What is PCAST?

LEADERSHIP SUMMIT PRESENTATION

SUSAN L. GRAHAM
FEBRUARY 24, 2014

The President has a National Science Advisor

John Holdren chairs both OSTP and PCAST

Office of Science and Technology Policy (OSTP)

- In White House Executive Office of the President
- Our community's primary contacts are
  - Director: John P. Holdren
  - U.S. Chief Technology Officer: Todd Park
  - Deputy Director for Technology and Innovation: Tom Kalil
  - Ass't Director, Robotics and Cyber-Physical Systems: Vijay Kumar (Penn)
  - Assistant Director, Advanced Manufacturing: Alex Slocum (MIT)
  - Associate Director for Nat'l Security and Int'l Affairs: Patricia Falcone

President's Council of Advisors on Science and Technology (PCAST)

PCAST is co-chaired by John Holdren and Eric Lander (MIT and Harvard)

- Twenty members; mostly since 2009
- Members with professional computing-related roles are
  - Mark Gorenberg (Zetta Venture Partners)
  - Susan Graham (UC Berkeley)
  - Eric Schmidt (Google)
  - William Press, vice-chair (UT Austin)
  - Craig Mundie (Microsoft)
  - Executive director: Marjory Blumenthal

Recent Reports

- Dec. 2012 *Agricultural Preparedness & the United States Agricultural Research Enterprise*

- Jan 2013 *Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology*

- March 2013 *Letter Report on Climate Change*

- Nov 2013 *Immediate Opportunities for Strengthening the Nation's Cybersecurity*

- Dec 2013 *Letter Report on Education Technology*

Networking and Information Technology R&D (NITRD) program

- Legislatively mandated coordination among Federal R&D agencies
- National Coordinating Office (NCO) facilitates
  - Interagency working groups
  - Coordinating groups
  - Senior steering groups
  - Community of practice
- Director is George Strawn

Communicating: PCAST NITRD Report - 2010

- 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

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

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DECEMBER 2010

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JANUARY 2013

The President Makes a Speech

- *I have also asked my Counselor, John Podesta, to lead a comprehensive review of big data and privacy. This group will consist of government officials who—**along with the President's Council of Advisors on Science and Technology**—will reach out to privacy experts, technologists and business leaders, and look at how the challenges inherent in big data are being confronted by both the public and private sectors; whether we can forge international norms on how to manage this data; and how we can continue to promote the free flow of information in ways that are consistent with both privacy and security.*

- *— President Barack Obama, 17 January 2014*

The Computing Community Consortium Catalyzing and Enabling Computing Research

Susan Graham

Chair

Gregory D. Hager

Vice-Chair

Ann Drobnis

Director

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

- Staffed by CRA

Our Mission

The **mission** of Computing Research Association's 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

Executive Committee
- Susan Graham, UC Berkeley (Chair)
- Greg Hager, Johns Hopkins (Vice Chair)
- Ed Lazowska, U. Washington (Past Chair)
- Elizabeth Mynatt, Georgia Tech
- Fred Schneider, Cornell
- Sue Davidson, Univ. Pennsylvania
- Ann Drobnis, Director
- Andy Bernat, CRA Executive Director

The CCC Council
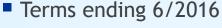
- Terms ending 6/2016
  - Randy Bryant, CMU
  - Limor Fix, Intel
  - Mark Hill, U. Wisconsin, Madison
  - Tal Rabin, IBM Research
  - Daniela Rus, MIT
  - Ross Whitaker, Univ. Utah

- Terms ending 6/2015
  - Liz Bradley, Univ. Colorado
  - Joe Evans, Univ. Kansas
  - Ran Libeskind-Hadas, Harvey Mudd
  - Shashi Shekhar, Univ. Minnesota

- Terms ending 6/2014
  - Deborah Crawford, Drexel
  - Anita Jones, Univ. Virginia
  - Bob Sproull, Sun Labs Oracle (ret.)
  - Josep Torrellas, Univ. Illinois

http://cra.org/ccc

The CCC Council

- Past Members
  - Stephanie Forrest, Univ. New Mexico
  - Chris Johnson, Univ. Utah
  - Frans Kaashoek, MIT
  - Robin Murphy, Texas A&M
  - Bill Feiereisen, LANL
  - Dave Kaeli, Northeastern
  - John King, Univ. Michigan
  - Dick Karp, UC Berkeley
  - Andrew McCallum, Umass
  - Dave Waltz, Columbia
  - Greg Andrews, Univ. Arizona
  - Peter Lee, Carnegie Mellon
  - Karen Sutherland, Augsburg College

