CCC COUNCIL MEETING

July 19, 2017

AGENDA

- Morning
  - Welcome and Introductions
  - Task Forces: Impact and Future Priorities
  - Task Force Discussion with Bryan Biegel (NITRD)
  - Other inputs to Task Forces
- Lunch
- Afternoon
  - CCC Planning / New Award Priorities
  - Next Steps for Task Forces
  - Open Discussion

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INTRODUCTIONS

2016- 2017 TASK FORCES

CCC task forces are organized around national priorities, community needs, and council member interests and abilities. 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.

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COMPUTING IN THE PHYSICAL WORLD

Chairs: Ben Zorn and Shwetak Patel

Ben Zorn
Microsoft Research
Bio

Shwetak Patel
University of Washington
Bio

Current Members:

Kevin Fu
University of Michigan
Bio

Daniel Lopresti
Lehigh University
Bio

Greg Morrisett
Cornell University
Bio

Beth Mynatt
CCC Chair
Georgia Institute of Technology
Bio

Klara Nahrstedt
University of Illinois at Urbana–Champaign
Bio

Jennifer Rexford
Princeton University
Bio

Debra Richardson
University of California–Irvine
Bio

Recent Activities:

- Response to NITRD Smart Cities and Community Strategic Plan (March 2017)

- Series of ten white papers on Intelligent Infrastructure (Spring 2017)

White Papers:

- *Safety, Security, and Privacy Threats Posed by Accelerating Trends in IoT* (Feb 2017)
- *Smart Communities Internet of Things* (Jan 2016)
- *System Computing Challenges in the Internet of Things* (Sept 2015)

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COMPUTING IN THE PHYSICAL WORLD
Suggested CCC Priorities for Next Year

- Goal: spin off security into separate task force
  - Enough going on independently of CPW in this area

- Goal: choose key focus areas for CPW (outside of security)

- Ideas being considered (building on white papers):
  - Intersection of smart cities and smart transportation
  - Systems requirements for disaster management/recovery
  - Systems issues related to power/communication/etc in small devices - overlap with AI, data TFs
  - Pick specific an IoT vertical (e.g., home, health, etc.) and consider technical challenges

See Next Steps Google Doc

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CONVERGENCE OF DATA AND COMPUTING

Chairs: Vasant Honavar

Vasant Honavar
Pennsylvania State University
Bio

Current Members:

Tom Conte
Georgia Institute of Technology
Bio

Mark Hill
CCC Vice Chair
University of Wisconsin, Madison
Bio

Klara Nahrstedt
University of Illinois at Urbana – Champaign
Bio

Holly Rushmeier
Yale University
Bio

Kathy Yelick
University of California at Berkeley
Bio

Recent Activities:

- *Advanced Cyberinfrastructure for Science, Engineering, and Public Policy* (June 2017)

- Discussions with DARPA (March 2017)

- *Challenges to Keeping the Computer Industry Centered in the US* (March 2017)

- Co-sponsor of the AAAI Symposium on *Accelerating Science: A Grand Challenge for AI* (Nov 2016)

White Papers:

- *Big Data, Data Science, and Civil Rights* (Feb 2017)
- *Democratizing Design for Future Computing Platforms*
- *Accelerating Science: A Computing Research Agenda* (Feb 2016)

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CONVERGENCE OF DATA AND COMPUTING
Suggested CCC Priorities for Next Year

(Depends on how task force jurisdiction evolves)

- Data Science Public Facing White Papers
  - The promise, potential, and limits of Data Science
  - Data science research frontiers

- Architecture, etc.

  - Addressing end of Moore's Law w/ IEEE, DARPA, etc.

  - Role for CCC to further catalyze Quantum Computing?

  - Interactions with DoE and high-end computing

C.f., [Next Steps Google Doc](#)

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HEALTHCARE

Chairs: Beth Mynatt

Elizabeth Mynatt
CCC Chair
Georgia Institute of Technology
Bio

Current Members

Kevin Fu
University of Michigan
Bio

Gregory Hager
Johns Hopkins University
Bio

Maja Matarić
University of Southern California
Bio

Nina Mishra
Amazon
Bio

Shwetak Patel
University of Washington
Bio

Recent Activities:

- Workshop (Dec 2016) and *Research Opportunities and Vision for Smart and Pervasive Health* white paper (June 2017)

- AAAS press briefing on *Health in Your Pocket: Diagnosing and Treating Disease with Smart Phones* (Feb 2017)

- Workshop series on Cyber Social Learning Systems (2016)

White Papers In Process

- *Population Health Surveillance and Response*
- *Transforming Aging*

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HEALTHCARE
Suggested CCC Priorities for Next Year

Lots of great work over the past 4.5 years (Health IT, Aging, Brain, Inclusive Access, Smart and Pervasive Health)

- Time to declare success?

