Computing Research Association
Annual Report

FY 2015-2016

CRA
Computing Research Association

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 2015-16 Fiscal Year (FY16), from July 1, 2015 to June 30, 2016, CRA made great strides in its efforts to strengthen research and advanced education in computing.

We'd like to share with you highlights of our FY16 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 mentor and cultivate individuals in each stage of the pipeline so that more computing researchers can reach their full potential. Before presenting our external activities, let me briefly describe some internal and administrative activities of 2015-16.

Board of Directors

In 2016, CRA members elected four new members to the board of directors: Penny Rheingans, Shashi Shekhar, Josep Torrellas, and Min Wang. Existing board members Chris Johnson and Ron Brachman were re-elected to the CRA board. Their terms run from July 1, 2016 through June 30, 2019. Elizabeth Mynatt (CCC Chair), Tom Conte (IEEE-CS representative), and Mario Nascimento (CS-Can/Info-Can representative) also started terms as new appointed board members.

CRA Awards

Three individuals were recognized by CRA for outstanding service in FY16 with the awards being presented at the 2016 CRA Conference at Snowbird.

Ayanna Howard was selected as the recipient of the 2016 A. Nico Habermann Award for her sustained commitment to increasing diversity combined with her distinction in research. She has a long track record of improving access to research for women and underrepresented minorities (URMs), as well as students with disabilities. Howard is currently a CRA-W board member and faculty member at Georgia Tech, where she has provided research opportunities to dozens of undergraduates (more 75 percent of whom are URMs and/or women)—and a majority of these students have gone on to graduate school.

Maria Klawe was selected as the recipient of the 2016 CRA Distinguished Service Award for her tireless commitment to and profound impact on the computing research community. Klawe, President of Harvey Mudd College, has used her leadership positions to strengthen the research discipline of computer science and to establish new norms and policies to increase the percentage of women and minorities in computer science and technology.

Fred Schneider, the Samuel B. Eckert professor and chair of computer science at Cornell University, was honored with a Service to CRA Award for his work and dedication to our organization. Schneider was a member of the CRA board from 2007 to 2016 during which time he thought deeply about how to have positive impact on the computing research community and spearheaded several key initiatives. As chair of the Government Affairs Committee from 2009-2016, Schneider helped drive CRA's policy agenda. He also led the Committee on Best Practices for Hiring, Promotion, and Scholarship, and played a central role in the development and success of the Computing Community Consortium.

CRA Communications

The new CRA unified website launched shortly after the July 2015 board meeting. We have continued to develop additional features and improve usability. The CRA Bulletin blog was launched at the same time to share timely information about CRA initiatives and items of interest to the general community including leaders at computing institutions. It is a complement to the monthly *Computing Research News (CRN)*. New themed columns, such as Profiles on CRA Award Winners, CRA Resource Highlights, and Profiles in Computing, were introduced.

CRA continues to produce *CRN* in its electronic format on a monthly basis (except July and December). *CRN* is distributed to more than 7,000 subscribers and is available on the CRA website. The last phase of the new website 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* remains the prime source of computing career advertising and now displays employer logos.

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.*

Susan Davidson
CRA Board Chair

CRA FINANCIAL STATEMENT

JULY 2015-JUNE 2016

Statement of Financial Position	
Cash & Accounts Receivable	$3,868,292
Investments	$2,223,886
Total Assets	$6,442,211
Total Liabilities	$1,656,413
Total Net Assets	$4,785,798
Total Unrestricted Net Assets	$4,518,138
Total Temporarily Restricted Net Assets	$267,660

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, Blue Sky Ideas Conference Tracks, and other activities. The CCC communicates the importance of these activities to policymakers, government and industry stakeholders, the public, and the research community itself.

