

The Computing Community Consortium

Dr. Erwin Gianchandani
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
Auburn University - CSSE
Ball State University - CS
Boston College - CS
Boston University - CS
Bowdoin College - CS
Bowling Green State University - CS
Bradley University - CS
Brandeis University - CS
Brigham Young University - CS
Brown University - CS
Bryn Mawr College - MCS
Bucknell University - CS
California Institute of Technology - CS
California Polytechnic State University - CS
California State University, Chico - CS
Carnegie Mellon University - CS
Case Western Reserve University - EECS
City University of New York, Graduate Center - CS
Clemson University - CS
Colgate University - CS
College of William & Mary - CS
Colorado School of Mines - MCS
Colorado State University - CS
Columbia University - CS
Cornell University - CS
Cornell University - ECE
Dalhousie University - CS
Dartmouth College - CS
DePaul University - CS
Drexel University - CS
Drexel University - IST
Duke University - CS
Emory University - MCS
Florida Atlantic University - CSE
Florida Institute of Technology - CS
Florida International University - CS
Florida State University - CS
Florida State University - IS
George Mason University - CS
George Washington University - CS
Georgia Institute of Technology - CSE
Georgia Southern University - IT
Georgia State University - CIS
Georgia State University - CS
Grinnell College - MCS
Harvard University - CS
Harvey Mudd College - CS
Hofstra University - CS
Illinois Institute of Technology - CS
Illinois State University - ACS
Indiana University - CS
Indiana University - I
Iowa State University - CS
Iowa State University - ECE

Johns Hopkins University - CS
Johns Hopkins University - SI
Juniata College - IT & CS
Kansas State University - CIS
Kent State University - CS
Lafayette College - CS
Lehigh University - CSE
Long Island University - ICS
Louisiana State University - CS
Loyola University, Chicago - CS
Massachusetts Institute of Technology - EECS
Miami University - CS
McMaster University - CE&S
Michigan State University - CSE
Michigan Technological University - CS
Mississippi State University - CS
Montana State University - CS
Montclair State University - CS
National University of Singapore - CS/IS
Naval Postgraduate School - CS
New Jersey Institute of Technology - CCS
New Mexico State University - CS
New York University - CS
North Carolina State University - CS
Northeastern University - CIS
Northwestern University - ECE
Nova Southeastern University - CS
Oakland University - CSE
Ohio State University - CSE
Ohio University - EECS
Oklahoma State University - CS
Old Dominion University - CS
Oregon Health & Science University - CSE
Oregon State University - EECS
Pace University - CSIS
Pennsylvania State University - CSE
Pennsylvania State University - IST
Polytechnic University - CIS
Pomona College - MCS
Portland State University - CS
Princeton University - CS
Purdue University - CS
Purdue University - ECE
Rensselaer Polytechnic Institute - CS
Rice University - CS
Rochester Institute of Technology - CS
Roosevelt University - CS&T
Rutgers University, Busch Campus - CS
Saint Louis University - MCS
Santa Clara University - CE
Simon Fraser University - CS
Singapore Management University - IS
Southern Illinois University, Carbondale - CS
Southern Methodist University - CSE
Southern Polytechnic State University - CSE

Stanford University - CS
State University of New York, Albany - CS
State University of New York, Binghamton - CS
State University of New York, Stony Brook - CS
Stevens Institute of Technology - CS
Swarthmore College - CS
Syracuse University - IS
Temple University - CIS
Texas A&M University - CS
Texas State University - CS
Toyota Technological Institute at Chicago - CS
Tufts University - CS
Tulane University - EECS
Union College - CS
University at Buffalo - CSE
University at Buffalo - IS
University of Alabama, Birmingham - CIS
University of Alabama, Tuscaloosa - CS
University of Alberta - CS
University of Arizona - CS
University of Arkansas - CSE
University of Arkansas at Little Rock - I
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 Florida - CS
University of Chicago - CS
University of Cincinnati - EECS
University of Colorado, Boulder - CS
University of Delaware - CIS
University of Denver - CS
University of Florida - CISE
University of Georgia - CS
University of Hawaii - ICS
University of Houston - CS
University of Houston - ECE
University of Idaho - CS
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 Louisville - CECS
University of Maine - CS
University of Maryland - CS

