Guest Editorial Introduction to Special Section on Smart Systems and Intelligent Networking Powered With Big Data Analytics

SMART systems, including Internet of Things (IoT), have emerged to address contemporary economic, societal, and environmental challenges, such as business and production automation, urban sustainability, climate change, healthcare, and globalization. They encompass different autonomous or collaborative systems with functions of sensing, actuation, and control for describing and analyzing a situation, and make decisions based on the available data in a predictive or adaptive manner. Intelligent networking enables these functions of smart systems by offering a global infrastructure for networked physical devices and everyday objects, which generates a gigantic amount of data, or big data. In addition, big data analytics is also employed in analyzing the big data so as to enable the networking to be intelligent and allow smart systems to perform astute, autonomous or collaborative actions. Nevertheless, the efficient and effective big data management and knowledge discovery of large-scale smart systems, big data analytics for intelligent networking, and networking technologies for big data (e.g., collection, processing, analysis and visualization) need more explorations.

The special section on "Smart Systems and Intelligent Networking Powered With Big Data Analytics" brings a timely research topic. The design of big data enabled smart systems and intelligent networks are still in a preliminary stage. Of the 39 submitted papers, 11 were selected for this issue. The selected articles cover topics including social network systems, cloud systems, network systems, blockchain systems, cyber-physical social systems, virtual network functions systems, smart IoT systems, disaster-resilient communication systems, smart grid systems, and indoor positioning systems. A brief review is provided as follows.

In "Fair-Aware Competitive Event Influence Maximization in Social Networks," Gao *et al.* address influential users' selection for social network systems, and they propose a propagation model to describe the information propagation process and a randomized algorithm based on cross entropy. To solve the problem of resource restriction for cloud systems, Yuan *et al.* in "Minimizing Financial Cost of DDoS Attack Defense in Clouds with Fine-Grained Resource Management" study the mainstream cloud pricing models and present a birth-death process-based mechanism that monitors the workloads of the customer systems, and adaptively increases the resources in the event of a DDoS attack. In "Decreasing Big Data Application Latency in Satellite Link by Caching and Peer Selection," Jiang *et al.* design a social relation exploration method in 6G integrated space-air-ground network systems to reduce the link delay between the satellite and the satellite base station. In "Secure Lending: Blockchain and Prospect Theory-Based Decentralized Credit Scoring Model," Hassija *et al.* propose a distributed credit score evaluation in blockchain systems to reduce the handful work in the current system. In "GAN-Driven Personalized Spatial-Temporal Private Data Sharing in Cyber-Physical Social Systems," Qu *et al.* investigate the problem of privacy protection in cyber-physical social systems and propose a generative adversarial nets (GAN)-based personalized model to achieve differential privacy and thereby enhance spatial-temporal private data sharing. To investigate the problem of virtual network function deployment and flow scheduling in distributed data centers, Gu *et al.*, in "Service Function Chain Deployment and Network Flow Scheduling in Geo-distributed Data Centers," combine server usage with the communication cost and present a two-phased algorithm by first balancing resource requirements and then selecting function locations.

In "An Intelligent Dynamic Offloading from Cloud to Edge for Smart IoT Systems with Big Data," Wang *et al.* address the dynamic offloading challenges for smart IoT systems and propose a dynamic switching algorithm to ensure tasks to be either offloaded on cloud or edge according to the system's real-time conditions. To solve the problem for the traffic classification of anonymity tools, Bovenzi *et al.,* in "A Big Data-Enabled Hierarchical Framework for Traffic Classification," leverage machine learning to design a big data-enabled hierarchical framework, which seamless integrates data parallelism with model parallelism. In "Big Data on the Fly: UAV-Mounted Mobile Edge Computing for Disaster Management," Xu *et al.* utilize unmanned aerial vehicles as big data carriers to realize emergency communication enabled by LoRaWAN (Long Range Wide Area Networking) for disaster management. In "A Differentially Private Big Data Nonparametric Bayesian Clustering Algorithm in Smart Grid," Guan *et al.* propose a differentially private clustering algorithm based on the infinite gaussian mixture model to

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achieve privacy-preserving cluster analysis in smart grid. Finally, to tackle the problem for the intrusion of malicious check-in behaviors in the crowd traffic evaluation, Li *et al.*, in "Defending Malicious Check-in Using Big Data Analysis of Indoor Positioning System: An Access Point Selection Approach," present an adversarial access point selection scheme based on mutual information by exploiting filter-based feature selection algorithm.

We believe this special section is timely and important in enhancing and advancing the research in the area of big data enabled intelligent systems and networking. The selected papers are evidence of the innovative research in this area, and we hope that this special section will impact and contribute to diverse communities in academia and industry interested in the cross area between big data and smart systems.

We would like to take this opportunity to thank all the reviewers for their great support in reviewing these manuscripts. We also thank the Editor-in-Chief, Prof. Dapeng Oliver Wu, for his supportive guidance during the entire process.

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