Guest Editorial: Smart Buildings for Smart Cities

IT is a global challenge to reduce environmental impact and the carbon footprint. At the same time, societal development needs to be addressed for societal resilience. Modern cities are facing the challenge of combining competitiveness on a global city scale and sustainable urban development to become smart cities.

The huge concern in increased greenhouse gas emissions, and evolving laws and regulations leads to a focus in smart building to reduce energy demand and improve energy efficiency.

Smart Building is the basic building block that will enable a true transformation of our cities through which one can have safe, sustainable, connected, and smart environments for the majority of the world's population as the buildings get smarter. There are various supporting technologies and requirements of smart buildings for smart cities. When equipped with smart home systems, data-driven energy modeling and simulation techniques can significantly transfer the world of smart cities.

It is now essential to consider not only the smart building environmental impact, but also its overall social performance and cost reduction over the building's lifecycle.

To gain insight into how the industry and companies are achieving smart building sustainability goals in a complex, challenging situation that is undergoing increasing and evolving environmental issues, regulations, and expectations, it is important to drive innovation and technology deployments that will ultimately enable vital data collection and analysis needed to assess, monitor, and maintain sustainability in a smart building and across campus environments, smart communities, and smart cities as a whole.

The Special Issue on "Smart Buildings for Smart Cities" presents work on multidisciplinary research for novel, scientific, technological insights, principles, algorithms, and experiences on technologies, case studies, novel approaches, and visionary ideas related to data-driven innovative solutions and big data-powered applications to cope with the real-world challenges for smart buildings. Eight articles are published and have the following contributions:

1) González-Vidal, Mendoza-Bernal, Niu et al. proposed a transfer learning framework for predictive energy-related scenarios in smart buildings.
2) Kabir, Gope, and Mohanty presented a novel security-enabled safety monitoring framework for IoT-based systems.
3) Fong, Dong, Hong et al. presented a case study of employing self-cognizant prognostics for the management of three key areas in a nursing home.
4) Dong, Ji, Zhou et al. demonstrated a multimodal neuromorphic sensory-processing system with memristor circuits for smart homes, offering a more environmentally friendly approach with low cost and easily deployable hardware.
5) Misaghian, Tardioli, Cabrera et al. designed and trained four machine learning models to predict data center energy consumption and server temperatures, using synthetic datasets generated from year-long building dynamic simulations under distinct system conditions.
6) Ibn Saif, Khadem, Conlon et al. presented a systematic approach to quantifying the benefits of smart homes, starting from the energy-passive to energy-active homes under smart community-based electricity market with intermediate stages identifying smart homes with distributed energy resources.
7) Zhang, Lin, Yin et al. studied the frequency control method of the net-zero smart building energy system adopting a wind power system. The influence of wind turbulence characteristics on the system frequency has been analyzed.
8) Alibrahim, Padmanaban, Khan et al. proposed a solution to activate the smart home sensors based on detecting the upcoming activities using a Deep Long-Short Term Memory model.

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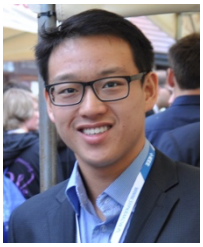

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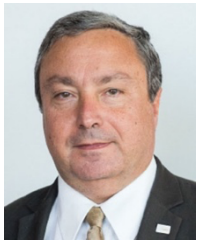

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