COMPUTING RESEARCH
CRA
ASSOCIATION

ANNUAL
REPORT
2012-2013

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ABOUT CRA

The Computing Research Association (CRA) is an association of more than 210 North American academic departments of computer science, computer engineering, and related fields; laboratories and centers in industry, government, and academia engaging in basic computing research; and affiliated professional societies.

CRA's mission 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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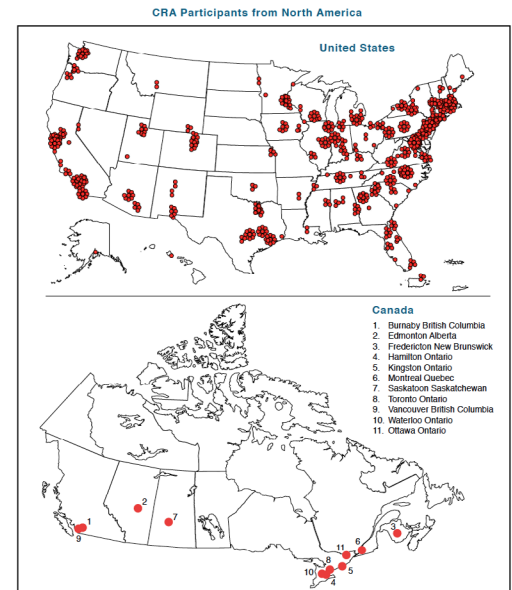P: 202-234-2111
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MESSAGE FROM THE BOARD CHAIR

I am pleased to report that CRA had a very productive year in 2012-13. CRA provided leadership on a range of issues and initiatives, detailed below. Despite challenges, the number of people actively engaged in CRA's activities continues to grow, and its financial position remains stable and sound.

CRA's mission to strengthen research and advanced education in computing research is made possible by the numerous individuals who support our work. From July 1, 2012 to June 30, 2013, more than 1,800 participants from the United States, Canada and around the world have been active in CRA and the programs of its committees. The map to the right shows the geographic diversity of CRA board members, committee members, awards program winners, nominees, and nominators (Outstanding Undergraduate Researchers, A. Nico Habermann and Distinguished Service), Computing Community Consortium event participants, and CRA-W event participants.

In July 2012, CRA celebrated the 40th anniversary of its founding at the 20th instance of its biennial CRA **Conference at Snowbird**. The two-day conference, held at the Snowbird Ski and Summer Resort in Little Cottonwood Canyon, Utah, is an opportunity for the leadership of the North American computing research community to gather and discuss issues of importance to the community.

CRA Participants from North America

United States

Canada
1. Burnaby British Columbia
2. Edmonton Alberta
3. Fredericton New Brunswick
4. Hamilton Ontario
5. Kingston Ontario
6. Montreal Quebec
7. Saskatoon Saskatchewan
8. Toronto Ontario
9. Vancouver British Columbia
10. Waterloo Ontario
11. Ottawa Ontario

The **Computing Community Consortium (CCC)** was funded in fall 2006 through a Cooperative Agreement between CRA and the National Science Foundation (NSF). Its goal is to mobilize the computing research community to debate long-range research challenges and build consensus around specific research visions. The CCC began full-scale operations in spring 2007, and, as its activities have increased over time, it has seen its annual expenditures ramp up toward $2 million/year (projected).

At the request of NSF, the CCC submitted a proposal in March 2011, seeking a four-year renewal of the Cooperative Agreement. NSF conducted a Reverse Site Visit of the CCC in February 2012. An award decision was quickly made, and the new award began August, 2012. One of the suggestions from the 2012 Site Visit was the transition from "start-up" to "steady state" for the CCC. The CCC answered this request by creating a formal Organizational Structure, approved by NSF. As of July 1, 2013, Susan Graham assumed the

role of Chair; Gregory Hager, Vice Chair; and Ed Lazowska, Past Chair. New Council Members have rotated onto the Council, and those with expiring terms have left the Council.

In September 2012, Erwin Gianchandani resigned as Director to assume the Deputy Division Director for CNS in CISE at NSF. Kenneth Hines has continued as CCC program associate. In March 2013, Ann Drobnis was hired as Director of CCC.

Since 2011, the CCC has continued to build upon its varied activities. Updates to key ongoing projects are provided in the Leadership Highlights section.

CRA's **Committee on the Status of Women in Computing Research (CRA-W)** continues to thrive as an energetic programmatic committee of CRA focused on increasing the number and success of women in computing research. A major goal of CRA's Broadening Participation in Computing (BPC) grant from NSF has been to increase coordination on several projects between **CRA-W** and the **Coalition to Diversify Computing (CDC)**. A major development in this fiscal year was the launching of the **CRA Center for Evaluating the Research Pipeline (CERP)**, a large-scale national data collection and analysis initiative. As of June 30, 2013, CRA had hired a team of social and behavioral scientists with expertise in quantitative and qualitative methods to run CERP, including a Director and Research Analyst, and planned to hire two Research Assistants. This effort responds to NSF's increasing interest in measures of performance of BPC programs. The initiative addresses a long-standing problem—the need for a comparison group to determine efficacy. In September 2012, CRA was awarded $5,569,433 for the five-year BPC proposal "Sustainable Diversity in the Computing Research Pipeline."

CRA-W coordinated a range of popular mentoring programs and workshops designed to increase the representation and opportunities for women in computing research. CRA-W and the Coalition to Diversify Computing (CDC) have partnered to expand several programs to include underrepresented minorities as well as women. Active CRA-W projects include: the Distributed Research Experience for Undergraduates (DREU) (US and Canada); the Collaborative Research Experiences for Undergraduates (CREU); and Discipline-Specific Workshops designed to increase the participation of members of underrepresented groups within a specific research area. In addition, CRA-W's Grad Cohort Program brought together 302 women graduate students in their first, second, or third year of graduate school for a two-day workshop on graduate school survival, career planning, and networking.

