

# The Computing Community Consortium

Dr. Erwin Gianchandani  
Director, Computing Community Consortium  
Computing Research Association

NIH Biomedical Information Science & Technology Initiative (BISTI)

April 7, 2011





# Overview

- The Computing Research Association
- What is the CCC?
- Possible synergistic directions?



# The Computing Research Association



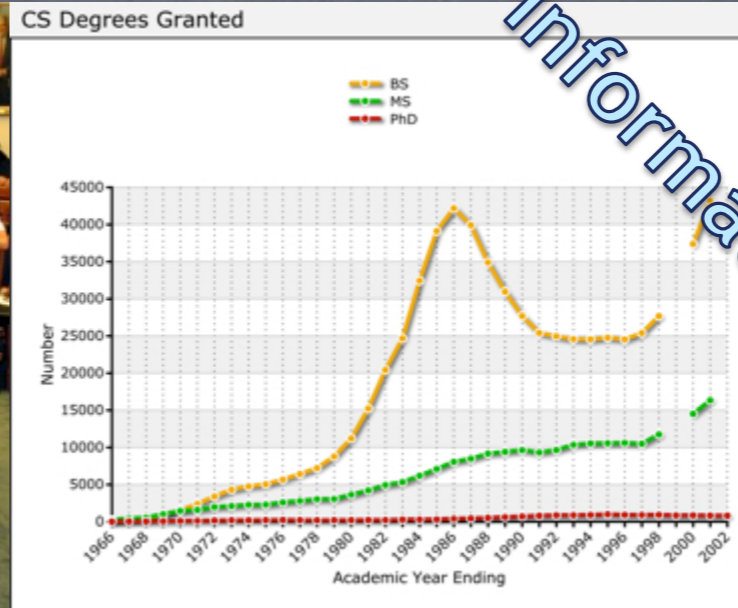
# Over 220 department/lab members

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 - CSCE  
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 - ECECS  
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



Information





# Mission + activities

- Strengthen research and education in the computing fields
  - working to influence **policy** that impacts computing research
  - 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





# Mission + activities

- Strengthen research and education in the computing fields

*Government  
Affairs*

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





# 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





# 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





# 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
- Hank Korth
- Eric Horvitz
- 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...

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



# Communicating about computing...

## ● Presentations

### The Computing Community Consortium: Stimulating Bigger Thinking

Ed Lazowska

Bill & Melinda Gates Chair in  
Computer Science & Engineering  
University of Washington

Chair, Computing Community Consortium

Tapia Conference Career Workshop  
April 2009

<http://www.cra.org/ccc/>



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



# Communicating about computing...

- Presentations
- Articles

*The Computing Community Consortium*

**V** viewpoints

DOI:10.1145/1378704.1378714 Ed Lazowska

## Viewpoint

### Envisioning the Future of Computing Research

*Advances in computing have changed our lives—the Computing Community Consortium aims to help the research community continue that lineage.*

**H**OW CAN WE work together to establish, articulate, and pursue compelling visions for our field—visions that will shape the intellectual future of the field, that will catalyze research investment and public support, and that will attract the best and brightest minds of a new generation? The National Science Foundation

many Internet hosts.

It was only 10 years ago that Deep Blue—a supercomputer by any definition—defeated world chess champion Garry Kasparov. Today, thanks more to progress in software than to progress in hardware, you can download for your PC a chess engine with a rating 10% higher than any human player. Most of the “futurist scenar-

try: timesharing, computer graphics, networking (LANs and the Internet), personal workstation computing, windows and the graphical user interface, RISC architectures, modern integrated circuit design, RAID storage, and parallel computing. In each case, the role of federally sponsored research was clear.

The panel conducting this study (I

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



# Communicating about computing...

- 👁 Presentations
- 👁 Articles
- 👁 CCC Blog

The screenshot displays the homepage of the Computing Community Consortium (CCC) Blog. The page features a navigation bar with links for Home, About the CCC, and About this blog, along with a search box. The main content area highlights a post titled "CCC Sponsors 'Headwaters Awards' at SSTD" by Erwin Gianchandani, dated February 19th, 2011. The post text discusses the CCC's sponsorship of "research visions" sessions at computing research conferences, aiming to provide venues for sharing and discussing forward-looking, visionary ideas. It mentions the CCC's role in announcing a "crazy ideas" session at the 12th International Symposium on Spatial and Temporal Databases in Minneapolis. A photograph of a riverbank with a sign that reads "HERE 1475 FT ABOVE THE OCEAN THE MIGHTY MISSISSIPPI BEGINS TO FLOW ON ITS WINDING WAY 2552 MILES TO THE GULF OF MEXICO" is included. The right sidebar contains subscription options (E-mail and RSS), a "LATEST TWEET" section, and "PREVIOUS ENTRY" and "NEXT ENTRY" links. A "RECENT POSTS" section lists several recent articles, and a "CATEGORIES" section lists "awards", "big science", and "CIFellows".

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



# Communicating about computing...

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

The image shows a stack of overlapping screenshots of the Computing Community Consortium (CCC) website. The top-most screenshot displays a blog post titled "One Keypad per Child" with a video player and various social media sharing options. The website header includes the CCC logo and navigation links such as HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, and CRA. The main content area features a "COMPUTING RESEARCH HIGHLIGHT OF THE WEEK" section with a detailed article about a system developed by the University of Washington.

viewpoints

The Computing Community Consortium Blog

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 HIGHLIGHT OF THE WEEK [January 14 - 21, 2010]

"One Keypad per Child" Lets School Children Share Screen to Learn Math

University of Washington computer science undergraduates have developed a system that lets up to four students share a single computer to do interactive math problems. Early tests show that students using the tool are able to share a single screen while working on problems at their own pace, effectively quadrupling the number of computers available for math exercises.

"Computer sharing is quite common in much of the world," said Joyojeet Pal, a lecturer in UW Computer Science & Engineering who has studied technology adoption in rural India, Rwanda, and the slums of Brazil. Despite this, though, practically no learning technologies accommodate sharing, Pal said.

