

THE COMPUTING COMMUNITY CONSORTIUM: CATALYZING AND ENABLING COMPUTING RESEARCH

Gregory Hager
Chair

Johns Hopkins University

Elizabeth Mynatt
Vice Chair
Georgia Tech

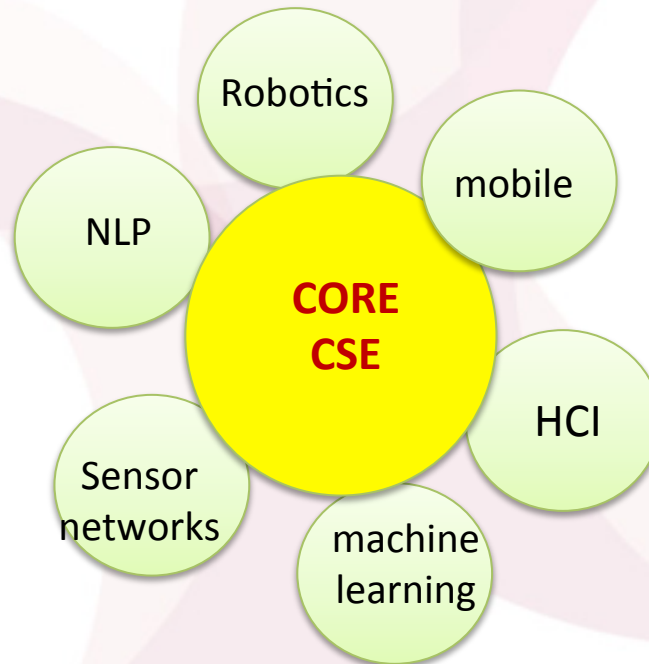
Ann Drobnis
Director



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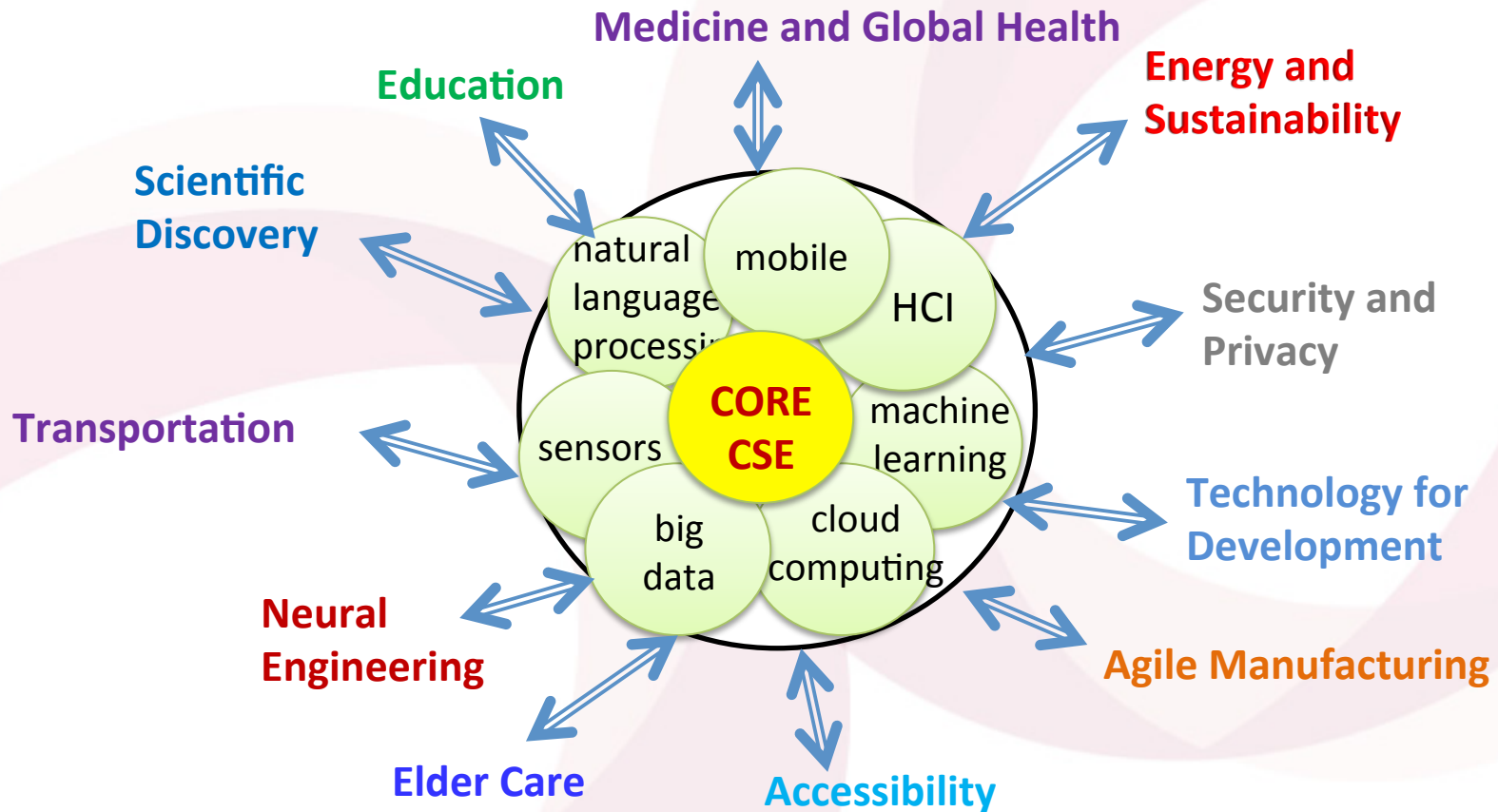
THE “CANONICAL” VIEW OF COMPUTER SCIENCE