CRA-W organized a teaching-oriented Career Mentoring Workshop in March 2013 that attracted 30 participants and eight speakers and in November 2012 CRA-W organized a Cohort of Advanced Professionals Project (CAPP) workshop designed to increase the percentage of CS&E women faculty members and researchers who reach the top of their career tracks. The CAPP workshop was attended by 49 participants and twenty-one speakers. In its Distinguished Lecture Series, faculty and lab researchers visited campuses to encourage women and minorities to attend graduate school. CRA-W also revamped its website, published regular "Expanding the Pipeline" articles in *Computing Research News;* and formed a team to develop a more formalized process to better manage its various evaluation efforts.

The **Coalition to Diversify Computing (CDC)** is a joint organization of the ACM, CRA and IEEE-CS. CDC's major effort was the February 2013 Tapia Conference, the premier conference for Celebration of Diversity in Computing. Other CDC activities included: Distributed Research Experiences for Undergraduates (DREU); Collaborative Research Experiences for Undergraduates (CREU); CDC/CRA-W Discipline Specific Workshops; CDC/CRAW Distinguished Lecture Series; IEEE-CS Distinguished Visitor Program Liaison; Sending Students to Conferences; Addressing the Shrinking Pipeline; and NCWIT Leadership Team.

The **CRA Deans Group** was established in an effort to provide leadership and community to emerging and established colleges of computing and interdisciplinary "IT" schools. The group is organized around schools of computing, schools of information, and/or schools of information technology with heads that report directly to the Provost or Chief Academic Officer at a university.

The **CRA Education Committee (CRA-E)** supports CRA's mandate of "facilitating the development of strong, diverse talent in the field." During the last year, CRA-E completed two major activities: (1) The committee studied the domestic pipeline of Ph.D. students in computing fields, resulting in a report entitled "Exploring the Baccalaureate Origins of Domestic Ph.D. Students in Computing Fields," published in Computing Research News in January 2013. Further studies on the domestic pipeline are ongoing. (2) The committee developed new resources and materials for faculty who are interested in engaging undergraduates in research. A new website has been designed to disseminate these materials. CRA-E has received a $36,000 grant from NSF to conduct workshops on undergraduate research for faculty, to be held at major research conferences in the next two years. In addition to these two activities, a number of new projects have been under discussion and will be explored further in the coming year.

CRA conducted the 42nd annual **Taulbee Survey** of Ph.D.-granting CS, CE, and Information departments. The survey documents trends in student enrollment, degree production, employment of graduates, and faculty salaries in Ph.D.-granting departments of computer science (CS), computer engineering (CE), and information (I) in the United States and Canada. This year's results showed a double-digit percentage increase in undergraduate degree production for the third straight year, and a record high in doctoral production (1,929 compared to the previous high of 1,877 in 2008). The overall response rate was 70 percent; the rate for US CS departments was higher at 80 percent. Plans are underway to replace the Taulbee survey data entry and reporting software with a completely new version providing better security, better data validation, better analytics, and a new peer group reporting feature.

CRA's Government Affairs Committee (GAC) served not only as the boots on the ground and the eyes on the Hill in Washington, DC, on behalf of the computing research community, but continued in its role trying to raise the "temperature" for science policy awareness in the community by hosting the second edition of its highly-regarded Leadership in Science Policy Institute (LiSPI) for computer science faculty and professionals. The goal of LiSPI is to develop a next generation of leadership in the computing research community. CRA also served as a trusted source of information—both 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, as all sought to understand the issues confronting the federal Networking and Information Technology Research and Development program (NITRD)—the thirteen-agency, nearly $4-billion-a-year federal effort to support computing research.

With a very difficult budget climate in DC – and an increasing number of newer Members of Congress who do not understand the value of federal investments in research – it is vitally important that GAC continues to work hard to make the case for research to Congress and the Administration and ensure that federal support for fundamental research in computing remains a priority.

The **CRA Communications Committee** reviewed the mission statement and updated it based on input from CRA staff, standing committees and the board of directors. The approved mission statement is: CRA's mission 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.

From Fall 1988 to 2012, CRA published *Computing Research News (CRN)* – the voice of the Computing Research Association – in hard copy and shipped it off to computing research leadership across North America. In September 2012, *CRN* evolved to a new digital format delivered via email to more than 7,000 subscribers. As times change, so do the needs of our community, and the format change has provided increased benefit to the community. *CRN* increased its publication frequency to 10 times a year in order to reach our audiences more frequently and with more timely information.

CRA hosted the annual **Computing Leadership Summit** for presidents, executive directors, and other senior leadership of CRA, its six affiliate societies (AAAI, ACM, CACS/AIC, IEEE-Computer Society, SIAM, and USENIX), and NRC's Computer Science and Telecommunications Board. The nineteenth Summit was held February 25, 2013, in Washington, DC. Speakers included Moshe Vardi, the Editor-in-Chief of the Communications of the ACM, on the publication culture in computing; a discussion on the rise of Massively Online Open Courses (MOOCs) led by CRA Chair Eric Grimson; Farnam Jahanian, head of the Computer and Information Science and Engineering directorate at NSF; and Vijay Kumar, from UPenn, about his appointment to the White House's Office of Science and Technology Policy.

Two individuals were recognized by CRA for outstanding service in 2012-2013. Peter G. Neumann, Principal Scientist at SRI International, received the 2013 **CRA Distinguished Service Award**. Neumann was selected in recognition of the outstanding contributions to advancing the field of computing made during half of a century of service and dedication. His activities have also had an enormous impact in computing science research and remain at the forefront today.

The 2013 **A. Nico Habermann Award** was given to David Notkin, Professor of Computer Science and Engineering at the University of Washington Seattle. The award recognized Notkin's deep commitment for increasing the participation of women and underrepresented groups in computing. He was an outspoken advocate for underrepresented groups in computing, pushed the field to try new approaches, and served as a role model for the computing community. The CRA community was saddened when Notkin passed away in April 2013. His children accepted the award on his behalf at the ACM Awards Banquet.

CRA welcomed four new Board members for full three year terms beginning July 1, 2012: Jeanne Ferrante, Lance Fortnow, Kathryn McKinley and Greg Morrisett. During the year, Julia Hirschberg and P. Takis Metaxas were selected to replace members that resigned before completing their terms, and our professional society members replaced three of their representatives to the CRA Board with: David Bader (IEEE-CS), Henry Kautz (AAAI), and Margo Seltzer (USENIX).

