

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

**November 1-2, 2011**

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

**MEETING SUMMARY**

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The fall meeting of the National Science Foundation's Directorate for Computer and Information Science and Engineering's Advisory Committee (CISE AC) was held at the National Science Foundation on November 1-2, 2011.

**November 1, 2011**

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

Drs. Jennifer Rexford and J Strother Moore, CISE AC co-chairs, opened the meeting at 1:00 p.m., welcoming participants physically present as well as those participating virtually. AC members introduced themselves. A list of attendees can be found in Appendix I.

The minutes from the Spring 2011 AC meeting were approved.

**CISE Overview and Update**

Dr. Farnam Jahanian, CISE AD, provided an update on NSF and CISE-specific activities. He highlighted some of the ongoing and new programs administered through CISE, including the National Robotics Initiative (NRI), Secure and Trustworthy Cyberspace (SaTC), Cyberlearning Transforming Education, Smart Health & Wellbeing, Science Engineering and Education for Sustainability (SEES), Innovation Corps (I-Corps), Expeditions-in-Computing, Global Environment for Networking Innovations (GENI), and US Ignite.

Dr. Jahanian charged the committee to form 2 new subcommittees focused on the issues of: (1) midscale infrastructure investments for computing, considering GENI and US Ignite, and (2) education and workforce development, particularly the underproduction, underrepresentation, and lack of a presence in K-12 for Computing.

Slides from Dr. Jahanian's presentation are posted on the CISE website.

### **NSF Merit Review Process Working Group**

Members of the NSF Merit Review Process presented an update on their recommendations. Candice Major, a program director in the GEO Directorate, noted that the efforts of the working group focused on suggesting enhancements for the review process (*e.g.*, reducing review burden, stimulating transformative proposals), not the review criteria.

Jim Kurose and Richard Ladner of the CISE AC, who serve on a WG of the CISE AC, as well as on this larger committee, presented Directorate-level information. In particular, it was noted that CISE has significantly more proposals per PI per year and a larger number of proposals submitted by PIs per award than other Directorates/ Offices. CISE also has an unusually large number of panels and a community that is facile with technology, which makes it a good Directorate for experimentation for panels.

Steve Meacham, a program director from the Office of Intramural Activities, led a discussion on potential new experiments. A discussion ensued among the CISE AC members, who noted a preference for a combined virtual and wiki panel, in lieu of one of those modes alone. They expressed concern about the use of pre-proposals as it may have unintended consequences for faculty and/or unintentionally discourage high-risk, game-changing and breakthrough projects. They also noted that if the agency explores the use of pre-proposals more widely, the length of the narrative should be considered carefully, noting that any more than 2 pages is a lot of effort for reviewers. Other ideas included decreasing the number of proposals per individual and increasing the award size per proposal as a means to reduce the number of proposals submitted. In addition, the members also suggested software may help to better align reviewers' expertise for proposals and panels. Dr. Meacham invited further ideas from the AC members, welcoming them to follow-up with him directly.

### **Working Group Break-Out Sessions**

AC Chairs, Jen Rexford and J Moore dismissed members for their break-out discussions at 2:30 pm.

The group reconvened at 4:30 pm.

### **Working Groups Report-Out and Discussion**

Breakthrough Proposals: The working group considering Breakthrough Proposals, whose report and discussion was led by Jon Kleinberg, reported that considering a proposal as risky wasn't enough, as high-potential proposals create research branches, break technical barriers, find new problems to solve, and bring new approaches to problems.

The group recommended that NSF should begin by assessing a baseline and the demand

vs supply. They also recommended instructions to encourage breakthrough proposals to project investigators, program managers, and panels. They noted that funding opportunities created to address this type of high-payoff work (*e.g.*, opportunities similar to I-Corps) should be made prestigious and perhaps have larger award sizes. To further encourage the supply of these proposals, the group suggested that NSF document and market awards that are exemplars for this high-payoff work, even before success, and help to show the value of this type of work to Deans and educational institutions.

Discussion topics following the report-out included importance of mail-in reviews, means to define and identify breakthrough proposals, the importance of risk and expectation management, and a desire to have multiple levels of award sizes available for breakthrough proposals.

Encouraging Service at NSF: The break-out group considering Encouraging Service at NSF, led by Eric Horvitz, identified four pillar challenges for encouraging service: (1) computer science culture and the need to increase the prestige and communication for rotators with a focus on the legacy that can result from being a leader for programs at NSF; (2) continuity of research such as IR/D contracts, per diem support, new kinds of support for research (*e.g.*, post-doc to keep research going), and support to restart research once the rotator returns full time to their position; (3) relocation including support for dual-career couples, increasing the ability to telework, offering part-time positions, availability to work in a West Coast office of NSF, and increasing pay to align better with competitive salaries for computer science PhDs in industry; and (4) recruiting horizons and better tracking of attempts to recruit rotators.

Panel Process for CISE: The breakout group for Panel Process for CISE, led by Jim Kurose and Richard Ladner, recommended a pilot of wiki-based reviews that would include discussion of reviews ahead of time by panelists together with virtualized, localized, and/or remote panels. Evaluation of pilot panels (*e.g.*, virtual panels vs traditional pilot) and determination of the optimum size of participants for virtual panels should be considered.

