fare in their computing career progression relative to non-participants. We invite all computing community members to get involved with CERP by (a) providing data to enable us to do comparative evaluation, (b) employing our infrastructure for program evaluation, and/or (c) by being an active audience as we learn about ways to increase diversity in computing.

Recent data from NSF, Taulbee, and CRA's Center for Evaluating the Research Pipeline (CERP) clearly portray this lack of diversity. For example, whereas the gender distribution of the U.S. population indicates that women and men make up roughly equal proportions of the population, a sample of undergraduate students majoring in computing during 2011 and 2012 indicates that women are grossly underrepresented relative to men (23% vs. 77%, respectively; see Figure 1).

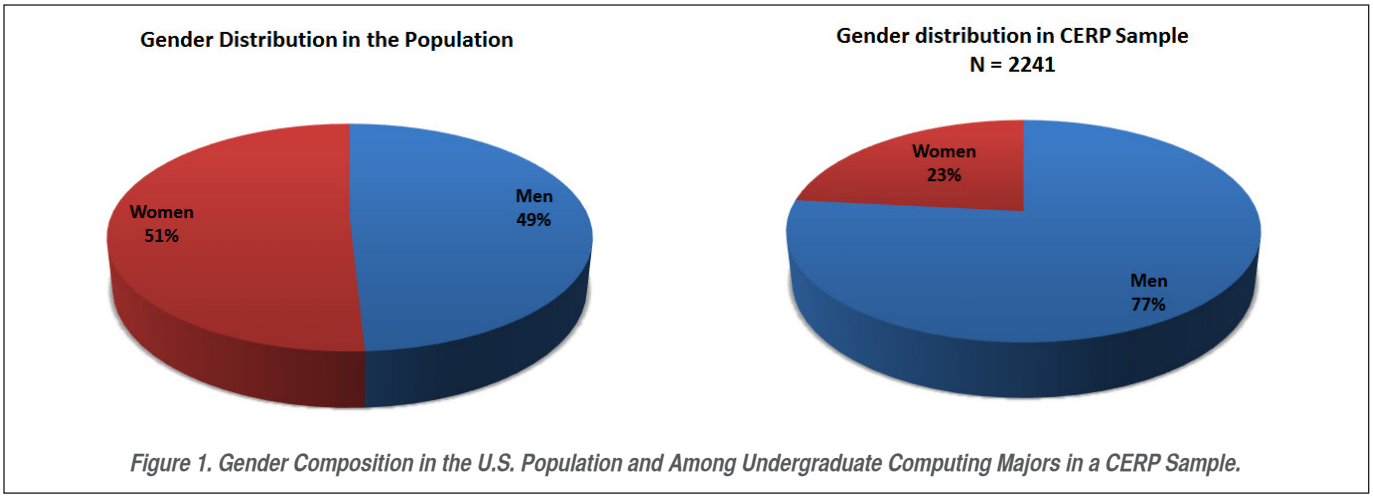


Figure 1. Gender Composition in the U.S. Population and Among Undergraduate Computing Majors in a CERP Sample.

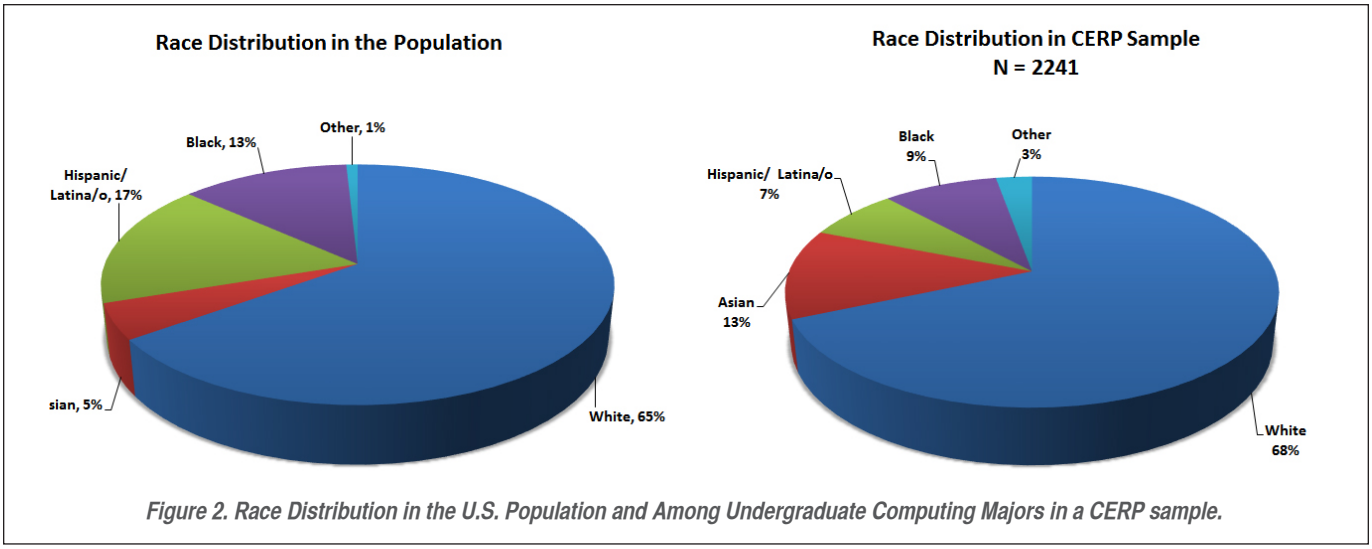


Figure 2. Race Distribution in the U.S. Population and Among Undergraduate Computing Majors in a CERP sample.

