The Promise and Peril of Social Computing

Welcome to the new Social Computing column. This column, to appear bimonthly in Computer, will highlight interesting developments in the world of social computing. In addition to exploring interesting phenomena in the social computing world, these articles will strive to peek into what the future holds by examining recent research.

What is Social Computing?

Social computing always involves groups of people interacting in some way, whether working together, playing together, or simply enjoying each other's company. Moreover, this interaction always involves computers. Many, if not most, social activities succeed perfectly well without computing. Humans organized into groups to learn mathematics, create the pyramids, and invent soccer, all without using computers. However, computers are fundamentally changing the way we interact today. One of this column's goals is to understand the ways in which computer-mediated interaction is succeeding and failing, and what the consequences are of both successes and failures.

The column will maintain a broad perspective on what constitutes social computing. Articles will examine collaborative projects like Wikipedia, consumer product review and rating systems like that offered by Amazon, social networking sites like Facebook, content-sharing sites like Flickr, and even microblogging services like Twitter—though with a healthy dose of skepticism about the depth of socializing 140 characters at a time.

At the technological margins, definitions get murky. For example, smartphone calls do not count as social computing even though a call is initiated on one computer, is connected through a packet-switched computer network, and ends on another computer. On the other hand, videocasts count, at least if the viewers can interact with the presenter and one another. At least one column will examine why some videos on YouTube go viral while others are scarcely viewed.

Social computing can also include social organizations that perform actual computing. These “collective intelligence” systems include futures markets like the Iowa Electronic Markets, which predict everything from the outcomes of US congressional elections to box office receipts for the latest Twilight movie. Such markets collect and process the opinions of hundreds or thousands of people about some future event to form a prediction of that event. An effective prediction market requires sampling large numbers of participants with divergent views and creating structures that motivate participants to provide honest information.

Although collective intelligence systems are an important aspect of social computing, this column aims construes the term more broadly, and will include many other types of social computing systems as well.

Who Am I?

As the Social Computing column editor, I should tell you a little about myself. I am a professor in the Department of Computer Science and Engineering at the University of Minnesota, where I codirect the GroupLens Research group (www.grouplens.org). GroupLens began in 1992 as one of the first recommender system research projects.

Our group, which currently consists of three faculty and about 20 students, continues to study these recommender systems, but in the past decade it has branched out to explore...
In his provocative book *Grooming, Gossip, and the Evolution of Language* (Harvard Univ. Press, 1998), anthropologist and evolutionary biologist Robin Dunbar popularized the view that language might have originally evolved as a more efficient way to manage social relationships. In a nutshell, his theory is that primate societies depend on strong relationships among individuals, and that maintaining those relationships is an important and expensive activity.

Members of primate societies spend many hours grooming one another—picking out debris and parasites from fur. Studies have shown that if chimpanzee Esther regularly grooms chimpanzee Debbie, then Debbie is much more likely to give a banana to Esther later. But grooming does not scale. If Esther wants to form an equally strong relationship with Fred, she must spend as much time grooming Fred as she does grooming Debbie. Further, grooming is an evolutionarily expensive activity. The more time Esther spends grooming Fred, the less time she has to find food for herself and take care of her offspring. Ultimately, the time required for grooming creates an upper limit on the size of the population in a chimpanzee society: only so many pairwise bonds can be created, limiting the maximum size of a stable society to about 30 chimpanzees.

Dunbar argues that humans invented language because it is superior to grooming—especially if you do not have a taste for nits. Language lets people communicate with many others simultaneously and, crucially, about other people. If Debbie, Esther, and Fred were human, Fred might give the banana to Esther just because he has heard that she is so good at caring for her children. The effect is that human societies can be stable up to much larger sizes. According to Dunbar, tightly connected human social groups tend to include about 150 members, a number limited by the size of our neocortex, the brain structure responsible for, among other things, keeping track of our social relationships.

Social computing systems could eventually lead to an expansion of Dunbar’s number. What if we develop social computing systems that are so efficient in maintaining relationships that they support richer and more complex social structures than our poor neocortexes can maintain on their own? Would such a society be better in fundamental ways than existing societies?

