



CRA

Computing Research
Association



Computing Research Association *Annual Report*

FY 2017

UNITING INDUSTRY, ACADEMIA, AND GOVERNMENT TO
ADVANCE COMPUTING RESEARCH AND CHANGE THE WORLD

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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.

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MESSAGE FROM THE BOARD CHAIR

During the CRA 2017 Fiscal Year (FY17), from July 1, 2016 to June 30, 2017, CRA made great strides in its efforts to strengthen research and advanced education in computing.

This report shares highlights of activities in our three mission areas of leadership, talent development, and policy during FY17. 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 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 accomplishments from FY17.

Board of Directors

In July 2016, seven individuals started terms as new board members: Tom Conte (IEEE-CS representative), Elizabeth Mynatt (CCC chair), Mario Nascimento (CS-Can/Info-Can representative), Penny Rheingans, Shashi Shekhar, Josep Torrellas, and Min Wang.

New Initiatives

In 2016-17 CRA organized several board member-led ad hoc committees:

- **Organizational Homes for Computing Programs:** Produced the white paper, *Creating Institutional Homes for Computing: Transforming a Department into a School or College*.
- **Underrepresented Populations:** Explored how CRA can support the inclusion of underrepresented groups into the computing research community with roundtable discussions and encouraged the development of a graduate student workshop for underrepresented minorities and persons with disabilities in computing.
- **Teaching Track Faculty:** Produced a best practices memo for engaging teaching faculty in research computing departments.
- **Industry:** Explored programs of value to industry, both for industrial labs in general and for industrial computing researchers in particular. Former CRA Board Member Mary Fernández presented a proposal on how CRA could better engage with industry.
- **Rankings:** Organized panel at the 2018 CRA Conference at Snowbird that explored data-driven evaluation methodologies.

CRA Awards

Two individuals were recognized by CRA for outstanding service in FY17.

Carol Frieze was selected as the recipient of the 2017 A. Nico Habermann Award for devoting nearly two decades to promoting diversity and inclusiveness in computing. She has worked with and supported a wide variety of students including women, people with disabilities, and various age groups ranging from K-12 to graduate students.

Tom Kalil was selected as the recipient of the 2017 CRA Distinguished Service Award for his long history of leading national initiatives that have produced a transformational impact on the computing research community. He has also been an exemplary spokesperson, advocate, and collaborator for the computing research community.

CRA Conference at Snowbird

The leadership of the computing research community convened July 17-19, 2016 for the biennial CRA Conference at Snowbird, our flagship conference, to network and discuss common issues concerning the field's future. Panel sessions included topics ranging from smart cities to computing's role in the university to the future of work. One major focus of the conference was booming student enrollments. A plenary session and three parallel sessions were devoted to this timely topic, its various ramifications, and ideas to help the computing community cope with its impact, including best practices for managing growth.

CRA Communications

CRA continues to publish *Computing Research News (CRN)* 10 times a year. *CRN* is distributed to more than 10,000 subscribers. The last phase of the new website's development included a revamp of the online and email versions of *CRN*, as well as how articles are displayed on committee sites. Job posting advertising on the website and *CRN* continues to provide a steady stream of revenue.

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 2017

Statement of Financial Position	
Cash & Accounts Receivable	\$3,271,554
Investments	\$1,748,307
Total Assets	\$5,730,460
Total Liabilities	\$1,067,839
Total Net Assets	\$4,662,621
Total Unrestricted Net Assets	\$4,438,777
Total Temporarily Restricted Net Assets	\$223,844





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 mission of the CCC is to catalyze the computing research community and enable the pursuit of innovative, high-impact research. CCC conducts activities that strengthen the research community, articulate compelling research visions, and align those visions with pressing national and global challenges.



CCC

Computing Community
Consortium
Catalyst

Industry-Academic Collaborations

In the summer of 2015, CCC conducted a survey and convened a round table of industry and academic participants to better understand the landscape of industry-academic interaction and to discuss possible actions that might enhance those interactions. The resulting report, *The Future of Computing Research: Industry-Academic Collaborations*, released in May 2016, communicates the results of the issues discussed.

