

The Computing Community Consortium

Ed Lazowska

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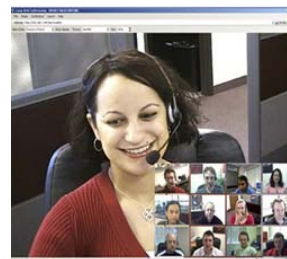
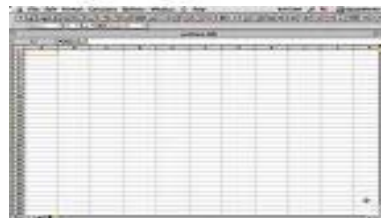
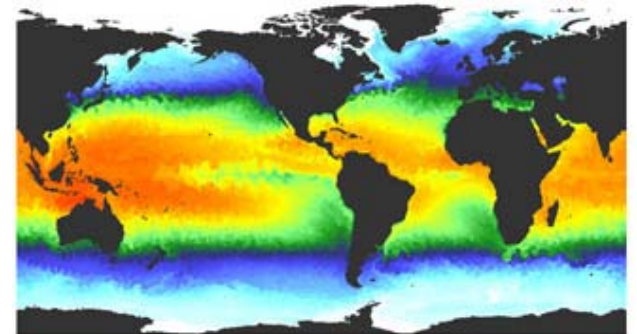
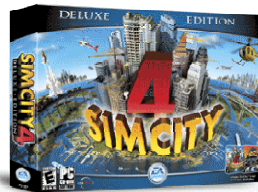
Chair
Computing Community Consortium