Nevertheless, key topics emerged that could inform future task force activities

- Security / Estimating clinical risk
- Next "911" System / Disaster Response
- Public Health and Big Data
- Early disease detection
- Augmenting Human Beings (physical, cognitive, behavioral)

See Next Steps Google Doc

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AI AND ROBOTICS

Chairs: Greg Hager and Eric Horvitz

Gregory Hager

Johns Hopkins University

Bio

Eric Horvitz

Microsoft Research

Bio

Current Members:

Randy Bryant
Carnegie Mellon University

Bio

Vasant Honavar
Pennsylvania State University

Bio

Maja Matarić
University of Southern California

Bio

Recent Activities:

- *Artificial Intelligence for Social Good* workshop report (April 2017)
- Tom Kalil's *AI for Good* white paper (April 2017)
- Co-sponsorship of AAAI Symposium on *Artificial Intelligence for Social Good* (March 2017)
- *Advances in Artificial Intelligence Require Progress Across all of Computer Science* white paper (Feb 2017)

White Papers In Process:

- *Accelerating Science: A Grand Challenge for AI and Computing Research*
- *Work Through Human Augmentation*

AI AND ROBOTICS
Suggested CCC Priorities for Next Year

See Next Steps Google Doc

- Public Facing White Papers
  - Why AI Needs People
  - 5 Great Myths of AI
  - 5 Great Opportunities of AI
  - Safe and Reliable AI report (Scherlis)

- Future of Work

- Leveraging underrecognized data

- AI Research Frontiers
  - Sociotechnical elements -- collaboration, dialog, trust
  - AI and Social/Psychological/Cognitive/Learning Science
  - Convergence of Cognition, Perception, Language, and Learning

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Other Considerations

Who else to add to the task force?

What sort of societies should we collaborate with?

How to integrate with Partnership?

Co?-Sponsor challenges?

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PRIVACY AND FAIRNESS

Chairs: Cynthia Dwork and Sampath Kannan

Cynthia Dwork
Microsoft Research
Bio

Sampath Kannan
University of Pennsylvania
Bio

Current Members:

Lorenzo Alvisi
University of Texas at Austin
Bio

Elizabeth Bradley
University of Colorado, Boulder
Bio

Vasant Honavar
Pennsylvania State University
Bio

Recent Activities:

- Published a white paper called *Privacy-Preserving Data Analysis for the Federal Statistical Agencies* (Jan 2017)

- Visioning Workshops on Sociotechnical Cybersecurity (Dec 2016 and Aug 2017)

White Papers In Process
- *An Ontology for Fairness*

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PRIVACY AND FAIRNESS
Suggested CCC Priorities for Next Year

- Write a white paper to encourage NIST to create a Standards Body

- Organize four Fairness Workshops for 2018

- White paper by Liz and Vasant (published)

- White papers on fairness will seed some workshops on the topic over the coming year.

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General CCC Task Force Priorities for 2017-2018

- Ben's notes:
  - Proactively thinking about alignment of task force priorities with NSF divisions (CCF, CNS, IIS, OAC?)
  - Making Security as a separate task force
  - Consider task force related to human/tech frontier
  - Strongly suggest >= 1 industry contributor to each TF

- Anything else?

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NITRD
BRYAN BIEGEL

OTHER INPUTS TO TASK FORCES

Discussions with NSF, ACM, IEEE, ECEDHA, (NITRD) with differing perspectives.

ACM:

- Computing + X is where the action is
- Quantum – only in industry

NITRD: national importance

- "Smart Infrastructure"
- "National Defense / Cyber security / Cyber espionage
- "Economic Strength"
  - innovation and IT
  - Supercomputing
- "Fake news" "making science believable"
- Future of work (automation)
- Heavy lift of SW development / AI
- Role of cloud for HPC
- Open Knowledge Network (internet for data)

NSF: span across divisions with particular emphasis; get topics within divisions that align with Hill / WH priorities

- Cyber Security
  - Education
  - Usability
  - Tools
  - Grand Challenges
- Human Tech Frontier / future of work
- Quantum
  - Bring together physics + CS
  - Look at PAWR partnership
- Research infrastructure / data / models / AWS
- Also engage SBE (HTF, Security, AI4SG)

IEEE

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OTHER INPUTS TO TASK FORCES

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SUGGESTED LUNCH TABLES

Table 1:

- AI (**Greg H**)

with

- HTF (**Shwetak**, Maja, Beth, Elizabeth) plus Andy and Khari

Table 3:

- Intelligent Infrastructure (**Ben**, Dan, Nina) plus Peter

  with

- Arch (Mark)

Table 2:

- Security (**Kevin**, Keith, Nadya, Greg M) plus Brian

Table 4

- Privacy and Fairness (**Liz**, Cynthia, Sampath)

with

- Data and Vis (**Holly**, Juliana) plus Ann

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LUNCH

CCC PLANNING / NEW AWARD PRIORITIES

- Increased capacity and focus on bi-directional engagement with the broader community

- Engagement with professional societies / sister orgs
- Engagement with industry
- Symposium planning

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ENGAGEMENT WITH PROFESSIONAL SOCIETIES AND SISTER ORGANIZATIONS

- ECEDHA
- MForesight

- ACM
  - ACM Digital Library
  - Interaction with SIGs
  - CACM
  - ACM Fellows / Future Computing Academy

- IEEE
  - Interaction with STCs

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THE INDUSTRY SAGA ...

The Future of Computing Research:
Industry-Academic Collaborations

Version 2

- July 2015: CCC Industry workshop
  -> focus on industry/academic interaction

- May 2016: Workshop report
  -> CISE AC industry committee accepts report with addendum

- July 2016: Snowbird breakout on industry/academic interaction
  -> Further notes and ideas

- Fall 2016-now: CRA ad-hoc committee
  -> what can/should CRA do to increase industry
     involvement?
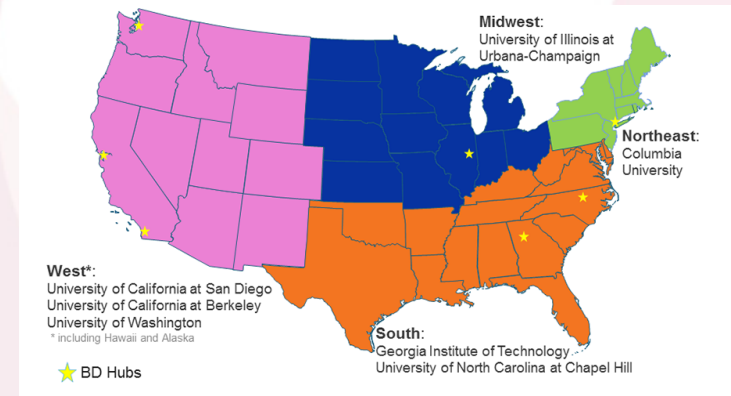
ENGAGING WITH INDUSTRY

- Working with industry leadership in planning CCC workshops

- Hosting CCC activities at industry events

- Cultivating and working with federal-industry partnerships

- Engaging non profits and industry consortia

- Taking a broad view on computing industry

Midwest: University of Illinois at Urbana-Champaign

Northeast: Columbia University

West*: University of California at San Diego, University of California at Berkeley, University of Washington
* including Hawaii and Alaska

South: Georgia Institute of Technology, University of North Carolina at Chapel Hill

⭐ BD Hubs

Partnership on AI
to benefit people and society

SYMPOSIUM PLANNING

- Oct 23-24
  - Dinner on the 22nd? (Sunday evening, speakers + ccc + ccc alums)
- Sessions
  - Keynotes (~ 3-4)
  - Panels (~ 4-6)
  - Poster session for junior faculty: Monday Oct 23

- Possible Themes (Mon am, Mon pm, Tues am)
  - YOUR IDEAS HERE

  - Tues lunch panel with respondents?

SYMPOSIUM PLANNING

- Oct 23-24
  - Reception on 22nd (Sun even: speakers + ccc + ccc alums)
  - Dinner on the 23rd? (Monday even: informal advisory group)
- Sessions
  - Keynotes (~ 3)
  - Panels (~ 4-7)
  - Poster session for junior faculty: Monday Oct 23
- Possible Themes (Mon am, Mon pm, Tues am)
  - Intelligent Infrastructure: Vision of Future Cities and Communities
  - Fairness: Overcoming Human and Computational Bias
  - AI and Amplifying Human Abilities:
  - Security and Safety:
  - Tues lunch panel with respondents?

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NEXT STEPS FOR TASK FORCES

- …

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OPEN DISCUSSION

- Orphan topics
- Orphan white papers

NEXT STEPS FOR CCC

- Visioning Workshop
  - Sociotechnical Cybersecurity Meeting #2
    - August 8-9, 2017
    - San Diego, CA
- CCC Computing Research Symposium
  - October 23-24, 2017
  - Washington, DC
- LiSPI
  - November 6-7, 2017
  - Washington, DC
- CCC Fall 2017 Council Meeting
  - November 29th, 2017
  - Washington, DC

- Plans to write
  - Implementation Plan (2017)
  - Engagement and Outreach Plan (2018)
  - Continuity Plan (2018)
  - Site visit (April 2019)
  - Strategic plan (April 2020)

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