Retiring from the board as of June 30, 2013, are Ed Fox, Mary Jean Harrold and Martha Pollack. CRA thanks them all for contributions during their service on the board. As always, we are grateful to the many people who contribute to CRA by serving as chairs and members of its various committees and who participate in its activities in other ways. Mary Jean Harrold passed away in 2013, after serving nine years on the CRA Board and a previous CRA-W Co-Chair and Board member. She will be sorely missed by the CRA community.

The success of any organization is defined by the enthusiasm and active participation of its members and volunteers. By that standard, CRA is a vibrant and thriving organization, committed to advancing aspects of computing research. This report is a vignette of the diverse activities of CRA and its members. On behalf of the CRA Board, thank you for all you do to make CRA the success that it is today.
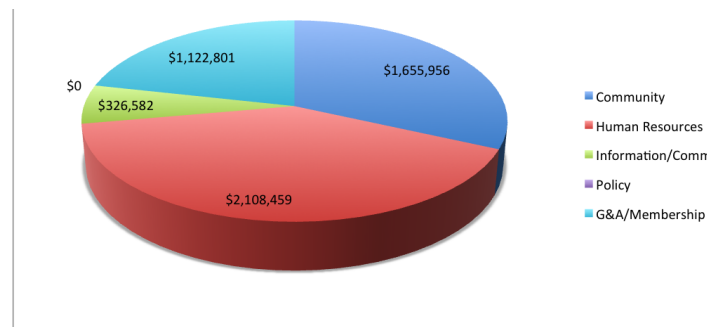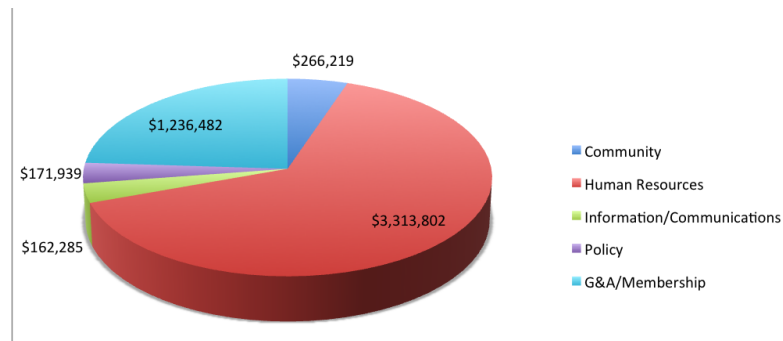
W. Eric Grimson
Board Chair

CRA FINANCIAL STATEMENT

JULY 2012 - JUNE 2013

INCOME $5,213,798

$1,122,801
$0
$326,582
$1,655,956
$2,108,459

- Community
- Human Resources
- Information/Comn
- Policy
- G&A/Membership

EXPENSES $5,150,727

$266,219
$1,236,482
$171,939
$162,285
$3,313,802

- Community
- Human Resources
- Information/Communications
- Policy
- G&A/Membership

Note:
CIFellows subawards totaling $2,430,688 in FY13 in both Income and Expenses are not included to provide a better comparison.

Statement of Financial Position

Cash & Accounts Receivable	$3,238,766
Investments	$2,221,982
Total Assets	$5,704,861
Total Liabilities	$1,439,958
Total Net Assets	$4,264,903
Total Unrestricted Net Assets	$4,011,666
Total Temporarily Restricted Net Assets	$253,237

POLICY

To carry out the policy pillar of its mission, CRA provides advocacy and policy analysis for the computing research community. FY 2012-13 was a very productive year for CRA government affairs.

CRA's **Government Affairs Committee (GAC)** served not only as the boots on the ground and the eyes on the Hill in Washington, DC, on behalf of the computing research community, but continued in its role trying to raise the "temperature" for science policy awareness in the community by hosting the second edition of its highly-regarded Leadership in Science Policy Institute (LiSPI) for computer science faculty and professionals. The goal of LiSPI is to develop a next generation of leadership in the computing research community. This year's edition, hosted in partnership with CRA's Computing Community Consortium, brought 53 researchers to Washington in April and featured presentations and discussions with science policy experts, current and former Hill staff, and relevant agency and Administration personnel about mechanics of the legislative process, interacting with agencies, advisory committees, and the federal case for computing. Feedback from the participants was overwhelmingly positive, and a significant number of LiSPI "Alumni" have since gone on to participate in other CRA-led advocacy activities.

The GAC also continued in its role as an advocate for the federal investment in science and engineering, and computing research in particular. The committee continued to make its case for computing in DC via a number of different vectors. In February 2013, CRA's CCC Chair Edward Lazowska and CRA Board Member Kathryn McKinley testified about the importance of the federal investment in computing research at a hearing of the House Committee on Science, Space and Technology. The GAC also led a community effort to endorse two key bills: HR 967, the Advancing America's Networking and Information Technology R&D Act and HR 756, the Cyber Security Enhancement Act. In addition, we joined with our affiliate, the Society for Industrial and Applied Mathematics (SIAM), in opposing the move of a graduate fellowship program from the Department of Energy, and joined with a large coalition of groups in endorsing a set of principles Congress should consider when reauthorizing the America COMPETES Act. The GAC also hosted a bipartisan briefing for Members of Congress sponsored by Reps. Buchson (R-IN) and Lipinski (D-IL) on IT at Global, City, and Human-scale, with speakers from Microsoft, Columbia University, and the University of Washington.

CRA also served as a trusted source of information—both 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, as all sought to understand the issues confronting the federal Networking and Information Technology Research and Development program (NITRD)—the thirteen-agency, nearly $4-billion-a-year federal effort to support computing research. The GAC also attempted to weigh-in with Members of Congress and their staffs against efforts to enact harmful legislation that would alter the way the National Science Foundation awards research grants and efforts to limit federal participation in scientific conferences. And the GAC continued to serve as the first point of contact for many in the press as they tried to understand issues like CS enrollments and the impact of budget sequestration on computing researchers.

With a very difficult budget climate in DC – and an increasing number of newer Members of Congress who do not understand the value of federal investments in research – it is vitally important that GAC continues to work hard to make the case for research to Congress and the Administration and ensure that federal support for fundamental research in computing remains a priority.

TALENT DEVELOPMENT

CRA has several programs and committeed dedicated to facilitating the development of strong, diverse talent in the field. Below are a few highlights of CRA talent development initiatives.

