Special Issue on
Emerging Technologies: IoT, Big Data, and CPS with Sensory Systems

Hindawi

CALL FOR PAPERS

The availability of uniquely addressable heterogeneous electronics (UAHE)—including sensors, actuators, smart devices, RFID tags, embedded computers, and mobile devices—is continuously growing day by day. From a networking perspective, the Internet of Things (IoT) relies on interconnected UAHE for creating a mesh of devices, producing information and building a worldwide network of real physical objects. In this context, the IoT presents a technology that enables loosely coupled decentralized systems to cooperate smart objects of autonomous physical-digital devices, augmented with sensing/actuating, processing, and networking capabilities.

On the other hand, the coupling between the IoT and the Big Data has become an essential component for extracting value from collected data. Big Data is one of the most important recent research challenges with a paradigm that relies on the collection of tremendous amount of data to support innovation in the upcoming decades. A dataset is considered as Big Data when it meets the four Vs requirements, namely, Volume, Variety, Velocity, and Value. The keystone of Big Data exploitation is to leverage the existing datasets to create new information and predict future happenings and to enrich the decision value chain. Accordingly, as the IoT continuously collects data about the surrounding living environments, it is considered as a prototypical example of Big Data and a great application area of Big Data Analytics.

Furthermore, Cyber-Physical Systems (CPS) are emerging from the integration of embedded computing devices, smart objects, people, and physical environments, which is typically tied by a communication infrastructure. So, the design of CPS and the implementation of their applications need to rely on IoT-enabled architectures and protocols that, both locally and globally, enable collecting, managing, and processing large datasets and support complex processes to manage and control such systems. Thus, as a matter of fact, the large-scale nature of IoT-based CPS can be effectively and efficiently facilitated and supported via utilizing the Cloud Computing infrastructures and platforms for providing flexible and extensive computational power, resource virtualization, and high-capacity storage for data streams in addition to ensuring safety, security, and privacy.

The goal of this special issue is to highlight and address the advances and challenges as well as providing insights and solutions to open issues associated with the concepts of IoT, Big Data, and CPS with focusing on sensors and sensory systems. Contributions to this special issue are welcome to present novel methods, algorithms, protocols, architectures, platforms, and applications.

Potential topics include but are not limited to the following:

- Architecture design and development of smart systems
- Standards, protocols, and methodologies for CPS and IoT
- Context-aware sensing and computing in IoT-based CPS
- Predictive maintenance in the IoT era
- CPS and wearable devices tracking
- Remote monitoring and interoperability in the IoT
- Big Data improvements in life quality and healthcare
- Intelligent platforms for collaborative test-beds
- Ambient intelligence, intelligent environments, and intelligent platforms
- Open IoT platforms for modeling, simulation, and testing
- Applied machine learning and computational intelligence
- Edge computing approaches for IoT-based CPS
- CPS and IoT applications on environmental monitoring, transportation, and healthcare
- CPS and decision support systems in the Industry 4.0
- Telepresence robot as the IoT-based CPS
- Cloud Computing as infrastructure in supporting IoT, Big Data Analytics, and CPS

Authors can submit their manuscripts through the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/js/interb/.

Lead Guest Editor
Qing Tan, Athabasca University, Alberta, Canada
qingt@athabascau.ca

Guest Editors
Nashwa El-Bendary, Arab Academy for Science Technology and Maritime Transport, Cairo, Egypt
nashwa.elbendary@ieee.org

Magdy A. Bayoumi, University of Louisiana at Lafayette, Lafayette, USA
mab@cacs.louisiana.edu

Xiaokun Zhang, Athabasca University, Alberta, Canada
xiaokunz@athabascau.ca

Javier Sedano, Technological Institute of Castilla y Leon, Burgos, Spain
javier.sedano@itcl.es

José R. Villar, University of Oviedo, Oviedo, Spain
villarjose@uniovi.es

Manuscript Due
Friday, 28 April 2017

First Round of Reviews
Friday, 21 July 2017

Publication Date
Friday, 15 September 2017