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
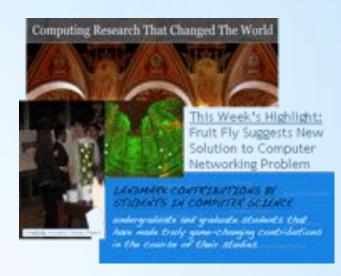
- **Leadership incubator**
  - Everyone is expected to do something!

A Multitude of Activities

- **Community-initiated visioning:**
  - Workshops to discuss "out-of-the-box" ideas
  - Challenges & Visions tracks at conferences

- **Outreach to White House, funding agencies:**
  - Outputs of visioning activities
  - Short reports to inform policy makers
  - Task Forces – Health IT, Sustainability IT, Data Analytics
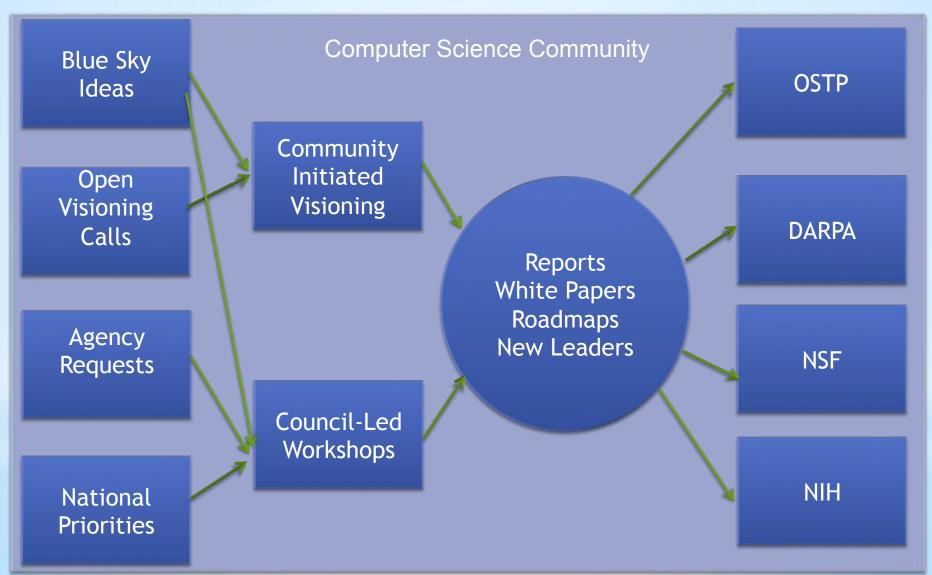
- **Communicating CS Research:**
  - "The Impact of NITRD" symposium
  - Research "Highlight of the Week"
  - CCC Blog [http://cccblog.org/]

- **Nurturing the next generation of leaders:**
  - Computing Innovation Fellows Project
  - "Landmark Contributions by Students"
  - Leadership in Science Policy Institute

Catalyzing: Visioning Activities

Computer Science Community

Blue Sky Ideas

Open Visioning Calls

Agency Requests

National Priorities

Community Initiated Visioning

Council-Led Workshops

Reports
White Papers
Roadmaps
New Leaders

OSTP

DARPA

NSF

NIH

CCC

Catalyzing: Visioning Activities

- Over 20 Workshops to date
- More than 1,500 participants

Extreme Scale Design Automation

Sustainability & IT

Financial Cyberinfrastructure

Computing and Healthcare

Privacy R&D

Cyber-physical systems

Spatial Computing

Big Data Computing

ROBOTICS

Disaster Management

Online Education

Free & Open Source Software

Learning Technologies

Global Development

Catalyzing and Enabling: Big Data

2008   2008   2010   2012

Catalyzing and Enabling: Past Efforts

October 2009 Workshop

Henrik Chistensen
Georgia Tech

Smart Health Program
announced, 2010

National Robotics
Initiative announced
in summer 2011

Big Data Initiative
announced, spring 2012

Catalyzing and Enabling: Architecture

2010

2010

2012

2013

Josep Torrellas
UIUC

Mark Oskin
Washington

Mark Hill
Wisconsin

Catalyzing and Enabling: Health IT

October 2009 Workshop

October 2012 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
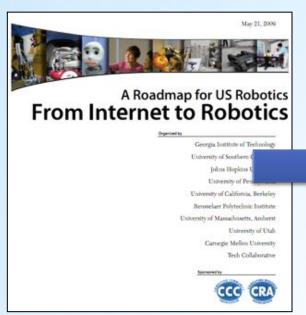
Recent CCC Workshop Activity