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

CRA-W continues to thrive as an energetic programmatic committee of CRA focused on increasing the number and success of women in computing research. A major goal of CRA's Broadening Participation in Computing (BPC) grant from NSF has been to increase coordination on several projects between CRA-W and the Coalition to Diversify Computing (CDC).

Workshops

Discipline-Specific Workshops: Funded by a grant from NSF, CRA-W and CDC are collaborating to provide discipline-specific mentoring workshops in various subfields of computing. The goal is to increase participation of members of underrepresented groups within a specific research area by providing career mentoring advice and discipline specific overviews of past accomplishments and future research directions.

Examples for this period included: 1) Computer Architecture Summer School in August. This workshop had 37 participants and 22 panelists from industry and academia; and 2) GREPSEC in May, which had 31 participants and 18 panelists from industry and academia.

Grad Cohort: This program brings together women graduate students in their first, second, or third year of graduate school for a two-day workshop on graduate school survival, career planning, and networking. The speakers and panelists are graduate students and senior women in academia and industry. The program continues to thrive with generous support from Microsoft, Google, a private foundation, ACM SIG Special Projects Fund, CRA, Yahoo!, and IBM Research. In addition, 33 departments provided support for 43 students.

Career Mentoring Workshops (CMW): The biennial CRA-W mentoring workshop took place this year for women at primarily teaching institutions. The CMW-E (Education) workshop took place March 6 at SIGCSE in Denver, CO. There were 30 participants and eight speakers at this one-day event.

Cohort of Advanced Professionals Project (formerly the Cohort of Associate Professors Project): The goal of CAPP is to increase the percentage of Computer Science and Engineering women faculty members and researchers who reach the top of their respective career tracks—faculty members by being promoted to full professor; and researchers in industrial or governmental labs by being promoted to the top of their institution's technical ladder or by entering research management. The workshop also aims to build a cohort of senior women in academia and industry who can provide each other with an information network and mutual support. CAPP is funded through an NSF grant and donations from IBM, Microsoft, and a private foundation. The CAPP Workshop was held in November 2012 in San Mateo, CA and included 49 participants and 21 speakers.

Distinguished Lecture Series: The Distinguished Lecture Series sends faculty and labs researchers to campuses to encourage women and minorities to attend graduate school. The visits include a technical talk as well as a variety of "recruiting" events: lunches with underrepresented undergraduates, panel discussions about graduate school, meetings with faculty interested in recruiting/retention, and meetings with female and minority graduate students. The program focuses on arranging events at institutions that do not have a large number of research, women, or minority faculty, and has an increasing emphasis on Historically Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs). Funded by a grant from the NSF, six events were held between July 2012 and June 2013.

Mentoring Programs

Distributed Research Experience for Undergraduates (DREU) (US and Canada) continues to be one of CRA-W's most visible and well-known programs. The program pairs each accepted undergraduate student with a research faculty member to pursue an in-depth summer research project at the faculty member's institution. Since 2008, CRA-W and CDC have partnered to expand this program to include underrepresented minorities as well as women. This program is funded by a grant from the NSF.

The DREU program organizers are Professors Nancy Amato (Texas A&M, CDC), Julia Hirschberg (Columbia, CRA-W), Maria Gini (Minnesota, CRA-W), and Monica Anderson (Alabama, CDC). A grant from the NSF and significant funding from the research community supports DREU students each year. The amount of mentor contributions has steadily increased from approximately $50,000 in 2008 to $176,900 this year, representing more than 39% of the budget in 2013. We also receive funding from the Luce Foundation to support two DREU students each year.

For Summer 2013, undergraduate students completed 168 applications in February. Of those, the DREU co-chairs successfully selected and matched 61 DREU students with 43 faculty mentors. The demographics of the 61 students are: 35 women (17 White, 8 Asian, 6 Hispanic, 4 African American) and 26 men (17 African American, 6 Hispanic, 3 White). Of the 4 Access Computing students there are 3 men (3 White) and 1 woman (1 White). The 17 students that participated through the iAAMCS program included 3 women (3 African American) and 14 men (14 African American). All but two students are a US citizen or permanent resident, and are funded with unrestricted funds. Of the 43 mentors, 29 provided full or partial funding for their students. Mentors fully fund the Access Computing and iAAMCS DREU students. DREU students participating in research this summer will have the opportunity to present their research at GHC in October. Further details on DREU can be found on the CRA-W DREU website: http://www.cra-w.org/dreu.

Students participating in DREU Summer 2013 attend the following institutions: Austin College, Bard College, Bowie State University, Boston University, Columbia University, Duke University, Emory University, Florida A&M University, Gallaudet University, Georgia Tech, Harvey Mudd College, Howard University, Indiana University, Johnson C. Smith University, Kean University, Miami Dade College, Mills College, Morehouse College, North Carolina Agricultural and Technical State University, Oberlin College, Pomona College, Radford University, Rhodes College, Rochester Institute of Technology, Savannah State University, Simmons

College, Southern Wesleyan, Texas A&M University, Texas Southern University, The College of William and Mary, Tulane University, University of California San Diego, University of California Merced, University of Colorado, University of Kentucky, University of Maryland Baltimore County, University of Minnesota, University of New Mexico, University of North Carolina Charlotte, University of Portland, University of Puerto Rico Mayaguez, University of the District of Columbia, University of Southern California, Vassar College, Wellesley College, Winston Salem State University, Winthrop University.

The DREU Summer 2013 host institutions include: Auburn University, Boise State University, Brown University, Clemson University, Carnegie Mellon University, Columbia University, DePaul University, Florida State University, Georgia Tech, Indiana University, Norfolk State University, Oregon State University, Pennsylvania State University, Princeton University, Rochester Institute of Technology, Southeast Methodist University, Texas A&M University, Tufts University, University of Colorado, University of Hawaii, University of Illinois Chicago, University of Maryland Baltimore County, University of Minnesota, University of New Mexico, University of North Carolina Charlotte, University of Southern California, University of Washington, University of Wyoming, Virginia Tech, Washington University St. Louis.