The report helped inform a CCC-sponsored program on industry-academic collaboration, which was implemented through the NSF-sponsored Big Data Regional Innovation Hubs. The goal of the program was to catalyze and foster partnerships between industry and academic research by creating mechanisms for early-career researchers in academia and industry representatives to interact and explore ways to work together. The program enabled shared learning and perspectives, access to problems and data, career training, and opportunities for long-term partnerships. Each hub was charged with addressing regional-specific big data challenges. For example, as one of its CCC-sponsored activities, the South Big Data Innovation Hub ran the DataStart internship program, which paired graduate students from the South Regional Innovation Hub with data-related startup companies for three months.

Federal Initiatives

During the last months of the Obama administration, CCC was involved with several reports and initiatives issued by the White House. In July 2016, the *National Privacy Research Strategy* by the National Science and Technology Council and Networking and Information Technology Research and Development Program was released. The CCC released a community report in 2015 entitled *Towards a Privacy Research Roadmap for the Computing Community*, which was used to help develop the National Privacy Research Strategy.

In fall 2016, the White House Office of Science and Technology Policy (OSTP) released a report entitled, *Preparing for the Future of Artificial Intelligence*. The CCC workshop Artificial Intelligence For Social Good and a submission directly to the White House were used as resources in the OSTP report and associated R&D Strategic Plan.

Visioning Activities



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

During FY17, several workshops were held:

- Nanotechnology-Inspired Information Processing Systems of the Future
- Cyber Security for Manufacturers
- Cyber-Social Learning Systems
- Discovery and Innovation in Smart and Persuasive Health
- Sociotechnical Cybersecurity

Workshop reports from each session are available on the CCC website at <http://cra.org/ccc/resources/workshop-reports/>.

White Papers

As a response to community needs and requests from various federal agencies, the CCC works with community leaders to produce white papers on specific topics. Below is a list of white papers published in the time period of this report:

- Safety, Security, and Privacy Threats Posed by Accelerating Trends in the Internet of Things
- Advances in Artificial Intelligence Require Progress Across all of Computer Science
- Privacy-Preserving Data Analysis for the Federal Statistical Agencies
- Arch2030: A Vision of Computer Architecture Research over the Next 15 Years
- A National Research Agenda for Intelligent Infrastructure

Additionally, during FY17, the CCC published a series of white papers on the science of autonomy for physical systems that was led by the Intelligent Infrastructure task force. The Intelligent Infrastructure white paper series was a collaboration between the CCC and the Electrical and Computer Engineering Department Heads Association. These papers drew from a large network of expertise, including CCC Council members, former CCC Council members, CRA board members,

and other members of the academic and industry communities, for a total of 49 authors from more than 30 institutions.

- CRA Government Affairs and three of the paper authors met with staff from Senator Cory Gardner's office (Gardner serves on the Senate Commerce, Science and Transportation Committee), majority staff from the House Energy and Commerce Committee, and majority and minority staff of the House Science, Space and Technology Committee. Staffers were largely supportive of the basic ask — that research that enables intelligent infrastructure ought to be a part of an infrastructure initiative — though all acknowledged the considerable challenge of getting something “forward looking” in a bill that's likely to be focused on “shovel-ready” projects.
- Ten papers were released as of June 2017:
 - A National Research Agenda for Intelligent Infrastructure
 - MOBILITY21: Strategic Investments for Transportation Infrastructure & Technology
 - Digital Grid: Transforming the Electric Power Grid into an Innovation Engine for the United States
 - Research Agenda in Intelligent Infrastructure to Enhance Disaster Management, Community Resilience and Public Safety
 - City-Scale Intelligent Systems and Platforms
 - Intelligent Infrastructure for Smart Agriculture: An Integrated Food, Energy, and Water System
 - Safety and Security for Intelligent Infrastructure
 - A Rural Lens on a Research Agenda for Intelligent Infrastructure
 - Privacy in Information-Rich Intelligent Infrastructure
 - Smart Wireless Communication is the Cornerstone of Smart Infrastructures

