CRA
Computing Research Association

Computing Research Association
Annual Report

FY 2018

TABLE OF CONTENTS

The mission of the Computing Research Association (CRA) is to enhance innovation by joining with industry, government, and academia to strengthen research and advanced education in computing. CRA executes this mission by leading the computing research community, informing policymakers and the public, and facilitating the development of strong, diverse talent in the field.

Computing Research Association
1828 L St, NW, Suite 800
Washington, DC 20036

P: 202-234-2111
F: 202-667-1066
E: info@cra.org
W: www.cra.org

MESSAGE FROM THE BOARD CHAIR

During the CRA 2017-18 Fiscal Year (FY18), from July 1, 2017 to June 30, 2018, CRA made great progress in its efforts to strengthen research and advanced education in computing.

This report contains highlights of FY18 activities in our three mission areas of leadership, talent development, and policy. These initiatives enhance public and policymaker understanding of the importance of computing, make the case for federal investment in research, and help mentor and cultivate individuals in each stage of the pipeline so that more computing researchers can realize their full potential. All of our programs are regularly evaluated in order to ensure their efficacy. But before presenting our external activities, let me briefly describe some internal and administrative accomplishments of 2017-18.

Board of Directors

In July 2017, four individuals started terms as new board members: Carla Brodley, Kim Hazelwood, Brian Noble (USENIX representative), and Jaime Teevan. During the fiscal year, Greg Byrd was appointed the new IEEE-CS representative; Charles Isbell was appointed the AAAI representative, and Kate Larson was appointed the Info-Can/CS Can representative.

CRA Awards

Four individuals were recognized by CRA for outstanding service in FY18, and the awards were presented at the 2018 CRA Conference at Snowbird.

The CRA board of directors selected two recipients for the 2018 A. Nico Habermann Award: Juan E. Gilbert and Manuel A. Pérez Quiñones. Gilbert is the chair of the Computer and Information Science and Engineering Department at the University of Florida. He is a role model for being an effective change agent in the field of computing and has demonstrated a model for how to attract people of color to computer science and help them thrive. Pérez Quiñones is the associate dean of the College of Computing and Informatics at the University of North Carolina at Charlotte. Through his work in broadening participation, he has provided guidance and inspiration to decision makers, academic institutions, industry, and, most importantly, young students.

Paul Messina was selected as the recipient of the 2018 Distinguished Service Award for his significant contributions to the advancement of high performance computing and decades of service to the field. Messina has an incredible record of building and managing large-scale, diverse research activities. Over the course of his career, he has designed, directed, and otherwise executed numerous initiatives that have influenced U.S. policy and programs resulting in the U.S. leadership position in high-performance computing.

Mary Fernández was honored with the 2018 Service to CRA Award for her work in transforming the visual identity and communications of the organization.

CRA Communications

CRA continues to publish *Computing Research News (CRN)* 10 times a year. *CRN* is distributed to more than 12,000 subscribers. Job posting advertising on the website and *CRN* continues to provide a steady stream of revenue.

New Diversity Initiative

In FY18, CRA introduced a new iteration of the Grad Cohort Workshop that is focused on underrepresented minorities and persons with disabilities in computing. The workshop is now in its second year, and aims to increase representation from these groups in computing research by building and mentoring nationwide communities through their graduate studies. It is modeled on the highly successful CRA-W Grad Cohort Workshop for Women.

Addressing Sexual Harassment Issues

CRA has engaged with consultant Sherry Marts to develop a comprehensive policy for dealing with sexual harassment issues at all CRA events. Recently Sherry developed the training materials for ACM's policy implementation.

Volunteer Involvement

Participation in our programs is open to everyone with interest and dedication. CRA members and volunteers support:

• Visioning future directions of the field
• Ongoing initiatives that help shape public policy relevant to our community
• Building a strong, diverse pipeline of students into the field
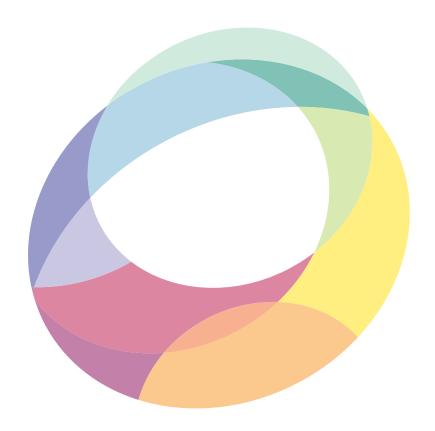• A broad range of programs to support the careers of researchers at all stages of the pipeline.

Sincerely,

Susan Davidson
CRA Board Chair

CRA FINANCIAL STATEMENT
FY 2018

Statement of Financial Position	
Cash & Accounts Receivable	$4,723,178
Investments	$1,748,307
Total Assets	$6,471,485
Total Liabilities	$1,776,826
Total Net Assets	$4,694,659
Total Unrestricted Net Assets	$4,528,669
Total Temporarily Restricted Net Assets	$165,990

LEADERSHIP

CRA empowers the research community to broaden the scope of computing research and to amplify its impact on society.

Computing Community Consortium (CCC)
The CCC continues its mission to catalyze the computing research community and enable the pursuit of innovative, high-impact research. CCC conducts activities that strengthen the research community such as community-based visioning workshops, white papers, the CCC blog, Blue Sky Ideas Conference Tracks, Great Innovative Ideas, and other activities. The CCC communicates the importance of these activities to policymakers, government and industry stakeholders, the public, and the research community itself.

Community-Based Visioning Workshops
Each year, the CCC hosts several visioning workshops that are initiated by the computer science research community, government agencies, and by the CCC Council to ensure that a broad range of topics are explored that are relevant to national priorities.

During FY18, several workshops were held:
- Sociotechnical Cybersecurity Workshop 2
- Fair Representations and Fair Interactive Learning
- Sociotechnical Interventions for Health Disparity Reduction: A Research Agenda
- Robotic Materials
- Digital Computing Beyond Moore's Law
- Next Steps in Quantum Computing: Computer Science's Role

Available workshop reports are published on the CCC website at http://cra.org/ccc/resources/workshop-reports/.