Collaborative Research Experiences for Undergraduates: CREU also continues to be a highly visible program. It provides research mentoring for small teams of students at the students' home institution during the academic year. Teams are composed of students from underrepresented groups in computing and with the selection committee composed of CRA-W and CDC members.

For the 2012-2013 year, CREU received 19 proposals and selected 15 for funding. One team dropped out before actually starting; another decided not to continue after one semester, leaving 13 funded teams for the remainder of the year. Of these, eight projects will run the full year (academic year plus the following summer) and five projects will run the academic year only. In all, 38 students will receive financial support from CREU. Of the 38 students, 24 are women and 14 are men. Eleven are self-identified African-American and seven are self-identified Hispanic. In addition, four students have self-identified as having a disability.

Other CRA-W Projects
Workshops at Grace Hopper: CRA-W hosted another successful set of Career Mentoring Workshops on the afternoon of Oct. 3rd at Grace Hopper 2012 in Baltimore. Designed to be a "bite-sized" version of our two day Career Mentoring workshops, CRA-W sessions at Grace Hopper are organized into three parallel tracks: Undergraduate, Graduate, and Early Career Researchers, each consisting of three one-hour sessions. CRA-W has run these workshops at Grace Hopper since 2009. Our workshops consistently have a large number of attendees and receive very positive ratings on the Grace Hopper attendee survey. In 2012, all nine sessions had more than 70 attendees and the final session in the Graduate track "Building Your Professional Network" had over 150 people learning about and actively practicing their networking skills.

Communications: The communications committee prepared the Winter/Spring 2013 CRA-W Newsletter. The Newsletter included a brief summary of activities (including all hosted workshops, talks, etc.). It featured an interview with Jan Cuny, an interview with CREU alum Samantha Finkelstein, an article on

ACM-W, and a report on the Grace Hopper Regional Consortium. The Winter/Spring 2013 CRA-W Newsletter was distributed in email, on the web, and at the 2013 Grad Cohort Workshop. The biannual Alumni Newsletter is on our website: http://www.cra-w.org/Newsletter.

Website: The CRA-W website was updated in 2011. We continue to update and maintain the CRA-W website. Aimée Vargas performs all updates to the site. Search engine results continue to be refined by limiting access to old, outdated information. New board members are assigned logins and passwords.

Fundraising: A five-year BPC grant was awarded to support several of the joint CRA-W and CDC programs (DREU, CREU, DSW, DLS, and Mentoring Workshops at GHC/Tapia). It also provided funding to develop a fully staffed research center called the CRA's Center for Evaluating the Research Pipeline (CERP). CERP now runs the Data Buddies Project, which allows for comparative evaluation of experiences and outcomes among the CRA's and other intervention programs' participants compared to non-participants. The data collected via the Data Buddies project also allows CERP staff to study antecedents to successful research careers in computing among the general population. CERP seeks to expand its network of clients for whom it provides comparative evaluation and to develop collaborative relationships with other behavioral and social scientists aiming to understand and thicken the computing research pipeline.

Additionally, a four-year grant was awarded through the NSF ADVANCE PAID program to support and adapt our faculty mentoring workshops, namely, the Career Mentoring and CAPP Workshops, and to fund evaluation efforts for faculty mentoring through CERP.

In March 2013 we submitted an REU Supplement for $48,000 in support of the DREU program. The request was approved and enabled us to support six additional DREU students for Summer 2013.

Travel Grant Program: Since inception in 2007, this program has received 47 applications and funded 40. This program has sent women to a variety of conferences including Grace Hopper, ICDE, SIGMOD, OSDI, NIPS, CSCW, and IEEE MICRO. In 2012, we saw an increased number of applicants needing to travel to international conferences (with correspondingly higher budgetary requirements) so we increased the funding level to $3,000 for international travel, while keeping the original $2,000 limit on domestic travel. The average requested amount of travel funding has increased from $1,964 to $2,373, reflecting the increased cost of international travel. This program is funded by a private foundation.

Pipeline Column: Between September 2012 and May 2013, eight articles were solicited, edited and submitted for publishing in *Computing Research News.*
  • September 2012: "2012 Academic Careers Workshops for Underrepresented Groups," Ann Gates (UTEP), Richard Ladner (University of Washington), Valerie Taylor (Texas A&M), and Bryant York (Portland State University).
  • November 2012: "The Grace Hopper Regional Consortium," Gloria Townsend, DePauw University.
  • November 2012: "Terrific CRA-W Mentoring Workshops at Grace Hopper 2012," A.J. Brush, Microsoft Research.
  • January 2013: "Latinas in Computing Find Their Sweet Spot," Patty Lopez, Intel Corporation, and Gilda Garreton, Oracle Labs.
  • February 2013 – "2012 CAPP Advanced Career Mentoring Workshop," Erik Russell, Director of

Programs, CRA.
- March 2013 – "Growing the Tech Talent Pool: NCWIT Aspirations in Computing Program Scales Up," Ruthe Farmer, Director of Strategic Initiatives, NCWIT.
- April 2013 – "Hispanic Momentum in Computing," Ann Gates, UTEP.
- May 2013 – "Diversity Drives Innovation," Kathryn McKinley and Tracy Camp, CRA-W Co-chairs.

Mail Lists: CRA-W provides a collection of mailing lists designed to cover all the stages of the research pipeline. The lists are monitored by CRA-W and hosted by ABI.

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Coalition to Diversify Computing (CDC)

CDC is a joint organization of the ACM, CRA and IEEE-CS. The leadership of CDC and CRA-W continued to streamline and merge their mentoring projects during the year. CDC's major effort was the February 2013 Tapia Conference, the premier conference for Celebration of Diversity in Computing. Other CDC activities included: Distributed Research Experiences for Undergraduates (DREU); Collaborative Research Experiences for Undergraduates (CREU); CDC/CRA-W Discipline Specific Workshops; CDC/CRAW Distinguished Lecture Series; IEEE-CS Distinguished Visitor Program Liaison; Sending Students to Conferences; Addressing the Shrinking Pipeline; Design your Future; and NCWIT Leadership Team.

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CRA Deans

The CRA-Deans Group was established in an effort to provide leadership and community to emerging and established colleges of computing and interdisciplinary "IT" schools. The group is organized around schools of computing, schools of information, and/or schools of information technology with heads that report directly to the Provost or Chief Academic Officer at a university.