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A MORE EXPANSIVE VIEW OF THE FIELD



Drivers: Industry, Society, Government, Science



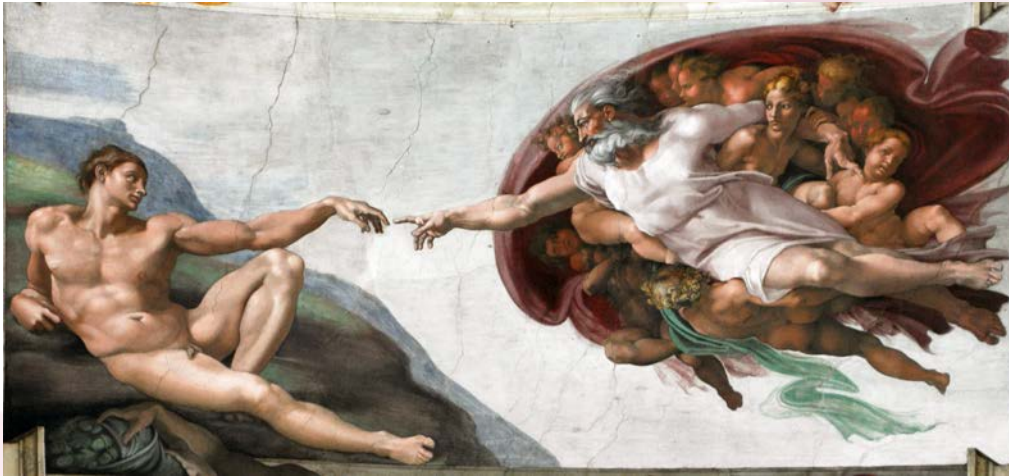
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Modified from Lazowska

WHAT IS OUR FUTURE? HOW DO WE SHAPE IT?

Enlightenment:
Is Computing the
future of thought
and discourse?



Renaissance: Is Computing creating a new ways to
Combine and create?



DIASPORA: Is it the beginning of
The end of Computing as
we know it?



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SOME MOTIVATING QUESTIONS

How do we energize the community around “big ideas” that will create excitement and energy for computing and computational research?

How do we shape and articulate the relevance of computing research to national priorities?

How do we communicate these ideas, as a community, to science policy and funding leadership?



