Social Networking: National Priorities, Deep Science, Extreme Technology

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Founding Director (1983-2000), Human-Computer Interaction Lab
Professor, Department of Computer Science
Member, Institute for Advanced Computer Studies
Interdisciplinary research community
- Computer Science & Info Studies
- Psych, Socio, Poli Sci & MITH

(www.cs.umd.edu/hcil)
Design Issues

- Input devices & strategies
  - Keyboards, pointing devices, voice
  - Direct manipulation
  - Menus, forms, commands
- Output devices & formats
  - Screens, windows, color, sound
  - Text, tables, graphics
  - Instructions, messages, help
- Collaboration & Social Media
- Help, tutorials, training
- Search
- Visualization
HCI Pride: Serving 5B Users

Mobile, desktop, web, cloud

→ **Diverse users:** novice/expert, young/old, literate/illiterate, abled/disabled, cultural, ethnic & linguistic diversity, gender, personality, skills, motivation, ...

→ **Diverse applications:** E-commerce, law, health/wellness, education, creative arts, community relationships, politics, IT4ID, policy negotiation, mediation, peace studies, ...

→ **Diverse interfaces:** Ubiquitous, pervasive, embedded, tangible, invisible, multimodal, immersive/augmented/virtual, ambient, social, affective, empathic, persuasive, ...
Next Goal

Apply social media to transform society

• Improve medical care, health/wellness
• Promote energy & water conservation
• Prevent disasters & terrorism
• Increase community safety
• Improve education
• Facilitate good government
• Resolve conflicts
Challenges

- Malicious attacks
- Privacy violations
- Not trusted
- Fails to be universal
- Unreliable when needed

- Misuse by
  - Terrorists & criminals
  - Promoters of racial hatred
  - Political oppressors
BEN SHNEIDERMAN

A National Initiative for Social Participation

THE TRANSFORMATIVE POWER OF THE INTERNET IS MORE THAN ACCESS TO INFORMATION; it is increasingly about contributing, collaborating, and participating. APIs and other information highway applications give way to community visions that capture the remarkable enthusiasm for user-generated content and social media. At the same time, President Obama is calling for civic service and personal responsibility to rebuild America. Combining these ideas could promote the shift from playful, discretionary Internet usage to larger, more serious projects aligned with national priorities such as health care, community safety, education, and innovation.

The good news is that there are many promising social action networks, but these nascent explorations could be greatly accelerated by an organized research program. This program would systematically study the emerging phenomena, determine the sources of success or failure, and disseminate best practices. The payoffs are large enough to warrant an intense national effort akin to NASA’s space program or the National Institutes of Health.

Health discussion groups have long been one of the Internet’s success stories. Now, clever entrepreneurs are exploring new social participation ideas with projects such as the www.PatientsLikeMe.com Web site, where users offer their medical experiences in the hope of learning about treatment outcomes from one another. At the same time, these users are building a remarkable resource for medical research and discovery.

Physicians have already discussed 30,000 cases at www.sermo.com, where they can offer insights about innovative treatments as well as detect unusual disease patterns. Large corporations also recognize the opportunities and are inviting customers to share their experiences.

Innovation itself is getting turbocharged by going social. Open-source software projects are now taken seriously by big companies who claim greater reliability for programs that have been tested and read by millions of eyes. Open innovation is gaining similar credibility as corporate research directors who post their problems on www.Innovative.com get hundreds of serious solutions from diverse creative minds.

http://iparticipate.wikispaces.com
Technology Mediated Social Participation

U.S. National Science Foundation sponsored workshops

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<th>Advisory Committee</th>
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<th>East Coast Workshop</th>
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<td>Books</td>
<td>All around us, technology-mediated social participation has been harnessed for remarkable social benefits. New thrusts in basic research and engineering are likely to move beyond existing socio-technical media to produce new participatory systems spanning people, computation, communication and action. These developments could produce profound transformations in health care, community safety, disaster response, life-long learning, business innovation, energy sustainability, environmental protection, and other spheres of important national priorities.</td>
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<td>Bibliographic resources</td>
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<tr>
<td>TMSP Google Group</td>
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Workshop Information

The west-coast workshop will be held on December 10-11, 2009, at the Palo Alto Research Center (PARC), Palo Alto, California.

Jenny Preece (PI), Peter Pirolli & Ben Shneiderman (Co-PIs)

www.tmsp.umd.edu
Cyberinfrastructure for Social Action on National Priorities

- Scientific Foundations
- Advancing Design of Social Participation Systems
- Visions of What is Possible With Sharable Socio--technical Infrastructure
- Participating in Health 2.0
- Educational Priorities for Technology Mediated Social Participation
- Engaging the Public in Open Government: Social Media Technology and Policy for Government Transparency
The Summer Social Webshop (@Webshop2011) is 4-day interdisciplinary workshop (August 23-26, 2011) at the University of Maryland, College Park organized by leading researchers for graduate students at US universities studying social-networking tools, blogs and microblogs, user-generated content sites, discussion groups, problem reporting, recommendation systems, and other social media.
International Efforts
UN Millennium Development Goals

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

To be achieved by 2015
Vision: Social Participation

1) National Priorities
   • Disaster response, community safety
   • Health, energy, education, e-government
   • Environmental awareness, biodiversity

2) Deep Science
   • How do social media networks evolve?
   • How can participation be increased?

3) Extreme Technology
   • Scalable, reliable, universal, manageable
   • Protect privacy, stop attacks, resolve conflicts
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911.gov: Internet & mobile devices

- Residents report information
- Professionals disseminate instructions
- Resident-to-Resident assistance

Professionals in control while working with empowered residents


www.cs.umd.edu/hcil/911gov
Reporting: Earthquakes & Storms

Did You Feel It?