The CRA Deans Group last met in Fort Worth, Texas on February 14-15, 2013 in a joint meeting with the iSchool deans. 30 people were in attendance. The iSchools is a consortium of schools with programs that emphasize the relationship between information, people, and technology. Given that there is significant overlap in both membership and disciplinary interests between the CRA Deans' schools and the iSchools, increasing cooperation and joint meetings between the two organizations are desired by the members of both organizations. The Fort Worth meeting was held in conjunction with iConference 2013.

The CRA Deans/iSchool Deans meeting focused on three topics of mutual interest: Data science as an emerging curriculum area, new programs for entrepreneurship, and alumni relations for fundraising. In each case, best practices and potential roadblocks were presented by deans with significant experience in the area, followed by discussion. The entrepreneurship topic was of particular interest, with many of the deans expressing an opinion that emphasizing entrepreneurship in the curriculum and research has had a significant positive impact in developing an entrepreneurial culture in their schools.

Members of the CRA Deans expressed an interest in holding meetings at opportunities where a significant number of deans are already present, e.g. the CRA biennial meetings at Snowbird, and the iConferences. The next iConference will be in Berlin, Germany in March 2014, and logistics are likely to present a problem for this conference. Hence, at present, the next meeting of the CRA Deans is scheduled to be held in conjunction with the CRA meeting at Snowbird in 2014.

Center for Evaluating the Research Pipeline

Center for Evaluating the Research Pipeline

In 2012, CRA-W and CDC was awarded a Broadening Participation in Computing (BPC) Alliance grant. A major focus of this grant was the formulation of a fully staffed evaluation center at the CRA called the Center for Evaluating the Research Pipeline (CERP). As of June 30, 2013, CRA had hired a team of social and behavioral scientists with expertise in quantitative and qualitative methods to run CERP, including a Director and Research Analyst, and planned to hire two Research Assistants. CERP has built on existing infrastructure from the Data Buddies Project, which was funded by a supplement to a prior BPC grant. Since its instantiation in October 2012, CERP has restructured existing Data Buddies surveys and created new ones, analyzed existing Data Buddies data, disseminated research findings and marketed its services through external presentations and professional networking. Thanks to CERP, the computing community now has access to a national sample of data for comparative evaluation of diversity initiatives within computing. To date, CERP has provided comparative evaluation for CRA-W/CDC diversity programs.

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The **CRA Education Committee (CRA-E)** supports CRA's mandate of ensuring that "society's need for a continuous supply of talented and well-educated computing researchers and advanced practitioners is met." During the last year, CRA-E completed two major activities: (1) The committee studied the domestic pipeline of Ph.D. students in computing fields, resulting in a report entitled "Exploring the Baccalaureate Origins of Domestic Ph.D. Students in Computing Fields," published in *Computing Research News* in January 2013. Further studies on the domestic pipeline are ongoing. (2) The committee developed new resources and materials for faculty who are interested in engaging undergraduates in research. A new website has been designed to disseminate these materials. CRA-E has received a $36,000 grant from NSF to conduct workshops on undergraduate research for faculty, to be held at major research conferences in the next two years. In addition to these two activities, a number of new projects have been under discussion and will be explored further in the coming year.

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Postdoctoral Positions in Computer Science

In recent years, academic departments, industrial research laboratories and government agencies have appeared to offer dramatically increasing numbers of postdoctoral positions in computer science and engineering. Because research organizations are suddenly channeling many more young researchers into these positions, it is incumbent upon us as a community to have a clear understanding of the best practices associated with pursuing, hosting, and nurturing postdocs. In December 2012, CRA's Board of Directors approved a Best Practices Guide, providing guidance to graduate students, postdocs, advisors and mentors, and departments and institutions on how to have a positive postdoctoral experience within computer science and engineering.

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Outstanding Undergraduate Researcher Awards

Each year, CRA recognizes undergraduate students for their outstanding research potential. In 2013, the Female Awardee was Vera Khovanskaya, a senior at Cornell University. There were two winners for the Male award - Matthew Bryan, a senior at the University of Washington and Zhengyuan Zhou, a senior at the University of California, Berkeley. The female runner-up was Mattea Welch, a senior at Queen's University in Ontario, and the male runner-up was Frank Ong, a senior at the University of California, Berkeley. In addition, twelve students were selected as Finalists and a number received Honorable Mentions.

Microsoft Research and Mitsubishi Electric Research Labs (MERL) sponsor the Outstanding Undergraduate Researcher Award Program in alternate years. The 2013 award was sponsored by Microsoft Research.

LEADERSHIP

CRA helps empower the research community to broaden and amplify the scope of computing research and to increase its impact on society. The following activities serve this pillar of our mission.

Computing Community Consortium

The Computing Community Consortium (CCC) was funded in fall 2006 through a Cooperative Agreement between CRA and the National Science Foundation (NSF). Its goal is to mobilize the computing research community to debate long-range research challenges and build consensus around specific research visions. The CCC began full-scale operations in spring 2007, and, as its activities have increased over time, it has seen its annual expenditures ramp up toward $2 million/year (projected). Since 2011, the CCC has continued to build upon its varied activities. Updates to key ongoing projects are provided below.

At the request of NSF, the CCC submitted a proposal in March 2011, seeking a four-year renewal of the Cooperative Agreement. NSF conducted a Reverse Site Visit of the CCC in February 2012. An award decision was quickly made, and the new award began August, 2012 (although spending on it did not begin until April, 2013). The CCC is now operating under the second NSF Award (1136963).

Transition Plan: One of the suggestions from the 2012 Site Visit was the transition from "start-up" to "steady state" for the CCC. The CCC answered this request by creating a formal Organizational Structure, approved by NSF. As of July 1, 2013, Susan Graham assumed the role of Chair, Gregory Hager, Vice Chair, and Ed Lazowska, Past Chair. New Council Members have rotated onto the Council, and those with expiring terms have left the Council.

Staff Updates: In September 2012, Erwin Gianchandani resigned as Director to assume the Deputy Division Director for CNS in CISE at NSF. Kenneth Hines has continued as CCC program associate. In March 2013, Ann Drobnis was hired as Director of CCC.

