

Guest Editor's Introduction: Special Section on Green Computing in Internet of Things

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With the attention to sustainable development increasing, the concept of green technology and energy saving has become a new hot issue. As described in the first part of this Feature Topic by the Guest Editorial department, as an emerging cross-disciplinary research area, Green Computing is attracting worldwide attention. The emergence of Green Computing will significantly change the way we see the world. All aspects of Information Technology are under investigation, from energy saving design of individual devices, to strategies that consider the entire energy consumption in the design, planning, and management phases, to new paradigms for long term sustainability that includes reformed attitudes of users' as well as smart energy harvesting techniques. As the advanced information technology at the present stage, Green Computing has received worldwide attention and efforts. Although the concept of Green Computing has been around for some time, its development is still at an exploratory stage. The IEEE Transactions on Emerging Topics in Computing (TETC) Special Section identifies and discusses technical challenges and recent results related to Green Computing in Internet of Things. We are very pleased to receive a large number of high quality articles from different parts of the world. After a rigorous review process, four papers have been selected for inclusion in this topic. In recent years, as a ubiquitously deployed infrastructure, WiFi can be considered as a platform for green sensing, the first article by Fu Xiao et al. propose SEARE, a novel energy-efficient solution using WiFi for exercise activity recognition. The authors select CSI-waveform shape as activity feature and design a series of de-noise methods, including low-pass, PCA, and median filtering, where PCA can remove the in-band noise that traditional low-pass filters fail to do. At the end of this article, the authors highlight the challenge of devising an approach to distinguish different CSI waveforms caused by different individuals. Some people may consider that the inherent task heterogeneity imposes increased complexities in achieving an energy efficient management of the Cloud jobs. For this, in the second article, John Panneerselvam et al. propose a novel analytics framework which integrates a resource estimation

module to estimate the resource requirements of tasks a priori, a straggler classification module to classify tasks based on their resource intensity, and a resource optimization module to optimize the level of resource provision depending on the task nature and various runtime factors. The authors demonstrate the effectiveness of the proposed methodology in achieving energy conservation. Finally, the authors highlight that evaluating the efficiencies of the proposed framework in classifying jobs with cascaded tasks is another future objective of their research. In the era of information, the green services of content centric IoT are expected to offer users the better satisfaction of Quality of Experience (QoE) than that in a conventional IoT. Nevertheless, the network traffic and new demands from IoT users increase along with the promising of the content-centric computing system. In the third article, to enhance the satisfaction of QoE, Xiaoming He et al. propose QoE models to evaluate the qualities of the IoT concerning both network and users, which could capture the influence factors from network cost and services for IoT users based on IoT conditions. In order to solve the problem of frequent content publishing, the authors propose three resource allocation algorithms. The authors prove that their proposals could achieve high QoE performance for content-centric IoT. Real-time surveillance systems with green wireless sensor networks (WSNs) are vital for maintaining high energy efficiency in many situations. The fourth article by Zhetao Li et al. considers a scenario utilizing green WSNs to monitor the situation of Internet of Things (IoT), which constitute one of the most crucial sources of electricity consumption in information and communications technologies (ICT). More specifically, the authors focus on optimizing the cluster structure to minimize the delay and energy consumption for aggregation converge cast in green WSNs. The results of this research will provide useful guidelines for the deployment of large-scale WSNs to effectively monitor the energy efficiency in IoTs. In closing, the guest editors would like to sincerely thank all the authors who contributed the papers for this Feature Topic. They made great contributions to this IEEE TETC Special Section and provided many ideas for the research

on Green Computing in Internet of Things. We would also like to express our gratitude to all volunteer reviewers for their timely and careful review to ensure the quality of the

papers, so that we can get these high-level articles. Finally, we also thank the Editor-in-Chief and the staff for their great support and hard work.

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