CCC
Computing Community Consortium
Catalyst

Community-Based Visioning Workshops

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

During FY 16, several workshops were held:

- Privacy by Design – Catalyzing Privacy by Design
  Jan. 6-7, 2016
- Computer-Aided Personalized Education
  Nov. 12-13, 2015
- Promoting Strategic Research on Inclusive Access to Rich Online Content and Services
  Sept. 24-25, 2015
- Privacy by Design – Engineering Privacy
  August 31-Sept. 1, 2015

Workshop reports from each activity 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. Many white papers have been influential in informing new programs or initiatives. The council has taken a leadership role with these white papers, but additional researchers from outside the council are often involved, sometimes as lead writers or co-authors, and also as editors. White papers written during the time period of this report are:

- Next Generation Robotics was released on June 9, 2016 as a result of two CCC mini-workshops to outline the opportunities for the National Robotics Initiative in the next five years.
- The Future of Computing Research: Industry-Academia Collaborations released on May 6, 2016, as a result of the CCC Roundtable on Industry-Academia Collaborations held in July 2015.
- Accelerating Science: A Computing Research Agenda was released on February 22, 2016.
- The Importance of Computing Education Research was released in January 2016.
- Smart Communities Internet of Things was released in January 2016.
- Next Generation Computing Challenges was released in October 2015.
- System Computing Challenges in the Internet of Things was released September 2015.
- Video Analysis for Body-worn Cameras in Law Enforcement was released in August 2015.

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:

- 38th International Conference on Software Engineering (ICSE), May 2016, Austin, Texas
- Fifteenth International Conference on Autonomous Agents and MutliAgent Systems (AAMAS), May 2016, Singapore
- Thirtieth Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence (AAAI-16), February 2016, Phoenix, Arizona
- 23rd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2015), November 2015, Seattle, Washington
- The 2015 Robotics: Science and Systems (RSS) Conference, July 13-17, 2015, University of Rome, Italy

Additional Activities

The CCC designed and sponsored a symposium titled "Computing Research: Addressing National Priorities and Societal Needs" in Washington, DC, on May 9-10, 2016. Over the past 10 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. The Computing Research: Addressing National Priorities and Societal Needs symposium drew these topics into a program designed to illuminate current and future trends in computing and the potential for computing to address national challenges. The meeting brought together more than 130 in-person participants and more than 1,000 online viewers to raise the visibility of work that connects innovative computing research to major societal needs. The seven panels, two plenaries, and an early career poster session, all of which are now online on the CCC website, presented numerous ideas that could shape our future world. One of the most dynamic and forward-looking events at the symposium was a poster session involving 38 early career faculty members, postdoctoral scholars, and graduate students.

The CCC co-sponsored an "Artificial Intelligence for Social Good" workshop with the White House Office of Science and Technology Policy and AAAI in Washington, DC, on June 7, 2016. More than 300 participants from academia, industry, and government attended the workshop in person and more than 3,500 unique viewers tuned in for the livestream. Videos from the public presentation can be found on the website.

There has been a dramatically increased interest in artificial intelligence (AI) in recent years. AI has been successfully applied to societal challenge problems, and it has a great potential to provide tremendous social good in the future. This workshop discussed the successful deployments and the potential use of AI in various topics that are essential for social good, including but not limited to urban computing, health, environmental sustainability, and public welfare.

Task Forces

The CCC Council also establishes task forces aligned with the community and national priorities. For the 2015-2016 year, CCC task forces included big data, education, healthcare, high performance computing, industry, Internet of Things/computing in the physical world, and privacy.

Communications

In order to communicate with both the computer science research community and policymakers, the CCC continued to publish timely articles on its blog, release workshop reports, and present in multiple different venues such as conferences, and agency workshop groups. CCC also continued "Great Innovative Ideas," a monthly feature on its website, to highlight the research of Blue Sky Award winners and other computer science researchers.

Postdoc Best Practices Program

With NSF's backing, the CCC created a program to develop, implement, and institutionalize the application of best practices for supporting postdocs. This program awarded grants to institutions and consortia of institutions to implement best practices for strengthening the postdoc experience in computer science and computing-related fields. These supporting programs have enabled Ph.D. graduates to transition effectively to research roles in a variety of sectors. The program was initially sponsored to run from 2014 to 2017, but has been extended to 2018 due to its continued success.