- Spatial Computing Workshop Report
  - *From GPS and Virtual Globes to Spatial Computing – 2020: The Next Transformative Technology*
- Robotics, Automation, and Computer Science
  - Sponsored by Robotics-VO, NSF, OSTP, and CCC
  - Goal: frame concrete problems used to guide basic and applied research through the National Robotics Initiative
- Extreme Scale Design Automation #3
  - Sponsored by ACM and CCC
  - Goal: concrete action items for the EDA community to re-invigorate the field

Catalyzing and Enabling: Robotics

A Roadmap for US Robotics
From Internet to Robotics

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: Upcoming Workshops

- Computing Visions 2025
  - Joint Venture of NSF CISE Advisory Committee and CCC
  - 3 Initial Workshops:
    - Interactions
      - Look at how technology could change how computers interface with people and the world around them.
    - New Renaissance of Indy Manufacturing: Programmable Matter and Things
      - Explore the way items are designed, manufactured, and delivered
    - Computing and the Smart World
      - Look at the massive amounts of data and advanced analytical techniques to "make the world smart"

Catalyzing and Enabling: Upcoming Workshops

- Community Visioning Workshops:
  - Human Computation Roadmap
  - Uncertainty in Computation

- BRAIN (NSF, NIH)

- Aging in Place (NIH)

Catalyzing: Blue Sky Ideas Conference Tracks

- Special tracks at major research conferences organized by faculty, graduate students, postdocs

- CCC provides prizes to three Best Papers

- "Reach out beyond the usual research papers that present completed work to seek out papers that present ideas and visions that can stimulate the research community to pursue new directions"

- Past Year:
  - 12th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

- Coming Year:
  - 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
  - 22nd ACM SIGSOFT International Symposium on Foundations of Software Engineering (SIGSOFT)
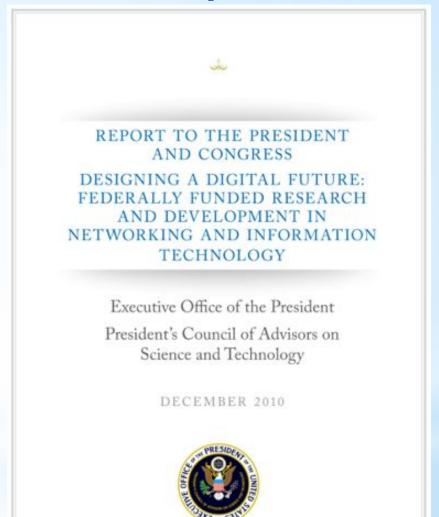
Research Visions
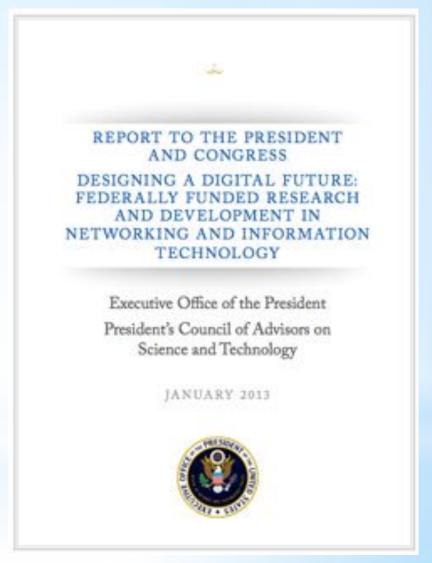
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JANUARY 2013

Communicating: NITRD Symposium (2/16/2012)

