

COMPUTING RESEARCH NEWS



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Advance Computing Research and Change the World.

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CRN At-A-Glance

Mary Fernández Receives 2018 Service to CRA Award

The [Computing Research Association](#) (CRA) is pleased to honor Mary Fernández with the [2018 Service to CRA Award](#) for her work in transforming the organization's visual identity and communications. Fernández was a member of the CRA board from 2009 to 2015, during which time she spearheaded several key initiatives to re-brand and revitalize communications.

See page 2 for full article.

Award Winning NSF Funded Data Research Presented at the 2018 CNSF Exhibition

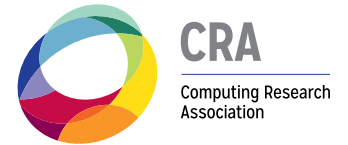
On May 9th, the [Coalition for National Science Funding](#) (CNSF), an alliance of over 140 professional organizations, universities, and businesses, held their [24th Annual Capitol Hill Exhibition](#). CNSF supports the goal of increasing the federal investment in the National Science Foundation's research and education programs, and the exhibition itself is a great way to show members of Congress and their staff what research the American people have funded.

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Mary Fernández Receives 2018 Service to CRA Award



Mary Fernández

The **Computing Research Association** (CRA) is pleased to honor Mary Fernández with the **2018 Service to CRA Award** for her work in transforming the organization's visual identity and communications. Fernández was a member of the CRA board from 2009 to 2015, during which time she spearheaded several key initiatives to re-brand and revitalize communications.

Fernández first became involved with CRA in 2008, serving as a speaker and mentor at CRA-W's Advanced Career Mentoring Workshop. She joined the CRA board in 2009 as an ACM representative and co-chaired the **2010 CRA Conference at Snowbird** the following year. Fernández was also a speaker at CRA-W Grad Cohort 2011, the **CRA-W Mentoring Tracks at Grace Hopper in 2012** and CRA-W's **Distinguished Lecture Series** in 2017.

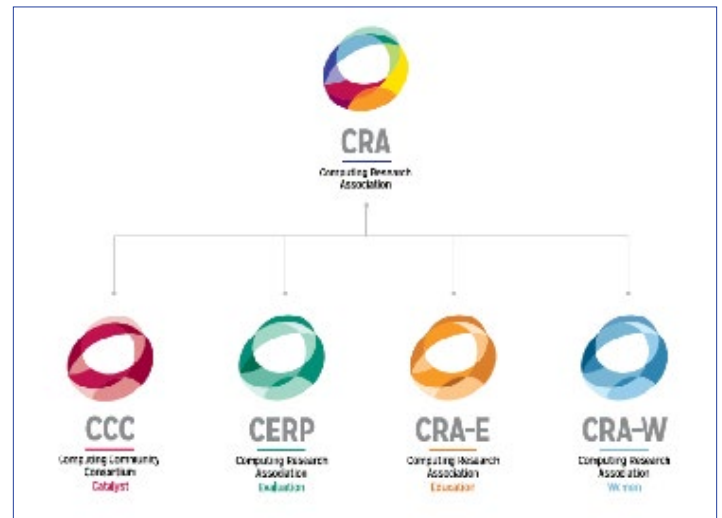
As chair of the communications committee, Fernández advocated to CRA's board of directors the importance of developing a strong brand identity and directed several initiatives to improve communications. She also guided a multi-year effort that clarified and strengthened the CRA mission statement and re-branded CRA as a more unified organization.

Fernández was instrumental to making the vision of creating a new brand identity for CRA a reality. She took on the challenge of finding a way to bring the multiple identities that comprise CRA under one cohesive brand and succeeded by building consensus with members, staff, committee chairs, and board members.

The **new look was unveiled** at the 2014 Conference at Snowbird and positioned CRA as dynamic and collaborative, while preserving the unique identities of CRA's distinct committees.

The new CRA symbol is designed to represent great minds coming together. The symbol was created by combining many ovals of different sizes into one symbol to illustrate dynamic collaboration. Each committee's logo is a different color to both strengthen its individual identity and connect it to the organization as a whole.

Fernández currently volunteers her time and energy to the boards of several nonprofit organizations, using her wealth of leadership expertise to help advance their missions. After serving on the board of MentorNet for several years, she took on the role of CEO in 2013 and revitalized the organization to enhance its mission to increase the representation of historically underrepresented individuals in STEM fields; it is now a division of Great Minds in STEM. Fernández also spent 17 years at AT&T Labs Research as a research computer scientist specializing



in database and information systems, then as the head of distributed computing research, and finally as assistant vice president of information and software systems research.

Fernández left the CRA board in 2015 to focus on other responsibilities, but her work has produced a lasting impact. The vibrant CRA and committee logos and unified web presence are all the results of her amazing leadership, and this is evident to anyone who attends our events or visits our websites.

The Service to CRA Award will be presented at the upcoming **2018 CRA Conference at Snowbird**.

Jan Cuny Receives 2017 ACM Distinguished Service Award

ACM recently announced that former CRA and CRA-W board member Jan Cuny has been named the recipient of the **2017 ACM Distinguished Service Award**. She received the award for the establishment and tireless promotion of projects that have nationally transformed computer science education by increasing and diversifying access to high-quality CS education.

From the announcement:

When she joined the US National Science Foundation (NSF) in 2004, Cuny initiated the Broadening Participation in Computing Program (BPC), which aimed to significantly increase the number of college students earning degrees in computing across the country. The BPC program sought to increase the participation in computing of traditionally underrepresented groups, including women, minorities and persons with disabilities. BPC seeded a number of alliances—large-scale efforts that are continuing to work at the national level to increase diversity in the computing field.

In the K-12 arena, Cuny built on the work of one of those alliances, *Into the Loop*, that successfully introduced a new high school course, Exploring Computer Science, designed with equity as a core consideration. Cuny worked with the College Board to develop a new national Advanced Placement (AP) computer science course and exam with similar goals of attracting traditionally underrepresented groups. One challenge the planners faced was

that of the 23,000 public high schools in the United States, only 2,000 offered computer science education. Creating new NSF programs, Cuny launched an effort to catalyze a movement to add 10,000 new well-trained CS teachers throughout the country in 10 years. This ambitious professional development effort was dubbed “CS10K.”

While the milestone of 10,000 new CS teachers has not quite been reached yet, Cuny’s vision of a new, more inclusive CS course is a reality. AP Computer Science Principles was launched in the 2016-2017 academic year. More than 2,500 schools offered the course and more than 50,000 students took the exam—the biggest launch in the AP’s history. CS10K became the forerunner to today’s CSforAll movement that is transforming CS education for grades preK-12.

Cuny has led several efforts to increase the participation of women and minorities in computing research for many years. Before joining NSF, she was a vice chair of CRA and a long-time board member of CRA-W,



Jan Cuny

where she organized Career Mentoring Workshops, co-founded the **Grad Cohort program** with Mary Lou Soffa, and served as co-chair and on the steering committee. For her work in this area, Cuny has also received an **ACM Presidential Award in 2006**, the **2007 CRA A. Nico Habermann Award**, and the 2009 Anita Borg Institute’s Woman of Vision Award for Social Impact. More recently, she organized a session at the 2016 CRA Conference at Snowbird called “**Finding a Role for Your Department in the Computer Science for All Initiative.**”

Congratulations to Cuny on this much-deserved award!

CRA Board Member Highlight: Carla Brodley

By Carla Brodley

For the past 30 years I have had two passions – machine learning (ML) that makes a difference in the real world and increasing diversity in computer science (CS). For the first 26 years, I focused on my first passion and developed new approaches to ML through applications to remote sensing, neuroscience, digital libraries, astrophysics, content-based image retrieval of medical images, computational biology, chemistry, evidence-based medicine, detecting lesions in the MRIs of epilepsy patients, and predicting disease progression for MS patients.

For the last four years my focus has been on my second passion: increasing diversity in CS. Although I've always been active both in my own university and on a national level on diversity initiatives, serving as a board member and co-chair of [CRA-W](#), I now spend close to 50% time on creating, fundraising for, and evaluating initiatives for encouraging women and under-represented minorities (URM) to *try* computer science. In my experience at both Tufts University and Northeastern University, if members of underrepresented groups try computer science, they go on to make this a major field of study in the same proportion as majority groups. My role as dean of Computer and Information Science (CCIS) at Northeastern enables me to focus on diversity in CS; as a dean, I have the resources and

opportunity to pilot many ideas, and based on the outcome I can scale the ideas that prove effective.

