

COMPUTING RESEARCH NEWS



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

JUNE 2019 Vol. 31 / No. 6



CRN At-A-Glance

“Second Place America?” Major Report Detailing the Nation’s Declining Leadership in Research and Technology Released at Capitol Hill Event

On May 14, the **Task Force on American Innovation (TFAI)**, an alliance of leading American companies and business associations, research university associations, and scientific societies, released a major report assessing the United States’ investment in science and engineering research. The report, titled **“Benchmarks 2019: Second Place America? Increasing Challenges to U.S. Scientific Leadership,”** is the fourth such “benchmarking” report that TFAI has released since its founding in 2004. The report found that the trends found in the original Benchmarks report in 2005, and the two subsequent follow-up reports, persist and the U.S. continues to lose ground to other nations in investments in science, technology, and talent.

See page 2 for full article.

CS for Social Good White Paper Competition

The **Computing Community Consortium (CCC)**, in conjunction with **Schmidt Futures**, will sponsor and administer a white paper competition on the future of “CS for Social Good,” in order to harness CS to address societal challenges.

See page 5 for full article.

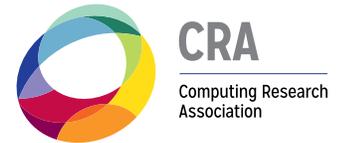
In This Issue

- 2 “Second Place America?” Major Report Detailing the Nation’s Declining Leadership in Research and Technology Released at Capitol Hill Event
- 4 Message from the Incoming Board Chair
- 5 CRA Board Member Mark D. Hill Receives Top Computer Architecture Award
- 6 CS for Social Good White Paper Competition
- 7 NAS Report on Reproducibility and Repeatability in Science
- 8 CRA-E Workshop at FCRC – Academic Careers: The Landscape is Broader than You Think
- 10 IT Majors are Less Likely to Intend to Pursue Formal Research Before Graduation Compared to CS and CSE Majors
- 11 Application Open for Rising Stars Workshop Academic Career Workshop for Women
- 13 Microsoft Research Ad
- 14 Board Members, Staff, Column Editor
- 15 Professional Opportunities

Call for Nominations! 2019 CRA/CCC Leadership in Science Policy Institute

We’re seeking nominations for participants for this year’s workshop, scheduled for November 21-22, 2019, in Washington DC. The nomination deadline is **June 14**.

“Second Place America?” Major Report Detailing the Nation’s Declining Leadership in Research and Technology Released at Capitol Hill Event



By Brian Mosley, CRA Policy Analyst

On May 14, the **Task Force on American Innovation (TFAI)**, an alliance of leading American companies and business associations, research university associations, and scientific societies, released a major report assessing the United States’ investment in science and engineering research. The report, titled “**Benchmarks 2019: Second Place America? Increasing Challenges to U.S. Scientific Leadership.**” is the fourth such “benchmarking” report that TFAI has released since its founding in 2004. The report found that the trends found in the original Benchmarks report in 2005, and the two subsequent follow-up reports, persist and the U.S. continues to lose ground to other nations in investments in science, technology, and talent.



Eric Fanning, Aerospace Industries Association, speaks about the impact on industry.



David Isaacs, Semiconductor Industry Association (podium) moderated the panel discussion at the release of the TFAI Benchmarks Report.



Nadya Bliss, of the Global Security Initiative at ASU, brought a researcher’s perspective to the panel discussion.

In order to assess the country’s standing against competitor nations, the report is broken into five distinct categories of benchmarks: R&D investments, knowledge creation (such as scientific publications and patents), education, workforce, and several high-tech sectors. In all the categories, signs point to the U.S. losing its competitive edge, as China and other countries rapidly increase investments in research and workforce development in order to assume positions of global leadership. The report makes clear that the U.S. needs to capitalize on its tremendous assets and make technological pre-eminence a national priority. This can be achieved through a national strategy that includes increased funding for

scientific research and human capital development, and targeted investments in new programs to grow, attract, and retain domestic and international STEM talent.

The report was released at an event on Capitol Hill in the Rayburn House Office Building, with honorary co-hosts Rep. Eddie Bernice Johnson (D-TX) and Rep. Frank Lucas (R-OK), the Chair and Ranking Member of the House Science, Space, and Technology Committee, respectively. CRA played a key role in the development and release of this report. Brian Mosley, Policy Analyst in the Office of Government Affairs, was a co-chair of the report. Additionally, Nadya Bliss, Director of the Global Security Initiative at Arizona State University and a Computing Community Consortium Council member provided the researcher perspective at the event. CRA was among the first members to join TFAI in 2004, and had a major role in the first Benchmarks report in 2005.

The majority of the event was devoted to a panel discussion of the report’s findings by key industry and scientific leaders. The panelists included **Eric Fanning**, former Secretary of the Army and current President and CEO of the Aerospace Industries Association; **John Neuffer**, President and CEO of the Semiconductor Industry Association; **Michael McQuade**, Vice President for Research at Carnegie Mellon University; and



Tobin Smith (AAU), one of the co-chairs of the Benchmarks report, briefs the attendees on the report findings.

Nadya Bliss, Director of the Global Security Initiative at Arizona State University. These speakers represent the three parts of the U.S. innovation ecosystem (industry, universities, and researchers), and they had a clear message: the nation needs a strong and sustained commitment to increasing federal investments in scientific research and human talent if the nation wants to maintain its global leadership role.

Tobin Smith, of the Association of American Universities, and one of the report co-chairs, said, **“this is a wake-up call for policymakers in Washington. Maintaining a global lead in science is critical to American national security and economic interests. But this report clearly documents that the rest of the world is catching up very quickly.”**

Message from the Incoming Board Chair

By Ellen Zegura



Ellen Zegura

On July 1, Ellen Zegura will become chair of the CRA Board of Directors. Zegura is the Fleming Professor in the School of Computer Science at Georgia Tech.