<http://lazowska.cs.washington.edu/ccc.overview.pdf>

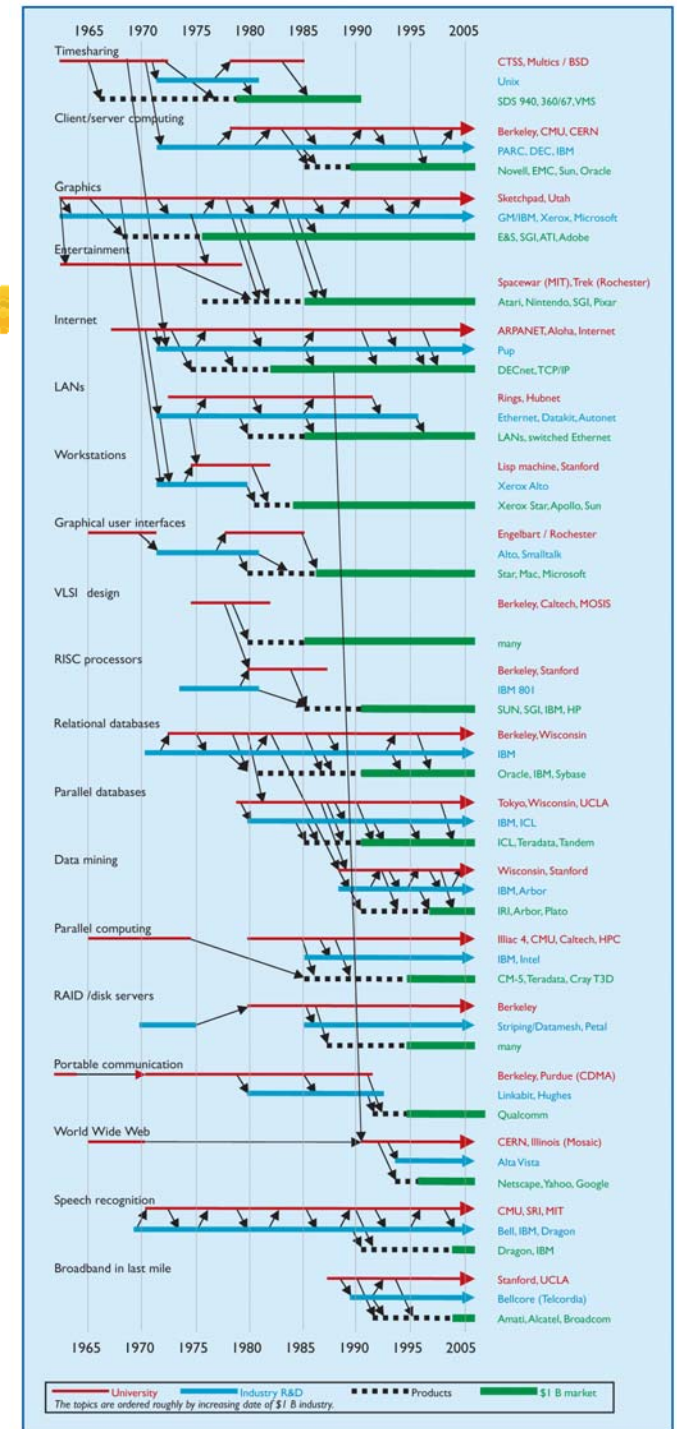
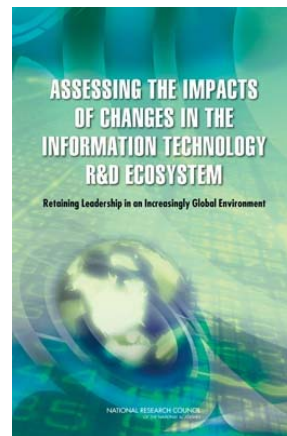
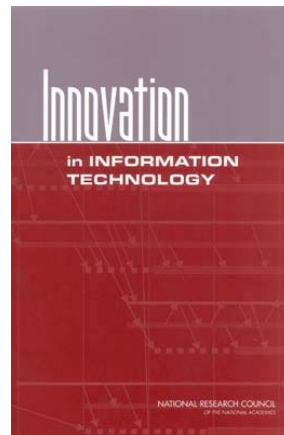
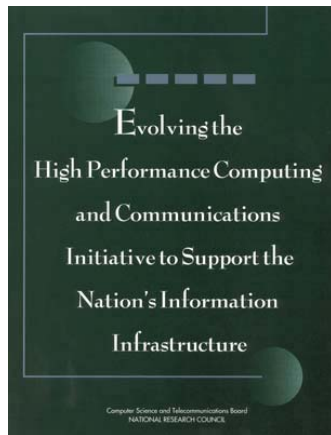


Computing has changed the world

- 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

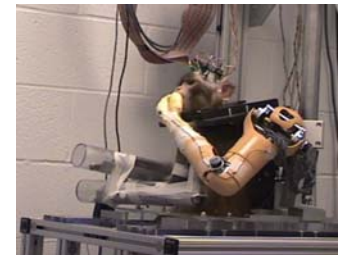
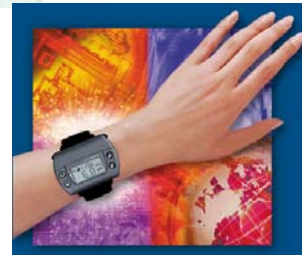
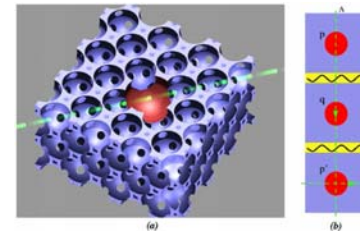
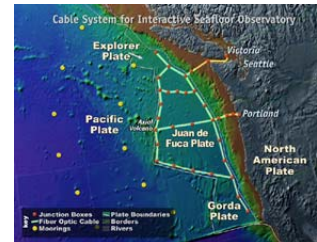
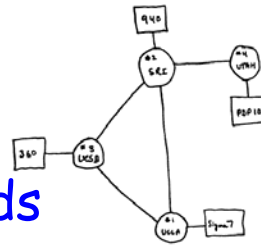