The mission of CCIS is “CS for Everyone.” We have several initiatives designed to meet that goal and demonstrate that CS can be meaningfully combined with other fields of study, increasing the diversity of thought and demographics in CS. To this end, the [combined majors program](#), allows students to choose majors from two colleges across the university, and it has led to significant increases in the number of women majoring in computer science at Northeastern. The required elective and capstone classes are carefully vetted by faculty from both CCIS and the other department or college before being approved by university governance. This is in contrast to a double major which would be difficult to complete at Northeastern because the majority of students go out on two or three six-month work experiences (co-ops) at one of our 500 partner companies. In the last four years, we have grown the number of combined majors from 12 to 30, with recent additions such as philosophy, English, history, linguistics, economics and health sciences. Our 30 combined majors span all CCIS undergraduate degrees (data science, information science, CS and cybersecurity), and we anticipate adding 10 additional combined majors this year. In Fall 2018, 907 of CCIS's 1807 majors will be combined majors. Across all majors, 26% of students are women. What is particularly striking is that women make up 33% of our combined majors versus 19% of our non-combined majors. About 50% of URM students are in the combined major versus 50% in the non-combined major, which is similar to non-URM students. We anticipate that our numbers will go up because our entering 2018 class is a record breaking 33% women and 15% URM.

Our second initiative stems from our belief that all university graduates should know some CS, but CS is not explicitly required at Northeastern. Our [Meaningful Minors in Computer Science](#) – is an initiative to customize each student's minor to their major field of study. Everyone starts with the same two required introductory classes and then selects three remaining courses relevant to their major. A biology major might take algorithms, ML, and computational biology; a media studies major might take data visualization, introduction to data science, and web programming;



Carla Brodley

and an English major might take introduction to data science, natural language understanding, and digital humanities. The key to the program's success is that all academic advisors are trained to help guide students to the electives most relevant to their major interests. Since implementing this initiative in Fall 2016, we have seen the number of minors double from 120 to an estimated 250. Due to the young age of this program and the fact that we cannot see if a student completed a meaningful minor until graduation, we are still evaluating the impact of Meaningful Minors.

The last initiative is an MS in CS for people who did not study CS as undergraduates. Too many people self-select out of CS without trying it in college – this new MS in CS provides a pathway to CS and allows us to take the decision of who is in tech out of the hands of 18 year olds! [Northeastern's Align MS in CS program](#) is a 2.5 year experiential master's program for college graduates with degrees outside of CS. The program starts with two semesters of preparatory courses and is followed by a wide variety of master's courses. After completing two semesters worth of master-level courses, Northeastern helps students find a six-month co-op (a paid internship from our network of over 500 companies with an

average salary of \$35k). Students then return for a final semester of classes. Classes are held in the evening to enable students to keep up with their other life commitments. Campuses in Boston, Seattle, Charlotte and the bay area, allow this program to reach a wide population of students. With a 93% retention rate and a 100% graduate employment rate (with \$100k+ salaries), the four-year pilot program has been a success. Currently the program has 360 students enrolled with diverse undergraduate majors such as English, economics, philosophy, chemistry, political science, biology, aerospace engineering and more. *Northeastern's goal is to scale this program over the next four years to produce more than 1,000 graduates per year whose demographics reflect those of the U.S. college graduate population (50% women and 25% URM).* A larger goal of this initiative is our hope that the Align MS in CS is replicated by other universities, making the MS in CS like the MBA and JD – a degree people can obtain after an undergraduate degree in another field. The Align program provides a new pathway to tech for the millions of people who have already graduated from college and thus is likely the fastest way for universities to help solve the lack of diversity in tech.

About the Author

Carla E. Brodley is the dean of the College of Computer and Information Science at Northeastern University. Prior to joining Northeastern, she was a professor of the Department of Computer Science and the Clinical and Translational Science Institute at Tufts University (2004-2014) and on the faculty at Purdue University (1994-2004). A Fellow of the ACM and AAAI, Dean Brodley's interdisciplinary machine learning research led to advances not only in computer and information science, but in many other areas of science, engineering and medicine. Dean Brodley's numerous leadership positions in computer science as well as her chosen research field include serving as program co-chair of ICML, co-chair of AAAI, and associate editor of *Machine Learning*, *JAIR*, and *JMLR*. She has previously served on the Defense Science Study Group, the board of the International Machine Learning Society, the AAAI Council, and DARPA's Information Science and Technology (ISAT) Board. She is currently serving on the CRA Board of Directors, as a member-at-large of the section on Information, Computing, and Communication of AAAS, and as a member of the advisory committee for NSF's Directorate of Computer and Information Science and Engineering.

Award Winning NSF Funded Data Research Presented at the 2018 CNSF Exhibition

By Brian Mosley

On May 9th, the **Coalition for National Science Funding (CNSF)**, an alliance of more than 140 professional organizations, universities, and businesses, held its **24th Annual Capitol Hill Exhibition**. CNSF supports the goal of increasing the federal investment in the National Science Foundation's research and education programs, and the exhibition is a great way to show members of Congress and their staff what research has been funded by American taxpayer dollars.



Jingrui He (lower right) presents her research to a number of attendees of the 2018 CNSF Capitol Hill Exhibition.

This year the Computing Research Association, a member of CNSF, sponsored Jingrui He and her graduate student, Dawei Zhou, from **Arizona State University**. They demonstrated He's research in complex anomaly/outlier detection. Her work, titled "Modeling the Heterogeneity of Heterogeneity: Algorithms, Theories and Applications," earned a **NSF CAREER award in 2016**.



Dawei Zhou (right) presents his research to an attendee of the 2018 CNSF Capitol Hill Exhibition.

This research has wide-ranging applications such as financial fraud prevention and malicious insider threat detection. He spoke about the information sources she uses, the data heterogeneity (or quality of the non-uniform data sets) that's typically present in such applications, as well as the techniques that can be used to leverage with data to

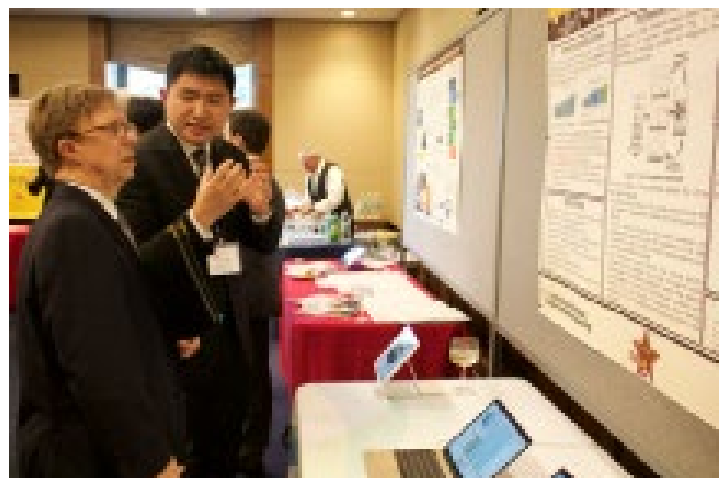
identify the targets of interest (such as new financial fraud patterns like synthetic identities or lone wolf type of hacking attacks).

All of this work is supported from the CISE directorate at NSF. He's presentation was well received by the attendees of the exhibition, and she fielded questions from congressional staffers, NSF program officers, and other attendees of the exhibition.



Jingrui He (left) presents her research to an attendee of the 2018 CNSF Exhibition.