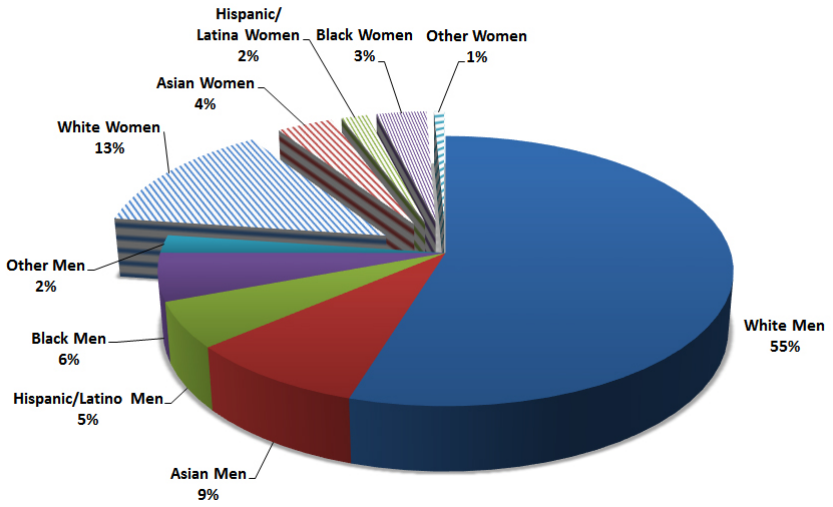


Figure 3. Gender x Race Make-up of Undergraduate Computing Majors in the CERP Sample.

The racial composition of undergraduate computing students differs from that of the general population as well (see Figure 2). Compared to a 2010 estimate of the U.S. population, Black and Hispanic/ Latina/o students are underrepresented but Asian and White students are overrepresented in computing majors.

The imbalance of representation is particularly striking when one considers both gender and racial composition of computing simultaneously. CERP's sample of undergraduate computing majors in Figure 3 shows that women are underrepresented across racial groups, men compose 77% of the sample, and white men alone make up greater than 50% of the sample.

Why should we care about this lack of diversity in the computing research world? When one demographic group dominates the field, computing lacks a diversity of perspectives and experiences, both of which promote innovation and creativity that are essential to problem solving. For example, NCWIT has found patents with mixed-gender teams are more highly cited in subsequent patents compared to patents authored by one gender. The issue of low diversity in computing becomes cyclical when underrepresented individuals feel like outsiders due to the low presence of other people who are "like them." Social science research indicates that this sense of alienation can lead individuals to avoid or drop out of computing, thus perpetuating underrepresented individuals' low participation in computing.

It goes without saying that all people, regardless of their gender, race, ethnicity, income level or disability status, should have the opportunity to pursue a computing career, and feel welcomed and efficacious while doing so. A number of faculty members, members of industry, government and policy affiliates, and non-profit professionals are working to create greater diversity in computing by developing mentorship, training, and professional networking programs for underrepresented individuals. For example, CRA-W has developed and runs mentorship programs for women at all stages of their career that aim to enhance the skills, confidence and intrinsic interest needed for those women to advance professionally in computing. There are numerous other programs in place to enhance diversity in computing such as AccessComputing, which focuses on increasing access to computing careers for people with disabilities; iAAMCS, a brand-new mentoring program for enhancing African American individuals' participation in computer science; MentorNet, which pairs successful professionals and computing students with an eye towards offering mentorship to women and other underrepresented individuals in engineering and related sciences; and CAHSI, an alliance of universities that work to boost the number of Hispanic individuals who pursue computing degrees. These are but a few of the many existing computing-related mentorship and training programs with diversity goals.

With a continuing growth in interventions aimed at increasing diversity in computing comes a need for rigorous, comparative evaluation of how program participants fare relative to non-participants. In 2010, the CRA-W/CDC Alliance was awarded a Broadening Participation in Computing (BPC) grant from the NSF to pilot the "Data Buddies Project" — an initiative that sought to collect data from a sample of students enrolled in computing programs nationwide with the generous assistance of department chairs and staff. These would serve as comparative data against which one could compare outcomes of intervention participants to outcomes of the "average student". Data collection was a success. With the Data Buddies framework established, in May of 2012, the CRA-W/CDC applied for an NSF BPC grant that would fund a research center called CRA's Center for Evaluating the Research Pipeline (CERP) using the Data Buddies model.