University of Maryland, Baltimore Co - CSEE
University of Maryland, Baltimore Co - IS
University of Massachusetts, Amherst - CS
University of Massachusetts, Boston - CS
University of Michigan - EECS
University of Michigan - I
University of Michigan, Dearborn - CIS
University of Minnesota - CSE
University of Minnesota, Duluth - CS
University of Mississippi - CIS
University of Missouri, Columbia - CS
University of Missouri, Rolla - CS
University of Montana - CS
University of Montreal - 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 Brunswick - CS
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 - IT
University of North Dakota - CS
University of North Texas - CS
University of Notre Dame - CSE
University of Oklahoma - CS
University of Oregon - CIS
University of Pennsylvania - CIS
University of Pittsburgh - CS
University of Pittsburgh - IS
University of Puget Sound - MCS
University of Rochester - CS
University of South Alabama - CIS
University of South Carolina - CSE
University of South Florida - CSE
University of Southern California - CS
University of Southern California - EES
University of Tennessee, Knoxville - CS
University of Texas, Arlington - CSE
University of Texas, Austin - CS
University of Texas, Dallas - CS
University of Texas, El Paso - CS
University of Toronto - CS
University of Tulsa - MCS
University of Utah - CS
University of Virginia - CS
University of Washington - CSE
University of Washington - I
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
Utah State University - CS
Vanderbilt University - EECS
Virginia Commonwealth University - CS
Virginia Tech - CS
Wake Forest University - CS
Washington State University - EECS
Washington University in St. Louis - CS
Wayne State University - CS
West Virginia University - CSEE
Western Michigan University - CS
Williams College - CS
Worcester Polytechnic Institute - CS
Wright State University - CSE
Yale University - CS
York University - CS

Sun Microsystems (Sponsoring Member)
Microsoft Corporation (Sustaining Member)
IBM Research (Supporting Member)

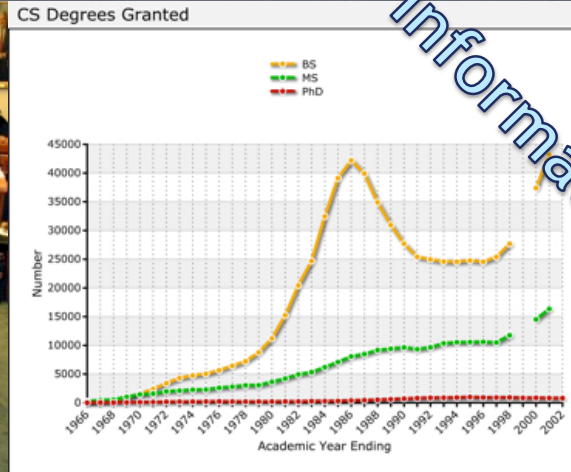
Accenture Technology Labs
Argonne National Laboratory
Avaya
CA Labs
Computer Science Research Institute,
Sandia National Labs
Fraunhofer Center for
Experimental Software Engineering
Fujitsu Laboratories of America
Google
Hewlett-Packard Company
IDA Center for Computing Sciences
Intel Corporation
Lawrence Berkeley National Laboratory
Los Alamos National Laboratory
Lucent Technologies, Bell Labs
McAfee Research
Mitsubishi Electric Research Labs
National Center for Atmospheric Research
NCSA
NEC Laboratories America
NTT DoCoMo USA Labs
Pacific Northwest National Laboratory
Panasonic Information &
Networking Technologies Lab
Ricoh Innovations
San Diego Supercomputer Center
SAP Labs
SRI International
Telcordia Technologies



Core activities



Policy



Information



Human resources



Community

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...