Social computing has existed for decades. Many existing forms were present in the PLATO (Programmed Logic for Automated Teaching Operations) system at the University of Illinois in the early 1970s, including multiuser chat rooms, group message boards, and instant messaging. However, during the next two decades, social computing grew relatively slowly. There were many reasons for this, but two of the most important were that many people did not have easy access to the Internet and that the user interfaces for accessing these social tools were confusing and difficult to use.

After a long period of relative hibernation, social computing exploded in the early 1990s and has now become ubiquitous—to the point that in 2006 *Time* magazine named “you” its Person of the Year in recognition of individual content contributions on the Internet. During the past decade, social computing has helped elect presidents and topple governments, and created the largest encyclopedia in history. After such a strong start, what will happen next?

One reason researchers are so interested in social computing is that it has the potential to change the type and structure of human relationships, as the “Social Computing and Dunbar’s Number” sidebar explains. Maintaining and growing these relationships, which have been nurtured in much the same way for more than 100,000 years, is one of the most basic human activities.

There is good evidence that computers can help our brains be much more efficient at certain tasks, like computing square roots, and that being better at those tasks can help us create a stronger society. On the other hand, there are many reasons to be skeptical that the social computing systems we are developing can fundamentally increase our social effectiveness. Yes, Facebook makes it easier to remember a distant friend’s birthday, but does that kind of sharing really nurture the rich social network that will support us during a hospital stay?

Some researchers worry that social computing might damage the structure of society in important ways—for example, by increasing balkanization. In the physical world I will still have frequent contact with my neighbor even if I disagree with him on politics, while in the virtual world I can easily avoid contact with anyone whose opinions I do not like.

Figure 1, which shows the links among political blogs during the 2004 US election cycle, powerfully illustrates this phenomenon. Nearly all of the links were liberal bloggers linking to other liberal bloggers or conservative bloggers linking to other conservative bloggers. The risk is that if people only talk to others.
with whom they agree, they will never challenge their own opinions or be open to new ideas. Over time, the ideas of each community will become more extreme and its members less open to interaction with other communities.

Happily, social computing also has demonstrable positive effects. For example, a future column will look at research by Moira Burke and her colleagues at Carnegie Mellon University that correlates having a rich social network on Facebook with feelings of well-being. Students who have more directed communication with their Facebook friends feel stronger bonds to them, and correspondingly experience less loneliness. (On the other hand, students who spend more time reading undirected communication on Facebook feel less connected and lonelier.)

A major question about social computing is whether it is here to stay or just a flash in the pan. For example, as Figure 2 shows, recently there has been a downturn in Wikipedia’s incredible exponential growth. Research suggests that new Wikipedia authors find the community inhospitable and often leave after their first entry. The next Social Computing column will examine the possible reasons for this change and what it means for Wikipedia’s future.

Feedback and suggestions for article ideas and guest authors are always welcome. I will author or coauthor some future columns, but I will also invite colleagues with interesting perspectives to submit their own pieces. Ideally, suggestions should include a concept, a few bullets to outline related ideas, and optionally a recommended author (including self-nominations). I have a queue of upcoming articles and cannot promise that your idea will be published immediately, but I will make an effort to get articles on current events out as quickly as possible.

I look forward to hearing from you—the only way this column can stay relevant is for its readers to actively contribute.

John Riedl is a professor in the Department of Computer Science and Engineering at the University of Minnesota. Contact him at riedl@cs.umn.edu.

Figure 1. Nearly all of the links among political blogs during the 2004 US election cycle were liberal bloggers (blue) linking to other liberal bloggers or conservative bloggers (red) linking to other conservative bloggers. Figure source: L.A. Adamic and N. Glance, “The Political Blogosphere and the 2004 U.S. Election: Divided They Blog,” Proc. 3rd Int’l Workshop Link Discovery (LinkKDD 05), ACM Press, 2005, pp. 36-43.

Figure 2. Number of articles on English-language Wikipedia from its creation in 2001 through June 2010. Recently there has been a slow down in the online encyclopedia’s incredible exponential growth.