

The Computing Community Consortium

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Director, Computing Community Consortium
Computing Research Association

UC-Davis Dept. of Computer Science
June 3, 2011



Overview

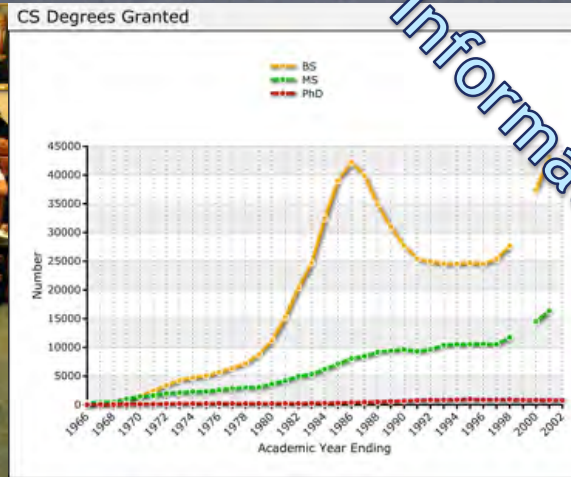
- The Computing Research Association
- What is the CCC?
- We need you!

The Computing Research Association

Over 220 department/lab members

Arizona State University - CSE	Johns Hopkins University - CS	Stanford University - CS	University of Maryland, Baltimore Co - CSEE	University of Wisconsin, Milwaukee - EECS
Auburn University - CSSE	Johns Hopkins University - SI	State University of New York, Albany - CS	University of Maryland, Baltimore Co - IS	University of Wyoming - CS
Ball State University - CS	Juniata College - IT & CS	State University of New York, Binghamton - CS	University of Massachusetts, Amherst - CS	Utah State University - CS
Boston College - CS	Kansas State University - CIS	State University of New York, Stony Brook - CS	University of Massachusetts, Boston - CS	Vanderbilt University - EECS
Boston University - CS	Kent State University - CS	Stevens Institute of Technology - CS	University of Michigan - EECS	Virginia Commonwealth University - CS
Bowdoin College - CS	Lafayette College - CS	Swarthmore College - CS	University of Michigan - I	Virginia Tech - CS
Bowling Green State University - CS	Lehigh University - CSE	Syracuse University - IS	University of Michigan, Dearborn - CIS	Wake Forest University - CS
Bradley University - CS	Long Island University - ICS	Temple University - CIS	University of Minnesota - CSE	Washington State University - EECS
Brandeis University - CS	Louisiana State University - CS	Texas A&M University - CS	University of Minnesota, Duluth - CS	Washington University in St. Louis - CS
Brigham Young University - CS	Loyola University, Chicago - CS	Texas State University - CIS	University of Mississippi - CIS	Wayne State University - CS
Brown University - CS	Massachusetts Institute of Technology - EECS	Toyota Technological Institute at Chicago - CS	University of Missouri, Columbia - CS	West Virginia University - CSEE
Bryn Mawr College - MCS	Miami University - CS	Tufts University - CS	University of Missouri, Rolla - CS	Western Michigan University - CS
Bucknell University - CS	McMaster University - CE&S	Tulane University - EECS	University of Montana - CS	Williams College - CS
California Institute of Technology - CS	Michigan State University - CSE	Union College - CS	University of Montreal - CS	Worcester Polytechnic Institute - CS
California Polytechnic State University - CS	Michigan Technological University - CS	University at Buffalo - CSE	University of Nebraska at Omaha - CS/IST	Wright State University - CSE
California State University, Chico - CS	Mississippi State University - CS	University at Buffalo - IS	University of Nebraska, Lincoln - CSE	Yale University - CS
Carnegie Mellon University - CS	Montana State University - CS	University of Alabama, Birmingham - CIS	University of Nevada, Las Vegas - CS	York University - CS
Case Western Reserve University - EECS	Montclair State University - CS	University of Alabama, Tuscaloosa - CS	University of Nevada, Reno - CSE	
City University of New York, Graduate Center - CS	National University of Singapore - CS/IS	University of Alberta - CS	University of New Brunswick - CS	Sun Microsystems (Sponsoring Member)
Clemson University - CS	Naval Postgraduate School - CS	University of Arizona - CS	University of New Hampshire - CS	Microsoft Corporation (Sustaining Member)
Colgate University - CS	New Jersey Institute of Technology - CCS	University of Arkansas - CSCE	University of New Mexico - CS	IBM Research (Supporting Member)
College of William & Mary - CS	New Mexico State University - CS	University of Arkansas at Little Rock - I	University of New Mexico - ECE	
Colorado School of Mines - MCS	New York University - CS	University of Calgary - CS	University of North Carolina at Chapel Hill - CS	Accenture Technology Labs
Colorado State University - CS	North Carolina State University - CS	University of California, Berkeley - EECS	University of North Carolina at Chapel Hill - SILS	Argonne National Laboratory
Columbia University - CS	Northeastern University - CIS	University of California, Berkeley - IMS	University of North Carolina, Charlotte - IT	Avaya
Cornell University - CS	Northwestern University - ECE	University of California, Davis - CS	University of North Dakota - CS	CA Labs
Cornell University - ECE	Nova Southeastern University - CS	University of California, Irvine - ICS	University of North Texas - CS	Computer Science Research Institute,
Dalhousie University - CS	Oakland University - CSE	University of California, Los Angeles - CS	University of Notre Dame - CSE	Sandia National Labs
Dartmouth College - CS	Ohio State University - CSE	University of California, Riverside - CSE	University of Oklahoma - CS	Fraunhofer Center for
DePaul University - CS	Ohio University - EECS	University of California, San Diego - CSE	University of Oregon - CIS	Experimental Software Engineering
Drexel University - CS	Oklahoma State University - CS	University of California, Santa Barbara - CS	University of Pennsylvania - CIS	Fujitsu Laboratories of America
Drexel University - IST	Old Dominion University - CS	University of California, Santa Cruz - CE	University of Pittsburgh - CS	Google
Duke University - CS	Oregon Health & Science University - CSE	University of California, Santa Cruz - CS	University of Pittsburgh - IS	Hewlett-Packard Company
Emory University - MCS	Oregon State University - EECS	University of Central Florida - CS	University of Puget Sound - MCS	IDA Center for Computing Sciences
Florida Atlantic University - CSE	Pace University - CSIS	University of Chicago - CS	University of Rochester - CS	Intel Corporation
Florida Institute of Technology - CS	Pennsylvania State University - CSE	University of Cincinnati - ECECS	University of South Alabama - CIS	Lawrence Berkeley National Laboratory
Florida International University - CS	Pennsylvania State University - IST	University of Colorado, Boulder - CS	University of South Carolina - CSE	Los Alamos National Laboratory
Florida State University - CS	Polytechnic University - CIS	University of Delaware - CIS	University of South Florida - CSE	Lucent Technologies, Bell Labs
Florida State University - IS	Pomona College - MCS	University of Denver - CS	University of Southern California - CS	McAfee Research
George Mason University - CS	Portland State University - CS	University of Florida - CISE	University of Southern California - EES	Mitsubishi Electric Research Labs
George Washington University - CS	Princeton University - CS	University of Georgia - CS	University of Tennessee, Knoxville - CS	National Center for Atmospheric Research
Georgia Institute of Technology - CSE	Purdue University - CS	University of Hawaii - ICS	University of Texas, Arlington - CSE	NCSA
Georgia Southern University - IT	Purdue University - ECE	University of Houston - CS	University of Texas, Austin - CS	NEC Laboratories America
Georgia State University - CIS	Rensselaer Polytechnic Institute - CS	University of Houston - ECE	University of Texas, Dallas - CS	NTT DoCoMo USA Labs
Georgia State University - CS	Rice University - CS	University of Idaho - CS	University of Texas, El Paso - CS	Pacific Northwest National Laboratory
Grinnell College - MCS	Rochester Institute of Technology - CS	University of Illinois, Chicago - CS	University of Toronto - CS	Panasonic Information &
Harvard University - CS	Roosevelt University - CS&T	University of Illinois, Urbana Champaign - CS	University of Tulsa - MCS	Networking Technologies Lab
Harvey Mudd College - CS	Rutgers University, Busch Campus - CS	University of Illinois, Urbana Champaign - ECE	University of Utah - CS	Ricoh Innovations
Hofstra University - CS	Saint Louis University - MCS	University of Iowa - CS	University of Virginia - CS	San Diego Supercomputer Center
Illinois Institute of Technology - CS	Santa Clara University - CE	University of Kansas - EECS	University of Washington - CSE	SAP Labs
Illinois State University - ACS	Simon Fraser University - CS	University of Kentucky - CS	University of Washington - I	SRI International
Indiana University - CS	Singapore Management University - IS	University of Louisiana at Lafayette - CACS	University of Washington, Bothell - CS	Telcordia Technologies
Indiana University - I	Southern Illinois University, Carbondale - CS	University of Louisville - CECS	University of Washington, Tacoma - CSS	
Iowa State University - CS	Southern Methodist University - CSE	University of Maine - CS	University of Waterloo - CS	
Iowa State University - ECE	Southern Polytechnic State University - CSE	University of Maryland - CS	University of Wisconsin, Madison - CS	