2016 Leadership Summit

In February 2016, CRA hosted its annual Computing Leadership Summit for the senior leadership of CRA member societies and the Computer Science and Telecommunications Board (CSTB). Several engaging sessions provided valuable information on current issues important to these organizations. CRA Director of Government Affairs Peter Harsha explained the implications for science of the president's FY17 federal budget request. Randy Bryant, who completed a rotation at the White House's Office of Science and Technology Policy, and Margaret Martonosi, a CRA board member who served as a Jefferson Science Fellow at the State Department, provided insights and updates about their time in government positions. Jim Kurose, assistant director of the Computer and Information Science and Engineering (CISE) Directorate at the National Science Foundation (NSF), gave an update on current and new initiatives, and hosted a Q&A session.

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.

During FY16, 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:

- Provided input to Senate committee staff and formally endorsed the Developing Innovation and Growing the Internet of Things Act (S. 2067), which emerged from the Senate Commerce, Science, and Transportation Committee;
- Aided the Computer Science Education Coalition in working to achieve the goals of the Computer Science For All Initiative, including securing $250 million in federal funding for K-12 computer science education;
- Provided input and ultimately endorsed the Networking and Information Technology Research and Development Modernization Act of 2016 (H.R. 5312), which passed overwhelmingly in the House;
- Sponsored and helped organize a successful congressional briefing and reception of the Congressional Robotics Caucus to mark the 5-year anniversary of the National Robotics Initiative;
- Provided formal input to the Senate Commerce, Science, and Transportation Special Task Force on Competitiveness about issues to consider for its upcoming reauthorization of the America COMPETES Act;
- Reviewed concerns over federal rulemaking efforts around student visa issues (STEM OPT) and changes to human-subject testing rules at NIH;
- Joined letters advocating on behalf of computer science education issues in advance of the passage of the Elementary and Secondary Education Act;
- Joined a number of coalitions in efforts advocating for the "innovation agenda," urging more funding for federal investments in fundamental research.

In addition, GAC organized several other activities in support of its mission. For instance, CRA participated in the Coalition for National Science Funding's annual Capitol Hill Science Exposition, with a group led by Vijaykrishnan Narayanan from Penn State University that highlighted their research on vision assistance technology.

The GAC sent the CRA Washington Update, which contains policy updates and other relevant news, to members of the Computing Research Advocacy Network. GAC staff also produced an analysis of computing research for the president's FY 2016 Budget Request for the AAAS Guide to R&D in the president's budget book. And the GAC continued to post for the the Computing Research Policy Blog a valuable resource for science policy news, advocacy, and analysis for the computing community.

CRA also hosted a Fall Congressional Fly-in in September 2015. Twenty-two participants from CRA institutions in 16 different states traveled to Washington, DC at their own expense. All together, they participated in 53 meetings with representatives in Congress and staffers, conveying a message about the importance of computing research and the importance of the federal role in investing in that research. Post-meeting "debriefs" from the participants were universally positive about the experience, with most indicating they would likely do it again.

The GAC also launched an effort to highlight the work of computer scientists who come to Washington, DC to serve in policy roles. This effort has a few different goals: to help CS folks who are in policymaking positions publicize their work and identify ways that the community might be supportive of their efforts; recognize those who have given up their time to serve their county in policymaking roles; and highlight different opportunities to engage even more of the community in policymaking roles. The highlights are short profiles and Q&As with these computer scientists that run in *Computing Research News* and are available at http://cra.org/govaffairs/cs-in-dc/.

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 by surveying, comparing, and analyzing computing departments and individuals.

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. In the past year, CRA-W continued administrating all existing programs; launched a new program, the NSF funded Virtual Undergraduate Town Hall Series; and designed and submitted proposals for two new programs, CRA-W Grace Hopper Celebration Research Scholars and Undergraduate Cohort. CRA-W programs impact more than 1,700 undergraduates, graduate students, and computing research professionals each year.