Research has built the foundation



The future is full of opportunity

- Creating the future of networking
- Driving advances in all fields of science and engineering
- Revolutionizing transportation
- Personalized education
- The smart grid
- Predictive, preventive, personalized medicine
- Quantum computing
- Empowerment for the developing world
- Personalized health monitoring => quality of life
- Harnessing parallelism
- Neurobotics
- Synthetic biology



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
- A "standing committee" of CRA
- Launched in 2007



CCC 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 1st search, Eric Grimson chaired 2nd and 3rd)

■ 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 Director, => Erwin Gianchandani

The CCC Council - broad representation

■ Chair

- Ed Lazowska, Washington

■ Terms ending 2013

- Randy Bryant, CMU
- Lance Fortnow, Northwestern
- Hank Korth, Lehigh
- Eric Horvitz, Microsoft Research
- Beth Mynatt, Ga Tech
- Fred Schneider, Cornell
- Margo Seltzer, Harvard

■ Terms ending 2012

- Stephanie Forrest, New Mexico
- Chris Johnson, Utah
- Anita Jones, UVa
- M. Frans Kaashoek, MIT
- Ran Libeskind-Hadas, Harvey Mudd
- Robin Murphy, Texas A&M

■ Terms ending 2011

- Bill Feiereisen, Lockheed Martin
- Susan Graham (v ch), Berkeley
- Dave Kaeli, Northeastern
- John King, Michigan
- Bob Sproull, Sun

■ Ex Officio

- Andy Bernat, CRA

■ Rotated off

- Dick Karp, Berkeley, 2010
- Andrew McCallum, UMass, 2010
- Dave Waltz, Columbia, 2010
- Greg Andrews, Arizona, 2009
- Peter Lee, CMU, 2009
- Karen Sutherland, Augsburg, 2009

Major continuing activities

■ Countless talks

The Computing Community Consortium: Stimulating Bigger Thinking

Ed Lazowska

Bill & Melinda Gates Chair in
Computer Science & Engineering
University of Washington

Chair, Computing Community Consortium

Tapia Conference Career Workshop
April 2009

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



Major continuing activities

- Countless talks
- Countless articles

The screenshot shows a document titled "Viewpoint" with the subtitle "Envisioning the Future of Computing Research" by Ed Lazowska. The DOI is 10.1145/1378704.1378714. The article discusses the Computing Community Consortium's mission to continue the lineage of computing research. It mentions that advances in computing have changed our lives and that the consortium aims to help the research community continue that lineage. The text is partially cut off at the bottom.

Vviewpoints

DOI:10.1145/1378704.1378714 Ed Lazowska

Viewpoint

Envisioning the Future of Computing Research

Advances in computing have changed our lives—the Computing Community Consortium aims to help the research community continue that lineage.

HOW CAN WE work together to establish, articulate, and pursue compelling visions for our field—visions that will shape the intellectual future of the field, that will catalyze research investment and public support, and that will attract the best and brightest minds of a new generation?

The National Science Foundation

many Internet hosts.


It was only 10 years ago that Deep Blue—a supercomputer by any definition—defeated world chess champion Garry Kasparov. Today, thanks more to progress in software than to progress in hardware, you can download for your PC a chess engine with a rating 10% higher than any human player. Most of the “futurist scenar-

try: 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, and parallel computing. In each case, the role of federally sponsored research was clear.

The panel conducting this study (I

Major continuing activities


- Countless talks
- Countless articles
- CCC blog



CCC BLOG

THE COMPUTING COMMUNITY CONSORTIUM

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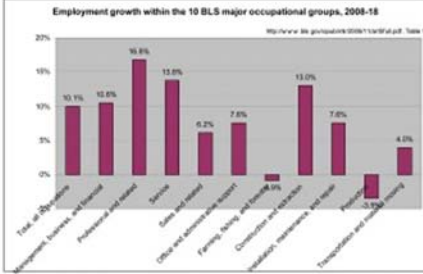
Recent Posts

- [Computing Research that Changed the World: Reflections and Perspectives](#)
- [Where the jobs are ...](#)
- ["Exponentials R Us" – Seven Computer Science Game-Changers from the 2000's, and Seven More to Come](#)
- [A Report on the Cross-layer Reliability Visioning Study Group](#)
- [A Report on the Discovery and Innovation in Health IT Workshop](#)

Where the jobs are ...

