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

May 7, 2010

National Science Foundation
Arlington, VA

MEETING SUMMARY

The spring meeting of the National Science Foundation's Directorate for Computer and Information Science and Engineering's Advisory Committee was held at NSF on May 7, 2010.

Welcome and Introductions

Professor Richard Karp, Chair, CISE Advisory Committee (AC), called the meeting to order at 8:30 a.m. A list of attendees can be found in Appendix I.

The minutes from the fall 2009 meeting were approved.

NSF and CISE Update

Dr. Jeannette Wing provided the NSF and CISE updates, covering information on priorities of the Administration, the CISE and NSF budgets including NSF-wide priorities in the FY 2011 request, CISE cross-cutting programs, education and workforce programs, and a new scientific focus on Smart Health. Dr. Wing welcomed new CISE staff and noted other staff transitions. Slides from Dr. Wing's presentation are included in Appendix II and her presentation is posted on the AC SharePoint site for the May 7th meeting, for those with access.

Advisory Committee members discussed the challenges associated with executive transitions in CISE over the summer and were reassured that incoming Division Directors were present at the meeting and were engaged in an on-boarding process. Dr. Wing also described plans for transitions at the Assistant Director and Deputy Assistant Director levels.

Computing Community Consortium (CCC)

Susan Graham, Executive Director of the CCC and Pehong Chen Distinguished Professor at the University of California at Berkeley, gave a presentation on the CCC. Professor Graham described the mission, activities, and vision of the CCC and described the vast research opportunities the future holds for computing. Professor Graham's presentation slides are included in Appendix II and her presentation is posted on the AC SharePoint site for the May 7th meeting, for those with access.

Advisory Committee members described challenges associated with defining a process for identifying high priority computing research areas for the future because members of the research community are motivated to keep their best ideas close because they feel these ideas give them a competitive advantage; NSF needs to find ways to motivate changes in this behavior. Members also discussed the challenges associated with the conservative nature of the merit review process, which they felt may discourage the support of high-risk projects with significant transformative potential. The transformative potential of the Expeditions in Computing program was noted as an example CISE program designed to encourage the bold exploration of new computing frontiers. Members commended Dr. Graham for the CCC's role in shaping the evolution of the GENI project. The role of NSF's EAGER and RAPID programs in incentivizing high-risk research was also noted, since historically CISE has been a big supporter of such grants.

Global Environment for Network Innovations (GENI)

Chip Elliott, Project Director for the GENI Project Office (GPO) and Chief Engineer at BBN Technologies, brought the committee up to date on GENI. Mr. Elliott described the current status, plans and goals for the project, and discussed the experiments now in progress. He also asked for suggestions and feedback from the committee for GPO solicitation 3, to be issued in late spring with proposals due in mid-late summer. Mr. Elliott's presentation slides are included in Appendix II and his presentation is posted on the AC SharePoint site for the May 7th meeting, for those with access.

Committee members commended Dr. Elliot for progress made in the GENI project.

Team for Research in Ubiquitous Secure Technology (TRUST)

John Mitchell, Stanford University, gave a presentation on the TRUST science and technology center, now in its fifth year. Professor Mitchell discussed the center's core research areas, education and human resource development, and knowledge transfer as well as how to sustain the center. He also discussed the feasibility of developing a science base for security, informed by TRUST experience. Presentation slides from this session are included in Appendix II and are posted on the AC SharePoint site for the May 7th meeting, for those with access.

Advisory Committee members discussed the challenges associated with transitioning TRUST research outcomes into the private sector, the need for the robust engagement of social, behavioral and economic scientists in trustworthy computing research, cybersecurity research challenges motivated by security and privacy needs in electronic healthcare, the Administration's interest in forging greater connections between the research community in cybersecurity and organizations in the financial sector.

Working Lunch: Committee of Visitors Reports and *Let's Compute!*

Committees of Visitors: Dr. Karp reviewed the status of the three CISE COV reports and associated management responses created as outcomes of the three CISE Committee of Visitors meetings held in the spring of 2009. The Advisory Committee accepted the reports and management responses; they will be posted on the NSF web site in the summer of 2010.

Let's Compute!: Dr. Crawford reviewed the creation of the draft *Let's Compute!* document, noting that it was prepared based on the recommendations of the Advisory Committee's sub-committee on broadening participation. Advisory Committee members discussed: CISE's increasing role in supporting education innovations at the K-12 level and the importance of engaging researchers with expertise in education and learning in this activity; the community's growing interest in and commitment to broadening participation in computing as a consequence of the success of the CISE Broadening Participation in Computing (BPC) program and the importance that this be sustained and grown; and the importance of helping the CISE community better understand what is expected in "broader impacts." Drs. Wing and Znati described the Broader Impacts for Research and Discovery Summit (BIRDS) being planned for June of 2010 to help CISE investigators integrate activities that address NSF's broader impacts review criterion into their research, see http://www.nsfbirds.org/. It is anticipated that one of the outcomes generated from the BIRDS activity is that researchers will be better able to plug into ongoing "broader impacts" efforts.   Advisory Committee members generally supported publication of the *Let's Compute!* document with broad dissemination to the community, including research offices, and suggested that a 2-page lighter weight document also be developed and made available.