## **November 2, 2011**

### **Committee of Visitors Discussion**

CISE Science Advisor, Suzi Iacono, provided an overview of Committee of Visitors (COV) and led a discussion to seek the advice about the best option for CISE's COVs in the coming year. She proposed models for consideration: (1) the typical approach such that each division does its own COV at their convenience; (2) ITR approach for one big COV for all divisions with subcommittees; (3) a hybrid model of options 1 and 2 such that individual COVs are staged over a short period of time followed by a 4<sup>th</sup> event with the COV chairs and CISE leadership; and (4) a single COV approach that considers CISE as a set of programs rather than as a set of divisions with 2-3 COV members per program for 9 core programs, a few more COV members for cross-cutting programs, and a few more to specifically consider diversity. The AC members demonstrated a preference for

the 4<sup>th</sup> model. Dr. Iacono asked the group to recommend people to serve CISE well for the upcoming COV.

### **Discussion with NSF Deputy Director**

Dr. Rexford welcomed Dr. Cora Marrett, NSF Deputy Director, and CISE AC members introduced themselves. Dr. Marrett welcomed the AC on behalf of the Director of NSF. Each of the three breakout groups provided a brief overview of their discussions. Dr. Marrett asked the group to consider how CISE might engage in large-scale funding mechanisms, such as major research instrumentation or facilities used in other directorates. Dr. Rexford noted that the CISE AC would also like to consider education and workforce development, including the CS10K initiative and scaling up efforts to broaden participation and help with the underproduction and underrepresentation in computing. Dr. Marrett closed by stating that the CISE AC's engagement was a model for other ACs and noted that the director may call a meeting of the chairs of the AC meeting to talk about this. Dr. Marrett then thanked the AC members for their participation and contributions.

### **Broadening Participation in Computing**

Richard Ladner, CISE AC member and member of CEOSE, briefed the members on CEOSE activities including the Biennial Report to Congress, liaisons to Directorate ACs, and meetings. He recommended that someone from the CISE community serve on CEOSE, noting that terms are limited to 2 times (3 years, renewable once) and his tenure will be up in March 2012. He noted that the CISE presentation from the Oct 17-18 meeting of CEOSE was an exemplar for other Directorates and demonstrated that there does not appear to be any implicit bias in CISE's review process, however, submission rates from underrepresented groups could be improved. He noted that CISE is the only directorate with a high level program to address broadening participation. He also recommended that the CISE AC have a representative from a community college.

Jan Cuny, CISE Program Director for Education and Workforce, provided an overview of the state of computer science education and ways NSF and CISE are attempting to improve the underproduction, underrepresentation, and lack of presence of computer science in K-12. In particular, she described the Computing Education for the 21<sup>st</sup> Century (CE21) program, which is jointly administered with the EHR Directorate, and the CS10K initiative that aims to train 10,000 teachers in 10,000 schools across the U.S. by 2016.

### **Wrap-up**

In closing, Dr. Jahanian invited all of the AC members who's termed ended in the winter of 2012 to continue through the next meeting (May 2012) and thanked the AC members for their participation.

The meeting was adjourned at 1:00 pm.

## ATTENDEES

### Members Present:

**Dr. Anant Agarwal-** Computer Science and Artificial Intelligence Lab, Massachusetts Institute of Technology

**Dr. Jaime Carbonell-** School of Computer Science, Carnegie Mellon University

**Dr. Teresa Dahlberg-** College of Computing and Informatics, University of North Carolina Charlotte

**Dr. Michelle Effros-** Department of Electrical Engineering, California Institute of Technology

**Dr. Jose Fortes-** Department of Electrical and Computer Engineering, University of Florida

**Dr. Juan Gilbert-** Human-Centered Computing Division, Clemson University

**Dr. Julian Goldman-** Partners Healthcare System, Massachusetts General Hospital

**Dr. Eric Horvitz-** Adaptive Systems and Interaction Group, Microsoft Research

**Dr. Charles Isbell-** College of Computing, Georgia Institute of Technology

**Dr. Jon Kleinberg-** Department of Computer Science, Cornell University

**Dr. James Kurose-** Department of Computer Science, University of Massachusetts Amherst

**\*Dr. Richard Ladner-** Department of Computer Science, University of Washington, Seattle

**Dr. James Landay-** Department of Computer Science and Engineering, University of Washington

**Dr. Maja Mataric-** Computer Science Department, University of Southern California (telecom)

**Dr. J. Strother Moore-** AC Co-Chair; Department of Computer Science, University of Texas at Austin

**Dr. Jennifer Rexford-** AC Co-Chair; Department of Computer Science, Princeton University

**Dr. Stefan Savage-** Department of Computer Science and Engineering, University of California, San Diego (telecom)

### Members Absent:

**Dr. Henrik Christensen-** College of Computing, Georgia Institute of Technology

**Dr. Bruce Hajek-** Computer and Systems Research Laboratory, University of Illinois Urbana-Champaign

**Dr. Susan Landau-** Radcliffe Institute for Advanced Study, Harvard University

**Dr. Greg Morrisett-** School of Engineering and Applied Sciences, Harvard University

**Dr. Andrew Ng-** Computer Science Department, Stanford University

**Dr. Keshav Pingali-** Department of Computer Science, University of Texas at Austin

**Dr. William Weihl-** Google, Inc., Mountain View, CA

\*Liaisons from other NSF Advisory Committees