Filed Under [Uncategorized](#), [pipeline](#), [resources](#)

Employment growth within the 10 BLS major occupational groups, 2008-18

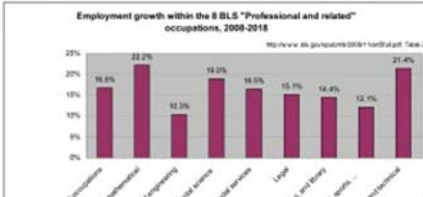


Occupational Group	Projected Growth (2008-18)
Total all occupations	10.1%
Management, business, and financial	10.8%
Professional and related	16.8%
Service	15.0%
Sales and related	6.2%
Office and administrative support	7.8%
Farming, fishing, and forestry	0.0%
Construction and extraction	13.0%
Installation, maintenance, and repair	7.8%
Transportation and material moving	4.0%

Every second year, the US Bureau of Labor Statistics provides a ten-year forecast of job growth in all fields of employment. The most recent forecast, released in November 2009 and covering the period 2008-2018, may be found [here](#) (pdf). Among the highlights:

- Among the 10 major BLS occupational groups, the "Professional and related" category (which includes computer science occupations) is projected to grow by the largest percentage between now and 2018, by 16.8%.

Employment growth within the 8 BLS "Professional and related" occupations, 2008-2018



Occupational Group	Projected Growth (2008-18)
Mathematicians	18.8%
Computer and mathematical scientists	22.2%
Engineers	19.3%
Physical sciences	13.0%
Social sciences	16.0%
Legal	15.1%
Health and life sciences	14.4%
Arts and humanities	12.1%

Major continuing activities

- Countless talks
- Countless articles
- CCC blog
- Computing research highlight of the week

The screenshot displays the homepage of the Computing Community Consortium (CCC). The header features the CCC logo and the text "Computing Community Consortium" with the tagline "We support the computing research community in creating compelling research visions and the mechanisms to realize these visions." Below the header is a navigation bar with links: HOME, YOUR VISION, PLANS, ACTIVITIES (highlighted in green), RESOURCES, ABOUT, CRA, and a GO button. The main content area is titled "COMPUTING RESEARCH HIGHLIGHT OF THE WEEK [January 14 - 21, 2010]". The featured article is "One Keypad per Child" Lets School Children Share Screen to Learn Math. The article text describes a system developed by University of Washington computer science undergraduates that allows up to four students to share a single computer for interactive math problems. It mentions that early tests show students can share a single screen while working on problems at their own pace, effectively quadrupling the number of computers available for math exercises. A quote from Jyojeet Pal, a lecturer in UW Computer Science & Engineering, states: "Computer sharing is quite common in much of the world," said Jyojeet Pal, a lecturer in UW Computer Science & Engineering who has studied technology adoption in rural India, Rwanda, and the slums of Brazil. Despite this, though, practically no learning technologies accommodate sharing, Pal said. The article also mentions that this month the team will test the system, called MultiLearn, with 180 students who are attending two government-run elementary schools in rural India. A quote from Pal says: "Children show dominance patterns when they sit in front of a machine," Pal said. "If there are three to five children, then the child who is the smartest and from the most affluent family controls the mouse." In 2006 Pal worked with Kentaro Toyama at Microsoft Research India helping to connect multiple mice to a single computer so that many users could. The article is accompanied by two images: one showing two young girls looking at a screen, and another showing a man (Jyojeet Pal) with a play button overlay. On the right side of the article, there are sections for "Relevant Links" (Press Release, Project Web Page, Research Papers, Media Contact), "Keywords" (educational technology, information technology for development, University of Washington), and "Buzz" (RSS, SUBSCRIBE, EMAIL, NOTIFY, EMBED, CODE, SHARE, and social media icons).

