The Computing Community Consortium Catalyzing and Enabling Computing Research

Gregory D. Hager

CCC Vice-Chair

Johns Hopkins University

An Overview of the Computing Community Consortium

- A standing committee of the Computing Research Association founded in 2006
- Funded by NSF under a Cooperative Agreement
- Facilitates the development of a bold, multi-themed vision for computing research – and communicates this vision to stakeholders
- Led by a broad-based Council
- Chaired by Susan Graham
- Staffed by CRA

Our Mission

The mission of Computing Research Association's (CRA)
Computing Community Consortium (CCC)
is to **catalyze** the computing research community and
enable the pursuit of innovative, high-impact research.

CCC conducts activities that
strengthen the research community,
articulate compelling **research visions**, and
align those visions with pressing **national and global challenges**.

CCC **communicates** the importance of those visions to **policymakers**, government and **industry stakeholders**, the **public**, and the **research community** itself.

The CCC Council

- Leadership
  - Susan Graham, UC Berkeley (Chair)
  - Greg Hager, Johns Hopkins (Vice Chair)
  - Ed Lazowska, U. Washington (Past Chair)
  - Ann Drobnis, Director
  - Kenneth Hines, Program Associate
  - Andy Bernat, CRA Executive Director
- Terms ending 6/2016
  - Randy Bryant, CMU
  - Limor Fix, Intel
  - Mark Hill, U. Wisconsin, Madison
  - Tal Rabin, IBM Research
  - Daniela Rus, MIT
  - Ross Whitaker, Univ. Utah
- Terms ending 6/2015
  - Liz Bradley, Univ. Colorado
  - Sue Davidson, Univ. Pennsylvania
  - Joe Evans, Univ. Kansas
  - Ran Libeskind-Hadas, Harvey Mudd
  - Elizabeth Mynatt, Georgia Tech
  - Shashi Shekhar, Univ. Minnesota
- Terms ending 6/2014
  - Deborah Crawford, Drexel
  - Anita Jones, Univ. Virginia
  - Fred Schneider, Cornell
  - Bob Sproull, Sun Labs Oracle (ret.)
  - Josep Torrellas, Univ. Illinois

Stehanie Forrest, Univ. New Mexico
Robin Murphy, Texas A&M
John King, Univ. Michigan
Dave Waltz, Columbia
Karen Sutherland, Augsburg College

Chris Johnson, Univ. Utah
Bill Feiereisen, LANL
Dick Karp, UC Berkeley
Greg Andrews, Univ. Arizona

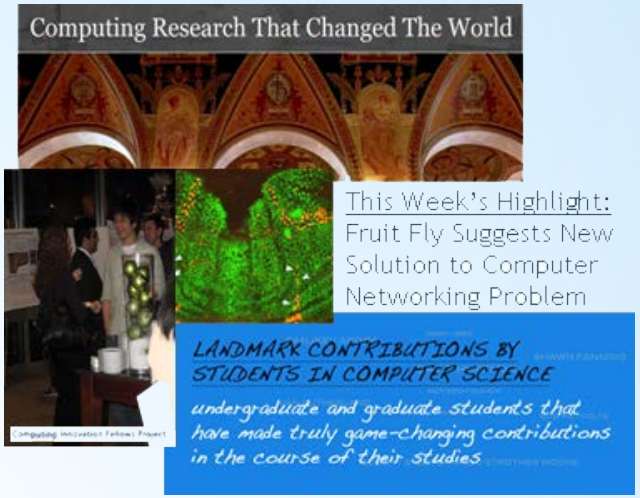
Frans Kaashoek, MIT
Dave Kaeli, Northeastern
Andrew McCallum, UMass
Peter Lee, Carnegie Mellon

What Distinguishes CCC?

- **Proactive, rapid response**
  - Identify, plan, and execute in a matter of weeks to months
- **Community-based**
  - Find and foster ideas from germination to fruition and beyond
- **Leadership incubator**
  - Everyone must do something!

A Multitude of Activities

- **Community-initiated visioning:**
  - Workshops to discuss "out-of-the-box" ideas
  - Challenges & Visions tracks at conferences
- **Outreach to the White House, Federal funding agencies:**
  - Outputs of visioning activities
  - Short reports to inform policy makers
  - Task Forces – Health IT, Sustainability IT, Data Analytics



- **Public relations efforts:**
  - Library of Congress symposia
  - Research "Highlight of the Week"
  - CCC Blog [http://cccblog.org/]
- **Nurturing the next generation of leaders:**
  - Computing Innovation Fellows Project
  - "Landmark Contributions by Students"
  - Leadership in Science Policy Institute

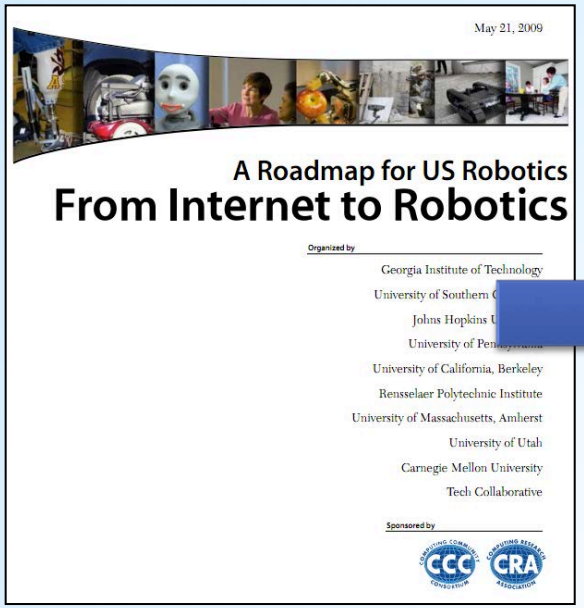
Catalyzing: Visioning exercises

Community visioning activities	Participants	Organizations	Status
Network science & engineering	109	44	completed
“Big Data” Computing	81	46	multi-agency initiative launched
Theoretical computer science	39	26	completed
Global development (ICT4D)	56	37	completed
Cyber-physical systems	100	47	multi-agency initiative launched
Free & open source software	45	35	completed
Learning technologies	55	30	following up
Robotics	141	79	multi-agency initiative launched
Cross-layer reliability	121	45	DARPA program launched
Advancing computer architecture	38	25	NSF program launched
Interactive technologies	74	42	completed
Health information technology	121	102	multiple programs launched

Catalyzing: Visioning exercises

Community visioning activities	Participants	Organizations	Status
Sustainability & IT	72	43	NSF program launched
Global Development	50		completed
Disaster Management	57	31	completed
Spatial Computing	73	47	following up
Computing and Healthcare	97	57	multi-agency initiative launched
Software Assurance and Trustworthy Semiconductor Design and Manufacture	58	37	completed
Multidisciplinary Research for Online Education	82	41	following up
Privacy R&D	39	31	completed
Extreme Scale Design Automation	23*	14*	In progress
Financial Cyberinfrastructure	28	14	Multi-initiative launched
Mid-Scale Infrastrugture Investments for Computing Research	24	18	NSF program launched

Catalyzing and Enabling: Robotics

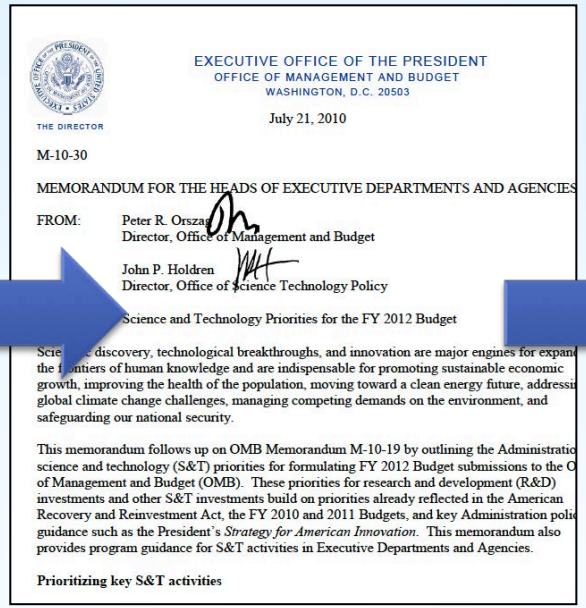

May 21, 2009

A Roadmap for US Robotics
From Internet to Robotics

Organized by

Georgia Institute of Technology
University of Southern C
Johns Hopkins U
University of Pen
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

THE DIRECTOR

July 21, 2010

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

Science and Technology Priorities for the FY 2012 Budget

Scie discovery, technological breakthroughs, and innovation are major engines for expand 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, addressi 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 Administratio science and technology (S&T) priorities for formulating FY 2012 Budget submissions to the O 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 poli 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 Po

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Developing the Next Generation of Robots

Posted by Tom Kalil and Sridhar Kota on June 24, 2011 at 10:14 AM EDT

Tweet Share

ch at Carnegie Mellon University, President Obama is launching the Advanc research initiative that will promote a renaissance of American manufacturing.

One ex ting element of the President's Advanced Manufacturing Partnership is the National Robots are working for us every day, in countless ways. At home, at work, and on the battlefie increasingly lifting the burdens of tasks that are dull, dirty, or dangerous.

But they could do even more, and that's what the National Robotics Initiative is all about. So t (the National Science Foundation, the National Institutes of Health, NASA, and the United Sta Agriculture) are issuing a joint solicitation that will provide up to $70 million in research fundin generation robotics.

