**Analyzing the Social Web, by Jen Golbeck**

Foreword by Ben Shneiderman, draft 11/26/2012

One way to track civilization’s progress is by our dramatically increasing capacity to perceive, understand, measure, and predict the influences on our lives.

When mapmaker Gerardus Mercator’s (1512–1594) developed a rectilinear projection of parallels of latitude and meridians of longitude, he enabled travelers to perceive a comprehensive world view. Mercator’s maps revealed the relationships among countries, giving travelers the capacity to measure distances, and the tools to predict future positions for ships that maintained a fixed heading.

Another visual breakthrough was Renee Descartes’s (1596-1650) infinite plane with x and y positions for attribute pairs. These Cartesian coordinates permitted analysts to plot algebraic equations to make discoveries about slopes, intersections, and correlations. Modern applications are pervasive, including charts that enable physicians to plot a child’s height and weight, so as to see growth patterns, clusters of similar children, as well as simple errors and meaningful exceptions.

When Isaac Newton (1643-1727) described gravity as the attraction between two masses, he could then develop formulas to quantify the forces and shift from primitive ideas of planetary motion to more modern explanations that had predictive power.

Similarly, Charles Darwin’s (1809-1882) understanding of natural selection was a revolution that recognized the complex relationships among animal species, plant life, climate, and environmental forces. He drew a tree of life that showed ever richer differentiation among and contrasts across species.

These stunning conceptual breakthroughs are just a few of the well-known transformative innovations that also include subject categories for books, the periodic table of elements, or choropleth maps to show regional economic or health data.

Within the past century a major shift is the growing recognition that networks effectively represent organizational structures, communications patterns, publication citations, and environmental interrelationships. While a spider’s orderly web is a visible network, the harder to see network of food webs is vital for understanding, measuring, and predicting how changes in food chains trigger environmentally favorable or destructive forces.

Early researchers of human social networks from August Comte to Jacob Moreno and contemporary researchers such as Mark Granovetter or Robin Dunbar enable us to understand the rich relationships that influence friendship patterns, scientific team collaborations, or international diplomatic conflicts. As the complex relationships become more visible and understandable, measurement and prediction become more reliable.

Jen Golbeck’s lucid and insight-filled book makes a substantial contribution to explaining these modern phenomena as they play out on the social web. She deftly integrates mathematical concepts with visual presentations, all conveyed with potent examples that engage and motivate readers.

For the first time in history, much of what we do is mediated electronically, and for the first time in history we are developing the tools, shown in this book, to make social behavior patterns visible. This growing capacity to perceive, understand, measure, and predict brings enormous power to those who master these network analysis skills. Measuring relationships and seeing changes over time is the first step to predicting future performance. More importantly network analysts gain the power to make bold decisions and take effective actions that influence outcomes in communities, markets, health/wellness, environmental preservation, sustainable energy, and many more domains of human activity.

Technology-mediated social participation is a rapidly rising force in which the chain reactions of human collaboration can overthrow oppressive regimes, influence democratic elections, and shape economic successes. These chain reactions can also trigger cascades of human activity that reduce obesity, support smoking cessation, encourage energy conservation, and accelerate citizen science.

However, social media can also be used by oppressive regimes to track/suppress opponents, extremists to promote racial hatred, or terrorists to coordinate their attacks. Since malicious spammers, criminal gangs, and illegal traffickers can also use these potent technologies, researchers and policy makers are well-advised to develop strong skills in responding with pro-social strategies that protect the public.

Social media developers could soon find themselves with ethical dilemmas similar to those faced by nuclear physicists in the late 1940s. Having developed a potent technology, the dangers of misuse could threaten the huge positive opportunities, which could bring stunning benefits for future generations.

Realizing the benefits of the social web is a grand interdisciplinary project that will play out over many decades and require new skills and substantial contributions from a wide variety of disciplines that span computing sciences, social sciences, communications, and more. The benefits will accrue most to those individuals, organizations, disciplines, and nations that appreciate the potential and take action.

This visionary book and many more are necessary to educate a new generation of students, researchers, and policy makers, so they can perceive, understand, measure, and predict future directions. More importantly, they will be able to intervene to produce more positive outcomes.