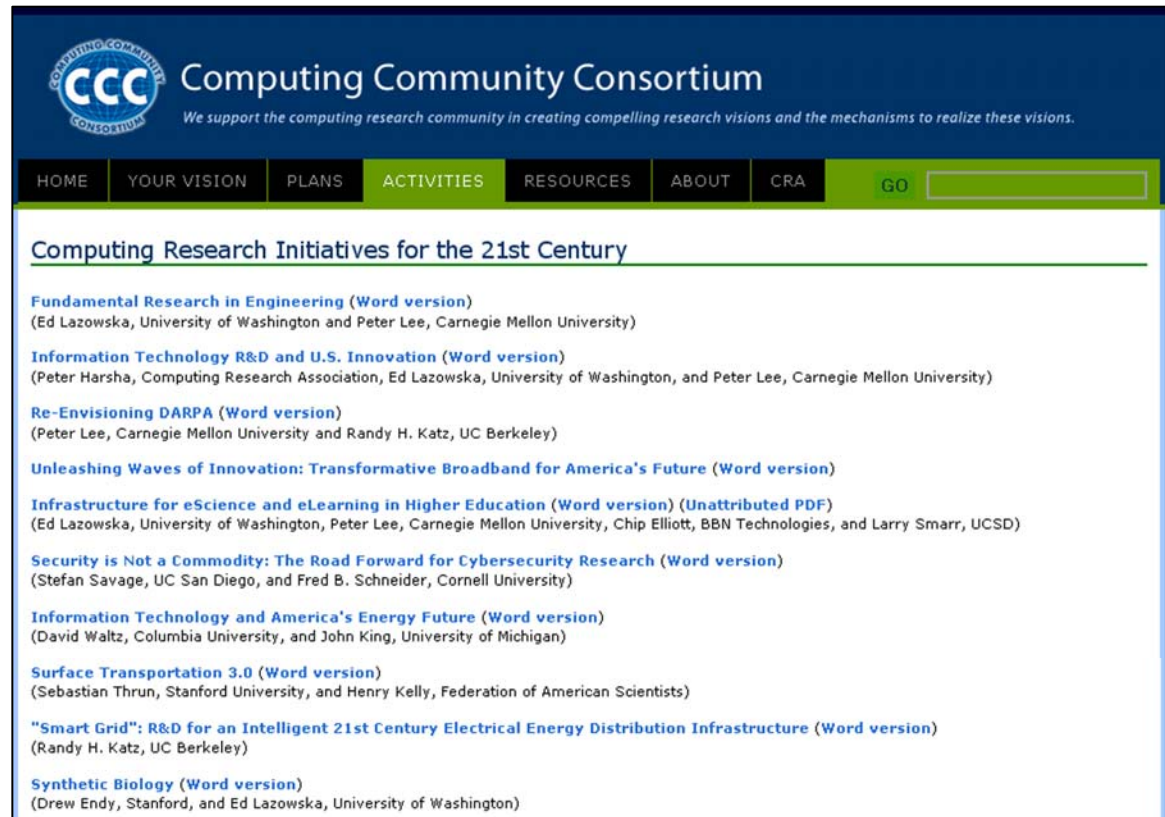
Major continuing activities

- Countless talks
- Countless articles
- CCC blog
- Computing research highlight of the week
- Community visioning exercises



Major special initiatives

■ Transition Team white papers



The screenshot shows the homepage of the Computing Community Consortium (CCC). The header features the CCC logo and the text "Computing Community Consortium" with a tagline: "We support the computing research community in creating compelling research visions and the mechanisms to realize these visions." Below the header is a navigation bar with links: HOME, YOUR VISION, PLANS, ACTIVITIES, RESOURCES, ABOUT, CRA, and a GO button. The main content area is titled "Computing Research Initiatives for the 21st Century" and lists several initiatives with links to their word versions and PDFs.

