

INTRODUCTION TO THE CCC AND THE CCC COUNCIL

June 20, 2017



CCC

Computing Community Consortium
Catalyst

AN OVERVIEW OF THE COMPUTING COMMUNITY CONSORTIUM

- Established in 2006 as a standing committee of the Computing Research Association (CRA)
- Funded by NSF under a Cooperative Agreement
 - Third Award begins in 2017, completed Reverse Site Visit (April 2017)
- Facilitates the development of a bold, multi-themed vision for computing research – and communicates this vision to stakeholders
- Led by a broad-based Council
- Staff based at CRA

WHAT WE'LL TRY TO COVER

- Brief history
- Role and mission of CCC
- Organizational details
- CCC Stakeholders
- CCC Goals, Activities and Desired Outcomes
- CCC Impact

PRE-HISTORY

In the mid-2000's, NSF CISE leaders and computing research community leaders had similar concerns regarding:

- The Federal commitment to research in general, and to computing research in particular
- Public and policymaker perception that computer science is “yesterday’s news”
- Failure to articulate and coalesce around exciting research visions in computer science – research visions that would galvanize the public, policymakers, researchers, and students
- Need to groom leadership for the field
- Decrease in student interest
- GENI Project direction

This led to:

- Increased focus on these issues by NSF CISE and the computing research community
- Computing Community Consortium solicitation by NSF
- Eager response by a group of computing research community leaders under the auspices of the Computing Research Association
 - Randy Bryant
 - Susan Graham
 - Anita Jones
 - Dick Karp
 - Ken Kennedy
 - Ed Lazowska
 - Peter Lee
 - Jeff Vitter

INFORMAL MISSION

“A catalyst and enabler for the computing research community”

- Bring the community together to contribute to shaping the future of the field
- Provide leadership for the community, encouraging revolutionary, high-impact research
- Encourage the alignment of computing research with pressing national priorities and national challenges (many of which cross disciplines)
- Work with policymakers to facilitate the translation of these important research directions into funded programs
- Give voice to the community, communicating to a broad audience the many ways in which advances in computing will create a brighter future
- Grow new leaders for the computing research community



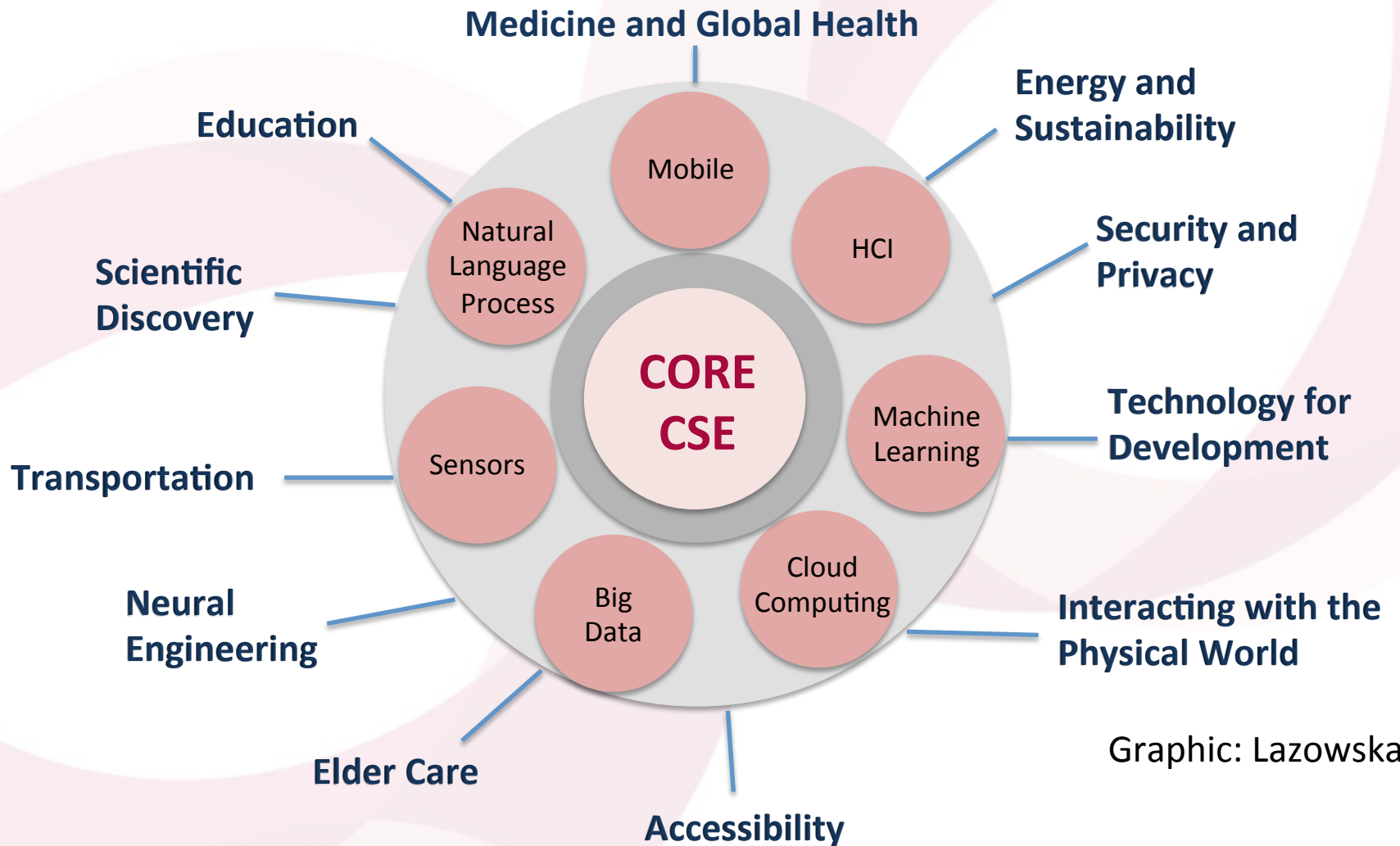
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MAJOR ORGANIZATIONAL MILESTONES

- NSF solicitation + CRA Proposal + Cooperative Agreement (2006)
- Chair appointed (Winter 2007) + Council appointed (Spring 2007)
- Vice-Chair position formalized: Fall 2007
- Full-time Director (Erwin Gianchandani) joins: Spring 2010
- Renewal proposal submitted: Spring 2011
- Steady-state organizational structure defined: Fall 2012
- Executive Committee launched: Winter 2013
- Ann Drobnis joins as Director: Spring 2013
- Regular Chair / Vice-Chair succession kicks in: Summer 2013
- Proposal and Renewal (in process, 2017)

THE RAPIDLY EXPANDING WORLD OF COMPUTING



Graphic: Lazowska

COMPUTING COMMUNITY CONSORTIUM

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.