This month the team will test the system, called **MultiLearn**, with 180 students who are attending two government-run elementary schools in rural India.

"Children show dominance patterns when they sit in front of a machine," Pal said. "If there are three to five children, then the child who is the smartest and from the most affluent family controls the mouse." In 2006 Pal worked with Kentaro Toyama at Microsoft Research India helping to connect multiple mice to a single computer so that many users could

Relevant Links  
[Press Release](#)  
[Project Web Page](#)  
[Research Papers](#)  
[Media Contact](#)

Keywords  
educational technology, information technology for development, University of Washington

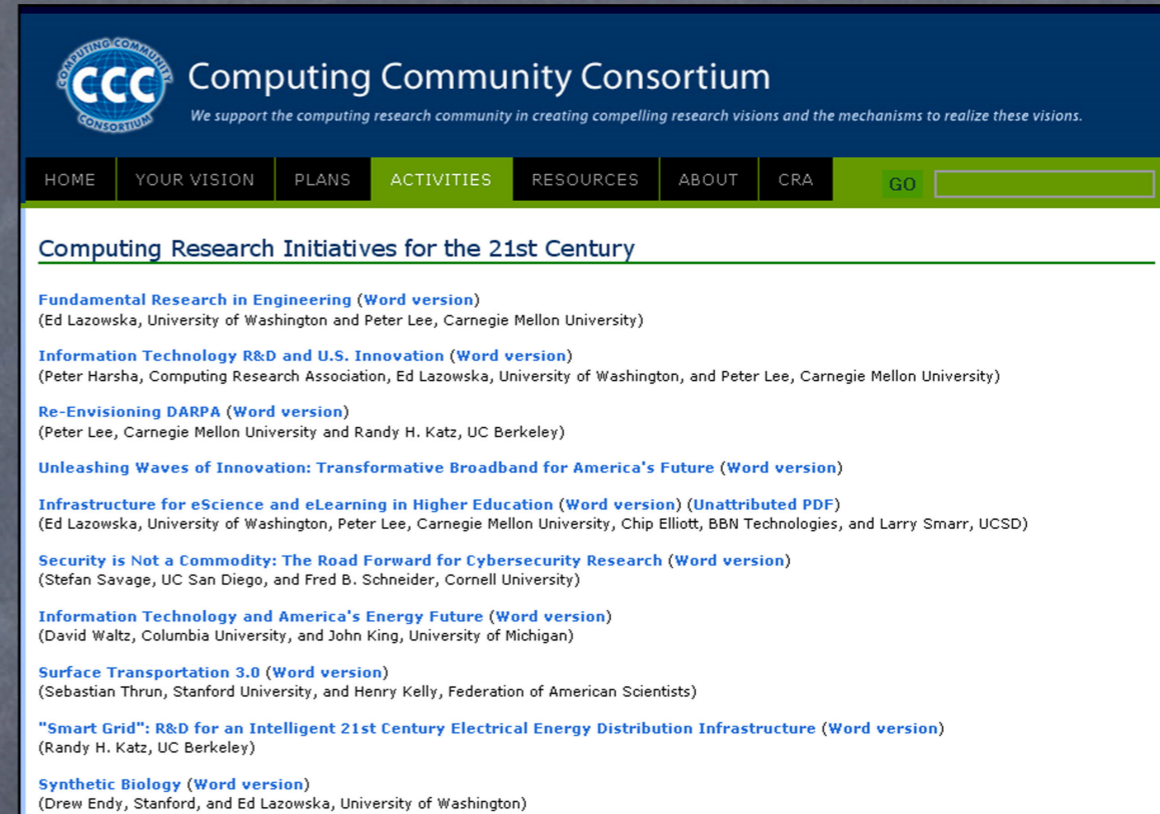
Buzz  
[RSS](#) [SUBSCRIBE](#)  
[EMAIL](#) [NOTIFY](#)  
[EMBED](#) [CODE](#)  
[SHARE](#)

...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, and CRA. A search bar with a "GO" button is also present. The main content area is titled "Computing Research Initiatives for the 21st Century" and lists several research initiatives with links to their respective documents.