Computing Community Consortium
We support the computing research community in creating compelling research visions and the mechanisms to realize these visions.

HOME YOUR VISION PLANS **ACTIVITIES** RESOURCES ABOUT CRA GO

Computing Research Initiatives for the 21st Century

- [Fundamental Research in Engineering \(Word version\)](#)
(Ed Lazowska, University of Washington and Peter Lee, Carnegie Mellon University)
- [Information Technology R&D and U.S. Innovation \(Word version\)](#)
(Peter Harsha, Computing Research Association, Ed Lazowska, University of Washington, and Peter Lee, Carnegie Mellon University)
- [Re-Envisioning DARPA \(Word version\)](#)
(Peter Lee, Carnegie Mellon University and Randy H. Katz, UC Berkeley)
- [Unleashing Waves of Innovation: Transformative Broadband for America's Future \(Word version\)](#)
- [Infrastructure for eScience and eLearning in Higher Education \(Word version\) \(Unattributed PDF\)](#)
(Ed Lazowska, University of Washington, Peter Lee, Carnegie Mellon University, Chip Elliott, BBN Technologies, and Larry Smarr, UCSD)
- [Security is Not a Commodity: The Road Forward for Cybersecurity Research \(Word version\)](#)
(Stefan Savage, UC San Diego, and Fred B. Schneider, Cornell University)
- [Information Technology and America's Energy Future \(Word version\)](#)
(David Waltz, Columbia University, and John King, University of Michigan)
- [Surface Transportation 3.0 \(Word version\)](#)
(Sebastian Thrun, Stanford University, and Henry Kelly, Federation of American Scientists)
- ["Smart Grid": R&D for an Intelligent 21st Century Electrical Energy Distribution Infrastructure \(Word version\)](#)
(Randy H. Katz, UC Berkeley)
- [Synthetic Biology \(Word version\)](#)
(Drew Endy, Stanford, and Ed Lazowska, University of Washington)

Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation

Unleashing Waves of Innovation Transformative Broadband for America's Future

Version 18: April 18, 2009¹

Executive Summary

A forward-thinking National Broadband Strategy should focus on the transformative power of advanced networks to unleash new waves of innovation, jobs, economic growth, and national competitiveness. Such a strategy should create new tools to deliver health care, education, and a low carbon economy. The American Recovery and Reinvestment Act broadband decisions should target high-impact investments with these criteria in mind. They should seek to rebuild U.S. global leadership in networking and in the economic innovations that networking can create. Broadband investments should “pull from the future.”

A National Broadband Strategy should begin with America's colleges and universities, community colleges, K-12 schools, public libraries, hospitals, clinics, and the state, regional and national research and education networks that connect them and extend to reach government agencies, agricultural extension sites, and community centers across the nation. A proven track record of innovating in networking and its applications, of deploying and continually upgrading advanced networks, and of extending those networks to the unserved and underserved across our nation, lies not with telephone or cable companies, nor with most state governments, but with our nation's colleges and universities and the state, regional and national research and education networks that this community has built, in many instances forged through partnerships with telecommunications providers and state agencies to achieve these goals.

Stimulus broadband investments should be a strategic down payment on positioning our nation

Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium



Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
 - 60,000 video views



Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
- Computing Innovation Fellows project



Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
- Computing Innovation Fellows project
 - 1,209 mentors
 - 526 applicants



Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
- Computing Innovation Fellows project
- Landmark Contributions by Students

Landmark Contributions by Students in Computer Science

Version 11: September 15, 2009

There are many reasons for research funding agencies (DARPA, NSF, etc.) to invest in the education of students. Producing the next generation of innovators is the most obvious one. In addition, though, there are an impressive number of instances in our field in which undergraduate and graduate students have made truly game-changing contributions in the course of their studies.

The inspiring list below was compiled by the following individuals and their colleagues: Bill Bonvillian (MIT), Susan Graham (Berkeley), Anita Jones (University of Virginia), Ed Lazowska (University of Washington), Pat Lincoln (SRI), Fred Schneider (Cornell), and Victor Zue (MIT).