Promote Audacious Thinking:

- Community Initiated Visioning Workshops
- Blue Sky Ideas tracks at conferences

Communicate to the Community:

- CCC Blog - <http://cccblog.org/>
- Great Innovative Ideas
- White Papers and Workshop Reports
- Social Media
- Council member presentations

Facilitate Investment:

- Outputs of visioning activities
- Task Forces - Health, AI, Privacy etc.
- Engage with federal agencies and industry

Inculcate Leadership and Service:

- Engage with CCC Alumni and Sister Organizations
- Biennial Symposia series

Influence Early Career Researchers:

- Industry - Academic Collaborations
- Leadership in Science Policy Institute
- Postdoc Best Practices

ORGANIZATIONAL STRUCTURES

June 20, 2017



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CCC ORGANIZATIONAL STRUCTURE

Chair, Vice-chair

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

Director, Program Associates (2)

- Full-time paid positions

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

Support

- As needed, from CRA Staff

WHAT DOES EXECUTIVE COMMITTEE DO?

- Each member has a major responsibility within the organization
- Oversees the work of subcommittees and working groups
- Guides the planning of new activities
- Oversees the execution of the Strategic Plan and annual Implementation Plan
- Meets biweekly by teleconference
- Meets biweekly with NSF by teleconference



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WHAT DO COUNCIL MEMBERS DO?

- Shepherd visioning activities
- Participate in topical task forces
 - Examples: AI and Robotics, Healthcare, Privacy and Fairness
 - Produce and curate relevant resources
 - Monthly teleconferences
- Develop new activities
 - Examples: CIFellows, LISPI, Post-doc Best Practices, Big Data Hub Industry-Academia Collaboration
- Engage with government agencies, industry, and sister organizations (NSF, ACM, Big Data Hubs...)
- Write white papers and blog posts
- Other requests as needed
- Monthly teleconferences
- Three face-to-face meetings each year



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THE CCC COUNCIL



Terms ending June 2020

- Nadya Bliss, Arizona State
- Elizabeth Churchill, Google
- Juliana Freire, NYU
- Keith Marzullo, Maryland
- Greg Morrisett, Cornell
- Manuela Veloso, Carnegie Mellon



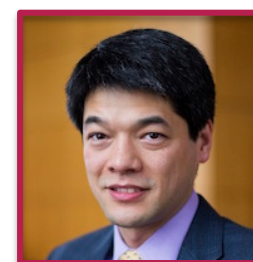
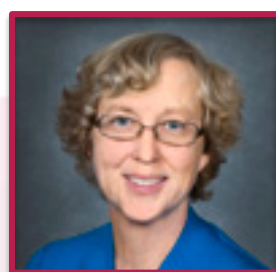
Terms ending June 2019

- Sampath Kannan, UPenn
- Maja Mataric, USC
- Nina Mishra, Amazon
- Holly Rushmeier, Yale



Terms ending June 2018

- Liz Bradley, CU Boulder
- Cynthia Dwork, Microsoft Research
- Kevin Fu, Univ. Michigan (Leave)
- Daniel P. Lopresti, Lehigh University
- Shwetak Patel, Univ. Washington
- Katherine Yelick, UC Berkeley
- Jennifer Rexford, Princeton
- Ben Zorn, Microsoft Research



CRA STAFF

CCC Director: Ann Drobnis

- 100% CCC, responsible for day-to-day management of the Organization

Senior Program Associate: Helen Wright

- 100% CCC, responsible for promoting the CCC mission through the website, blog, and social media

Program Associate: Khari Douglas

- 100% CCC, responsible for supporting CCC special programs, workshops, and communications

CRA Executive Director: Andy Bernat

- 10% CCC, responsible for general oversight

Other CRA Staff:

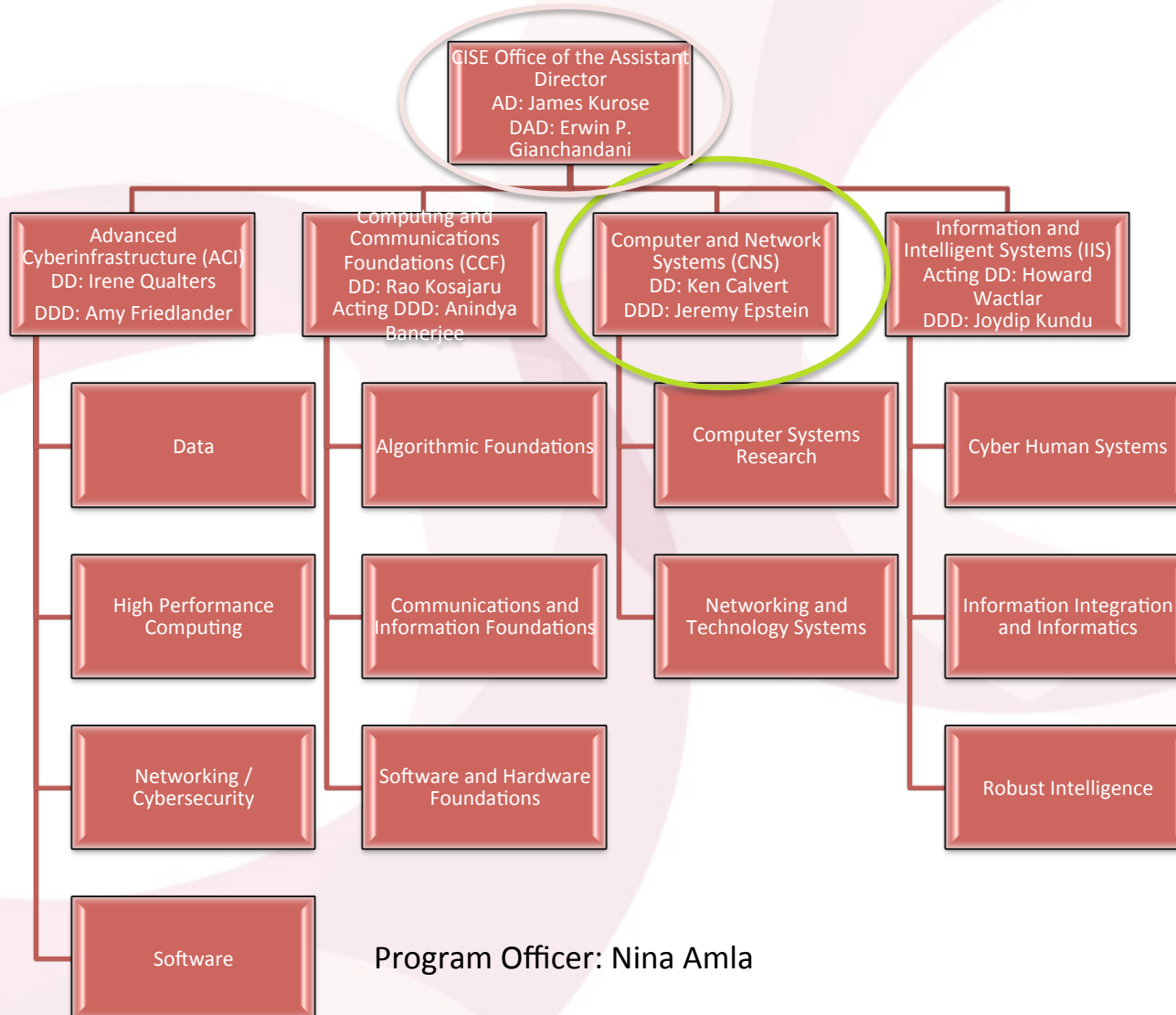
- Peter Harsha, Director of Government Affairs
- Sandra Corbett
- Sabrina Jacob



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NSF INTERACTIONS



RELATIONSHIP TO COMPUTING RESEARCH ASSOCIATION (CRA)

NSF cooperative agreement is with CRA

CCC is a standing committee of CRA

- Andy Bernat, CRA Executive Director, is an ex officio member of the CCC Executive Committee
- Beth Mynatt, the CCC Chair is a member of the CRA Board of Directors
- Susan B. Davidson, the CRA chair must consent to CCC Council appointments (and is a former Council member)
- Greg Hager, past CCC Chair and member of the CRA Board of Directors
- Greg Morrisett, CCC Council member and member of the CRA Board of Directors
- Shashi Shekhar, past CCC Council member and member of the CRA Board of Directors
- Josep Torrellas, past CCC Council member and member of the CRA Board of Directors

CCC staff are based in CRA

CCC AND ITS STAKEHOLDERS



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MAJOR STAKEHOLDERS

- Computing Research Community
 - CRA
 - CSTB (Computer Science and Telecommunications Board, part of National Research Council)
 - Professional societies
 - Academic units
 - Research labs
- Industry
 - Computing industry, Major users of IT
- Public
- Government
 - See following slides

GOVERNMENT STAKEHOLDERS

Agencies important to us

- NSF – strong ties with CISE
- NIH – growing ties with folks interested in Health IT
- DARPA – ties come and go
- DoE – ties with ASCR; interest in ARPA-E

Others that are relevant

- NIST
- HHS/ONC



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GOVERNMENT STAKEHOLDERS

Networking and Information Technology R&D (NITRD)

- 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 Bryan Biegel



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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

2013

- 1/4 Contributing Members were CCC Council Members
- An excellent review of progress from 2010 report
- The challenge now: Continuing to translate it into action

2015

- 1/3 Contributing Members were CCC Council Members
- An update to the 2013 report, including recommendations for Federal Agencies
- The challenge now: restructuring NITRD



CCC GOALS AND ACTIVITIES

June 20, 2017

GOALS FOR CCC

- 1. Bring the computing research community together to envision audacious research challenges, and to articulate concrete pathways to enable pursuit of these challenges.**
- 2. Communicate** these challenges and opportunities to the broader national community.
- 3. Facilitate investment** in these research challenges **by key stakeholders.**
- 4. Inculcate** values of **leadership** and service by the computing research community.
- 5. Inform and influence early career researchers** to engage in these community-led research challenges.

DESIRED OUTCOMES

- 1. Create broad awareness of the role computing research will play in future science and technology advances** within federal agencies, philanthropic organizations, and industry through concrete examples and products.
- 2. Facilitate broad engagement of the computing research community** in identifying and articulating new directions for computing research, in shaping priorities for those new directions, and in responding to existing opportunities in the computing research ecosystem.
- 3. Create high-impact tangible resources** that inform stakeholders as to the current and potential impact of computing research.
- 4. Sustain the CCC** as a widely accepted catalyst and voice for the computing research community.
- 5. Grow leadership and community capacity** to engage in and respond to national science policy needs.

Mapping CCC Strategic Goals to Priority Outcomes

	Goal 1: Research Challenges	Goal 2: Communicate Broadly	Goal 3: Research Investments	Goal 4: Leadership	Goal 5: Influence Community
Outcome 1: Agency Awareness	✓	✓	✓		
Outcome 2: Community Engagement	✓	✓		✓	✓
Outcome 3: Tangible Resources	✓	✓	✓		✓
Outcome 4: CCC Role	✓	✓		✓	
Outcome 5: Leadership and Capacity	✓	✓	✓	✓	✓

PLANNED ACTIVITIES

- Envisioning Future Computing Research
- Engaging and Aligning with National and Computing Research Priorities
- Communicating Future Computing Research
- Cultivating Computing Leadership and Community Capacity to Engage and Respond to National Priorities

ENVISIONING FUTURE COMPUTING RESEARCH

“The Computing Community Consortium (CCC) solicits proposals that will galvanize the community to define visions and agendas for exciting frontiers of computing research.”

