

THE COMPUTING COMMUNITY CONSORTIUM

Elizabeth D. Mynatt
Chair



CCC

Computing Community Consortium
Catalyst

COMPUTING COMMUNITY CONSORTIUM

The **mission** of the Computing Research Association's Computing Community Consortium (CCC) is to **catalyze** the computing research community and **enable** the pursuit of innovative, high-impact research.



Bring the computing research community together to envision audacious research challenges.

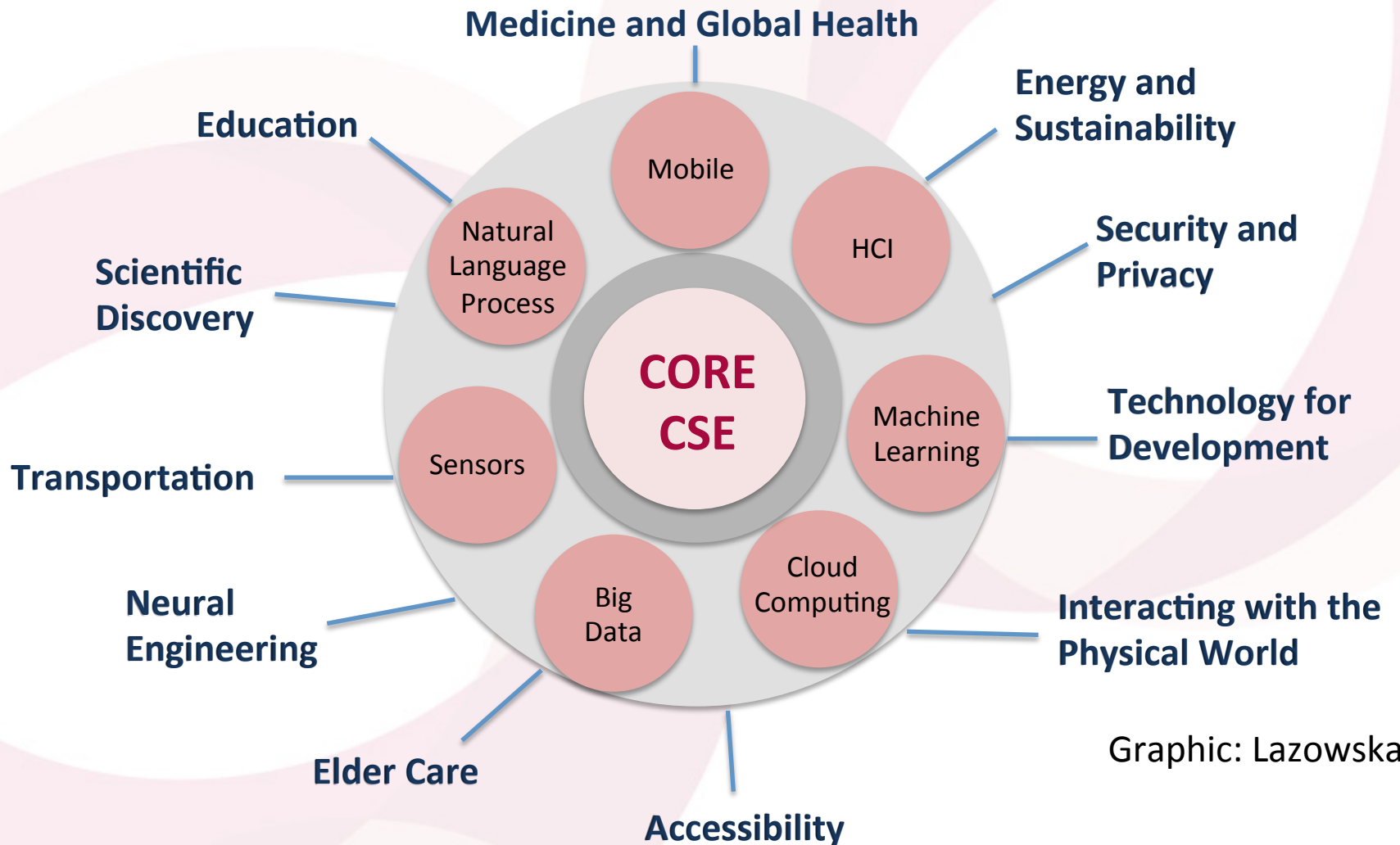
Communicate these challenges and opportunities to the broader national community.