I am delighted to take the mantle from Susan Davidson as the next chair of the CRA Board. Under Sue's leadership CRA strengthened its position in leadership and service to the computing community in North America and beyond. Over the next year CRA and the Board are embarking on a strategic planning effort to think broadly and ambitiously about the future of the organization. I welcome your thoughts on this or any other CRA issue at any time. I can be reached at ewz@cc.gatech.edu.

CRA Board Member Mark D. Hill Receives Top Computer Architecture Award



The Association for Computing Machinery (ACM) and IEEE Computer Society recently announced that CRA Board Member and CCC Council Chair Mark D. Hill of the University of Wisconsin-Madison is the recipient of the 2019 **Eckert-Mauchly Award**. Hill was cited for contributions to the design and evaluation of memory systems and parallel computers. The Eckert-Mauchly Award is known as the computer architecture community's most prestigious award.

Mark D. Hill is John P. Morgridge Professor and Gene M. Amdahl Professor of Computer Sciences at the University of Wisconsin-Madison. In addition to being a CRA board member, he currently serves as chair of the **Computing Community Consortium (CCC)** Council and served as vice chair from 2016-18. In 2018, he organized the Computing Research Futures talks at the CRA Conference at Snowbird. Hill helped organize a number of recent CCC workshops including Digital Computing Beyond Moore's Law (May 2018), Next Steps in Quantum Computing: Computer Sciences Role (May 2018), and Thermodynamic Computing (January 2019). As CCC Council Chair, Hill helped organize a workshop in January 2019 on Identifying Research Challenges in Post Quantum Cryptography Migration and Cryptographic Agility as well as support the 20-year AI Research Roadmap.



Mark D. Hill

From the IEEE Computer Society release:

Widely regarded as the leading memory systems researcher in the world today, Hill made seminal contributions to the fields of cache memories, memory consistency models, transactional memory, and simulation. Hill's work with over 160 co-authors, which has received more than 20,000 citations, has been guided by the tenet that researchers should develop designs and models.

The ACM release also describes Hill's accomplishments:

Hill's research targets computer design and evaluation. He has made contributions to parallel computer system design (e.g., memory consistency models and cache coherence), memory system design (caches and translation buffers), computer simulation (parallel systems and memory systems), software (e.g., page tables and cache-conscious optimizations), deterministic replay and transactional memory. For example, he is the inventor of the widely-used 3C model of cache behavior (compulsory, capacity, and conflict misses) and co-inventor of the memory consistency model "sequential consistency for data-race-free programs" that serves as a foundation for the C++ and Java multi-threaded memory specifications. Hill's work is highly collaborative with over 160 co-authors and especially his long-time colleague David A. Wood.

...

Hill was selected as a John P. Morgridge Endowed Chair of UW-Madison Computer Sciences in 2015. He was named an ACM Fellow in 2004 for contributions to memory consistency models and memory system design, elevated to a Fellow of the IEEE in 2000 for contributions to cache memory design and analysis, and was awarded the ACM SIGARCH Alan Berenbaum Distinguished Service Award in 2009.

Hill will be formally recognized with the award at the 46th International Symposium on Computer Architecture (ISCA) to be held June 22-26, 2019 in Phoenix, Arizona.

About the ACM-IEEE CS Eckert-Mauchly Award

ACM and IEEE Computer Society co-sponsor the Eckert-Mauchly Award, which was initiated in 1979. It recognizes contributions to computer and digital systems architecture and comes with a \$5,000 prize. The award was named for John Presper Eckert and John William Mauchly, who collaborated on the design and construction of the Electronic Numerical Integrator and Computer (ENIAC), the pioneering large-scale electronic computing machine, which was completed in 1947.

CS for Social Good White Paper Competition



CCC

Computing Community Consortium
Catalyst

By CCC Staff

The **Computing Community Consortium** (CCC), in conjunction with **Schmidt Futures**, will sponsor and administer a white paper competition on the future of “CS for Social Good,” in order to harness CS to address societal challenges such as:

- Accelerating the transition to a low-carbon economy;
- Reducing the inter-generational transmission of poverty;
- Feeding 10 billion people while reducing the environmental footprint of agriculture;
- Reducing the time and cost for a low-income worker to gain a skill that is a ticket to the middle class;
- Using data to support evidence-based policy while protecting privacy and security;
- Reducing health care costs while maintaining or improving health outcomes; and
- Improving K-12 student learning outcomes in core academic subjects such as math.

White papers should propose new directions for research as well as new ideas about public-private partnerships or education (at both the undergraduate and graduate level); they should also make the case for resources to support the associated initiatives. One particular area of interest is the role that datasets can play in accelerating applications of AI and machine learning that address key societal challenges.

As part of its mission to catalyze the computing research community and enable the pursuit of innovative, high-impact research, CCC will work to operationalize the results of the associated initiatives through potential visioning activities and/or its **Symposium on Addressing National Priorities and Societal Needs**.



The winning teams will:

1. Receive an honorarium for the writing team (actual amount dependent on number of submissions, but in the \$10,000-\$20,000 range)
2. Present their paper at the CCC Symposium (Addressing National Priorities and Societal Needs) in Washington, DC in Spring, 2020
3. Have the opportunity to present their idea to the staff of Schmidt Futures.

White papers should be no more than 6 pages in length and a multidisciplinary team should author them. A panel of judges from the community will review the white papers. The number of winners in each category will depend on the number of submissions. **White papers must be submitted here by June 28, 2019 and winners will be announced by September 15, 2019.**

See the competition website to learn more.

NAS Report on Reproducibility and Repeatability in Science

By CCC Staff

Significant contributions to this post were provided by Computing Community Consortium (CCC) council member **Juliana Freire from NYU**.