Core activities



Mission + activities

- Strengthen research and education in the computing fields

*Government
Affairs*

- working to influence **policy** that impacts computing research

*CRA-W
CDC*

- encouraging the development of **human resources**



- contributing to the cohesiveness of the professional **community**

- Collect and disseminate **information** about the importance and state of computing research

The Computing Community Consortium

Concerns in the mid-2000s...

- NSF leaders and computing research leaders had similar deep concerns about computing:
 - Failure to articulate and coalesce around exciting research visions in computer science that could galvanize the public, policymakers, researchers, and students
 - Need to groom the future leadership of the field
 - Decrease in student interest

...Led to the need for a "CCC" ...

- Increased focus by NSF leaders and computing research leaders in academia & industry
- A Computing Community Consortium solicitation & proposal
 - "[NSF] will support the CCC as a community proxy responsible for facilitating the conceptualization and design of promising infrastructure-intensive projects..."
 - "The purpose of the CCC is to provide a voice for the national computing research community. The CCC will **facilitate** the development of a bold, multi-themed vision for computing research and education... [communicating] that vision to ... major stakeholders."

...And NSF asked CRA to create it

- To catalyze the computing research community to consider such questions
 - To envision long-range, more audacious research challenges
 - To build momentum around such visions
 - To state them in compelling ways
 - To move them towards funded initiatives
 - To ensure “science oversight” of large-scale initiatives
- A “cooperative agreement” with NSF
 - Close coordination

The CCC -- a broad-based Council

• Leadership:

- Ed Lazowska, Chair
- Susan Graham, Vice-Chair
- Erwin Gianchandani, Director
- Andrew Bernat, CRA Executive Director

• Terms ending 2014

- Deborah Crawford
- Gregory Hager
- John Mitchell
- Bob Sproull
- Josep Torrellas

• Terms ending 2013

- Randy Bryant
- Lance Fortnow
- Eric Horvitz
- Hank Korth
- Beth Mynatt
- Fred Schneider
- Margo Seltzer

• Terms ending 2012

- Stephanie Forrest
- Chris Johnson
- Anita Jones
- Frans Kaashoek
- Ran Libeskind-Hadas
- Robin Murphy