Facilitate investment in these research challenges by key stakeholders.

Inculcate values of **leadership** and service by the computing research community.

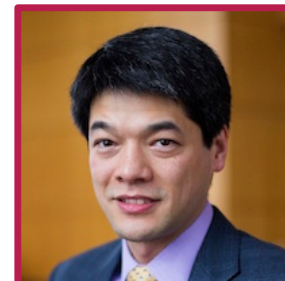
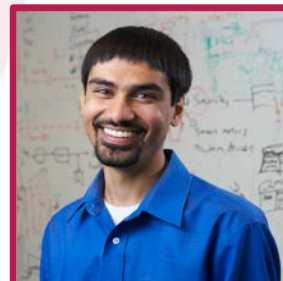
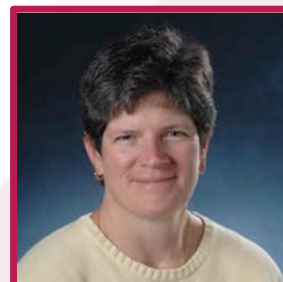
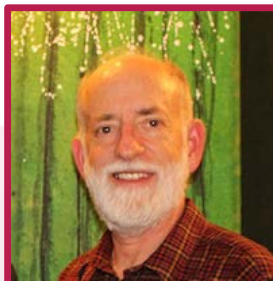
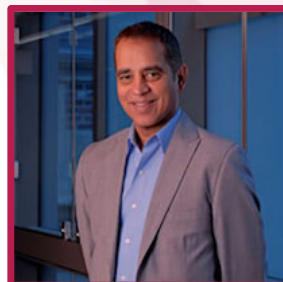
Inform and influence early career researchers to engage in these community-led research challenges.

THE RAPIDLY EXPANDING WORLD OF COMPUTING



Graphic: Lazowska

THE CCC COUNCIL



KEY CCC ACTIVITIES

Community Visioning
Blue Sky Conference Tracks

Reports and Whitepapers

Task Forces

- Artificial Intelligence
- Cybersecurity
- Human Technology Frontier
- Intelligent Infrastructure
- Post Moore's Law Computing
- Privacy and Fairness

Intelligent Infrastructure Papers
(Spring 2017):

- Research Agenda for Intelligent Infrastructure
- Transportation and Mobility
- Digital Grid
- Disaster Management, Community Resilience and Public Safety
- City Scale Intelligent Systems and Platforms
- Food, Energy, and Water
- Safety and Security for II
- Privacy in Information-Rich Intelligent Infrastructure
- A Rural Lens on Intelligent Infrastructure
- Smart Wireless Communication

COMPUTING RESEARCH

ADDRESSING NATIONAL PRIORITIES AND SOCIETAL NEEDS



Communicate the role of computing research to address national and societal priorities

- Inform
- Frame
- Catalyze
- Propel



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INTELLIGENT INFRASTRUCTURE FOR OUR CITIES AND COMMUNITIES



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ECEDHA

A National Research Agenda for Intelligent Infrastructure

Elizabeth Mynatt
Georgia Tech
Computing Community Consortium

Jennifer Clark
Georgia Tech

Greg Hager
Johns Hopkins University

A Rural Lens on a Research Agenda for Intelligent Infrastructure

Ellen Zegura
Georgia Tech

Beki Grinter
Georgia Tech

Elizabeth Belding
University of
California, Santa
Barbara

Klara Nahrstedt
University of Illinois at
Urbana-Champaign

A National Agenda for Intelligent Infrastructure is not complete without explicit consideration of the needs of rural communities. While the American population has urbanized, the United States depends on rural communities for