A number of other organizations had displays and demonstrated NSF-funded research at the event. From Cornell University's "Cabernet, Copper, Caterpillar & Cement: Using High Energy X-Rays as a Multi-Disciplinary Tool of Discovery" to the American Sociological Association's "Opioid Distribution on a Darknet Cryptomarket" to the American Political Science Association's

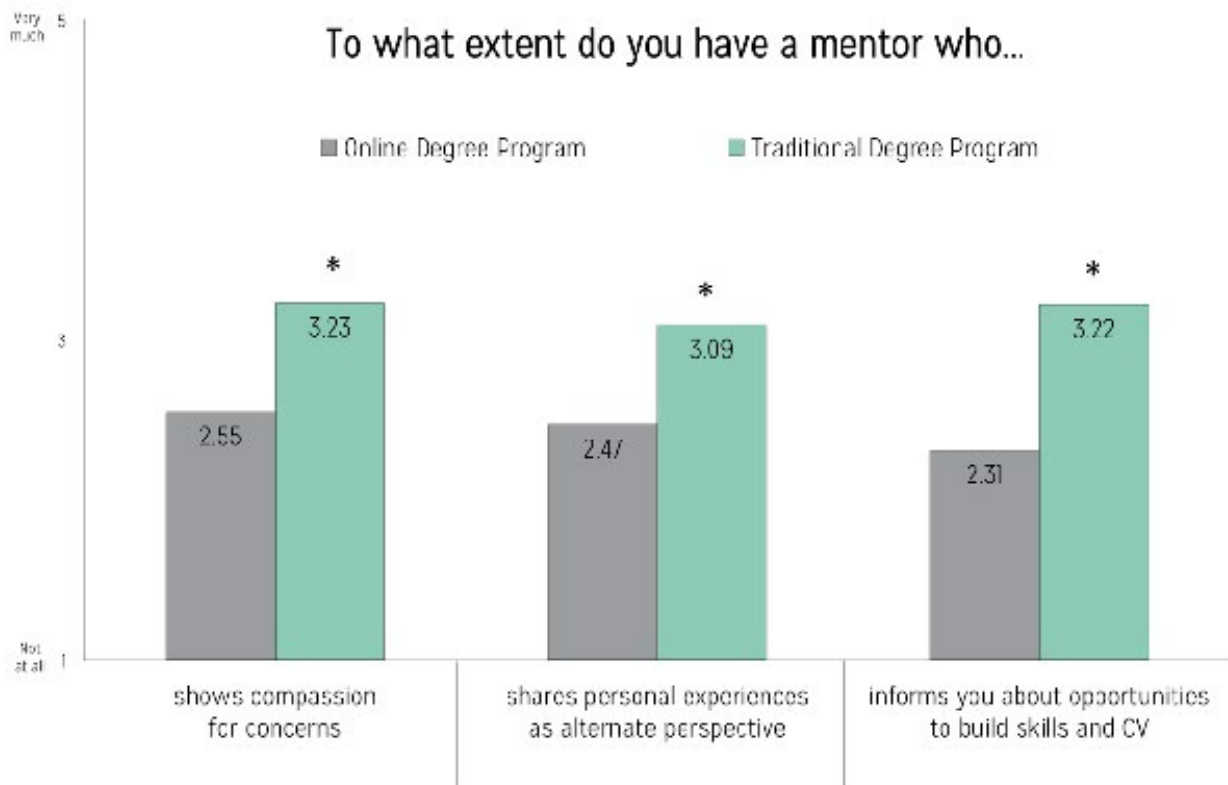


Dawei Zhou (right) presents his research to an attendee of the 2018 CNSF Capitol Hill Exhibition.

"Exploring Trade-offs in Cyber Offense and Defense Through the Lenses of Computer and Political Science," the exhibition was a great display of the different types of research being supported by NSF. Click [here](#) to see a list of the participating organizations and other exhibitors' presentations.

Compared to Students in Traditional Master's Degree Programs, Online Master's Students Report Lower Mentorship Support

By Heather Wright, Associate Director of CERP



According to the new [2017 Taulbee Survey report](#), the production of CS master's degrees in the U.S. rose more than 19 percent from 2016-2017, and the average number of new CS master's students per department [1] last year was 93.8 students. As CS enrollments continue to rise, departments that are facing capacity issues may turn to online education as a means to manage the influx of new students. According to a [report](#) from Babson Survey Research Group, graduate-level distance education enrollments in all fields have grown 18 percent from 2012-2015, with percentage change as high as 33 percent at private non-profit institutions (Allen & Seaman, 2017).

Because students in online programs are not physically on campus, these students may not have access to as many academic mentors as their on-campus peers. To test this, CERP analyzed survey responses from joint

bachelor's/master's and terminal master's students earning their degree in a computing-related field [2]. Compared to students in traditional degree programs, students enrolled in online degree programs reported lower levels of mentorship support. Because mentorship is important for students' success and persistence in academic degree programs (Campbell & Campbell, 1997; Pascarella, 1980; Kim & Sax, 2009), and especially underrepresented students in computing (Kendricks, Nedunuri & Arment, 2013; Kim & Sax, 2009), it is important that departments consider ways of increasing accessibility and/or visibility of mentorship resources to online students. Although time and financial limitations may hinder departments' ability to do so, the following suggestions are ways in which departments can provide stronger mentorship resources for online students:



Lower Mentorship Support (*continued*)

- Directing students to **online mentorship resources** such as the **CRA-E CONQUER website** [3] or **MentorNet**, which is a nonprofit organization that matches students in STEM with mentors through its website
- Hosting **virtual office hours**, and discussing professional development in addition to classwork
- Utilizing several **teaching assistants** who can serve as peer mentors
- Hosting **visit days** for online students during which students can meet peers and faculty in person

Departments that provide this mentorship support may help online master's students persist in their computing degree programs.

Notes:

- [1] The average number of new CS Master's students per department was calculated using the number of CS, CE, and Informatics doctoral-granting departments in the U.S. that participate in the Taulbee Survey and report this information, $n = 130$ (Zweben & Bizot, 2018).
- [2] The survey data used in this figure were collected during the fall 2017 by CERP via the **Data Buddies Project**. The total sample ($n = 2,524$) includes joint Bachelor's/Master's and terminal Master's students earning their degree in a computing-related field (i.e., Computer Science, Computer Engineering, Computing Information Systems, and other computing). Using a scale from (1) Not at all to (5) Very much, survey respondents were asked to answer the following: *To what extent do you have a mentor who (a) shows compassion for concerns and feelings you discussed with them (b) shares personal experiences as an alternative perspective to your problem (c) informs you about opportunities that would help you build skills or enhance your CV.* Mean differences between online ($n = 512$) and traditional ($n = 1,978$) students were tested using independent samples t-tests. * $p \leq 0.01$.
- [3] The CRA-E CONQUER website is largely targeted at undergraduate students; however, CONQUER provides tips and advice about whether to pursue a Ph.D. in computing and how to choose a career path with a Ph.D. Finally, while this infographic exclusively focuses on master's level students, CONQUER would also be a positive resource for undergraduate students within departments in both online and traditional degree programs.

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

Do you have a research question you'd like CERP to answer? Submit ideas for future infographics [here](#). Subscribe to the CERP newsletter [here](#).

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Expanding the Pipeline: Computer Science Outreach Program Evaluation Network – Increasing Quality and Capacity



CRA-W

Computing Research Association
Women



By Karen Peterson, Founder and CEO, The National Girls Collaborative Project

The National Girls Collaborative Project (NGCP) brings together organizations throughout the United States that are committed to informing and encouraging girls to pursue careers in science, technology, engineering, computer science, and mathematics. NGCP serves more than 35,000 programs in 41 states and uses a collective impact model that builds the capacity of educational programs.

With a desire to support the development of effective and equitable computer science opportunities for girls and the acknowledgment that many nonprofits lack the evaluative capacity needed to ensure high-quality programming, the [Google K-12 Outreach](#) team and NGCP developed the CS Outreach Program Evaluation Network (CS OPEN). Launched in 2015 at an event co-hosted by the Center for Gender Equity in Science and Technology and the White House Council on Women and Girls, CS OPEN provides support to develop the evaluative capacity of network grantees. The CS OPEN is designed to improve opportunities and empower underserved girls through CS education by boosting program knowledge on exemplary evaluation practices in studying CS education.

Google, in partnership with [Haynie Research and Evaluation](#), provides expertise and professional development to promote evaluation of CS education initiatives within the NGCP network. The overall goal of the network is not only to enhance the participating programs, but also to inform the field of CS education. The CS OPEN is designed to meet a wide range of needs through professional development opportunities and individualized support. NGCP identifies potential applicants, leads the selection process, and manages the grantee community. Grantees receive the following benefits:

- The CS OPEN network community of practice, including monthly web-based meetings with topic-based trainings and sharing of successes and challenges
- Grantee involvement in their own evaluation process, including writing an evaluation plan, developing instruments, collecting data, analyzing data, and reporting
- A web repository of online evaluation resources
- Individualized support and mentoring

From 2015-2018, 16 CS OPEN projects have served a total of 6,823 participants, of which 5,028 were girls. Project evaluations were conducted by each of the grantees. Each of the project evaluations included an evaluation plan, evaluation questions, methodology, a data collection plan, analysis work, and a final report to the CS OPEN team. Because of CS OPEN funding, eight new project evaluations were implemented and eight existing evaluation efforts were expanded. Grantees were asked through the surveys, interviews, and a final report to describe their growth in evaluative capacity, as well as the ways they attribute this growth to participating in the CS OPEN initiative.