Blue Sky Ideas Conference Tracks
In order to help the community realize the importance of out-of-the-box thinking and promote open discourse, the CCC sponsors special tracks at conferences. Conferences that held Blue Sky Ideas Tracks during the time of this report are:

- NAACL 2018 Student Research Workshop, June 2018, New Orleans, LA
- Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence (AAAI-18), February 2018, New Orleans, LA
- International Symposium on Robotics Research, December 2017, Puerto Varas, Chile
- 25th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2017), November 2017, Redondo Beach, CA
- 15th International Symposium on Spatial and Temporal Databases (SSTD), August 2017, Arlington, VA
- Material Robotics (MaRo)- Bridging Materials Science and Robotics Workshop at the Robotics: Science and Systems (RSS) Conference, July 2017, Cambridge, MA

CCC Responds to the Community
In November 2017, the CCC published a response to the National Library of Medicine's September 2017 request for information on Next-Generation Data Science Challenges in Health and Biomedicine that focused on three areas:

1. Promising directions for new data science research in the context of health and biomedicine.
2. Promising directions for new initiatives relating to open science and research reproducibility.
3. Promising directions for workforce development and new partnerships.

CCC at AAAS 2018
The CCC has attended and hosted sessions at the American Association for the Advancement of Science's annual meeting since 2013. In 2018, the CCC hosted three scientific sessions:
- Rethinking Approaches to Disaster Management and Public Safety with Intelligent Infrastructure
- Transforming Cities, Transportation, and Agriculture with Intelligent Infrastructure
- Artificial Intelligence: Augmenting Not Replacing People

Additional Activities
Over the past 11 years, the CCC has hosted dozens of research visioning workshops to imagine, discuss, and debate the future of computing and its role in addressing societal needs. CCC's second Computing Research symposium, "Computing Research: Addressing National Priorities and Societal Needs 2017," was held in October 2017, and organized these topics into a program designed to illuminate current and future trends in computing and the potential for computing to address national challenges.

In November 2017, CCC offered its Leadership in Science Policy Institute (LiSPI) to educate computing researchers on how science policy in the U.S. is formulated and how our government works. LiSPI features 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.

Task Forces
The CCC has established task forces to ensure coverage of key areas related to national priorities and strategic areas. These groups also involve community members who are not on the CCC Council, and CCC plans to continue this model to further engage the community. The FY18 task forces were:
• Artificial Intelligence
• Cybersecurity
• Human Technology Frontier
• Intelligent Infrastructure
• Privacy and Fairness
• Post Moore's Law Computing

Communications
In order to communicate with both the computer science research community and policy makers, the CCC published timely articles on its blog, released workshop reports and white papers, and presented in multiple venues such as conferences, agency working groups, and universities.
For additional information on CCC initiatives and related activities, subscribe to the CCC Blog at cccblog.org.

2018 CRA Computing Leadership Summit

In February 2018, CRA hosted its annual Computing Leadership Summit for the senior leadership of CRA member societies. Several engaging talks provided valuable information on current issues important to the organizations. Cameron Wilson from Code.org reported on the state of K-12 CS education in the United States. Moshe Vardi from Rice University detailed his thoughts on technology and the future of work. During the society round-table session, representatives of each organization discussed their current projects, future directions, and activities. CRA Board Chair Susan Davidson shared updates on CRA's increased focus on teaching track faculty, and plans to strengthen diversity initiatives.

Summit on Technology and Jobs

On December 12, 2017, CRA hosted the Summit on Technology and Jobs in Washington, D.C. The day was packed with sessions that explored issues surrounding the impact of artificial intelligence and the future of work. Leading technologists, economists, and policy experts offered their views on where technology is headed and what its impact may be, and on policy issues raised by these projections and possible policy responses.

Teaching Faculty at Research Universities

To achieve their educational mission, computing departments at research universities increasingly depend on full-time teaching faculty who choose teaching as a long-term career. A committee prepared a best practices memo that discusses the need for teaching faculty, explores the impact of teaching faculty, and recommends best practices. The best practices are designed to benefit everyone: teaching faculty, other faculty, students, and administrators, and they recognize the unique and complementary role that full-time teaching faculty play in the educational mission of the academic computing-research community.

POLICY

CRA is a trusted source of information—formally and informally—for Members of Congress and their staff, as well as the White House and the President's Council of Advisors for Science and Technology.

Government Affairs Committee (GAC)

The GAC serves as the computing community's representatives in Washington, D.C., conveying the importance of federal support for computing research, tracking and influencing relevant science policy, and helping engage members of the community in the policymaking process. The GAC reorganized in FY18 by reducing its size and creating a new "Friends of the Government Affairs Committee" email distribution list. The committee named Stephanie Forrest as chair, and Greg Hager filled a vacant co-chair role which was left open when former co-chair Jeff Vitter stepped down.

During FY18, the GAC continued its efforts to make the case for increased funding for fundamental computing research to both Congress and the administration. Below are a few highlights of its activities:

- Tracked the FY 2018 appropriations process—and the potential for a government shutdown—and advocated for the community.
- Hosted the annual CRA Congressional Fall Fly-in, September 12-13, 2017, with 14 participants representing member institutions in 11 states, holding meetings with ~40 congressional offices.
- Conducted additional outreach to the White House Office of Science and Technology Policy and members of the new Congressional Artificial Intelligence Caucus, as we continue to make the case for the importance of federal investments in computing research.
- Filed comments with the Department of Education urging it to make computer science education a priority, in light of the President's pledge to make $200 million available for CS education efforts in FY 2018.
- Led a coalition of computing associations in opposing a provision in the House version of the tax reform bill that would have increased dramatically the tax liability of graduate students.
- Organized and sponsored a congressional briefing, co-hosted with the chair and ranking member of the House Committee on Science, Space and Technology, on intelligent infrastructure research.