In September of 2012, the grant was awarded and CERP is now housed at the CRA office in Washington D.C. As of March 1, 2013, Dr. Jane Stout directs CERP, and is joined by Dr. Jessica Cundiff, who is CERP's Research Analyst. Both Drs. Stout and Cundiff are social psychologists that study women and underrepresented minority groups' involvement in STEM fields. Dr. Betsy Bizot, who is CRA's Director of Evaluation, also collaborates on CERP projects. All members of the CERP team have expertise in program evaluation and quantitative methods. The number of CERP staff continues

to grow; we are currently seeking a qualified research assistant who will help perform the rapidly increasing number of administrative tasks necessary for CERP to thrive.

The ultimate goal of CERP is to use its unique Data Buddies infrastructure to facilitate the computing community's efforts to thicken and build diversity in the research pipeline. One way CERP will do this is through its continued relationship with a national sample of academic computing departments (i.e., our "Buddies"). In this relationship, departments encourage students and faculty to complete Data Buddies surveys. In return, CERP provides each department with an individualized report on how their own students and faculty are progressing in the research pipeline compared to the national sample. To date, many departments have found these reports to be useful for internal evaluation purposes. A second way CERP helps broaden the research pipeline is by using the collected Data Buddies data for comparative evaluation of interventions with diversity initiatives. Specifically, CERP works with "clients" who have interventions in place (e.g., CRA-W/CDC DREU participants), by comparing outcomes of the "average student" with outcomes of students who participated in a client's program(s). Because CERP staff has extensive behavioral science and quantitative expertise, CERP is well situated to collect *and analyze* comparative data for our clients. For example, using Data Buddies data, CERP has found that undergraduate students who have participated in CRA-W/CDC REU programs are more likely than students who had no REU experience or other REU experiences to be enrolled in a graduate program in computing the fall after graduation; that graduate program is also more likely to be a PhD degree program for CRA-W/CDC REU participants than all other students (see Figure 4).

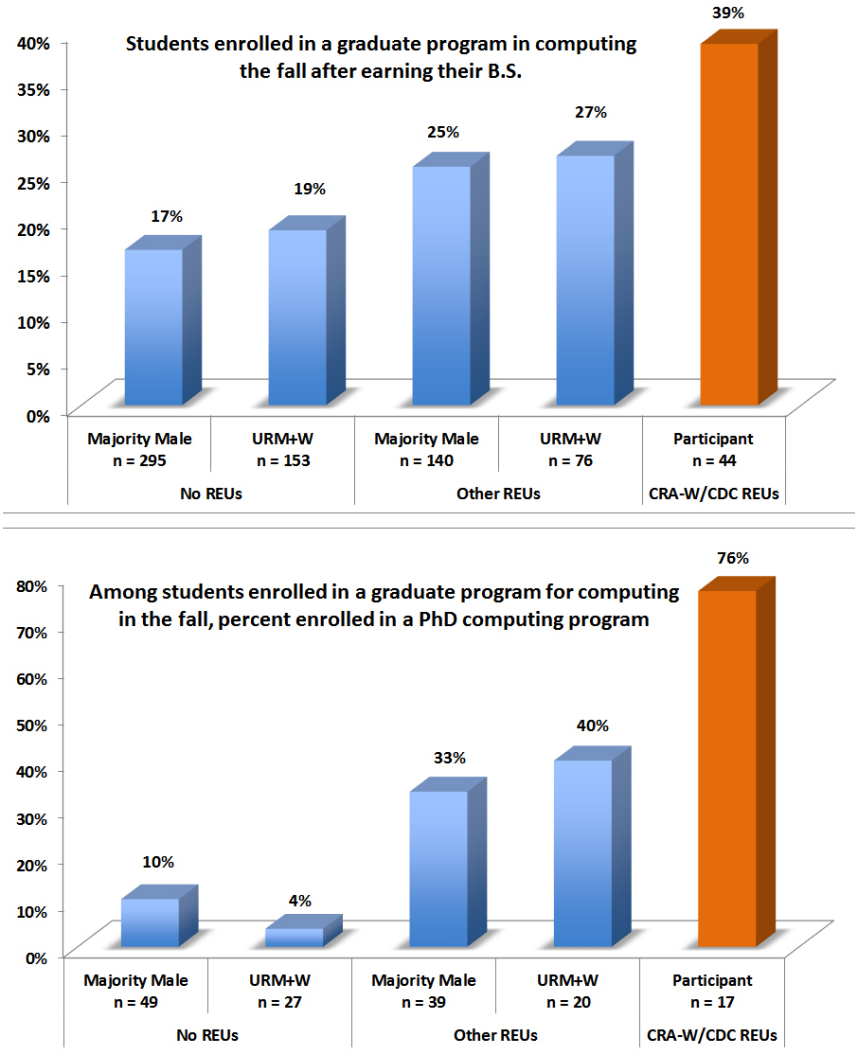


Figure 4. CRA-W/CDC REU Students and all Other Students' Enrollment in Computing Graduate Programs After College. Note: Majority male students include Asian and White men. Underrepresented minorities and women (URM + W) include American Indian, Black, Hawaiian or Hispanic men and women of all ethnic backgrounds. Other research experiences include research projects at one's home institution during the school year as well as summer research projects at another university. CRA-W/CDC REU programs included Collaborative Research Experience for Undergraduates (CREU), Distributed Research Experience for Undergraduates (DREU) and Multidisciplinary Research Opportunities for Women (MRO-W).