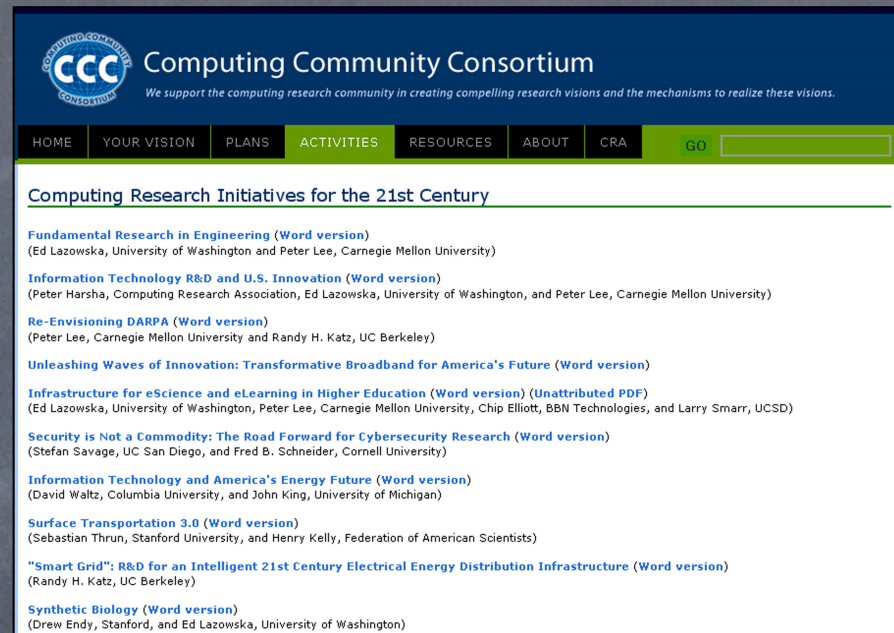
- Presentations
- Articles
- CCC Blog
- Computing Research "Highlight of the Week"

The screenshot displays the CCC website interface. At the top, the navigation menu includes: HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, CRA, and a GO search bar. The main content area features a "COMPUTING RESEARCH HIGHLIGHT OF THE WEEK [January 14 - 21, 2010]" section. The featured article is titled "One Keypad per Child" Lets School Children Share Screen to Learn Math. The text describes a system developed by University of Washington computer science undergraduates that allows four students to share a single computer for interactive math problems. A quote from Joyojeet Pal, a lecturer at UW, notes that computer sharing is common in rural India, Rwanda, and the slums of Brazil. The article includes a photo of two children looking at a screen and a video player showing a man speaking. On the right side, there are sections for "Relevant Links" (Press Release, Project Web Page, Research Papers, Media Contact), "Keywords" (educational technology, information technology for development, University of Washington), "Buzz" (RSS SUBSCRIBE, EMAIL NOTIFY, EMBED CODE), and a "SHARE" button with social media icons.

...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 menu with links for HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, CRA, and a GO button. The main content area is titled "Computing Research Initiatives for the 21st Century" and lists several white papers with their authors and affiliations.

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 | GO

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)**
- Infrastructure for eScience and eLearning in Higher Education (Word version) (Unattributed PDF)**
(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”

The LIBRARY of CONGRESS

Landmark Contributions by Students in Computer Science
Version 11: September 15, 2009

There are many reasons for research funding agencies (DARPA, NSF, etc.) to invest in the education of students. Producing the next generation of innovators is the most obvious one. In addition, though, there are an impressive number of instances in our field in which undergraduate and graduate students have made truly game-changing contributions in the course of their studies.

The inspiring list below was compiled by the following individuals and their colleagues: Bill Bonvillian (MIT), Susan Graham (Berkeley), Anita Jones (University of Virginia), Ed Lazowska (University of Washington), Pat Lincoln (SRI), Fred Schneider (Cornell), and Victor Zue (MIT).

We solicit your suggestions for additional student contributions of comparable impact – post them on the Computing Community Consortium blog, <http://www.cccblog.org/2009/08/28/landmark-contributions-by-students-in-computer-science/>, or send them to Ed Lazowska, lazowska@cs.washington.edu.

Leadership development

Computing Innovation Fellows (CIFellows)



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



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.](#)

