Guest Editorial
Special Issue on Behavior Data Analytics for Cybersecurity

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With rapid development of smart cities and digital economy, cybersecurity has already become the cornerstone to ensure the resilience of the entire ecosystem. On top of traditional systems/data/network security research, cybersecurity is facing new challenges. This is mainly due to the increasing scale of complex collaboration among stakeholders on a loosely regulated network of insecure devices. Advances in hacking and malware techniques, including APTs (advanced persistent threats), fileless malware, zero-days exploits, …, etc. already make active in-time defense difficult to achieve. Even worse, insider threats and human factors have already moved to the top in the main security threat list. Conventional security measures often find to be ineffective when dealing with them; and all these are just magnifying the negative impacts of cyber-attacks.

Facing this challenge, it is believed that behavior analytics, in particular using knowledge modeling and semantics to couple with data mining and pattern discovery, is very effective in understanding not only the transactional behavior patterns of entities in the cyberspace, but also the causations behind these patterns as well as the quantification of their cognitive experience. When these two areas are put together, it creates a promising direction to address new cybersecurity challenges. It also opens up new fundamental research questions in both fields, data analytics, and cybersecurity.

This special issue offers an update of research field in line with behavior data analytics and cybersecurity. It was generated from the 18th International Conference on Information and Communications Security 2016 and papers submitted for this special issue. It includes four papers. The first paper, “A Machine Learning Framework for Adaptive FinTech Security Provisioning” by La and Kim presents a software architectural framework for behavior model-driven security analytics. It details not only the architectural aspects but also covers details about the analytics algorithms involved. With such framework, behavior-driven analytics and threat intelligence initiatives can be built and supported. The second paper, “Towards a Flexible Experience of Data Provenance Summarization”, by Pei and Ye investigates the bridges between transactional raw data and aggregated knowledge. It also looks into the potentials and effects of interactive human machine collaboration, which is a critical step in behavior-driven analytics. The third paper, “Real Time Attacker Behavior Pattern Discovery and Profiling Using Fuzzy Rules”, by Mallikarjunan and Shalinie et al. goes deep into the algorithm aspects of behavior analytics for cyber attack detection. Finally, the last paper, “Smart TV Face Monitoring for Children Privacy”, by Hung et al. investigates the issue of privacy for behavior analytics. This is particularly important to insider threats in cybersecurity. On one hand, analytics for cybersecurity demands multi- data sources to re-construct the persona of human for risk analysis and active defense. On the other hand, such approach will definitely touch the sensitive issue of privacy in behavior analytics.

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Guest Editors

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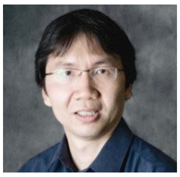

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