Guest Editor’s Introduction to the Special Section on Social Network Security

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The emerging paradigm of social network provides an enormous number of novel approaches to implementing advanced networking communications and data analysis schemes efficiently using existing datasets, networks, and infrastructure. Social networks have had a great impact on people’s daily life and global businesses, as has been addressed by recent research. However, the security issue is also a critical concern when adopting social network technologies in practice. Considering the uniqueness of social networks, the mechanism is now facing a variety of security challenges from multiple dimensions, such as mobile apps, wireless communication, cloud systems, big data, and security operations. Compared with traditional security issues, the applications of social networks are operated in a dynamic circumstance involving different internal and external inputs and factors, which requires new security mechanisms in distinct operational environments. The complexity of the technical implementations may result in unexpected consequences when adopting social network technologies. It is therefore important for current researchers and practitioners to address the security issues and seek out efficient ways to handle different hazards. For the purpose of preventing social network-based solutions from the threats of social networks, a variety of cyber security approaches or mechanism have been proposed. This special issue concentrates on the challenging topic—“Social Network Security” and aims to invite the cutting-edge academic achievements to be submitted here.

This special issue has collected 58 submissions and 9 of them were eventually accepted to appear in this issue. Each accepted article has been assessed by a careful review and evaluation process. The decisions considered both research quality and variety of topics. We organized the articles into four topics, which are advanced persistent threats in social network, privacy protection in social network, secure mobile social network architecture, and risk analysis and data governance in social network dimensions.

First, three articles on the advanced persistent threats in social networks were accepted. Part 1: Khan et al. introduced the rise in use of Online Social Networks (OSNs) which brings out insecure activities, such as the existence of spammers sending illegal emails and the polluted results of recommendation systems some legitimate users caused. They proposed a framework to segregate such type of users from real experts by leveraging digital DNA sequence, which is superior in spambot detection capability. Part 3: Cai et al. explored how to launch an interface attack exploiting social networks with a mixture of non-sensitive attributes and social relationships. This is the first work that employs collective methods involving various data-manipulating methods and social relationships to protect against inference attacks in social networks.

Next, on the topic of privacy protection in social networks we accepted two articles. Part 4: Wang et al. showed that a wide spread use of data mining applications had brought out a huge threat to mobile users’ privacy due to the release of crowd-sources social network data to the public. They designed an online aggregate monitoring framework over infinite streams with w-event privacy guarantee-RescureDP to provide privacy-preserving statistics and an enhanced RescureDP with neural networks to predict the values of statistics and improve the utility of released data accurately. Part 5: Zhang et al. presented a novel human-to-human infection analysis approach by exploiting social network data and health data that are collected by social network and e-healthcare technologies.

Also, we accepted three articles in the dimension of secure mobile social network architecture. Part 6: Guerar et al. presented an overview of identity authentication mechanism in mobile social network. The proposed approach introduces screen brightness as a random input of PIN-based identity authentication, which can resist unauthorized access attacks in mobile social network. Part 7: He et al. proposed a new framework for the handshake scheme in MHSNs, which is based on hierarchical identity-based cryptography. The article then proved the security of the scheme, and a comparative summary demonstrates that the proposed scheme requires fewer computation and lower communication costs. Part 8:
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Guest Editors

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Yang Xiang received the PhD degree in computer science from Deakin University, Australia. He holds the position of the dean of Digital Research & Innovation Capability Platform, Swinburne University of Technology, Australia. In the past 20 years, he has been working in the broad areas of network and system security, AI, data analytics, and networking. His translational research has made significant impact to the real-world applications, such as blockchain applications, AI-driven cyber security applications, cloud and IoT security applications. In particular, he is currently leading his team developing active defense systems against large-scale distributed network attacks. He is a senior member of the IEEE.

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