CCC Council meetings: Continuing its tradition of three meetings each year, the CCC Council met in August 2012, November, 2012 and March, 2013.

Key activities: Below is a summary of our key activities.

Communication with the community
• In August, 2012, the CCC launched a new webpage describing the Computing Innovation Fellows Project.
• The CCC launched a new updated website to share information with the Community in May 2013.
• Through the CCC blog, *Computing Research News*, and Research Highlight of the Week, CCC informs the community about what is happening with the visions of computing research.

Community visioning activities
• Spatial Computing – The CCC convened a workshop in September, 2012 titled *From GPS and Virtual Globes to Spatial Computing*, which aimed to identify fundamental research questions for individual

computing disciplines as well as cross-cutting research questions requiring novel, multi-disciplinary solutions.

• Health IT – The CCC held a Computing and Healthcare symposium in October 2012. The goal of the symposium was to bring segmented communities (biomedical informatics, computer science, clinical medicine and public health) together and release the potential of cross-community collaboration. There were one hundred participants at this workshop. The final report has been published.

• The Semiconductor Research Corporation (SRC), NSF and CCC held a joint workshop on Convergence of Software Assurance Methodologies and Trustworthy Semiconductor Design and Manufacture (SA+TS) in January 2013. The workshop brought together academic and industry expert from the programming language and semiconductor design / manufacturing communities to discuss challenges to securing the semiconductor manufacturing process.

• The CCC held a workshop on Multidisciplinary Research for Online Education in February 2013. The workshop addresses education-relevant research in areas such as intelligent student modeling through data mining, mobile computing for data logging, social networking, and many other areas, to include research at the interface of computing and the social / behavioral sciences.

• Privacy R&D – The Privacy Workshop was held in March 2013. The organizing committee is currently determining if a second workshop is warranted. There were 38 participants at this workshop.

• Extreme Scale Design Automation – The second of 3 workshops was held in March 2013. The final report will be produced after the third workshop. Twenty three people participated in this workshop.

• Mid-Scale Infrastructure Investments for Computing Research – The CCC solicited White Papers on the topic to better understand what the ecosystem is for shared research infrastructure. Twenty four people participated in this call.

CCC-sponsored Visionary Conference Tracks
•There was a Challenges and Visions Track at Autonomous Agents and Multiagent Systems (AAMAS), May 6-10. Twenty-four submissions were received for the track, and underwent double-blind review, as is the current AAMAS practice. Out of these twenty-four papers, six semifinalist papers were then selected through reviewer ratings and discussion.

Workshop Reports:
• Computing and Healthcare: New Opportunities and Directions was produced as a result of The Discovery and Innovation in Health IT Workshop.
• Research Needs for Secure, Trustworthy, and Reliable Semiconductors was produced as a result of the SA+TS Workshop.

Simons Institute Visions on the Theory of Computing
• CCC co-sponsored the Simons Institute Visions on the Theory of Computing symposium in Berkeley, CA, May 29-31. This three-day symposium brought to-gether distinguished speakers and participants from the Bay Area and all over the world to celebrate both the excitement of fundamental research on the Theory of Computing, and the accomplishments and promise of computational research in effecting progress in other sciences — the two pillars of the Institute's research agenda.
• There were 313 participants at the Symposium.
• CCC created videos of each session, so that all could view the event.

Computing Research in Action (CRiA)- The first CRiA Video was produced on Vehicle-To-Grid at the University of Delaware.

CCC Council Meetings - In addition to the Council Meetings described above, the Council meets bi-weekly via teleconference.

CIFellows Update:

CIF1 (2009): All of the 2009 CIFellows concluded their CIFellowships by the fall of 2012.
As of the date of this report, more than two-thirds of the original 60 CIFellows have landed permanent positions in academia, industry, or government. In particular, 41 CIFellows have found tenure-track (24) or teaching-track (2) faculty positions or research-primary positions in industry (14) or government (1). Of the rest, 11 are currently in non-tenure-track faculty positions in aca-demia, with many of these in the midst of new job searches; four have elected to pursue non-research positions in industry on a permanent basis (e.g., one is serving as an independent con-sultant and recently received press for his work at the intersection of computation and journalism); and 5 are continuing as postdocs.

CIF2 (2010): 41 of the 47 2010 CIFellows concluded their CIFellowships by the fall of 2012.
As of the date of this report, more than three-fourths of the original 47 CIFellows have landed permanent positions in academia, industry, or government. In particular, 38 CIFellows have found faculty positions (20) or research-primary positions in industry (18).

CIF3 (2011): 15 of the 20 2011 CIFellows will have completed their CIFellowship by fall 2013.
As of the date of this report, more than half of the original 20 CIFellows have landed permanent positions in academia, industry, or government. In particular, 11 CIFellows have found faculty positions (9) or research-primary positions in industry (2).

The CCC is about to begin an evaluation of the CIFellows Program. CERP will be conducting a longitudinal study to fully understand the value of the CIFellowship to keeping research students in the pipeline.

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Computing Leadership Summit

CRA hosted the annual **Computing Leadership Summit** for presidents, executive directors, and other senior leadership of CRA, its six affiliate societies (AAAI, ACM, CACS/AIC, IEEE-Computer Society, SIAM, and USENIX), and NRC's Computer Science and Telecommunications Board. The nineteenth Summit was held February 25, 2013, in Washington, DC. Speakers included Moshe Vardi, the Editor-in-Chief of the Communications of the ACM, on the publication culture in computing; a discussion on the rise of Massively Online Open Courses (MOOCs) led by CRA Chair Eric Grimson; Farnam Jahanian, head of the Computer and Information Science and Engineering directorate at NSF; and Vijay Kumar, from UPenn, about his appointment to the White House's Office of Science and Technology Policy.

IN SUPPORT OF ALL MISSION AREAS

CRA conducts activities that serve more than one mission area.
The Surveys and Communications Committees provide information and communications that support the policy, talent development and leadership pillars of our mission statement.

