DESIGNING AND ANALYZING SOCIETAL NETWORKS

Session co-chairs: Tanzeem Choudhury, Cornell University, and Scott Klemmer, University of California, San Diego

Computing is increasingly woven into the fabric of everyday life. Many remarkable societal changes emerge as social technologies are adopted at massive scale: social networks, smart mobile devices, digital health, online education. Socially and physically embedded computing opens up new possibilities for increased sensing and data mining, and personalized information. This panel will focus on the dramatic opportunities and challenges of this quickly increasing scale.

One dramatic change in society over the last decade is the number of people who carry Internet-connected rich sensing devices. Smart mobile devices make it possible to monitor health, capture rich media, and access vast information repositories at the push of a button. Perhaps more than any other technology, smart mobile devices are ushering in new techniques for massive data science by correlating sensing and behavior -- and also bringing about many of the concerns of a 'transparent' society.

Another dramatic change is massive, socially-connected online media. Social networks open up new avenues for communication and civic engagement. Online health platforms enable people to share health information. Online education has burst into the public consciousness, enrolling millions of students in just the past year and causing many universities to rethink their long-term strategy. All of us -- as citizens, people, and educators -- are affected by these changes. How should citizens, families, and universities think about massive online social interaction? How do they change the services we provide, science we conduct, and conversations that we have. This panel will explore these issues.

Tony Jebara will speak about modeling large-scale networks based on mobility data. While most network growth models are based on incremental link analysis, we explore how users' data profiles alone (without any connectivity information) can be used to infer their connectivity with others. For example, in a class of incoming freshmen students with no known friendship connections, can we predict which pairs will become friends at the end of the year using only their demographic profile information? Similarly, by observing only the location history from a population of mobile phone users, can we predict what pairs of users are likely to communicate and text/call each other?

Rob Miller will speak about how Crowd computing harnesses the power of people out in the Web to do tasks that are hard for individual users or computers to do alone. This talk describes several prototype crowd-computing systems we have built, including Soylent, a Word plugin that crowdsources text editing tasks; VizWiz, an app that helps blind people see using a crowd's eyes; and Caesar, a system for code reviewing by a crowd of programmers. Crowd computing raises new challenges at the intersection of computer systems and human-computer interaction, including improving quality of work, minimizing latency, and providing the right incentives to the crowd.

Kate Starbird's talk will examine the *crowdsourcing* phenomenon during natural disasters and other crisis events. Armed with mobile devices and connected through social media platforms, people on the ground of disaster events are newly enabled to share information about unfolding

events. This real-time information could become a vital resource for affected people and responders, but it remains difficult to get the right information to the right person at the right time. One approach to solving this problem involves having members of the remote crowd process these data—e.g. by filtering, categorizing, and mapping. In this talk, I'll describe various ways that the crowd is already working to process data during disaster events and suggest future directions for leveraging "crowd work" to improve response efforts.

Duncan Watts will speak about exciting progress and grand challenges. The past 15 years have witnessed an incredible increase in both the scale and also scope of social and behavioral data available to researchers, leading some to hail the arrival of a new field of “computational social science.” Against these exciting developments stands a stubborn fact—that in spite of many thousands of published papers, surprisingly little progress has been made on the “big” questions that motivated the field—from systemic risk in financial systems, to problem solving in complex organizations, to the dynamics of epidemics or social movements. There are many reasons for this state of affairs, but in this talk I will concentrate on three. First, social scientific problems are almost always more difficult than they seem. Second, the data required to address many problems of interest to social scientists remain hard to assemble. And third, thorough exploration of complex social problems often requires the complementary application of diverse research traditions. Meeting these challenges, I claim, will require both new platforms for collecting the appropriate data, and also new institutions for conducting social science research.