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

Milt Corn, NIH

Henry Kelly, DoE

Attendees

Communicating: CCC Blog

On average, 300 hits/day

Communicating: Computing Research in Action
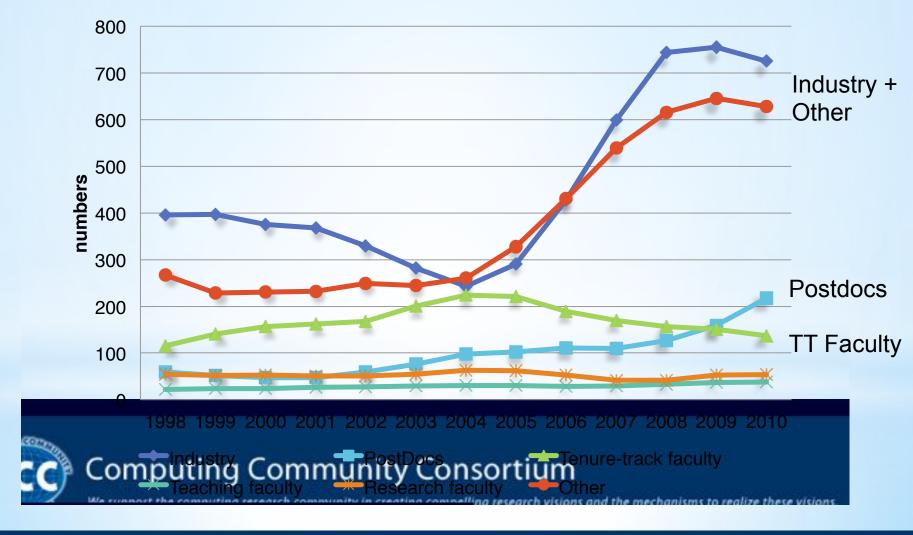
- *SmartGeo* at the Colorado School of Mines

- *Ubiquitous Computing Lab* at The University of Washington.

Computing Research in Action
A video showcase of breakthrough CS Research.
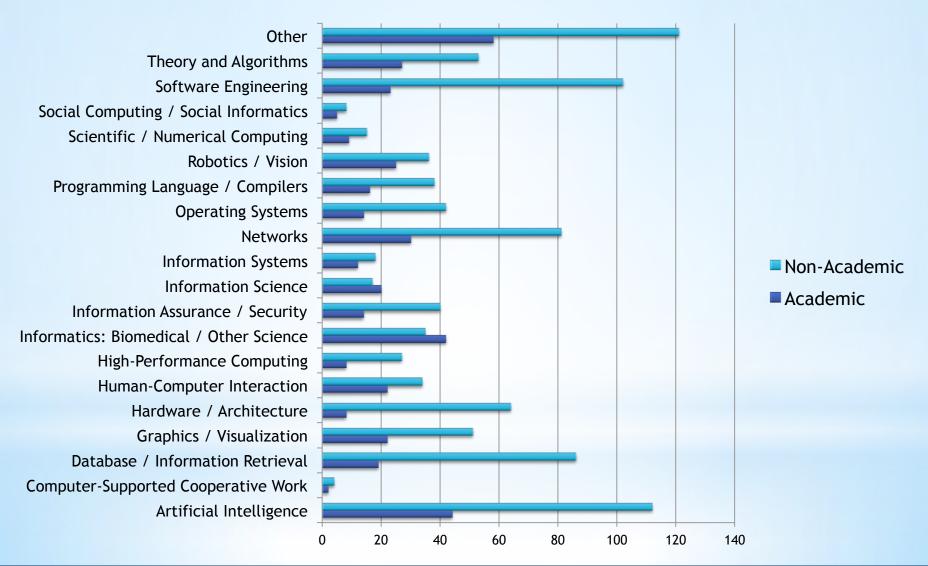
People: Changing Complexion of Computing