Additional Activities

The CCC sponsors an initiative to bring special “Blue Sky Ideas” tracks to leading computer science research conferences. The goal of this initiative is to help conferences reach out beyond the usual research papers that present completed work and to seek out papers that present ideas and visions that can stimulate the research community to pursue new directions. FY17 tracks included:

- 24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2016), November 2016, San Francisco, CA
- Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence (AAAI-17), February 2017, San Francisco, CA
- Sixteenth International Conference on Autonomous Agents and MultiAgent Systems (AAMAS), May 2017, Sao Paulo, Brazil



AAAS 2017 ANNUAL MEETING

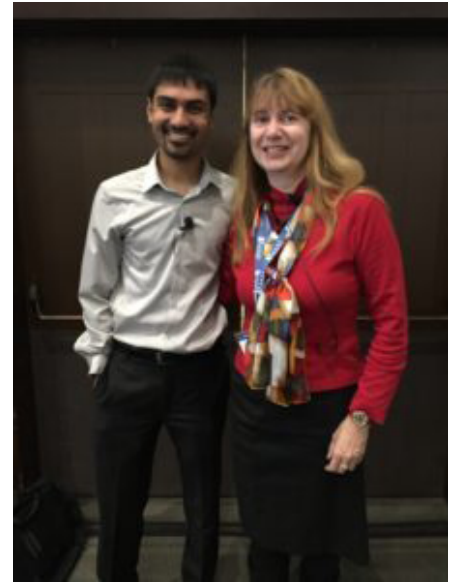
FEBRUARY 16-20 • BOSTON

The CCC participated in the American Association for the Advancement of Science (AAAS) 2017 Annual Meeting in Boston, MA. CCC organized the following sessions:

- Press Briefing on Mobile Health Devices: Health in Your Pocket: Diagnosing and Treating Disease with Smartphones
- What Happens When Everyday Objects Become Internet Devices: A Science Policy Agenda
- The Technology of the Future Flash Talks

The CCC also responded to a request for public comment on the Networking and Information Technology Research and Development program's draft *Smart Cities and Communities Federal Strategic Plan*. The CCC prepared a response to the draft strategic plan that describes several challenges that merit increased attention.

In order to communicate with both the computer science research community and policymakers, the CCC published timely articles on its blog, released workshop reports, 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.



Leadership Summit

On February 27, 2017 in Washington, D.C., CRA hosted its annual Computing Leadership Summit for the senior leadership of CRA member 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, and USENIX Association) and the Computer Science and Telecommunications Board.

Several engaging sessions provided valuable information on current issues important to the organizations. During the society round table, each organization discussed current projects and new initiatives, and identified opportunities for collaboration and support.

Data Science Statement

CRA's Committee on Data Science built upon discussion and input from the session at the 2016 CRA Conference at Snowbird and used that information to compose CRA's position statement titled "Computing Research and the Emerging Field of Data Science." The computing research community has a unique opportunity to help define and shape the emerging field of data science. Together with statisticians, mathematicians, social scientists, data analysts, domain scientists and subject matter experts, computer scientists can develop the new theoretical foundations, algorithmic principles, and systems upon which the foundations of data science will be built. CRA is committed to supporting computing professionals and others in developing ethical and responsible data science research.





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.

In FY17, the Government Affairs Committee (GAC) actively tracked the new administration and communicated with Congress and federal agencies on a number of topics relevant to the computing research community. Below is a summary of highlighted activities:

- Disseminated white papers produced by CCC on **Intelligent Infrastructure** to appropriate congressional committee staff, including meetings with Senate Commerce, Science and Transportation majority and minority staff, House Energy and Commerce majority and minority staff, and House Science, Space and Technology majority and minority staff.
- Responded to requests from Senate Commerce Committee staff looking to identify potential areas in science that could merit inclusion in a large **Infrastructure Bill**. Made use of the CCC white papers on Smart Communities and the Internet of Things in our response.
- Analyzed and tracked developments in the **FY 2018 budget process**, including a review of the President’s “skinny” budget, his detailed request for FY 2018, and FY 2018 appropriations bills for key science agencies.
- Joined the Coalition for National Science Funding’s efforts to **advocate for robust and sustained levels of funding** for the National Science Foundation in FY 2018, the Coalition for National Security Research’s efforts to advocate for Defense research and development, a AAAS effort to oppose the administration’s FY 2018 request for science agencies, and the Task Force on American Innovation’s efforts to advocate for federal investments in basic research.
- Endorsed the **STEM Opportunities Act of 2017 (H.R. 2653)**, which supports efforts to expand the inclusion of women and underrepresented groups in STEM fields.



- Worked with CRA-W to identify and invite 167 Members of Congress who represent poster presenters at **Grad Cohort 2017** to attend the poster session. Prepared for meetings between 11 Grad Cohort participants and their representatives (although several of those meetings were cancelled because of flight delays).

- Arranged congressional visits for more than 20 computing researchers from CRA member institutions during our **Congressional Visit Days**.

- Planned for the **2017 CCC Leadership in Science Policy Institute** in Washington, D.C.

- In fall 2016, the CRA Policy Blog analyzed each of the 2016 presidential candidate's views on science policy.

- Endorsed the passage of **The American Innovation and Competitiveness Act** (S. 3084), a reauthorization of **The America COMPETES Act**, which is the primary science policy bill for the National Science Foundation and National Institute for Standards and Technology, and which included a reauthorization of the **Networking and Information Technology R&D** program that we endorsed.

- Expressed CRA's objection to a **presidential executive order** banning visa approvals for nationals of seven different Muslim-majority nations.

- Provided input on and endorsed the **Developing Innovation in Government and the Internet of Things (DIGIT) Act of 2017** (S. 88).

- GAC member Andrew Moore (Carnegie Mellon University), along with Eric Horvitz (Microsoft), testified about "**The Dawn of Artificial Intelligence**" before a Senate Commerce, Science and Transportation subcommittee chaired by Sen. Ted Cruz (R-TX).

- Endorsed the **K-12 Computer Science Education Framework** put together by the Computer Science Teachers Association, ACM, and code.org, to enable states and localities develop their own CS education standards.

- Responded to **other congressional requests** for information about potential witnesses for hearings on cybersecurity workforce and artificial intelligence, and information about the Internet of Things, the status of the CS for All initiative, the NITRD program, the impact of definitional changes in the COMPETES reauthorization, and why efforts to increase the participation of women and underrepresented minorities in STEM fields were worthy of federal support.





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 increase talent in this pool.

Committee on the Status of Women in Computing Research (CRA-W)

CRA's CRA-W programs aim to increase the success and participation of women and other underrepresented groups in computing. To that end, in FY 17, CRA-W continued to organize its well-known programs such as CREU and DREU, mentoring tracks at the Grace Hopper Celebration of Women in Computing (GHC) and the Richard Tapia Celebration of Diversity in Computing, and workshops including Grad Cohort for Women.



CRA-W

Computing Research
Association
Women

CRA-W also actively introduces new programs. The Virtual Undergraduate Town Hall, which began in fall 2015, is a series of webinars that give undergraduates the opportunity to learn about a specific research topic in computing and ask questions about graduate school and other topics. Additionally, in 2016, CRA-W initiated the GHC Research Scholars program, which brings undergraduate women with an interest in computing research to the GHC conference and provides them with mentoring and networking opportunities. The RECOGNizing Notable Women in Computing project works to identify the current status of women in computing and to develop practices to increase their recognition, and is done in collaboration with ACM. CRA-W also started planning a new iteration of the Graduate Cohort Workshop. The CRA Grad Cohort for Underrepresented Minorities and Persons with Disabilities Workshop was launched in 2018.