Intelligent Infrastructure for Smart Agriculture: An Integrated Food, Energy and Water System

Shashi Shekhar
University of Minnesota

Joe Colletti
Iowa State University

Francisco Muñoz-Arriola
University of Nebraska-L

Lakshmish Ramaswamy
The University of Georgia

Chandra Krintz
University of California, Santa
Barbara

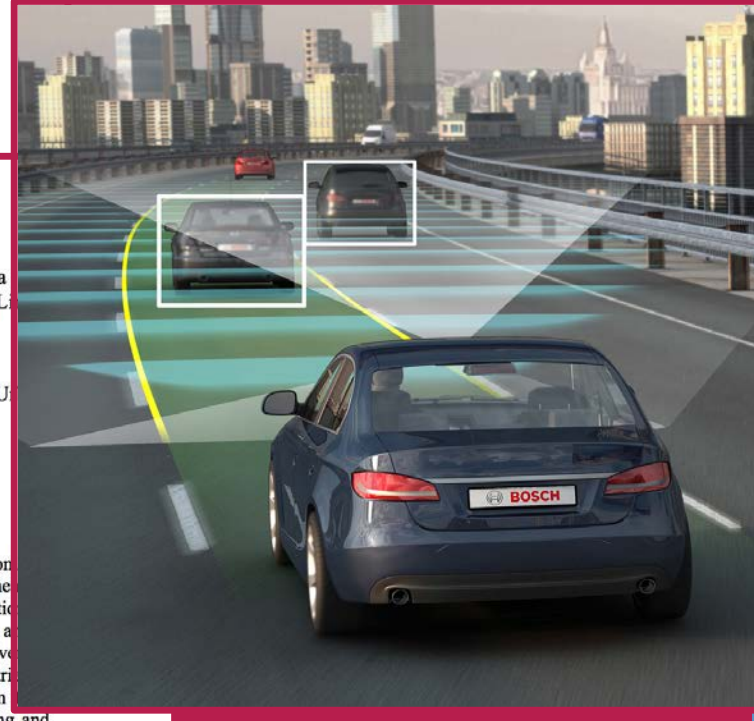
Lav Varshney
University of Illinois at U
Champaign

Debra Richardson
University of California, Irvine

Abstract: Agriculture provides economic opportunity through innovation; helps rural America to thrive; promotes agricultural production that better nourishes Americans; and aims to preserve natural resources through healthy private working lands, conservation, improved watersheds, and restored forests. From agricultural production to food supply, agriculture supports rural and urban economies across the U.S. It accounts for 10% of U.S. jobs and is currently creating new jobs in the growing field of data-driven farming. However, U.S. global competitiveness associated with food and nutrition security is at risk because of accelerated investments by many other countries in agriculture, food, energy, and resource management. To ensure U.S. global competitiveness and long-term security, it is imperative that we build sustainable physical and cyber infrastructures to enable self-managing and