The focus of this initiative is on developing robots that work with or beside people to extend o capabilities, taking advantage of the different strengths of humans and robots. In addition to i technology needed for next-generation robotics, the initiative will support applications such a

4 meetings during summer 2008

Roadmap published May 2009

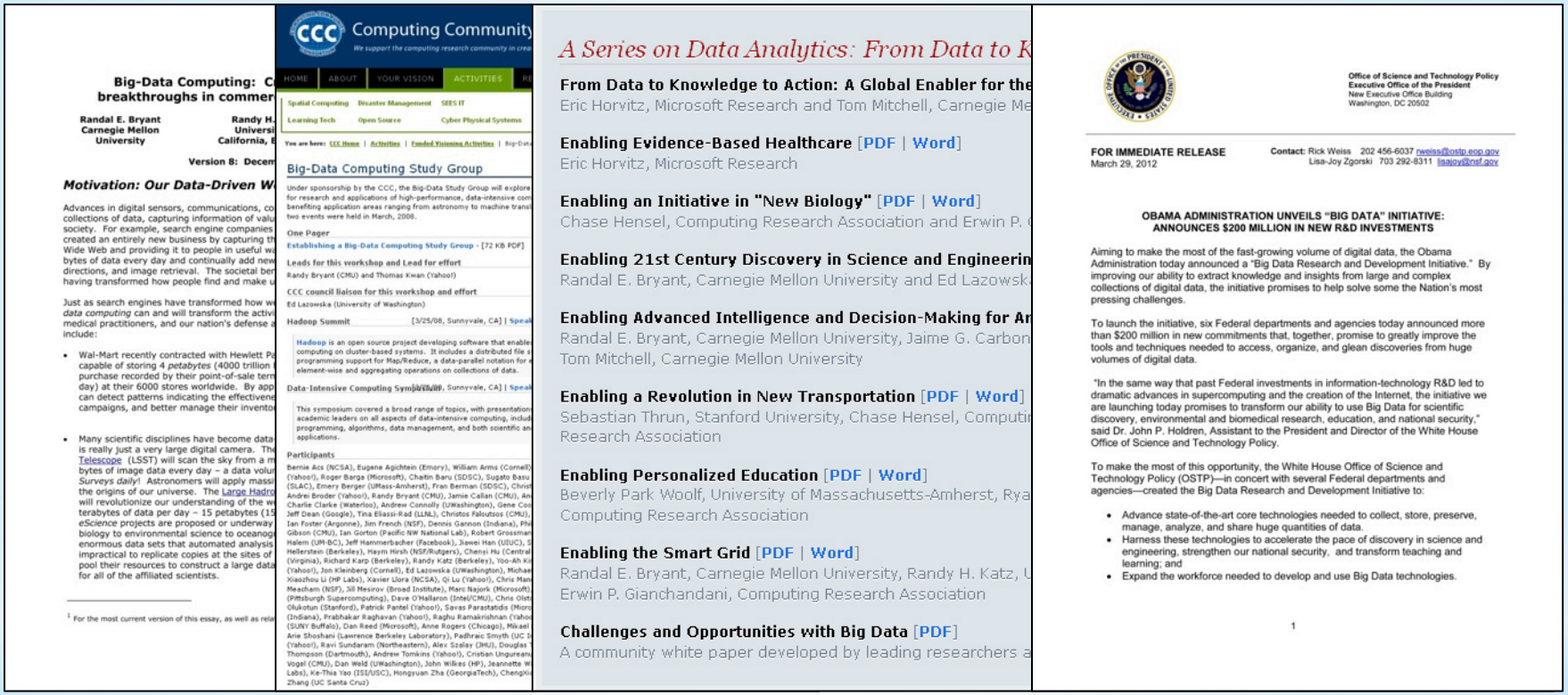
Extensive discussions between visioning leaders & agencies

OSTP issues directive to all agencies in summer 2010 to include robotics in FY 12 budgets

National Robotics Initiative announced in summer 2011

Henrik Chistensen
Georgia Tech

Catalyzing and Enabling: Big Data



Big-Data Computing: C
breakthroughs in commer

Randal E. Bryant
Carnegie Mellon University

Randy H.
Universi
California, E

Version 8: Decem

Motivation: Our Data-Driven W

Advances in digital sensors, communications, co
collections of data, capturing information of valu
society. For example, search engine companies
created an entirely new business by capturing th
Wide Web and providing it to people in useful w
bytes of data every day and continually add new
directions, and image retrieval. The societal ben
having transformed how people find and make u

Just as search engines have transformed how w
data computing can and will transform the activ
medical practitioners, and our nation's defense a
include:

- Wal-Mart recently contracted with Hewlett P
capable of storing 4 *petabytes* (4000 trillion
purchase recorded by their point-of-sale term
day) at their 6000 stores worldwide. By app
can detect patterns indicating the effectiveness
campaigns, and better manage their inventor

- Many scientific disciplines have become data
is really just a very large digital camera. The
Telescope (LSST) will scan the sky from a m
bytes of image data every day – a data volu
Surveys daily! Astronomers will apply massi
the origins of our universe. The Large Hadro
will revolutionize our understanding of the w
terabytes of data per day – 15 petabytes (15
eScience projects are proposed or underway
biology to environmental science to oceanog
enormous data sets that automated analysis
impractical to replicate copies at the sites of
pool their resources to construct a large data
for all of the affiliated scientists.

[1] For the most current version of this essay, as well as rela

CCC Computing Community
We support the computing research community in creat

HOME | ABOUT | YOUR VISION | ACTIVITIES | RE

Spatial Computing | Disaster Management | SEES IT
Learning Tech | Open Source | Cyber Physical Systems

You are here: CCC Home | Activities | Funded Visioning Activities | Big-Data

Big-Data Computing Study Group

Under sponsorship by the CCC, the Big-Data Study Group will explore
for research and applications of high-performance, data-intensive com
benefiting application areas ranging from astronomy to machine transl
two events were held in March, 2008.

One Pager
Establishing a Big-Data Computing Study Group - [72 KB PDF]

Leads for this workshop and Lead for effort
Randy Bryant (CMU) and Thomas Kwan (Yahoo!)

CCC council liaison for this workshop and effort
Ed Lazowska (University of Washington)

Hadoop Summit [3/25/08, Sunnyvale, CA] | Speak
Hadoop is an open source project developing software that enables
computing on cluster-based systems. It includes a distributed file s
programming support for Map/Reduce, a data-parallel notation for
element-wise and aggregating operations on collections of data.

Data-Intensive Computing Symposium [4/14/08, Sunnyvale, CA] | Speak
This symposium covered a broad range of topics, with presentation
academic leaders on all aspects of data-intensive computing, includ
programming, algorithms, data management, and both scientific an
applications.

Participants
Bernie Acs (NCSA), Eugene Agichtein (Emory), William Arms (Cornell),
(Yahoo!), Roger Barga (Microsoft), Chaitin Baru (SDSC), Sugato Basu
(SLAC), Emery Berger (UMass-Amherst), Fran Berman (SDSC), Christ
Andrei Broder (Yahoo!), Randy Bryant (CMU), Jamie Callan (CMU), An
Charlie Clarke (Waterloo), Andrew Connolly (UWashington), Gene Coo
Jeff Dean (Google), Tina Eliassi-Rad (LLNL), Christos Faloutsos (CMU),
Ian Foster (Argonne), Jim French (NSF), Dennis Gannon (Indiana), Phi
Gibson (CMU), Ian Gorton (Pacific NW National Lab), Robert Grossman
Halem (UM-BC), Jeff Hammerbacher (Facebook), Jiawei Han (UIUC), S
Hellerstein (Berkeley), Haym Hirsh (NSF/Rutgers), Chenyi Hu (Central
(Virginia), Richard Karp (Berkeley), Randy Katz (Berkeley), Yoo-Ah Ki
(Yahoo!), Jon Kleinberg (Cornell), Ed Lazowska (UWashington), Michae
Xiaozhou Li (HP Labs), Xavier Llora (NCSA), Qi Lu (Yahoo!), Chris Man
Meacham (NSF), Jill Mesirov (Broad Institute), Marc Najork (Microsoft),
(Pittsburgh Supercomputing), Dave O'Hallaron (Intel/CMU), Chris Olst
Olukotun (Stanford), Patrick Pantel (Yahoo!), Savas Parastatidis (Micro
(Indiana), Prabhakar Raghavan (Yahoo!), Raghu Ramakrishnan (Yahoo
(SUNY Buffalo), Dan Reed (Microsoft), Anne Rogers (Chicago), Mikael
Arie Shoshani (Lawrence Berkeley Laboratory), Padhraic Smyth (UC I
(Yahoo!), Ravi Sundaram (Northeastern), Alex Szalay (JHU), Douglas T
Thompson (Dartmouth), Andrew Tomkins (Yahoo!), Cristian Ungureanu
Vogel (CMU), Dan Weld (UWashington), John Wilkes (HP), Jeannette W
Labs), Ke-Thia Yao (ISI/USC), Hongyuan Zha (GeorgiaTech), ChengXi
Zhang (UC Santa Cruz)

A Series on Data Analytics: From Data to K

From Data to Knowledge to Action: A Global Enabler for the
Eric Horvitz, Microsoft Research and Tom Mitchell, Carnegie Me

Enabling Evidence-Based Healthcare [PDF | Word]
Eric Horvitz, Microsoft Research

Enabling an Initiative in "New Biology" [PDF | Word]
Chase Hensel, Computing Research Association and Erwin P.

Enabling 21st Century Discovery in Science and Engineerin
Randal E. Bryant, Carnegie Mellon University and Ed Lazowsk

Enabling Advanced Intelligence and Decision-Making for Ar
Randal E. Bryant, Carnegie Mellon University, Jaime G. Carbon
Tom Mitchell, Carnegie Mellon University

Enabling a Revolution in New Transportation [PDF | Word]
Sebastian Thrun, Stanford University, Chase Hensel, Computi
Research Association

Enabling Personalized Education [PDF | Word]
Beverly Park Woolf, University of Massachusetts-Amherst, Rya
Computing Research Association

Enabling the Smart Grid [PDF | Word]
Randal E. Bryant, Carnegie Mellon University, Randy H. Katz,
Erwin P. Gianchandani, Computing Research Association

Challenges and Opportunities with Big Data [PDF]
A community white paper developed by leading researchers a

Office of Science and Technology Policy
Executive Office of the President
New Executive Office Building
Washington, DC 20502

FOR IMMEDIATE RELEASE
March 29, 2012

Contact: Rick Weiss 202 456-6037 rweiss@ostp.eop.gov
Lisa-Joy Zgorski 703 292-8311 lisajoy@nsf.gov

**OBAMA ADMINISTRATION UNVEILS "BIG DATA" INITIATIVE:
ANNOUNCES $200 MILLION IN NEW R&D INVESTMENTS**

Aiming to make the most of the fast-growing volume of digital data, the Obama Administration today announced a "Big Data Research and Development Initiative." By improving our ability to extract knowledge and insights from large and complex collections of digital data, the initiative promises to help solve some the Nation's most pressing challenges.