**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)



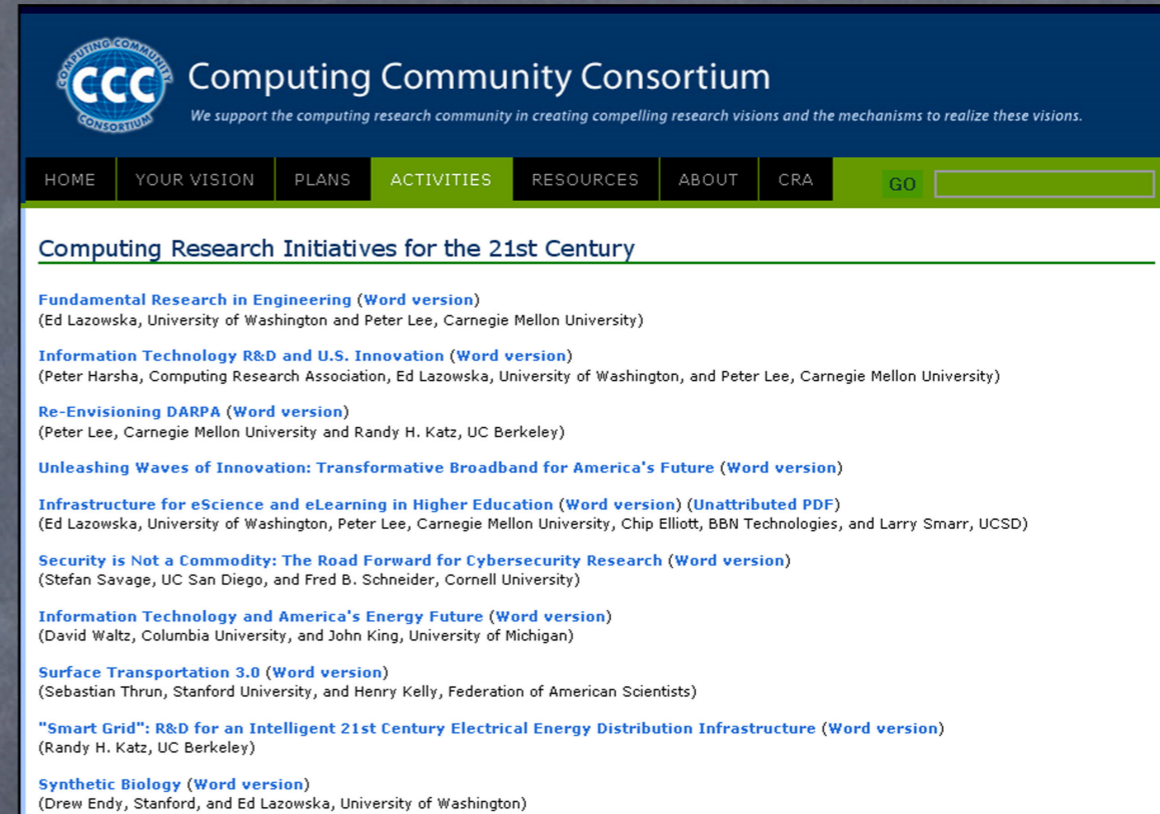
# “Transition Team” white papers

- 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



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, and CRA. A search bar with a "GO" button is also present. The main content area is titled "Computing Research Initiatives for the 21st Century" and lists several research initiatives with links to their respective documents.

**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)



# Outreach to Federal agencies

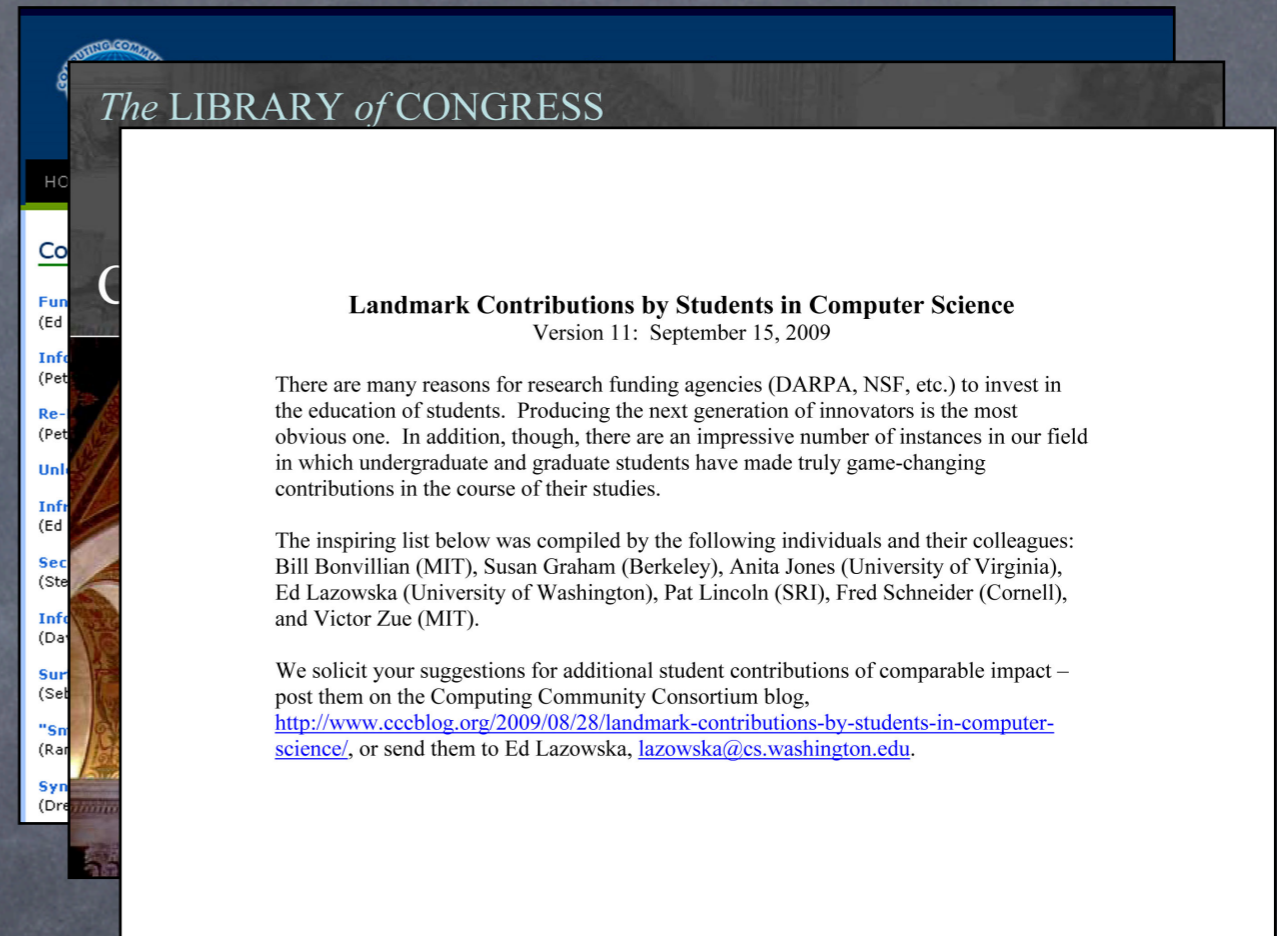
- “Transition Team” white papers
- Library of Congress Symposium





# Outreach to Federal agencies

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



The screenshot shows a document from The Library of Congress. The title is "Landmark Contributions by Students in Computer Science" and the version is "Version 11: September 15, 2009". The text discusses the reasons for research funding agencies to invest in student education and lists several individuals and their colleagues who compiled the list. It also includes a call for suggestions for additional student contributions and provides contact information for Ed Lazowska.

**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.cccb.org/2009/08/28/landmark-contributions-by-students-in-computer-science/>, or send them to Ed Lazowska, [lazowska@cs.washington.edu](mailto:lazowska@cs.washington.edu).