- In May 2018, CRA was represented at the Coalition for National Science Funding's annual Capitol Hill Science Exhibition by Jingrui He, an assistant professor in the CSE Department at Arizona State University. The exhibition serves to highlight research supported by the National Science Foundation (NSF).

- Co-sponsored and staffed a congressional briefing of the Coalition for National Security Research on the important role of defense science and technology investments.
- Joined 11 letters with our partner organizations in science advocacy, urging passage of various aspects of the FY 2018 appropriations process, including raising the caps on non-defense discretionary spending and increasing investments in key science agencies.
- Provided informal guidance to House and Senate committees asking for advice on autonomous vehicle legislation; intelligent infrastructure; Internet of Things; cybersecurity research; artificial intelligence; and encouraging the participation of girls in computer science.
- Advocated against unfavorable language in the House National Defense Authorization Act that could have restricted computing faculty who have received support from Chinese entities from receiving any further Department of Defense research grants.
- Issued a statement and advocated against new U.S. consular guidance that would restrict Chinese graduate students studying robotics to 1-year student visas.
- Provided input on and ultimately a letter in support of a House Science, Space, and Technology Committee bill that would create a new National Quantum Information Science Initiative.
- Helped organize a coalition to advocate against the administration's proposed move of the National Institute on Disability, Independent Living and Rehabilitation Research from its home in the Department of Health and Human Services, to the National Institutes of Health.
- Co-sponsored a briefing with the Congressional Robotics Caucus on robotics and the future of workforce.
- Tracked and received briefings on administration actions to create new activities in artificial intelligence and machine learning, and quantum information science within the executive branch and the Office of Science and Technology Policy.
- Tracked increasing congressional interest in artificial intelligence and quantum computing, particularly efforts by some committees who are not our typical audience (including the House Energy and Commerce Committee and House Oversight and Government Reform Committee).
- In November 2017, GAC hosted the 4th Leadership in Science Policy Institute workshop, which is held to teach mid-career computing faculty and researchers how science policy gets made in Washington, with the goal of helping them become better leaders in their own spheres of influence and become better advocates for the field. This iteration had 23 participants from 20 institutions.

TALENT DEVELOPMENT

CRA's programs help undergraduate students, graduate students, postdocs, and early-career and mid-career professionals develop valuable skills that prepare them to achieve success throughout their research careers. CRA analyzes the health of the computing research talent pool and evaluates the effectiveness of intervention programs intended to grow this pool of talent.

Committee on the Status of Women in Computing Research (CRA-W)
CRA-W seeks to accelerate computing innovation by increasing the participation and success of women and other underrepresented groups, including ethnic minorities and persons with disabilities, in computing research. For nearly a decade, most of its program portfolio has been aimed at, and inclusive of, underrepresented groups without regard for gender. The CRA-W Board voted in favor of formally expanding its mission to include additional underrepresented groups such as ethnic minorities and persons with disabilities. It is revising its bylaws to reflect this.

CRA-W
Computing Research
Association
Women

Impact Highlights
- More than 2,600 undergraduates, graduate students, and computing research professionals were supported or mentored through CRA-W programs in FY18.
- The $2,500,000 budget expenditure for FY18 is supported by the National Science Foundation (NSF), Department of Energy, industry, university departments, ACM and ACM SIGs, foundations, CRA, generous donors, and extremely dedicated volunteers.

Industry Interactions
CRA-W conducts a substantial amount of CRA's overall industry interactions. Individuals from industry are sponsors, speakers, and mentors in programs such as Grad Cohort, Early and Mid Career Mentoring Workshops, and other career mentoring sessions. CRA-W provides an Industry CRA-W Graduating Class resource for Grad Cohort sponsors that includes information about past program participants who are looking for industry jobs or internships.

Development

During FY18 CRA-W submitted the following proposals:

- BPCnet Plug and Play is a two-year EAGER proposal in the amount of $299,676 to NSF aimed at supporting additional DREU, CREU, and DSW participants due to the anticipated increase in interest and demand expected to accompany the planned January 1, 2019 launch of the BPCnet Resource Portal.
- Grace Hopper Celebration (GHC) Research Scholars is a two-year EAGER proposal in the amount of $299,403 to NSF aimed at supporting 75 GHC research scholars as well as 15 GHC returning scholars per year for the 2018 and 2019 Grace Hopper Celebrations.
- 2018 Alliance is a five-year BPC Alliance proposal to NSF requesting support in the amount of $4,940,542 to extend existing programs, establish new programs, leverage and expand our infrastructure to support an expected increase in demand for plug-and-play program engagement.

Programs

Evaluations show that Career Mentoring Workshop (CMW) participants find the mentoring and networking opportunities valuable for their professional development. CMW participants are also more likely to advance further in their career than non-participants with similar amount of experience.

CRA-W successfully executed the 15th Graduate Cohort for Women Workshop in San Francisco on April 12-14, 2018. Twenty-four senior researchers mentored 418 women Master's and Ph.D. students from 166 U.S. and Canadian institutions. Analysis of the impact of Grad Cohort for Women shows that attending a Grad Cohort increases the participants' self-confidence and identification with computing. During the 2017 and 2018 Grad Cohort Workshops, CRA-W partnered with ACM-W to host about 10 groups of ACM-W International Observers to attend in the hope that they would establish Grad Cohort Workshops in other regions of the world. As a result, Grad Cohort Workshops are being planned in India and Catalonia.

In addition, the inaugural CRA Grad Cohort for URMD Workshop was held March 16-17, 2018. This workshop aims to increase the ranks of senior underrepresented minorities and persons with disabilities in computing. Throughout the workshop, participants developed peer networks and gained insights from senior computing researchers in sessions that covered topics such as strategies for surviving and thriving in graduate school, presentation skills, networking, and how to handle difficult situations.

The Virtual Undergrad Town Hall (VUTH) series program provides ongoing support in between in person mentoring. Evaluation of the VUTH webinars found that majority of attendees felt inspired to pursue undergraduate research after watching a VUTH webinar.