To launch the initiative, six Federal departments and agencies today announced more than $200 million in new commitments that, together, promise to greatly improve the tools and techniques needed to access, organize, and glean discoveries from huge volumes of digital data.

"In the same way that past Federal investments in information-technology R&D led to dramatic advances in supercomputing and the creation of the Internet, the initiative we are launching today promises to transform our ability to use Big Data for scientific discovery, environmental and biomedical research, education, and national security," said Dr. John P. Holdren, Assistant to the President and Director of the White House Office of Science and Technology Policy.

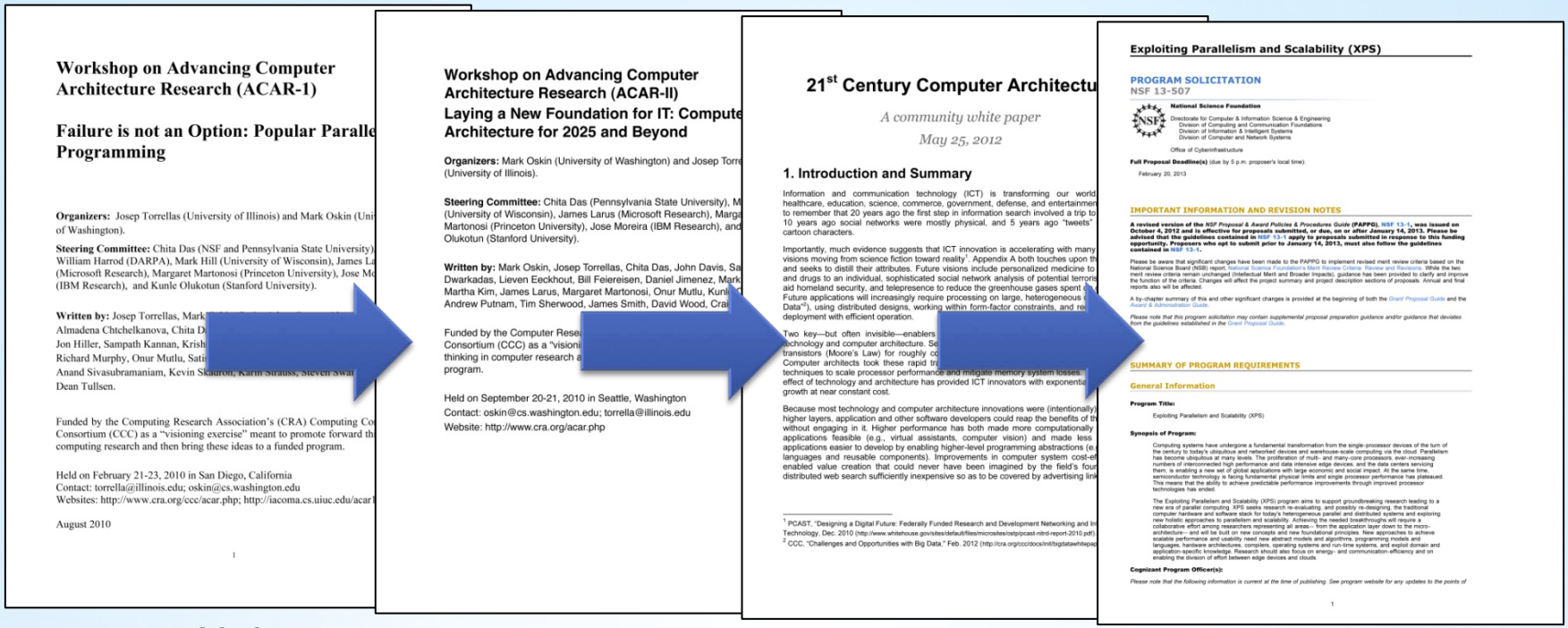
To make the most of this opportunity, the White House Office of Science and Technology Policy (OSTP)—in concert with several Federal departments and agencies—created the Big Data Research and Development Initiative to:

- Advance state-of-the-art core technologies needed to collect, store, preserve, manage, analyze, and share huge quantities of data.
- Harness these technologies to accelerate the pace of discovery in science and engineering, strengthen our national security, and transform teaching and learning; and
- Expand the workforce needed to develop and use Big Data technologies.

1

2008 2008 2010 2012

Catalyzing and Enabling: Architecture



Workshop on Advancing Computer Architecture Research (ACAR-1)

Failure is not an Option: Popular Paralle Programming

Organizers: Josep Torrellas (University of Illinois) and Mark Oskin (Uni of Washington).

Steering Committee: Chita Das (NSF and Pennsylvania State University) William Harrod (DARPA), Mark Hill (University of Wisconsin), James La (Microsoft Research), Margaret Martonosi (Princeton University), Jose Mo (IBM Research), and Kunle Olukotun (Stanford University).

Written by: Josep Torrellas, Mark Almadena Chtchelkanova, Chita D Jon Hiller, Sampath Kannan, Krish Richard Murphy, Onur Mutlu, Sati Anand Sivasubramaniam, Kevin Skadron, Karin Strauss, Steven Swa Dean Tullsen.

Funded by the Computing Research Association's (CRA) Computing Co Consortium (CCC) as a "visioning exercise" meant to promote forward th computing research and then bring these ideas to a funded program.

Held on February 21-23, 2010 in San Diego, California
Contact: torrella@illinois.edu; oskin@cs.washington.edu
Websites: http://www.cra.org/ccc/acar.php; http://iacoma.cs.uiuc.edu/acar

August 2010

1

Workshop on Advancing Computer Architecture Research (ACAR-II)
Laying a New Foundation for IT: Compute Architecture for 2025 and Beyond

Organizers: Mark Oskin (University of Washington) and Josep Torre (University of Illinois).

Steering Committee: Chita Das (Pennsylvania State University), M (University of Wisconsin), James Larus (Microsoft Research), Marga Martonosi (Princeton University), Jose Moreira (IBM Research), and Olukotun (Stanford University).

Written by: Mark Oskin, Josep Torrellas, Chita Das, John Davis, Sa Dwarkadas, Lieven Eeckhout, Bill Feiereisen, Daniel Jimenez, Mark Martha Kim, James Larus, Margaret Martonosi, Onur Mutlu, Kuni Andrew Putnam, Tim Sherwood, James Smith, David Wood, Cra

Funded by the Computer Rese Consortium (CCC) as a "visioni thinking in computer research a program.

Held on September 20-21, 2010 in Seattle, Washington
Contact: oskin@cs.washington.edu; torrella@illinois.edu
Website: http://www.cra.org/acar.php

21st Century Computer Architectu

A community white paper
May 25, 2012

1. Introduction and Summary

Information and communication technology (ICT) is transforming our world healthcare, education, science, commerce, government, defense, and entertainmen to remember that 20 years ago the first step in information search involved a trip to 10 years ago social networks were mostly physical, and 5 years ago "tweets" cartoon characters.

Importantly, much evidence suggests that ICT innovation is accelerating with many visions moving from science fiction toward reality[1]. Appendix A both touches upon th and seeks to distill their attributes. Future visions include personalized medicine to and drugs to an individual, sophisticated social network analysis of potential terroris aid homeland security, and telepresence to reduce the greenhouse gases spent Future applications will increasingly require processing on large, heterogeneous Data"[2]), using distributed designs, working within form-factor constraints, and re deployment with efficient operation.

Two key—but often invisible—enablers Technology and computer architecture. Se transistors (Moore's Law) for roughly co Computer architects took these rapid tr techniques to scale processor performance and mitigate memory system losses. effect of technology and architecture has provided ICT innovators with exponentia growth at near constant cost.

Because most technology and computer architecture innovations were (intentionally) higher layers, application and other software developers could reap the benefits of th without engaging in it. Higher performance has both made more computationally applications feasible (e.g., virtual assistants, computer vision) and made less applications easier to develop by enabling higher-level programming abstractions (e. languages and reusable components). Improvements in computer system cost-ef enabled value creation that could never have been imagined by the field's four distributed web search sufficiently inexpensive so as to be covered by advertising lin

[1] PCAST, "Designing a Digital Future: Federally Funded Research and Development Networking and In Technology, Dec. 2010 (http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010.pdf).
[2] CCC, "Challenges and Opportunities with Big Data," Feb. 2012 (http://cra.org/ccc/docs/init/bigdatawhitepap

Exploiting Parallelism and Scalability (XPS)

PROGRAM SOLICITATION
NSF 13-507

National Science Foundation

Directorate for Computer & Information Science & Engineering
Division of Computing and Communication Foundations
Division of Information & Intelligent Systems
Division of Computer and Network Systems

Office of Cyberinfrastructure

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

February 20, 2013

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 13-1, was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in NSF 13-1 apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 14, 2013, must also follow the guidelines contained in NSF 13-1.

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, National Science Foundation's Merit Review Criteria: Review and Revisions. While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the Grant Proposal Guide and the Award & Administration Guide.

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the Grant Proposal Guide.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Exploiting Parallelism and Scalability (XPS)

Synopsis of Program:

Computing systems have undergone a fundamental transformation from the single-processor devices of the turn of the century to today's ubiquitous and networked devices and warehouse-scale computing via the cloud. Parallelism has become ubiquitous at many levels. The proliferation of multi- and many-core processors, ever-increasing numbers of interconnected high-performance and data intensive edge devices, and the data centers servicing them, is enabling a new set of global applications with large economic and social impact. At the same time, semiconductor technology is facing fundamental physical limits and single processor performance has plateaued. This means that the ability to achieve predictable performance improvements through improved processor technologies has ended.