Expanding the Pipeline *(continued)*

“It was helpful to learn I wasn’t alone – there are a lot of people all over the United States doing this stuff. It was encouraging to me. The ideas and plans that everyone was doing. Different ideas, but at the end we all have the same goal.”

—Regarding Monthly Community Meetings

“We were able to consult not only with local evaluators, but also with the CS-Open team and other awardees. Due to the similarities of several CS-Open projects, we were able to get ideas and receive feedback as part of our monthly meetings.”

*—Regarding Collaboration with other
CS OPEN Grantees*

Grantees were asked through surveys, interviews, and a final report to describe their growth in evaluation capacity. These are some of the skills and advancements grantees self-reported as correlated with participation in the CS OPEN initiative:

- Actively streamline evaluation tools across all programs
- Created and developed better evaluation tools and instruments with more relatable context
- Empowering all staff
- Qualitative evaluation approaches
- Creating milestones and measures, developing survey schedules
- Transcribing data

When analyzed collectively, the broader evaluation findings on engaging girls in CS education were as follows:

- Tap girls’ natural enthusiasm at young ages. Girls are interested and want to be engaged in computer science.
- Consider best environments. Girls do well in all-girl settings. Physical activity can be integrated.
- Offer hands-on, exploratory activities. Use hands-on activities, not lectures. Make activities engaging and relevant.
- Provide support and encouragement. Provide help that is always available.
- Use longer delivery formats. More contact time can support stronger outcomes.
- Provide role models, a vision for future career. Linking CS to the real world is key.

The CS OPEN community meets quarterly to focus on evaluation capacity building, responding to the needs of the community. Applications for the next cohort of CS OPEN grantees will be announced in early 2019. To learn more, visit the NGCP [website](#), and contact Karen Peterson at kpeterson@ngcproject.org to get involved in the community.



**CRA-W**Computing Research Association
Women

Expanding the Pipeline *(continued)*

Grantees and Members of the CS OPEN Community

Digital Girl, Inc.

DIY Girls

LA Makerspace

TechGirlz

Boys & Girls Clubs of Austin Area

CodeNow

CU Science Discovery

GEMS: Girls Excelling in Math and Science

Girl Scouts of Connecticut

Mobile Apps for Hartford

OSU Open Campus

STEM Academy @ OSU

UMBC

University of New Hampshire

Women in Science and Engineering Community Outreach

Young Women in Computing

About the Author

Karen Peterson is the founder and CEO of the National Girls Collaborative Project. She has more than 25 years of experience in education as a classroom teacher, university instructor, teacher educator, program administrator, and researcher. Peterson is also Co-Principal Investigator for Leap into Science: Cultivating a National Network for Informal Science and Literacy, STEM Integration into Digital Forensics Science Learning, SciGirls Code: A National Connected Learning Model to Integrate STEM Learning with Middle School Girls, and Code: SciGirls! Media to Engage Girls in Computing Pathways. All of these projects are funded by the National Science Foundation and address gender, racial, and socioeconomic underrepresentation in STEM fields. Many of them access the NGCP's national network and dissemination tools to distribute, scale-up, and/or replicate project outcomes. These projects have leveraged Karen's expertise in STEM equity project development, effective national scale-up strategies, dissemination, and capacity building.

The National Girls Collaborative Project™ has been partially funded by a grant from the National Science Foundation, "GSE/EXT: National Girls Collaborative Project: Building the Capacity of STEM Practitioners to Develop a Diverse Workforce," grant HRD-1532643.



CRA-E Selects 2018 Graduate Fellow



CRA's **Education Committee** (CRA-E) has recently selected its 2018 CRA-E Graduate Fellow – Robert (“Rob”) Bowden. Rob is a Ph.D. student in computer science at Harvard University. After earning his undergraduate degree at Harvard in 2013, he spent a year working as the course preceptor for Harvard’s CS50 course, and then returned to graduate school with Margo Seltzer as his adviser. Rob’s Ph.D. research includes work on file systems and code synthesis. His current work focuses on how to use the vast amount of CS50 solutions generated by students to not only detect errors on student programs but also propose ways to fix them. Rob’s goal is to advance automated program repair of buggy solutions to introductory programming assignments.

Over the past four years, Robert has been a Freshman Proctor and a Teaching Fellow for a wide range of undergraduate courses. In this mentoring role, Rob lives in a freshman dorm alongside thirty first-year students, and is the primary academic advisor for many of them. Rob has an interest in computer science education, with a focus on students underrepresented in computer science and undergraduate research, including first-generation college students. Rob has served as the research mentor for a number of undergraduates.

CRA-E Fellow Keith Feldman (University of Notre Dame) ends his term this year. Keith helped improve the usability and resources on the CRA-E **Conquer** site and started the “**Undergraduate Research Highlights**” series, which showcases outstanding research done by undergraduate students at universities and colleges across North America. Keith has completed his Ph.D. and will continue at Notre Dame working on a long-term collaboration with a group in Brazil. He will teach a course in healthcare analytics in the fall, and will be pursuing work at a children’s research hospital the following year. CRA-E Fellow **Booma Sowkarthiga Balasubramani** will continue for a second year.

The **Graduate Fellows Program** was established in 2015 to give graduate students the opportunity to contribute to **CRA-E projects** and promote computer science research and undergraduate education at the national level. CRA would like to thank Nancy Amato (chair) and Jeff Forbes for managing the selection process last year.

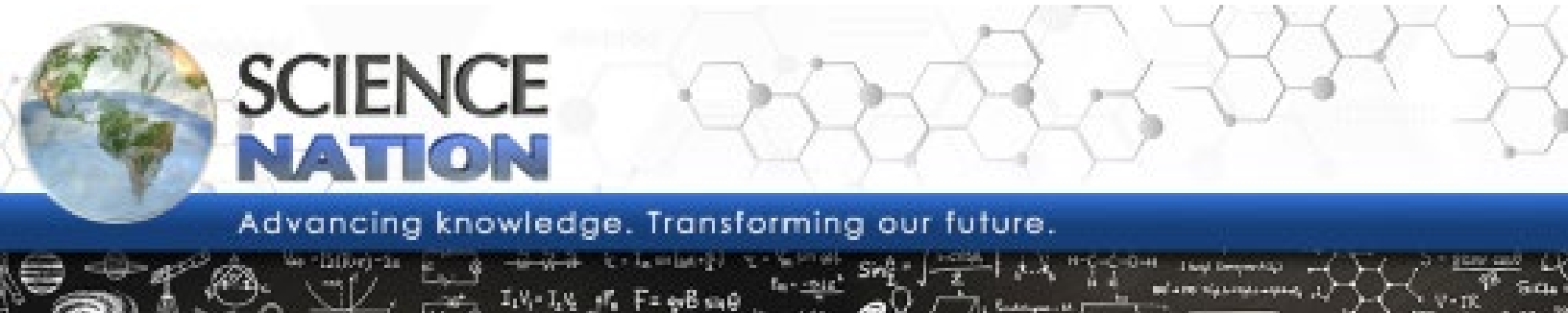
NSF Science Nation Highlights CCC Council Member Shwetak Patel's Ubicomp Lab



CCC

Computing Community Consortium
Catalyst

By CCC Staff, and Shwetak Patel



Would you like to know how much energy your living room TV is using when it is running? What about when how much it uses while still plugged in and turned “off”? How about checking to see if your newborn baby has jaundice using your smartphone? Would that be helpful? All these practical applications are now possible using a smart sensor in the home and on your phone.

The **National Science Foundation Science Nation** recently went to the **Computing Community Consortium (CCC)** council member **Shwetak Patel's lab to learn how to use smart sensors to create a breakdown of the everyday energy in the home.** The goal of Patel and his team is to empower people to make better decisions for themselves and their homes. They use machine learning and pattern matching on the signals from the smart sensors to recognize and monitor the electrical outputs from various appliances.

