The Computing Community Consortium: An Update

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Chair, Computing Community Consortium

Computing Leadership Summit

February 2009

http://www.cra.org/ccc/

Today ...

- Origins
- Structure
- Continuing activities
- Recent and current special initiatives

Computing has changed the world

▊ Advances in computing change the way we live, work, learn, and communicate

▊ Advances in computing drive advances in nearly all other fields

▊ Advances in computing power our economy

  ▊ Not just through the growth of the IT industry – through productivity growth across the entire economy
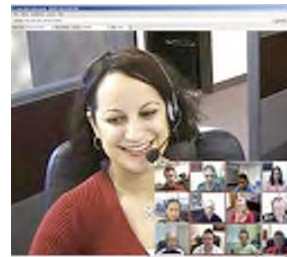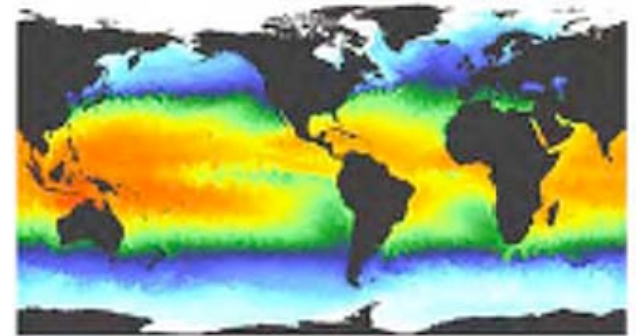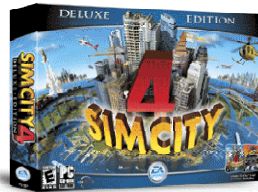
Research has built the foundation

- Timesharing
- Computer graphics
- Networking (LANs and the Internet)
- Personal workstation computing
- Windows and the graphical user interface
- RISC architectures
- Modern integrated circuit design
- RAID storage
- Parallel computing
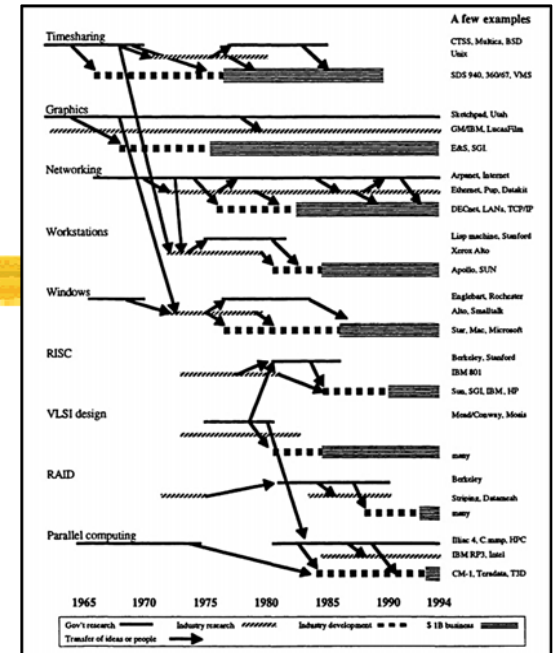
Much of the impact is recent