# Leadership development



# 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 are leaving by the end of year I, most with permanent positions, many with tenure-track faculty appointments
  - 41 are continuing for a second year
- Additional 47 CIFellows funded in 2010

## 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.](#)

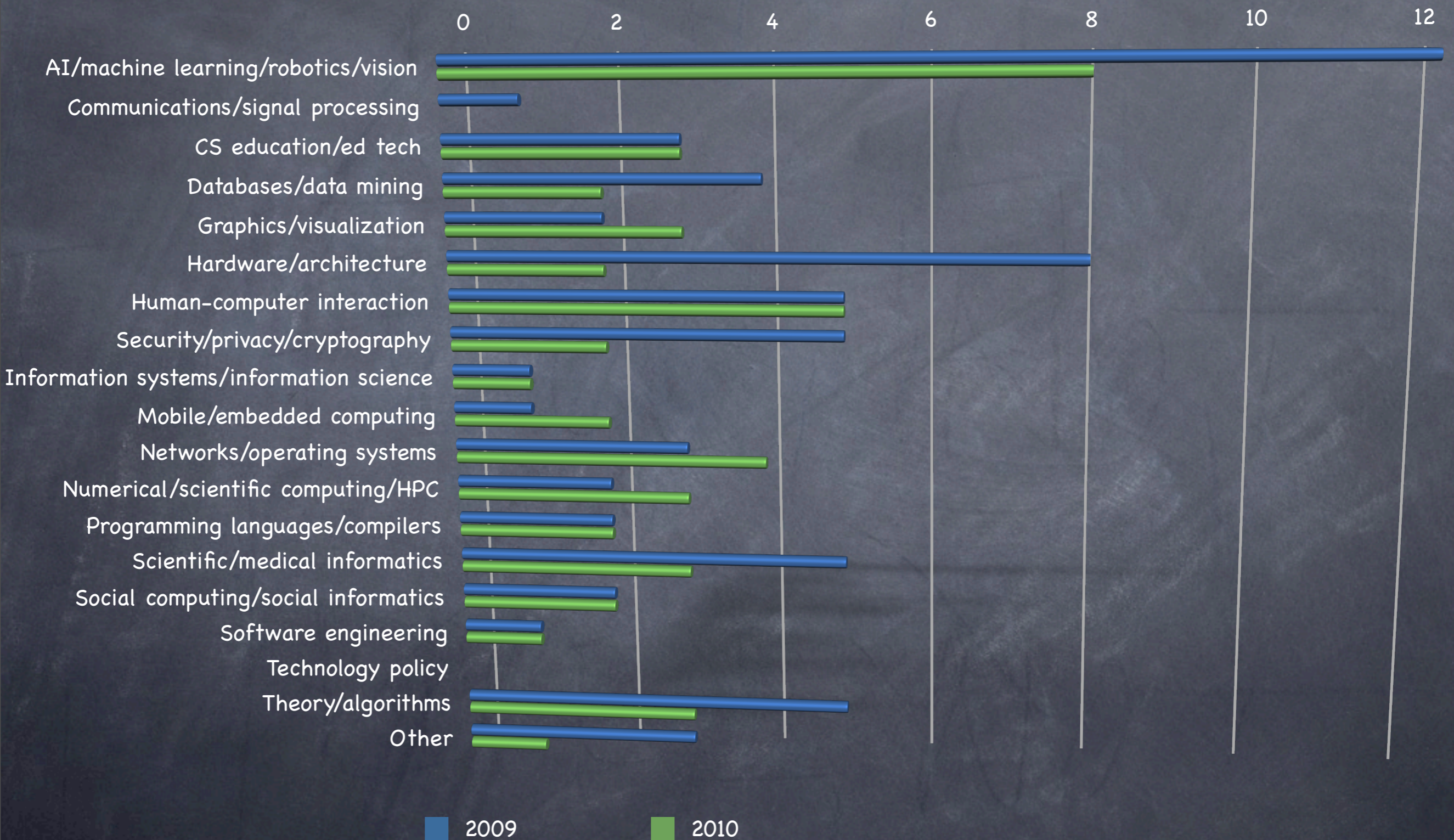
In the light of the response that the CIFellows has received, we have set up a courtesy website where employers can post available positions suitable for new computing PhD's. This site is available at <http://cifellows.org/opportunities>.

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



# 2009 & 2010 CIFellows Projects





# 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



# Leadership development

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



The screenshot shows the website for the Computing Community Consortium (CCC). The header includes 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 also present. A secondary navigation bar lists various research areas: 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 banner for "CCC Leadership in Science Policy Institute" with a background 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 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 is a "Logistics" section with the following information: "Date: November 7, 2011 Location: Hyatt Regency Capitol Hill, Washinton, 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



# Visioning for the future

- Research visions sessions at conferences...

The screenshot shows the website for the Computing Community Consortium (CCC). The header includes 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, and CRA. A search bar is also present. The main content area features a large banner with the text "Research Visions" and a background image of a human eye. Below the banner, there is a section titled "Call for Visionary Conference Tracks" which contains several paragraphs of text. To the right of this section is a sidebar titled "Prior Vision Tracks" which lists two previous sessions with links to blog posts and session information pages.

**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](mailto: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
Theoretical computer science	39	26
Global development (ICT4D)	56	37
Learning technologies	55	30
Health information technology	121	102
Cross-layer reliability	121	45
Free and open source software	42	35
Advancing computer architecture	In progress	
Interactive technologies	In progress	
Sustainability + IT	In progress	

Open RFP for community-driven visioning



# ...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



# ...And lots of "visioning activities"

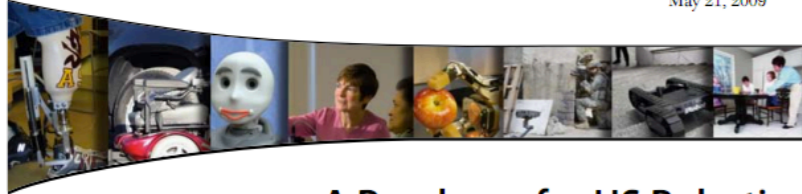
Community visioning activities	Participants	Organizations	
Networking science & engineering	109	44	
Cyber-physical systems	100	47	
Robotics	141	79	
"Big data" computing	81	46	→ Yahoo!
Theoretical computer science	39	26	
Global development (ICT4D)	56	37	
Learning technologies	55	30	
Health information 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, Amherst  
University of Utah  
Carnegie Mellon University  
Tech Collaborative

