

**National Science Foundation  
Directorate for Computer and Information Science and Engineering Advisory Committee  
(CISE AC)**

**June 11-12, 2015**

**National Science Foundation  
4201 Wilson Boulevard  
Arlington, VA 22230**

**Meeting Summary**

The spring meeting of the National Science Foundation's (NSF) Directorate for Computer and Information Science and Engineering's (CISE) Advisory Committee (AC) was held at the National Science Foundation on June 11-12, 2015.

**Thursday, June 11, 2015**

**Welcome, Introductions, Review of Agenda, and Approval of Minutes**

Drs. David Culler (UC Berkeley) and Fran Berman (RPI), CISE AC co-chairs, opened the meeting at 12:20 p.m., and welcomed all in attendance, including five new members, Drs. Thomas Cortina, Michael Franklin, Vijay Kumar, Margaret Martonosi (absent) and Padma Raghavan (a list of attendees is in Appendix I). Following AC member introductions, Drs. Culler and Berman reviewed the meeting agenda, and then the minutes from the November 2014 meeting were unanimously approved.

**NSF and CISE Update**

Dr. Jim Kurose, Assistant Director of NSF for CISE, welcomed the AC and provided an update on NSF and CISE (slides are posted on the [CISE AC website](#)). He highlighted CISE staff changes, including the arrival of Dr. Lynne Parker as the Division Director for the CISE division of Information and Intelligent Systems (IIS) as well as the detail of Dr. Keith Marzullo to the White House Office of Science and Technology Policy (OSTP) as the Director of the National Coordination Office for Networking and Information Technology Research and Development (NITRD). Dr. Kurose summarized the NSF and CISE budgets, core programs and priorities, cross-directorate initiatives, and cross-agency and cross-sector partnerships. In closing, Dr. Kurose highlighted CISE's commitment to research and education through its rich intellectual agenda and balanced award portfolio, including its investments in basic research, education and infrastructure.

**Program Updates**

*NSF Advanced Cyberinfrastructure*

Dr. Irene Qualters, the Division Director for the CISE division of Advanced Cyberinfrastructure (ACI), provided an overview of NSF cyberinfrastructure activities and investments. She emphasized the coordination role of ACI for cyberinfrastructure across NSF, the growing demand and increased use of collaborative cyberinfrastructure in transforming research frontiers,

and upcoming activities that will influence the future of cyberinfrastructure such as a National Academy of Sciences study and an OSTP-led effort.

### *Big Data Regional Innovation Hubs*

Dr. Suzi Iacono, the CISE Deputy Assistant Director, provided an overview of the Big Data Regional Innovation Hubs (BDHubs) program. Dr. Iacono briefly described NSF's big data investments since the launch of the National Big Data R&D Initiative in March 2012, providing context for the BDHubs solicitation. She emphasized the intent of the BDHubs to build partnerships around big data and the anticipated societal benefits that will emerge from these partnerships.

### **CISE Working Group Overview and Breakout**

The CISE AC separated into two working group sessions:

- The “New Partnership Models among NSF, Industry and Academia in US Academic CISE Research” working group, led by Drs. David Culler and Peter Lee, was charged with discussing existing models for NSF/CISE collaborations, potential barriers for success, actions for stronger and broader partnerships, collaboration opportunities for infrastructure and education, and indicators of short- and long-term success.
- The “Fourth Paradigm: Data Science” working group, led by Drs. Fran Berman and Rob Rutenbar, was charged with discussing how NSF/CISE can nurture the development of data science (DS), the current and future mix of NSF/CISE programs related to DS, DS as a field in its own right, how NSF/CISE can help DS curriculum and programmatic development, and where NSF/CISE efforts can have impacts on DS.

The working group sessions presented the outcome of their discussion on day two of the CISE AC meeting.