Distributed REU (DREU) added a new "early action" option for the DREU 2018 cohort to allow students to apply and get matched sooner if they are accepted. DREU partners with the iAAMCS and AccessComputing to recruit and fund more students. DREU students are twice as likely (roughly 40 percent) as other REU students to enroll directly in a Ph.D. program after graduation. Collaborative REU (CREU) selected 34 team projects for the 2017-18 term, providing 79 students with firsthand research experiences.

The Discipline Specific Workshops (DSW) program provided support to three workshops during spring 2018, supporting more than 140 participants. The Distinguished Lecture Series (DLS) held three DLS events in spring 2018, reaching nearly 1,500 attendees.

Center for Evaluating the Research Pipeline (CERP)

CERP's mission is to increase diversity in the field of computing research through evaluation and research. The center provides data resources and evaluation services to the computing community. CERP collects data from undergraduate and graduate students in computing through an annual national survey and surveys designed for specific programs. Using these data resources, CERP is able to conduct systematic evaluations of programs and workshops such as CRA-W's Grad Cohort workshop, track career paths and outcomes of computing students, and provide information on the state of the computing research talent pool to the computing community. Below are FY18 highlights:

Staff Changes

CERP underwent staffing changes with the departure of Director Jane Stout. Burçin Tamer, Ph.D., has become the director of CERP, and Heather Wright is the associate director. Going forward, CERP will focus on extending its value as a resource for the computing community through its Data Buddies Project, evaluation services, research, and other activities.

New Advisory Committee

CERP established a new advisory committee to help CERP's efforts to be more responsive to the computing community and to become more integrated with other CRA committees. The new advisory committee members are:
• Andrew Bernat (CRA)
• Jeff Forbes (Duke University, CRA-E committee)
• Sampath Kannan (University of Pennsylvania, CCC Council)
• Ran Libeskind-Hadas (Harvey Mudd College, CRA-E committee)
• Kathryn McKinley (Google, CRA-W board, CRA board)
• Rebecca Wright (Rutgers University, CRA-W board)

Data Collection

Data Buddies Project collected responses from 10,282 undergraduate and 4,540 graduate students during fall 2017. CERP also continued its collaboration with the UCLA research team of the Building, Recruiting, and Inclusion for Diversity (BRAID) initiative in data collection from undergraduate students at institutions participating in the BRAID initiative. Through this collaboration, responses from an additional 2,550 undergraduate students were added to CERP's final dataset for fall 2017.

Through the Data Buddies Project, CERP continued collecting longitudinal data from three previous cohorts (2014, 2015, 2016) and added a fourth cohort of undergraduate and graduate students.

Program Evaluation

CERP conducted evaluations of CRA-W programs: Career Mentoring Workshops, Collaborative Research Experiences for Undergraduates, Distributed Research Experiences for Undergraduates (DREU), Discipline Specific Workshops, Grad Cohort for Women, Grace Hopper Celebration Research Scholars, and Virtual Undergraduate Town Hall Series.

External clients also recruited CERP for evaluation of their programs. These included Computer Science Living-Learning Community for Women at Rutgers University and University of California San Diego CSE Early Research Scholars Program.

Research
CERP staff conducted research on students' formal research experiences, effort expenditure, and belonging in their field. This research was presented in several conferences and published journals in the computing education field.

In each issue of *CRN*, CERP showcases the types of analyses it conducts by producing infographics.

Papers
Stout, J. G., & Blaney, J. M. (2018). "But it doesn't come naturally": How Effort Expenditure Shapes the Benefit of Growth Mindset on Women's Sense of Intellectual Belonging in Computing. Computer Science Education.

Stout, J. G., Tamer, N. B., & Alvarado, C. J. (2018). Formal Research Experiences for First Year Students: A key to Greater Diversity in Computing? Proceedings of the 49th ACM Technical Symposium on Computing Science Education.

Presentations
Stout, J. G., & Blaney, J. M. (November, 2017). "But it doesn't come naturally": How Effort Expenditure Shapes the Benefit of Growth Mindset on Women's Intellectual Belonging in Computing.

Stout, J. G. & Blaney, J. M. (November, 2017). "Am I working harder than everyone else?" Paradoxically Negative Impact of Hard Work on Women's Retention in STEM. Invited panelist, 51st Association for Behavioral and Cognitive Therapies convention, San Diego, CA.

Stout, J. G., Tamer, N. B. & Alvarado, C. J. (2018) Formal Research Experiences for First Year Students: A key to Greater Diversity in Computing? Proceedings of the 48th ACM Technical Symposium on Computing Science Education.

Stout, J. G., & Blaney, J. M. (2018). "But it doesn't come naturally": How Effort Expenditure Shapes the Benefit of Growth Mindset on Women's Intellectual Belonging in Computing. Computer Science Education 27(3-4): 215-228.

CERP hosted a panel at the 2018 CRA Conference at Snowbird, "Using CRA Data to Improve Your Department and Inform Decision Making," with Betsy Bizot on CRA's data resources (Taulbee Survey and Data Buddies survey).

Stout, J. G., Tamer, N. B., & Wright, H. M., (2017, October). *Career Mentoring Workshops for Women in Computing Professions: Evaluation Findings.* Poster presented at the ADVANCE PI Meeting, Washington, D.C.

Tamer, N. B. (2018) *Retaining Diverse Students*. Invited panelist, American Association of Physics Teachers 2018 Summer Meeting. Washington, D.C.

Clarke, L., Pollock, L., Stout, J., Ellis, C., Camp, T., Bizot, B., & McKinley, K. S. (2018). Improving Diversity in Computing Research: An Overview of CRA-W Activities. In *2018 IEEE/ACM 1st International Workshop on Gender Equality in Software Engineering* (GE) (pp. 41-44). IEEE.

Evaluation Reports
Wright, H. M. (2017*). CRA-W Grad Cohort for Women Workshop: 2017 Immediate Impact Evaluation Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2017). *CRA-W Grad Cohort for Women Workshop: 2017 Speaker Feedback Report*. Computing Research Association: Washington, D.C.