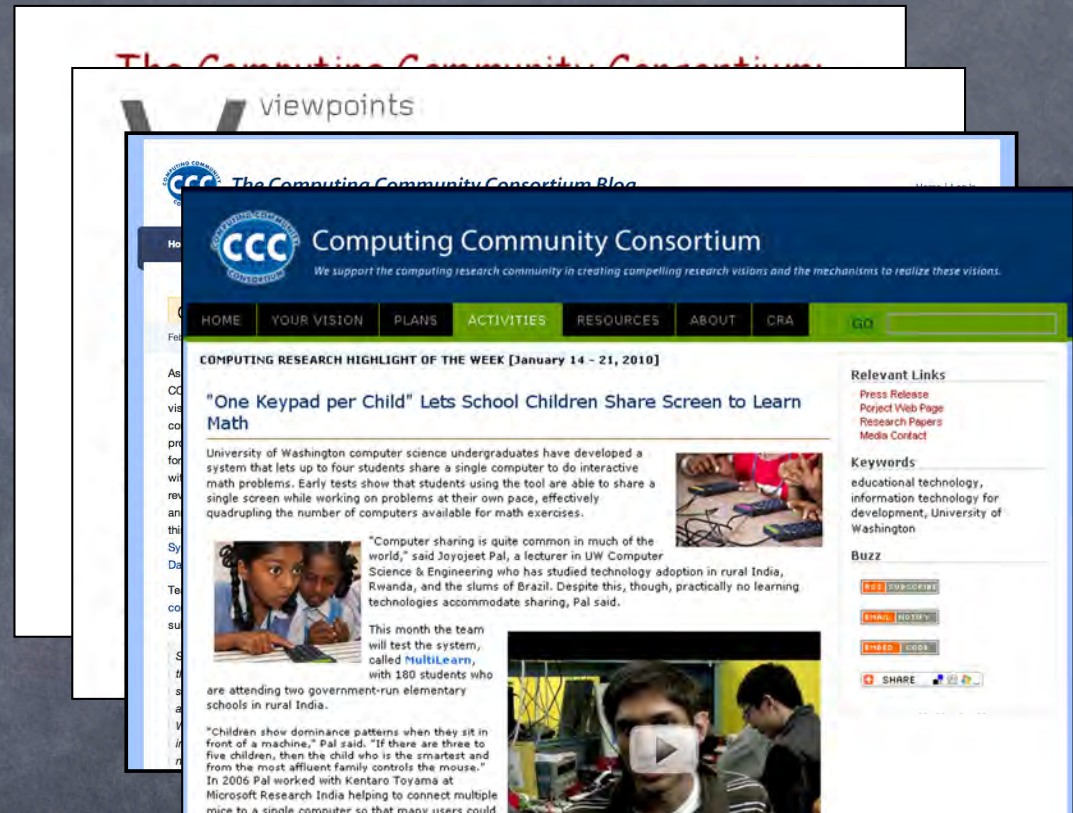
• Rotated off

- Greg Andrews, 2009
- Bill Feiereisen, 2011
- Dave Kaeli, 2011
- Dick Karp, 2010
- John King, 2011
- Peter Lee, 2009
- Andrew McCallum, 2010
- Karen Sutherland, 2009
- Dave Waltz, 2010

Meets three times a year, including once in DC
Funded at \$2M/year for three years

Communicating about computing...

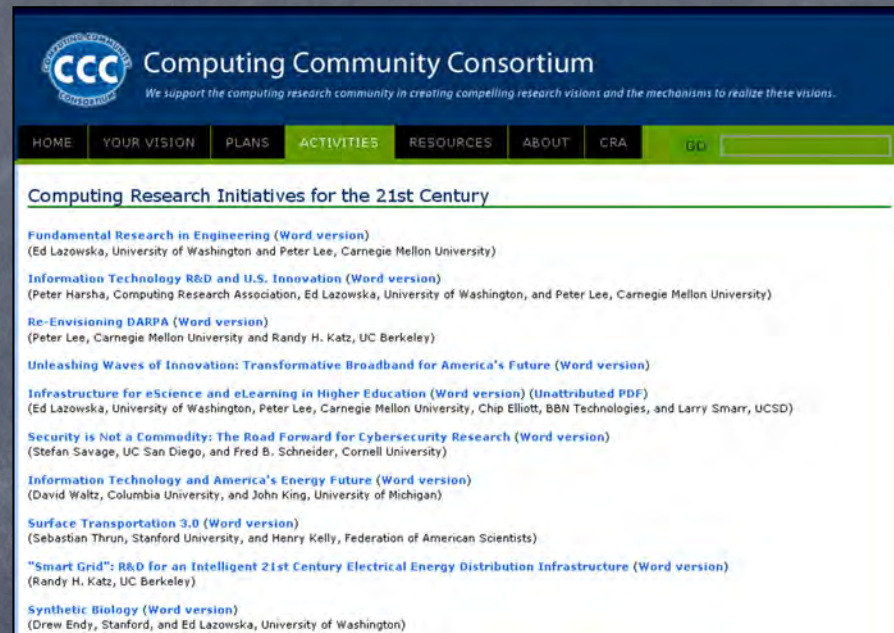
- Presentations
- Articles
- CCC Blog
- Computing Research "Highlight of the Week"



...to the community, to the public, etc.

Outreach to Federal agencies

“Transition Team” white papers



The screenshot shows the homepage of the Computing Community Consortium (CCC). The header features the CCC logo and the text "Computing Community Consortium" with the tagline "We support the computing research community in creating compelling research visions and the mechanisms to realize these visions." Below the header is a navigation bar with links: HOME, YOUR VISION, PLANS, ACTIVITIES (highlighted in green), RESOURCES, ABOUT, CRA, and a search box. The main content area is titled "Computing Research Initiatives for the 21st Century" and lists several white papers with their authors and affiliations.