Expeditions: RoboBees

Gu-Yeon Wei, Harvard School of Engineering and Applied Sciences, gave a presentation on the Expedition award on RoboBees. Professor Wei discussed the scientific challenges involved in creating RoboBees, a convergence of brain, body and colony, and the team's approach to each. He noted that the breadth of these challenges is driving connections among many diverse disciplines with the core research interest of individuals tied to collective research goals. Presentation slides from this session are included in Appendix II and are posted on the AC SharePoint site for the May 7th meeting, for those with access.

Advisory Committee members were very supportive of the project, noting that it was a terrific example of a high-risk, scientifically challenging, visionary project. It was noted that this was a great example of the promise of the Expeditions in Computing program.

Dr. Wing noted the decreasing response rate of the CISE community to the Expeditions proposal solicitation (the number of proposals submitted has declined over the last few years).   The Advisory Committee members discussed the disincentives to high-risk proposal submission, including the community's perception of the conservative nature of

merit review. Yet clearly, high-risk proposals like the RoboBees project are supported, so NSF and the Advisory Committee need to get the word out. It was noted that the average rating of CISE reviews is lower than in any other NSF directorate, not because the quality of proposal is lower, but because the community is more critical, perhaps hyper-critical. This disadvantages CISE proposals when they are compared across scientific communities (e.g. with astronomy proposals). Members discussed approaches to manage this difference in community practices, and to address the perceived "culture of negativity" in the CISE community. The influence of the community's preference to publish in conference proceedings as opposed to in journal articles was also discussed, the concern being that researchers were motivated to create results to meet conference deadlines, rather than to publish scholarly research outcomes generated in a more rigorous fashion.

Preparing to Meet with and Meeting with Dr. Marrett

The AC prepared to meet with the NSF acting Deputy Director, Dr. Cora Marrett.

AC members discussed feedback on NSF's Strategic Plan. Members discussed the following recommendations with Dr. Marrett: NSF should better define acronyms in the Plan; NSF should place more emphasis on the role of growing domestic student participation in the science and engineering enterprise; the agency should place more emphasis on the importance of evaluation and assessment; there was confusion over goals and strategies and it was suggested this confusion be resolved; and the Plan should place more emphasis on NSF's role in creating the science and engineering professionals of the future.

Concluding Session

The Advisory Committee discussed their role in CISE's work, and ways in which to strengthen their contributions to shaping the community's future. This will be discussed further at a future meeting.

Dr. Wing concluded the meeting by thanking Dr. Karp, outgoing AC chair, for his many contributions during his AC tenure, and thanking other AC members for whom this was their last meeting.

With no further discussion, the meeting was adjourned at 4:30 p.m.

Appendix I

ATTENDEES

Members Present:
Professor Richard M. Karp, Chair, Electrical Engineering & Computer Science, Univ. of California at Berkeley, CA
Professor Anant Agarwal, MIT Computer Science and Artificial Intelligence Lab, Cambridge, MA (telecon)
Dr. Andrew A. Chien, Vice President, Corporate Technology Group, Intel Research, Hillsboro, OR
Dean Jorge Díaz-Herrera, College of Computing and Information Sciences, Rochester Institute of Technology
Professor Michelle Effros, Department of Electrical Engineering, California Institute of Technology, Pasadena, CA
Professor Carla Ellis, Department of Computer Science, Duke University, Durham, NC
Dr. Stuart Feldman, Vice President, Engineering, Google, New York, NY (ACCI liaison)
Dr. Julian M. Goldman, Director, CIMIT Program on Interoperability and the MD PnP Program, Massachusetts General Hospital, Boston, MA
Dr. Eric Horvitz, Microsoft Research, Redmond, WA
Professor Charles L. Isbell, Jr., College of Computing, Georgia Institute of Technology, Atlanta, GA
Dr. Alan Kay, President, Viewpoints Research Institute, Glendale, CA
Professor Jon Kleinberg, Cornell University, Ithaca, NY **(telecom)**
*Dr. Richard Ladner, Department of Computer Science, University of Washington, Seattle, WA
Dr. Susan Landau, Sun Microsystems Laboratories, Burlington, MA
Professor Andrea Lawrence, Department of Computer Science, Spelman College, Atlanta, GA
Professor Jeffrey MacKie-Mason, School of Information, University of Michigan, Ann Arbor, MI
Professor Andrew Ng, Computer Science Department, Stanford University, Stanford, CA
Professor Donald Norman, Northwestern University (retired), Palo Alto, CA
Professor Melissa O'Neill, Computer Science, Harvey Mudd College, Claremont, CA
Professor Keshav Pingali, Director, Center for Distributed & Grid Computing ICES, University of Texas, Austin, Texas
Dean Martha E. Pollack, School of Information, University of Michigan, Ann Arbor, MI
Dr. Vijay V. Raghavan, Center for Advanced Computer Studies, University of Louisiana at Lafayette, Lafayette, LA
Professor Jennifer Rexford, Department of Computer Science, Princeton University, Princeton, NJ
Dr. William Weihl, Google, Inc., Mountain View, CA

Members Absent:
*Professor Cynthia Barnhart, Associate Dean for Academic Affairs, MIT School of Engineering, Cambridge, MA (ENG AC liaison)
Professor Maja Mataric, Computer Science Department, University of Southern California, Los Angeles, CA

*Liaisons from other NSF Advisory Committees

Appendix II

NSF and CISE Update

Computing Community Consortium (CCC)

Global Environment for Network Innovations (GENI)

Team for Research in Ubiquitous Secure Technology (TRUST)

Expeditions: RoboBees