The Computing Community Consortium
Catalyzing and Enabling Computing Research

Gregory D. Hager
CCC Vice-Chair
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

http://cra.org/ccc
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

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

Stephanie 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

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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!
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

- 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
Challenges & Visions 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 and to seek out papers that present ideas and visions that can stimulate the research community to pursue new directions”

- Have supported 8 in the past year
Catalyzing: Visioning Activities

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

Sustainability & IT
- Financial Cyberinfrastructure
- Computing and Healthcare
- Cyber-physical systems
- Spatial Computing
- Big Data Computing
- Privacy R&D

Disaster Management
- ROBOTICS
- Online Education
- Free & Open Source Software
- Learning Technologies
- Global Development
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

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Catalyzing and Enabling: Big Data

A Series on Data Analytics: From Data to Knowledge to Action

From Data to Knowledge to Action: A Global Enabler for the

Eric Horvitz, Microsoft Research and Tom Mitchell, Carnegie Mellon University

Enabling Evidence-Based Healthcare [PDF | Word]

Eric Horvitz, Computing Research Association

Enabling an Initiative in “New Biology” [PDF | Word]

Chase Hensel, Computing Research Association and Erwin P. Dunn

Enabling 21st Century Discovery in Science and Engineering

Randal E. Bryant, Carnegie Mellon University and Ed Lazowska

Enabling Advanced Intelligence and Decision-Making for America

Randal E. Bryant, Carnegie Mellon University, Jamie G. Carboni, Tom Mitchell, Carnegie Mellon University

Enabling a Revolution in New Transportation [PDF | Word]

Sebastian Thrun, Stanford University, Chase Hensel, Computing Research Association

Enabling Personalized Education [PDF | Word]

Beverly Park (Wolf), University of Massachusetts-Amherst, NSF Computing Research Association

Enabling the Smart Grid [PDF | Word]


Challenges and Opportunities with Big Data [PDF]

A community white paper developed by leading researchers
Catalyzing and Enabling: Architecture
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
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 2012 Workshop

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

http://cra.org/ccc
Directorate for Computer & Information Science & Engineering

SMART HEALTH AND WELLBEING (SHW)

CONTACTS

See program guidelines for contact information.

SYNOPSIS

Information and communications technologies are poised to transform our access to and participation in our own health and well-being. The complexity of this challenge is being shaped by concomitant transformations to the fundamental nature of what it means to be healthy. Having good health increasingly means managing our long-term care rather than sporadic treatment of acute conditions; it places greater emphasis on the management of wellness rather than healing illness; it acknowledges the role of home, family, and community as significant contributors to individual health and wellbeing as well as the changing demographics of an increasingly aging population; and it recognizes the technical feasibility of diagnosis, treatment, and care based on an individual's genetic makeup and lifestyle. The substrate of 21st century healthcare will be computing and networking concepts and technologies whose transformative potential is tempered by unresolved core challenges in designing and optimizing them for applicability in this domain.

The goal of the Smart Health and Wellbeing program is to seek improvements in safe, effective, efficient, equitable, and patient-centered health and wellness services through innovations in computer and information science and engineering. Doing so requires leveraging the scientific methods and knowledge bases of a broad range of computing and communication research perspectives.

Some illustrative examples are described here. Protecting patient privacy while providing legitimate anytime, anywhere access to health services will require new security and cryptographic solutions. Personalized medicine will require advances in information retrieval, data mining, and decision support software systems. Continuous monitoring and real-time, customized feedback on health and behavior will rely on remote and networked sensors and actuators, mobile platforms, novel interactive displays, and advances in computing and networking infrastructure. Data collected by sensors, at clinics, and labs need to be anonymized and aggregated for community-wide health awareness and maintenance. Such data, especially collected over populations, can lead to inferences about best practices and cost savings in providing health services. Virtual worlds, robotics, image, and natural language understanding can facilitate better and more efficient delivery of health services. Software-controlled and interoperable medical devices are necessary for providing safe critical care. Healthcare systems and applications must be usable, to preclude or minimize failures due to human error; and they have to be useful, by matching the mental model of users, from provider to patient, so people make appropriate decisions and choices. These examples are meant to convey the breadth of computing areas that...

Smart and Connected Health (SCH)

PROGRAM SOLICITATION
NSF 13-543

REPLACES DOCUMENT(S):
NSF 12-512

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

Agenda

8:30 am - 9:00 am
Welcome [100 KB PDF]\n(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 [43 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?

Logistics

Date: November 7, 2011
Location: Hyatt Regency Capitol Hill, Washington, 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
“Improving Brain-Computer Interfaces”

October 17th, 2011 by Erwin Gianchandani | Edit this entry

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”

Network in big science, research horizons, research news
The Future of Computer Science is at the Interface

NEW DRIVERS: INDUSTRY, SOCIETY, GOVERNMENT, SCIENCE
Opportunities in Biology, Health, and HealthCare

- The growing interest and need for
  - cloud-based data analytics
  - data curation
  - replicable analysis

- Mobile health applications
  - Now over 13k health-related iphone apps

- Care monitoring and analytics

- Individualized health
How Can Computing Community Support the NIH Mission?
How Can Computing Community Support the NIH Mission?

- What do you see coming down the road?

- What do flat budgets mean for computational research at NIH?

- How can we help leverage NIH spending as a “neutral ground”
  - Foundations
  - Other agencies
  - Commercial sector
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