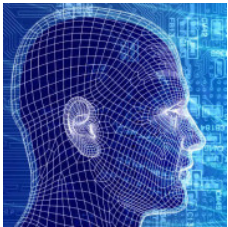
- Create a new community of researchers.
- Inform a new funding initiative.
- Help an extant community define a new trajectory.

Goals for next phase

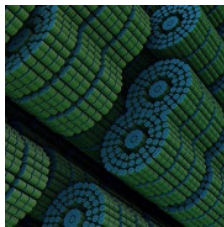
- Increase the participation of industry leadership and early career researchers at Visioning Workshops
- Expand the adoption of Blue Sky tracks at computing conferences
- Establish a biennial symposia series Computing Research: Addressing National Priorities and Societal Host on odd years and host in DC.

VISIONING PROCESSES

- Periodic RFP for Community Initiated Activities
- 6 workshops per year in the last 3 years
- Top-down (agency initiated)
- Bottom-up (open call)
- Sideways (council initiated, joint with other agencies,....)



Cyber Social
Learning
Systems



Nanotechnology-
inspired
Information
Processing Systems



Smart
Health



Sociotechnical
Cybersecurity



Cybersecurity
for
Manufacturers

VISIONING ACTIVITIES

- Over 40 visioning activities in 10-year history
- Average of 6 activities per year in the last 4 years
- Research areas include:
 - Smart and Pervasive Health
 - Nanotechnology-inspired Information Processing Systems
 - Cyber Social Learning Systems
 - Privacy by Design
 - BRAIN Initiative
 - Inclusive Access
 - Personalized Education
- 13 workshop reports released in past 4 years
- 20 white papers released in past 4 years

Workshop	Date
Privacy by Design – Catalyzing Privacy by Design	January 6-7, 2016
Robotics	March 5 and 11, 2016
Cyber-Social Learning Systems Workshop 1	August 29-30, 2016
Nanotechnology-Inspired Information Processing Systems of the Future	August 31-September 1, 2016
Cyber-Social Learning Systems Workshop 2	November 2-3, 2016
Discovery and Innovation in Smart and Pervasive Health	December 5-6, 2016
Sociotechnical Cybersecurity Workshop 1	December 12-13, 2016
Cyber-Social Learning Systems Workshop 3	January 24-25, 2017
Cyber Security for Manufacturers	March 14-15, 2017

SUCCESSFUL VISIONING ACTIVITIES

- Engage the community and relevant stakeholders
- Facilitate broad thinking with compelling examples
- Create new avenues for (interdisciplinary) collaboration
- Prepare and energize the community for future opportunities
- Rapidly capture and synthesize ideas from the community.
- Present ideas and engage possible funders and stakeholders
- Articulate needs and barriers to research impact

BLUE SKY

Goal - Help conferences reach out beyond the usual research papers. Papers are opened ended and possibly “outrageous” or “wacky.”

- 8 different tracks at 6 different conferences in last 4 years
- On average, 13 papers submitted per track at a conference
- Winners are asked to submit Great Innovative Ideas



Past CCC Chair Gregory Hager with AAI-16 Blue Sky award winner Francesca Rossi



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RECENT 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, AAMAS-2016, AAMAS-2017)
- Foundations of Software Engineering (ACM SIGSOFT 2014)
- Advancement of Artificial Intelligence (AAAI-15, AAAI-16, AAAI-17)
- Advances in GIS (ACM SIGSPATIAL 2015, ACM SIGSPATIAL 2016)
- Robotics: Science and Systems (RSS) 2015
- Advancement of Artificial Intelligence (AAAI-15 and AAAI-16)
- International Conference on Software Engineering (ICSE 2016)
- **Upcoming:**
- Robotics: Science and Systems (RSS) 2017
- AAAI-18



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ENGAGING AND ALIGNING WITH NATIONAL AND COMPUTING RESEARCH PRIORITIES

- Agility to respond to requests and ideas.
- Outreach pulls together visioning with stakeholder needs and timely opportunities
- Increase scale and capacity through CCC Task Forces
- Increase engagement with industry, sister organizations and other relevant stakeholders (philanthropy)

CCC TASK FORCES

CCC task forces are organized around national priorities, community needs, and council member interests. Our current set of topics are:

- Computing in the Physical World
- Convergence of Data and Computing
- Artificial Intelligence and Robotics
- Healthcare
- Privacy and Fairness

Goal is for CCC to be **engaged in ongoing activities** around these topics, to **identify needs and opportunities** in the topic area, and to **identify actions** (generating white papers, convening a workshop, publicizing information, etc.) that have the possibility of “moving the needle” for these topics.

Annual process to determine topics, membership and priorities. Informed by major stakeholders (NSF, OSTP, PCAST, NITRD, workshops and council members)

COMPUTING RESEARCH

ADDRESSING NATIONAL PRIORITIES AND SOCIETAL NEEDS



- Held first National Symposium to Highlight the Impact of Computing Research in 2016
- Establish a biennial Symposium to communicate the role of computing research to address national and societal priorities
- Bring in early career researchers to connect them with and invigorate the community



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COMMUNICATING

- Workshop Reports
- White Papers
 - CCC works with community to produce timely white papers that inform policymakers and the broader community on national priorities
- CCC Blog
 - Provides a continuous stream of information on advances in computing research
 - Opportunities for community to get involved
 - Forum for community discussion
- Great Innovative Ideas
 - A way to showcase the exciting new research and ideas generated by the computing community
- Annual events
 - CCC Symposium
 - CRA Snowbird
- Special Events



Computing
Research
2016



AI for Social Good
2016

NURTURING NEXT GENERATION OF LEADERS

Grow leadership and community capacity to engage in and respond to national science policy needs and identify new directions for computing research.