CERP has a number of ambitious goals for the coming years. This summer, CERP will build its network of Data Buddies by recruiting more participating departments to complete the Data Buddies surveys. Increasing participation will help ensure that CERP consistently obtains large and demographically diverse samples of students and faculty members in our comparative datasets. Ultimately, we also aim to display our comparative data using an interactive web interface. For example, viewers could use such an interface to observe patterns of persistence in computing among demographic groups of interest. Most immediately, we are seeking a stable constituency of CERP clients who need CERP's comparative evaluation structure and analytic rigor. Through all of these initiatives, it is our goal to become a sustainable, national resource for the computing research community. Join us in diversifying computing.

Become a Data Buddy!

Center for Evaluating the Research Pipeline

Participation is FREE and EASY!

CRA's Center for Evaluating the Research Pipeline (CERP) is currently recruiting computing departments to participate in the Data Buddies Project.

The Data Buddies Project collects and reports institutional survey data from computer science and computer engineering departments to **examine patterns of entry, experience, and progress among students and faculty.**

As a Data Buddy, your department will help us distribute two online surveys per year to your undergraduate and/or graduate students. Participation is easy and takes very little of department staff time. Over 40 institutions are already enrolled — you should too!

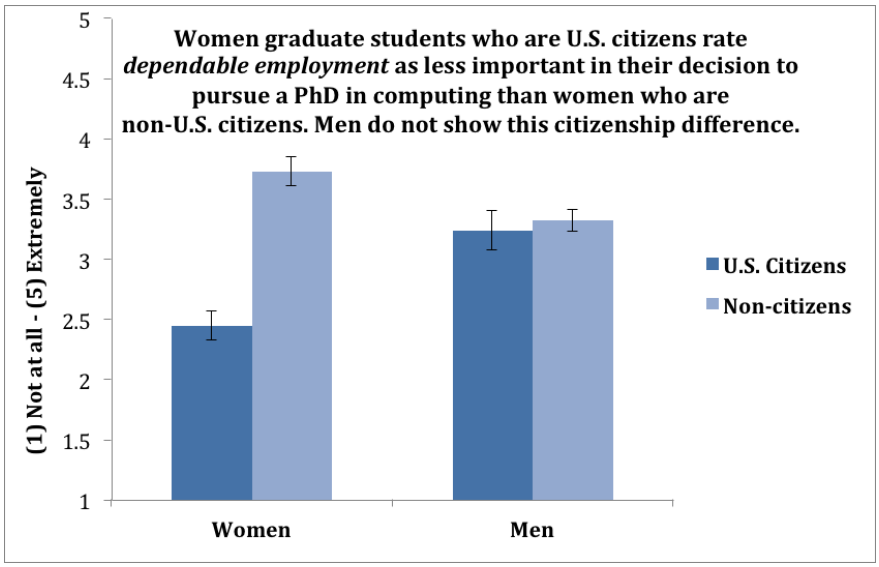
Benefits of becoming a Data Buddy:

- Receive a **free customized summary report** of student and faculty responses in your department compared to other departments' responses. Existing Data Buddies find these reports extremely helpful for internal evaluation purposes.
- The **computing community** will benefit from **increased understanding of enrollment and persistence** in computing career tracks, particularly among students from underrepresented groups.

Department participation is critical to our evaluation of the computing research pipeline. Visit the CERP website at http://cra.org/cerp/our-buddies to enroll your department now! Participation is free and easy.

Center for Evaluating the Research Pipeline

First year graduate students enrolled in a PhD program in computing (N = 129) were asked *How important was each of the following factors in your decision to pursue your current graduate degree in computing? Salary potential; Dependable employment; Career opportunities/advancement outside of academia.* Responses ranged from (1) *Not at all* to (5) *Extremely.* These three items were aggregated to make a *dependable employment* index (Cronbach's alpha = .81). Among women, U.S. citizens indicated that *dependable employment* was less important in their decision to pursue a PhD in computing than non-citizens, $p \leq .05$; men showed no such difference. This finding highlights the importance of taking cultural beliefs and ideals into consideration when exploring reasons for gender disparities in computing fields.



Note: U.S. citizens = Native born + Naturalized + Permanent resident. Non-citizens = non-U.S. citizen with a temporary visa. Women U.S. citizens, $n = 31$. Men U.S. citizens, $n = 31$. Women non-citizens, $n = 15$. Men non-citizens, $n = 52$.

Center for Evaluating the Research Pipeline

This analysis brought to you by the CRA's Center for Evaluating the Research Pipeline (CERP). Want CERP to do comparative evaluation for your program or intervention? Contact cerp@cra.org to learn more. Be sure to also visit our website at http://cra.org/cerp/.

2013 Microsoft Research Faculty Summit — OFF THE CHARTS

By Ed Lazowska, Past-Chair, Computing Community Consortium, University of Washington

From the CCC Blog post on July 16:

It's impossible to convey how great this year's Microsoft Research Faculty Summit has been: a "who's who" of attendees from academia; heavy participation by top people from Microsoft Research; superb presentations on a range of research topics; and a total absence of marketing.

