

Half-Day Workshop on Social Computing and Collective Intelligence

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Background

Twitter announced in April 2010 that its 105,779,710 registered users posted 55 million tweets a day on average, and its website attracted 180 million unique visitors a month (Twitter, 2010). Web services like Twitter and Facebook are becoming integral to our everyday lives. While cognitive scientists have much to say about how the information flow between humans and systems eventually lead to emergent social behavior, there is still a lack of momentum in gathering researchers to systematically study these social phenomena in cognitive science.

Using these and other services, crowds can carry out tasks akin to computers performing processing. Users with diverse backgrounds can work across time and space, their ideas aggregated later. This process is involved in collaborative tagging and filtering, online auctions, prediction markets, and crowdsourcing. Amazon, Yahoo!, eBay, and Digg, for example, let users rate a product, and show the aggregate rating as a collective opinion. Because crowds are cheap and motivated, yet their collective solutions can be as good as experts' (Surowiecki, 2004), social production has even become a viable alternative to firms and markets (Benkler, 2006).

Clearly, technologies are changing how humans think and act, and cognitive science needs to consider this issue (Glushko et al., 2008). The overall aim of this workshop is to foster research collaboration among researchers in multiple areas of cognitive science to systematically study issues related to social computing and collective intelligence.

Topics and Goals

We propose a half-day workshop on social computing and collective intelligence. The workshop will cover the following three topics:

- **How networks of humans and computers generate and use social information:** The Internet is changing the way humans learn and categorize information, make decisions, and solve problems.
- **How individual cognition is influenced by behavior of others:** Social influence is often found to be

important in explaining human behavior, especially when humans are situated in a social environment where individuals interact and observe others' behavior.

- **How research in cognitive science can be applied to the design of social media tools:** Work in cognitive science can provide recommendations for improving the design of social tools.

The three main goals of this workshop are to:

- **bring together researchers working in this area**
- **bridge research in different fields**
- **discuss directions for future research**

To achieve these goals, we invited speakers with diverse backgrounds. They study the three topics we have listed, and conduct research that will shape the future of social computing and collective intelligence in cognitive science. Brief introductions of the invited speakers are included in the Participants section. We will build a webpage to start discussing current and future research before the workshop.

Justification and Relevance

Yasuaki Sakamoto and Wai-Tat Fu will organize the workshop. Both have background in cognitive science, and are actively engaged in the study of social computing and collective intelligence. They have experiences in organizing similar workshops and conference tracks.

Sakamoto is the Co-PI on a project funded by the Social-Computational Systems program at NSF. He studies how social networks shape cognition, and how they can be designed to augment cognition (e.g., Nickerson & Sakamoto, 2010; Sadlon et al., 2009; Sakamoto, 2010). Fu's research focuses on developing cognitive models of how people interact with social information systems, and how people can learn from social information shared by the aggregate users.

The topics addressed in this workshop are current and cut across disciplines. For example, in the fields of information systems and human-computer interaction, workshops related to social-computational systems have been organized recently. Time is ripe to organize a workshop on this area in cognitive science.

Consistent with the theme of this year's conference, one goal of the workshop is to "expand the space of cognitive science" by introducing work from multiple disciplines. Participants who have expressed their intention to attend

come from cognitive and social psychology, computer science, information systems, and management, all relevant to cognitive science. Cognitive science can learn from what has been done in these other fields. Conversely, research in cognitive science can greatly influence research in other fields. We hope that this workshop can serve as an initial step in integrating work from cognitive science and work from related disciplines.

Participants

We expect that our audience will come from various backgrounds, as mentioned in the previous paragraph. Some participants in last year's invited CogSci workshop by Ron Sun, titled "Cognitive social sciences – grounding the social sciences in the cognitive sciences?" might be interested in our workshop. Some attendees of a social networks track of an information systems conference have expressed their interests in attending this workshop. Likely audience also includes a few professionals outside of academia, such as marketing firms and Yahoo! Research. In fact, one of the invited speakers is from Yahoo! Research.

We estimate that the workshop will attract between 25 and 50 participants.

Invited Speakers

Robert L. Goldstone is Chancellor's Professor of Psychological and Brain Sciences, and Director of the Cognitive Science Program at Indiana University at Bloomington. His research interests range from concepts to collective behavior.

David Lazer is Associate Professor in Northeastern University's Department of Political Science and the College of Computer and Information Science, and Director of the Program on Networked Governance at Harvard. His work focuses on the nexus issues in networks, computational social science, and collaborative intelligence.

Tobias Ley is Professor of Digital Ecosystems at the University of Tallinn in Estonia. His research interests are in the areas of intelligent human-computer interfaces for workplace learning and knowledge management, in cognitive modeling and social media.

Winter Mason received his Ph.D. in Cognitive Science and Social Psychology from Indiana University in 2007. Since then he has worked at Yahoo! Research in the Human Social Dynamics group.

Jeffrey V. Nickerson is Associate Professor of Technology Management and Director of the Center for Decision Technologies at Stevens Institute of Technology. He studies various topics in design and social networks.

Publicity

Members of the Program Committee will directly ask researchers working on related topics to attend the workshop. In addition, participants will be recruited using several relevant mailing lists. We have lists of people in information systems, computer science, and cognitive

science, including lists from previous workshops and conferences on social computing.

We will solicit 1- to 6-page papers in the conference format. Program Committee will screen the submissions and schedule the presentations. We plan to obtain about 10 submissions. We will select 4 or 5 submissions as talks. Invited speakers will provide us 100- to 200-word abstracts. If we receive many high-quality submissions, we will make the last hour either short presentations or posters depending on the number of such submissions.

We will develop a webpage for this workshop. Detailed descriptions of the workshop will be available on the website. Abstracts by invited speakers and accepted papers will be put together in the workshop program, and made available on the workshop website. In the future, we plan to follow up the workshop with a special issue in a relevant journal.

Program Committee

All members of the program committee have agreed to contribute to the running of the workshop.

- Wai-Tat Fu, University of Illinois, Urbana-Champaign
- Yasuaki Sakamoto, Stevens Institute of Technology
- John Voiklis, Stevens Institute of Technology

We expect no special requirements.

References

- Benkler, Y. (2006). *Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CT: Yale University Press.
- Fu, W.-T., & Dong, W. (in press). From Collaborative Indexing to Knowledge Exploration: A Social Learning Model. *IEEE Intelligent Systems*.
- Fu, W.-T., Kannampalli, T. G., Kang, R., & He, J. (2010). Semantic imitation in social tagging. *ACM Transactions on Computer-Human Interaction*.
- Glushko, R. J., Maglio, P. P., Matlock, T., and Barsalou, L. W. (2008). Categorization in the wild. *Trends in Cognitive Sciences*, 12, 129-135.
- Nickerson, J. V. & Sakamoto, Y. (2010). Crowdsourcing creativity: Combining ideas in networks. *Workshop on Information in Networks*.
- Sadlon, E., Sakamoto, Y., Ma, J., Barrett, S., & Nickerson, J. V. (2009). The ecology of Digg: Niches and reciprocity in a social network landscape. *CHI Workshop on Social Mediating Technologies: Developing the Research Agenda*.
- Sakamoto, Y. (2010). The impact of collective opinion on online judgment. *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*.
- Surowiecki, J. (2004). *The wisdom of crowds: Why the many are smarter and how collective wisdom shapes business, economies, societies, and nations*. New York: Random House.
- Twitter (2010). <http://www.businessinsider.com/twitter-stats-2010-4>