

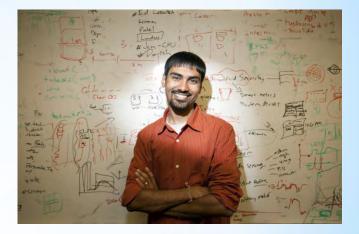
# On the Edge: The Future of Computing Research



### Two talks

Shwetak Patel, University of Washington
Your Noise is My Signal

Daphne Koller, Stanford University
Data-Driven Medicine









## The Computing Community Consortium

### A Catalyst and Enabler for the Computing Research Community

- Catalyzing the definition of and providing exposure for new research directions, including those that confront national and global challenges
- Communicating with policymakers
- Inspiring and growing the community
- Growing new leaders
- "Just being there" community leaders who can create and/or seize opportunities





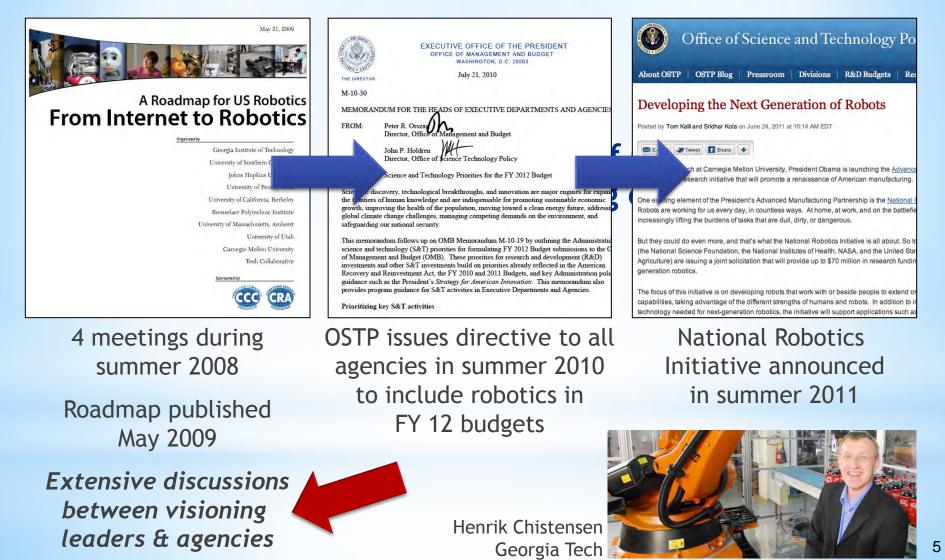


- Operates as a "standing committee" of the Computing Research Association (similar to CRA-W)
- Funded by NSF under a Cooperative Agreement
  - Additional funding from NSF and other organizations for specific activities
- Led by a broad-based, continually refreshed Council
- Chaired by Ed Lazowska and Susan Graham
- Staffed by Erwin Gianchandani (Director), Kenneth Hines (Program Associate), and many members of the CRA staff





## **Outcome: National Robotics Initiative**





### http://cra.org/ccc

NSF

## **Outcome: Multi-Agency "Big Data" Initiative**

WhitePaners



### A Series on Data Analutics: From Data to Knowledge to Action

From Data to Knowledge to Action: A Global Enabler for the 21st Century [PDF | Word] Eric Horvitz, Microsoft Research and Tom Mitchell, Camegie Mellon University

### 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. Gianchandani, Computing Research Association

Enabling 21st Century Discovery in Science and Engineering [PDF | Word] Randal E. Bryant, Camegie Mellon University and Ed Lazowska, University of Washington

Enabling Advanced Intelligence and Decision-Making for America's Security [PDF | Word] Randal E. Bryant, Carnegie Mellon University, Jaime G. Carbonell, Carnegie Mellon University and Tom Mitchell, Carnegie Mellon University

### Enabling a Revolution in New Transportation [PDF | Word]

Sebastian Thrun, Stanford University, Chase Hensel, Computing Research Association and Erwin P. Gianchandani, Computing **Research Association** 

### Enabling Personalized Education [PDF | Word]

Beverly Park Woolf, University of Massachusetts-Amherst, Ryan Baker, Worcester Polytechnic Institute, Erwin P. Gianchandani, Computing Research Association