Leadership in Science Policy Institute

- Educates and trains computing researchers on how science policy in the U.S. is formulated and how to advocate for computing research
- Co-sponsored by CRA's Government Affairs Committee

Industry – Academic Collaborations

- CCC collaborated with Big Data Regional Hubs
- Activities to enhance the research of early career faculty

Postdoc Best Practices

- Program to study institutional support structures for postdocs
- 3 programs: University of Washington, NY ASCENT, Arizona

Computing Innovation Fellows (CIFellows) Project

- Rapidly created the CI Fellows program to preserve human capital when faculty positions became scarce with the financial crisis

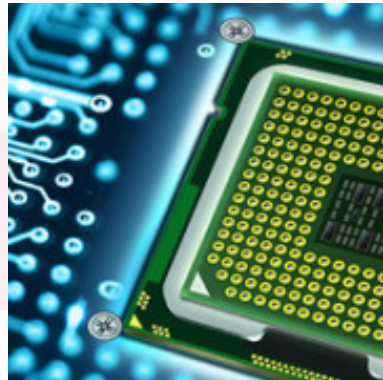
IMPACT

AMPLIFICATION



BRAIN Initiative launched in 2013.

CCC co-hosted the Brain Workshop with NSF in 2014.



CCC co-hosted the SA+TS workshop with SRC and NSF in 2013.

Produced Research Needs for Trustworthy, and Reliable Semiconductors Report in 2015.



NSCI announced in July 2015.

CCC produced a series of blog posts on the topic, featuring one from Doug Burger, and the Convergence of Data and Computing task force frequently overlaps with this topic.



Smart and Connected Health Program in NSF and NIH.

CCC has hosted several workshops on related topics, including: Aging in Place (2014), Inclusive Access (2015), and Smart and Pervasive Health (2016) and produced related reports and white papers.

IMPACT: BIG DATA

Big-Data Computing: Creating breakthroughs in commerce, science, and medicine

Randy H. Katz
University of California, Berkeley

Version 8: December 22, 2008

Motivation: Our Data-Driven World

Advances in digital sensors, communications, computational collections of data, capturing information of value to business and society. For example, search engine companies such as Google have created an entirely new business by capturing the information on the Wide Web and providing it to people in useful ways. The bytes of data every day and continually add new services, directions, and image retrieval. The societal benefits of having transformed how people find and make use of information are enormous.

Just as search engines have transformed how we access data computing can and will transform the activities of medical practitioners, and our nation's defense and intelligence.

- Wal-Mart recently contracted with Hewlett Packard to be capable of storing 4 petabytes (4000 trillion bytes) of purchase records by their point-of-sale terminals (at day) at their 6000 stores worldwide. By applying machine learning can detect patterns indicating the effectiveness of the campaigns, and better manage their inventory and sales.
- Many scientific disciplines have become data-driven. It is really just a very large digital camera. The proposed Telescopio (LISST) will scan the sky from a mountain top. Surveys daily! Astronomers will apply massive computing to the origins of our universe. The Large Hadron Collider will revolutionize our understanding of the workings of terabytes of data per day - 15 petabytes (15 million gigabytes) of data per day - 15 petabytes (15 million gigabytes) of data per day are proposed or underway in a wide range of environmental science to oceanography. It is impractical to replicate copies at the sites of individual pool their resources to construct a large data center for all of the affiliated scientists.

1 For the most current version of this essay, as well as related essays.

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A CATALYST AND ENABLER
for the computing research community

VISIONING ACTIVITIES

BIG-DATA COMPUTING STUDY

Under sponsorship by the CCC, the Big-Data Study applications of high-performance, data-intensive computing from astronomy to machine translation. To be published in the CCC White Paper series.

Leads for this workshop and for effort Randy Bryant (Carnegie Mellon University) and CCC council liaison for this workshop and Ed Lazowska (University of Washington)

Hadoop Summit
2008-2009, UC Berkeley, Steve and Mike
Hadoop is an open source project developing a distributed file system based systems. It includes a distributed file system parallel notation for expressing both elements of data-intensive computing, including both scientific and information-based applications.

Data-Intensive Computing Symposium
2008-2009, UC Berkeley, Steve and Mike
This symposium covered a broad range of topics aspects of data-intensive computing, including both scientific and information-based applications.

Participants | **Resources** | **Related Events**

Data-Intensive Scalable Computing in Education
July 14 - 18, 2008, University of Washington, Seattle
Cloud Computing and Its Applications 2008 (CCA)
October 22-23, 2008, Geacser Center, Chicago, IL

CCC-LED WHITE PAPERS

Big Data and National Priorities

From Data to Knowledge to Action: A Global Enabler for the 21st Century
September 11, 2010
Eric Horvitz, Microsoft Research and Tom Mitchell, Carnegie Mellon University

Enabling the Smart Grid
September 21, 2010
Randy E. Bryant, Carnegie Mellon University, Randy H. Katz, UC Berkeley, Chase Hansen, Association and Erwin P. Gianchandani, Computing Research Association

Enabling Evidence-Based Healthcare
September 16, 2010
Eric Horvitz, Microsoft Research

Enabling a Revolution in New Transportation
September 11, 2010
Sebastian Thrun, Stanford University, Chase Hansen, Computing Research Association

Enabling Personalized Education
September 16, 2010
Beverly Park Woolf, University of Massachusetts-Amherst, Ryan Baker, Worcester Polytechnic Institute, Erwin P. Gianchandani, Computing Research Association

Enabling an Initiative in "New Biology"
August 1, 2010
Chase Hansen, Computing Research Association and Erwin P. Gianchandani, Computing Research Association

Enabling Advanced Intelligence and Decision-Making for America
July 28, 2010
Randy E. Bryant, Carnegie Mellon University, Jaime G. Carbonell, Carnegie Mellon University

Enabling 21st Century Discovery in Science and Engineering
June 18, 2010
Randy E. Bryant, Carnegie Mellon University and Ed Lazowska, University of Washington

FOR IMMEDIATE RELEASE
March 29, 2012

Contact: Rick Weis
Lisa-Joy

OBAMA ADMINISTRATION UNVEILS "BIG DATA RESEARCH AND DEVELOPMENT STRATEGIC PLAN"

Aiming to make the most of the fast-growing volume of digital data, the initiative promises to help pressing challenges.