CRA-W
Computing Research Association
Women

With program expenditures exceeding $2 million for the last fiscal year, CRA-W's breadth of programs are financially supported by the NSF, DOE, industry, university departments, ACM SIGs, foundations, CRA, and extremely dedicated volunteers.

In 2015, CRA-W added two specific benefits for CRA members. CRA-W introduced priority in the selection process for Grad Cohort applicants who come from CRA member departments. It also added an academic version of the CRA-W Grad Cohort Graduating Class document that includes information about Grad Cohort alums who are either graduating M.S. students looking for Ph.D. programs or graduating Ph.D. students looking for faculty positions. Because of these new benefits, five new department members joined CRA in FY16.

Last year marked CRA-W's 25th anniversary year. Throughout 2016, CRA-W accomplishments were documented on its website, with celebrations at the spring CRA-W board meeting at Grad Cohort, the CRA Conference at Snowbird, and other events.

Programs

The goal of CRA-W programs is to increase computing research skills, knowledge of computing careers and next steps, peer communities, mentoring, role models, and successful outcomes of progressing to the next career level (i.e., participation in graduate school, a research career, or promotion) for women and other underrepresented groups, including ethnic minorities and persons with disabilities. CRA-W programs include Early and Mid Career Mentoring Workshops for research universities, teaching focused institutions and research labs, Grad Cohort Workshop, Mentoring tracks at Grace Hopper, Scholarships for Women Studying Information Security, and the new Virtual Undergrad Town Hall series. CRA-W partnered with the Coalition to Diversify Computing on six additional programs: Distributed REU (DREU), Collaborative REU (CREU), Discipline Specific Workshops (DSW), Distinguished Lecture Series (DLS), and mentoring tracks at the Tapia Celebration of Diversity in Computing.

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

Fundraising

The community continues to support CRA-W programs with funding and professionals who volunteer their time. CRA-W receives significant funding from the NSF for many programs. This includes an NSF Broadening Participation in Computing (BPC) Alliance grant ($1.5 million over five years) together with the Coalition to Diversify Computing funding CREU, DREU, DLS, and DSW; an NSF ADVANCE grant ($750,000 over 5 years) funding the Early and mid-Career Mentoring Workshops, and a NSF DUE IUSE grant ($180,000 over 2 years) funding the Virtual Undergraduate Town Hall.

Additionally, supplements to the Alliance grant provided funding for Grad Cohort ($100,000 a year), additional funding for DREU ($48,000 a year), and funding to pilot a new project called the CRA-W Grace Hopper Celebration (GHC) Research Scholars ($84,000) to provide positive, research related experiences for undergraduates at GHC, including interaction with CRA-W mentors and participation in CRA-W programs throughout the academic year.

Thanks to fundraising efforts, in FY16 Grad Cohort program saw a 34 percent funding increase, made possible by expanding contributions from sponsors such as industrial, ACM, departmental, and government.

Center for Evaluating the Research Pipeline (CERP)

CERP continues to establish itself as a sustainable and reputable research and evaluation center for the computing research community. Among its FY16 projects are:

CERP
Computing Research Association
Evaluation

Data Collection

- ~4,900 of undergraduate students and ~2,700 graduate students participated in CERP's annual Data Buddies survey for continuing students.
- Data were collected for program evaluation as part of a longitudinal research program measuring predictors of student retention in computing degree programs, and to assess students' motivation for pursuing Introductory CS courses, as part of the CRA's "booming enrollments" initiative.
- CERP collected data from hundreds of undergraduate students and graduate students during its annual survey for graduating students. The data relates to students' immediate plans following graduation, and are being used primarily for program evaluation.
- ~800 computing research professionals completed a CERP survey assessing workplace climate and aspirations for the future.
- Data were collected to evaluate a CRA-W mentorship program, funded by an ADVANCE grant to the CRA.