Computing Research Initiatives for the 21st Century

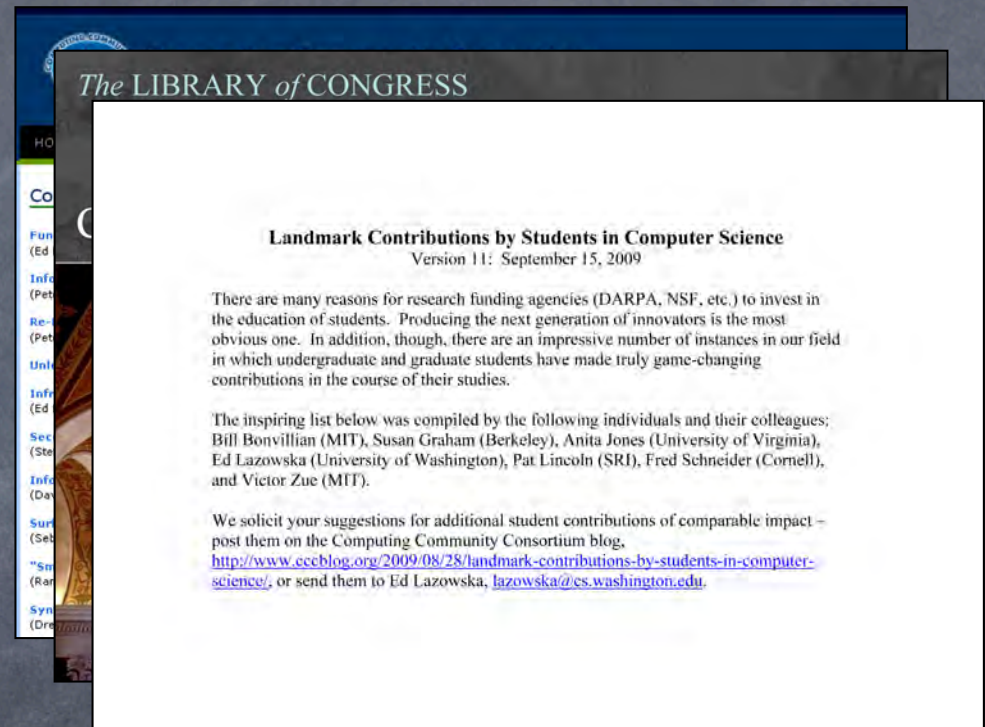
- [Fundamental Research in Engineering \(Word version\)](#)
(Ed Lazowska, University of Washington and Peter Lee, Carnegie Mellon University)
- [Information Technology R&D and U.S. Innovation \(Word version\)](#)
(Peter Harsha, Computing Research Association, Ed Lazowska, University of Washington, and Peter Lee, Carnegie Mellon University)
- [Re-Envisioning DARPA \(Word version\)](#)
(Peter Lee, Carnegie Mellon University and Randy H. Katz, UC Berkeley)
- [Unleashing Waves of Innovation: Transformative Broadband for America's Future \(Word version\)](#)
(Ed Lazowska, University of Washington, Peter Lee, Carnegie Mellon University, Chip Elliott, BBN Technologies, and Larry Smarr, UCSD)
- [Security is Not a Commodity: The Road Forward for Cybersecurity Research \(Word version\)](#)
(Stefan Savage, UC San Diego, and Fred B. Schneider, Cornell University)
- [Information Technology and America's Energy Future \(Word version\)](#)
(David Waltz, Columbia University, and John King, University of Michigan)
- [Surface Transportation 3.0 \(Word version\)](#)
(Sebastian Thrun, Stanford University, and Henry Kelly, Federation of American Scientists)
- ["Smart Grid": R&D for an Intelligent 21st Century Electrical Energy Distribution Infrastructure \(Word version\)](#)
(Randy H. Katz, UC Berkeley)
- [Synthetic Biology \(Word version\)](#)
(Drew Endy, Stanford, and Ed Lazowska, University of Washington)

“Transition Team” white papers

- Sensed and seized an opportunity to influence Federal science policy through the Presidential Transition Team
 - 19 papers produced in late 2008 & early 2009
 - 30 separate authors
 - Many highly influential:
 - **Re-envisioning DARPA** -- Peter Lee, Randy Katz
 - **Infrastructure for eScience & eLearning/Unleashing waves of innovation** -- Ed Lazowska, Peter Lee, Chip Elliott, Larry Smarr
 - **Security is not a commodity** -- Stefan Savage, Fred Schneider
 - **Synthetic biology** -- Drew Endy, Ed Lazowska
 - **Big-data computing** -- Randy Bryant, Randy Katz, Ed Lazowska
 - **The ocean observatories initiative** -- John Delaney, John Orcutt, Robert Weller
 - **Cyber-Physical Systems** -- Janos Sztipanovits, Jack Stankovic

Outreach to Federal agencies

- “Transition Team” white papers
- Library of Congress Symposium
- “Landmark Contributions by Students in Computer Science”



Leadership development

● Computing Innovation Fellows (CIFellows)



The screenshot shows the homepage of the Computing Innovation Fellows Project. At the top, there are logos for the Computing Research Association (CRA), the National Science Foundation (NSF), and the Computing Community Consortium (CCC). Below the logos, the title "Computing Innovation Fellows Project" is displayed. A navigation bar includes links for "Home", "CRA", "CCC", and "CISE". The main content area features a red announcement: "The 2009 Computing Innovation Fellows have been selected!". Below this, there is a link to "View the press release with the names of the 2009 Fellows and their Mentors." followed by a congratulatory message and a link to "For up-to-the-minute news on the progress of the selection process, check out the forum." The footer contains information about the project's funding from the National Science Foundation.

Computing Innovation Fellows Project

[Home](#) [CRA](#) [CCC](#) [CISE](#)

The 2009 Computing Innovation Fellows have been selected!

[View the press release with the names of the 2009 Fellows and their Mentors.](#)

Congratulations to everyone who was selected for a CIFellow award!
Thank you for your interest in CIFellows. The response has been tremendous!
[For up-to-the-minute news on the progress of the selection process, check out the forum.](#)

In the light of the response that the CIFellows has received, we have set up a courtesy website where employers can post available positions suitable for new computing PhD's. This site is available at <http://cifellows.org/opportunities>.

An additional courtesy site has been set up for computing PhD's to post their profiles and availability. This website is available at <http://cifellows.org/profiles>. We encourage employers and candidates to make use of these complimentary services.