I'm currently sitting in the final breakout session of the second day: on quantum computing, with extraordinary talks by Scott Aaronson (MIT), Charlie Marcus (Niels Bohr Institute), and Matthias Troyer ETH Zürich). But I'm missing concurrent sessions on machine learning (with Andrew Ng (Stanford and Coursera) and 3 others), beating spam (with Stefan Savage (UCSD) and two others), and visual motion (with Noah Snavely (Cornell) and two others).

The good news for me and for you: videos and slides of almost all of it are on the web. Kudos to Microsoft Research for a truly worthwhile event!

Stay up to date with the CCC Blog by visiting: www.cccblog.org

Taulbee in Depth: Department Space Per Faculty Member

By Betsy Bizot, Director of Statistics, CRA

Every three years, the CRA Taulbee Survey asks a set of Department Profiles questions including questions about department space. In the full Taulbee report published in CRN in May 2013, we reported on the space data collected in fall 2012. Tables in that report provided percentiles for department space in the categories of total space, offices, conference and seminar rooms, research labs, and instructional labs. The percentiles were across all departments of a given type (US CS Public, US CS Private, US CE, US Information, and Canadian) without regard for the size of the department. However, department size is clearly a major determiner of space.

To allow departments to better compare their own space allocations to the overall Taulbee numbers, this analysis reports on space per faculty member in two ways: by number of tenured and tenure-track faculty, and by number of tenured and tenure-track faculty plus number of research faculty and postdocs. Those values were computed for each department; percentiles of the normalized space for all US departments and for each type of department are given in tables Space1 through Space6.

The total space per tenured or tenure-track faculty member varies little across the US department types; the median value ranges from 1,141 (US CS private) to 1,297 square feet (US Information) .

Space allocation, however, varies. Not surprisingly, Computer Engineering departments have the highest median per capita research lab space at 442 square feet, while Information has the lowest at 62. Computer Engineering likewise has a higher median per capital square footage for instructional lab space at 242, while the US CS and Information programs range from 128 to 185. (The Computer Engineering numbers, however, should be treated with caution as they are from a small number of departments.)

There is substantially more variation in per capita total space across departments and across department types at the 90th percentile. There's no

Table Space 1. Department Space, net square feet per faculty member (tenured and tenure-track, or tenured and tenure-t rack plus research faculty and postdocs), 135 US institutions

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10	758	579	252	202	20	16	33	29	0	0
25	892	790	350	298	39	31	130	100	78	55
50	1,214	1,029	489	430	77	66	248	225	156	134
75	1,647	1,378	772	612	123	97	455	393	315	281
90	2,514	1,926	1,055	846	217	163	652	578	449	415

Table Space 2. Department Space, net square feet per faculty member (tenured and tenure-track, or tenured and tenure-track plus research faculty and postdocs), 86 US Public CS programs

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10	717	625	247	205	23	22	76	57	16	9
25	892	804	335	302	36	31	145	129	94	86
50	1,207	1,050	456	433	72	65	262	239	168	148
75	1,639	1,429	729	603	105	91	442	405	311	283
90	2,068	1,894	1,001	816	164	150	599	513	449	415

clear pattern for these departments; some are small and some large, and some are colleges of computing or information rather than individual departments, but some are not. Probably the variation represents some type of "other" space.

Table Space7 offers a different way of looking at space allocation. For each department, the percent of total space represented by offices, conference and seminar rooms, research labs, and instructional labs was computed. The table shows percentiles of these percents; for example, the median of space allocated to offices is 41%, and the median of space allocated to research labs is 23%.

Table Space 3. Department Space, net square feet per faculty member (tenured and tenure-track, or tenured and tenure-track plus research faculty and postdocs), 31 US Private CS programs

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10	767	509	271	204	0	0	4	3	0	0
25	855	675	370	292	39	29	131	71	33	27
50	1,141	852	501	379	77	55	219	170	128	80
75	1,672	1,337	813	610	163	116	560	393	251	204
90	3,173	2,980	1,440	877	326	227	917	792	499	440

Table Space 4. Department Space, net square feet per faculty member (tenured and tenure-track, or tenured and tenure-track plus research faculty and postdocs), 6 US CE programs

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10										
25	702	552	145	127	13	8	100	100	87	76
50	1,181	872	318	260	60	50	442	370	242	162
75	2,821	2,566	1,411	1,088	159	141	1,219	1,107	427	386
90										

Table Space 5. Department Space, net square feet per faculty member (tenured and tenure-track, or tenured and tenure-track plus research), 12 US Information programs

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10	901	612	375	196	39	36	0	0	0	0
25	1,079	860	460	321	74	68	14	13	41	24
50	1,297	1,053	599	513	88	77	62	54	185	167
75	2,813	1,688	790	690	227	133	299	263	361	321
90	4,009	3,560	1,667	1,259	378	299	1,651	495	553	413

Table Space 6. Department Space, net square meters per faculty member (tenured and tenure-track, or tenured and tenure-track plus research), 13 Canadian programs