Papers

- Camp, T., Zweben, S., Stout, J., & Buell, D. (2016). Booming enrollments: A panel summary from SIGCSE 2016. *ACM Inroads*, 7, 12-14.
- Stout, J. G., Tamer, B., & Wright, H. M. (2016). Toward a Deeper Understanding of First Generation Students' Success in Computing. *Proceedings of the NSF Envisioning the Future of Undergraduate STEM Education: Research and Practice Symposium.*
- Stout, J. G., Grunberg, V., & Ito, T. A. (2017). Gender Roles and Stereotypes About Science Careers Help Explain Women's and Men's Science Pursuits. *Sex Roles.*
- Stout, J. G., & Tamer, B. (2016). Collaborative Learning Eliminates the Negative Impact of Gender Stereotypes on Women's Self-Concept. *Proceedings for the Annual Meeting of the American Society for Engineering Education.*

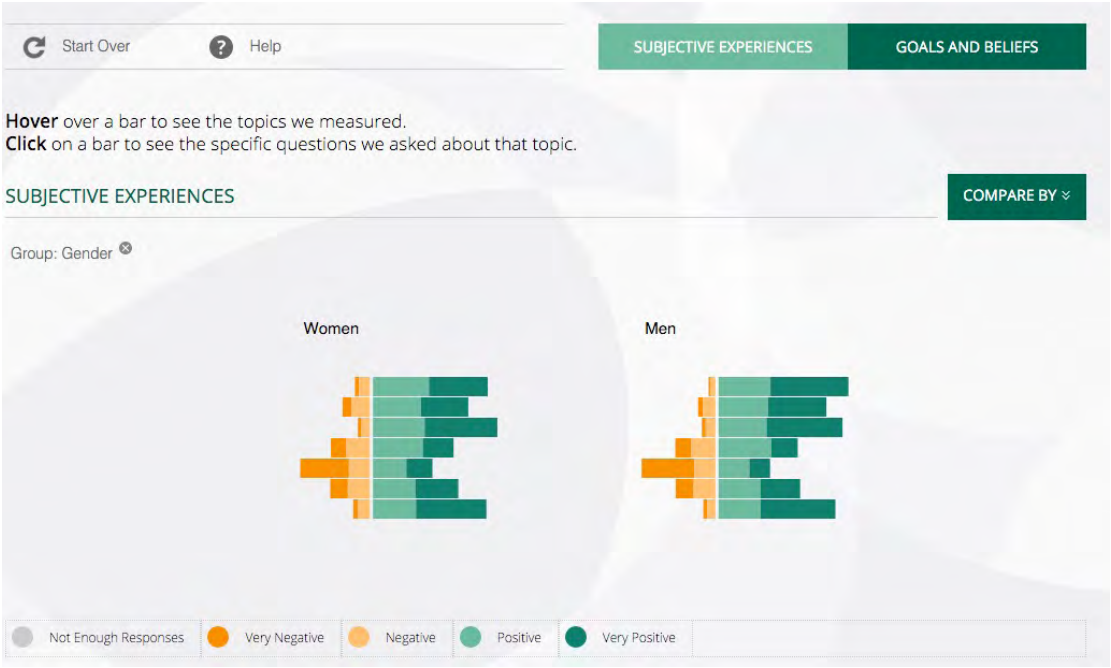
Presentations

- Camp, C., Zweben, S., Buell, D., & Stout, J. G. (2016). *Booming Enrollments – Survey Data*. Panel at the annual meeting of SIGCSE.
- Stout, J. G. (2016). *New research on women's low participation in science and technology.* Invited presentation at the annual meeting of the American Physical Society.
- Stout, J. G., & Tamer, B. (2016). *Study support eliminates the negative impact of gender stereotypes on women's self-concept.* Flashtalk presented at the annual meeting of SIGCSE.

- Tamer, B. & Stout, J. G. (2016). *Understanding How Research Experiences for Undergraduate Students May Foster Diversity In The Professorate.* Paper presented at the annual meeting of SIGCSE.
- Wright, H. M., & Stout, J. G., (2016). *Mentoring Women Professionals in Computer Science and Engineering, and Evaluating Impact.* Poster presented at the ADVANCE PI Meeting.