Similarly, pattern matching can be applied to sensors found on smartphones. Patel and his team, for example, use a smartphone's microphone to listen for coughs or breathing and identify possible health indicators that the human ear might not be able to detect. Just like with your smart sensor that tracks energy use in the home, they can construct models based on the frequency and sound of a cough and look at patterns. This early prevention of illness, which could theoretically alert people before they become even more symptomatic has the potential to change the course of a disease.

While this is just the beginning, it is an exciting look into the future of medicine and the future of smart homes. See **the full video** and **UW Ubicomp Lab website** to learn more.

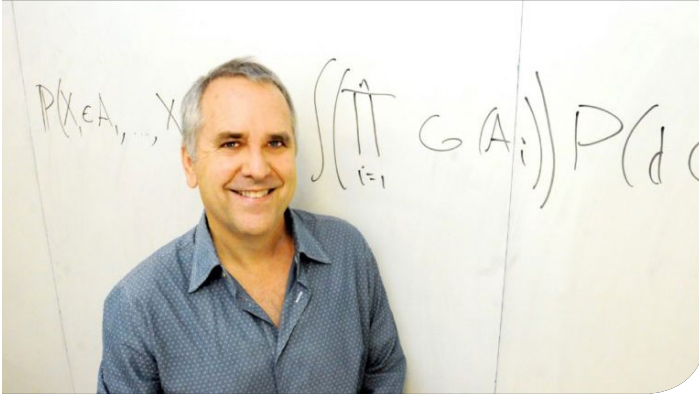
Artificial Intelligence—The Revolution Hasn't Happened Yet



CCC

Computing Community Consortium
Catalyst

By CCC Staff, and Maja Mataric



If we train Artificial Intelligence (AI) to do our work for us it will still need to be periodically checked for errors and random noise. This detailed human oversight is not something we can skip. As AI has more and more power, it will also have more responsibility and the decisions it makes could be deadly if incorrect. We still have so much to learn about building machines that could potentially make life-altering decisions, and we cannot predict what kinds of serious engineering flaws will occur in the future.

Michael I. Jordan, Photo credit: Peg Skorpinski

Michael I. Jordan from the **University of California, Berkeley**, recently wrote an article for **Medium** called **Artificial Intelligence—The Revolution Hasn't Happened Yet**. He points out that the current public understanding and dialog on AI can potentially blind us to “the challenges and opportunities that are presented by the full scope of AI, intelligence augmentation, and intelligent infrastructure.”

Jordan stresses that while industry will continue to drive the developments of these technologies, it is also critically important that academia play an “essential role.” Academia has the ability to bring together an interdisciplinary team of researchers who are not only in “computational and statistical disciplines” but also in “the social sciences, the cognitive sciences, and the humanities.” How can we even begin to imagine the next phase of AI if we do not take into account human interactions, societal norms, and other aspects of the social sciences? As Jordan says, we need to “broaden our scope, tone down the hype and recognize the series challenges ahead.”

See the **full article on Medium here**.

CCC Workshop on Robotic Materials

By Nikolaus Correll



The **Computing Community Consortium (CCC)** recently sponsored a workshop on “**Robotic Materials**” in Washington, DC. This workshop was the second **in a series of interdisciplinary workshops** aimed at transforming our notion of materials to become “robotic”, that is have the ability to sense and impact their environment. Participants were recruited from a diverse set of stakeholders including material and computer scientists, researchers in government labs, industry, government agencies, and policymakers.

There was broad agreement that computation will become an important part of future material systems. Computation will allow materials to analyze, change, store and communicate states in ways that are not possible using mechanical or chemical processes alone. Yet, what “computation” is, is unclear to most material scientists, whereas computer scientists are largely unaware of recent advances in so-called active and smart materials. For example, there is agreement that a nervous system is a critical part of natural material systems such as an octopus arm, a cuttlefish skin or even a bone, but it is hard to see what is computed and communicated. Yet, there is agreement that everything that can be computed can also be achieved by smart arrangement of mechanical processes, an insight rooted in the concept of Turing universality of mechanical computers. Here, a dialog and formal understanding of what is physically possible, e.g. stimulus-responsive “smart materials”, and how an abstract treatment of these concepts allows for mathematical reduction might enable the creation of new materials

with unprecedented functionality without requiring von Neumann architectures. This gap is currently shrinking, with Computer scientists embracing neural networks and material scientists actively researching novel substrates such as memristors and other neuromorphic computing devices.

Both material and computer scientists are intrigued alike that biological material systems are exclusively made from cells, which is in contrast with engineered materials that are homogeneous or composites at best. Unlike conventional material systems, biological cells rely on digital information in the form of DNA that control their formation and enable their rapid evolution. It is conceivable that material engineering might reach similar sophistication, pioneered by subfields of computer science such as modular robotics, swarm robotics, social insects and amorphous computing. The latter has already begun to blend with the field of synthetic biology, creating inroads between computer scientists and chemists, and thereby material scientists.

Further pursuing these ideas will require an emphasis on interdisciplinary collaboration between chemists, engineers, and computer scientists, possibly elevating mankind to a new material age that is similarly disruptive as the leap from the stone to the plastic age. With the fast convergence of technologies that are already happening such a transition might not require an additional 300000 years, but merely a few decades.

See the **workshop website** for more information including the forthcoming workshop report.





CRA CONFERENCE 2018 AT SNOWBIRD

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For the latest program update visit:

<https://cra.org/events/2018-cra-conference-snowbird/#agenda>



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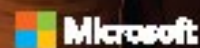
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EPFL

Post-Doctoral Researcher in Security and Privacy

Participate in strategic research projects in the area of data privacy and security, with an emphasis on health-related data and personalized medicine.

Full job description and application procedure:

<https://recruitingapp-2863.umantis.com/Vacancies/542/Description/2>

Georgetown University

Teaching Faculty

The Department of Computer Science at Georgetown University is seeking an Assistant Teaching Professor and multiple adjunct faculty for the coming year.

The Assistant Teaching Professor will teach three introductory courses per semester, including Data Structures and our Advanced Programming class in Java. Courses are generally capped at 45 students. Candidates must have completed a PhD in Computer Science or a related field by August 1, 2018. Experience with curriculum planning and student advising is preferred, as are applicants who conduct research in computer-science education or whose research interests align with those of the department.

Please apply using this link: https://georgetown.wdl.myworkdayjobs.com/en-US/Georgetown_Faculty/job/Main-Campus/Assistant-Teaching-Professor--Department-of-Computer-Science_JR03870



Postdoctoral Fellow in Center For Complex Networks and Systems Research

The Center for Complex Networks and Systems Research (CNetS.indiana.edu) has one open postdoctoral position to conduct an empirical investigation of time-evolving processes in large-scale complex networks, with a focus on scholarly communication. The appointment starts in September 2018 for one year and is renewable for another year, subject to funding and performance. The salary is competitive and benefits are generous.

The postdoc will join a dynamic and interdisciplinary team that includes computer scientists, physicists, and social scientists. The postdoc will work with Prof. Johan Bollen (www.informatics.indiana.edu/jbollen/) and Prof. Filippo Radicchi (homes.soc.indiana.edu/filradicchi/)

Minimum Qualifications:

The ideal candidate will have a PhD in Physics, Applied Mathematics, Computer Science, or Computational Science; a strong background in analysis and modeling of complex systems and networks; and solid programming skills necessary to handle big data and develop large scale simulations.

Salary: Commensurate with qualifications and experience.

Rank: Postdoctoral Fellow

Appointment Type: Twelve-month non-tenure track appointment subject to satisfactory performance and funding; Potential to be extended annually for a maximum term of 2 years, subject to performance and funding. Position is currently funded for two years.

Apply Online at: <https://indiana.peopleadmin.com/postings/5933>

Special Instructions: Interested applicants should upload a letter of interest, CV, and contact information for three professional references using above application link.

Questions may be sent to: tgholbro@indiana.edu

For Best Consideration Apply By: July 1, 2018

Ideal Start Date for position: September 1, 2018

Indiana University is an equal employment and affirmative action employer and a provider of ADA services. All qualified applicants will receive consideration for employment without regard to age, ethnicity, color, race, religion, sex, sexual orientation or identity, national origin, disability status or protected veteran status.