Community Internet Intensity Maps

To view a map or report a felt earthquake, select your region from the map or the list below the map.

earthquake.usgs.gov/eqcenter/dyfi

weather.kimt.com
Reporting: Community Safety

watchjeffersoncounty.net → nationofneighbors.net
Disaster Response: Wildfires

Yahoo! News California Wildfires

Twitter

#sandiegofire Harris fire now 50 percent contained 08:21 AM October 27, 2007 from web 🌋

#sandiegofire Witch Creek fire now 60 percent contained 08:21 AM October 27, 2007 from web 🌋

#sandiegofire Rice Canyon fire now 80 percent contained 08:21 AM October 27, 2007 from web 🌋

@pinguino that's really cool. Thanks! 08:20 AM October 27, 2007 from web 🌋

#sandiegofire All Del Dios residents may return to their homes, county officials say.
Community Safety: Abducted Children

The AMBER Alert™ Program is a voluntary partnership between law-enforcement agencies, broadcasters, transportation agencies, and the wireless industry, to activate an urgent bulletin in the most serious child-abduction cases. The goal of an AMBER Alert is to instantly galvanize the entire community to assist in the search for and the safe recovery of the child.

The information and statements contained on this official Department of Justice AMBER Alert website shall not be used for the purposes of advertising, nor to imply the endorsement or recommendation of the United States Government. Use of the AMBER Alert™ logo is subject to the Department of Justice legal policies and disclaimers regarding the use of DOJ seals and logos.
Doctor-to-Doctor Networks

Sermo is where physicians collaborate on challenging cases, share clinical insights and improve patient care in real-time. To date, they've generated over 30,000 discussions and sparked over 3,000,000 comments. Add your voice to the conversation.
Energy Sustainability

Energystar.gov

Microsoft-hohm.com
 Serve.gov: Voluntary service

Register Your Project & Recruit Volunteers
Find a Volunteer Opportunity
Read Inspiring Stories of Service & Share Your Own Story
Open Data.gov + Recovery.gov
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Network Theories: Evolution models

- Random, preferential attachment,…
- Monotonic, bursty,…
- Power law for degree (hubs & indexes)
- Small-world property
- Forest fire, spreading activation,…
- Matures, decays, fragments,…

Network Theories: Social science

- Relationships & roles
- Strong & weak ties
- Motivations: egoism, altruism, collectivism, principiplism
- Collective intelligence
- Collective action & governance
- Social information foraging

Moreno, 1938; Granovetter, 1971; Burt, 1987; Ostrom, 1992; Wellman, 1993; Batson, Ahmad & Tseng, 2002; Malone, Laubaucher & Dellarocas, 2009; Pirolli, 2009
Network Theories: Stages of participation

Wikipedia, Discussion & Reporting

• Reader
• First-time Contributor  
  (Legitimate Peripheral Participation)
• Returning Contributor
• Frequent Contributor

Preece, Nonnecke & Andrews, CHB2004
Forte & Bruckman, SIGGROUP2005; Hanson, 2008
Vassileva, 2002, 2005; Ling et al., JCMC 2005; Rashid et al., CHI2006
From Reader to Leader: Motivating Technology-Mediated Social Participation

[aisel.aisnet.org/thci/v011/iss1/5/](aisel.aisnet.org/thci/v011/iss1/5/)
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Technology Infrastructure

- Mobile, Desktop, Web, Cloud
- 100% uptime, 100% secure
- Giga-collabs, Tera-contribs
- Universal accessibility & usability
- Trust, empathy, responsibility, privacy
- Leaders can manage usage
- Designers can continuously improve
NodeXL:
Network Overview for Discovery & Exploration in Excel
NodeXL: Import Dialogs
Tweets at #WIN09 Conference: 2 groups
Twitter discussion of #GOP

Red: Republicans, anti-Obama, mention Fox
Blue: Democrats, pro-Obama, mention CNN
Green: non-affiliated

Node size is number of followers
Politico is major bridging group

<table>
<thead>
<tr>
<th>Vertex</th>
<th>In-Degree</th>
<th>Out-Degree</th>
<th>Betweenness Centrality</th>
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</tbody>
</table>
WWW2011 Twitter Community: Grouped
Flickr networks
Flickr clusters for “mouse”

- Computer
- Mickey
- Animal
Figure 7.11. Lobbying Coalition Network connecting organizations (vertices) that have jointly filed comments on US Federal Communications Commission policies (edges). Vertex Size represents number of filings and color represents Eigenvector Centrality (pink = higher). Darker edges connect organizations with many joint filings. Vertices were originally positioned using Fruchterman-Rheingold and hand-positioned to respect clusters identified by NodeXL’s Find Clusters algorithm.
Analyzing Social Media Networks with NodeXL

I. Getting Started with Analyzing Social Media Networks
   1. Introduction to Social Media and Social Networks
   3. Social Network Analysis

II. NodeXL Tutorial: Learning by Doing
   4. Layout, Visual Design & Labeling
   5. Calculating & Visualizing Network Metrics
   6. Preparing Data & Filtering
   7. Clustering & Grouping

III. Social Media Network Analysis Case Studies
   8. Email
   9. Threaded Networks
  10. Twitter
  11. Facebook
  12. WWW
  13. Flickr
  14. YouTube
  15. Wiki Networks

http://www.elsevier.com/wps/find/bookdescription.cws_home/723354/description
We are a group of researchers who want to create open tools, generate and host open data, and support open scholarship related to social media.
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Let’s get to work!

• Do great research!!!! → Inspirational

• Government
  • National Initiative for Social Participation
  • Develop Federal & Local applications

• Universities
  • Add courses & degree programs
  • Help Federal & Local governments

• Industry
  • Offer researchers access to data
  • Develop infrastructure and analysis tools