The National Academies of
SCIENCES • ENGINEERING • MEDICINE

When a new exciting discovery is announced in our field, can we trust it? How was it produced? What data and code was used? How accurate are the results? Can they be reproduced?

Recently, Congress¹ directed the **National Science Foundation** (NSF) to contract with the **National Academies of Sciences, Engineering, and Medicine** (NAS) to “undertake a study to assess reproducibility and replicability in scientific and engineering research and to provide findings and recommendations for improving rigor and transparency in research.”

An interdisciplinary committee of fifteen members, including CCC Council Member Juliana Freire, came together to “define what it means to reproduce or replicate a study across different scientific fields, to explore issues related to reproducibility and replicability across science and engineering, and to assess any impact of these issues on the public’s trust

in science.” They produced the newly released NAS **Reproducibility and Replicability in Science (2019)** report.

A key takeaway from the report is that there is no crisis, but we cannot be complacent either. Reproducibility and replicability are important to attain confidence in scientific knowledge, but they are not the end goal of science. The fact that a given result cannot be reproduced (or replicated) does not mean it is incorrect, and conversely, replication and reproducibility do not imply correctness. Multiple channels of evidence from a variety of studies provide a robust means for gaining confidence in scientific knowledge over time. In fact, the inability to replicate a study is part of the self-correcting nature of science – it can signal a problem and it can also lead to new discoveries. At the same time, there is room for improvement. The report provides a series of recommendations to scientists, funding agencies, and

publishers that aim to increase the adoption of reproducibility.

Various scientific disciplines define and use the terms “reproducibility” and “replicability” in different and sometimes contradictory ways. After considering the state of current usage, the committee adopted definitions that are intended to apply across all fields of science and help untangle the complex issues associated with reproducibility and replicability. Their definitions are as follows:

- **Reproducibility** – obtaining consistent computational results using the same input data, computational steps, methods, and code, and conditions of analysis
- **Replicability** – obtaining consistent results across studies aimed at answering the same scientific question, each of which has obtained its own data.
- **Generalizability** – refers to the extent that results of a study apply in other contexts or populations that differ from the original one.

In short, reproducibility involves the original data and code; replicability involves new data collection and similar methods used by previous studies. Note that the definition of reproducibility focuses on computation in recognition of its large and increasing role in scientific research.



NAS Report *(continued)*

The authors have some recommendations for funding agencies:

Funding agencies and organizations should consider investing in research and development of open-source, usable tools and infrastructure that support reproducibility for a broad range of studies across different domains in a seamless fashion. Concurrently, investments would be helpful in outreach to inform and train researchers on best practices and how to use these tools.

In addition, they have specific recommendations for the NSF:

The NSF should, in harmony with other funders, endorse or create code and data repositories for long-term preservation of digital artifacts. In line with its expressed goal of “harnessing the data revolution,” NSF should consider funding tools, training, and activities to promote computational reproducibility.

They include a set of criteria in the report to help determine when testing replicability may be necessary. As “it is important for everyone involved in science to endeavor to maintain public trust in science based on a proper understanding of the contributions and limitations of scientific results.”

Finally, they end with an important warning “a predominant focus on the replicability of individual studies is an inefficient way to assure the reliability of scientific knowledge. Rather, reviews of cumulative evidence on a subject, to assess both the overall effect size and generalizability, is often a more useful way to gain confidence in the state of scientific knowledge.”

If you always expect your results to be identical you will not only be severely disappointed but could possibly miss an even greater discovery.

¹This was done in response to **Public Law 114-329**, which cites “growing concern that some published research findings cannot be reproduced or replicated.”

CRA-E Workshop at FCRC - Academic Careers: The Landscape is Broader than You Think



CRA-E

Computing Research Association
Education

The CRA Education Committee, with support from Google, is organizing an **Academic Careers Workshop** at FCRC 2019. The workshop will be held on Tuesday, June 25 from 12:30-6:30 PM. The organizers of the workshop are Nancy Amato (UIUC), Dan Grossman (University of Washington), Susanne Hambrusch (Purdue University) and Ran Libeskind-Hadas (Harvey Mudd College).

Most PhD granting departments have introduced a teaching faculty track, often with academic rank, and many 4-year colleges are expanding the size of their computer science department. The workshop is intended for PhD students and postdocs who want to learn about academic career options with a focus on teaching and gain a better understanding of the landscape of academic positions. Experienced and successful academic leaders as well as junior faculty in different teaching oriented positions will highlight how to best prepare for the different teaching positions and compare teaching-focused career paths.

The sessions of the workshop will focus on the responsibilities, benefits, challenges, and opportunities of the different career paths as well as on teaching focused positions, including information on what's needed to be a competitive candidate. The workshop concludes with a networking reception where potential candidates can meet representatives from institutions with teaching focused positions.

Please register for the workshop [through the FCRC registration page](#).