Percentiles	Total Space		Faculty, Staff, and Student Offices		Conference and Seminar Rooms		Research Labs		Instructional Labs	
	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch	Ten-Track	TT+Rsrch
10	68	68	6	6	0	0	3	3	0	0
25	90	77	31	25	4	3	28	28	5	4
50	131	116	34	33	8	7	49	39	18	15
75	176	172	48	43	12	10	58	53	28	27
90	241	210	87	87	25	24	78	75	35	35

Table Space 7. Department Space, 135 US institutions

	Percent of Total Space Allocated To			
Percentiles	Faculty, Staff, and Student Offices	Conference and Seminar Rooms	Research Labs	Instructional Labs
10	20	2	2	0
25	31	3	11	6
50	41	6	23	15
75	53	9	37	22
90	66	14	48	31

CRA Staff Update

CRA welcomes its newest staff member, Dr. Jessica Cundiff, Research Analyst for the Center for Evaluating the Research Pipeline (CERP). Jessica is passionate about improving the experiences, recruitment, and retention of members of groups that have been historically underrepresented in highly valued and high-paying fields such as computing. She believes that it is important for computing to thicken the pipeline for women and other underrepresented groups in order to take advantage of the talent, innovation, and diverse perspectives that will move the field forward. Prior to joining CERP, Jessica earned her Ph.D. in Social Psychology and Women's Studies at Penn State University where she conducted research examining subtle forms of gender and racial bias in STEM fields. She is eager to provide research and evaluation services that will help inform diversity initiatives in computing, and she looks forward to helping CERP become a national resource for the computing community.

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Professional Opportunities

Arizona State University

School of Computing, Informatics, and Decision Systems Engineering

Computer Science and Engineering Lecturer (Job #10448)

The School of Computing, Informatics, and Decision Systems Engineering (SCIDSE) in the Ira A. Fulton Schools of Engineering at Arizona State University (ASU) seeks applicants for a full time lecturer position beginning August 2013. This is a non-tenure track appointment with a fixed term academic year contract.

A minimum of a M.S. in Computer Science, Computer Engineering or a related discipline and teaching experience in an undergraduate engineering program is required.

The successful candidate for this position will have a demonstrated record of excellence in teaching that incorporates active learning, an extensive knowledge of software engineering, programming languages, information assurance, or computer systems and networks.

Preference will be given to those candidates with a Ph.D. or near completion Ph.D. with proven teaching skills in undergraduate education. Professional experience in the areas of software application and systems development and a commitment to work collaboratively with a diverse student population is also desirable.

Current information regarding this position and instructions for applying are available at http://engineering.asu.edu/hiring. Review of applications will begin on July 15, 2013; if not filled, reviews will occur on the 1st and 15th each month thereafter until the search is closed.

Arizona State University is an equal opportunity/ affirmative action employee. Women and minorities are encouraged to apply. ASU's complete non-discrimination statement can be found at: www.asu.edu/titleIX.

Carnegie Mellon University

The Information Networking Institute

Faculty Positions (1. risk management and information assurance 2. networking, systems and security)

Positions available:

The Information Networking Institute at Carnegie Mellon University is soliciting applications for multiple open faculty positions in the areas of 1) risk management and information assurance and 2) networking, systems and security.

The positions are based at Carnegie Mellon[1]s main campus in Pittsburgh, PA, and Carnegie Mellon[1]s Silicon Valley campus in Moffett Field, CA.

Responsibilities for one position include teaching courses for the various Master of Science programs INI offers (Information Networking; Information Security Technology and Management; and Information Technology ¬ Information Security, ¬Mobility and ¬Software Management), as well as leading and participating in research projects. Candidates must demonstrate a strong commitment to teaching, a strong research background, and a proven research track record evidenced by a publication history.

Preference will be given to candidates having a documented track record of interdisciplinary research experience.

The second position will have formal administrative role and focus on overseeing academic processes, serving on committees and other, in addition to the regular teaching and advising responsibilities for the INI programs. Prior experience in higher education administration or a similar capacity and domain area expertise are preferred for candidates for this position.

Joint appointments with other departments in the College of Engineering including CyLab, Engineering and Public Policy, Electrical and Computer Engineering may be explored for both positions.

A Ph.D. in Information Systems, Computer Science, Electrical Engineering, or closely related field is required.

Interested candidates are requested to submit a curriculum vitae, statements of teaching and research interests, a cover letter indicating which area they are applying to (risk management or networking, systems and security) as well as the names and contact information of three references to:

Dena Haritos Tsamitis
Director, Information Networking Institute;
Director of CyLab Education, Training and Outreach
4616 Henry Street
Pittsburgh, Pennsylvania 15213
Email at: dena@cmu.edu

Columbia University

Department of Computer Science and the Institute for Data Sciences and Engineering

Lecturer in Discipline

The Department of Computer Science at Columbia University in the New York City invites applications for Lecturer in Discipline in the area of Data Science.

Lecturers in Discipline are officers who meet a programmatic need for instruction in specialized fields. The selected candidate/s will be expected to teach courses on Algorithms and Machine Learning. Courses will be geared towards data science, at the graduate level, and the candidate/s will be responsible for advising students in Institute for Data Sciences and Engineering Certification of Professional Achievement program. In addition to teaching and mentoring responsibilities, the selected candidate will assist the growth and development of future graduate degree programs within the Institute, while ensuring adequate linkage with industry and practical applications; and coordinating with the faculty in the Institute for Data Sciences and Engineering.