Stout, J.G. (2017). *University of California, San Diego Computer Science and Engineering Early Scholars Research Program: A Within-UCSD Comparison*. Computing Research Association: Washington, D.C.

Wright, H. M. (2017). *CRA-W Virtual Undergraduate Town Hall Series: Speeding up Deep Reinforcement Learning via Transfer and Multitask Learning (July 2017 Event Feedback Report)*. Computing Research Association: Washington, D.C.

Wright, H. M. (2017). *CRA-W Virtual Undergraduate Town Hall Series: Using Machine Learning for Network Capacity Management (November 2017 Event Feedback Report)*. Computing Research Association: Washington, DC.

Wright, H. M. (2017). *CRA-W Virtual Undergraduate Town Hall Series: Inferring User Context from Smartphone Data (September 2017 Event Feedback Report)*. Computing Research Association: Washington, D.C.

Wright, H. M. (2018). *CRA-W Virtual Undergraduate Town Hall Series: Tail Latency for Interactive Services and Research Relationships (April 2018 Event Feedback Report)*. Computing Research Association: Washington, D.C.

Wright, H. M. (2018). *CRA-W Virtual Undergraduate Town Hall Series: High Performance Computing at Oak Ridge National Laboratory: Careers, Research Opportunities, and State-of-the-Art Technology (February 2018 Event Feedback Report)*. Computing Research Association: Washington, D.C.

Wright, H. M. (2017). *CRA-W CREU 2017-2018 Program: Demographics & Recruitment Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2017). *CRA-W DREU 2017 Program: December 2017 Feedback Report*. Computing Research Association: Washington, D.C.

Stout, J.G. (2018). *CRA-W CREU 2016-2017 Program: Comparative Feedback Report.* Computing Research Association: Washington, D.C.

Education Committee

The mission of CRA-E is to address society's need for a continuous supply of talented and well-educated computing researchers. In particular, CRA-E seeks to:

- Foster a healthy pipeline of domestic students who continue to graduate school and careers in research
- Develop practices and materials to help departments attract, educate, and retain talented and diverse researchers.

CRA-E was very productive in FY18. The following is a summary of activities:

- The nomination guidelines for the CRA Outstanding Undergraduate Researchers Award were revised for the 2018 competition. Key changes: 1) Nomination materials are no longer required to include information on nominees' gender identities 2) Each nomination requires one letter of recommendation rather than two 3) Each nominee must submit a personal statement in addition to their resume and research statement.
- The goal of the CRA-E Graduate Fellows program is to provide CRA-E with perspectives from graduate students and to provide leadership experience to graduate students who are committed to undergraduate research. The two fellows for 2017-18 are Booma Balasubramani (University of Illinois at Chicago) and Keith Feldman (Notre Dame).
- These two fellows, along with CRA-E members Eric Aaron and Ran Libeskind-Hadas, launched the Undergraduate Research Highlights project which profiles students engaged in research. The series showcases outstanding research done by undergraduate students at universities and colleges across North America. Each article features the story of a successful undergraduate researcher and offers personal insights into their experiences about finding an advisor, undertaking new research projects, and discovering how research can impact their personal and professional futures.
- CRA-E developed a website that serves as a platform for best practices for scalable class management approaches used by instructors of computing courses. The site is initially populated with the Google's Capacity Building awards. Google has contributed $10,000 toward the development and maintenance of the site. CRA-E has developed a system to evaluate and include additional efforts.
- The 2018 Faculty Mentoring Award committee selected two awardees: Michael Ernst (University of Washington) and Catherine Putonti (Loyola of Chicago).
- Two new CRA-E members, Christine Alvarado (University of California, San Diego) and Neil Spring (University of Maryland) ran a workshop on developing classes and programs that prepare undergraduates for research at SIGCSE 2018.
- CRA-E, jointly with the CRA committee on teaching faculty, offered a workshop titled "Professional Development for Teaching Faculty" in association with SIGCSE 2018. The workshop focused on teaching track faculty in Ph.D.-granting departments and how to mentor, evaluate, and ensure their success. The sessions focused on how teaching faculty can strategize their involvement in departmental as well as research activities, different forms of scholarship and leadership activities to pursue, and best practices for success, promotion, and advancement.

Surveys

CRA conducted the 46th annual Taulbee Survey of Ph.D.-granting computer science (CS), computer engineering (CE), and Information (I) departments in fall 2017. The survey documents trends in student enrollment, degree production, employment of graduates, and faculty salaries in Ph.D.-granting CS, CE, and I departments in the U.S. and Canada.

A supplement to the 2016 Taulbee Survey report included the results of the course-level enrollment data that was collected in the Taulbee Survey for the first time in 2016. Subsequent years' course-level enrollment data will be incorporated into the main report. The report also contained the results of the questions about teaching faculty that were requested from departments in the 2016 survey to help decide how to more formally incorporate questions about teaching faculty in future Taulbee surveys.

CRA Director of Statistics and Evaluation Betsy Bizot worked with the Teaching Faculty Committee to implement a teaching position survey through the Taulbee infrastructure.

Bizot also participated on a panel at the 2018 CRA Conference at Snowbird on "Using CRA Data to Improve Your Department and Inform Decision Making." The Taulbee portion discussed the available benchmarking/peer group comparisons and solicited input on additional interests of the attendees, with an emphasis on alternative presentations and analyses of existing data rather than adding to the survey.

CRA-Deans Group

The CRA-Deans Group was established to provide leadership and community to emerging and established colleges of computing and interdisciplinary IT schools. The CRA-Deans Group convenes to discuss a range of topics and share their experiences creating independent schools and IT units. Currently, more than 40 institutions from several countries participate in the CRA-Deans Group. The group also welcomes participation from those actively considering the establishment of independent schools of Computing, Information, or IT.

2017-18 MEMBERS

ACADEMIC DEPARTMENTS
The following departments held membership in CRA for all or, in a few cases, part of the period from July 1, 2017 to June 30, 2018.