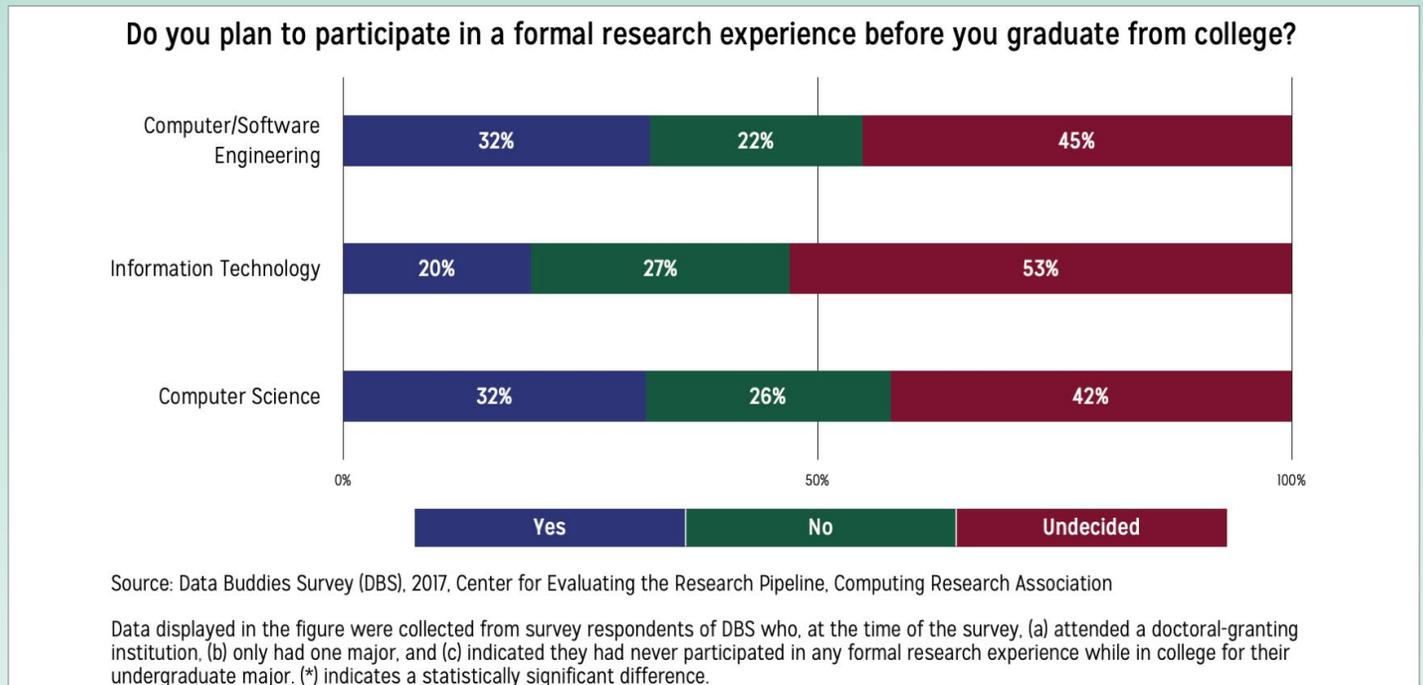
IT Majors are Less Likely to Intend to Pursue Formal Research Before Graduation Compared to CS and CSE Majors



CERP

Computing Research Association
Evaluation

By Heather M. Wright, Associate Director of CERP



During the 2017 fall semester, undergraduate students majoring in computer science (CS), information technology (IT), and computer/software engineering (CSE) were asked the following question, which included a brief definition of formal research experiences for undergraduate students (REUs): “During your undergraduate career to date, have you participated in any formal research experiences?” Among those who had never participated in an REU, 32% of CS and CSE students planned to participate in an REU in the future. This is compared to 20% of IT majors, who were statistically significantly less likely than both majors to have plans to do so. There were no differences among the three majors who had no plans to participate in an REU or were undecided about it.

These findings are important, because extensive evidence suggests REUs make a positive impact on undergraduate students’ academic engagement and persistence. Academic departments should consider the ways in which REUs available to students are promoted within the department and [help students understand how to get involved](#). While some REU programs may be limited to specific majors, many REU programs are open to all relevant majors, like the [CRA-W DREU program](#).

Notes: The survey data analyzed for this infographic were collected by [Center for Evaluating the Research Pipeline](#) via [The Data Buddies Project](#). The sample includes 3,937 CS majors, 121 IT majors, and 294 CSE majors who only had one declared major, attended a doctoral-granting institution, and indicated they had never participated in any formal REUs while in college at the time of the survey. CS, IT, and CSE majors were compared using a z-test and Bonferroni-corrected p values.

This analysis is brought to you by the CRA’s Center for Evaluating the Research Pipeline (CERP). CERP provides social science research and comparative evaluation for the computing community. Subscribe to the CERP newsletter [here](#). Volunteer for Data Buddies by signing-up [here](#).

This material is based upon work supported by the National Science Foundation under grant numbers CNS-1246649, DUE-1431112, and/or DUE-1821136. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Application Open for Rising Stars Workshop Academic Career Workshop for Women



This fall, the University of Illinois at Urbana-Champaign will host Rising Stars, an academic career workshop for women in EECS. At this workshop, female graduate students and postdocs who are interested in faculty careers will learn how to navigate academic life while meeting new mentors and peers. This year's event, to be held in Urbana, IL during Oct. 29-Nov. 1, 2019, will bring together more than 60 top young women in EECS for two days of research presentations, poster sessions, and candid discussions about navigating academic life.

Please encourage your best and brightest to apply by June 15, 2019. [Please share this flier](#) to help spread the word about this exciting opportunity.

For more information, please visit the Rising Stars in EECS 2019 [website](#) or email the Rising Stars in EECS 2019 team at risingstars2019@illinois.edu.

This year's co-chairs are CRA Board Member Nancy M. Amato and Wen-mei Hwu both from University of Illinois.

Rising Stars 2019

An Academic Career Workshop for Women in EECS

October 29 - November 1, Urbana, IL

Departments of Computer Science and
Electrical & Computer Engineering,
University of Illinois at Urbana-Champaign

I ILLINOIS
College of Engineering



I ILLINOIS
Computer Science



I ILLINOIS
Electrical & Computer Engineering

Call for Nominations! – 2019 CCC Leadership in Science Policy Institute



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



LiSPI will be centered around a two day workshop to be held November 21 – 22 2019, in Washington, DC. (Full details of LiSPI are available [here](#).)

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

- Complete a reading assignment and a short written homework prior to attending the workshop, so that time spent at the workshop can focus on more advanced content,
- Attend the November 21 – 22nd workshop, which includes breakfast both days, lunch, and a reception with the speakers and invited guests at the conclusion of the first day, and
- Complete an assignment afterwards that puts to use the workshop content on a policy problem that has significant projection onto computing and information. LiSPI is not intended for individuals who wish to undertake

research on science policy, become science policy fellows, or take permanent positions in Washington, DC. Rather, we are trying to reach work-a-day academics who appreciate that our field must be engaged in helping government. LiSPI Alumni have gone on to testify before Congress, appear at Congressional briefings, take seats on Federal advisory committees, provide input on legislation and federal rule making, and serve on the CCC Council and the CRA Board.

