Rethinking Approaches to Disaster Management and Public Safety With Intelligent Infrastructure

AAAS 2018: Advancing Science Discovery to Application

February 16, 2018

CCC
Computing Community Consortium
Catalyst

COMPUTING COMMUNITY CONSORTIUM

Computing Research Association represents more than 200 organizations in North America active in computing research.

Mission of CRA's Computing Community Consortium is to:

- **Catalyze** computing research community,
- **Enable** pursuit of innovative, high-impact research.

CCC conducts activities that:

- **Strengthen** research community,
- **Articulate** compelling **research visions**,
- **Align** visions with key **national and global challenges**.

www.cra.org/

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COMPUTING COMMUNITY CONSORTIUM

CCC **communicates** the importance of research visions to **policymakers**, **government** and **industry stakeholders**, the **public**, and the **research community** itself.

- Established in 2006 as standing committee of CRA,
- Funded by **NSF** through a Cooperative Agreement,
- Over 40 visioning **workshops**, >3,075 **participants**,
- 68 strategic **whitepapers**,
- 52 presentations to **policymakers**, **researchers**, and **industry stakeholders**,
- 1,676 blog posts to the **community**.

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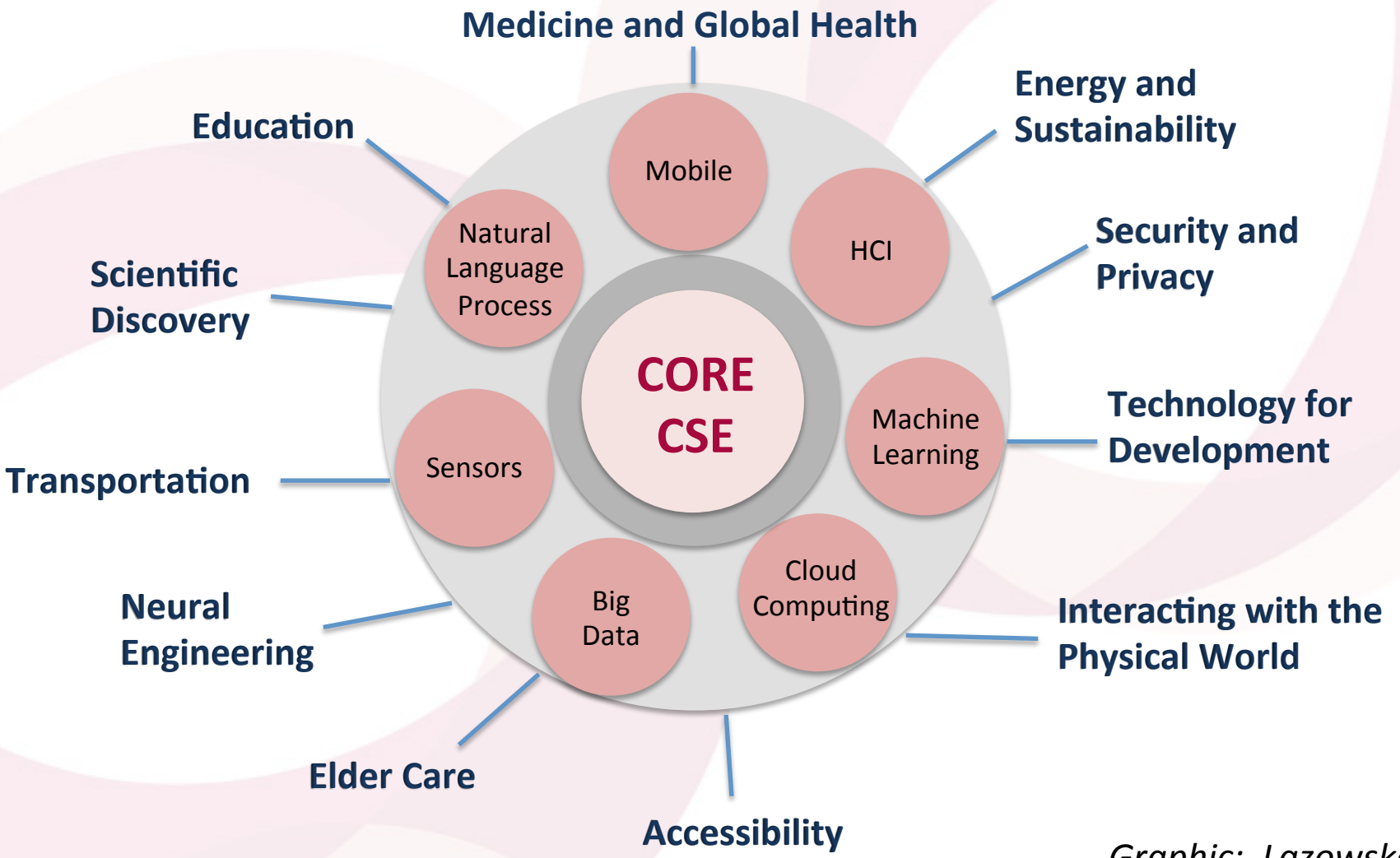
EXPANDING WORLD OF COMPUTING