The Exploiting Parallelism and Scalability (XPS) program aims to support groundbreaking research leading to a new era of parallel computing. XPS seeks research re-evaluating, and possibly re-designing, the traditional computer hardware and software stack for today's heterogeneous parallel and distributed systems and exploring new holistic approaches to parallelism and scalability. Achieving the needed breakthroughs will require a collaborative effort among researchers representing all areas - from the application layer down to the micro-architecture-- and will be built on new concepts and new foundational principles. New approaches to achieve scalable performance and usability need new abstract models and algorithms, programming models and languages, hardware architectures, compilers, operating systems and run-time systems, and exploit domain and application-specific knowledge. Research should also focus on energy- and communication-efficiency and on enabling the division of effort between edge devices and clouds.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of

1

2010 2010 2012 2013

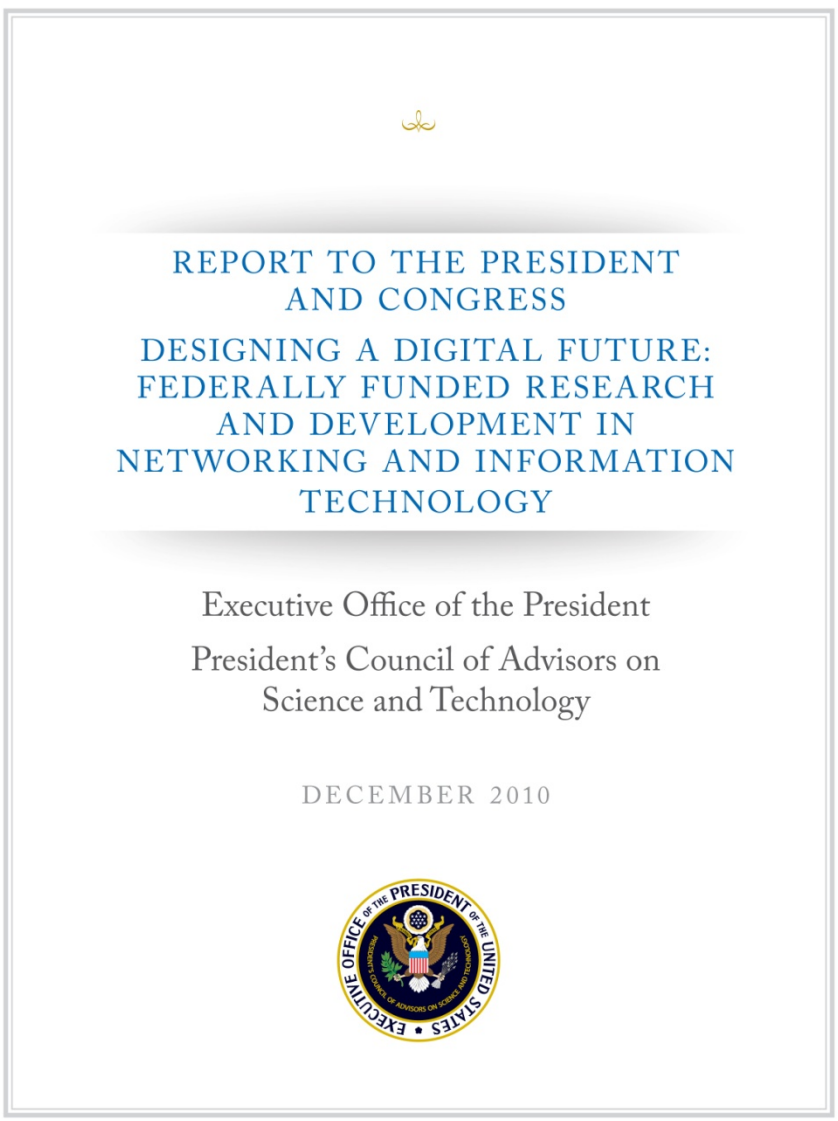
Josep Torrellas
UIUC

Mark Oskin
Washington

Mark Hill
Wisconsin

Communicating: PCAST NITRD Report

- 1/3 of the PCAST NITRD Working Group members were CCC Council members
- The report drew extensively on CCC White Papers
- An excellent roadmap for the field
- The challenge now: continuing to translate it into action


REPORT TO THE PRESIDENT AND CONGRESS

DESIGNING A DIGITAL FUTURE: FEDERALLY FUNDED RESEARCH AND DEVELOPMENT IN NETWORKING AND INFORMATION TECHNOLOGY

Executive Office of the President

President's Council of Advisors on Science and Technology

DECEMBER 2010

The PCAST report

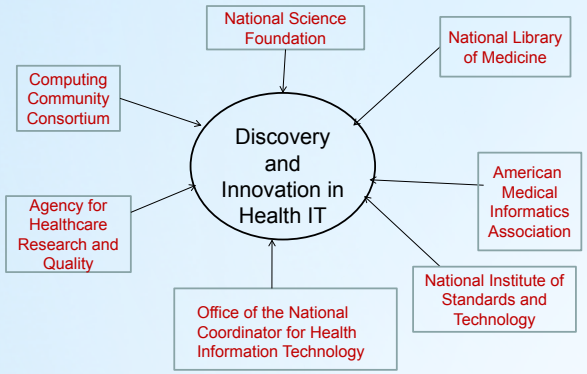
- Health information technology
  - "Go well beyond the current national program to adopt electronic health records"
  - "Make possible comprehensive lifelong multi-source health records for individuals; enable both professionals and the public to obtain and act on health knowledge from diverse and varied sources as part of an interoperable health IT ecosystem; and provide appropriate information, tools, and assistive technologies that empower individuals to take charge of their own health and reduce costs."

National Challenges: Healthcare

- Identify research challenges and opportunities
- Connect researchers, practitioners, industry
- Identify proof-of-concept models to drive research and translation

National Challenges: Healthcare

October 2009 Workshop



National Science Foundation
WHERE DISCOVERIES BEGIN

Directorate for Computer & Information Science & Engineering

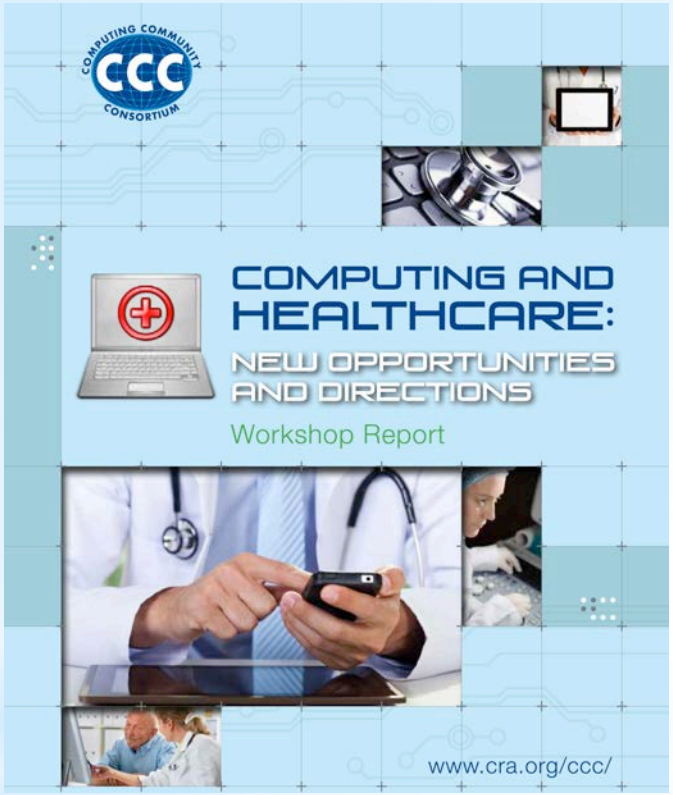
SMART HEALTH AND WELLBEING (SHW)

CONTACTS

See program guidelines for contact information.

SYNOPSIS

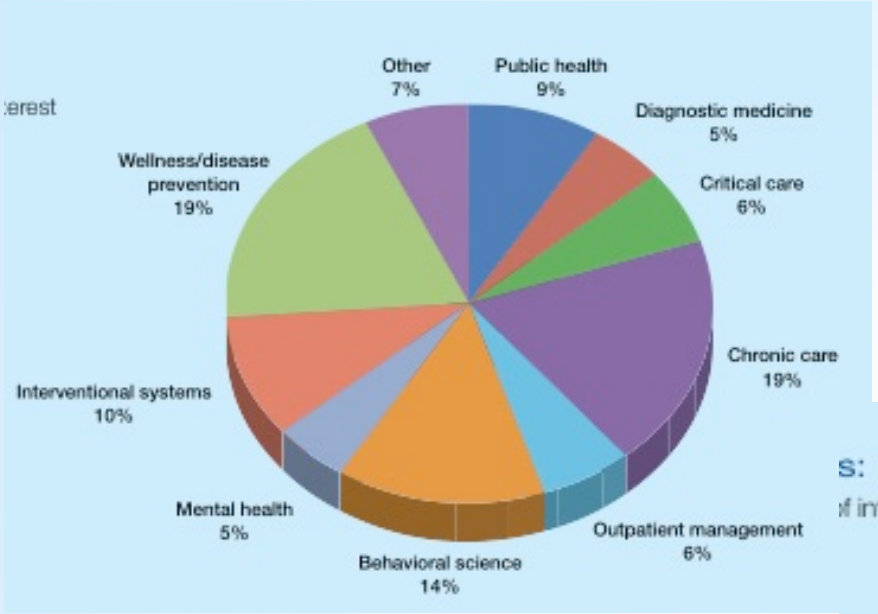
National Challenges: Healthcare



Beth Mynatt, Greg Hager
Susan Graham, Eric Horvitz
Deborah Estrin, Kevin Johnson
Christopher Chute, Kevin Patrick