Sponsored by



4 meetings during  
summer 2008

Roadmap published  
May 2009

Extensive discussions  
between visioning  
activity leaders &  
agencies

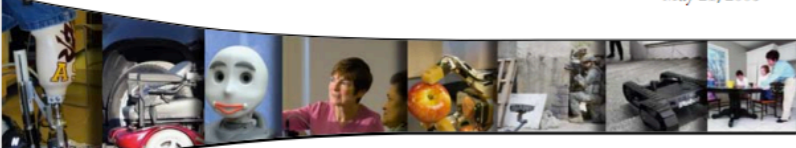
Henrik Christensen  
Georgia Tech





# 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 Calif
- Johns Hopkins Unive
- University of Pennsylvania
- University of California, Berkeley
- Rensselaer Polytechnic Institute
- University of Massachusetts, Amherst
- University of Utah
- Carnegie Mellon University
- Tech Collaborative

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   
Director, Office of Science Technology Policy

SUBJECT: Science and Technology Priorities for the FY 2012 Budget

Scientific discovery, technological breakthroughs, and innovation are major engines for expanding the frontiers of human knowledge and are indispensable for promoting sustainable economic growth, improving the health of the population, moving toward a clean energy future, addressing global climate change challenges, managing competing demands on the environment, and safeguarding our national security.

This memorandum follows up on OMB Memorandum M-10-19 by outlining the Administration's science and technology (S&T) priorities for formulating FY 2012 Budget submissions to the Office of Management and Budget (OMB). These priorities for research and development (R&D) investments and other S&T investments build on priorities already reflected in the American Recovery and Reinvestment Act, the FY 2010 and 2011 Budgets, and key Administration policy guidance such as the President's *Strategy for American Innovation*. This memorandum also provides program guidance for S&T activities in Executive Departments and Agencies.

Prioritizing key S&T activities

4 meetings during  
summer 2008

Roadmap published  
May 2009

Extensive discussions  
between visioning  
activity leaders &  
agencies

OSTP issues  
directive to all  
agencies to include  
robotics in FY 12  
budgets

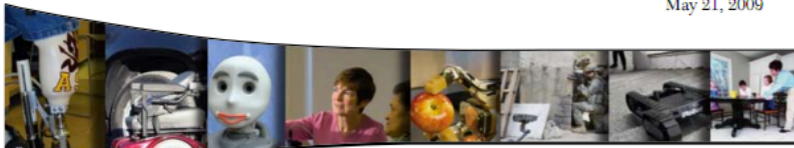
Henrik Christensen  
Georgia Tech





# 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 Calif
- Johns Hopkins Unive
- University of Pennsylvania
- University of California, Berkeley
- Rensselaer Polytechnic Institute
- University of Massachusetts, Amherst
- University of Utah
- Carnegie Mellon University
- Tech Collaborative

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  
Director, Office of Science Technology Policy

SUBJECT: Science and Technology Priorities for the FY 2012 Budget

Scientific discovery, technological breakthroughs, and innovation are major engines for expanding the frontiers of human knowledge and are indispensable for promoting sustainable economic growth, improving the health of the population, moving toward a clean energy future, addressing global climate change challenges, managing competing demands on the environment, and safeguarding our national security.

This memorandum follows up on OMB Memorandum M-10-19 by outlining the Administration's science and technology (S&T) priorities for formulating FY 2012 Budget submissions to the Office of Management and Budget (OMB). These priorities for research and development (R&D) investments and other S&T investments build on priorities already reflected in the American Recovery and Reinvestment Act, the FY 2010 and 2011 Budgets, and key Administration policy guidance such as the President's *Strategy for American Innovation*. This memorandum also provides program guidance for S&T activities in Executive Departments and Agencies.

Prioritizing key S&T activities

Office of Science and Technology Policy

About OSTP | OSTP Blog | Pressroom | Divisions | R&D Budgets | Resource Library | NS

## RTD2: Research for Robotics

Posted by Tom Kalil 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, defense, medicine, healthcare, space exploration, environmental monitoring and remediation, transportation, advanced manufacturing, logistics, services, and agriculture. Robotics is also nearing a tipping point in terms of its usefulness and versatility as technologies such as software, chips, and computer vision continue to improve.

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

As part of this effort, five agencies teamed up to issue a joint solicitation for small business research for [Robotics Technology Development and Deployment](#) (RTD2). Small businesses can apply for research funding for a wide range of topics, including robot-assisted rehabilitation, robotics for drug discovery, and robots that can disarm explosive devices.

Expect to see more to come in the months ahead from a newly energized and collaborative Federal robotics community!

Tom Kalil is Deputy Director for Policy in the White House Office of Science and Technology Policy

Sridhar Kota is Assistant Director for Advanced Manufacturing in the White House Office of Science and Technology Policy