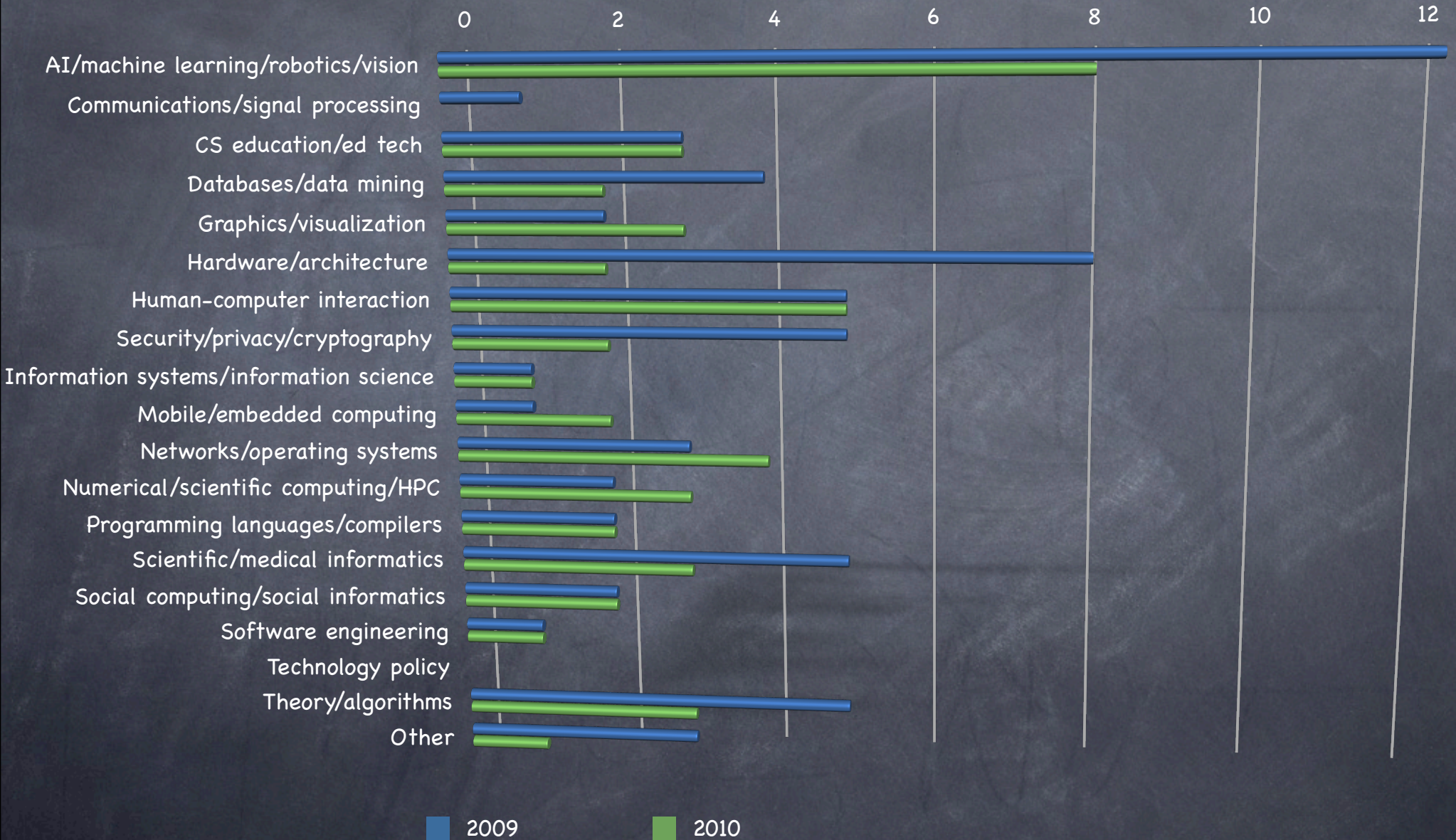
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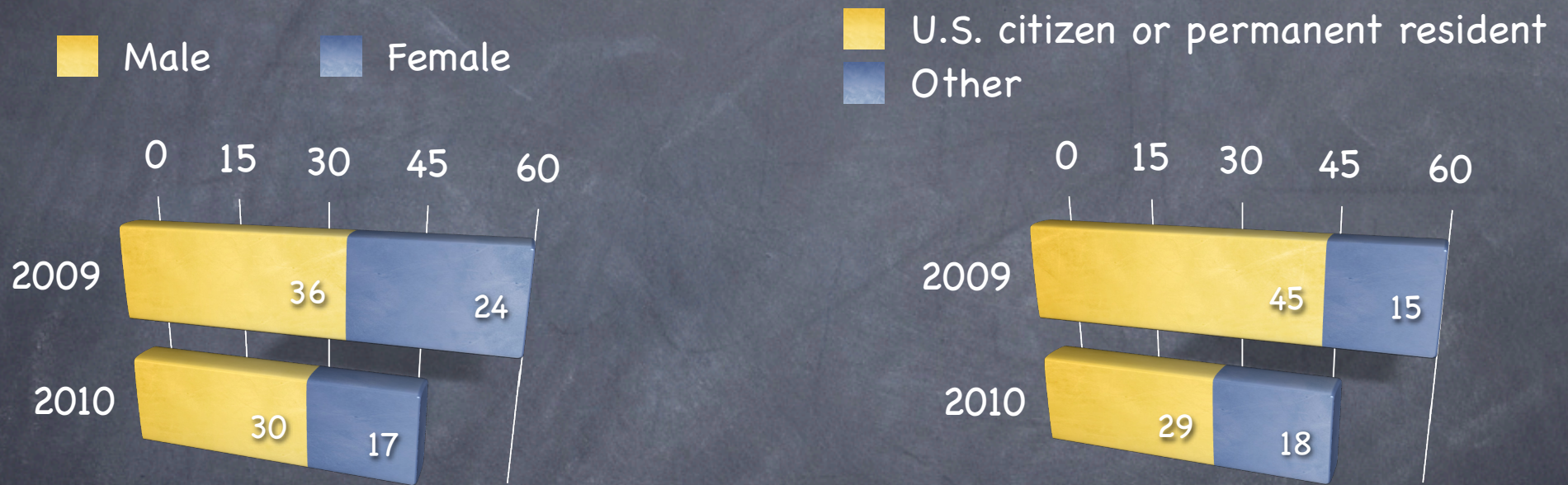
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2009 & 2010 CIFellows Projects