To launch the initiative, six Federal departments and agencies announced a "Big Data Research and Development Strategic Plan" that will harness the power of digital data, together with tools and techniques needed to access, organize, and analyze volumes of digital data.

"In the same way that past Federal investments in information technology have transformed our ability to discover, environmental and biomedical research, education, and industry, said Dr. John P. Holdren, Assistant to the President and Director of the Office of Science and Technology Policy.

To make the most of this opportunity, the White House Technology Policy (OSTP)—in concert with several Federal agencies—created the Big Data Research and Development Program.

- Advance state-of-the-art core technologies needed to manage, analyze, and share huge quantities of data.
- Harness these technologies to accelerate the pace of engineering, strengthen our national security, and improve learning; and
- Expand the workforce needed to develop and use these technologies.

THE NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT PROGRAM

NITRD

MAY 2016

2008

2008

2010

2012

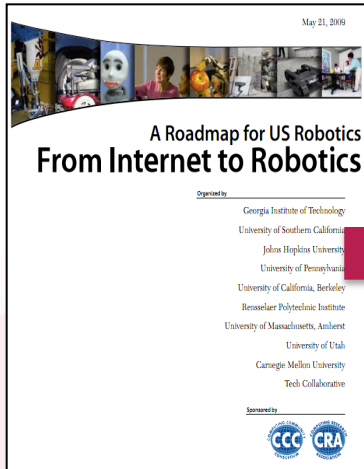
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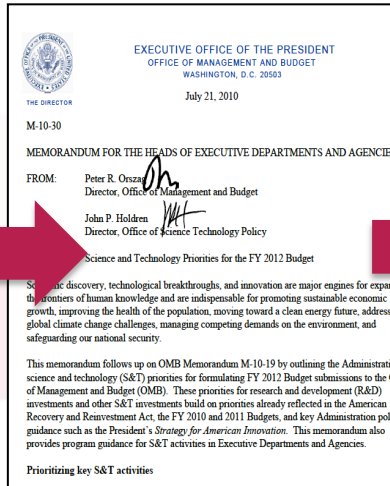
IMPACT: ROBOTICS



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



2 meetings in Spring, 2016
Report and Congressional Briefing in June, 2016



Henrik Chistensen



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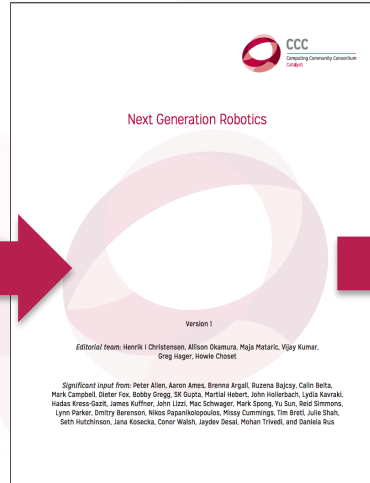
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IMPACT: ROBOTICS