We are also seeking instructors for elective courses for graduate and undergraduate students for the Fall of 2018.

We are seeking a graduate course in deep learning or in other areas of professional interest to graduate students that are taught by people who have extensive experience in the area taught. We are interested in two undergraduate courses in: software engineering; parallelism in systems, algorithms, or programming; HCI; or a rigorous course in web development.

We also welcome proposals for other electives that would be of interest to undergraduates that reflect the expertise of the instructor.

To apply, please submit a single PDF file that contains: a cover letter that addresses the instructors experience in the topic proposed and interest in teaching; a CV or resume; a proposed course description or syllabus, including individual topics, brief project descriptions and grading criteria. For questions or to apply, please email

Clay Shields clay@cs.georgetown.edu.
Applications will be considered on a rolling basis starting on May 14th, 2018.

Georgetown University is an Equal Opportunity/Affirmative Action Employer fully dedicated to achieving a diverse faculty and staff. All qualified applicants are encouraged

to apply and will receive consideration for employment without regard to race, color, religion, national origin, age, sex (including pregnancy, gender identity and expression, and sexual orientation), disability status, protected veteran status, or any other characteristic protected by law.



Postdoctoral Fellow in Center For Complex Networks and Systems Research

The Center for Complex Networks and Systems Research (CNetS.indiana.edu) has one open postdoctoral position to study critical processes in networks of networks. The appointment starts in August 2018 for one year and is renewable for another year, subject to funding and performance. The salary is competitive and benefits are generous.

The postdoc will join a dynamic and interdisciplinary team that includes computer, physical, and cognitive scientists. The postdoc will work with Prof. Filippo Radicchi (homes.soic.indiana.edu/filiradi/).

Minimum Qualifications:

The ideal candidate will have a PhD in Physics or Applied Mathematics; a strong background in analysis and modeling of complex systems and networks; and solid programming skills necessary to handle big data and develop large scale simulations.

Salary: Commensurate with qualifications and experience.

Rank: Postdoctoral Fellow (RSP)

Appointment Type: Twelve-month non-tenure track appointment subject to satisfactory performance and funding. Potential to be extended annually for a maximum term of 2 years, subject to performance and funding. Position is currently funded for two years.

Apply Online at: <https://indiana.peopleadmin.com/postings/5833>

Special Instructions: Interested applicants should upload a letter of interest, CV, and contact information for three professional references using above application link.

Questions may be sent to filiradi@indiana.edu

For Best Consideration Apply By: June 1, 2018

Ideal Start Date for position: August 1, 2018

Indiana University is an equal employment and affirmative action employer and a provider of ADA services. All qualified applicants will receive consideration for employment without regard to age, ethnicity, color, race, religion, sex, sexual orientation or identity, national origin, disability status or protected veteran status.

Johns Hopkins University

Postdoctoral Researcher

The Center for Language and Speech Processing (CLSP) at Johns Hopkins University seeks postdoctoral fellows in natural language processing, machine learning and health informatics.

Example topics include:

- Social Media Trend Detection
- Clinical NLP
- Cross-lingual Information Retrieval
- Multilingual Morphology and Low-Resource MT

CLSP is one of the world's largest academic centers focused on speech and language. CLSP is home to a dozen faculty members, half a dozen postdocs, and over 60 graduate students.

Details: <https://www.clsp.jhu.edu/employment-opportunities/>

NEC Laboratories America

Researcher and Senior Associate

Researcher - Data Science & Systems Research

The Data Science & Systems Research Department of NEC Laboratories America aims to build novel big data solutions and service platforms that simplify complex computer systems management, and to develop new information technology that supports innovative applications, from big data analytics to the Internet of Things. Our research is both experimental and theoretical, covering many domains in

Professional Opportunities

data science and system research, such as: time series mining, graph mining, deep learning, text mining, anomaly detection, signal processing, cloud computing, data centers, software-defined networking and streaming processing.

The goal of our research is to fully understand the dynamics of big data from complex systems, retrieve patterns to profile them and build innovative solutions to help end user managing those systems. We have built a number of analytic engines and system solutions to process and analyze big data and support various applications in detection, prediction and optimization. Our research leads to both award-winning NEC products and publications in top conferences.

Our group is looking for Researchers and Senior Associate Researchers to work in the areas of artificial intelligence, machine learning and data mining. The ideal candidate must have expertise in one of the above areas, and can develop algorithms to analyze massive data and build innovative applications. He/she must have a PhD in CS/CE with a strong publication record in at least one of the following areas:

- Machine learning and AI (Especially neural networks and deep learning)
- Text mining and information retrieval
- Time series analysis and prediction
- Graph and information network mining
- Data mining and statistical learning
- Large scale optimization and learning
- Signal processing, image processing and computer vision

NEC Labs 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, access <http://www.nec-labs.com/>, and submit your CV and research statement through our career center at https://www.appone.com/MainInfoReq.asp?R_ID=1802426.

EOE-M/F/D/V

Occidental College

Full-Time Adjunct Instructor in Computer Science

Occidental College is seeking applicants for a 1-year, full time Adjunct Instructor who will teach the following four courses (a combined 3/3 load) during the 2018-2019 academic year, starting in late August 2018.

Fall 2018: Fundamentals of Computer Science is an introductory course for beginners in computer science, covering variables, branches, loops, and basic OOP in Python, but also briefly introduces Java, HTML, and CSS. The course has two three-hour lab sections in addition to three hours of lecture, for a total of nine hours of contact a week. This course and its labs count as 2 teaching units.

Fall 2018: An upper division elective to be chosen by the successful candidate. This course counts as 1 teaching unit.

Spring 2019: Fundamentals of Computer Science and its labs.

Spring 2019: Mathematical Foundations for Computer Science is a course for students who prefer not to take Linear Algebra and Discrete Math. It is a one-semester course with 4-week units on each of logic and intro to proofs, linear algebra, and statistics. This course counts as 1 teaching unit.

Applicants should have a Master's degree in computer science or a related field, with PhD and college-level teaching experience preferred. Applicants should submit a curriculum vitae, statement of teaching interests and experience (maximum two pages), and a list of references to the Chair of Computer Science, Kathryn Leonard (leonardk@oxy.edu), with the subject "Computer Science Adjunct Application." Review of applications will begin immediately and will continue until the position is filled. Applications from all qualified candidates may be kept on file for future semesters.

Occidental College serves a diverse body of students, a diversity which is reflected in the enrollment in computer science courses. Women, persons of color, and minorities are strongly encouraged to apply. Please direct all questions about the position to Kathryn Leonard.

Occidental College is an Equal Opportunity Employer and does not discriminate against employees or applicants because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender,

gender identity, gender expression, age, or sexual orientation or any other characteristic protected by State or Federal Law.

Queens College of the City University of New York

Lecturer Computer Science

The Department of Computer Science at Queens College of CUNY is accepting applications for a Lecturer position starting Fall 2018.

Consult <http://www.cs.qc.cuny.edu> for further information.

UNC Charlotte

College of Computing and Informatics Bank of America Endowed Chair in Computing and Informatics

UNC Charlotte The College of Computing and Informatics at the University of North Carolina at Charlotte (<http://cci.uncc.edu/>) invites applications for Bank of America Endowed Chair in Computing and Informatics. The ideal candidate is a highly motivated, exceptionally qualified faculty member with an international reputation for establishing research programs, including interdisciplinary collaborative programs, in computational analytics.

UNC Charlotte is North Carolina's urban research university. Located in the state's largest metropolitan area, it is the fastest growing university in the UNC System. The College doubled its size over the past 5 years and is currently the academic home

for over 3,000 students pursuing BA, BS, MS, and PhD degrees. UNC Charlotte's Data Science initiative (dsi.uncc.edu) is the major emphasis area for education, research and industry collaboration.

Detailed position and the application process descriptions are available at <https://cci.uncc.edu/about-us/job-opportunities/departments-computer-science>. Candidate reviews will start on June 1, 2018.

Applications must be made electronically at <https://jobs.uncc.edu> (Position No. 004654) and should include a statement of interest, CV, a statement of teaching, research and leadership, copies of five representative scholarly publications and contact information of at least three references. For additional information, contact Prof. Daniel Janies (djanies@uncc.edu).

As an EOE/AA employer and an ADVANCE Institution that strives to create an academic climate in which the dignity of all individuals is respected and maintained, the University of North Carolina at Charlotte encourages applications from all underrepresented groups.