In November 2016, CRA-W hosted Early and Mid Career Mentoring Workshops (CMWs) in Washington, D.C. The Early CMW brought junior researchers and educators together with women already established in their field to provide practical information, advice, and support to their younger colleagues. The Mid CMW provided advice and mentoring to faculty members seeking promotion to full professor and to researchers and technologists in industrial or governmental labs seeking promotion to the top of their institution's technical ladder or entering upper management.

CRA-W programs are regularly evaluated in order to understand each program elements' performance, to improve existing programs, and to start new ones that effectively achieve goals. Information on all program requirements, applying, schedules, slides from speakers, and more are available on the CRA-W website.

CRA-W provides specific benefits for CRA members. Grad Cohort applicants from CRA member departments receive priority in the selection process. Members also get access to the CRA-W Grad Cohort Graduating Class Directory that includes information about program participants who are graduating undergraduate students looking for a graduate program, M.S. students looking for Ph.D. programs, or graduating Ph.D. students looking for faculty positions.

CRA-W programs impact more than 2,400 undergraduates, graduate students, and computing research professionals each year. With program expenditures exceeding \$2,100,000, CRA-W's programs are financially supported by the National Science Foundation, Department of Energy, industry, university departments, ACM and ACM SIGS, foundations, CRA, and individuals.



Center for Evaluating the Research Pipeline (CERP)

CERP is an evaluation and research center designed to help increase diversity in the field of computing research. During FY17, CERP engaged in several activities in support of this mission:

Data Collection and Analysis

CERP collaborates with departments across the U.S. for its Data Buddies Project, which collects national survey data from computing students. It provides a customized department report to each department that distributes CERP surveys to their students. Then, CERP utilizes these large datasets for its unique evaluation method and for social science research.

The Data Buddies survey collected responses from 7,286 undergraduate and 3,851 graduate students during fall 2016. 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 4,467 undergraduate students were added to CERP's final dataset for fall 2016.

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

Evaluation

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

CERP extracted web data to assess whether participants in the 2008-2009 CRA-W Career Mentoring Workshop are further along in their career track than a comparable sample of non-participants.

CERP conducted interviews with participants from two clients:

- Computer Science Living-Learning Community for Women at Rutgers University
- University of California San Diego CSE Early Research Scholars Program

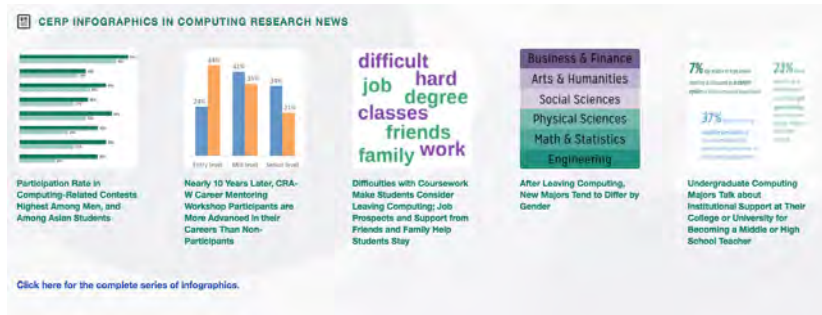
Research

CERP staff conducted research on students' experiences in introductory computer science courses, booming enrollments in computing fields, intersectionality in the context of computing education, and students' belonging in their field. This research was presented at 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. This year, CERP also contributed an article to *CRN* describing its social science



perspective (Stout, J.G. (2017). The Social Science Side of CERP. Computing Research News, 29 (4), 8-11.).



Papers

Blaney, J. & Stout, J. G. (in press). Examining the Relationship Between Introductory Computing Course Experiences, Self-Efficacy, and Belonging Among Women First-Generation College Students. Proceedings of the 48th ACM Technical Symposium on Computing Science Education.

Stout, J. G., Tamer, B., Wright, H. M., Clarke, L., Dwarkadas, S., & Howard, A. (2017). The Grad Cohort workshop: Evaluating an Intervention to Retain Women Graduate Students in Computing. *Frontiers in Psychology*, 7, 2071.