Data Visualization Project

In February 2016, CERP launched its data visualization website displaying Data Buddies data. Ron Metoyer, associate professor of computer science and engineering at the University of Notre Dame, designed the website, alongside a team of student developers and CERP Research Scientist Burçin Tamer. This project was funded by a NSF award to the CRA: CNS-1246649.



The data visualization website allows viewers to explore trends in students' experiences in the computing community, and features the capability to compare across student groups (i.e., women vs. men; students of different racial backgrounds). Currently, the website is displaying data collected during the fall semester of 2014.

Data were collected from Data Buddies departments. Is your department a buddy? If not, help the computing community by volunteering your department to become a Data Buddy today! Visit CERP's website to sign up: http://cra.org/cerp/data-buddies/.

BRAID-CRA Collaboration

CERP began working with Linda Sax, a professor of education at UCLA, and a team of graduate students, on the research component of the Building Recruiting and Inclusion for Diversity (BRAID) initiative. The BRAID initiative was established in 2014 by Harvey Mudd College and the Anita Borg Institute for Women and Technology. It currently involves 15 computing departments across the U.S. that are committed to recruiting and retaining women as well as underrepresented men in computing majors. To that end, BRAID departments implement changes to their introductory computer science courses, and pathways into the major, as well as improve departmental climates, and promote outreach efforts for students.

Recognizing the importance of comparing students at BRAID departments with students at other institutions, Sax and her team reached out to CERP for data on a comparison group of non-BRAID institutions. CERP distributes an annual survey to a network of computing departments across the U.S., which assesses students' experiences and progress in their computing degree program. This initiative is the previously described Data Buddies Project. Institutions participating in the Data Buddies Project are an ideal comparison group for BRAID, so the collaboration is a natural fit.

The UCLA team and CERP collaborate to:

- Compare subjective experiences in computing among underrepresented students from BRAID institutions versus non-BRAID institutions. For instance, analyses focus on students' sense of "fit" in the computing community, access to mentors, and aspirations for the future, as a function of whether students are enrolled in a BRAID versus non-BRAID institution.
- Disseminate findings to the computing education community and other STEM fields suffering from low diversity.
- Utilize lessons learned from this project to inform a longitudinal follow-up study on students enrolled at BRAID/CERP institutions.

Education Committee (CRA-E)

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 and
- Develop practices and materials to help departments attract, educate, and retain talented and diverse researchers.

The CRA-E was very productive in FY16. The following is a summary of some of our activities:

- The Faculty Mentoring Award Committee selected three outstanding nominees to receive the award: Pieter Abbeel (University of California, Berkeley), Marie desJardins (University of Maryland, Baltimore County), and Judy Goldsmith (University of Kentucky).

- CRA-E oversaw the 2016 CRA Outstanding Undergraduate Researchers Award process. A list of the winners, runners-up, finalists, and honorable mentions is available here: http://cra.org/about/awards/outstanding-undergraduate-researcher-award/#2016. Many of the nominees were involved in successful summer research or internship programs; many had been teaching assistants, tutors, or mentors; and a number had significant involvement in community volunteer efforts. CRA gratefully acknowledges the support of Microsoft Research and Mitsubishi Electric Research Labs (MERL) who sponsor the Outstanding Undergraduate Researcher Award program in alternate years. MERL sponsored the FY16 awards.
- The CRA-E Graduate Fellows program (http://cra.org/crae/activities/fellows) was initiated in 2016. The program's goal is to provide CRA-E with perspectives from graduate students and to provide leadership experience to graduate students who are committed to undergraduate research and are likely to continue advancing undergraduate research in the future. Two fellows were selected in 2016 – Max Grossman (Rice University) and Keith Feldman (Notre Dame). The fellows worked on the content and usability of the Conquer website (http://conquer.cra.org) and on providing resources for supporting graduate students who do research with undergraduates.
- CRA allocated funding for the Videos for Undergraduates project entitled "Choosing a PhD in Computer Science." This project showcases recent computer science Ph.D.s talking about why they chose to pursue a doctorate and their current research. The emphasis is on young Ph.D.s in industry since this is a sector that most undergraduates don't understand, and it is where the largest percentage of new CS Ph.D.s are headed. CRA-E worked with videographer Patrick Sammon to select researchers to interview and to develop the videos.
- A listing service of research opportunities for undergraduates was set up on the Conquer website in early 2016 (http://conquer.cra.org/research-opportunities). This service allows researchers to post research positions for undergraduates and for students to search for positions.
- A best practices in mentoring undergraduate research workshop was held at ICSE in May 2016 (which was funded by a National Science Foundation grant to CRA-E).

