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Editorial

Collective Behavior Analysis and Graph Mining in Social Networks 2021

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With the development of Internet technology, social networks have become a popular communication place in which people can interact with others conveniently and freely. Many sorts of social networks have emerged, such as online social networks, employment relationship networks, and scientific cooperation networks. Users in social networks may create new connections with other users, so they can interact through those links, or they may break existing connections. Therefore, the structure of social networks is evolving every day [1,2]. Users can contact their neighbors, send information to them, and exchange their opinions, leading to dynamics on social networks, including opinion formation [3], spreading dynamics [4], and collaborative behaviors [5]. Individual behaviors accumulate through local interactions and may result in complex collective phenomena, demonstrating the significant role of social networks in driving society development. Analyzing complex human behaviors and mining graph topology can help understand the essential mechanism of macroscopic phenomena [6]. These studies would help attract public interest and excavate useful resources. Therefore, social network mining has become a promising research area and attracts lots of attention.

Studies on social networks can be divided into two categories: theoretical modeling and data-driven methods. Theoretical methods characterize individual user behaviors and try to find the microscopic origin of collective phenomena by statistical physics, probability theory, and numerical stochastic processes [7]. Data-driven methods use machine learning, data mining, and natural language processing to exploit hidden patterns from the data in social networks [8]. They are also used to estimate the future evolution of social behaviors. In recent years, with the growth of the massive amount of data, it becomes more difficult to mine social networks and analyze user behaviors. Therefore, advanced interdisciplinary data analysis and data mining methods should be suggested and developed to study social networks [9].

In this special issue, 23 papers have been published. All the papers must undergo a rigorous peer review process. The published papers can be divided into three categories, i.e., empirical social behavior analysis, social network modeling, and network data mining.

In the category of empirical social behavior analysis, the article by Liu et al. [10], "The Influence of Individual Characteristics on Cultural Consumption from the Perspective of Complex Social Network," studied the social network effect on cultural consumption. The article by Gu and Xiao [11], "Social Network Structure as a Moderator of the Relationship between Psychological Capital and Job Satisfaction: Evidence from China," primarily examined the role of social network structure in the relationship between psychological capital and employment satisfaction by adopting a two-wave data from undergraduate students. In the article titled "The Sustainability of Knowledge-Sharing Behavior Based on the Theory of Planned Behavior in Q&A Social Network Community," by Feng et al. [12], the authors investigated the important factors which drive users to share knowledge and they verified their model by questionnaire data.

In the category of social network modeling, the article by Xiaokaiti et al. [13], "Efficient Data Transmission for Community Detection Algorithm Based on Node Similarity in Opportunistic Social Networks," studied the problem of community detection and presented a new data transmission method which considers social attributes. In the article titled "Layer Information Similarity Concerned Network Embedding," by Lu et al. [14], the authors explored the method of network embedding and they introduced the layer information similarity to enhance the representation of nodes.

In the category of network data mining, the article by Asgari-Chenaghlu et al. [15], "Topic Detection and Tracking Techniques on Twitter: A Systematic Review," overviewed the technology of detecting popular topics on Twitter and analyzed some common problems in this area. The article "DWNet: Dual-Window Deep Neural Network for Time Series Prediction," by Fan et al. [16], exploited multi-granularity dependencies of time series and constructed a dual-window deep neural network to predict future data.

Conflicts of Interest

The editors declare that they have no conflicts of interest.

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