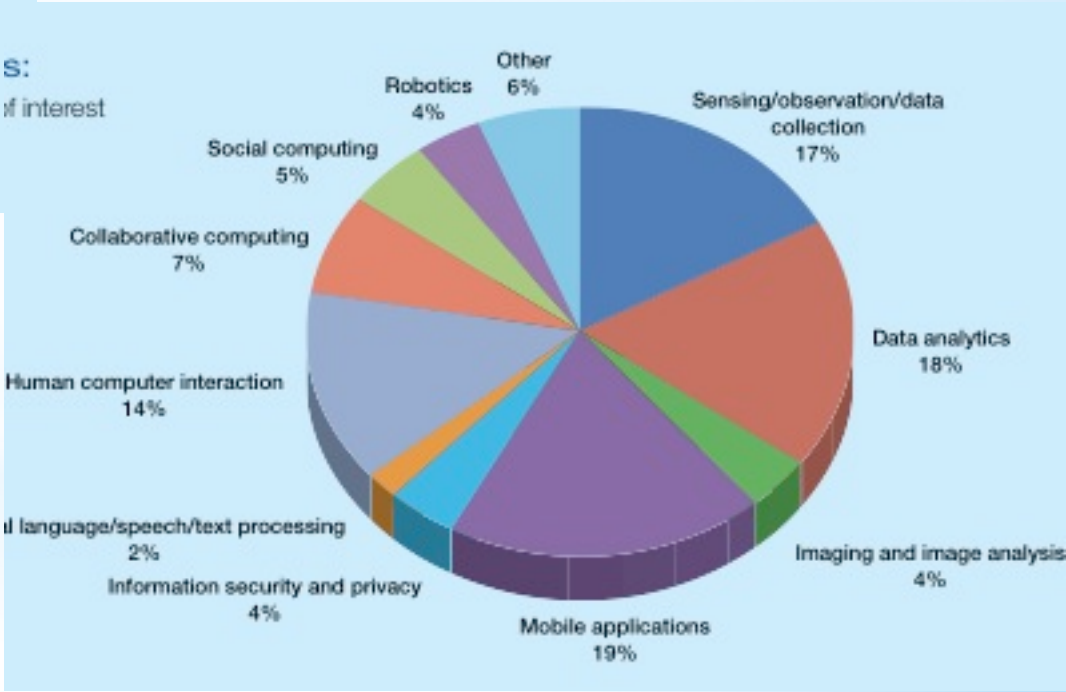
October 2012 Workshop

A Broad Conversation



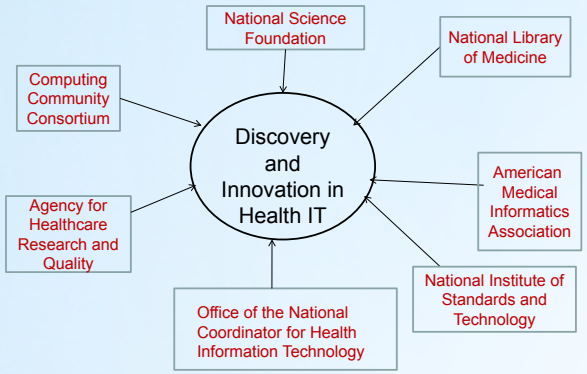
Health Interests

Technology Interests



National Challenges: Healthcare

October 2009 Workshop



National Science Foundation
WHERE DISCOVERIES BEGIN

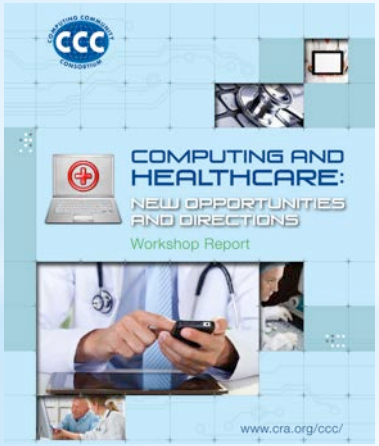
Directorate for Computer & Information Science & Engineering

SMART HEALTH AND WELLBEING (SHW)

CONTACTS

See program guidelines for contact information.

SYNOPSIS



Smart and Connected Health (SCH)

PROGRAM SOLICITATION
NSF 13-543

REPLACES DOCUMENT(S):
NSF 12-512

National Science Foundation

Directorate for Computer & Information Science & Engineering
Division of Computing and Communication Foundations
Division of Computer and Network Systems
Division of Information & Intelligent Systems

Directorate for Engineering

Directorate for Social, Behavioral & Economic Sciences

National Institutes of Health

October 2012 Workshop

The PCAST report II

- Health information technology
  - "Go well beyond the current national program to adopt electronic health records"
  - "Make possible comprehensive lifelong multi-source health records for individuals; enable both professionals and the public to obtain and act on health knowledge from diverse and varied sources as part of an interoperable health IT ecosystem; and provide appropriate information, tools, and assistive technologies that empower individuals to take charge of their own health and reduce costs."
- Energy and transportation
  - "dynamic power management broadly; interoperable standards for real-time control; low-power systems and devices; and improved surface and air transportation."

Computational Sustainability

- Workshop with 60+ computer scientists, systems engineers, social scientists, "sustainability scientists"
- Produced a report summarizing key research questions and directions
- NSF has announced several FY 2012 solicitations as part of its SEES initiative

- Big Data
  - Temporal & geographic
  - Very large, heterogeneous (graphical structures, sampled measurements, images, extensive notes/comments, social network data, etc.)
  - (Meta)data provenance, federation, curation, visualization, analytics, archiving
- Common infrastructure
- Privacy & security
  - Aggregations of personal data
  - Targeting feedback systems
- Quality & transparency of models
- Understanding human needs, encouraging behavior changes

Computational Sustainability

- Workshop with 60+ computer scientists, systems engineers, social scientists, "sustainability scientists"
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  2012 solicitation
  SEES initiative

Special tracks at AAAI, ACM SIGDEV, CHI, ICML, and Pervasive, with CCC "Best Paper" awards

- Big Data
  - Temporal & geographic
  - Very large, heterogeneous (graphical structures, sampled measurements, images, extensive
    ts, social network
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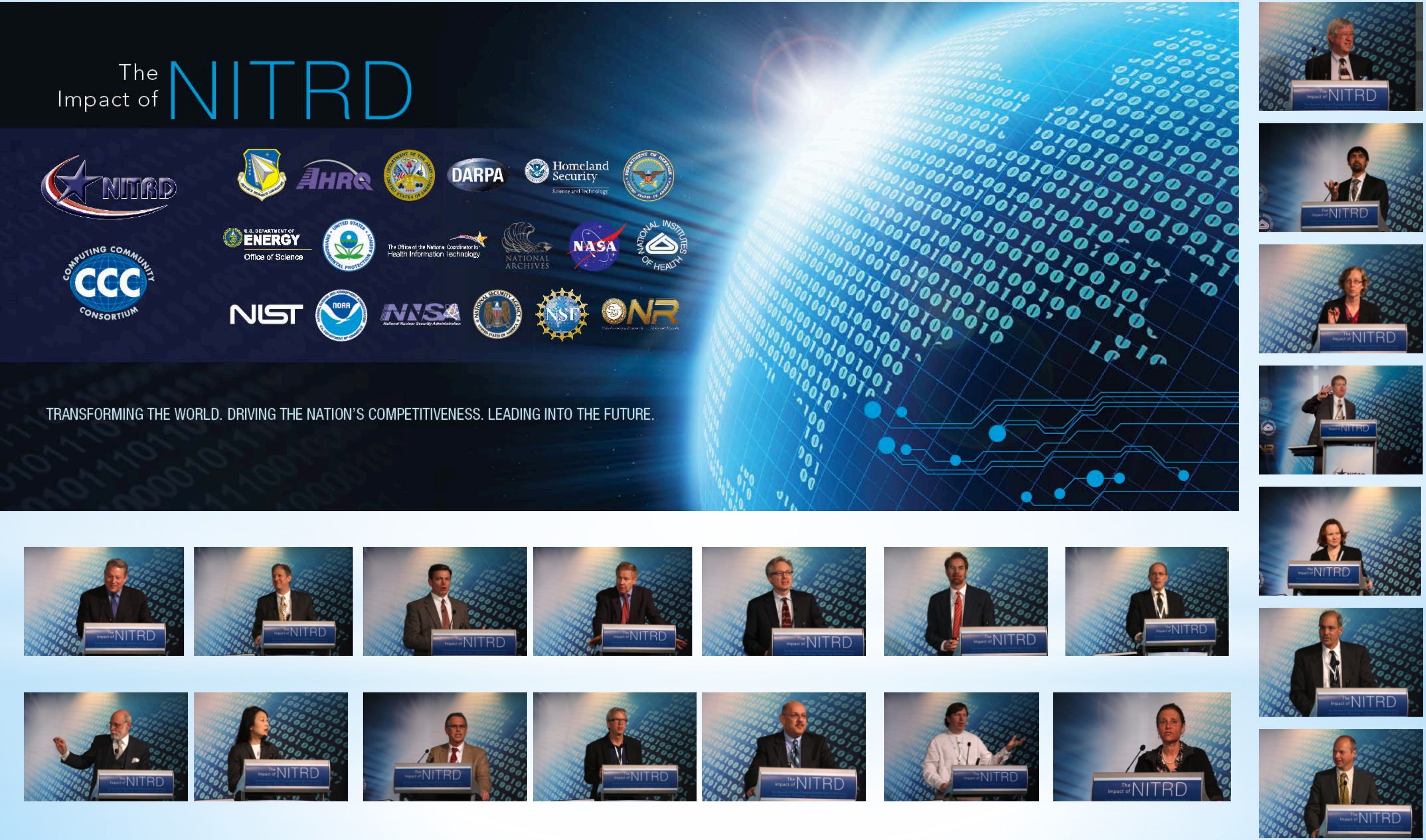
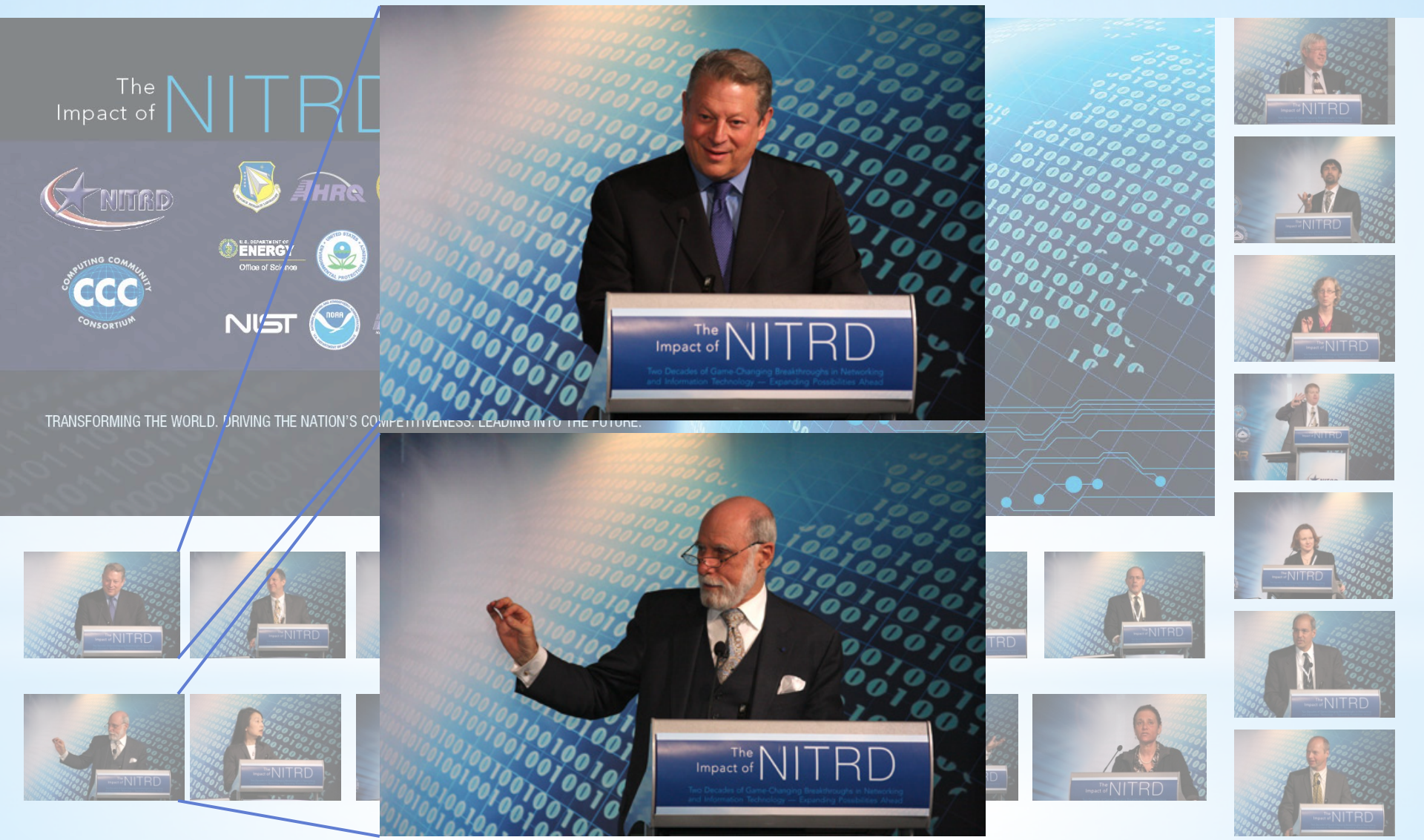
Communicating: NITRD Symposium (2/16/2012)



