Special Issue "Security and Privacy Issues in Systems and Networks Beyond 5G"

Submission Deadline: 31 December 2021

Guest Editors

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Summary

5G's capabilities and flexibility hold the promise of further facilitating the society's digitalization by enabling new services (e.g., remote advanced industrial applications) and communication modes (e.g., gestures, facial expressions and haptics). Current wireless communication do not meet the performance requirements of these new services, such as bandwidth, latency and reliability. Furthermore, the current COVID-19 pandemic has fundamentally changed the way the world communicates and operates, accelerating the shift towards a more digital world. Such transform the new requirements make the need of secure, reliable and high-quality digital services promised by 5G more crucial than ever. Moreover, the fundamental drivers are expected to amplify and become even more prominent in future 6G networks.

For Systems and Networks Beyond 5G (SysNetB5G), there are two main technologies: Beyond 5G mobile communications and Industrial Things (IIoT). Obviously, IIoT and SysNetB5G, if not well protected, are vulnerable to critical security and privacy problems. Compared to traditional IoT networks, IIoT and SysNetB5G have a much broader scope of security concerns. Moreover, in IIoT and SysNetB5G, various kinds of massive data are quickly generated by many heterogeneous nodes, which makes it so difficult to preserve privacy. In order to counter such problems, researchers have increased tremendously in recent years. Nevertheless, many security and privacy issues remain open to IIoT and SysNetB5G.

This special issue aims to bring together the current state of-the-art research and future directions for security and privacy issues in SysNetB5G. Especially, it focuses on discussing innovative concepts for security management of IIoT and SysNetB5G from a holistic architecture perspective to reach a fully-automated and secured B5G infrastructure. For this goal, we cordially invite researchers and engineers from both academia and industry to submit their original and novel work for inclusion in this Special Issue. Additionally, high-quality review and survey articles are also welcome.

The topics of interests include, but are not limited to:
- Emerging privacy and security issues in IIoT and SysNetB5G
- Secure and privacy-preserving communications in IIoT and SysNetB5G
- Developing secure communication systems or environments
- Secure and private mobility solutions for IIoT and SysNetB5G
- Future authentication and key exchange protocols in IIoT and SysNetB5G
- Formal security analysis on security protocols for IIoT and SysNetB5G
- Physical security solutions in IIoT and SysNetB5G
- Trustworthiness mechanism in IIoT and SysNetB5G
- Balancing security, privacy and trust and QoS in IIoT and SysNetB5G
- Zero-touch network and Service Management (ZSM) for secure IIoT and SysNetB5G
- Intrusion and malware detection for secure IIoT and SysNetB5G
- Software-Defined Security (D-SEC) models
- AI/ML driven security network management
- Cyber-attacks detection for IIoT and SysNetB5G

Keywords

Security, privacy, 5G and Beyond (5GB), Industrial IoT (IIoT)