

Social Computing: An Opportunity for Mathematical Sociologists By Sun-Ki Chai

As you might have inferred from the emails sent to this section, there are a rapidly growing number of conferences and workshops whose focus is on applying computer science to the analysis of society and culture. These include the *Conference on Social Computing, Behavioral Modeling, and Prediction* <<http://www.public.asu.edu/~huanliu/sbp09/>> in Phoenix a month ago and the *International Conference on Computational Cultural Dynamics* <<http://www.umiacs.umd.edu/conferences/icccd2008/>> in College Park, MD on September of last year, both sponsored by the association for computing machinery (the equivalent to ASA for computer scientists). This August's *IEEE Conference on Social Computing* <<http://cse.stfx.ca/~socialcom09/>> is sponsored by the main professional organization for Electrical and Computer Engineers. New conferences are being created regularly, such as the upcoming Human Behavior-Computational Modeling and Interoperability Conference <<http://www.csiir.ornl.gov/HBIOC/>> sponsored by Oak Ridge National Laboratory. Likewise, major computer science conferences now often host sizable social-science related workshops, exemplified by the upcoming *Workshop on Social Networks, Applications and Systems* <<http://www.cs.umsl.edu/~glchen/snas09/>>.

Why are so many computer scientists becoming interested in social analysis? One answer is that this is where the funding sources are moving. There seems to be a meeting of the minds in the portals of government that solving the pressing problems of the world requires the channeling of more resources into the study of human societies. The most notable example is the US Department of Defense's recent Minerva Research Initiative, which includes plans to spend \$50 million per. year for research on society and culture, but this change in thinking had already been reflected for the past few years in major requests for proposals generated by government agencies. Another answer is that the rise in the answer has turned computing from a solitary activity to intrinsically social one. The rise of online forums, blogs, content sharing and social networking sites has made this clear, hence much of contemporary computer science research already contains a social analysis component.

Why is so little of the new funding for social analysis going to social scientists since this is, after all, our area of expertise? Here are two plausible reasons for this: The first is the lack of familiarity that most social scientist have with the process of locating and applying for funding from the wide range of government departments and agencies who have been sponsoring this research. As a starting point, this problem can be dealt with by the regular perusal of the Grants.gov omnibus site looking particularly for the BAAs or Broad Agency Announcements that signal major initiatives. The second reason is more complicated—typically, the RFPs one will find in this area are aimed at incorporating social knowledge into technology, usually software tools and applications. This means that whatever social knowledge is being provided usually needs to be formalized so that it can eventually be converted into algorithms used to develop software. A primary example of this is the recent Human, Social, Cultural and Behavioral Modeling programs (HSCB), which coordinate efforts across all DoD agencies to develop a “science base and associated technologies for modeling human, social and cultural behavior.” (HSCB Spring 2009 Newsletter p. 1). The emphasis on technology and modeling means that social scientists with mathematical skills are going to be in the best position to take advantage of these opportunities.

This also means that social scientists will need to team up more often with the computer scientists and engineers that currently dominate this realm of “sociocultural modeling” and form the vast bulk of attendees at the kinds of conferences previously listed. While computer scientists in the field of social computing will often make use of concepts, theories and techniques borrowed from social science (e.g. game theory and social network theory), their depth

of understanding of these methodologies is typically quite shallow. The need for the participation of more social scientists in social computing research is often noted by computer scientists, but there is more specific need for both social and computer scientists who not only possess technical skills but also have the broad knowledge and flexibility necessary to engage in interdisciplinary research. This provides an opportunity for mathematical sociologists, whose technical skills are often more eclectic and flexible than those of mathematical social scientists in other fields. I have been trying to find ways to encourage more mathematical sociologists to participate in social computing conferences, but with only mixed results so far. The potential payoff is great in terms of possible opportunities for funding since they provide good opportunities to network not only with computer scientists, but also with representatives from the major donor agencies. For instance, I have been funded by the Air Force Office of Scientific Research BAAs and will soon be receiving an HSCB grant in collaboration with ASU funded by the Office of Naval Research, in part as a result of information and relationships gained from these types of conferences.

Beyond the question of funding, however, this work offers an opportunity to enter an exciting interdisciplinary field in which social science knowledge is incorporated into technology that can potentially affect everyday life. Computer science has become more and more “social” in its concerns with every passing year, yet much of the work in this area exists in a kind of vacuum in which the research knows little about the relevant research on the social field for which she is developing a new application. Hence, if more mathematical sociologists open themselves to social computing research, the resulting software technologies are likely to be better both in addressing users’ present needs and in their, larger, long-term effects on society.