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CATALYZING: VISIONING ACTIVITIES

Inclusive Access

BRAIN

Personalized Education

Sustainability & IT

Financial Cyberinfrastructure

Extreme Scale Design Automation

Online Education

Cyber Security for Manufacturers

Uncertainty

Privacy by Design

Computing and Healthcare

Cyber-physical systems

Spatial Computing

ROBOTICS

Aging in Place

Big Data Computing

Human Computation

Disaster Management

Sociotechnical Cybersecurity

Theoretical Foundations for Social Computing

Learning Technologies

Cyber Social Learning Systems

Global Development

CCC TASK FORCES

CCC Task Forces are centered around national **priorities**, community **needs**, and council member **interests**:

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

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CCC TASK FORCES

CCC Task Forces:

- **Engage** in ongoing activities in key areas,
- **Identify** needs and opportunities,
- **Act** (whitepapers, workshops, communications),
- **"Move the needle"** on important topics.

Task Force topics determined through annual process informed by major stakeholders: NSF, OSTP, PCAST, NITRD, workshops and CCC council members. External members are included to round-out key areas.

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OUR PANEL

Rethinking Approaches to Disaster Management and Public Safety With Intelligent Infrastructure

Public Safety Considerations for Smart, Connected Communities

Michael Dunaway, University of Louisiana at Lafayette

Robots, Emergency Management, and People

Robin R. Murphy, Texas A&M University

Enabling Resilient Situational Awareness in Disasters: A Cross-Layer Approach

Nalini Venkatasubramanian, University of California, Irvine

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OUR PANELISTS

Michael Dunaway is director of the National Incident Management Systems and Advanced Technologies Institute at the University of Louisiana at Lafayette. A former Navy captain, he has 15 years of experience in homeland security and emergency preparedness in a variety of roles, including serving as senior director for Preparedness and Resilience Programs at the national headquarters of the American Red Cross, and as chief for risk management and program manager for Community Resilience in the Science and Technology Directorate, U.S. Department of Homeland Security, among others.

Robin Murphy is the Raytheon Professor of Computer Science and Engineering at Texas A&M University and director of the Humanitarian Robotics and Artificial Intelligence Laboratory, and member of the Center for Robot-Assisted Search and Rescue. She helped found the fields of disaster robotics and human-robot interaction, concentrating on developing human-centered AI for ground, air, and marine robots. Her work is captured in more than 150 publications including Introduction to AI Robotics and the award-winning Disaster Robotics as well as a TED talk. She has deployed robots to over 27 disasters in five countries.

Nalini Venkatasubramanian is a Professor of Computer Science in the Donald Bren School of Information and Computer Sciences at the University of California, Irvine. She is known for her work in effective management and utilization of resources in the evolving global information infrastructure. Her research interests include Networked and Distributed Systems and Ubiquitous Computing and Urban Crisis Responses, among others. Her research focuses on enabling effective management and utilization of resources in the evolving global information infrastructure.