We solicit your suggestions for additional student contributions of comparable impact – post them on the Computing Community Consortium blog, <http://www.cccblog.org/2009/08/28/landmark-contributions-by-students-in-computer-science/>, or send them to Ed Lazowska, lazowska@cs.washington.edu.

Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
- Computing Innovation Fellows project
- Landmark Contributions by Students
- NetSE Research Agenda

NetSE Research Agenda: Executive Summary and Recommendations

Over the past forty years, computer networks, and especially the Internet, have gone from research curiosity to fundamental infrastructure. In terms of societal impact, the Internet has changed the way we live, work and play, and altered our notions of democracy, education, healthcare, entertainment and commerce. In terms of its design, the Internet has shown a remarkable ability to adapt to, even inspire, changes in technologies and applications. In short, the Internet has been a powerful engine for technological innovation and societal evolution.

However, this is no time to rest on the successes of the past. To meet society's future requirements and expectations, networks in general, and the Internet in particular, will need to be better: more secure, more accessible, more predictable, and more reliable.

In 2008, the Computing Community Consortium (CCC) charged the Network Science and Engineering (NetSE) Council with developing a comprehensive research agenda that would support the development of better networks. The NetSE Council was to consider previous reports such as those produced by the Global Environment for Network Innovation (GENI) Science Council, as well as encourage new interdisciplinary participation. Over the summer and fall of 2008, the NetSE Council held a number of disciplinary and interdisciplinary workshops that, together with several GENI and pre-GENI workshops and documents, resulted in the network science and engineering research agenda detailed in this report. The NetSE-sponsored interdisciplinary workshops were structured to bring participants from closely related fields together with networking researchers to explore problems and opportunities in the intersection. The diversity of backgrounds of the workshop participants highlights the breadth of the intellectual space.

Major special initiatives

- Transition Team white papers
 - Unleashing Waves of Innovation
- Library of Congress Symposium
- Computing Innovation Fellows project
- Landmark Contributions by Students
- NetSE Research Agenda
- Health IT

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HOME YOUR VISION PLANS **ACTIVITIES** RESOURCES ABOUT CRA GO

Discovery and Innovation in Health IT

This invitation only workshop, "Discovery and Innovation in Health IT," is sponsored by the National Science Foundation, the Office of the National Coordinator for Health Information Technology, the National Institute of Standards and Technology, the National Library of Medicine, the Agency for Healthcare Research and Quality, the Computing Community Consortium, and the American Medical Informatics Association. It will be held at the Parc 55 Hotel in San Francisco on October 29 and 30, 2009.

The talks and plenary discussions will be videotaped and a web presence will be developed to make the workshop material broadly available.

The goals of the workshop are to:

- Explore and define fundamental research challenges and opportunities in healthcare IT in both the near- and long-term;
- Provide opportunities for relevant academic and industrial researchers, healthcare practitioners and IT healthcare suppliers to identify mutual interests in healthcare IT, as they relate to both near- and long-term challenges and solutions;
- Identify a range of "model" proof-of-concept, integrative systems that might serve as motivating and unifying forces to drive fundamental research in healthcare IT and accelerate the transition of research outcomes into products and services;

The workshop will have four half-day sessions. Each of the first three sessions will have two plenary talks followed by small-group breakout discussions to define particular research challenges, multiple lines of attack, and possible test-beds or demonstration systems. Each of these sessions, which are further described subsequently, will end with short reports from the

Content is still being added to this site.
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December 16, 2009.

Session Videos

HIT - Thursday Morning Op...

0:00:00 / 1:45:22

Reply/Registration

[Link to Reply/Registration Form](#)

Logistics

Date: October 29-30, 2009

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, CPS)
- Better public appreciation of the potential of the field
- Attraction of a new generation of students
- More robust support for computing research
- Greater impact!