The CCC will provide funds for hotel accommodations for two nights of local expenses (hotel, meals) for the November 21 – 22nd workshop. Nominees are expected to pay their own travel expenses, though there will be a limited fund available for participants who cannot attend unless their travel is provided

Eligibility and Nomination Process

LiSPI participants are expected to have the experience and flexibility in their current positions to engage with government. Participants should be adept at communicating. They must be nominated by their chair or department head and must have demonstrated an interest in science policy, especially as it relates to computer science (and closely allied fields).

Specifically, the nomination process is as follows:

- A chair or department head proposes a LiSPI candidate by visiting the [nomination page \(http://link.cra.org/LiSPI2019-Nominations\)](http://link.cra.org/LiSPI2019-Nominations) and providing the name and institution of the nominee, along with a letter of recommendation.
- The candidate will then be contacted by the workshop organizers and asked to submit a CV, a short essay detailing their interests in science policy, and an indication of whether they would require financial aid to attend.

All nominations and material from nominators and nominees must be received by June 14, 2019.

Selection Process:

The LiSPI selection committee will evaluate each nomination based on record of accomplishment, proven ability to communicate, and promise. Selections will be announced by July 15, 2019. We plan to open the workshop to 35 participants.

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



From the everyday to the exceptional, Microsoft Research pushes boundaries to help you achieve more.

microsoft.com/research



CRA Board of Directors

James Allan, University of Massachusetts, Amherst
Nancy Amato, University of Illinois, Urbana-Champaign
Ronald Brachman, Cornell Tech
Carla Brodley, Northeastern University
Greg Byrd, North Carolina State University
Susan Davidson, University of Pennsylvania
Eric de Sturler, Virginia Tech
David Ebert, Purdue University
Stephanie Forrest, Arizona State University
Michael Franklin, University of Chicago
Dan Grossman, University of Washington
Brent Hailpern, IBM Research – Almaden
Mary Hall, University of Utah
Susanne Hambrusch, Purdue University
Kim Hazelwood, Facebook
Mark Hill, University of Wisconsin-Madison
Julia Hirschberg, Columbia University
Ayanna Howard, Georgia Tech
Charles Isbell, Georgia Tech
Chris Johnson, University of Utah
Kate Larson, University of Waterloo
Ran Libeskind-Hadas, Harvey Mudd College
Kathryn McKinley, Google
Greg Morrisett, Cornell University
Brian Noble, University of Michigan
Rachel Pottinger, University of British Columbia
Chris Ramming, VMWare
Penny Rheingans, University of Maine
Barbara Ryder, Virginia Tech
Vivek Sarkar, Georgia Tech
Andrew Sears, Penn State University
Shashi Shekhar, University of Minnesota
Jaime Teevan, Microsoft/University of Washington
Josep Torrellas, University of Illinois at Urbana-Champaign
Min Wang, Google
Ellen Zegura, Georgia Tech

CRA Board Officers

Susan Davidson, Chair, University of Pennsylvania
Susanne Hambrusch, Vice Chair, Purdue University
Ronald Brachman, Treasurer, Cornell Tech
Greg Morrisett, Secretary, Cornell University

CRA Staff

Andrew Bernat, Executive Director
Betsy Bizot, Director of Statistics and Evaluation
Daniela Cárdenas, Program Associate
Sandra Corbett, Program Manager
Khari Douglas, Program Associate, Computing
Community Consortium
Ann Drobnis, Director, Computing Community Consortium
Alejandra Guzman, Program Associate
Jill Hallden, Accounts Payable Specialist
Peter Harsha, Director of Government Affairs
Sabrina Jacob, Administrator
Brian Mosley, Policy Analyst
Erik Russell, Director of Programs
Shar Steed, Communications Specialist
Burçin Tamer, Director, Center for Evaluating the
Research Pipeline
Heather Wright, Associate Director, Center for Evaluating the
Research Pipeline
Helen Wright, Senior Program Associate, Computing
Community Consortium

Column Editor

Expanding the Pipeline
Patty Lopez, Intel

The Jackson Laboratory

Research Assistant III / Computational Scientist / Postdoctoral Associate

The Ucar laboratory at The Jackson Laboratory for Genomic Medicine in Farmington, CT is seeking outstanding individuals to join our team to work at the intersection of Computational Biology and Immunology to perform analyses and develop methods to drive forward our understanding of how immune system and immune responses are changing with age in human and mice. For this, we generate state-of-the-art genomics data (ATAC-seq, CITE-seq) from primary human cells and develop computational methods to analyze and integrate these data. More information can be found at:

<https://www.ucarlab.com/>

You will work closely with an interdisciplinary team of scientists including clinical and immunologist collaborators as we continue to build systems immunology pipelines and use them in exciting and novel ways. Your work will focus on age and sex-related variation in the immune system and in immune responses. We are currently seeking scientists of all levels.

Please visit <https://careers-jax.icims.com/jobs/search?ss=I&searchKeyword=ucar> to see a complete listing of all positions available within The Ucar Laboratory.

Lawrence Berkeley National Laboratory

HPC Storage Systems Analyst

The NERSC Division at Berkeley Lab is looking for a talented systems analyst with a focus on extreme scale high performance storage. If you have experience with storage hardware and software technologies including block storage arrays, storage networks, parallel file systems, hierarchical storage systems and object stores, we want to hear from you!