4 meetings during summer 2008

Roadmap published May 2009

Extensive discussions between visioning activity leaders & agencies

OSTP issues directive to all agencies to include robotics in FY 12 budgets

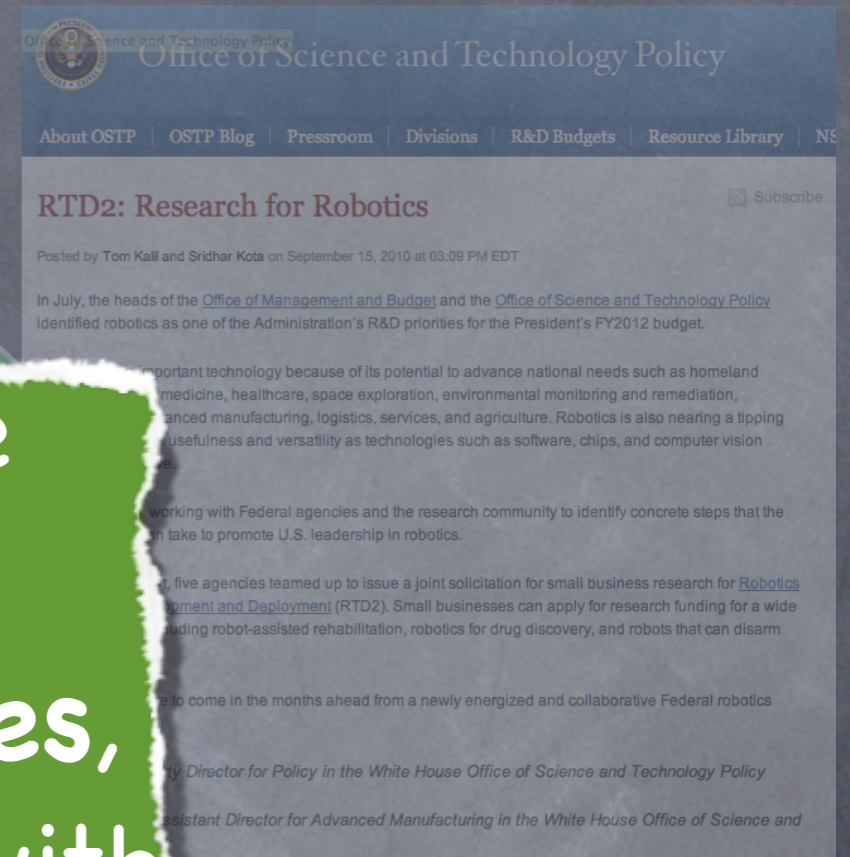
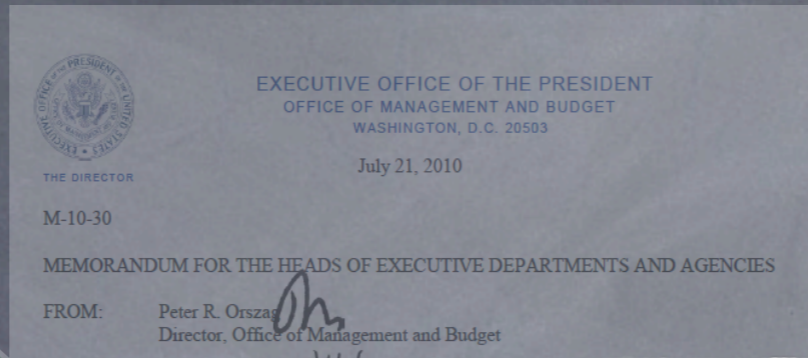
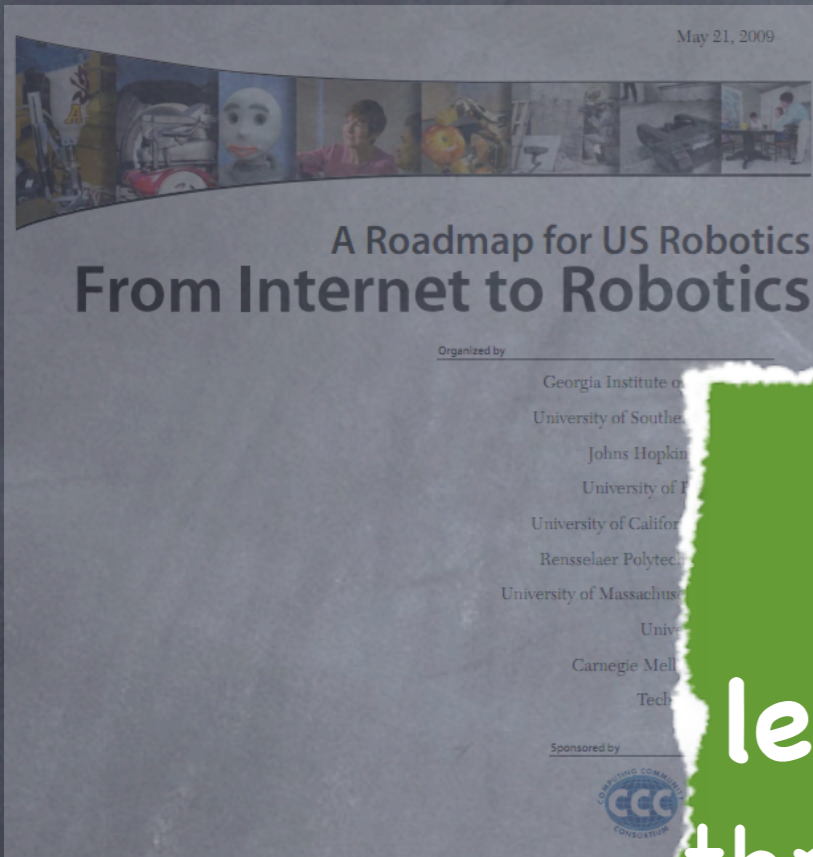
Agencies begin rolling out robotics initiatives, beginning with RTD2

Henrik Christensen  
Georgia Tech





# 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

Agencies begin rolling out robotics initiatives, beginning with RTD2

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 technology
- New Transportation
- Intelligence
- New Biology
- Robotics & emergency response

The screenshot shows the homepage of the Data Analytics website. At the top is a navigation menu with links for HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, and CRA. Below this is a secondary navigation bar with links for Data Analytics, Energy and IT, Education Technology, Health IT, and New Transportation. The main header features the text "Data Analytics: From Data to Knowledge to Action" over a background of mathematical symbols and code. The "Overview" section contains a paragraph about the importance of data analytics in the 21st century. To the right of the text is a graphic of a large red triangle with a grid of numbers inside. Below the overview are three columns of links: "White Papers" (including "From Data to Knowledge to Action: A Global Enabler for the 21st Century"), "Workshops/Conferences" (including "Hadoop Summit" and "Data-Intensive Computing Symposium"), and "Funding Opportunities" (including "NSF Cyber-Enabled Discovery and Innovation (CDI) Program").