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THE COMPUTING COMMUNITY CONSORTIUM

- Established in 2006 as a standing committee of the Computing Research Association
- Funded by NSF under a Cooperative Agreement
 - Second Award began in 2012, Site Visit completed in 2014
- 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



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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.



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CCC ORGANIZATIONAL STRUCTURE

Chair, Vice-chair

- 2 year non-staggered terms
- Vice-chair is presumptive chair

Executive Committee

- Chair, Vice-chair, Director
- 3 at large drawn from Council for 1-year terms
- CRA Executive Director

Council

- 20 members
- 3 year terms, at most 2 consecutive terms

Director, Program associate

- Full-time paid positions



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THE CCC COUNCIL – EXECUTIVE COMMITTEE



- Greg Hager, Johns Hopkins Univ. (Chair)
- Beth Mynatt, Georgia Tech (Vice Chair)
- Susan Graham, UC Berkeley (Past Chair)
- Bob Sproull, formerly Sun Labs, Oracle
- Liz Bradley, University of Colorado, Boulder
- Mark Hill, University of Wisconsin, Madison
- Ann Drobnis, Director
- Andy Bernat, CRA Executive Director



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THE CCC COUNCIL

Terms ending June 2017

- Lorenzo Alvisi, UT Austin
- Vasant Honavar, Penn State
- Jennifer Rexford, Princeton
- Debra Richardson, UC Irvine
- Klara Nahrstedt, UIUC
- Ben Zorn, Microsoft Research

Terms ending June 2016

- Randy Bryant, CMU**
- Limor Fix, formerly Intel
- Tal Rabin, IBM
- Daniela Rus, MIT
- Ross Whitaker, Univ. Utah

Terms ending June 2015

- Sue Davidson, Univ. Pennsylvania
- Joe Evans, Univ. Kansas
- Ran Libeskind-Hadas, Harvey Mudd College
- Shashi Shekhar, Univ. Minnesota

** 1 year leave



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OUR MISSION

Catalyze and communicate the excitement of computing research

Align and articulate our contributions to other fields and to national priorities

Groom future leadership to help shape science policy



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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!



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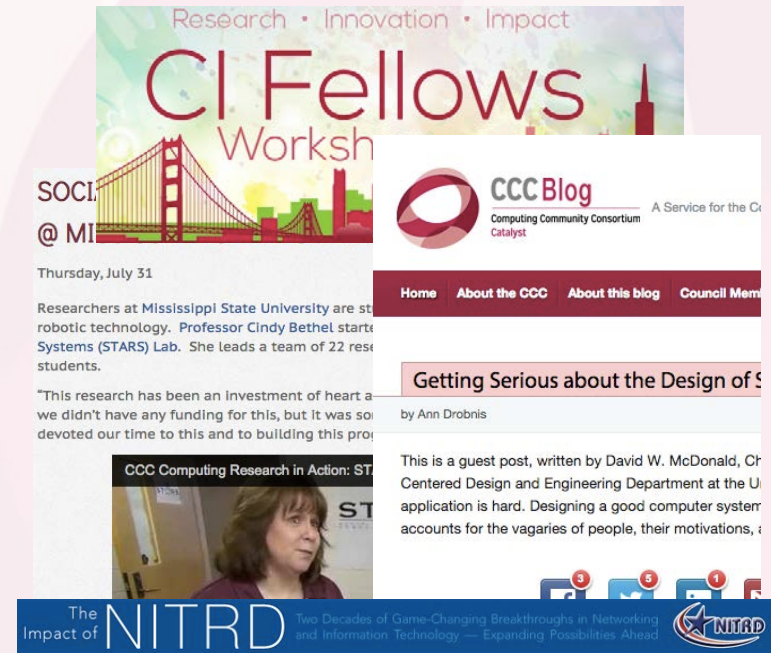
WHAT DO WE DO?