RELATED RESOURCES

CCC at AAAS 2018

The Computing Community Consortium (CCC) has attended and hosted sessions at the American Association for the Advancement of Science (AAAS) Annual Meeting since 2013. Below you can find links to slides and resources from the 2018 sessions and links to related CCC white papers and resources. To learn more about the 2018 AAAS Meeting visit the webpage.

Rethinking Approaches to Disaster Management and Public Safety With Intelligent Infrastructure

Friday, February 16, 8:00 – 9:30 am

Synopsis: Modern societies can be understood as the intersection of four interdependent systems: the natural environment, the built environment, the social environment of humans and their activities, and an information ecosystem overlaying the other three domains. The latter provides the means for understanding, interacting with, and managing the relationships between the natural, built, and human environments. This increased connectedness creates both new challenges and opportunities that demand new approaches to public safety and emergency management. The design and integration of intelligent infrastructure — including embedded sensors, the Internet of Things, advanced wireless information technologies, real-time data capture and analysis, and machine-learning-based decision support — holds the potential to greatly enhance public safety, emergency management, disaster recovery, and overall community resilience, while addressing new and emerging threats to public safety and security.

Speakers:

Michael Dunaway

University of Louisiana, Lafayette

Public Safety Considerations for Smart, Connected Communities

Robin Murphy

Texas A&M University

Robots, Emergency Management, and People

Nalini Venkatasubramanian

University of California, Irvine

Enabling Resilient Situational Awareness in Disasters: A Cross-Layer Approach

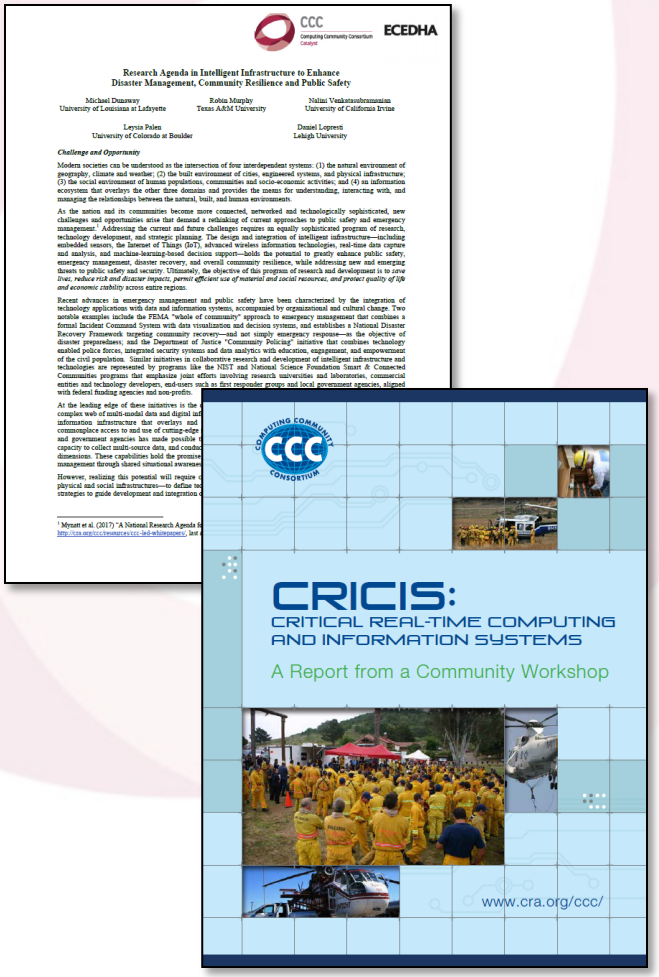
Moderator:

Dan Lopresti

Lehigh University

Related Links:

- *Research Agenda in Intelligent Infrastructure to Enhance Disaster Management, Community Resilience and Public Safety* white paper
- Intelligent Infrastructure plenary and panel at the 2017 Computing Research Symposium
- *Crisis: Critical Real-time Computing and Information Systems* report from the 2012 Computing for Disaster Management Workshop



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