HOME YOUR VISION PLANS ACTIVITIES RESOURCES ABOUT CRA GO

Data Analytics Energy and IT Education Technology Health IT New Transportation

## Data Analytics: From Data to Knowledge to Action

### Overview

Today, data available via the Internet, sensor networks, and new and higher resolution sensors across the sciences allow us to capture more data about people and the world than ever before – and the quantities of data available are accelerating. Coupled with recent advances in machine learning and reasoning, as well as rapid rises in computing power and storage, we are transforming our ability to make sense of these increasingly large, heterogeneous, noisy or incomplete datasets collected from a variety of sources; to visualize and infer important new knowledge from the data; and to guide action and policies in mission-critical situations, enabling us to make the best decisions. The pipeline of data --> predictive models --> decision analyses will transform many facets of our daily lives, from healthcare delivery to transportation to energy and the environment. These methods will be critical for Federal agencies tasked with protecting America from threats. And they have the potential to alter how we educate the next generation, how we interact with one another, and how we protect our personal privacy and security in an era of constant connectivity and unfiltered access. Ultimately, data analytics – enabling the transition from data to knowledge to action – is critical to address our nation's priorities and to ensure our nation's prosperity well into the 21st century.

### White Papers

- From Data to Knowledge to Action: A Global Enabler for the 21st Century – PDF | Word
- Enabling Evidence-Based Healthcare – PDF | Word
- Enabling an Initiative in "New Biology" – PDF | Word
- Enabling 21st Century Discovery in Science and Engineering – PDF | Word

### Workshops/Conferences

- Hadoop Summit – March 25, 2008, Sunnyvale, CA
- Data-Intensive Computing Symposium – March 26, 2008, Sunnyvale, CA

### Funding Opportunities

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



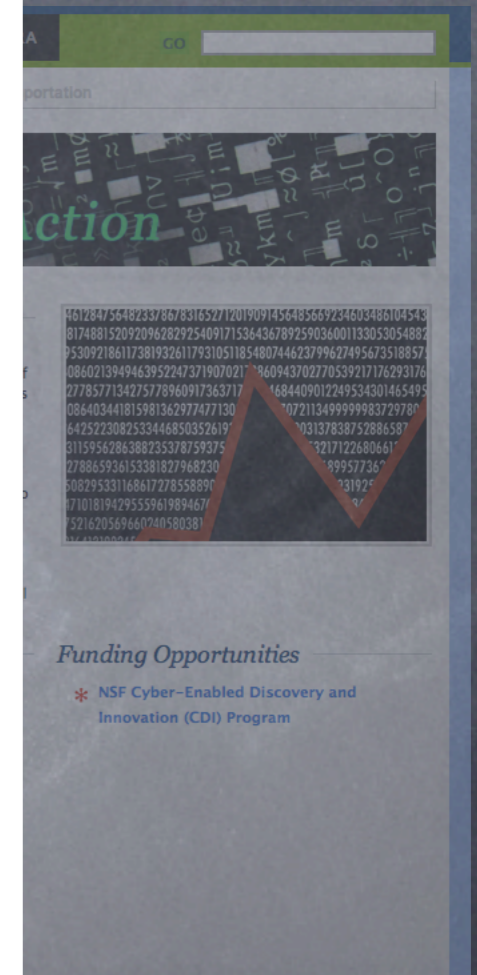
# Data analytics

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

*Systems biology:* As the NAS report stated, “Improved measurement technologies and mathematical and computational tools have led to the emergence of a new approach to [address] biological questions termed ‘systems biology’ [that] strives to [integrate heterogeneous experimental data sets] and achieve predictive modeling [of biological systems].” Rather than pursuing the decades-old *reductionist* approach, interrogating individual components and reactions underlying a given system, systems biology attempts to *integrate* various biological structures and create predictive models representing systems-level functions and behaviors.

For example, in 2007, systems biologists published a genome-scale reconstruction of the human metabolic network<sup>3</sup>. This reconstruction catalogs all known gene, protein, and reaction relationships underlying human metabolism – the vital cellular process that is attributed to many human diseases – in a highly quantitative, structured, and chemically consistent manner. In other words, the reconstruction assimilates all existing experimental knowledge about the system, and enables a quantitative analysis of the “flows” through the network – much like a map of a highway system overlaid with quantitative data about traffic volumes. Nearly 1,500 genes spanning 2,000 proteins and 3,300 reactions were incorporated from nearly 1,600 different papers. The resultant *model* represents the set of all hypotheses about the network that have been reported in the literature to date and, in turn, can be used to *predict which genes are essential or inessential, and which ones are involved in mechanisms of chronic diseases like cancer and arthritis*. Ultimately, such a model *enables us to better understand the manifestation of human diseases and identify ideal drug targets to combat these illnesses*.

*Computational biology:* Whereas systems biology takes an integrative, systems-based approach, computational biology applies data mining, machine learning, graphics/visualization, and related computational techniques to specific biological questions. For instance, clustering algorithms have been applied to gene expression data to associate genes with similar functions. High-throughput gene expression assays are enabling us to measure the expression levels of thousands of genes simultaneously, across different conditions and over time. These assays result in incredibly large data sets: the expression of each gene requires multiple “probes,” meaning that there are often 20 or more data elements per gene, and a routine experiment involving human cells measures 54,000 human gene transcripts concurrently. By clustering these data, we are able to make sense of the data and gain insight into gene function; genes that respond similarly to different stimuli are more likely to have related functions. Likewise, “compendium analyses” are used to study the mechanisms underlying drug function, by comparing the gene expression profiles of unknown drugs with databases of profiles of known drugs. Drugs with similar mechanisms are likely to have correlative gene expression footprints<sup>4</sup>.



The screenshot shows a webpage with a grid of numbers, likely a data visualization or a list of identifiers. Below the grid, there is a section titled "Funding Opportunities" with a sub-section for "NSF Cyber-Enabled Discovery and Innovation (CDI) Program".