Surveys

CRA conducted the 42nd annual Taulbee Survey of Ph.D.-granting CS, CE, and Information departments. The survey documents trends in student enrollment, degree production, employment of graduates, and faculty salaries in Ph.D.-granting departments of computer science (CS), computer engineering (CE), and information (I) in the United States and Canada. This year's results showed a double-digit percentage increase in undergraduate degree production for the third straight year, and a record high in doctoral production (1,929 compared to the previous high of 1,877 in 2008). The overall response rate was 70 percent; the rate for US CS departments was higher at 80 percent. Plans are underway to replace the Taulbee survey data entry and reporting software with a completely new version providing better security, better data validation, better analytics, and a new peer group reporting feature.

Communications

The CRA Communications Committee aims to establish a strong CRA brand and to develop a strategic communications plan to guide future CRA communications. CRA began the strategic communications process by reviewing the mission statement and updating it based on input from CRA staff, standing committees and board of directors. The updated mission statement was approved in March 2013.

The Communications Committee will work with other CRA committees to bring future communications into alignment with CRA and hire a firm to develop design guidelines to establish consistency in all CRA communications.

From Fall 1988 to 2012, CRA published *Computing Research News (CRN)* – the voice of the Computing Research Association – in hard copy and shipped it off to computing research leadership across North America. In September 2012, Computing Research News (CRN) evolved to a new digital format delivered via email to more than 7,000 subscribers. As times change, so do the needs of our community, and the format change has provided increased benefit to the community. CRN increased its publication frequency to 10 times a year in order to reach our audiences more frequently and with timely information.

2012-2013
COMPUTING RESEARCH ASSOCIATION MEMBERS

ACADEMIC MEMBERS

The following departments held membership in CRA for all, or in a few cases part, of the period from July 2012 to June 2013.

- A -
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)
Case Western Reserve University (EECS)
Clemson University (CS)
Colgate University (CS)
College of Charleston (CS)
College of William & Mary (CS)
Colorado School of Mines (MCS)
Colorado State University (CS)
Columbia University (CS)
Cornell University (CS)

- D -
Dartmouth College (CS)
DePaul University (CDM)
Drexel University (CS)
Drexel University (IST)
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 (IT)
Georgia State University (CS)
Grinnell College (MCS)

- H -
Harvard University (CS)
Harvey Mudd College (CS)
Hobart and William Smith Colleges (MCS)

- I -
Illinois Institute of Technology (CS)
Indiana University School of Informatics and Computing
Iowa State University (CS)

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

- K -
Kansas State University (CIS)
Kent State University (CS)

- L -

Lafayette College (CS)

Lehigh University (CSE)

Loyola University, Chicago (CS)

- M -

Marquette University (CS)

Massachusetts Institute of Technology (EECS)

Miami University (CS)

Michigan State University (CSE)

Michigan Technological University (CS)

Mississippi State University (CSE)

Missouri University of Science and Technology (CS)

Montana State University (CS)

Montclair State University (CS)

Mount Holyoke College (CS)

-N-

National University of Singapore (CS/IS)

Naval Postgraduate School (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)

Nova Southeastern University (CS)

-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 (CIT)

Purdue University (CS)

-R-

Regis University (CIS)

Rensselaer Polytechnic Institute (CS)

Rice University (CS)

Rochester Institute of Technology (CS)

Rutgers University, Busch Campus (CS)

- S -

Saint Louis University (MCS)

Santa Clara University (CE)

Simon Fraser University (CS)

Singapore Management University (IS)

Southern Methodist University

Stanford University (CS)

Stevens Institute of Technology (CS)

Stony Brook University, SUNY (CS)

Swarthmore College (CS)

Syracuse University (IS)

-T-

Tecnologico de Monterrey, ITESM, Guadalajara Campus

Texas A&M University (CSE)

Texas A&M University, Corpus Christi (CS)

Texas State University (CS)

Toyota Technological Institute at Chicago (CS)

Tufts University (CS)

- U -

Union College (CS)

University at Albany, SUNY (CI)

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 Arkansas at Little Rock (IS&SE)

University of British Columbia (CS)

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, Los Angeles (CS)

University of California, Riverside (CSE)

University of California, San Diego (CSE)

University of California, Santa Barbara (CS)

University of California, Santa Cruz (CE)

University of California, Santa Cruz (CS)
University of Central Arkansas (CS)
University of Central Florida (EECS)
University of Chicago (CS)
University of Cincinnati (CS)
University of Colorado, Boulder (CS)
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 Graduate School of Library and Information Science
University of Illinois, Chicago (CS)
University of Illinois, Urbana Champaign (CS)
University of Illinois, Urbana Champaign (ECE)
University of Iowa (CS)
University of Kansas (EECS)
University of Kentucky (CS)
University of Louisiana at Lafayette (CACS)
University of Maine (CS)
University of Maryland (CS)
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 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 at Omaha (CS/IST)
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 New Mexico (ECE)
University of North Carolina at Chapel Hill (CS)
University of North Carolina at Chapel Hill (SILS)
University of North Carolina, Charlotte

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 Carolina (CSE)
University of Southern California (CS)
University of Southern California (EES)
University of Texas, Austin (CS)
University of Texas, Brownsville (CIS)
University of Texas, Dallas (CS)
University of Texas, El Paso (CS)
University of Toronto (CS)
University of Utah (CS)
University of Virginia (CS)
University of Washington (CSE)
University of Washington, Bothell (CS)
University of Washington, Tacoma (CSS)
University of Waterloo (CS)
University of Wisconsin, Madison (CS)
University of Wisconsin, Milwaukee (EECS)
University of Wyoming (CS)

-V -
Vanderbilt University (EECS)
Villanova 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)
Williams College (CS)
Worcester Polytechnic Institute (CS)
Wright State University (CSE)

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

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Association for the Advancement of Artificial Intelligence
Association for Computing Machinery
Canadian Association for Computer Science (CACS/AIC)
IEEE Computer Society
Society for Industrial and Applied Mathematics
USENIX Association

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2012- 2013

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COMMITTEES AND JOINT ACTIVITIES

CRA relies on the volunteers that serve on its committees, as well as its professional staff, to carry out its programs. CRA also participates in joint activities with other organizations.

CRA Committees

CRA Awards

CRA Deans Group

Education (CRA-E)

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

Center for Evaluating the Research Pipeline (CERP)

Conference at Snowbird

Communications

Computing Community Consortium (CCC)

Elections

Executive

Finance

Government Affairs

Membership

Surveys

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