Numbers of New Ph.D.s Hired
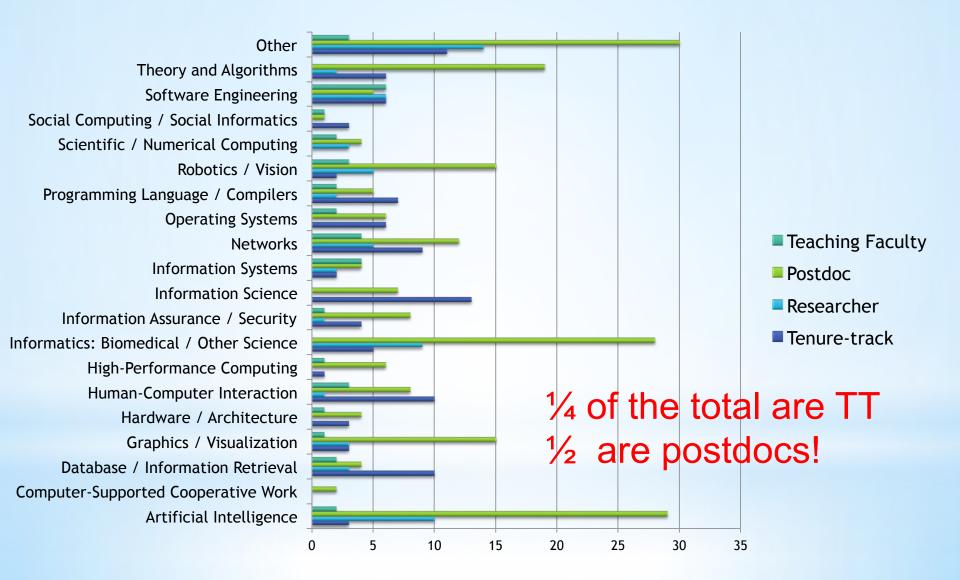
2011-2012 Employment Data by Sector

http://cra.org/ccc
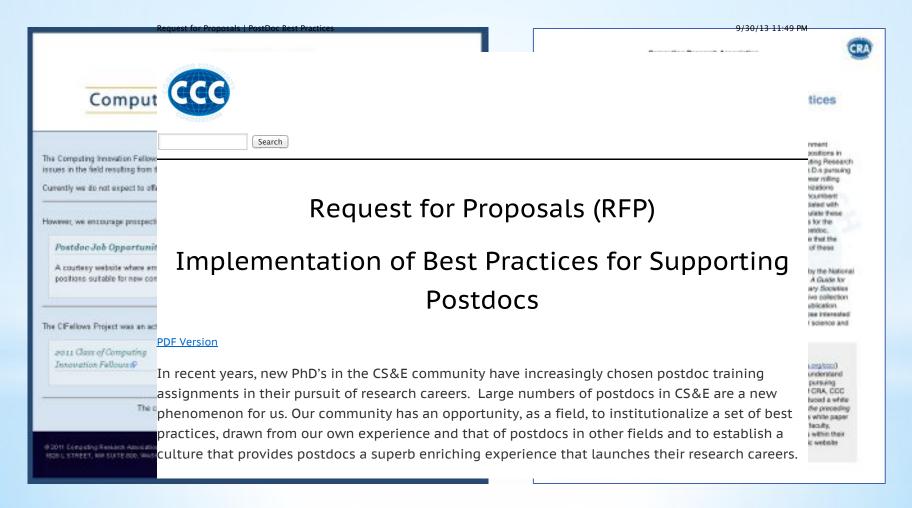
2011-2012 Employment for PhD Graduates by Sector

¼ of the total are TT
½ are postdocs!

Enabling: Computing Innovation Fellows Project -> Postdoc Best Practices

Comput **CCC**

Search

Request for Proposals (RFP)

Implementation of Best Practices for Supporting Postdocs

PDF Version

In recent years, new PhD's in the CS&E community have increasingly chosen postdoc training assignments in their pursuit of research careers. Large numbers of postdocs in CS&E are a new phenomenon for us. Our community has an opportunity, as a field, to institutionalize a set of best practices, drawn from our own experience and that of postdocs in other fields and to establish a culture that provides postdocs a superb enriching experience that launches their research careers.

Enabling: Postdoc Best Practices

- 3 Projects to be awarded soon for implementation in 2014 – 2017
  - 1 consortia across a city / state
    - Virtual Engagement
  - 1 focusing on Postdoc Independence
  - 1 focusing on Postdoc Community

Looking Ahead

- **CI Fellows Workshop, May 22-23**

- **NOMINATIONS for CCC DUE March 6!**
  - We are in the process of soliciting nominations for new council members more information at:

http://www.cccblog.org/2014/02/11/nominations-sought-for-new-ccc-council-members-2/

CCC: Catalyzing and Enabling Computing Research

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