Community-initiated visioning:

- Workshops to discuss “out-of-the-box” ideas
- Blue Sky Ideas tracks at conferences

Outreach to White House, funding agencies:

- Outputs of visioning activities
- Short reports to inform policy makers
- Task Forces – Health IT, Computing in the Physical World, Manufacturing, Big Data, Industry, High Performance Computing, Education



Communicating CS Research:

- CCC Blog [<http://cccblog.org/>]
- Computing Research in Action Video Series
- Research “Highlight of the Week”
- “The Impact of NITRD” symposium

Nurturing the next generation of leaders:

- Computing Innovation Fellows Project
- Leadership in Science Policy Institute
- Postdoc Best Practices Program



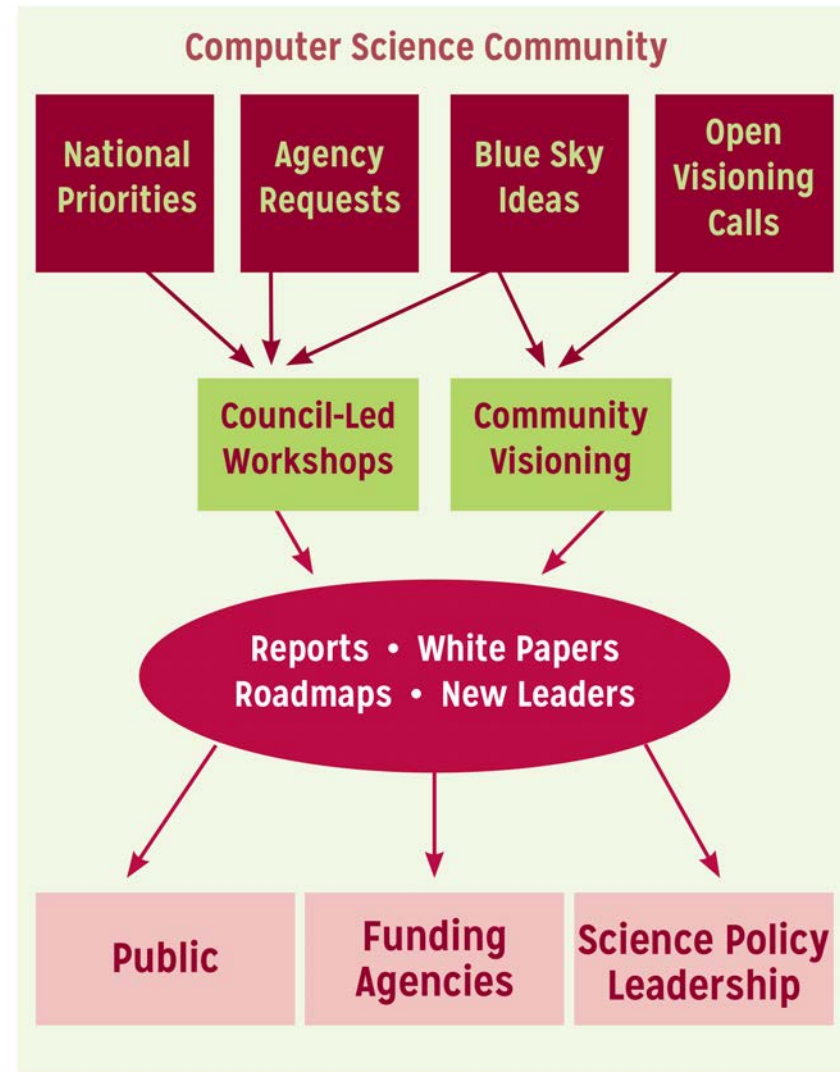
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VISIONING GOALS

Communicate the role of CS research to stakeholders

Develop leadership capacity to help shape science policy



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VISIONING PROCESSES

- Periodic RFP for Community Initiated Activities
- Historically 3-7 workshops per year
- Top-down (agency initiated)
- Bottom-up (open call)
- Sideways (council initiated, joint with other agencies,)



Robotics



Spatial
Computing



Online
Education



Privacy R&D



Uncertainty in
Computation



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VISIONING ACTIVITIES

2012

- From GPS and Virtual Globes to Spatial Computing – 2020
- Computing and Healthcare: New Opportunities and Directions