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Head of the Department of Computer Science and Engineering

The Hong Kong University of Science and Technology (HKUST), opened in October 1991, comprises four Schools: Science, Engineering, Business & Management, and Humanities & Social Science. The University's mission is to advance learning and scholarship; to promote research, development, and entrepreneurship, and to contribute to the region's economic and social development.

The School of Engineering, the largest School of the University, currently enrolls about 38% of the University's total undergraduate and postgraduate students of approximately 12,600. It comprises six departments: Chemical & Biomolecular Engineering, Civil & Environmental Engineering, Computer Science & Engineering, Electronic & Computer Engineering, Industrial Engineering & Logistics Management, and Mechanical Engineering.

The Department of Computer Science & Engineering (CSE) currently has 44 faculty members, teaching about 560 undergraduate students and 180 postgraduate research students. The Department conducts comprehensive teaching and research programs in both basic and applied aspects of Computer Science & Engineering. The academic degrees offered by the Department are: BEng, MSc, MPhil and PhD. Research activities in the Department are broadly categorized into artificial intelligence; data, knowledge and information management; networking and computer systems; software technologies; theoretical computer science; vision and graphics. For more information, please visit the University and Department websites available on http://www.ust.hk/ and http://www.cse.ust.hk/ respectively.

Applications/nominations are invited from well-qualified and accomplished scholars for the position. In addition to extensive teaching and research experience, the successful candidate must have demonstrated leadership qualities necessary to lead and manage the Department in its diverse academic and administrative functions and to interact effectively with industry and commerce.

Salary will be highly competitive with generous benefits. Applications/nominations together with detailed curriculum vitae and the names and addresses/fax numbers/email addresses of three referees should be sent to Professor Chung Yee Lee, Chair of Search Committee for Headship of CSE, c/o School of Engineering, HKUST, Clearwater Bay, Kowloon, Hong Kong [Fax No.: (852) 2358 1458, e-mail: dhcse@ust.hk] before **Tuesday, 1 October 2013.**

HKUST is committed to increasing the diversity of its faculty and has a range of family-friendly policies in place.

(Information provided by applicants will be used for recruitment and other employment-related purposes.)

Professional Opportunities

Candidates for appointment must demonstrate practice expertise, professional competence and scholarship in Computer Science. Candidates must hold a doctorate degree or its professional equivalent. The ideal candidate also possesses the ability to bring real world approaches, methods and technologies from industry to the School's classrooms. In collaboration with the Institute's Director of Industry Interactions and Entrepreneurship, the incumbent will provide students with exposure to practitioners of outstanding professional achievement and leadership. The Department is especially interested in qualified candidates who can contribute, through their teaching and/or service, to the diversity and excellence of the academic community.

Apply here: https://academicjobs.columbia.edu/applicants/jsp/shared/frameset/Frameset.jsp?time=1371763560614

Galois, Inc.

Software Engineer/Researcher

We are currently seeking software engineers/researchers to play a pivotal role in fulfilling our mission to make critical systems trustworthy.

Galois engineers participate in one or more projects concurrently, and specific roles vary greatly according to skills, interests, and company needs. Your role may include technology research and development, requirements gathering, implementation, testing, formal verification, infrastructure development, project leadership, and/or supporting new business development.

Skills & Requirements

- Education — Minimum of a Bachelor's degree in computer science or equivalent. MS or PhD in CS or a related field desirable but optional, depending on specific role.
- Required Technical Expertise — Must have hands-on experience developing software and/or performing computer science research. Demonstrated expertise in aspects of software development mentioned above.
- Desired Technical Expertise — Fluency in the use of formal or semi-formal methods such as Haskell or other functional programming languages. Direct experience in developing high assurance systems and/or security products. Experience with identity management, security risk analysis, systems software, or networking.
- Required General Skills — Must work well with customers, including building rapport, identifying needs, and communicating with strong written, verbal, and presentation skills. Must be highly motivated and able to self-manage to deadlines and quality goals.

Our engineers develop in programming languages including functional languages, designing and developing advanced technologies for safety- and security-critical systems, networks, and applications. Engineers work in small team settings and must

Professional Opportunities

successfully interact with clients, partners, and other employees in a highly cooperative, collaborative, and intellectually challenging environment.

We're looking for people who can invent, learn, think, and inspire. We reward creativity and thrive on collaboration. If you are interested, please send your cover letter and resume to us at careers@galois.com

The Jacobs Technion-Cornell Innovation Institute (JTCII)

Senior Faculty Positions, JTCII

Multiple Technion-affiliated faculty positions are available at the Jacobs Technion-Cornell Innovation Institute (JTCII), a key component of the new Cornell NYC Tech in New York City, at the Associate or Full Professor level. Faculty will be academically affiliated with a relevant Technion department, but permanently located in NYC.