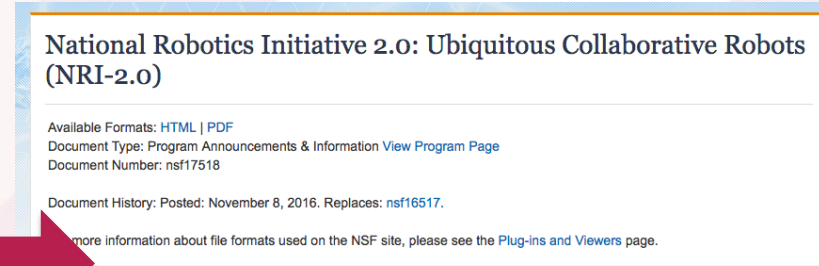


2 meetings in Spring, 2016

Report and
Congressional Briefing in
June, 2016



Next Generation
Robotics
published June, 2016



NRI 2.0 announced
November 2016



Henrik Chistensen



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IMPACT: ARCHITECTURE

<p>Workshop on Advancing Computer Architecture Research (ACAR-1)</p> <p>Failure is not an Option: Popular Parallel Programming</p> <p>Organizers: Josep Torrellas (University of Illinois) and Mark Oskin (University of Washington).</p> <p>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 M. (IBM Research), and Kunko Olukotun (Stanford University).</p> <p>Written by: Josep Torrellas, Mark Almadena Chichelkanova, Chita Das, Jon Hillier, Sampath Kannan, Krishna Richard Murphy, Onur Mutlu, Satish Anand Sivasubramanian, Kevin Skadron, Karin Strauss, Steven Swanson, Dean Tullsen.</p> <p>Funded by the Computing Research Association's (CRA) Computing Co Consortium (CCC) as a "visioning exercise" meant to promote forward thinking computing research and then bring these ideas to a funded program.</p> <p>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</p>	<p>Workshop on Advancing Computer Architecture Research (ACAR-II)</p> <p>Laying a New Foundation for IT: Computer Architecture for 2025 and Beyond</p> <p>Organizers: Mark Oskin (University of Washington) and Josep Torrellas (University of Illinois).</p> <p>Steering Committee: Chita Das (Pennsylvania State University), M. (University of Wisconsin), James Larus (Microsoft Research), Margaret Martonosi (Princeton University), Jose Moreira (IBM Research), and Olukotun (Stanford University).</p> <p>Written by: Mark Oskin, Josep Torrellas, Chita Das, John Davis, S. Dwarakadas, Lieven Eeckhout, Bill Feoerisen, Daniel Jimenez, Mark Martho Kim, James Larus, Margaret Martonosi, Onur Mutlu, Kunko Andrew Putnam, Tim Sherwood, James Smith, David Wood, Craig</p> <p>Funded by the Computer Research Consortium (CCC) as a "visioning exercise" meant to promote forward thinking in computer research and then bring these ideas to a funded program.</p> <p>Held on September 20-21, 2010 in Seattle, Washington Contact: oskin@cs.washington.edu; torrella@illinois.edu Website: http://www.cra.org/acar.php</p>	<p>21st Century Computer Architecture</p> <p><i>A community white paper</i></p> <p>May 25, 2012</p> <p>1. Introduction and Summary</p> <p>Information and communication technology (ICT) is transforming our world, healthcare, education, science, commerce, government, defense, and entertainment 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" and cartoon characters.</p> <p>Importantly, much evidence suggests that ICT innovation is accelerating with many visions moving from science fiction toward reality. Appendix A both touches upon the and seeks to distill their attributes. Future visions include personalized medicine to and drugs to an individual, sophisticated social network analysis of potential terrorist homeland security, and telepresence to reduce the greenhouse gases spent. Future applications will increasingly require processing on large, heterogeneous "Data"), using distributed designs, working within form-factor constraints, and deployment with efficient operation.</p> <p>Two key—but often invisible—enablers of technology and computer architecture, See Moore's Law for roughly of Computer architects took these rapid techniques to scale processor performance and mitigate memory system losses. effect of technology and architecture has provided ICT innovators with exponential growth at near constant cost.</p> <p>Because most technology and computer architecture innovations were (intentionally) higher layers, application and other software developers could reap the benefits of 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.g., languages and reusable components). Improvements in computer system cost-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</p> <p><small>¹ FCAST, "Designing a Digital Future: Federally Funded Research and Development Networking and Technology, Dec. 2010 (http://www.whitehouse.gov/sites/default/files/microsites/efpcast-nrtd-report-2010.pdf) ² CCC, "Challenges and Opportunities with Big Data," Feb. 2012 (http://info.library.yale.edu/ccc/bigdata/whitepaper)</small></p>	<p>Exploiting Parallelism and Scalability (XPS)</p> <p>PROGRAM SOLICITATION NSF 13-507</p> <p>National Science Foundation Division of Computer & Information Science & Engineering Division of Computing & Communications Technology Division of Information & Intelligent Systems Division of Computer and Network Systems Office of Cyberinfrastructure</p> <p>Full Proposal Deadline(s) (due by 5 p.m. proposer's local time): February 20, 2013</p> <p>IMPORTANT INFORMATION AND REVISION NOTES</p> <p>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 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.</p> <p>Please be aware that significant changes have been made to the PAPPG to implement revised review criteria based on the Director's Executive Order 13526, "Transparency, Accountability, and Open Government." While the new review criteria provide a more transparent and open review process, certain guidelines have 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 will be affected.</p> <p>A by-chapter summary of the and other significant changes is provided at the beginning of both the Guidelines for Proposers and the Award & Administration Guide.</p> <p>Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the Guidelines for Proposers.</p> <p>SUMMARY OF PROGRAM REQUIREMENTS</p> <p>General Information</p> <p>Program Title: Exploiting Parallelism and Scalability (XPS)</p> <p>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 and expanding numbers of interconnected high-performance and data intensive edge devices, and the data centers serving them, is enabling a new set of global applications with large economics and social impact. At the same time, this means that the ability to harness predictive performance improvements through "empirical optimization" is essential.</p> <p>The Exploiting Parallelism and Scalability (XPS) program aims to support groundbreaking research leading to a new era of parallel computing. XPS seeks research to evaluate, 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 breakthrough will require a collaborative effort among researchers representing an array from the application layer down to the micro-architecture—and all the way to the operating and new hardware programs. Scalable performance and usability need new abstract models and algorithms, programming models and languages, hardware architectures, compilers, operating systems and run-time systems, and expert domain and application-specific knowledge. Research should also focus on energy- and communication-efficiency and on enabling the creation of robust hardware devices and clouds.</p> <p>Principal 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</p>
2010	2010	2012	2013



Josep Torrellas
UIUC



Mark Oskin
Washington

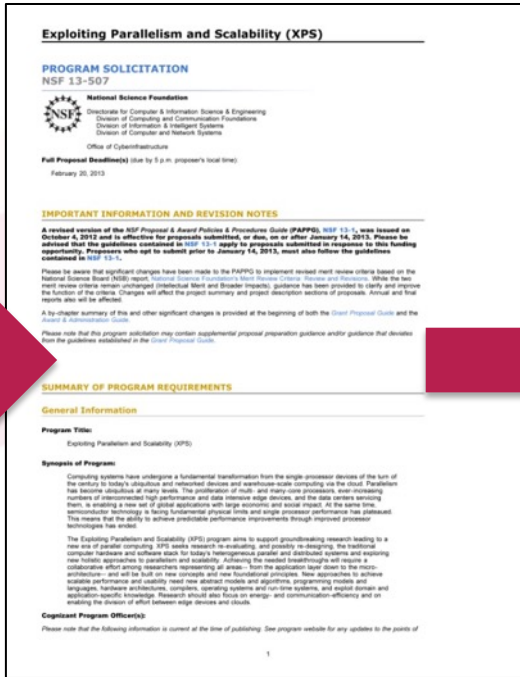


Mark Hill
Wisconsin



CCC
Computing Community Consortium
Catalyst

IMPACT: ARCHITECTURE

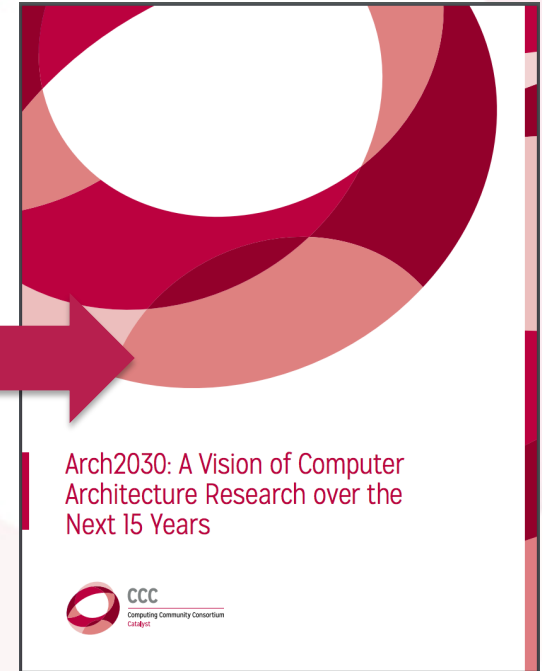


2013

Architecture 2030 Workshop @ ISCA 2016

CCC report out: Read the final report [here](#).