- Entertainment technology
- Data mining
- Portable communication
- The World Wide Web
- Speech recognition
- Broadband last mile
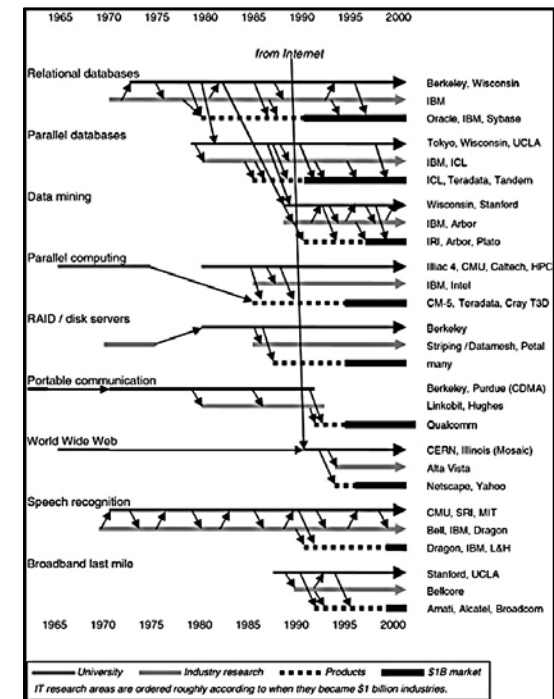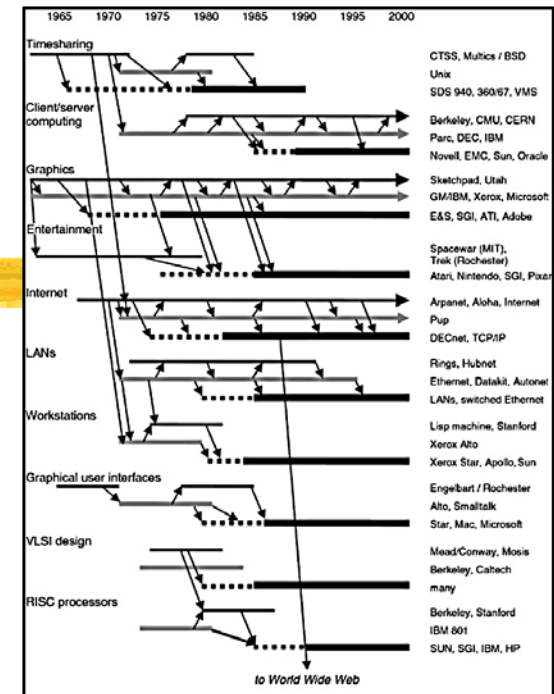
The future is full of opportunity

- Creating the future of networking
- Driving advances in all fields of science and engineering
- Revolutionizing transportation
- Personalized education
- Predictive, preventive, personalized medicine
- Quantum computing
- Empowerment of the developing world
- Personalized health monitoring => quality of life
- Harnessing parallelism: many-core and DISC
- Neurobotics
- Synthetic biology
- The algorithmic lens: Cyber-enabled discovery and innovation
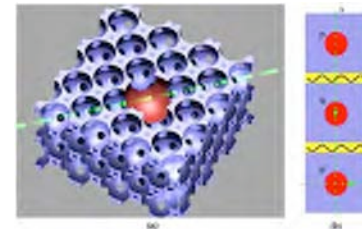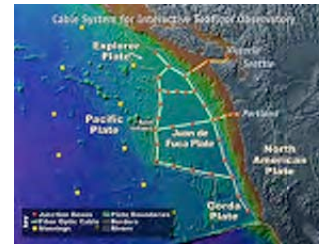
We must work together to establish, articulate, and pursue visions for the field

- The challenges that will shape the intellectual future of the field
- The challenges that will catalyze research investment and public support
- The challenges that will attract the best and brightest minds of a new generation

To this end, NSF asked CRA to create the Computing Community Consortium

- **To catalyze the computing research community to consider such questions**
  - To envision long-range, more audacious research challenges
  - To build momentum around such visions
  - To state them in compelling ways
  - To move them towards funded initiatives
  - To ensure "science oversight" of large-scale initiatives
- **A "cooperative agreement" with NSF**
  - Close coordination
- **Launched in 2007**
  - Chair appointed in March
  - Inaugural Council appointed in June

The structure

- **CCC is all of us!**
  - This process *must* succeed, and it *can't* succeed without broad community engagement
- **There is a CCC Council to guide the effort**
  - The Council *stimulates* and *facilitates* – it doesn't "own"
  - Chosen through an open process under CRA auspices (Randy Bryant chaired first search, Eric Grimson chaired second)
- **The Council is led by a Chair**
  - Ed Lazowska, University of Washington
    - Susan Graham, UC Berkeley, serves as Vice Chair
  - 50% effort – not titular
- **The CCC is staffed by CRA**
  - Andy Bernat serves as Executive Director

The CCC Council

Chair

- Ed Lazowska

Terms expire 2012

- Stephanie Forrest
- Chris Johnson
- Anita Jones
- M. Frans Kaashoek
- Ran Lebeskind-Hadas
- Robin Murphy