Apply at <http://50.73.55.13/counter.php?id=161237>

Marquette University

Professor and Co-Director for the Northwestern Mutual Data Science Institute

Marquette University invites applications for a Professor of Computer Science in the new Department of Computer Science (scheduled to launch in Fall 2019) and Co-Director of the Northwestern Mutual Data Science Institute (NM DSI). We are particularly interested in candidates whose area of expertise addresses one of the many facets of the broadly defined areas in data science and big data and can develop research collaborations with the institute's partners. The Department highly regards and encourages interdisciplinary research in both academia and industry.

The NM DSI is a \$40 million partnership between Northwestern Mutual, the University of Wisconsin Milwaukee

and Marquette University that seeks to create a world-class institute to transform the world through the power of data science. It is engaged in research, education, professional and academic career development, fostering innovation, and community impact. The mission of the institute is strongly aligned with the strategic goals of Marquette University. The institute is also aligned with regional commercial and academic efforts to advance technology in Milwaukee through programs in four key areas: talent, innovation, identity, and community.

Our campus is located in downtown Milwaukee, WI, a racially diverse city with convenient access to many government and private and nonprofit agencies, and ripe with opportunity for community engagement and research. Find out more about the city at <http://choosemilwaukee.com/>. Marquette University, an EOE that values diversity, is a Jesuit, Catholic university with a wide range of undergraduate and graduate programs. We seek candidates who understand and respect the University's Mission Statement, which can be found at <https://www.marquette.edu/about/mission.php>. Candidates from underrepresented groups are especially encouraged to apply.

All applications for this position must be received through Marquette University's electronic recruiting system. Review of applications will commence May 1, 2019 and continue until the position is filled with an outstanding candidate.

For more information, or to apply for the position, please see the listing on Marquette University's electronic recruitment system: <https://employment.marquette.edu/postings/11176>

Milwaukee School of Engineering

Computer Science and Software Engineering Faculty - All Ranks

The Electrical Engineering and Computer Science (EECS) department at the Milwaukee School of Engineering (MSOE) seeks applicants to fill multiple computer science (CS) and software engineering (SE) faculty positions at all ranks. MSOE expects, rewards, and supports a strong primary commitment to excellence in teaching. Among the department's strengths are strong partnerships with numerous businesses and academic institutes, which guide applied projects, undergraduate research, and curriculum development.

Candidates with expertise in any field of CS or SE are encouraged to apply. Applicants must have an earned PhD in a computing field by the start of the appointment and be proficient in oral and written communication.

To apply, please visit <http://www.milwaukeejobs.com/apply/add/36309571>

When applying, please upload a single pdf file which includes: 1) a letter of interest; 2) a curriculum vitae; 3) statement of teaching philosophy (including evidence of successful teaching if available); 4)

statement of research interests including a plan to involve undergraduate students or impact teaching; and 5) contact information for three professional references.

It is the policy of MSOE to provide equal employment opportunity to all individuals regardless of their race, ethnicity, color, creed, religion, sex, age, national origin, physical or mental disability, military and veteran status, sexual orientation, gender identity, genetic characteristics, marital status or any other characteristic protected by local, state or federal law. This policy applies to all jobs at the University and to all the terms, benefits, and conditions of employment/enrollment.

Missouri State University

Visiting Assistant Professor

The Computer Science Department at Missouri State University invites applications for a visiting Assistant Professor position starting Fall 2019. A PhD in CS or closely related field is preferred (ABD or Master's degree will be considered). Applicants from all areas of computer science are invited to apply.

To learn more, visit <https://jobs.missouristate.edu/postings/45104>.

Employment will require a criminal background check at University expense.

EO/AA/M/F/Veterans/Disability/Sexual Orientation/Gender Identity.

NEC Labs America

Researcher - Computer Vision and Machine Learning

The Media Analytics Department of **NEC Laboratories America, Inc.** is seeking outstanding researchers with backgrounds in computer vision, machine learning or robotics. Candidates must possess an exceptional track record of original research and passion to create high impact products. Our researchers are expected to establish worldwide leadership in their communities.

NEC Labs provides a vibrant research environment to produce strong research results. We extensively publish high-impact papers at top-tier venues such as CVPR or NIPS. Our two key research directions are visual recognition and 3D scene understanding, with applications such as face recognition or self-driving. We provide ample opportunities to demonstrate applications of our research and express your vision, for example, by building a self-driving platform from scratch.

We are located in San Jose, with very competitive pay and benefits. We have a strong internship program and active collaborations with academia. To check out our latest work, please visit: <http://bit.ly/2o5gSJ4>.

Required Skills or Experiences:

- PhD in Computer Science (or equivalent)
- Strong publication record at top-tier computer vision or machine learning venues

- Solid foundations in applied mathematics, optimization and statistical inference
- Motivation to conduct independent research from conception to implementation
- Programming skills in Python, C or C++

For more information about NEC Labs, please access www.nec-labs.com. Submit your CV and research statement through our career center at https://www.appone.com/MainInfoReq.asp?R_ID=2454961.

Equal Opportunity Employer

NEC Labs America

Researcher - Security

The Computer Security (CS) Department at **NEC Labs America** in Princeton, NJ, is seeking outstanding researchers who have passion to apply AI related technologies such as machine learning, data mining, and anomaly detection to solve real-world security problems, and who have passion to build security defense systems.

The CS department has been developing innovative security solutions and grown NEC's business. We provide a vibrant environment that has produced very strong research results based on our large-scale real-world security data collection and analytics framework. We embrace opportunities to leverage big-data and AI technologies to improve security. We strongly value interdisciplinary research.