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

A series of white papers prepared in fall 2010 relating data mining, machine learning, predictive modeling, etc., to national challenges

Discussions with OSTP, Federal agencies

**Multi-agency Big Data** initiative rollout, March 29



## **Outcome: PCAST NITRD Report**

- 1/3 of the PCAST NITRD Working Group members were CCC Council members (Bryant, Graham, Jones, Lazowska, Sproull)
- The report drew extensively on CCC White Papers
- A thoughtful roadmap for the field



President's Council of Advisors on Science and Technology

DECEMBER 2010







## Activity: NITRD Symposium







## **Activity: Leadership in Science Policy Institute**

### **Computing Community Consortium**

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

ABOUT YOUR VISION

### 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

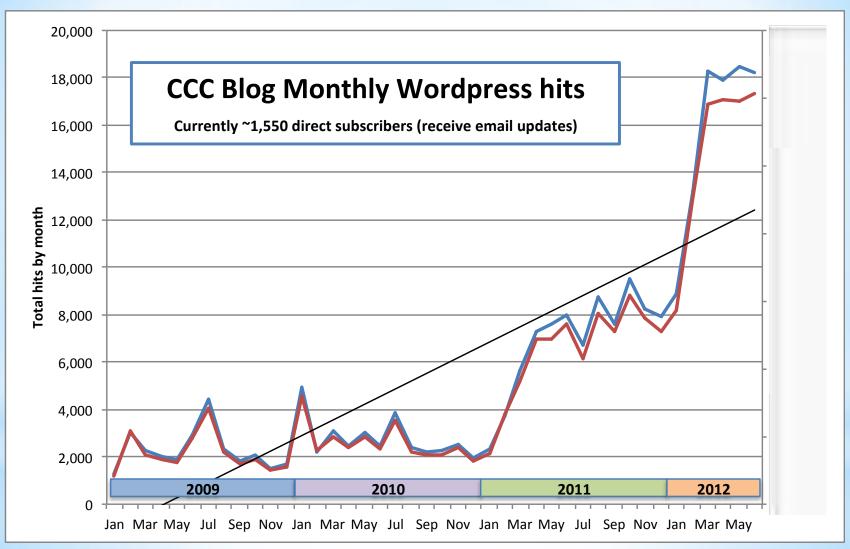








## Activity: CCC Blog





http://cra.org/ccc



### Lots more! Get involved! http://cra.org/ccc/

### 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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YOUR VISION

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### **Describing Computing Research Challenges**

BOUT

A set of brochures describing fundamental computing research challenges in a few areas of national priority, including healthcare, sustainability (spanning energy, transportation, and environment), and education.



#### **Recent Press Releases**

#### July 9, 2012

New Community Report Defines Opportunities for Computer Science in Disaster Management

#### March 15, 2012

Computing Community Consortium Welcomes New Council Members

#### October 14, 2012

CCC Announces 2011 Computing Innovation Fellows: CIFellows Project Continues to Seek to Retain Recent PhDs in Computing Research

### About the CCC

### CCC Council

Press Releases

### Contact Us

**Visioning & Funding Opportunities** 

Call for Visioning Activities

#### Activities

Funded Visioning Activities

White Papers

A Symposium on the Impact of NITRD

Computing Research That Changed the World

Symposium

### From the CCC Blog:

### CCC Calling for Papers for Spatial Computing Visioning Workshop

The Computing Community Consortium (CCC) has issued a call for participation for an upcoming visioning workshop on spatial ...

#### First GraphLab Workshop on Large-scale Machine Learning

The following is a special contribution to this blog by Carlos Guestrin, who will be joining the faculty of the University of ...

#### Four Researchers Honored With 2012 Dijkstra Prize

The Association for Computing Machinery's (ACM) Special Interest Groups on Algorithms and Computation Theory (SIGACT) and ...

#### NSF Announces New SAVI at Intersection of IT, Disasters

At a meeting of the National Science Board (NSB) yesterday, National Science Foundation (NSF) Assistant Director for Computer ...