Lewis, K., Stout, J. G., Finkelstein, N. F. Pollock, S. J., Cohen, G. L, Miyake, A., & Ito, T. A. (in press). Fitting in to Move Forward: Using a Belonging Framework to Understand Gender Disparities in Persistence in the Physical Sciences, Technology, Engineering and Mathematics (pSTEM), *Psychology of Women Quarterly*.

Presentations

In August 2016, Jane Stout, former CERP director, gave an invited distinguished lecture titled “New Research on Women’s Low Participation Rates in Science and Technology Fields” at the annual meeting of the American Psychological Association to share best practices to encourage people from underrepresented groups in computing to enter the field.

Stout, J. G. (August, 2016). New Research on Women’s Low Participation Rates in Science and Technology Fields. Psi Chi invited address, American Psychological Association, Denver, CO.

Stout, J. G. (October, 2016). Booming Enrollments and Gender Diversity: How do we Keep History from Repeating Itself? Invited panelist, Grace Hopper Celebration of Women in Computing, Houston, TX.

Stout, J.G. (April, 2017). Increasing the Number of Girls and Women Choosing Computing as a Career. Invited panelist, AAUW Summit on Gender and Tech. Washington, D.C.

Stout, J.G. (May, 2017). Intersectional Analysis Using CERP Data. Invited presentation at Harvey Mudd College, Claremont, CA.

Stout, J. G. (June, 2017). A Research Agenda on Gender in Engineering and Computing. Invited panelist, 2017 WEPAN Change Leader Forum, Westminster, CO.

Lewis, K., Stout, J. G., Finkelstein, N. F. Pollock, S. J., Cohen, G. L, Miyake, A., & Ito, T. A. (invited resubmission). Fitting in to Move Forward: Using a Belonging Framework to Understand Gender Disparities in Persistence in the Physical Sciences, Technology, Engineering and Mathematics (pSTEM), *Psychology of Women Quarterly*.

Evaluation Reports

Wright, H. M. (2016). *CRA-W/CDC DSW Program: Women in AI, August 2016 Participant Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W/CDC DSW Program: Becoming a Robot Guru 2, August 2016 Speaker Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W/CDC DSW Program: Becoming a Robot Guru 2, August 2016 Participant Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W/CDC DSW Program: Broadening Participation in Data Visualization 2016, August 2016 Speaker Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W/CDC DSW Program: Broadening Participation in Data Visualization 2016, August 2016 Participant Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W Virtual Undergraduate Town Hall Series: Accelerated Cloth Simulation for Virtual Try-On, August 2016 Feedback Report*. Computing Research Association: Washington, D.C.

Wright, H. M. (2016). *CRA-W DREU 2016 Program: December 2016 Feedback Report*. Computing Research Association: Washington, D.C.

Education Committee

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

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



CRA-E

Computing Research
Association
Education

The following is a brief overview of activities during FY17:

- The 2017 CRA-E Undergraduate Research Faculty Mentoring Award was presented to three outstanding individuals. It recognizes those who have provided exceptional mentorship and undergraduate research experiences and, in parallel, guidance on admission and matriculation of these students to research-focused graduate programs in computing.
- CRA-E organized a committee to run the 2017 CRA Outstanding Undergraduate Researchers Award process. These student awards, sponsored by Microsoft and Mitsubishi Electric Research Labs in alternate years, recognize undergraduate students in North American colleges and universities who show outstanding research potential in an area of computing research.
- CRA-E released a series of videos showcasing young researchers with Ph.D.s sharing what compelled them to pursue a doctorate and how they are using their advanced training in their work in industry. While many undergraduates understand that a Ph.D. is needed for a position in academia, these videos demonstrate how a Ph.D. can also be useful in industry.
- The first two CRA-E Graduate Student Fellows, Max Grossman (Rice University) and Keith Feldman (Notre Dame), joined the committee in June 2017. The Fellows program provides CRA-E with perspectives from graduate students, while also providing leadership experience to graduate students who are committed to promoting undergraduate research.
- CRA-E hosted a series of workshops on engaging undergraduates in research at major computer science research conferences. A workshop, titled “Best Practices in Mentoring Undergraduate Research in Supercomputing,” was held at Supercomputing 2016 in Salt Lake City, Utah.