### **The Rising and Broadening Tide in CS Education: Presentation and Discussion**

Dr. Jan Cuny, CISE Program Director for Education and Workforce Development (EWF), provided an overview of the EWF cluster's activities, describing its efforts in broadening participation, K-12 education, and undergrad education for computing (and closely related) disciplines. Dr. Cuny also presented a potential charge for a National Academies of Science study to be focused on the recent surge in undergraduate enrollments in computer science and engineering departments across the U.S. The AC members provided input on the charge.

The AC adjourned for the day at 5:30 p.m.

### **Friday, June 12, 2015**

#### **Welcome**

The CISE AC resumed at 8:25 a.m. with brief remarks from Dr. Culler, who provided an overview of the day's agenda.

## **Working Group Breakout Report Out and Discussion**

The working groups summarized their breakout sessions from day one of the CISE AC.

### *New Partnership Models among NSF, Industry and Academia in US Academic CISE Research*

Dr. Lee led the report-out on new partnership models, noting that the discussion focused on taking stock of existing partnership examples, describing partnership models, and brainstorming next steps. Moving forward, the group will engage with other industry leaders, consider education in addition to research, and look for additional examples of transformational partnerships. The group noted the need to remain aligned with the NSF mission and maintain the balance between mission-focused/use-inspired versus curiosity-driven research.

### *The Fourth Paradigm: Data Science*

Dr. Rob Rutenbar led the discussion on the development of DS and its potential as a new paradigm for research and innovation. The discussion focused on DS over the next 15 years, how it will relate to today's disciplines, and what actions NSF could take now and in the future to ensure U.S. leadership in DS, especially with regard to education needs. The working group will explore items such as the need for a DS roadmap that could consider curriculum and pedagogy, research, infrastructure, verticals, and ethics and society.

After the presentations and discussions, Dr. Kurose encouraged the groups to plan activities for the period between AC meetings to more fully address the two breakout topics.

## **Meeting with NSF Director**

NSF Director Dr. France Córdoba (participating remotely) and Chief Operating Officer Dr. Richard Buckius joined the CISE AC. During this session, AC members noted the importance of access to computer science education, NSF's unique role as a convener in enabling new public-private partnerships, NSF's potential to lead data science education and research, cyberinfrastructure as a driver for discovery and innovation in all areas of science and engineering, and the central role of CISE in addressing national priorities. Dr. Córdoba shared her appreciation of the work of the CISE directorate and the CISE AC.

## **CISE AC Updates and Discussion: Looking Forward**

Dr. Kurose provided an update on issues from past CISE AC meetings including the expanding computer science professoriate, NSF's public access plan, and support of mid-scale research infrastructure, and welcomed suggestions from the AC on future agenda items. Members suggested items such as CISE's role in NSF's efforts to transition research to practice and additional details about the CISE award portfolio.

## **Closing Remarks and Wrap-up**

In closing, Dr. Berman thanked Dr. Kurose, CISE staff, and CISE AC members for a successful meeting. The fall AC meeting dates of December 3-4, 2015, were announced.

The meeting adjourned at 12:10 p.m.

## **Appendix I: Attendance for CISE AC June 11-12, 2015**

### AC Members Present

Francine Berman, Rensselaer Polytechnic Institute  
Henrik Christensen, Georgia Institute of Technology  
Thomas Cortina, Carnegie Mellon University  
David Culler, University of California at Berkeley  
Susan Davidson, University of Pennsylvania  
Michael Franklin, UC Berkeley  
Brent Hailpern, IBM Research - Almaden  
Charles Isbell, Jr., Georgia Institute of Technology  
Vijay Kumar, University of Pennsylvania  
James Landay, University of Washington (*participated via teleconference 6/11 and 6/12*)  
Peter Lee, Microsoft Research Redmond  
Craig Partridge, BBN Technologies  
Padma Raghavan, Pennsylvania State University  
Ronitt Rubinfeld, Massachusetts Institute of Technology  
Rob Rutenbar, University of Illinois  
Robert Schnabel, Indiana University  
Victoria Stodden, Columbia University  
Alex Szalay, The Johns Hopkins University  
Jeffrey Vitter, University of Kansas

### AC Members Absent

Margaret Martonosi, Princeton University