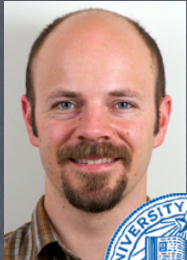
Demographics



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

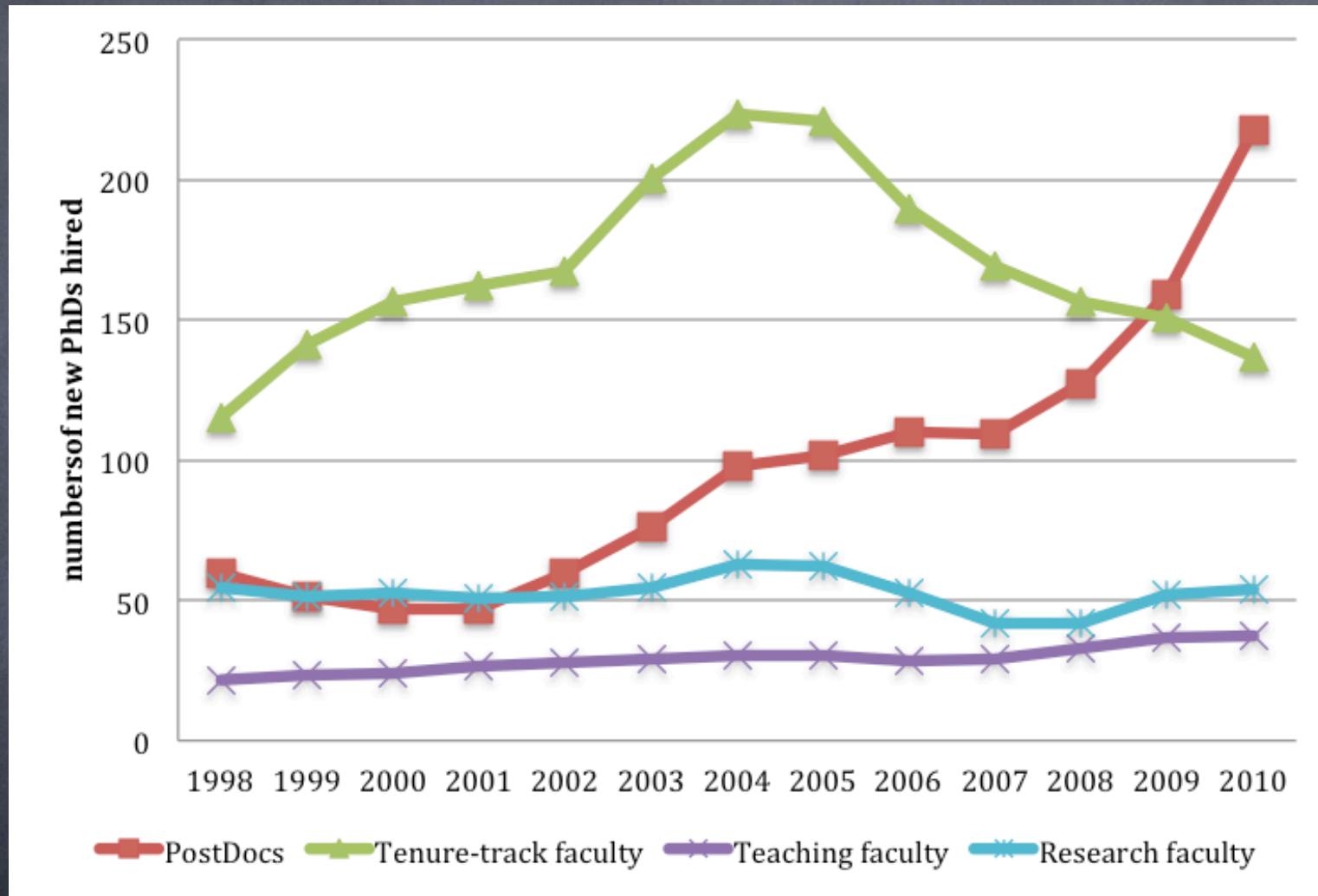


Bernardo Huberman
HP Labs



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 website for 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 menu with links for HOME, YOUR VISION, PLANS, ACTIVITIES (highlighted), RESOURCES, ABOUT, and CRA. A search bar is located to the right of the menu. Below the navigation menu is a secondary menu with links for 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 "CCC Leadership in Science Policy Institute" with an image of the US Capitol dome. Below the banner 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 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 text: "Date: November 7, 2011 Location: Hyatt Regency Capitol Hill, Washington, DC 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 CCC website with a navigation menu and a main content area. The navigation menu includes links for HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, and CRA, along with a search bar. The main content area features a large banner for 'Research Visions' and a section titled 'Call for Visionary Conference Tracks'.

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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 GO

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.](#)

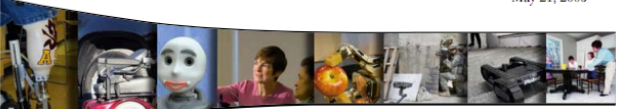
...And lots of "visioning activities"

	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

May 21, 2009





A Roadmap for US Robotics From Internet to Robotics

Organized by

- Georgia Institute of Technology
- University of Southern California
- Johns Hopkins University
- University of Pennsylvania
- University of California, Berkeley
- Rensselaer Polytechnic Institute
- University of Massachusetts Lowell
- University of Michigan
- Carnegie Mellon University
- Georgia Tech

Sponsored by