The ideal candidates should have expertise in applying machine learning

or data mining techniques to solve security problems, should be able to develop algorithms for big data, and should be able to build innovative security defense systems. S/he must have a PhD in Computer Science or Computer Engineering with strong publication records and/or hands on experience in at least one of the following areas:

- Machine learning and AI (especially neural networks and deep learning)
- Data mining and statistical learning
- Graph and information network mining
- Anomaly detection
- IoT, critical infrastructure (ICS, SCADA), and automotive security
- Network security with deep learning
- System security

NEC Laboratories America is located in Princeton, NJ, home of the Princeton University and one of New Jersey's most beautiful and idyllic towns. The area offers many exciting cultural, entertainment and outdoor activities. The office is minutes away from Princeton University and an hour from New York, Philadelphia, and the Atlantic Ocean. For more information about NEC Labs, please access www.nec-labs.com, and submit your CV and research statement through our career center at https://www.appone.com/MainInfoReq.asp?R_ID=2396741.

Equal Opportunity Employer

Occidental College

Visiting Instructor in Computer Science

Come join a growing computer science department! **Occidental College**, located in Los Angeles, is a four-year liberal arts college that emphasizes interdisciplinary connections and community engagement. In our two-year-old computer science department, our majors are over 50% women, over 20% students of color, and over 35% Pell-eligible students, demonstrating our commitment to access and excellence.

The successful candidate will teach our Introductory Computer Science course with labs, and Data Structures. The position is eligible for renewal, and the department provides mentoring and professional development. See the full job posting here:

https://www.oxy.edu/sites/default/files/assets/jobad2019_1.pdf

Rochester Institute of Technology

Post Doctoral Research Scientist in Machine Learning

Detailed Job Description

Two research scientist positions available at Rochester Institute of Technology - Golisano College of Computing and Information Sciences. The research scientists will primarily work in the areas of AI/machine learning and are primarily responsible for developing advanced machine learning models to support

complex decision-making. The positions will allow the candidates to further grow their expertise in AI/machine learning or related areas by working on important data analytics problems in specialized domains, building a strong publication record. The positions will also enable the candidates to interact with a large team of PhD/MS students in Dr. Qi Yu's research group (<http://www.ist.rit.edu/~qyuvks/>) as well as domain experts through multiple research projects.

Required Minimum Qualifications

- A PhD in Computing Science or a relevant field with specialization in machine learning, data mining, and their applications.
- Strong programming skills and familiar with widely used machine learning packages.
- 5-years of research experience working in the areas of machine learning and AI

Specialized Skills

- Good publication record in reputable machine learning, data mining, and AI venues (e.g., NIPS/ICML/AAAI/IJCAI/KDD/ICDM/)
- Experience in interactive machine learning and visual analytics
- Experience in working with heterogeneous data, including images, videos, among others
- Good communication skills (written and verbal)

Seton Hall University

Data Scientist Contract Faculty

The Department of Mathematics and Computer Science at Seton Hall University invites applications for a full-time term faculty position in data science/machine learning to start in August 2019, with an annual term and renewable up to three years. The Department offers a new online M.S. program in Data Science, undergraduate majors in Computer Science and in Mathematics, minors in both fields, an undergraduate and graduate certificate program (with the Department of Psychology) in Data Visualization and Analysis, and a certificate program in Cybersecurity.

Duties and Responsibilities:

- Teaching responsibilities will include M.S.-level and undergraduate data science courses (online and in-person). Specifically teaching Machine Learning and its applications, Data Mining and Data Visualization. The usual teaching load is eight courses per year (four courses per semester). Since the M.S. program runs year-long, one course will be scheduled during the summer sessions. During the first year, the teaching load is reduced to five courses to allow for online course development.
- Online course development responsibilities will include developing an M.S.-level course in Machine Learning (ML), an undergraduate version of the ML course, and a special topics course in Data Science/ML.

- Participate in University, College of Arts & Science, and Departmental activities including the departmental seminar.
- Applicants must understand and be willing to support the Seton Hall University Catholic mission.

Required Qualifications:

- Ph.D. in Data Science, Computer Science or related fields.

Desired Qualifications:

- Teaching experience in machine learning is highly desired.
- Experience in teaching and/or developing online courses is desired, but not required.

Apply at:

<http://jobs.shu.edu/cw/en-us/job/493804/contract-faculty-department-of-mathematics-and-computer-science>

University of Alabama at Birmingham

Open Rank Tenured Faculty Position

The Department of Computer Science (CS) at the University of Alabama at Birmingham (UAB) is seeking candidates for a tenure-track/tenured faculty position. While preference is given to candidates at the Assistant Professor rank, highly qualified candidates at Associate Professor and Professor rank will also be considered. For additional information about the Department, please visit: <http://www.cs.uab.edu/>.

Candidates with expertise in all core CS areas are sought, with preference given to Software Engineering, Computing Systems, and Data Science areas. UAB has made a significant commitment to both research and teaching in Computer Science. Candidates must consequently have strong research and teaching credentials. Experience and success in funded research is desirable for junior-level candidates, and required for senior-level candidates. UAB is a Carnegie “Very High Research Activity” University.

The CS Department at UAB offers PhD, MS, BS, and BA programs. The Department has a strong research focus, and a strong commitment to teaching, service, and outreach. The goal is to grow the PhD, MS, and BS significantly over the next several years. Research funding is expanding significantly, and the Department has a leadership role in a Center focusing on Cyber Security. Collaborations with UAB’s medical enterprise are strong and growing, with many opportunities for faculty to participate in interdisciplinary work.

A Ph.D. in Computer Science or a closely related field is required. Applications should include a curriculum vitae, a list of publications and scholarly achievements, a statement of future research plans, a statement of teaching experience and philosophy, and at least three reference letters. Applications and all other materials (including reference letters) should be submitted through UAB’s portal at People Admin: <http://uab.peopleadmin.com/postings/5119>.

UAB is an Equal Opportunity/Affirmative Action Employer committed to fostering a diverse, equitable and family-friendly environment in which all faculty and staff can excel and achieve work/life balance irrespective of ethnicity, gender, faith, gender identity and expression as well as sexual orientation. UAB also encourages applications from individuals with disabilities and veterans. A pre-employment background investigation is performed on candidates selected for employment.