– A –
Amherst College (CS)
Arizona State University (CSE)
Auburn University (CSSE)

– B –
Binghamton University, SUNY (CS)
Boston College (CS)
Boston University (ECE)
Boston University (CS)
Bowling Green State University (CS)
Bradley University (CS)
Brandeis University (CS)
Brown University (CS)
Bryn Mawr College (MCS)
Bucknell University (CS)

– C –
Carnegie Mellon University (CS)
Carnegie Mellon University (ECE)
Case Western Reserve University (EECS)
Clemson University (CS)
Clemson University (ECE)
Colgate University (CS)
College of Charleston (CS)
College of William & Mary (CS)
Colorado School of Mines (EECS)
Colorado State University (CS)
Columbia University (CS)
Cornell University (CS)
Cornell (IS)

– D –
Dartmouth College (CS)
DePaul University (CDM)
Drexel University (IST)
Duke University (CS)

– E –
Embry-Riddle Aeronautical University (ECSSE)
Emory University (MCS)

– F –
Florida International University (CS)
Florida State University (CS)

– G –
George Mason University (CS)
George Washington University (CS)
Georgetown University (CS)
Georgia Institute of Technology (CS)
Georgia Institute of Technology (CSE)
Georgia Institute of Technology (IC)
Georgia Southern University (CS)
Georgia State University (CS)
Grinnell College (MCS)

– H –
Harvard University (CS)
Harvey Mudd College (CS)
Hofstra University (CS)

– I –
Illinois Institute of Technology (CS)
Indiana University (IC)
Iowa State University (CS)

– J –
Johns Hopkins University (CS)
Johns Hopkins University (SI)
Juniata College (IT & CS)

– K –
Kansas State University (CIS)
Kean University (CS)
Kent State University (CS)

– L –
Lafayette College (CS)
Lehigh University (CSE)
Louisiana Tech University (CS)
Loyola University, Chicago (CS)

– M –
Marquette University (CS)
Massachusetts Institute of Technology (EECS)
McMaster University (C&S)
Miami University (CS)
Michigan State University (CSE)
Michigan Technological University (CS)
Mississippi State University (CSE)
Missouri University of Science & Technology
Montana State University (CS)
Montclair State University (CS)
Mount Holyoke College (CS)

– N –
Naval Postgraduate School (CS)
New Jersey Institute of Technology (CS)
New Mexico State University (CS)
New York University (CS)
North Carolina State University (CS)
North Dakota State University (CSOR)
Northeastern University (CIS)
Northwestern University (EECS)

– O –
Oakland University (CSE)
Ohio State University (CSE)
Ohio University (EECS)
Oklahoma State University (CS)
Old Dominion University (CS)
Oregon State University (EECS)

– P –
Pace University (CSIS)
Pennsylvania State University (CSE)
Pennsylvania State University (IST)
Polytechnic University (CIS)
Pomona College (CS)
Portland State University (CS)
Princeton University (CS)
Purdue University (CS)

– R –
Regis University (CIS)
Rensselaer Polytechnic Institute (CS)
Rice University (CS)
Rochester Institute of Technology (CS)
Rutgers University (ECE)
Rutgers University, Busch Campus (CS)

– S –
Saint Louis University (MCS)
Santa Clara University (CE)
Simmons College (COCIS)
Simon Fraser University (CS)
Stanford University (CS)
Stevens Institute of Technology (CS)
Stony Brook University, SUNY (CS)
Swarthmore College (CS)
Syracuse University (IS)
Syracuse University (EECS)

– T –
Tecnologico de Monterrey-Chihuahua Campus
Texas A&M University (CSE)
Texas A&M University, Corpus Christi (CS)
Texas State University (CS)
Texas Tech University (CS)
Toyota Technological Institute at Chicago (CS)
Tufts University (CS)
Tulane University (CS)

– U –
Union College (CS)
University at Buffalo, SUNY (CSE)
University of Alabama, Birmingham (CIS)
University of Alabama, Tuscaloosa (CS)
University of Alberta (CS)
University of Arizona (CS)
University of Arkansas (CSCE)
University of British Columbia (CS)
University of British Columbia (ECE)
University of Calgary (CS)
University of California, Berkeley (EECS)
University of California, Berkeley (IMS)
University of California, Davis (CS)
University of California, Irvine (ICS)

University of California, Riverside (CSE)
University of California, San Diego (CSE)
University of California, Santa Barbara (CS)
University of California, Santa Cruz (CS)
University of Central Florida (EECS)
University of Chicago (CS)
University of Cincinnati (IT)
University of Colorado, Boulder (CS)
University of Colorado, Boulder (IS)
University of Connecticut (CSE)
University of Delaware (CIS)
University of Florida (CISE)
University of Georgia (CS)
University of Hawaii (ICS)
University of Houston (CS)
University of Idaho (CS)
University of Illinois, Chicago (CS)
University of Illinois, Chicago (ECE)
University of Illinois at Urbana-Champaign (CS)
University of Illinois at Urbana-Champaign (ECE)
University of Iowa (CS)
University of Kansas (EECS)
University of Kentucky (CS)
University of Louisiana at Lafayette (SCI)
University of Maryland (CS)
University of Maryland (iSchool)
University of Maryland, Baltimore County (CSEE)
University of Maryland, Baltimore County (IS)
University of Massachusetts, Amherst (CS)
University of Massachusetts, Boston (CS)
University of Massachusetts, Lowell (CS)
University of Memphis (CS)
University of Michigan (EECS)
University of Michigan (I)
University of Michigan, Dearborn (CIS)
University of Minnesota (CSE)
University of Mississippi (CIS)
University of Missouri, Columbia (CS)
University of Missouri, Kansas City (CS)
University of Nebraska, Lincoln (CSE)
University of Nevada, Las Vegas (CS)
University of Nevada, Reno (CSE)
University of New Hampshire (CS)
University of New Mexico (CS)
University of North Carolina at Chapel Hill (CS)
University of North Carolina at Chapel Hill (SILS)
University of North Carolina, Charlotte (IT)
University of North Carolina, Greensboro (CS)
University of North Dakota (CS)
University of North Texas (CS)
University of Notre Dame (CSE)
University of Oklahoma (CS)
University of Oregon (CIS)
University of Pennsylvania (CIS)
University of Pittsburgh (CS)
University of Pittsburgh (IS)
University of Puget Sound (MCS)