Communicating: NITRD Symposium (2/16/2012)



Communicating: Leadership in Science Policy Inst.(November 2011, April 2013)

Computing Community Consortium

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

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CCC Leadership in Science Policy Institute

Agenda

8:30 am - 9:00 am
Welcome [180 KB PDF] [Referenced videos - Lazowska | Bartlett | Brooks]
(Fred Schneider, Cornell, Workshop Chair)

Lay out the goals of the workshop: to provide a crash-course in relevant science policy issues and the mechanics of policymaking, including a sense of how federal science policy is crafted, how it's implemented, and where are the opportunities for members of the community to participate in the policy-making process.

9:00 am - 10:30 am
Interacting with Agencies/Creating New Initiatives
(Jeannette Wing, CMU [434 KB PDF]; Milt Corn, NIH [242 KB PDF]; Henry Kelly, DOE)

The agencies are where the science-policy rubber hits the road, where decisions made in both the Administrative and Legislative branches get implemented, and the most common avenue for individuals in the science community to interact with the federal government. Influencing policy decisions at the agency level can require a somewhat different skill set and somewhat different approach than influencing your faculty peers, the Congress, or the White House. Agencies also provide opportunities for individuals in the community to directly shape federal policy in their field, by serving on an agency advisory committee, or by taking a rotation as a program manager, division director, or office director. This session will cover the agency budget process and will discuss opportunities for scientists to advise and engage federal science agencies like NSF, DOE, and NIH. The speakers will discuss the mechanics of how agency new initiatives get started, focusing on the culture and traditions that constitute the lens through which agencies view themselves and are viewed by others. In practical terms, how is success measured? To what extent is outside advice sought and in support of what kinds of activities? What kinds of advice and modes of engagement are unlikely to be effective?

Back to Main Page

Content is still being added to this site. Please check back periodically. The last change was made on: **December 13, 2011.**

Logistics

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 expenses will be provided by the workshop (through funding from CCC).

Agenda

List of Sessions and Speakers and Slides


Milt Corn, NIH


Henry Kelly, DoE


Attendees

Public outreach: CCC Blog

The Computing Community Consortium Blog

A Service for the Computing Research Community

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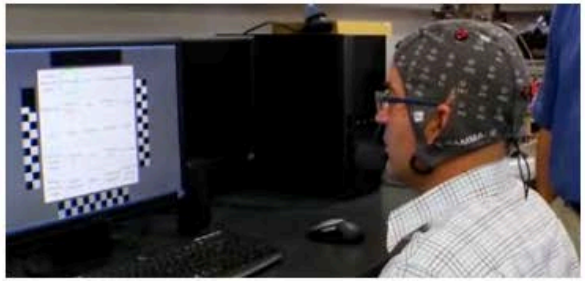
"Improving Brain-Computer Interfaces"

October 17th, 2011 by Erwin Gianchandani | Edit this entry — 0 Comments and 3 Reactions



A *Science Nation* story published today describes a public-private partnership funded in part by the National Science Foundation (NSF) that is attempting to link mind and machine to ultimately improve the living conditions of those with "locked-in syndrome" — a malady in which people with normal cognitive brain activity suffer severe paralysis, often from injuries or an illness such as Lou Gehrig's disease.

From the *Science Nation* article (see a video after the jump!):

» Read more: "Improving Brain-Computer Interfaces"

Posted in big science , research horizons , research news — 0 Comments and 3 Reactions

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LATEST TWEET

"Improving Brain-Computer Interfaces" http://t.co/SrgTEr8A

Follow CCC on twitter here.

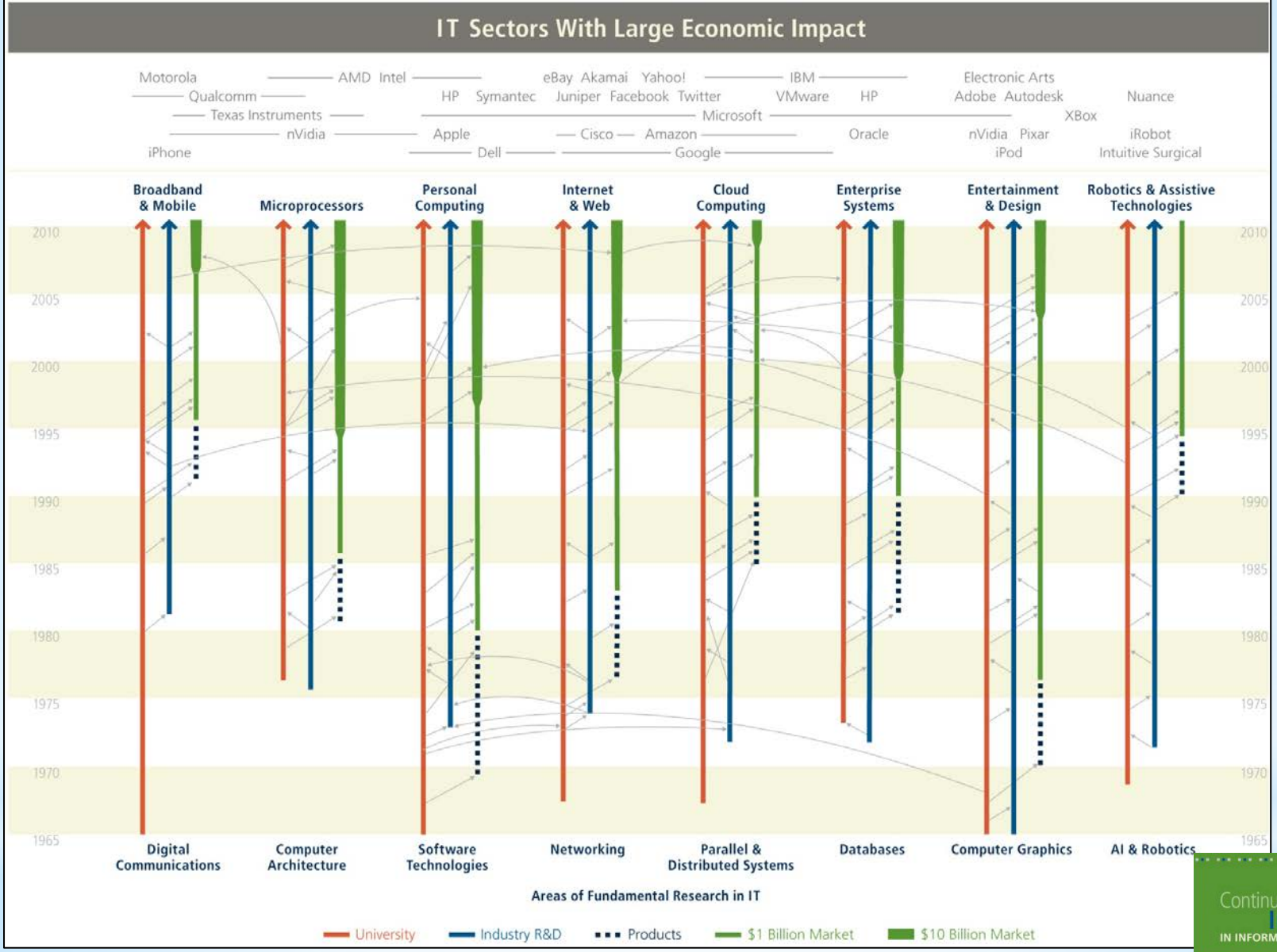
RECENT POSTS

- "Improving Brain-Computer Interfaces"
- Administration Seeking Input on National Bioeconomy Blueprint
- First Person: "One of My Most Exciting Internship Experiences"
- Announcing the 2011 Computing Innovation Fellows
- Susan Graham to Receive Ken Kennedy Award