University of Denver

Teaching Assistant Professor - Ritchie School of Engineering & Computer Science

The Department of Computer Science at the University of Denver is committed to building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment. We invite applications for two or more full-time non-tenure track Teaching Professor Line or Professors of the Practice Line positions for the 2019-2020 academic year beginning September 1, 2019. We are especially interested in faculty who can teach courses in our data science and cybersecurity programs as well as general computer science classes. Appointments at the Associate or Full Teaching Professor level may be possible for well qualified applicants. A typical new assistant professor appointment would be made initially as a one-year contract renewable on a yearly basis for three years, followed

by a three-year contract where renewal is contingent on formal performance review. During the sixth year a faculty member can apply for promotion to Teaching Associate Professor or Associate Professor of the Practice and if successful be awarded a 5-year contract.

Position Summary

The hired individuals will be responsible for teaching introductory, higher level undergraduate, and possibly graduate level computer science courses. Duties include six quarter-based system courses per year, advising students, and participating in department and university service. These positions do not require research. The successful applicant will have a passion for teaching and a demonstrated ability to teach Computer Science courses.

Required Qualifications

- MS in Computer Science related disciplines is required by time of appointment.
- Demonstrated ability to teach CS courses.
- Significant industry experience for a position in the professor of the practice line.

Preferred Qualifications

- Previous experience teaching computer science courses.
- Demonstrated knowledge and experience with culturally responsive teaching methods and/or pedagogies to effectively engage broadly diverse

student populations.

- Ph.D. in Computer Science or related disciplines.

Application Deadline

For best consideration, please submit your application materials by 4:00 p.m. (MST) Friday, August 30, 2019.

Special Instructions

Candidates must apply online through www.du.edu/jobs to be considered. Only applications submitted online will be accepted. Once within the job description online, please scroll to the bottom of the page to apply. For questions regarding this position, please contact Scott Leutenegger at leut@du.edu.

Please include the following documents with your application:

- Cover letter that includes what courses and areas you are especially interested in and qualified to teach
- Curriculum Vitae indicating teaching experience
- Course evaluations (if applicable)
- A one-page teaching statement that includes information about how you will advance our inclusive excellence commitment through your teaching and service
- Names and contact information of three references

NOTE: The online system is limited to uploading 10 files. Please combine content if necessary to get all content uploaded.

The University of Denver is committed to enhancing the diversity of its faculty and staff. We are an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment regardless of age, race, color, national origin, religion, sex, sexual orientation, gender identity, disability, military/ veteran status or any other status protected by law.

All offers of employment are based upon satisfactory completion of a criminal history background check.

UTHealth School of Biomedical Informatics

Tenure-Track, Open Rank Faculty Position in Medical AI

JOB SUMMARY: The School of Biomedical Informatics (SBMI) at the University of Texas Health Science Center at Houston (UTHealth) is recruiting one full-time, tenure-track faculty member, open rank, in applications of artificial intelligence (AI) and machine learning (ML) to medicine and healthcare.

The successful applicant will join a dynamic faculty at SBMI who are active in research, education, and applying informatics to medicine and healthcare. SBMI is one of the largest programs of biomedical informatics in the nation with about fifty regular faculty and additional fifty adjunct faculty. SBMI's Vision is "Transforming Data to Power Human Health". The Mission of SBMI is to collect, process, and convert data -

ranging from molecules to populations - into actionable information, knowledge, and intelligence; educate current and future leaders, innovators, and problem solvers across Texas, the nation, and the world; disrupt, transform, and innovate to elicit biomedical discoveries, improve healthcare delivery, and aid in disease prevention by conducting outstanding basic and applied research and developing impactful information technology products and solutions.

SBMI offers one master's degree with two tracks (research and applied) and two doctoral degrees (research-focused Doctor of Philosophy or PhD and practice-focused Doctor in Health Informatics or DHI), along with several graduate certificate programs, in the unique environment of the Texas Medical Center, the most concentrated area of biomedical and healthcare expertise, knowledge and skills in the world with more than fifty health-related institutions, 100k employees, 9,200 patient beds, and 10 million patient encounters, 180k surgeries, and 750k ER visits per year.

QUALIFICATIONS: Applicants should possess a PhD in computer science, engineering, biostatistics, cognitive science, biomedical informatics, or related disciplines. Candidates possessing MD-PhD are highly encouraged to apply. MDs with a strong quantitative background will also be considered. We are especially interested in applicants with strong background in AI and ML and an interest in integrating

Professional Opportunities

multiple sources of data (clinical, behavioral, temporal, environmental, etc.) to understand human behavior (both patients and providers) and its implications for health quality, safety, and efficiency.

Applicants at the associate or full professor levels should have a strong track record of teaching at the graduate level, extramural funding, and published research. Applicants at assistant professor level should have demonstrated potentials in extramural funding and published research and a strong commitment to graduate level

teaching. Candidates who are likely to develop collaborative research with other SBMI faculty and faculty at UTHealth and the Texas Medical Center are preferred.

RESPONSIBILITIES: The successful candidate will be expected to conduct funded research, participate in teaching activities at the graduate level, and provide service at the school, university, national, and international levels. Collaborative research with other faculty in the school and across UTHealth and the Texas Medical Center is expected.

SALARY: Competitive and dependent upon qualifications and experience.

APPOINTMENT/BENEFITS: This position is a 12-month full-time appointment on the tenure-track. All interested parties should go to the link below to provide their curriculum vitae, research and teaching statement, names of three references, and a letter describing the applicant's qualifications and career goals.

Link to job: <http://p.rfer.us/UTH4Nd4s5>

UTHealth is an EEO/AA employer. UTHealth does not discriminate on the basis of race, color, religion, gender, sexual orientation, national origin, genetics, disability, age, or any other basis prohibited by law. EOE/M/D/F/V.