2013

- Convergence of Software Assurance Methodologies and Trustworthy Semiconductor Design and Manufacture (SA+TS)
- Multidisciplinary Research for Online Education
- Privacy R&D Workshop (with ITIF)
- Extreme Scale Design Automation 2 (with ACM)
- Visions of Theory of Computing (with Simons Institute)
- Robotics, Automation, and Computer Science (with NSF, OSTP)

2014

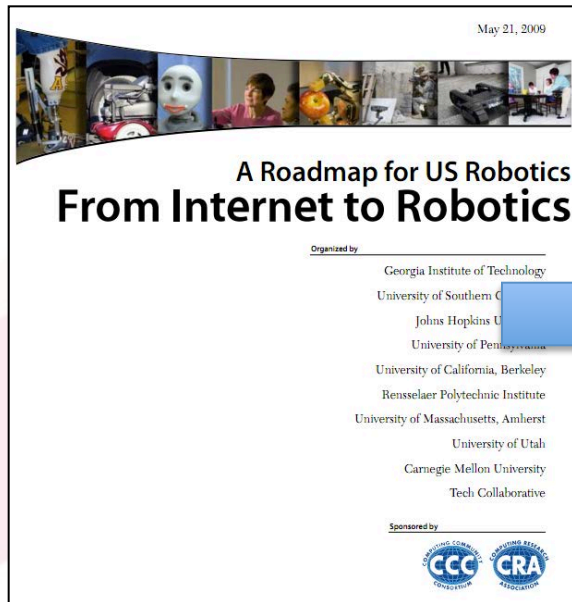
- Extreme Scale Design Automation 3 (with ACM)
- Computing Visions 2025: Interacting with the Computers All Around Us (with CISE)
- Computing Visions 2025: The New Making Renaissance: Programmable Matter and Things (with CISE)
- Human Computation
- Aging in Place
- Uncertainty in Computation
- BRAIN



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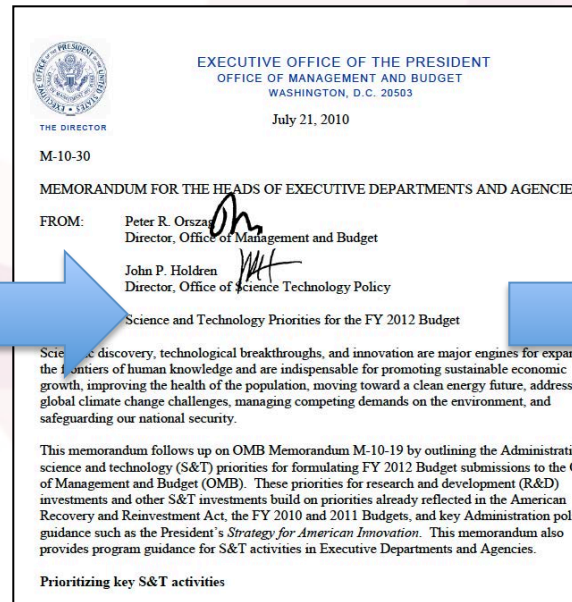
CATALYZING AND ENABLING: ROBOTICS



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: BIG DATA

A Series on Data Analytics: From Data to Knowledge

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

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

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

Enabling a Revolution in New Transportation [PDF | Word]
Sebastian Thrun, Stanford University, Chase Hensel, and Erwin P. Chao, Computing Research Association

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

Enabling the Smart Grid [PDF | Word]
Randal E. Bryant, Carnegie Mellon University, Randy H. Katz, University of Illinois at Urbana-Champaign, and Erwin P. Chao, Computing Research Association