# Data analytics

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

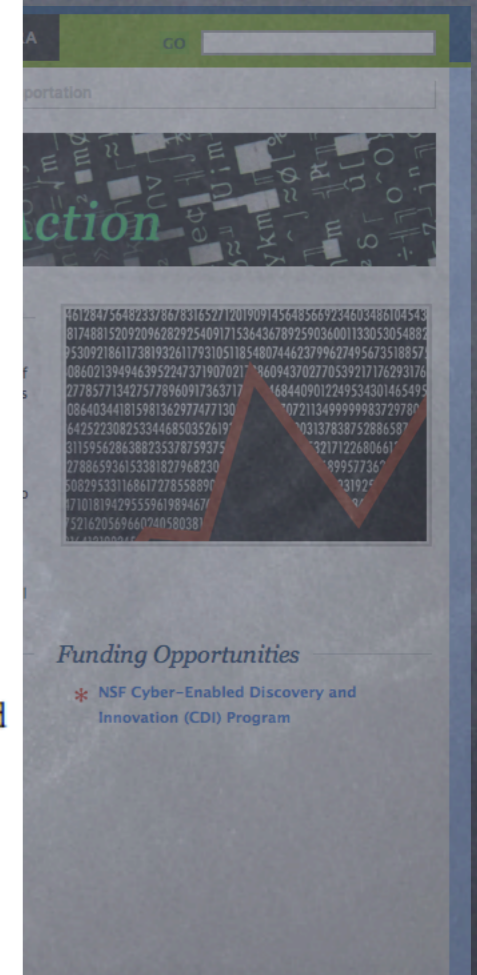
Nearly 2500 years ago, Hippocrates kicked off a revolution in healthcare by calling for the careful collection and recording of evidence about patients and their illnesses. This call—which first introduced the goal of sharing data among physicians to provide the best care possible for patients—established 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,

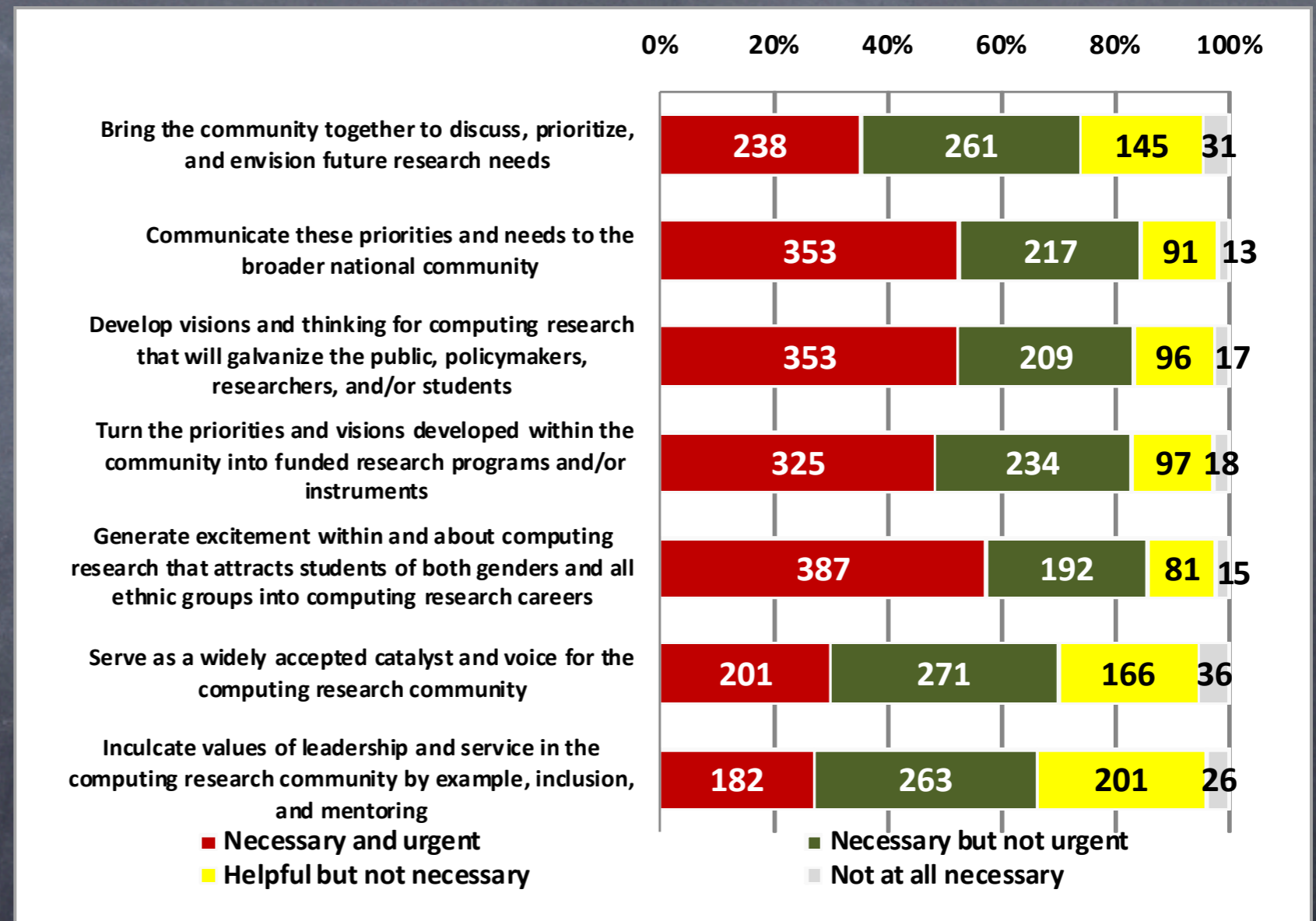




# The value of the CCC

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



# Synergistic steps forward?

- Number of places where computing can help with NIH mission and activities
  - Modeling & simulation
  - Robotics and cyber-physical systems
  - "Big data"/data analytics
- Ways to get more computer scientists involved?
- Workshops that bring CS folks together with domain scientists?
- Getting the word out about NIH RFPs relevant for computer scientists?



# Questions?

- E-mail: [erwin@cra.org](mailto:erwin@cra.org)
- Phone: (202) 266-2936
- Online: [www.cra.org/ccc](http://www.cra.org/ccc)