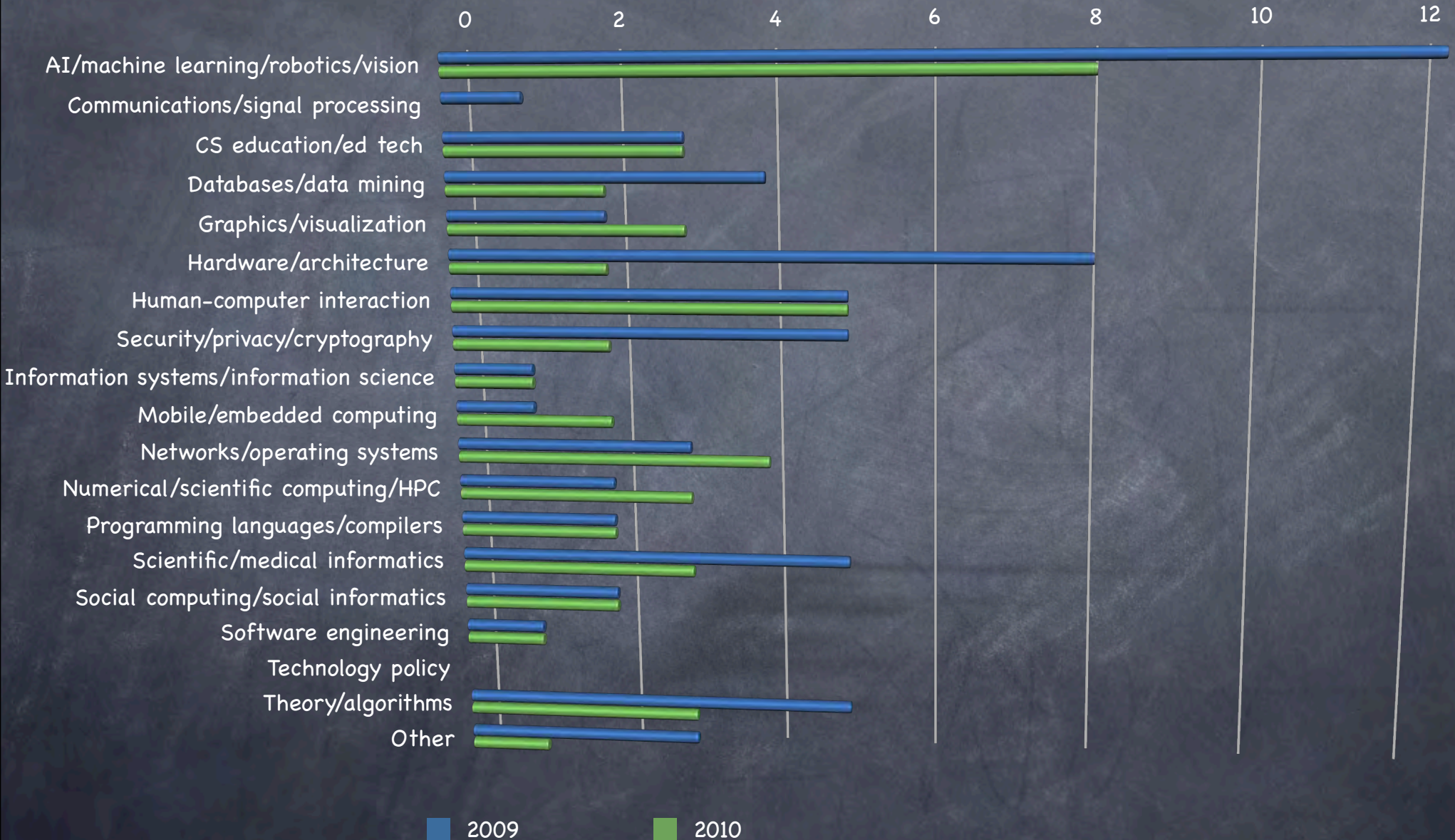
The Computing Community Consortium (CCC) and the Computing Research Association (CRA), with funding from the National Science Foundation, announce a program for new PhD graduates to obtain one-to-two year postdoctoral positions

CIFellows Project overview

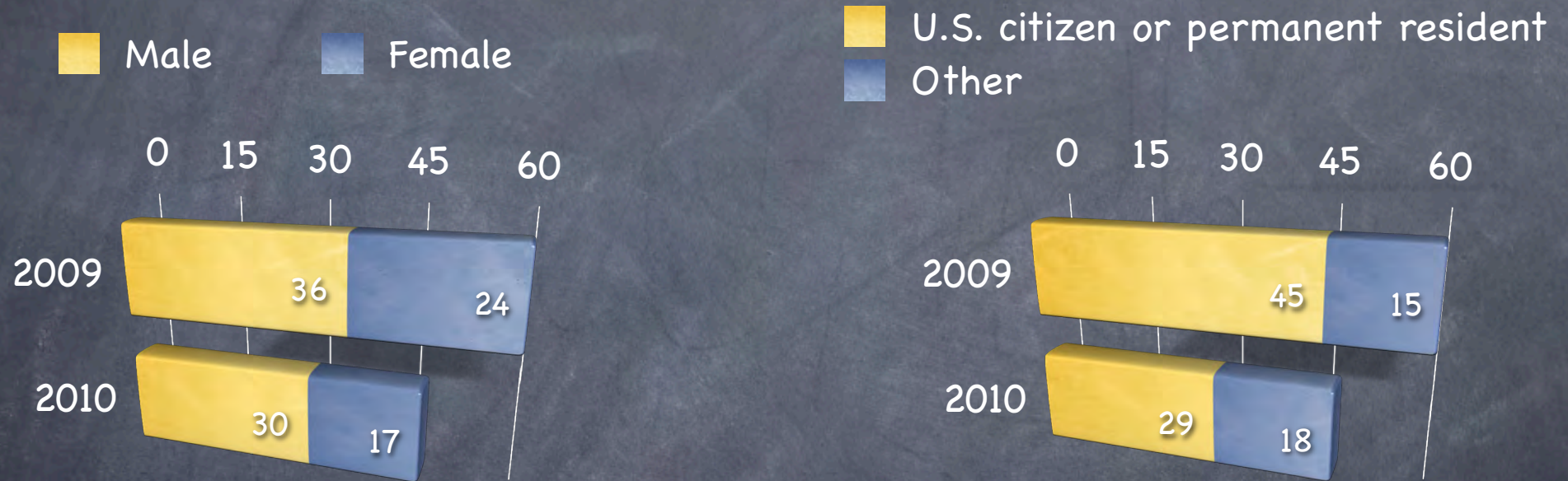
- Established in 2009 with NSF/CISE funding
- Provides recent Ph.D.s in computer science (and allied fields) post-doctoral positions
- Positions span one to two years
- Goal is to retain new Ph.D.s in research & teaching during difficult economic times
- 60 CIFellows funded in 2009
 - 19 left the program by the end of year I, most with permanent positions, many with tenure-track faculty appointments
 - 41 continued for a second year
- Additional 47 CIFellows funded in 2010
- Have announced a call for 2011-12 CIFellowships