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

2008

2008

2010

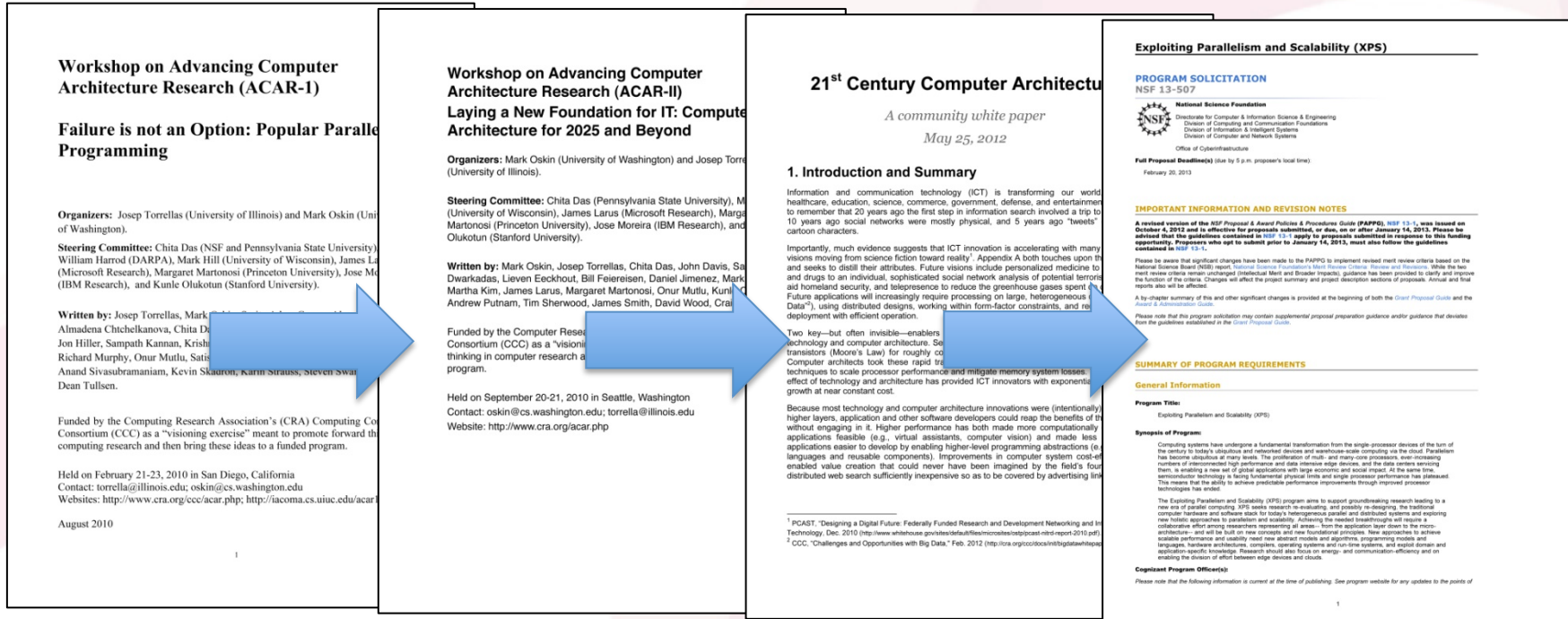
2012



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CATALYZING AND ENABLING: ARCHITECTURE



2010

2010

2012

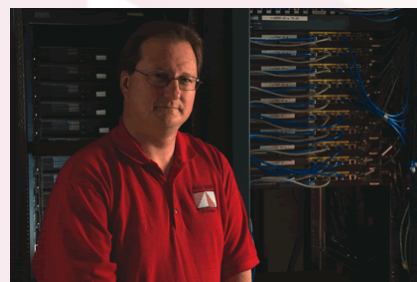
2013



Josep Torrellas
UIUC



Mark Oskin
Washington



Mark Hill
Wisconsin

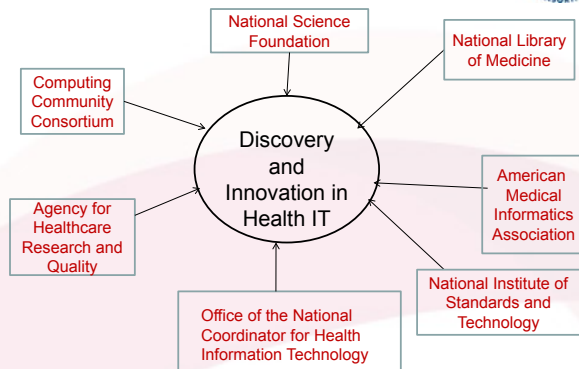


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CATALYZING AND ENABLING: HEALTH IT