Exceptional applicants involved in data- and information-technologies related to JTCII's current research hubs—Connective Media, Healthier Life, and Built Environment—and whose research will have a substantial impact on the information technology aspects of acquisition and processing of complex data sets, in particular as related to manipulating different types of media, improving human health, and developing intelligent infrastructure, should apply. Applicants must hold a PhD and have demonstrated ability to conduct outstanding research and education at the level of tenured faculty at Technion. Applicants must also have a strong and demonstrated record in the technology commercialization and entrepreneurship mission of JTCII.

Applicants should submit a CV, brief research and teaching statements, and the contact information of at least three references. The research statement should also explicitly describe the entrepreneurial and commercialization aspects of the applicants' research. Applications should be made online at: https://academicjobsonline.org/ajo/jobs/2650

Technion–Israel Institute of Technology (http://www1.technion.ac.il/en) is Israel's premier technological university. JTCII is a joint venture of the Technion and Cornell University, combining the strengths of both institutions.

St. John's University

Computer Science, Mathematics and Science

Assistant Professor

The Division is seeking applications for one tenure track position. Position available for Fall 2013 or Spring 2014. Expertise and substantial experience in computer, network, and mobile device security are essential.

Qualifications: Candidates must be experienced in multiple areas of cyber security such as digital forensics and securing medical records and must hold a Ph.D. in computer science, or a closely related area, with specialization in cyber security, and possess industry field experience as well as university-level teaching experience and/or publications and presentations.

Apply online at www.stjohns.edu by clicking the "work at St. John's" tab at the bottom of the page and then click "Faculty positions".

Professional Opportunities

Technicolor Palo Alto Research Center

Researcher

The Technicolor Research Center (http://paloalto.thlab.net) is located in downtown Palo Alto, just steps from the Stanford campus. We are looking for **several researchers** to create and develop next-generation solutions to discover, deliver and manage personalized digital media. We are looking for outstanding researchers with expertise in **statistics, machine learning, and data mining** to lead research in areas ranging from recommender systems to user behavior analysis and privacy.

Candidates must show evidence of a promising research record as well as visibility and influence in their academic community.

Key Responsibilities:

- Propose, launch, lead and execute research with peer researchers at Technicolor labs, in collaboration with academic partners (PhD students, postdocs, professors)
- Develop new and innovative technologies and contribute to developing intellectual property
- Publish in top conferences, maintain world-class academic credentials and visibility
- Help transfer research advances to products, establish relationships with business divisions
- Develop and strengthen relationships with the academic community and attract high-quality visiting students, postdocs and professors

Skills and Qualifications:

- Ph.D. in Computer Science, Statistics, EE, MS&E or other relevant discipline
- Strong academic track record and in-depth knowledge in one or more of the following areas: statistics, systems, data mining, machine learning, human factors/interfaces, privacy
- Practical expertise in areas such as statistical analysis, statistical machine learning, recommender systems, user profiling or privacy
- Effective interpersonal and communication skills
- Ability to perform research guided by business opportunities

Technicolor is a leading provider of production and distribution services to movie and TV studios, network service providers and broadcasters. The Palo Alto lab works closely with Technicolor groups focused on entertainment services, analytics for studios, and new services for personalized content delivery such as www.mgo.com.

Application Instructions:

Send in your resume to paloaltojobs@technicolor.com

Texas Tech University

Department of Computer Science

Assistant or Associate Professor

The Department of Computer Science at Texas Tech University invites applications for a tenure-track position at the rank of assistant or associate professor starting in Fall 2014. Successful candidates must have a Ph.D. in computer science or a closely related field, be able to teach graduate and undergraduate courses, and perform research as evidenced by scholarly publications. Successful candidates are also expected to contribute through professional and departmental service. Preference will be given to researchers in cyber security and software engineering and candidates with strong potential to obtain extramural funding.

The Department of Computer Science currently has 15 faculty members with 293 undergraduate and 119 graduate students. Texas Tech University, with an enrollment of 32,000 students, comprises 12 academic colleges/schools and is a part of the state-supported Texas Tech University System. The university shares its campus with the TTU Health Science Center.

Lubbock, a city of more than 200,000, is an economic and medical center on the Texas South Plains. The area offers a low cost of living, no state income tax, short commute times, and a rich heritage of music and culture.

Review of applications will begin in September 2013 and will continue until the position is filled. A letter of application, curriculum vitae, statement of proposed research, teaching statement, a sample of three papers published, and three letters of reference should be submitted electronically at http://jobs.texastech.edu. Please use Requisition number 86897.

As an Equal Employment Opportunity/Affirmative Action employer, Texas Tech University is dedicated to the goal of building a culturally diverse faculty committed to teaching and working in a multicultural environment. We actively encourage applications from all those who can contribute, through their research, teaching and/or service, to the diversity and excellence of the academic community at Texas Tech University. The university welcomes applications from minorities, women, veterans, persons with disabilities, and dual-career couples.

The University of Pennsylvania

Department of Computer and Information Science

Postdoctoral Research Fellow: Machine Learning

The University of Pennsylvania invites applications for a Postdoctoral Fellow in machine learning.

For further details and to apply, visit:
http://cs.brynmawr.edu/~eeaton/openpositions.html