University of Rochester (CS)
University of South Alabama (C)
University of South Carolina (CSE)
University of South Florida (CSE)
University of Southern California (CS)
University of Southern California (EES)
University of Tennessee, Knoxville (EECS)
University of Texas, Arlington (CSE)
University of Texas, Austin (CS)
University of Texas, Dallas (CS)
University of Texas, El Paso (CS)
University of Toronto (CS)
University of Utah (CS)
University of Vermont (CS)
University of Victoria (CS)
University of Virginia (CS)
University of Washington (HCDE)
University of Washington (IS)
University of Washington, Seattle (CSE)
University of Waterloo (CS)
University of West Florida (CS)
University of Wisconsin-Madison (CS)
University of Wisconsin-Milwaukee (EECS)
University of Wyoming (CS)

– V –
Vanderbilt University (EECS)
Villanova University (CS)
Virginia Commonwealth University (CS)
Virginia Tech (CS)

– W –
Wake Forest University (CS)
Washington State University (EECS)
Washington University in St. Louis (CSE)
Wayne State University (CS)
Western Michigan University (CS)
Whitman College (CS)
Williams College (CS)
Worcester Polytechnic Institute (CS)
Wright State University (CSE)

– Y –
Yale University (CS)
York University (CSE)

LABS AND CENTERS

Top Contributors
Facebook
Google
IBM Research
Microsoft Research
National Security Agency

FX Palo Alto Laboratory
Lawrence Berkeley National Lab
Mitsubishi Electric Research Labs
SCI Institute
Two Sigma Labs
Visa Research
VMWare Research

AFFLIATED PROFESSIONAL SOCIETIES

Association for the Advancement of Artificial Intelligence
Association for Computing Machinery
CS-Can/Info-Can
IEEE Computer Society
Society for Industrial and Applied Mathematics
USENIX Association

ASSOCIATE ACADEMIC DEPARTMENTS

Korea Advanced Institute of Science & Technology (CS)
National University of Singapore (CS/IS)
Singapore Management University (IS)

ASSOCIATE LAB

Elsevier

BOARD OF DIRECTORS FY18

Sarita Adve
UIUC

Nancy Amato
Texas A&M University

Ronald Brachman
Treasurer
Cornell Tech

Carla Brodley
Northeastern University

Greg Byrd
(IEEE-CS Representative)
North Carolina State University

Tom Conte
(IEEE-CS Representative)
Georgia Tech

Susan Davidson
Board Chair
University of Pennsylvania

Eric de Sturler
(SIAM representative)
Virginia Tech

David Ebert
(IEEE-CS representative)
Purdue University

Joel Emer
NVIDIA/MIT

Stephanie Forrest
Arizona State University

Michael Franklin
University of Chicago

Lise Getoor
(AAAI representative)
UC Santa Cruz

Dan Grossman
University of Washington

Gregory Hager
Johns Hopkins University

Brent Hailpern
IBM Research-Almaden

Mary Hall
(ACM representative)
University of Utah

Susanne Hambrusch
Vice Chair
Purdue University

Kim Hazelwood
Facebook

Julia Hirschberg
Columbia University

Charles Isbell
(AAAI Representative)
Georgia Tech

H. V. Jagadish
University of Michigan

Farnam Jahanian
Carnegie Mellon University

Chris Johnson
University of Utah

Kate Larson
(Info-Can/CS-CAN)
University of Waterloo

Kathryn McKinley
Microsoft Research

Greg Morrisett
Secretary
Cornell University

Elizabeth Mynatt
Georgia Tech

Mario A. Nascimento
(CS-Can/Info-Can)
University of Alberta

Brian Noble
(USENIX Representative)
University of Michigan

Penny Rheingans
University of Maryland, Baltimore
County

Barbara Ryder
Virginia Tech

Vivek Sarkar
Rice University

Andrew Sears
(ACM representative)
Penn State

Shashi Shekhar
University of Minnesota

Jaime Teevan
Microsoft Research

Josep Torrellas
UIUC

Min Wang
Visa Research

Ellen Zegura
Georgia Institute of Technology

*Elected board officers are
highlighted in red.

COMMITTEES

CRA relies on the volunteers that serve on its committees, as well as its professional staff, to carry out its programs.

A. Nico Habermann Award
Carla Brodley (Northeastern University), Chair
Kunle Olukotun (Stanford University)
Ann Gates (University of Texas, El Paso)

Center for Evaluating the Research Pipeline
Steering Committee:
Nancy Amato (Texas A&M University)
Andrew Bernat (CRA)
Jeff Forbes (Duke University)
Julia Hirschberg (Columbia University)
Kathryn McKinley (Google)
Linda Sax (UCLA)
Burçin Tamer (CRA)
Heather Wright (CRA)

Committee on the Status of Women in Computing Research
Julia Hirschberg (Columbia University), Co-chair
Margaret Martonosi (Princeton University), Co-chair
Deb Agarwal (Lawrence Berkeley National Laboratory)
Nancy Amato (Texas A&M University)
A. J. Bernheim Brush (Microsoft Research)
Ramon Caceres (Google)
Tracy Camp (Colorado School of Mines)
Sheila Castañeda (Clarke University)
Lori Clarke (University of Massachusetts, Amherst)
Dilma Da Silva (Texas A&M University)
Andrea Danyluk (Williams College)
Sandhya Dwarkadas (University of Rochester)
Carla Ellis (Duke University)