Surveys

CRA conducted the 45th annual Taulbee Survey of Ph.D.-granting computer science (CS), computer engineering (CE), and Information (I) departments in fall 2016 and published the results in the May 2017 issue of *CRN* and on the CRA website. The Taulbee 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. The 2016 Taulbee Survey included some new questions about course-level enrollment.

CRA Enrollment Committee

To investigate the surge in computer science enrollments, CRA conducted an enrollment survey to measure, assess, and better understand enrollment trends and their impact on computer science units, diversity, and more. Part of this effort included a survey of doctoral- and non-doctoral granting academic units in fall 2015. Results and analysis were published in February 2017 in a report called *Generation CS: CS Enrollments Surge Since 2006*. This online resource provides the survey results with respect to majors, non-majors, diversity, impact on academic units, and units' actions in response to the surge. The results were used extensively by the National Academies in its report *Assessing and Responding to the Growth of Computer Science Undergraduate Enrollments*.



At the CRA Conference at Snowbird in 2016, the CRA Enrollments Committee, led by Tracy Camp, presented preliminary results from the enrollment survey conducted in fall 2015. The key message was that the enrollment surge is real, large, being felt at almost every institution in North America, and includes both majors and non-majors.

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.



FY17 MEMBERS

ACADEMIC DEPARTMENTS

The following departments held membership in CRA for all or, in a few cases, part of the period from July 1, 2016 to June 30, 2017.

– 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)

– D –

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

– E –

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)
Miami University (CS)
Michigan State University (CSE)
Michigan Technological University (CS)
Midwestern State University (CS)
Mississippi State University (CSE)
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)
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University of California, Berkeley (IMS)
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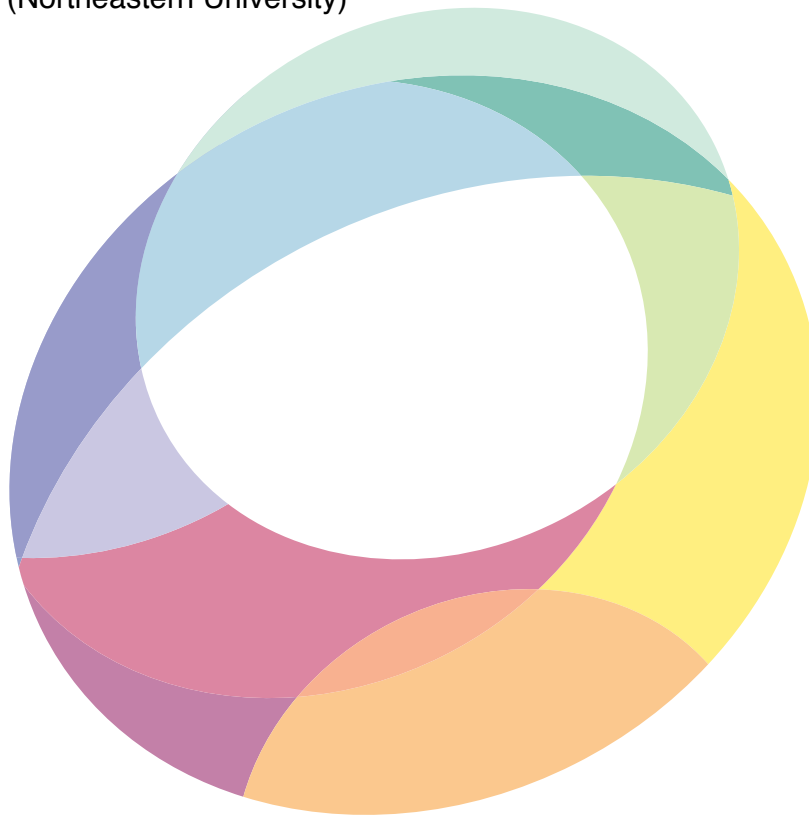
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