MOST READ POSTS

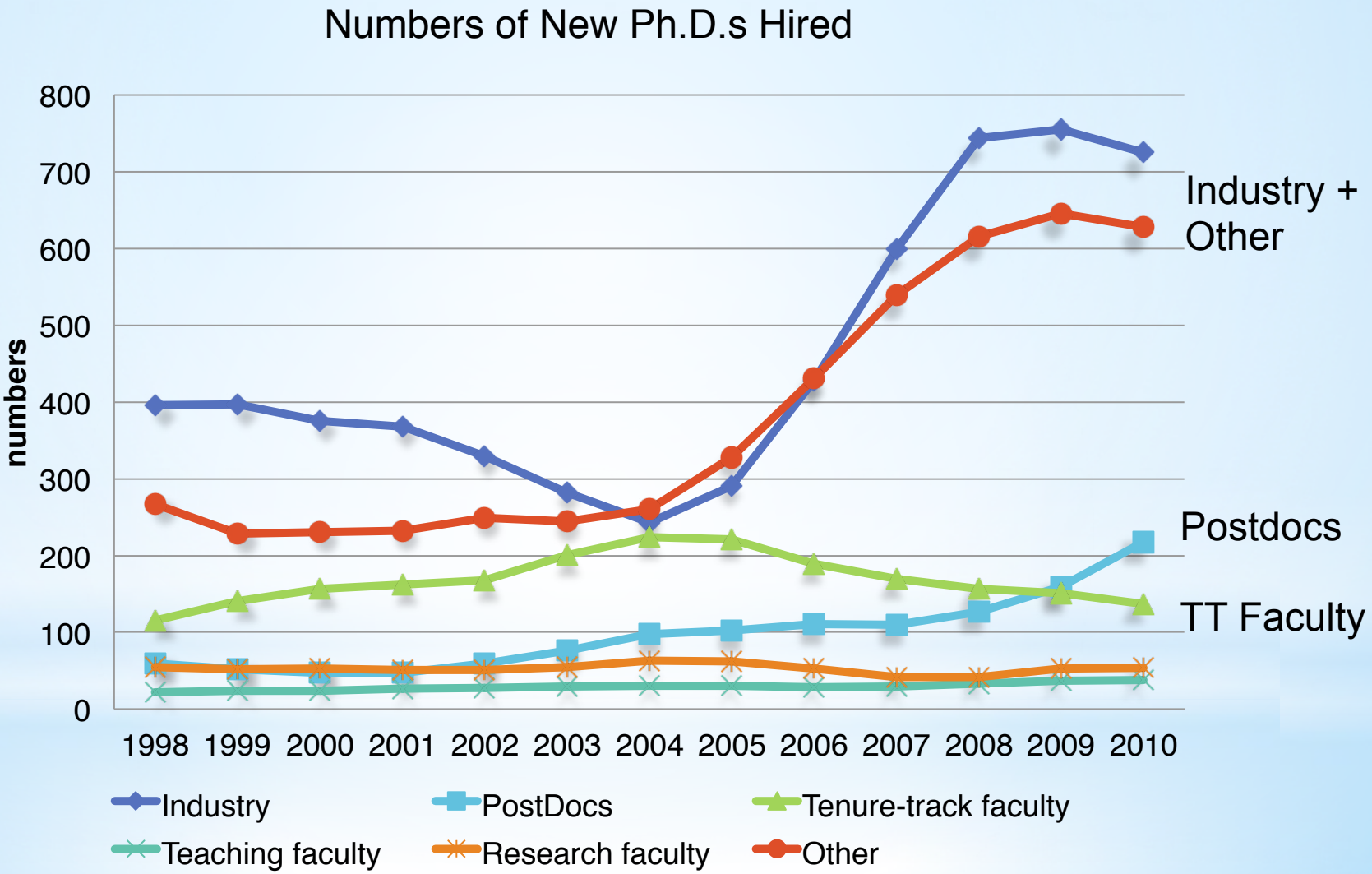
- "Improving Brain-Computer Interfaces" (22)
- Administration Seeking Input on National Bioeconomy Blueprint (15)
- Announcing the 2011 Computing Innovation Fellows (4)

New Challenges in a Rapidly Expanding World of Computing?

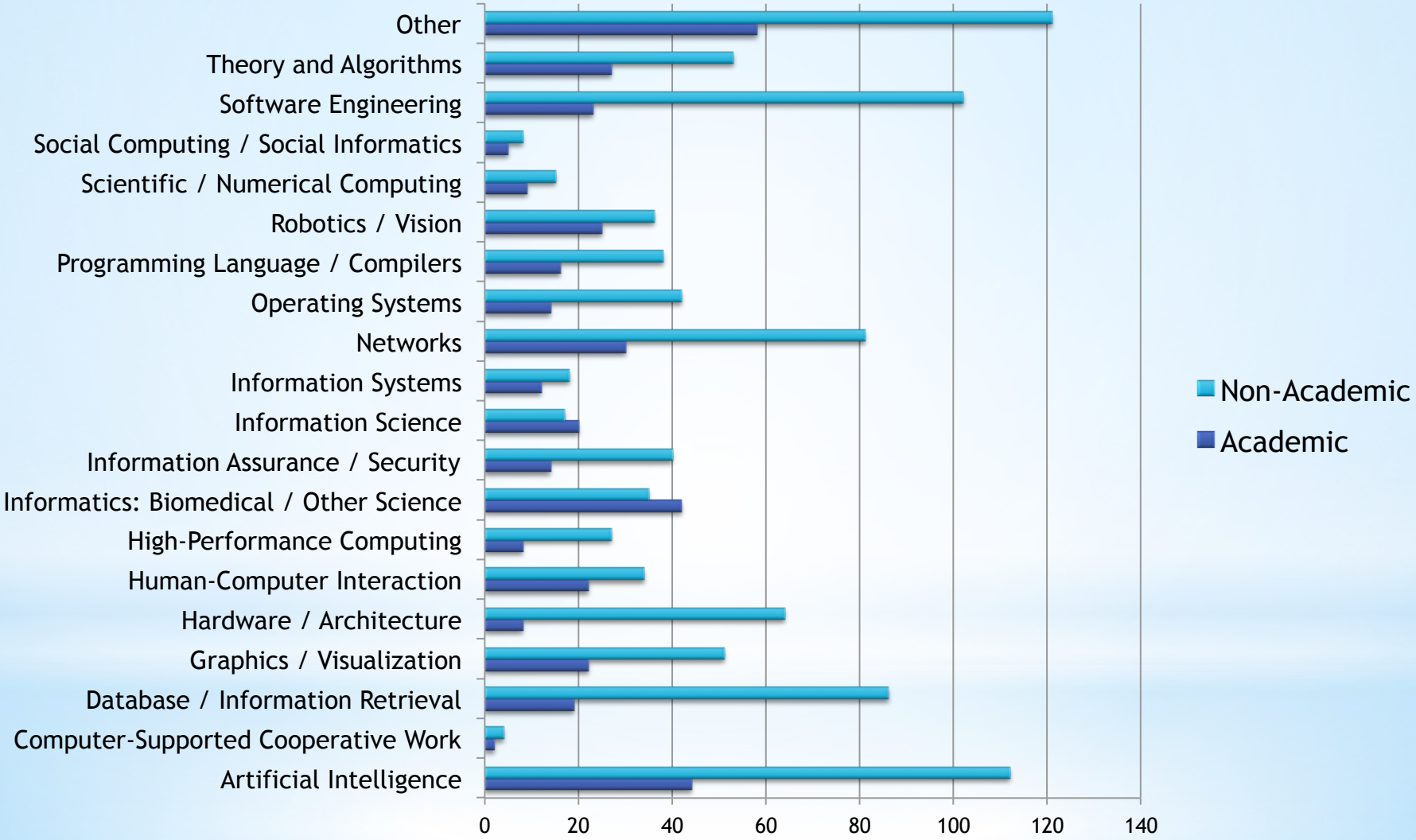


Excerpt from *Continuing Innovation in Information Technology*, National Research Council, Computer Science and Telecommunications Board, 2012.