Video recordings: Watch the video recordings [here](#).



2016



Luis Ceze
Washington



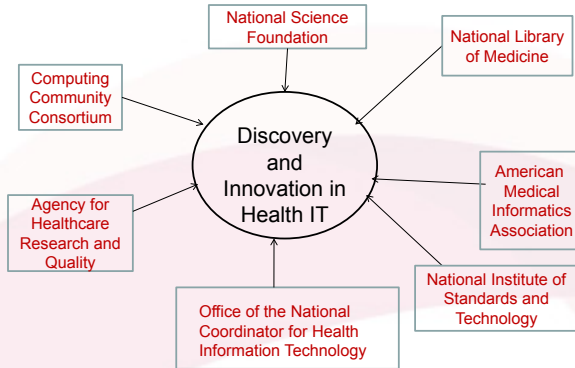
Tom Wenisch
Michigan



Mark Hill
Wisconsin

IMPACT: HEALTH IT

October 2009 Workshop



National Science Foundation
WHERE DISCOVERIES BEGIN

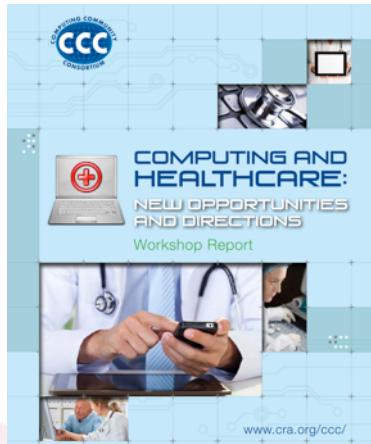
Directorate for Computer & Information Science & Engineering

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



CCC

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IMPACT: AGING IN PLACE

Aging In Place

September 10-11, 2014
National Institutes of Health

September 8, 2014 (Tuesday)

September 10, 2014 (Wednesday)

08:30 AM CCC Informal Networking Event (Embassy)

08:30 AM Opening Remarks (NH Building 318C, Room 318C)

09:00 AM Overview of the workshop (NH Building 318C)

09:30 AM Participant Introductions (NH Building 318C)

10:00 AM Break

11:00 AM Insights and Realities of Designing for Older Adults (NH Building 318C)

12:30 PM Lunch

Trans-NIH/Interagency Workshop on the Use and Development of Assistive Technologies for Aging Population and People with Chronic Disabilities
Computing Community Consortium
February 17, 2015¹

Elizabeth Mynatt
Professor of Interactive Computing, Georgia Tech

Alice Berrelli
Director of Global Healthcare Policy, Intel

Sara Czaja
Professor, Psychiatry and Behavioral Sciences & Industrial Engineering, UC Berkeley

Erin Iturrigu
Professor of Neurology and Biomedical Engineering, National Heart, Lung and Blood Institute

Marie Bernard, M.D.
Professor of Neurology and Biomedical Engineering, National Heart, Lung and Blood Institute

John Stankovic
Buhl University Professor of ECE and Computer Science, CMU

John Stankovic
Professor, Computer Science, University of Virginia

Executive Summary

As baby boomers age, the nation's elderly population continues to grow. As they will continue to live in their own home. Meeting this societal need requires a technology that addresses the complexity of supporting the quality of life and independent aging population. New technologies could potentially allow older adults and their families to remain in their homes longer, reduce health care costs, enhance their quality of life, and support to independent caregivers.

In September 2014, the Computing Community Consortium and National Heart, Lung, and Blood Institute held a workshop to explore the use and development of assistive technologies. Here we describe the outcomes of the workshop, highlighting the technologies that meet the needs of our aging population and providing specific recommendations for investments.

¹ Contact: Ann W. Drobnis, Director, Computing Community Consortium (202.266-2662)

Department of Health and Human Services
Part 1. Overview Information

Participating Organization(s)
National Institutes of Health (NIH)
Department of Veterans Affairs (VA)

Components of Participating Organizations
National Institute on Aging (NIA)
National Cancer Institute (NCI)
National Institute of Biomedical Imaging and Bioinformatics (NIBIB)
National Institute of Neurological Disorders and Stroke (NINDS)
National Institute of Nursing Research (NINR)
Office of Behavioral and Social Sciences Research (OBSSR)

Funding Opportunity Title
Collaborative Aging (in Place) (J2C)

Announcement Type
New

Related Notices
None

Funding Opportunity Announcement (FOA) Number
RFA-AG-16-021

Companion Funding Opportunity
None

Number of Applications
See Section III.3. Additional Information on E.O.

Catalog of Federal Domestic Assistance (CFDA) Number(s)
93.399, 93.866, 93.298, 93.853, 93.561

Funding Opportunity Purpose
The purpose of this, Inter-Agency Funding Opportunity is to support the development of a special emphasis on people from underrepresented groups. This FOA is designed to support Collaborative Aging (in Place) research infrastructure validating a research infrastructure that has the existing technologies, and can accommodate future technologies.

**REPORT TO THE PRESIDENT
Independence, Technology, and
Connection in Older Age**

Executive Office of the President
President's Council of Advisors on
Science and Technology

March 2016

Joint NIH/CCC Meeting
September 2014

Produced Workshop Report
February 2015

NIH released new RFP informed by AIP Workshop
October 2015

PCAST Report
March 2016



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Computing Community Consortium
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COMPUTING COMMUNITY CONSORTIUM

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.



Promote Audacious Thinking:

- Community Initiated Visioning Workshops
- Blue Sky Ideas tracks at conferences

Communicate to the Community:

- CCC Blog - <http://cccblog.org/>
- Great Innovative Ideas
- White Papers and Workshop Reports
- Social Media
- Council member presentations

Facilitate Investment:

- Outputs of visioning activities
- Task Forces - Health, AI, Privacy etc.
- Engage with federal agencies and industry

Inculcate Leadership and Service:

- Engage with CCC Alumni and Sister Organizations
- Biennial Symposia series

Influence Early Career Researchers:

- Industry - Academic Collaborations
- Leadership in Science Policy Institute
- Postdoc Best Practices

DISCUSSION, QUESTIONS, IDEAS