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

July 21, 2010

THE DIRECTOR

M-10-30

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Peter R. Orszag, Director, Office of Management and Budget
John P. Holdren



Office of Science and Technology Policy

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RTD2: Research for Robotics

Posted by Tom Kall and Sridhar Kota on September 15, 2010 at 03:09 PM EDT

In July, the heads of the [Office of Management and Budget](#) and the [Office of Science and Technology Policy](#) identified robotics as one of the Administration's R&D priorities for the President's FY2012 budget.

Robotics is an important technology because of its potential to advance national needs such as homeland security, medicine, healthcare, space exploration, environmental monitoring and remediation, advanced manufacturing, logistics, services, and agriculture. Robotics is also nearing a tipping point in terms of usefulness and versatility as technologies such as software, chips, and computer vision advance.

We are working with Federal agencies and the research community to identify concrete steps that the Administration can take to promote U.S. leadership in robotics.

In July, five agencies teamed up to issue a joint solicitation for small business research for [Robotics Deployment and Employment](#) (RTD2). Small businesses can apply for research funding for a wide range of applications including robot-assisted rehabilitation, robotics for drug discovery, and robots that can disarm land mines.

We expect to come in the months ahead from a newly energized and collaborative Federal robotics research effort.

By Director for Policy in the White House Office of Science and Technology Policy
Assistant Director for Advanced Manufacturing in the White House Office of Science and Technology Policy

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
- Intelligenc
- 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.