2009 & 2010 CIFellows Projects



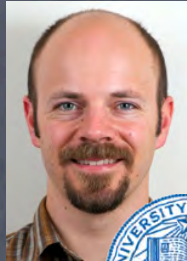
Demographics



Three early successes

CIFellow

Thomas Schmid
UCLA



Mentor

Prabal Dutta
U of Michigan EECS



CIFellow's current status



Assistant Professor
Electrical &
Computer Engineering

Jennifer Vaughan
UPenn



Yiling Chen
Harvard CS



Assistant Professor
Computer Science

Sitaram Asur
Ohio State

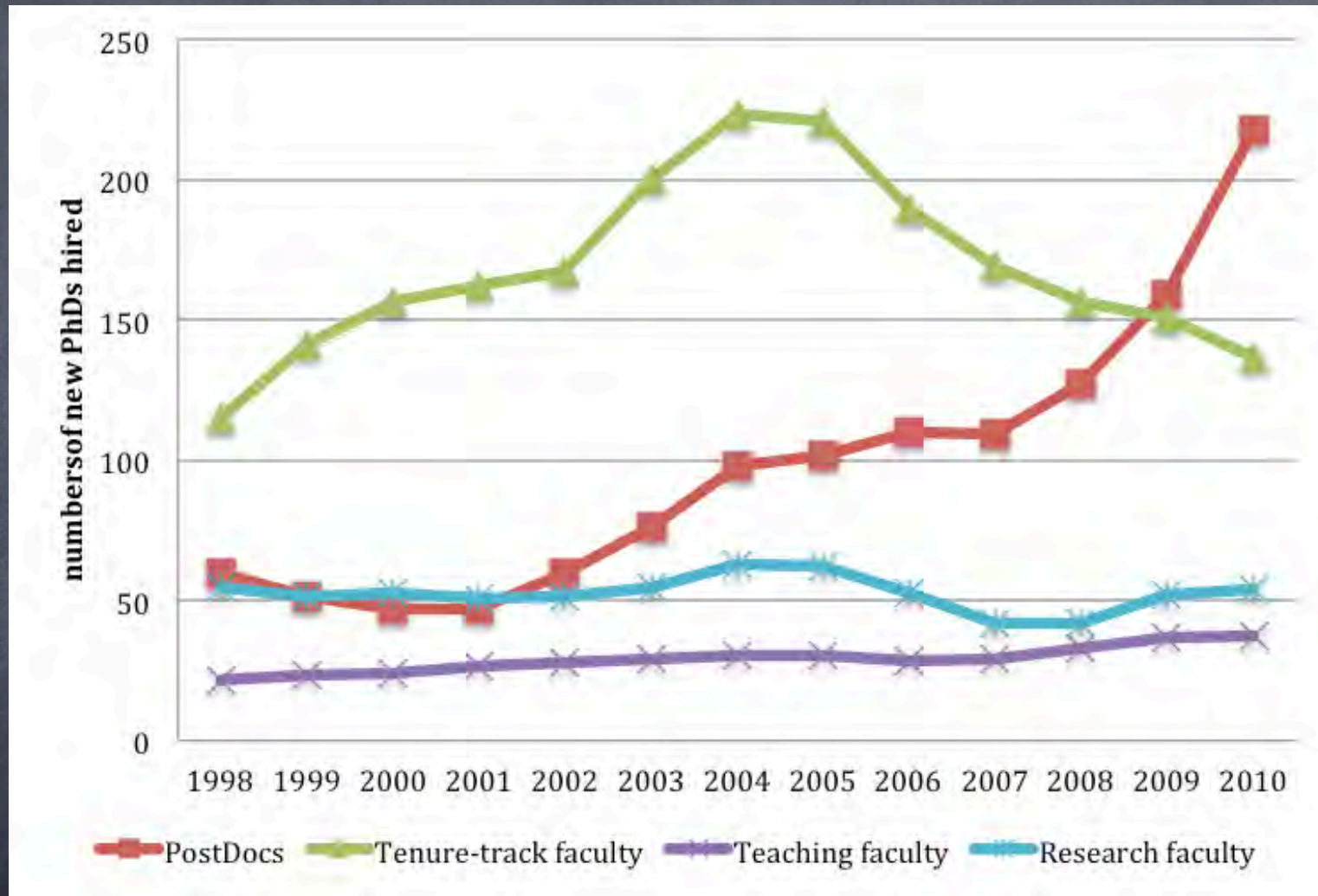


Bernardo Huberman
HP Labs



Researcher
Social Computing Lab

Postdocs in computing



Seeking your input: <http://cra.org/postdocs>

Leadership development


- Computing Innovation Fellows (CIFellows)
- Leadership in Science Policy Institute



The screenshot shows the homepage of the Computing Community Consortium (CCC). The header features the CCC logo and the text "Computing Community Consortium" with a tagline: "We support the computing research community in creating compelling research visions and the mechanisms to realize these visions." Below the header is a navigation bar with links: HOME, YOUR VISION, PLANS, ACTIVITIES (highlighted), RESOURCES, ABOUT, and CRA. A search bar is also present. Under the navigation bar, there are several topic links: NetSE, XLayer, Cyber Physical Systems, Global Development, Robotics, Architecture, Big Data Computing, HealthIT, SEES IT, Theoretical CS, Interactive Tech, EDTECH, and Open Source. The main content area features a large banner for the "CCC Leadership in Science Policy Institute" with an image of the U.S. Capitol dome. Below the banner, there is an "Overview" section with the following text: "As part of its mission to develop a next generation of leaders in the computing research community, CRA's Computing Community Consortium (CCC) announces the CCC Leadership in Science Policy Institute (LISPI), intended to educate a small cadre of computing researchers on how science policy in the U.S. is formulated and how our government works. We seek nominations for participants. LISPI will be centered around a one-day workshop to be held on Monday, November 7, 2011 in Washington, DC. LISPI will feature 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. Here is a list of Sessions and Speakers. LISPI participants are expected to:". To the right of the overview text, there is a yellow box with the text: "Content is still being added to this site. Please check back periodically. The last change was made on: March 30, 2011." Below this box is a "Logistics" section with the following information: "Date: November 7, 2011", "Location: Hyatt Regency Capitol Hill, Washington, DC", and a paragraph about participation: "Participation in the workshop will include breakfast and lunch at the workshop, as well as a reception with workshop speakers and other interested guests at the conclusion of the meeting. Hotel accommodations for two nights (before and after the workshop) as well as reimbursement for airfare and other travel."

Visioning for the future

- White papers
- Research visions sessions at conferences...



