

Editorial

Analysis and Applications of Complex Social Networks 2018

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It is our great pleasure to present to you the second edition of this special issue discussing the analysis and applications of complex social networks. Similarly to the one published in this journal last year, this one also turned out to be a great success as we managed to attract a number of high-quality researches in the area of complex social networks.

The research space in complex social networks grows every year as they are systems with many levels of complexity and there is a constant need to challenge our current understanding in the field. The results of the community research efforts enable the understanding of different social phenomena including social structures evolution, communities, spread over networks, and control in and of complex networks. This huge interest in the analysis of large-scale social networks resulted in a lot of new approaches, methods, and techniques but with every advancement in this area, we uncover new challenges and new levels of complexity in the network universe that are far from being explored and addressed. The increasing complexity of the tasks to be performed in terms of network analysis together with the volume, variety of social data about people and their interactions, and velocity with which this data is generated in the online world poses new requirements and challenges on researchers. One of them is how to build accurate methods that would be able to cope with these vast amounts of data. This issue is a result of an attempt to address these emerging challenges with a big emphasis on the applicability of the developed approaches.

One of the goals of this special issue is to show that analysis of large-scale, real-world social networks underpinned by

fundamental research is the direction to take when it comes to the future of complex social network analysis. We emphasize that in the world of network science fundamental research and application- and data-driven research are equally important and they need to go together to generate significant academic, societal, and commercial impact.

The variety of papers published in this special issue shows that there is a long list of topics that have not yet been comprehensively researched. These papers also show the future challenges and trends in analysis and applications of complex social networks. Within this special issue, we present a wide variety of application-driven studies looking, for example, at complexity of a microblogging system, transportation systems, an emergency management system, organizational structure and management, innovation, or food safety. The fundamental research that is covered within these special issues ranges between (i) investigation and analysis of network structure and metrics, e.g., signed networks, modularity, and communities, (ii) link prediction approaches, (iii) resilience in complex networks, (iv) diffusion and influence, and (v) control in networked systems—the topic that is currently of great interest to the community.

Some of the papers already in this special issue are as follows: “The Settlement Structure Is Reflected in Personal Investments: Distance-Dependent Network Modularity-Based Measurement of Regional Attractiveness” by L. Gadar et al.; “Simulation of Knowledge Transfer Process Model Between Universities: A Perspective of Cluster Innovation Network” by F. Wei and X. Limin; “Variational Approach for Learning Community Structures” by J. J. Choong et

al.; “Complexity of a Microblogging Social Network in the Framework of Modern Nonlinear Science” by A. Dmitriev et al.; “More on Spectral Analysis of Signed Networks” by G. Yu and H. Qu; “Modelling Multilevel Interdependencies for Resilience in Complex Organisation” by J. Tasic et al.; “Establishment and Analysis of the Supernetwork Model for Nanjing Metro Transportation System” by Y. Wei and S. Ning.

This special issue also contains the following papers: “A Semantic Community Detection Algorithm Based on Quantizing Progress” by X. Han et al.; “Scare Behavior Diffusion Model of Health Food Safety Based on Complex Network” by J. Luo et al.; “Examining the Intergovernmental and Interorganizational Network of Responding to Major Accidents for Improving the Emergency Management System in China” by P. Tang et al.; “Exponential Synchronization Control of Discontinuous Nonautonomous Networks and Autonomous Coupled Networks” by C. Yang et al.; “Crisis Spreading Model of the Shareholding Networks of Listed Companies and Their Main Holders and Their Controllability” by Y. Ma and L. Li; “Predicting Missing Links Based on a New Triangle Structure” by S. Bai et al.; “Competition-Based Benchmarking of Influence Ranking Methods in Social Networks” by A. Topîrceanu.

Published papers show that although all of the presented topics have been researched for many years now, there is still space and need for new contributions. Challenges change their nature as we face vast amounts of heterogeneous data that are continuously generated. Network resilience, communities, spread and influence analysis, network complexity, control, and structural properties are topics that are trending in the research community all over the world. Those are very hard problems to address because of their complexity originating from two sources: (i) system: variety of connections, attributes of nodes and connections, nontrivial structure, and dynamics of a system; (ii) process: evolution driven by a variety of factors including external ones that are very hard to capture, spreading over complex structure of multiple processes or needed process adaptation connected with evolving structure. Thus, there is a continuous need to create cross-disciplinary teams that would work on those challenges with a holistic view of the problem.

So our work does not stop here, and we aim at continuing to bring together people from different fields to work on the topics covered within this special issue.

Conflicts of Interest

The editors declare that they have no conflicts of interest regarding the publication of this special issue.

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