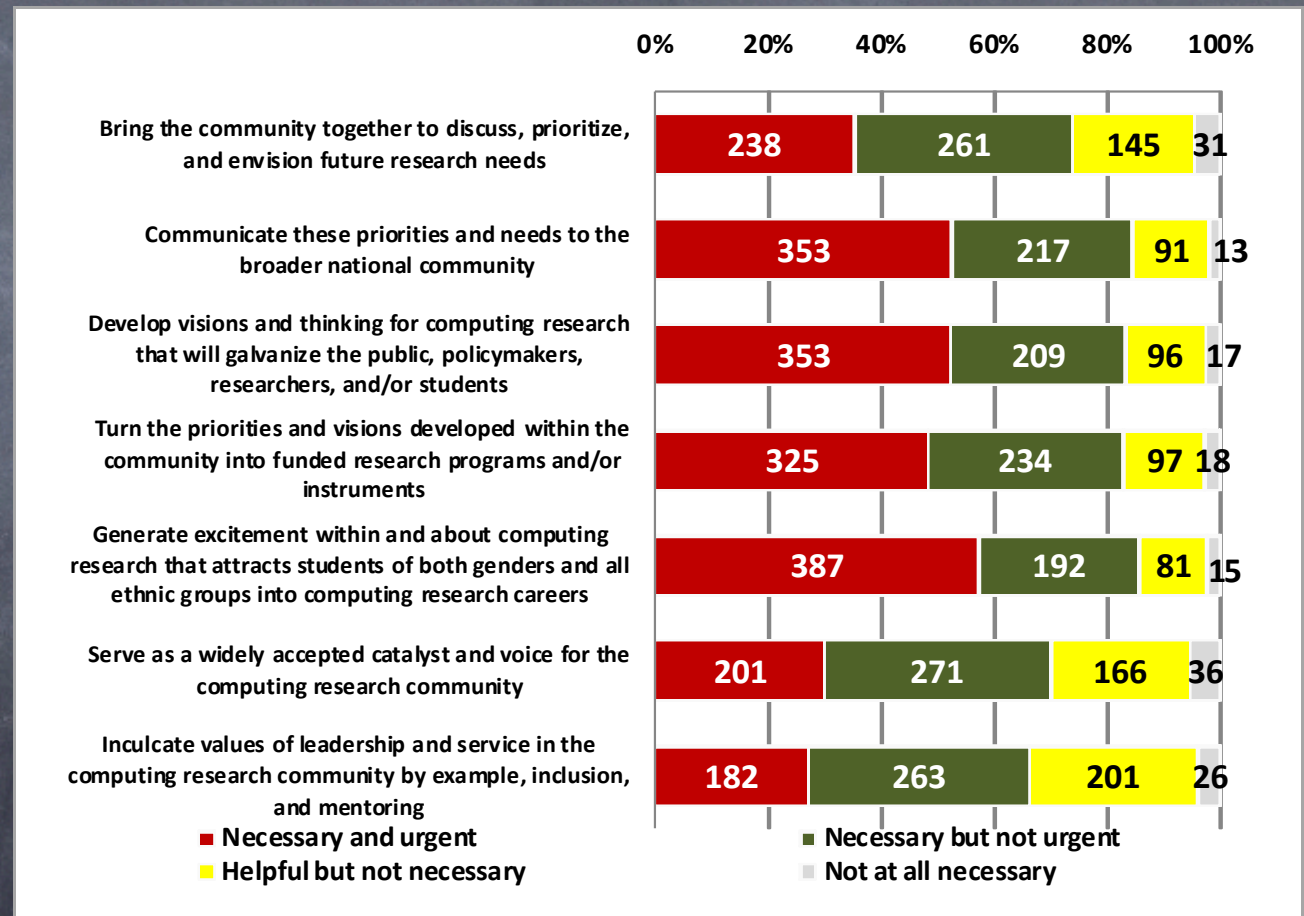
The pipeline of *data to prediction to action* can be used to automate or provide decision support for accurate triage and diagnosis, to generate well-calibrated predictions about health outcomes,

The screenshot shows a web interface with a search bar at the top containing the text "portation". Below the search bar is a navigation menu with the word "action" visible. The main content area displays a list of funding opportunities, including a prominent red triangle graphic. At the bottom of the page, there is a section titled "Funding Opportunities" with a sub-section for "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?

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