Rotated off
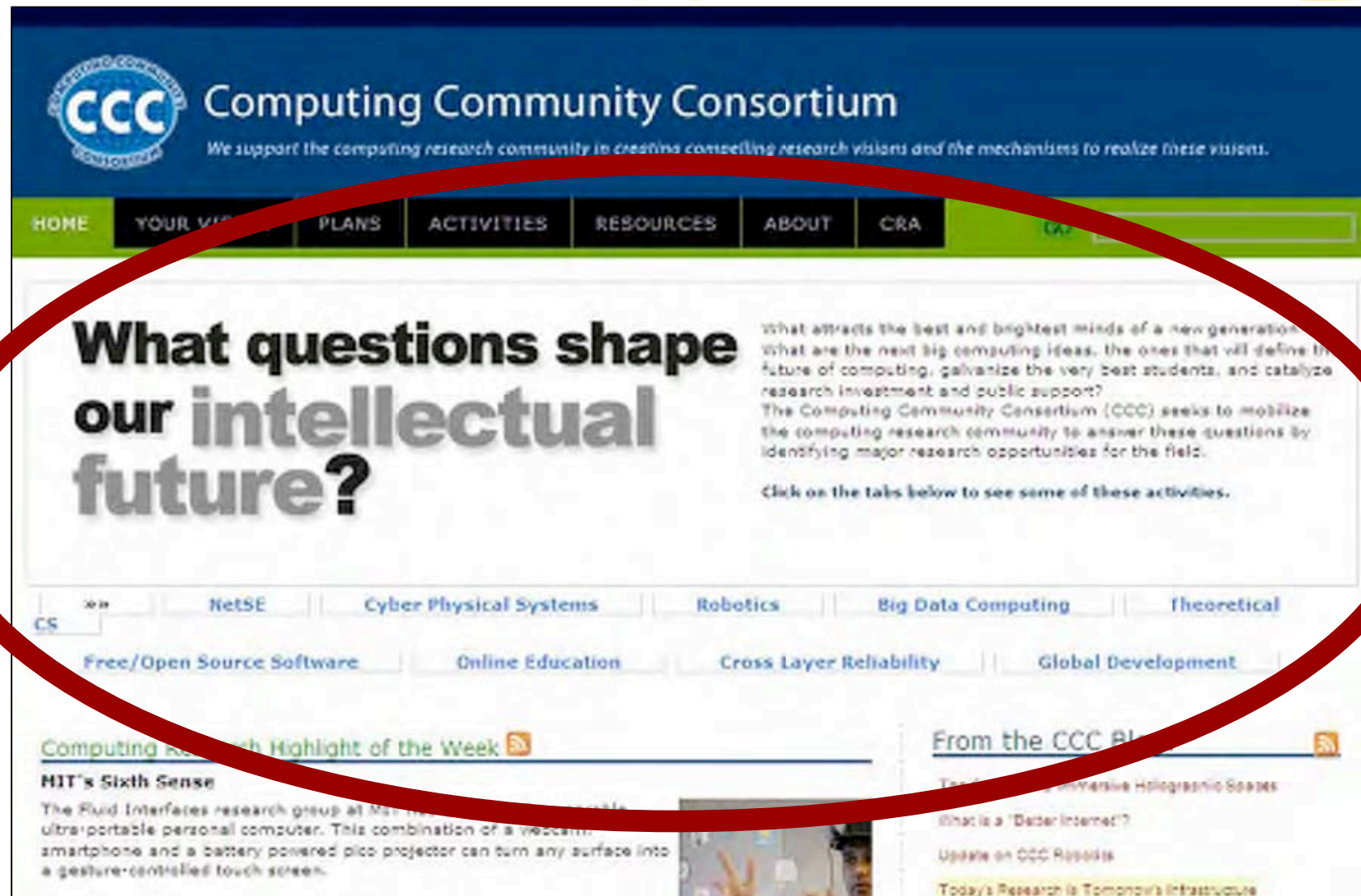
- Greg Andrews
- Karen Sutherland

Terms expire 2011

- Bill Feiereisen
- Susan Graham (v ch)
- Dave Kaeli
- John King
- Peter Lee
- Bob Sproull

Terms expire 2010

- Dick Karp
- Andrew McCallum
- Beth Mynatt
- Fred Schneider
- David Tennenhouse
- Dave Waltz

Continuing activities

CCC BLOG

THE COMPUTING COMMUNITY CONSORTIUM

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FEB 21 — Does Better Security Depend on a Better Internet?