### 🔝 Highlight of the Week

Microsoft training computers to finish our sentences A team of computer



### http://cra.org/ccc



### Drivers of fundamental research: demand pull vs. technology push



Bob Lucky, 1998: "the last electrical engineer"

Turing's Cathedral ORIGINS OF THE DIGITAL UNIVER George





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## **A National Imperative**

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

LOUGHARDS AND



http://www.whitebouse.gov/sites/default/files/microsites/asto/acast-nitid report-2010.pdf "Recent technological and societal trends place the further advancement and application of networking and information technology squarely at the center of our Nation's ability to achieve essentially all of our priorities and to address essentially all of our challenges."

Source: PCAST (2010). Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology. – A periodic congressionally-mandated review of the Federal Networking and Information Technology Research and Development (NITRD) Program.

Farnam Jahanian, NSF



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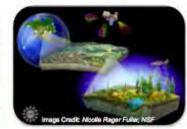
## **CISE and National Priorities**



Broadband & Universal Connectivity



Emergency Response & Disaster Resiliency



Environment & Sustainability



Health & Wellbeing



Manufacturing, Robotics, & Smart Systems



Secure Cyberspace



Transportation & Energy



Education and Workforce Development

Farnam Jahanian, NSF







Farnam Jahanian, NSF







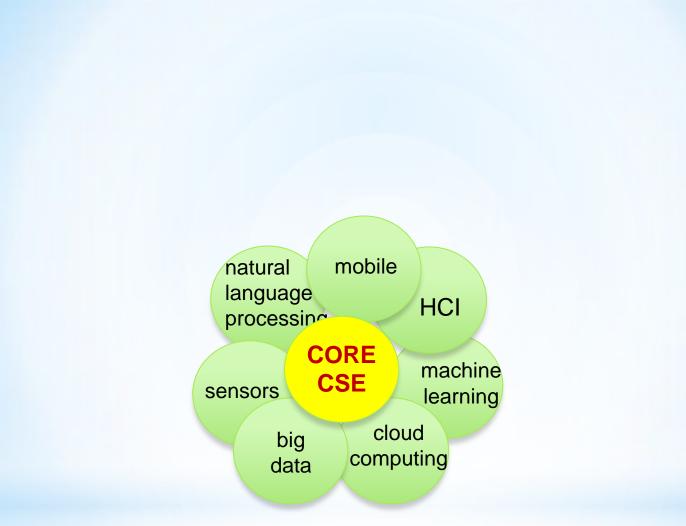










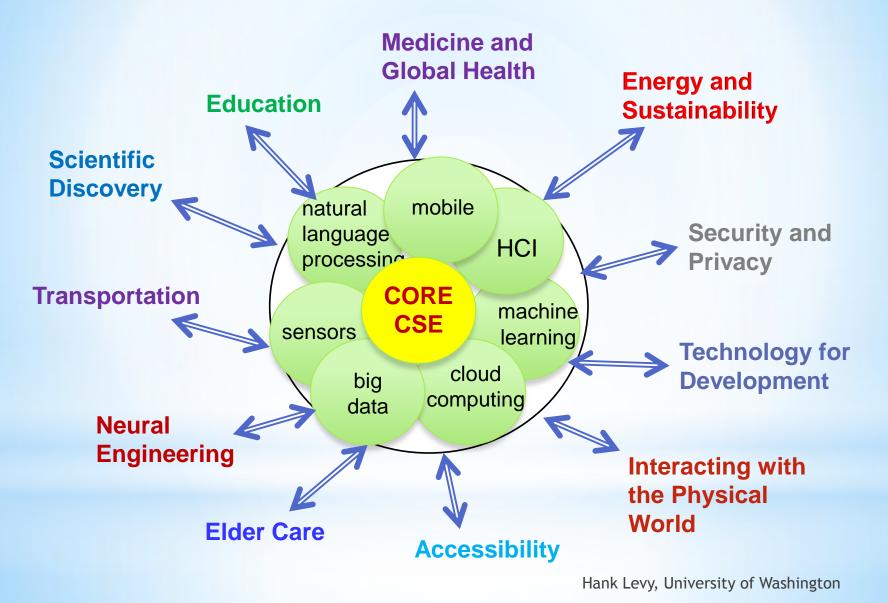












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