Editorial: Recent Internet of Things Applications in Smart Grid and Various Industries

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1 Editorial

This special issue focuses on the discussion on the recent advances in technologies of smart grid and the Internet of things (IoT), and their applications in various industries. The IoT is a grand vision as it ascribes the concept of millions of interconnected intelligent devices that can communicate with one another, and thereby control the world around us. The IoT has been widely employed in various industries, including smart energy, smart healthcare, smart factory, smart city, and so on. Technically speaking, the Internet of energy (IoE) and the smart grid can be considered to be an example of the IoT composed of embedded machines, which sense and control the behavior of the energy world, including conventional energy and renewable energy. With recent development of IoT technologies, IoT has been applied in various industries, including smart healthcare, smart agriculture, smart home, and smart city.

This special issue features six selected papers with high quality. Consider the IEEE 802.11ax, which focuses more on the network performance of the high-dense deployment scenarios in wireless local area networks (WLANs), which is an important network system of IoT. The first article, “Utility Maximization of Capacity Entropy for Dense IEEE 802.11ax WLANs Based on Interference characteristics”, authored by Annan Yang, Bo Li, Mao Yang, Zhongjiang Yan, and Xuewei Cai, employed simulation to obtain the probability density curve and further generate interference power random variables from dense multi-cell

scenarios of IEEE 802.11ax, and then proposed an algorithm which can maximize total utility of scheduling and random access STAs, i.e., to maximize the total satisfaction of all STAs.

Voice control technology makes speech recognition more precisely in various IoT domains. The second article titled “Data Augmentation for Internet of Things Dialog System”, authored by Eric Ke Wang, Juntao Yu, Chien-Ming Chen, Saru Kumari, and Joel J. P. C. Rodrigues, presented a data augmentation technique based on the model of generative adversarial network (GAN) to effectively solve the problem of data lacking in dialog systems.

In smart agriculture, the third article titled “MobileNet Based Apple Leaf Diseases Identification”, authored by Chongke Bi, Jiamin Wang, Yulin Duan, Baofeng Fu, Jia-Rong Kang, and Yun Shi, proposed a low-cost, stable, high-precision method based on the MobileNet model to efficiently identify two common types of apple leaf diseases.

In smart home, the fourth article titled “Developing Smart Home Applications”, authored by Yun-Wei Lin, Sheng-Kai Tseng, Jyun-Kai Liao, and Ta-Hsien Hsu, utilized an IoT platform called IoTtalk to shape “intelligence” into a house to make it a smart home, in which various smart home applications were developed, including PlantTalk, FishTalk, BreathTalk, TheaterTalk, FrameTalk, and GardenTalk.

In smart home healthcare, the fifth article titled “DTMFtalk: A DTMF-based Realization of IoT Remote Control for Smart-Home Elderly Care”, authored by Shun-Ren Yang, Shih-Chun Yuan, Yi-Chun Lin, and I-Fen Yang, implemented a circuit-switched approach for smart-home elder care IoT remote control platform.

In smart city, geo-tagged data has rapidly been emerging as smart things, e.g., mobile devices or connected cars equipped with the GPS module. The last article titled “Monitoring Spatial Keyword Queries Based on Resident Domains of Mobile Objects in IoT Environments”, authored by Jun-Hong Shen, Mu-Yen Chen, Ching-Ta Lu, and Rou-Hua Wang”, presented a resident-domain-based approach for continuously monitoring spatial keyword queries, which shifts the

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monitoring of tasks of affected queries from the server to mobile objects which have computational and storage abilities.

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