Maria Gini (University of Minnesota)
Soha Hassoun (Tufts University)
Ayanna Howard (Georgia Tech)
Chad Jenkins (University of Michigan)
Anna Karlin (University of Washington)
Ming Lin (University of North Carolina)
Patty Lopez (Intel)
Kathryn McKinley (Google)
Lori Pollock (University of Delaware)
Susan Rodger (Duke University)
Holly Rushmeier (Yale University)
Amanda Stent (Bloomberg)
Rita Wouhaybi (Intel)
Rebecca Wright (Rutgers University)
Yuqing Melanie Wu (Pomona College)

Committee on Teaching Faculty at Research Universities
Penny Rheingans (UMBC), Chair
Betsy Bizot (CRA)
Michelle Craig (University of Toronto)
Susan Davidson (University of Pennsylvania)
Jeff Forbes (Duke University)
Dan Garcia (UC Berkeley)
Dan Grossman (University of Washington)
Mary Beth Rosson (Penn State)
Mark Sherriff (University of Virginia)

Computing Community Consortium
Elizabeth Mynatt (Georgia Institute of Technology), Chair
Mark Hill (University of Wisconsin, Madison), Vice Chair
Nayda Bliss (Arizona State University)
Elizabeth Churchill (Google)
Cynthia Dwork (Harvard University)
Juliana Freire (New York University)
Kevin Fu (University of Michigan)
Sampath Kannan (University of Pennsylvania)
Daniel P. Lopresti (Lehigh University)
Keith Marzullo (University of Maryland)
Maja Matarić (University of Southern California)
Nina Mishra (Amazon Research)
Greg Morrisett (Cornell University)
Shwetak Patel (University of Washington)
Jennifer Rexford (Princeton University)
Holly Rushmeier (Yale University)
Manuela Veloso (Carnegie Mellon University)
Katherine Yelick (University of California at Berkeley)
Ben Zorn (Microsoft Research)

Conference at Snowbird

Kim Hazelwood (Facebook), Co-chair
Vivek Sarkar (Georgia Tech), Co-chair
Lorenzo Alvisi (Cornell University)
Carla Brodley (Northeastern University)
Chris Johnson (University of Utah)
Mario Nacimento (University of Alberta)
Joe Sventek (University of Oregon)
Jaime Teevan (Microsoft Research)

Deans Group
CRA-Deans Leadership:
Raj Acharya (Indiana University), Chair
Liz Liddy (Syracuse University), Vice Chair
CRA Board Rep:
Greg Morrisett (Cornell University)

Distinguished Service Award

Greg Morrisett (Cornell University), Chair
Chris Johnson (University of Utah)
Min Wang (Visa Research)

Education

Susanne Hambrusch (Purdue University), Co-chair
Lori Pollock (University of Delaware), Co-chair
Eric Aaron (Vassar College)
Nancy Amato (Texas A&M University)
Christine Alvarado (University of California, San Diego)
Jeff Forbes (Duke University)
Dan Grossman (University of Washington)
Ran Libeskind-Hadas (Harvey Mudd College)
Barbara Ryder (Virginia Tech)
Neil Spring (University of Maryland)

Elections

Susan Davidson (University of Pennsylvania), Chair
Ed Lazowska (University of Washington)
Steve Heller (Two Sigma)

Enrollment

Tracy Camp (Colorado School of Mines), Chair
W. Richards Adrion (University of Massachusetts, Amherst)
Betsy Bizot (CRA)
Susan Davidson (University of Pennsylvania)
Mary Hall (University of Utah)
Susanne Hambrusch (Purdue University)
Ellen Walker (Hiram College)
Stuart Zweben (The Ohio State University)

Finance
Ron Brachman (Cornell Tech), Chair
Phil Bernstein (Microsoft Research)
David Ebert (Purdue University)
Vivek Sarkar (Rice University)

Government Affairs
Stephanie Forrest (University of New Mexico), Chair
Greg Hager (Johns Hopkins University), Co-chair
Ed Lazowska (University of Washington), Co-chair
Sarita Adve (University of Illinois)
David Bader (Georgia Institute of Technology)
David Ebert (Purdue University)
Joel Emer (NVIDIA/MIT)
Dan Grossman (University of Washington)
Jeff Hollingsworth (University of Maryland)
Farnam Jahanian (Carnegie Mellon University)
John King (University of Michigan)
Margaret Martonosi (Princeton University)
Andrew Moore (Carnegie Mellon University)
Dan Reed (University of Iowa)
Bobby Schnabel (Association of Computing Machinery)
Fred Schneider (Cornell University)
Marc Snir (University of Illinois, Urbana-Champaign)
Eugene H. Spafford (Purdue University)
David Tennenhouse (VMware)

Membership
H.V. Jagadish (University of Michigan), Co-chair
Joel Emer (NVIDIA/MIT), Co-chair

Surveys
Stu Zweben (Ohio State University), Chair
Tracy Camp (Colorado School of Mines)
Susanne Hambrusch (Purdue University)
Shashi Shekar (University of Minnesota)

2018 Outstanding Undergraduate Researcher Award
Ran Libeskind-Hadas (Harvey Mudd College), Chair
Eric Aaron (Vassar College)
Pieter Abbeel (University of California, Berkeley)
Michela Becchi (North Carolina State University)
Cristina Nita-Rotaru (Northeastern University)
Margo Seltzer (Harvard University)
Brian Tjaden (Wellesley College)

CRA STAFF

Andrew Bernat, Ph.D.
Executive Director

Betsy Bizot, Ph.D.
Director
Statistics and Evaluation

Sandra Corbett
Program Associate

Daniela Cárdenas
Program Associate

Khari Douglas
Program Associate
CCC

Ann Drobnis, Ph.D.
Director
CCC

Jill Hallden
Accounts Payable Specialist

Peter Harsha
Director
Government Affairs

Sabrina Jacob
Administrator

Brian Mosley
Policy Analyst

Erik Russell
Director
Programs

Shar Steed
Communications Specialist

Burçin Tamer, Ph.D.
Director
CERP

Heather Wright
Associate Director
CERP

Helen Vasaly Wright
Senior Program Associate
CCC

*Also pictured above is 2018 CRA Tisdale Fellow Amita Shukla