Introduction to the Network Analysis of Digital and Social Media Minitrack

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1. Introduction

Social networks are representation of complex systems defined by the patterns of relationships among a system's components. Networks are created by information flows or other relations among entities through time and space. The goal of network analysis is to describe the structure of a higher-level system based on the pattern of linkages among a set of lower level nodes, and how this structure changes over time. It differs from traditional research by focusing on relationships rather than the attributes of individuals. The complex social networks that people create and manage are dynamic, multi-modal, and increasingly mediated by social and digital media.

Digital and social media have provided precise measures of social networks. From social networking sites (e.g. Facebook), to microbloging networks (e.g. Twitter) and global cooperation networks (e.g. CouchSurfing), the material and nonmaterial exchanges of individuals and larger social systems are being recorded and largely retrievable, presenting social network researchers with powerful new data.

There are four main implications of having access to digital and social media data. First, we now have access to measurements of network relations that are more reliable than in the past. Second, the nature of the relational data is unique, allowing for the analytical exploration of network structures in ways that are pushing the boundaries of the science. Third, analysis of network evolution is increasingly possible since much of the data available through social media is dynamic (a historically persistent challenge when collecting network data). Fourth, dynamic network data has contributed to visualization methods that allow for the animation of social networks.

Network science has progressed in parallel with the development of social and digital media, computers and other information systems. The increased theoretical understanding and analytic representation of computer and information systems provides developers with a greater sense of how people and organizations utilize technology to manage resources embedded in their social and digital networks.

The papers in this minitrack represent theoretical and analytic developments in social and digital media research. They focus on new media and information technology, or use new media data in the analysis. They cross disciplines and levels of analysis, using novel approaches to discover aspects of digital networks.

2. Papers included in the minitrack

In *A Dynamic Sequence Model of Information Sharing Processes in Virtual Teams*, Aaron Schecter and Noshir Contractor investigate information sharing via the sequence and timing of individual decisions during a virtual team task. Using a temporal, event-based model to investigate the behavioral and cognitive factors that influence information sharing, they found significant heterogeneity in sharing propensities. Impacts of the research in this paper include contributions to the theories of motivation and structure of information sharing, as well as methodological contributions with the use of their a latent-class relational event model.

In *The Network Structure of Successful Collaboration in Wikipedia*, Juergen Lerner and Alessandro Lomi look into the variance of quality in Wikipedia articles using network mechanisms that regulate the interaction among Wikipedia contributors to address. By comparing the network mechanisms underlying the production of the complete set of featured articles in the English-language edition of Wikipedia with the network mechanisms underlying the production of a set of comparable non-featured articles, the authors were able to find that contributors to featured articles display greater deference for the reputation of their team members, and display a weaker tendency to follow the behavioral norms predicted by the theory of structural balance, and hence a weaker tendency toward polarization.

In *A Network View of Social Media Platform History: Social Structure, Dynamics and Content on*

YouTube, John Paolillo, Sharad Ghule, and Brian P. Harper present research that identifies historical patterns in YouTube's content as related to internal and external events. Stemming from an ongoing study of YouTube's history, and using a combination of iterative browsing, network crawling, and clustering within and across time periods, the authors illustrate an adaptation of network analysis for understanding the content histories of social media platforms.