Filed Under big science, research horizons (Edit Post)

Last week the New York Times printed an article by John Markoff entitled, Do We Need a New Internet? In the article, Markoff states, "…there is a growing belief among engineers and security experts that Internet security and privacy have become so maddeningly elusive that the only way to fix the problem is to start over." Stanford's Nick McKeown is quoted in the article, "Unless we're willing to rethink today's Internet, we're just waiting for a series of public catastrophes." The article speculates that in a new network architecture, some users would "give up their anonymity and certain freedoms in return for safety."

It's certainly exciting to see core computer science issues featured so prominently in the press! Indeed, this article has generated quite a bit of discussion in the research community. For example, while acknowledging that a new network architecture would certainly play an important role in improving security, Purdue's Gene Spafford writes on his CERIAS blog, "Do we need a new Internet? Short answer: Almost certainly, no." (Gene tells me that he will be interviewed on this topic on C-SPAN's Washington Journal, airing at 9:30am on Saturday, February 21.) UCSD's Stefan Savage is largely in agreement, saying that "the network is by

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**COMPUTING RESEARCH HIGHLIGHT OF THE WEEK [... ... 2009]**

MIT's Sixth Sense

The Fluid Interfaces research group at MIT has developed a wearable, ultra-portable personal computer. This combination of a webcam, smartphone and a battery powered pico projector can turn any surface into a gesture-controlled touch screen.

Hand gestures can be used to take pictures (draw a frame around a scene), project the time (make a circle with a finger) or check e-mail (draw an @ sign in the air). The camera can be used to create, a ubiquitous, highly aware and tangible environment. The smart-phone taps into the all-knowing internet and returns information on the current surroundings of the user/wearer. It's like is having the entire world as your computer.

Here's a video from Wired.com:

WIRED VIDEO
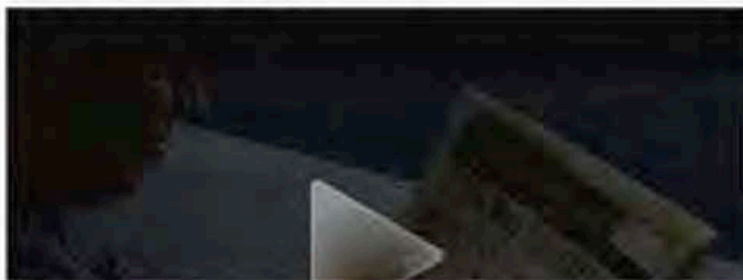
Relevant Links

Press Release
Research Papers
Media Contact

Keywords

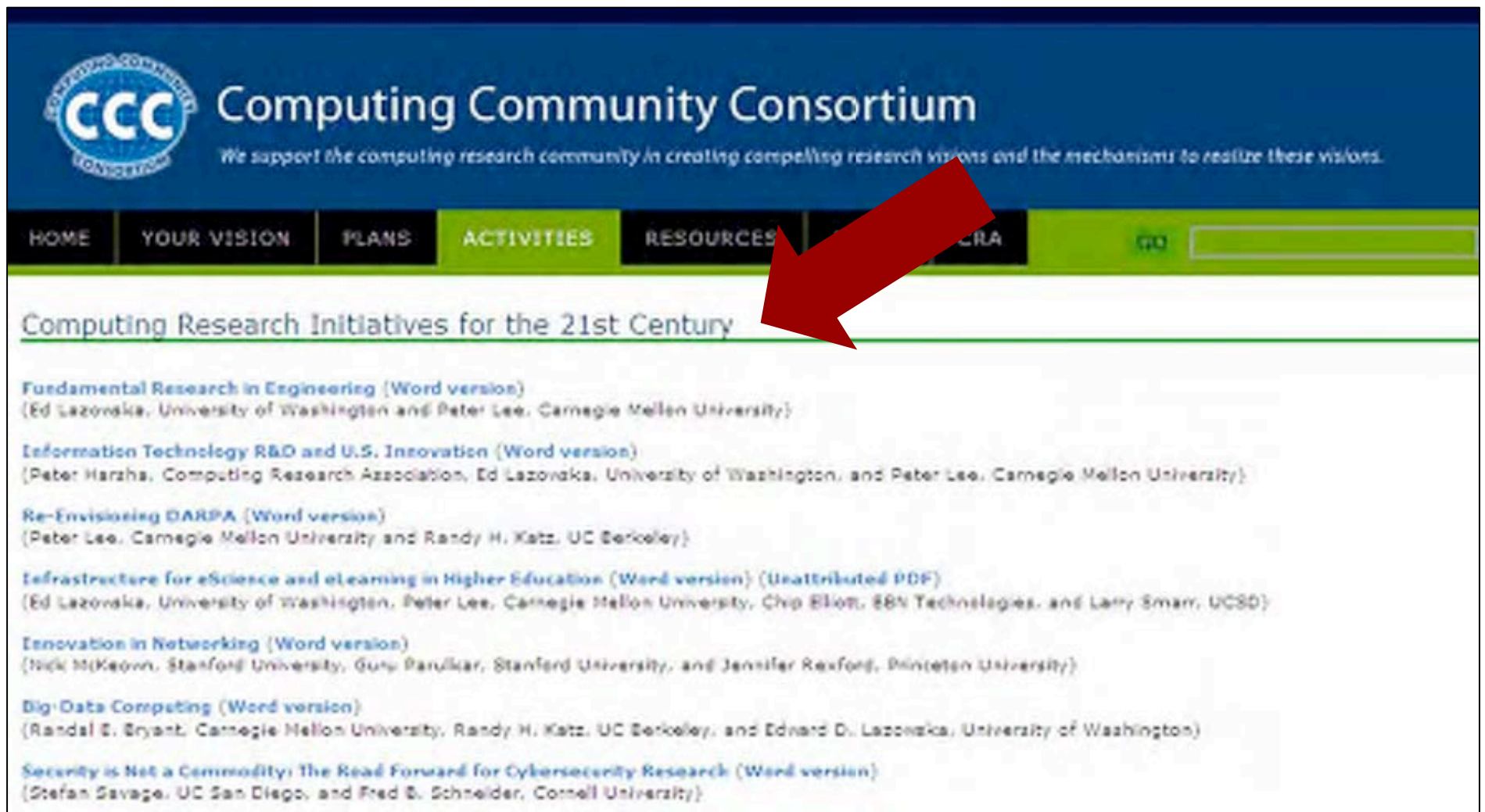interfaces, just-in-time-information, mobile, tangible, ubiquitous

Buzz

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Recent and current special initiatives

Surface Transportation 3.0 (Word version)
(Sebastian Thrun, Stanford University, and Henry Kelly, Federation of American Scientists)

The Ocean Observatories Initiative (Word version)
(John Delaney, University of Washington, John Orcutt, Scripps Institute of Oceanography, and Robert Weller, Woods Hole Oceanographic Institution)

Quality of Life Technology (Word version)
(Howard Wactlar, Carnegie Mellon University, and Takeo Kanade, Carnegie Mellon University)

P4 Medicine (Word version)
(Leroy Hood, Institute for Systems Biology, and David Galas, Battelle Memorial Institute)

"Smart Grid": R&D for an Intelligent 21st Century Electrical Energy Distribution Infrastructure (Word version)
(Randy H. Katz, UC Berkeley)

Quantum Computing (Word version)
(Scott Aaronson, MIT, and Dave Bacon, University of Washington)

Synthetic Biology (Word version)
(Drew Endy, Stanford, and Ed Lazowska, University of Washington)

Computer Architecture (Word version)
(David Patterson, UC Berkeley)