October 2009 Workshop



National Science Foundation
WHERE DISCOVERIES BEGIN

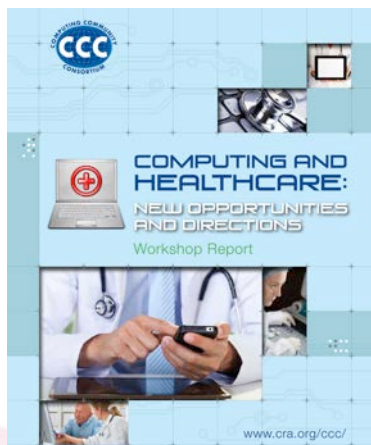
Directorate for Computer & Information Science & Engineering

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



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COMPUTING VISIONS 2025

- Joint Venture of NSF CISE Advisory Committee and CCC
- Articulate future trends and opportunities in computing research. Envision evolution and growth over the next 10 to 15 years.
- 3 Initial Workshops:
 - **Interacting with the Computers All Around Us**
 - Look at how technology could change how computers interface with people and the world around them.
 - **The New Making Renaissance: Programmable Matter & Things**
 - Explore the way items are designed, programmed, manufactured, and delivered/deployed.
 - **Summarizing roundtable(forthcoming)**
 - Discuss emerging themes from prior workshops and deliver a summarizing report.
- Panel session at Snowbird 2014



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SOME RECENT AND UPCOMING EVENTS

- Aging in Place (with NIH)
- Uncertainty in Computation (Community driven)
- BRAIN (with CISE)
- Privacy by Design (Community driven)
- CS Visions 2025 (with CISE AC)



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CCC WORKING GROUPS

Topic areas stemming from societal priorities and the needs of our community

- Computing and the Physical World
- Data Analytics
- Education
- Health IT
- Industry
- Manufacturing
- High Performance Computing



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BLUE SKY IDEAS CONFERENCE TRACKS

- Special “Blue Sky Ideas” tracks at leading conferences
 - Reach beyond usual papers
- CCC provides prize money for top 3 papers
 - Papers should be:
 - open-ended
 - “outrageous” or “wacky”
 - Present new problems, new application domains or new methodologies
 - Relatively short (4-6 pages)
 - Published after the conference



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DETAILS

- Conference Organizers write a proposal, indicating how papers will be solicited and reviewed
- Blue Sky Chair and Director read proposals and determine viability
- Once Track is approved, a CCC liaison is assigned
- BS Chair or liaison may attend the Conference to present information about the CCC and the awards



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BLUE SKY IDEAS CONFERENCE TRACKS

- BuildSys 2012
- Computational Sustainability Track @ AAI 2013
- Computational Sustainability Award @ CHI 2013
- Robotics: Science and Systems 2013
- Conference on Innovation Data Systems Research (CIDR-2013)
- Autonomous Agents and MultiAgent Systems (AAMAS-2014)
- Foundations of Software Engineering 2014
- Upcoming:
 - Association for the Advancement of Artificial Intelligence 2015
 - SIGSPATIAL 2015



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LEADERSHIP IN SCIENCE POLICY INSTITUTE

To educate a cadre of computing researchers on how science policy in the U.S. is formulated and how our government works

November, 2011

- 34 attendees
- 7 women
- 19 received financial aid
- 24 institutions represented
- 23 participants from public institutions, 7 from private, 4 from industry



April, 2013

- 53 attendees
- 12 women
- 6 received financial aid
- 47 institutions represented
- 40 participants from public institutions, 12 from private, 1 from industry



Next LISPI: April, 2015



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www.cra.org/ccc

www.cccblog.org



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