Smart America

Intel and City of
San Jose
partnering for a
Smarter City



INTELLIGENT INFRASTRUCTURE FOR OUR CITIES AND COMMUNITIES

Daniel Lopresti
Moderator
Lehigh University



Michael Dunaway
Plenary
Louisiana at Lafayette



Jennifer Clark
Panelist
Georgia Tech



Elizabeth Belding
Panelist
UC Santa Barbara



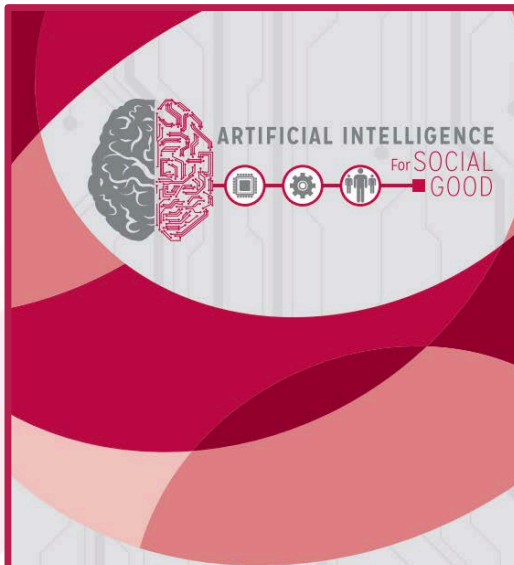
Chandra Krintz
Panelist
UC Santa Barbara



Megan Ryerson
Panelist
U Penn



AI AND AMPLIFYING HUMAN ABILITIES



Artificial Intelligence for Social Good



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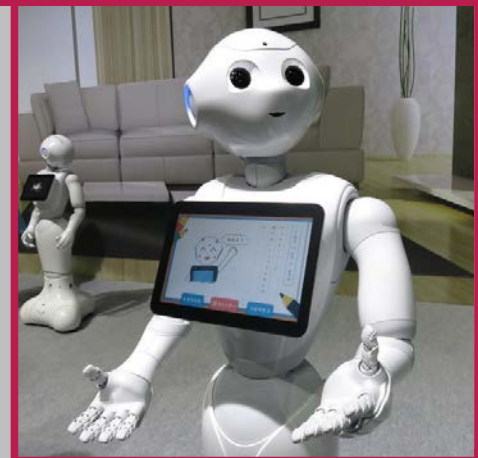
IBM Watson



**BUILDING
WITH WATSON**
A TECHNICAL WEB SERIES

Episode 1: *Building an App Using the News API*

IBM



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Advances in Artificial Intelligence Require Progress Across all of Computer Science

February 2017

Gregory D. Hager, Randal Bryant, Eric Horvitz, Maja Matarić, and Vasant Honavar

Over the last decade, the constellation of computing technologies referred to as artificial intelligence (AI) has emerged into the public view as an important frontier of technological innovation with potential influences in many realms. Advances in many disciplines related to AI, including machine learning, robotics, computer vision, natural language processing, inference, decision-making, and planning, are contributing to new-fielded products, services, and experiences. Offerings such as navigation systems, web search, speech recognition, machine translation, face recognition, and recommender engines have become part of the daily life of millions of people. Other applications coming to the fore include semi-autonomous and autonomous ground and air vehicles, systems that harness planning and scheduling, intelligent tutoring, robotics. More broadly, cyber-physical and robotic systems, incorporating varying degrees of AI technology, are poised to be fielded in a variety of real-world settings.

AI AND AMPLIFYING HUMAN ABILITIES

Elizabeth Mynatt
Moderator
Georgia Tech



Thad Starner
Plenary
Georgia Tech



Brenna Argall
Panelist
Northwestern



Jeffrey Bingham
Panelist
Carnegie Mellon



Suchi Saria
Panelist
Johns Hopkins



Cliff Young
Panelist
Google



SECURITY AND PRIVACY FOR DEMOCRACY



Safety, Security, and Privacy Threats Posed by Accelerating Trends in the Internet of Things

Kevin Fu, Tadayoshi Kohno, Daniel Lopresti, Elizabeth Mynatt, Klara Nahrstedt, Shwetak Patel, Debra Richardson, Ben Zorn

Abstract: The Internet of Things (IoT) is already transforming industries, cities, and homes. The economic value of this transformation across all industries is estimated to be trillions of dollars and the societal impact on energy efficiency, health, and productivity are enormous. Alongside potential benefits of interconnected smart devices comes increased risk and potential for abuse when embedding sensing and intelligence into every device. One of the core problems with the increasing number of IoT devices is the increased complexity that is required to operate them safely and