Cyber-Physical Systems: A National Priority for Federal Investment in Infrastructure and Competitiveness (Word version)
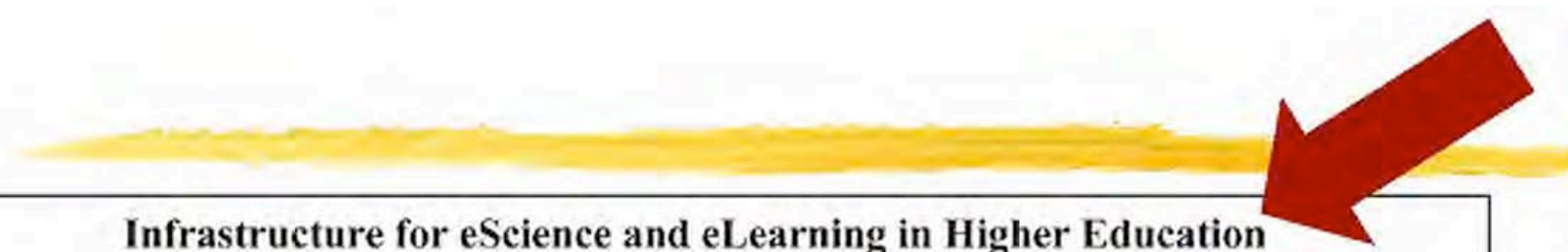(Janos Sztipanovits, Vanderbilt University, and John Stankovic, University of Virginia)

Post your comments on the Computing Community Consortium blog!

Infrastructure for eScience and eLearning in Higher Education

Ed Lazowska
University of
Washington

Peter Lee
Carnegie Mellon
University

Chip Elliott
BBN
Technologies

Larry Smarr
UC San Diego

Version 11: December 22, 2008[1]

Recent rapid advances in information and communication technologies – both hardware and software – are creating a new revolution in discovery and learning, laying the foundation for a more competitive US economy in the second decade of the 21st century.

Over the past several decades, computational science – the large-scale simulation of phenomena – has joined theory and experiment as a fundamental tool in many branches of science and engineering. Today we are at the dawn of a second revolution in discovery – a revolution that will have far more pervasive impact. The focus of this new approach to science – called *eScience* – is *data*; specifically:

- the ability to manage orders of magnitude more data than ever before possible;
- the ability to provide this data directly and immediately to a global community;
- the ability to use algorithmic approaches to extract meaning from huge volumes of data.

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(March 25, 2009)

Computing Research that Changed the World:
Reflections and Perspectives

This invitation only symposium, "Computing Research that Changed the World: Reflections and Perspectives," is being organized by the Computing Community Consortium in collaboration with Congressman Bart Gordon (D-TN) and Congressman Vern Ehlers (R-MI). It will be held in the Library of Congress on March 25, 2008.

The overall message of the symposium is that computing research has made gamechanging advances in the last two decades, from which we can extract lessons for structuring future programs to sustain that track record.

The symposium will have four sessions: "**The Internet and the World Wide Web**," "**Emerging Foundations**," "**The Transformation of the Sciences via Computation**," and "**Computing Everywhere**." In each session, we will have three talks and a short discussion that identifies future challenges. These four sessions will be followed by a discussion among all the speakers, with input from attendees, which frames a call-to-action for the future. The symposium will conclude with a session in a nearby room providing the opportunity for informal interaction, as well as remarks from some of our Congressional guests and a brief summary of the highlights of the day. We will videotape the talks and discussions, prepare a brochure, and develop a web presence to make the symposium material broadly available.

Library of Congress Logo

Symposium:

8:45 am - 5:00 pm
Members' Room, Library of Congress

Closing Session:

5:30 pm - 8:30 pm
Madison Hall, Library of Congress

Speakers:

Eric Brewer
University of California, Berkeley

Rodney Brooks
MIT and Heartland Robotics

Deborah Estrin
University of California, Los Angeles

Pat Hanrahan
Stanford University

The desired outcomes

- Broad community engagement in establishing more audacious and inspiring research visions for our field
  - Some may require significant research infrastructure (e.g., NetSE); some will be new programs (e.g., CDI)
- Better public appreciation of the potential of the field
- Attraction of a new generation of students
- More robust support for computing research
- Greater impact!

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