University of British Columbia

Master of Data Science Program Postdoctoral Teaching and Learning Fellow

The University of British Columbia, Vancouver invites applications for a Postdoctoral Teaching & Learning Fellow, associated with the Master of Data

Science (MDS) program. This program is a collaborative effort of the Department of Computer Science and the Department of Statistics, within the Faculty of Science. The Fellow may be based in either department and will work closely with colleagues from both departments.

The MDS program focusses on the innovative and responsible use of Data Science tools across a broad spectrum of data types and domain areas. It is a 10-month, full-time program, delivered in course modules of four-week durations. The last two months are devoted to a capstone project. The first cohort of students began their studies in September 2016.

The position is subject to final budgetary approval. The Fellow will be appointed for up to one year (with the possibility of renewal), with an anticipated start date of August 1st, 2018. The Fellow will primarily report to the MDS Program Directors. We anticipate being able to offer a competitive salary compared to norms for postdoctoral fellowships.

The application package should contain the following elements: cover letter, curriculum vitae, teaching statement, contact information for three references, and any other pertinent information (e.g., links to relevant data scientific work or evidence of teaching effectiveness). The cover letter should specifically address how this position relates to the applicant's experience and career aspirations. The application should be sent to info-mds@science.ubc.ca either a single combined PDF file or a link to a public GitHub repository containing the application materials. Applications will be

reviewed as they arrive; those received by June 7, 2018 will receive full consideration.

Equity and diversity are essential to academic excellence. An open and diverse community fosters the inclusion of voices that have been underrepresented or discouraged. We encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Metis, Inuit, or Indigenous person. All qualified candidates are encouraged to apply; however Canadians and permanent residents of Canada will be given priority.

University of California, Riverside

Faculty Position (Open Rank) in Computer Engineering

The Electrical and Computer Engineering (ECE) department at University of California, Riverside invites applications for a faculty position (open rank) in Computer Engineering. The position may be filled starting the winter quarter of 2019, but the search will continue, with a possible later starting date, until the position is filled.

Applicants are invited in all major areas of Computer Engineering such as embedded and real-time systems, cyber-physical systems, connected and automated systems, computer architecture, design automation, and VLSI design. For appointments at the Assistant

Professor (JPF00905) level, we seek candidates that demonstrate potential for exceptional research and teaching. For appointments at the Associate or Full Professor (JPF00906) level, we will consider candidates with an exceptional track record in research, teaching and graduate student supervision. The position requires a Ph.D. in Computer Engineering, Electrical Engineering or Computer Science at the start of employment.

The Department of Electrical and Computer Engineering has over 30 faculty members. Over half of our senior faculty members are fellows of IEEE, AAAS or other professional societies, and 12 junior faculty members have been awarded Young Investigator/ CAREER awards. The ECE department is focused on research and graduate education, with over 150 graduate students and over \$7 million USD in new grants annually. Our faculty are active in areas including computer engineering, robotics and controls, computer vision and machine learning, intelligent systems, smart grids and energy, nano materials and devices and signal processing. The ECE department was ranked 24th overall in the scholarship metric in the latest National Research Council (NRC) rankings. The position also includes appointment in the Computer Engineering Program, which is jointly administered with the Computer Science and Engineering Department. More information on the department is available at <http://www.ece.ucr.edu>

Salary level will be competitive and commensurate with qualifications and experience. Advancement through the

faculty ranks at the University of California is through a series of structured, merit-based evaluations, occurring every 2-3 years, each of which includes substantial peer input.

Full consideration will be given to applications received by August 31, 2018. We will continue to consider applications until the position is filled. To apply, please submit your application materials (CV, cover letter, statement of research, statement of teaching, statement of contributions to diversity, and contact information for 3 references for Associate/ Full Professors level through the web link at <https://aprecruit.ucr.edu/apply/JPF00906>. For Assistant Professors use the web link at <https://aprecruit.ucr.edu/apply/JPF00905>. For inquiries and questions, please contact us at cen-search@ece.ucr.edu at <http://www.engr.ucr.edu/about/employment.html>.

UCR is a world-class research university with an exceptionally diverse undergraduate student body. Its mission is explicitly linked to providing routes to educational success for underrepresented and first-generation college students. A commitment to this mission is a preferred qualification.

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

Professional Opportunities

University of Copenhagen

PhD fellow(s) in Algorithms

Department of Computer Science,
University of Copenhagen is offering
Postdoctoral Fellowships in algorithms
expected to commence 1 October 2018 or
as soon as possible thereafter.

The applications deadline is 1 July 2018.

Please find the full announcement at
<http://barc.ku.dk/about/#career>

University of Massachusetts Amherst

PT Lecturer/Sr. Lecturer

The College of Information and Computer
Sciences (CICS) of the University of
Massachusetts at Amherst is looking
to fill multiple part-time Lecturer or
Sr. Lecturer openings. For a complete
position announcement including
minimum qualifications and application
instructions, please see <http://umass.interviewexchange.com/jobofferdetails.jsp?JOBID=96602>.

The University of Massachusetts Amherst
is an Affirmative Action / Equal Opportunity
Employer of women, minorities, protected
veterans, and individuals with disabilities,
and encourages applications from these
and other protected group members.

University of Massachusetts Amherst

Teaching Fellow

The College of Information and Computer
Sciences (CICS) at the University of
Massachusetts Amherst is looking to fill
multiple openings for Teaching Fellows.
This is a position targeting new PhDs who
hope to increase their teaching experience,
but also have the opportunity to continue
their research to prepare themselves for
a future faculty position. For a complete
position announcement including
minimum qualifications and application
instructions, please see <http://umass.interviewexchange.com/jobofferdetails.jsp?JOBID=96543>.

The University of Massachusetts Amherst
is an Affirmative Action / Equal Opportunity
Employer of women, minorities, protected
veterans, and individuals with disabilities,
and encourages applications from these
and other protected group members.

University of Rochester

Teaching Position in Computer Science

The University of Rochester's Department
of Computer Science seeks applicants for a
full-time teaching position, as an assistant,
associate, or full professor of instruction
(non-tenure), or lecturer. Candidates must
have a PhD in computer science or a related
discipline (or industry experience/expertise
commensurate with having earned a PhD).
The preferred candidate will have college
teaching experience, a strong commitment
to working with students, the ability and

passion to help develop new courses along
with any necessary labs, and high personal
motivation and responsibility. The position
may start as early as July 1, 2018.

Responsibilities will include:

Instruction – Teach three courses per
semester (for a total of 6 per year). These
may include required courses for the
computer science undergraduate major in
addition to more advanced undergraduate
and graduate courses, in consultation
with the chair and the undergraduate and
master's program directors.

Advising – Advise CS undergraduate majors
and/or MS students. Participate in academic
advising sessions, open houses, etc.

Administration – Handle any non-
routine issues with regard to students
on probation/dropped from major, pre-
graduation review, etc.

Program Development – Participate
in the development of new course
clusters, joint ventures with other
departments, etc., in conjunction with
other faculty and undergraduate and
Master's program directors.

Promote undergraduate and Master's
participation in research projects. Promote
and coordinate undergraduate summer
employment, both within and outside the
department (industrial practica, summer
research, etc.). Develop more active
programs for undergraduate recruiting
(robot fair, high school visits, etc.)

Candidates should supply a letter of
interest, curriculum vitae, a teaching
statement, and the names of 3 references.

Apply online at <https://www.rochester.edu/faculty-recruiting/login>

For more information about the Computer Science department, please visit:
<https://www.cs.rochester.edu>

EEO/AA Policy

The University of Rochester is an Equal Opportunity Employer:

EOE Minorities/Females/Protected Veterans/Disabled

University of Stuttgart, Germany

Faculty of Computer Science, Electrical Engineering and Information Technology

Full Professorship (W3) in Autonomous Systems

The professorship will be part of the newly established Institute for Artificial Intelligence (IfKI) within the Faculty. It will cover the area of autonomous, cooperative, cognitive and self-aware systems in research and teaching. The focus of the professorship should be on methods for modeling, realization and evaluation of such systems, including drones and robots. Its scope can stretch from individual systems to distributed systems-of-systems. The Faculty is looking for candidates with an excellent and internationally recognized record of scientific achievements in several of the following fields:

- Context and situation recognition
- Self-aware systems, including environment modeling and state estimation

- Functional safety and robustness of autonomous systems
- Security and privacy in autonomous systems
- Self-test, self-diagnosis and self-repair
- Methods for cooperation, navigation and planning for autonomous systems
- Methods of human-machine cooperation for autonomous systems
- Machine learning for autonomous systems
- Architectures of autonomous systems

The Faculty expects that the new colleague participates in its interdisciplinary research activities and actively acquires research funding from public and industrial sources. The Faculty currently plays a significant role in Collaborative Research Centers of the DFG, in Germany's Excellence Strategy, and in research initiatives of the Federal State of Baden-Württemberg (Cyber Valley).