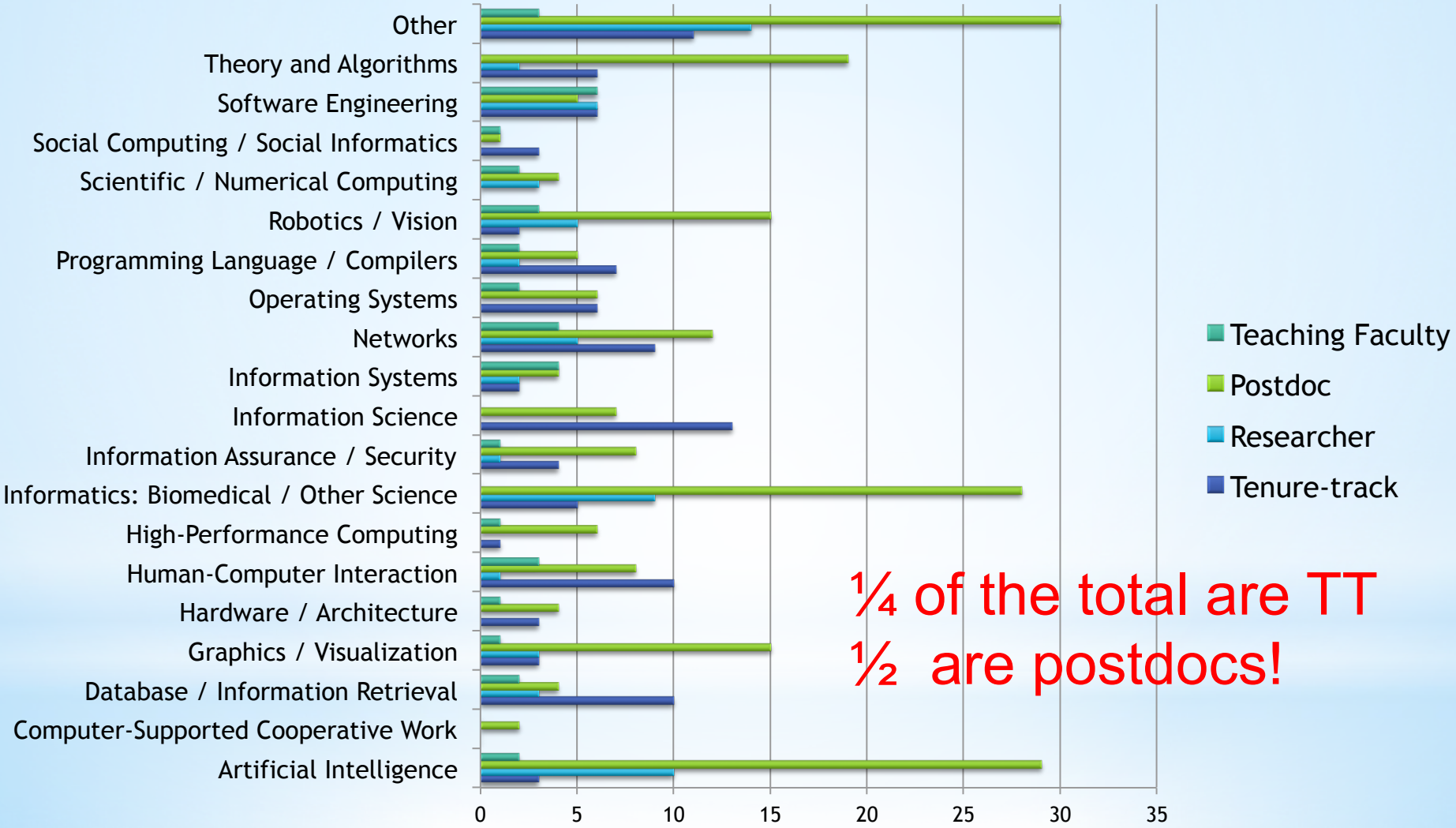
The Changing Complexion of Computing



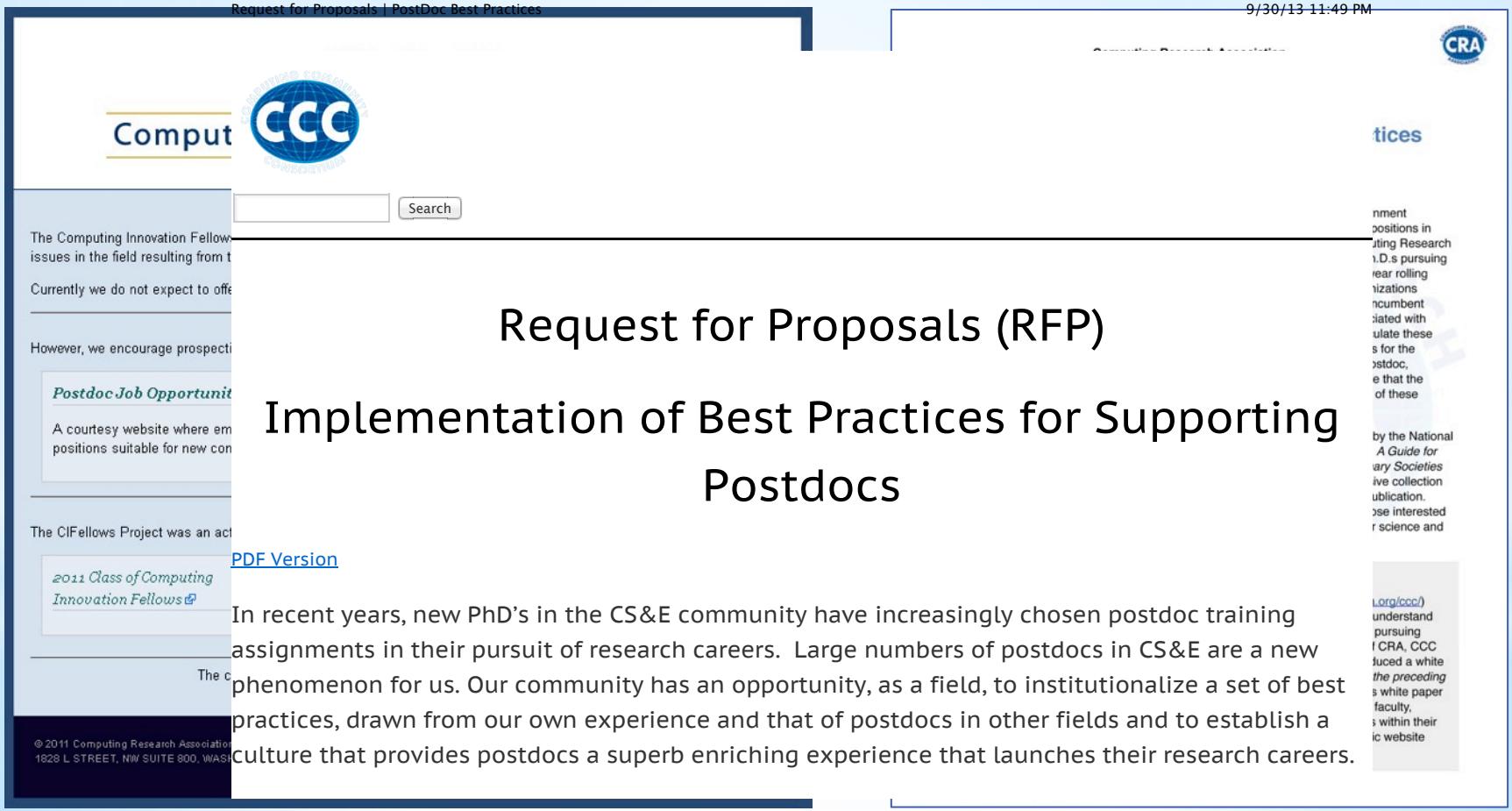
2011-2012 Employment Data by Sector



2011-2012 Employment for PhD Graduates by Sector



Enabling: Computing Innovation Fellows Project -> Postdoc Best Practices



Key drivers: information

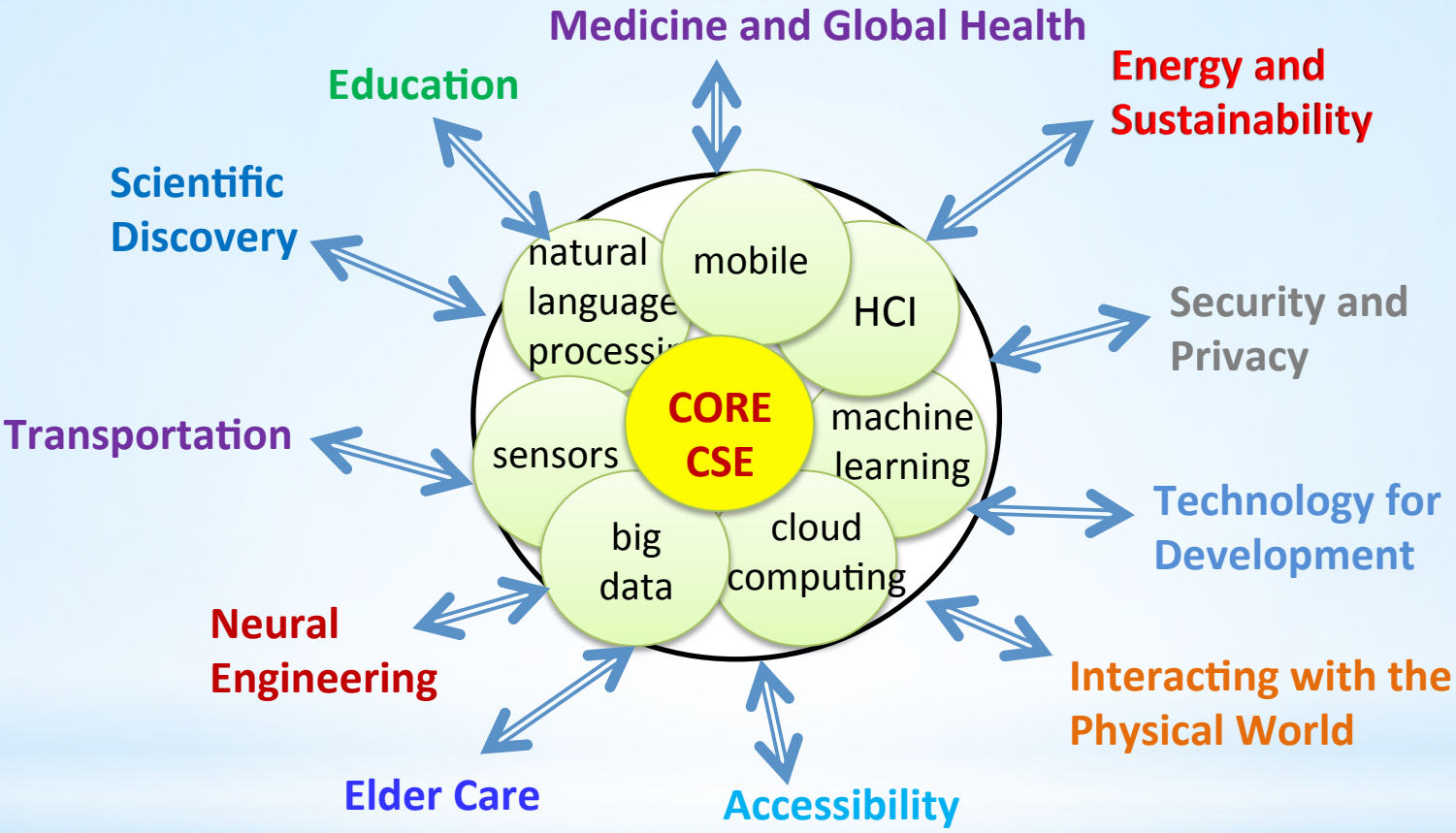
- Just about every field is becoming an information field

- "NIT is arguably unique among all fields of science and engineering in the breadth of its impact … Recent technological and societal trends place the further advancement and application of NIT squarely at the center of our Nation's ability to achieve essentially all of our priorities and to address essentially all of our challenges … All indicators – all historical data, and all projections – argue that NIT is the dominant factor in America's science and technology employment.

-- *PCAST report, December 2010*

Implications for academia

Implications for academia



New Drivers: Industry, Society, Government, Science

Implications for academia

CCC: Catalyzing and Enabling Computing Research

Gregory D. Hager

CCC Vice-Chair

Johns Hopkins University