Privacy-Preserving Data Analysis for the Federal Statistical Agencies

January 2017

John Abowd, Lorenzo Alvisi, Cynthia Dwork, Sampath Kannan, Ashwin Machanavajjhane, Jerome Reiter

Government statistical agencies collect enormously valuable data on the nation's economy and business activities. Wide access to these data enables evidence-based policy analysis and supports new research that improves society, facilitates training for students and researchers, and provides resources for the public to better understand and participate in the economy. These data also affect the private sector. For example, the Employment Situation Report, published by the Bureau of Labor Statistics, moves markets. Nonetheless, government agencies are under increasing pressure to limit access to data because of a growing public understanding of the threats to data privacy and confidentiality.



Hackers
break
into
voting
machines



SECURITY AND PRIVACY FOR DEMOCRACY

Kevin Fu
Moderator
Michigan



Roger Dingledine
Panelist
Tor Project



Simson L. Garfinkel
Panelist
US Census



Phillipa Gill
Panelist
UMass



Daniela Oliveira
Panelist
Florida



Dan Wallach
Panelist
Rice



DATA, ALGORITHMS, AND FAIRNESS

What's Even Creepier Than Target Guessing You're Pregnant?

By Jordan Ellenberg



ECEDHA

Privacy in Information-Rich Intelligent Infrastructure

Cynthia Dwork

George J. Pappas



Big Data, Data Science, and Civil Rights

Solon Barocas, Elizabeth Bradley, Vasant Honavar, and Foster Provost

Abstract

Advances in data analytics bring with them civil rights implications. Data-driven and algorithmic decision making increasingly determine how businesses target advertisements to consumers, how police departments monitor individuals or groups, how banks decide who gets a loan and who does not, how employers hire, how colleges and universities make admissions and financial aid decisions, and much more. As data-driven decisions increasingly affect every corner of our lives, there is an urgent need to ensure they do not become instruments of discrimination, barriers to equality, threats to social justice, and sources of unfairness. In this paper, we argue for a concrete research agenda aimed at addressing these concerns, comprising five areas of emphasis: (i) Determining if models and modeling procedures exhibit objectionable bias; (ii) Building awareness of fairness into machine learning methods; (iii) Improving the transparency and control of data- and model-driven decision making; (iv) Looking beyond the algorithm(s) for sources of bias and unfairness—in the myriad human decisions made during the problem formulation and modeling process; and (v) Supporting the cross-disciplinary scholarship



PREDPOL[®]
The Predictive Policing Company[®]

PredPol[®] uses artificial intelligence to help you prevent crime by predicting when and where crime is most likely to occur, allowing you to optimize patrol resources and measure effectiveness.

DATA, ALGORITHMS, AND FAIRNESS

Nadya Bliss
Moderator
Arizona State



Solon Barocas
Panelist
Cornell



Nick Diakopoulos
Panelist
Northwestern



Kelly Jin
Panelist
Laura and John Arnold
Foundation



PLENARY – FARNAM JAHANIAN



*Our Accelerating
Digital Future:
Trends, Disruptions,
and Market
Opportunities*

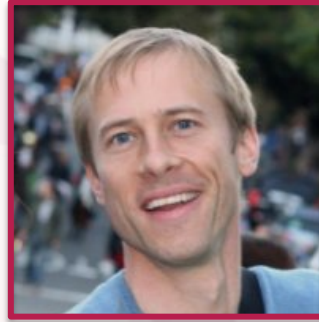
Interim President of
Carnegie Mellon University

CONNECTING COMPUTING WITH NATIONAL PRIORITIES

Mark Hill
Moderator
Wisconsin



Will Barkis
Panelist
Orange Silicon Valley



Patti Brennan
Panelist
NIH



Jim Kurose
Panelist
NSF



Bill Regli
Panelist
DARPA



POSTER RECEPTION



**46 Early Career
Researchers**

Poster Session Part 1
3 PM in Waterside 2
& 3

Poster Reception Part 2
5:30 PM in Waterside 2 & 3



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