The screenshot shows the homepage of the Computing Community Consortium (CCC) Research Visions website. The header features the CCC logo and the text "Computing Community Consortium" with the tagline "We support the computing research community in creating compelling research visions and the mechanisms to realize these visions." Below the header is a navigation bar with links: HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, and CRA. A search bar is also present. The main content area is titled "Research Visions" and includes a section "Call for Visionary Conference Tracks" which describes the CCC's initiative to sponsor "Challenges and Visions" tracks at leading computer science research conferences. It details the prize money for the top 3 papers and the requirements for papers. A sidebar on the right lists "Prior Vision Tracks" with two entries: "Outrageous Ideas and Visions (OIV) session, at the 5th Biennial Conference on Innovative Data Systems (CIDR), January 2011, Asilomar, CA" and "Research Vision session, at the 9th Symposium on Operating Systems Design and Implementation (OSDI), October 2011, Vancouver, BC, Canada". Both entries include links to "CCC Blog Post" and "Session Information Page". A link to "See the full list." is also present at the bottom of the sidebar.

Computing Community Consortium
We support the computing research community in creating compelling research visions and the mechanisms to realize these visions.

HOME YOUR VISION PLANS ACTIVITIES RESOURCES ABOUT CRA

Research Visions

Call for Visionary Conference Tracks

The Computing Community Consortium (CCC) is sponsoring an initiative to bring special "Challenges and Visions" tracks to leading computer science research conferences. The goal of this initiative is to help conferences reach out beyond the usual research papers that present completed work and to seek out papers that present ideas and visions that can stimulate the research community to pursue new directions.

Conferences may request CCC sponsorship of such tracks along with a CCC grant that provides for prize money for the top 3 papers (first prize \$1000, second prize \$750, and third prize \$500, to be awarded as travel grants). (See below for details about selecting and awarding these prizes.)

Papers in a "Challenges and Visions" track should be open-ended, possibly "outrageous" or "wacky", and present new problems, new application domains, or new methodologies that are likely to stimulate significant new research. The CCC is seeking papers (roughly 4 pages in length) so that the ideas can be referenced after the conference is over.

After the conference, the CCC will post links to the track papers on its [Challenges and Visions web page](#) and help disseminate these ideas broadly in the computer science research community.

Requests for CCC sponsorship should include information on the conference and a proposed list of program committee members for the track. We provide below a prototype call for papers and suggestions regarding the review process. Proposals should be sent to Erwin Gianchandani, the CCC Director, at erwin@cra.org.

Prior Vision Tracks

- Outrageous Ideas and Visions (OIV) session, at the 5th Biennial Conference on Innovative Data Systems (CIDR), January 2011, Asilomar, CA
- [CCC Blog Post](#)
- [Session Information Page](#)
- Research Vision session, at the 9th Symposium on Operating Systems Design and Implementation (OSDI), October 2011, Vancouver, BC, Canada
- [CCC Blog Post](#)
- [Session Information Page](#)

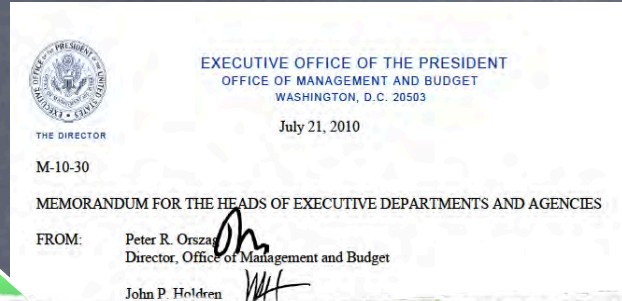
[See the full list.](#)

...And lots of "visioning activities"

	Community visioning activities	Participants	Organizations	
	Networking science & engineering	109	44	
	Cyber-physical systems	100	47	
	Robotics	141	79	
	"Big data" computing	81	46	Yahoo!
	Theoretical computer science	39	26	
	Global development (ICT4D)	56	37	
	Learning technologies	55	30	
	Health information technology	121	102	NSF, ONC, NLM, NIST, AHRQ
	Cross-layer reliability	121	45	
	Free and open source software	42	35	
	Advancing computer architecture	In progress		
	Interactive technologies	In progress		Canada GRAND, ACM CHI
	Sustainability + IT	In progress		

Open RFP for community-driven visioning

Robotics as an example



Trying to replicate
success with
learning technologies,
through discussions with
ED and NSF leaders

4 meetings during
summer 2008

Roadmap published
May 2009

Extensive discussions
between visioning
activity leaders &
agencies

agencies to include
robotics in FY 12
budgets

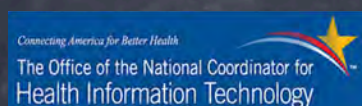
National Robotics
Initiative (NRI) is
included in
President's FY 12
budget request

Henrik Christensen
Georgia Tech



Health information technology

- Following ARRA, NSF asked CCC to organize workshop
- Computer scientists, systems engineers, social scientists, care practitioners
- Produced a report summarizing key research questions and directions



- From data to knowledge to action -- enabling evidence-based healthcare
- Empowering people -- providers and consumers -- improves healthcare quality
- Computer-based augmentation of human learning, reasoning, decision-making, and physical motion significantly enhances human capabilities
- Healthcare is a complex, large-scale, adaptive distributed evolving system
- The Importance of Collaborative Government Investment

Sustainability + IT

- NSF/CISE recently asked CCC to run a workshop on sustainability
- Computer scientists, systems engineers, social scientists, sustainability scientists
- Produced a report summarizing key research questions and directions

- Defining sustainability
- Routine uses of CISE for sustainability
- CISE research to further sustainability
 - “Big data”
 - Modeling & simulation
 - Optimization
 - Intelligent systems
 - Cyber-physical systems
 - Human-centered & social computing
 - Privacy & security
 - Systems engineering & systems integration
 - Green IT
- The power of applied problems
- Collaboration & interdisciplinary research
- Education & workforce development
- The importance of collaborative Federal investment

Data analytics

- Overview
- eScience
- Healthcare
- Energy
- Education
- New Transp
- Intelligence
- New Biolog
- Robotics & response

Systems biology: As the NAS report stated, “Improved measurement technologies and

Nearly 2500 years ago, Hippocrates kicked off a revolution in healthcare by calling for the careful collection and recording of evidence about patients and their illnesses. This call—which first introduced the goal of sharing data among physicians to provide the best care possible for patients—established a foundation for the evolution of modern healthcare. Although 25 centuries have passed since Hippocrates’ call, we have not yet attained the dream of true evidence-based healthcare. Large quantities of data about wellness and illness continue to be dropped on the floor, rather than collected and harnessed to optimize the provision of care. We are simply not yet doing the best that we can.