Surveys

CRA conducted the 44th annual Taulbee Survey of Ph.D.-granting computer science (CS), computer engineering (CE), and Information (I) departments. 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. In 2015, response rates were comparable to those from the 2014 survey, despite the inclusion of the profiles section, which is added every three years, and the addition of a separate enrollment survey to gather information about the enrollment boom in computer science. The 2015 survey results document the continued enrollment growth in undergraduate CS programs, and a small but predictable drop-off in doctoral production. Diversity showed little change in both the students and faculty data. Faculty hiring increased from the previous year, including growth in both tenure-track and teaching faculty.

Generation CS Report

The CRA Enrollment Survey of computer science departments elicited responses from 123 doctoral CS departments and 84 non-doctoral CS departments. Preliminary results were presented at ACM SIGCSE by a panel chaired by Tracy Camp, and including Stuart Zweben from the surveys committee, and Jane Stout and Duncan Buell from another team working with Camp on the enrollments project. The survey data was analyzed in greater depth by a team that included Camp, Betsy Bizot, Susanne Hambrusch, and Zweben from the surveys committee, and Rick Adrion, Susan Davidson, Mary Hall, and Ellen Walker. Generation CS: CS Enrollments Surge Since 2006 reports the survey results with respect to majors, nonmajors, diversity, impact on academic units, and units' actions in response to the surge. Several committee members also participated in the National Academies of Sciences, Engineering, and Medicine's ad hoc Committee on Growth of Computer Science Undergraduate Enrollments.

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 meets annually 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.

The CRA-Deans group met during the 2016 CRA Conference at Snowbird to discuss the following topics:

- Process for faculty review
- Cross campus initiatives
- Cybersecurity
- Collaborative activities with the iCaucus

2016 CRA Career Mentoring Workshop

The CRA Career Mentoring Workshop was held Feb. 22-23, 2016 in Arlington, Va. More than 80 attendees learned about valuable career skills from distinguished researchers who served as speakers, including several CRA board members, as well as representatives from the NSF.

In addition to panel sessions, the mentoring workshop was interspersed with opportunities to network and receive career advice. Attendees learned about improving grant proposals, preparing for tenure, managing life-work balance, and planning a research career. The workshop participants also attended a reception with CRA board members and leaders of CRA affiliate societies. During part of the final day, they also met with program directors from NSF's CISE Directorate.

2015-16 MEMBERS

ACADEMIC DEPARTMENTS

The following departments held membership in CRA for all or, in a few cases, part of the period from July 1, 2015 to June 30, 2016.

- A -

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

- B -

Binghamton University, SUNY (CS)
Boston College (CS)
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)
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 (CCI)
Duke University (CS)

- E -

Emory University (MCS)

- F -

Florida Institute of Technology (CS)
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)
Hobart and William Smith Colleges (MCS)
Hofstra University (CS)

- I -

Illinois Institute of Technology (CS)
Indiana University (SIC)
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 -

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Lehigh University (CSE)
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- M -

Marquette University (CS)
Massachusetts Institute of Technology (EECS)
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- N -

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Northeastern University (CIS)
Northwestern University (EECS)
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- O -

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- P -

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- V -

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