In teaching, we expect involvement in the study programs of the Department of Computer Science, in particular in the focus area Autonomous Systems; in the international study program Information Technology; and in courses offered for study programs of other Faculties.

The requirements for employment listed in § 47 and § 50 Baden-Württemberg university law apply.

Written applications (including a detailed curriculum vitae, certificates, list of publications, research and teaching statement, re-prints of up to five selected publications as well as the application form available from www.f05.uni-stuttgart.de/open-positions) should be sent no later than June 4th, 2018 to the Dean of the

Faculty of Computer Science, Electrical Engineering and Information Technology, University of Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany, and if possible by Email to: dekanat@f05.uni-stuttgart.de

The University of Stuttgart has established a Dual Career Program to offer assistance to partners of those moving to Stuttgart. For more information, please visit the website: <https://www.uni-stuttgart.de/universitaet/arbeitsgeber/dualcareer/>

The University of Stuttgart is an equal opportunity employer. Applications from women are strongly encouraged. Severely challenged persons will be given preference in case of equal qualifications.

University of Tartu

Six Junior Research Group Leader Positions

University of Tartu is calling for applications from highly promising early-career researchers to fill six Independent Junior Group Leader positions in the areas of **AI, Data Analytics, Health Informatics, Security and Privacy, Mixed Reality, and Robotics.**

University of Tartu is ranked as the leading research university in "new Europe" (the EU-13 group of countries) by the Times Higher Education regional ranking. Its Computer Science department is ranked in the top-2 in Central and Eastern Europe according to the field-specific Times ranking 2018.

The new Junior Research Groups will be created as part of a national strategic initiative to boost the Estonian ICT

Professional Opportunities

research capacity. Each Junior Group Leader position comes with a seed grant of 1.25 million euros over 5 years, which will cover the salary of the group leader, two postdoc positions, three PhD studentships, and other expenses. The salary of the Junior Group Leader will be internationally competitive: in the range of 3000-3500 euro per month plus access to the national health and social security system, paid by the employer on top of the salary. Estonia applies a flat income tax of 20%.

The ideal candidates have:

- 4-7 years of postdoctoral experience
- High-quality publications in the finest venues in their specialty
- An ambitious long-term research vision
- Ability to attract prestigious grants and high-level funding in a four-years horizon, such as an ERC - Starting or Consolidator Grant, FET project, DARPA project, or other substantial and prestigious grants.

The Junior Group Leaders will be hired on indefinite contracts. University of Tartu is committed to open professorial positions in areas matching the specialties of the successful Junior Group Leaders within a five years term, in order to allow them to pursue a professorial career at the University past their initial seeding period.

Further information: www.cs.ut.ee/jobs and ics@ut.ee

University of Texas at San Antonio

Faculty Positions in Computer Science

The Department of Computer Science at The University of Texas at San Antonio invites applications for multiple full-time, non-tenure track faculty positions, starting in Fall 2018. Interested candidates whose teaching interests are aligned with one or more of the following topics clusters are encouraged to apply. Depending on the qualifications and experience, the successful candidates may be considered at the level of Lecturer III, Senior Lecturer, Assistant or Associate Professor in Practice.

- **Topics Cluster 1:** C programming and data structures (stacks, linked lists, queues, binary trees, graphs, associative arrays), and related courses
- **Topics Cluster 2:** Java Programming, object-oriented programming, UML, GUI development, software life cycle and tools (Eclipse, Git, JavaFx), and related courses
- **Topics Cluster 3:** Programming Languages and Concepts (C, Java, LISP, Python, C++, storage management, data representation, bindings, data control, operations, sequence control, language syntax), and related courses
- **Topics Cluster 4:** Systems Programming (shell programming, Linux utilities, bash, sed, awk, regular expressions, low-level C programming, Python, file I/O, process control, interprocess communication), and related courses

See <http://www.cs.utsa.edu/about/nttsearch/> for information on the Department and application instructions. Screening of applications will begin

immediately. The University of Texas at San Antonio is an Affirmative Action/Equal Opportunity Employer.

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

University of Toronto in collaboration with Carnegie Mellon

Postdoc in Dynamic Enhancement & Personalization of Educational Technology

Postdoc will set agenda in collaboration with Joseph Jay Williams (www.josephjaywilliams.com/postdoc). Topics include intelligent systems for conducting interventions to dynamically enhance and personalize real-world education (from K12/university students to crowd workers) and mental health, crowdsourcing & human computation, interpretable and interactive machine learning.

Virginia Tech

Research Assistant Professor / Postdoctoral Research Associate / Research Associate

Virginia Tech (<https://vt.edu/>), founded in 1872 as a land-grant institution, is currently ranked as a Top 25 Public University by US News & World Report (USNWR) and a Top 25 Public Research University by the National Science Foundation. The Department of Electrical and Computer Engineering (ECE; <https://ece.vt.edu/>)'s graduate programs are ranked in the Top 20 by USNWR.

Professional Opportunities

ECE's Systems Software Research Group (SSRG; <http://www.ssrgece.vt.edu/>) has multiple research positions available in the category of Research Assistant Professor, Postdoctoral Associate, and Research Associate. The positions involve conducting research in the areas of operating systems, virtualization, programming languages, compilers, and formal methods, and their intersection across different projects. Projects in operating systems involve developing innovative operating systems for emerging multicore platforms, in particular those with heterogeneous instruction sets, from node-scale (e.g., ARM/x86, CPU/GPU/FPGAs) to rack-scale (e.g., Scale-out processors, Firebox). Virtualization projects involve designing hypervisor systems with significantly reduced attack surface and strong degree

of isolation in untrusted, publicly available cloud computing environments. Projects in languages and compilers involve designing domain-specific languages that automatically generate parsers for OS/hypervisor input handling, following the language-theoretic security paradigm. Projects in formal methods involve verifying machine code through de-compilation, instruction-set-architecture formalization (e.g., x86, ARMv8), and reasoning about program behaviors, all inside theorem provers (e.g., Isabelle/HOL). A cross-cutting theme across projects is to understand how to build software systems that are scalable, energy-efficient, reliable, and secure.

More details about the position, research projects, etc. can be found at: <http://www.ssrgece.vt.edu/positions.html>

Position-specific responsibilities, minimum required qualifications, and details on how to apply are available at:

- Research Assistant Professor: <https://listings.jobs.vt.edu/postings/68372>
- Postdoctoral Associate: <https://listings.jobs.vt.edu/postings/63862>
- Research Associate: <https://listings.jobs.vt.edu/postings/63883>

Interested applicants are strongly encouraged to contact Prof. Binoy Ravindran (binoy@vt.edu) for any questions.



Worcester Polytechnic Institute

Post-Doctoral Fellow

We seek to hire a post-doctoral researcher to join our research team, which includes faculty, several graduate students and a software engineer, for the DARPA-sponsored Warfighter Analytics using Smartphones for Health (WASH) project. Research funding for the post-doctoral position is available for 18 months, with a likely extension for a total of 4 years.

Position requires a PhD in computer science or closely related field, with demonstrated background in statistical analysis, signal processing, machine learning and/or deep learning. An interest in interdisciplinary research, in particular, in digital health, and a proven track record of high-quality research and academic excellence are expected. Experience analyzing smartphone sensor signals is desirable but not a must. Excellent written and verbal communication in English are required.

To apply, please send a cover letter, CV, a statement of research interests, and the names and contact information of three references, to:

Professor Emmanuel Agyi (emmanuel@wcup.edu)
Computer Science Department
Worcester Polytechnic Institute
Worcester, MA 01609

To promote education through diversity, WPI is an affirmative action, equal opportunity employer. Women and members of traditionally underrepresented groups are especially encouraged to apply.

GREAT MINDS at WORK