We now stand at the brink of a potential revolution in data-centric healthcare, enabled by advances in computer science. Such a revolution promises to enhance the quality of healthcare while cutting costs, and, more generally, enabling physicians to do the very best that is possible with realistically bounded healthcare resources. Doing the best that can be done with available resources aligns with the core promise that all physicians make when they solemnly raise their hand and recite the Hippocratic Oath upon receipt of their medical degree.

Enabling this vision of true evidence-based healthcare will require critical investments for translating key methods and insights into working systems, as well as for advances in core computer science research and engineering to address key conceptual bottlenecks and opportunities.

Collecting and analyzing data collected on health and illness promises to enhance the quality and efficacy of healthcare, and to enhance the quality and longevity of life. The collection and analysis of data can provide new insights about wellness and illness that can be operationalized. Data-centric methods allow us to transform *data* into *predictive models*. Predictive models can be used to generate forecasts with well-characterized accuracies about the future—or diagnoses about states of a patient that we cannot inspect directly. Such forecasts or diagnoses can be harnessed within procedures that generate recommendations for *actions in the world*, and decisions about *when it is best to collect more information about a situation before acting*, considering the costs and time delays associated with collecting more information to enhance a decision.

The pipeline of *data to prediction to action* can be used to automate or provide decision support for accurate triage and diagnosis, to generate well-calibrated predictions about health outcomes,

correlation

action

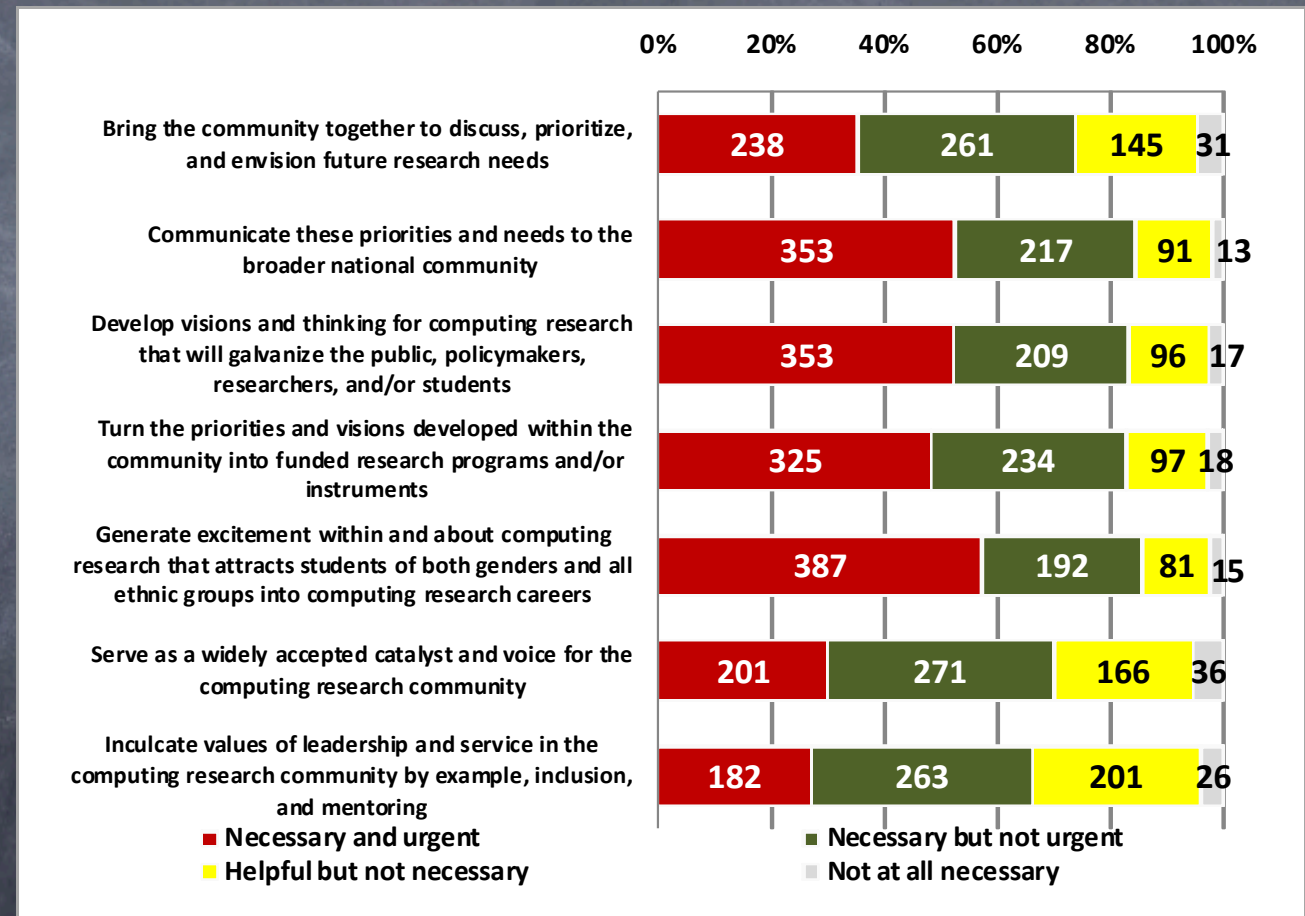
Funding Opportunities

- * NSF Cyber-Enabled Discovery and Innovation (CDI) Program

The value of the CCC

How necessary is it to have within the U.S. computing research community an organization designated to perform one or more of the following activities?

- Small, nimble organization
- Unique components to the mission
- Provides a "leadership voice" for the community



--SRI International

A community effort -- we need you!

- Visioning activities, white papers on specific research areas
 - Challenges & Visions Sessions at conferences
 - Short videos for undergraduates
 - CCC Blog contributions
 - Computing Research Highlights of the Week
 - ...Tell us what else...
-
- And join us!

Questions?

- E-mail: erwin@cra.org
- Phone: (202) 266-2936
- Online: www.cra.org/ccs