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Editorial

Smart Objects, Infrastructures, and Services in the Internet of Things

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The Internet of Things (IoT) is a novel paradigm that is shaping the evolution of the future Internet. According to the vision underlying the IoT, the next step in increasing the ubiquity of the Internet is to connect inanimate objects. By providing objects with embedded communication capabilities and a common addressing scheme, a highly distributed and ubiquitous network of seamlessly connected heterogeneous devices is formed, which can be fully integrated into the current Internet and mobile networks. Thus, it allows for the development of new intelligent services available anytime and anywhere and to anyone.

When human interaction is absent from the system dynamics, the vision is also referred to as Machine-to-Machine (M2M) communications. Many applications with high social and business impact fall under the IoT/M2M umbrella, including personal healthcare, Smart Grids, smart city, surveillance, home automation, and intelligent transportation, and it is strongly expected that new applications will emerge once the enabling technologies reach a stable state.

The aim of this special issue is to bring together practitioners and researchers from both academia and industry to discuss recent advances in theory, application, and implementation of the IoT technologies, protocols, algorithms, and services. The special issue hosts both revised and extended papers coming from the Internet of Things, Smart Objects and Services 2015 conference, and other papers strongly related to IoT, smart devices, objects, infrastructures, and services. Specifically, 7 high quality papers out of 21 submitted have been accepted.

The paper titled "Advancing Building Energy Management System to Enable Smart Grid Interoperation" by E.-K. Lee proposes a new Energy Management System (EMS) model named Premises Automation System (PAS) dealing with the interoperation between Smart Grid and customer facilities in buildings. The system is implemented and evaluated with an in-campus testbed using standard technologies such as oBIX (Open Building Information Exchange, i.e., a standard for RESTful Web Services-based interfaces to building control systems).

The paper "High Performance Web of Things Architecture for the Smart Grid Domain" by D. Vernet et al. proposes an interesting approach to manage information in a Smart Grid Domain. Smart Grid systems often contain a large number of heterogeneous devices from different vendors, running on different policies and protocols. In this scope, the access to the devices within the grid is challenging. The authors address this problem by providing novel architecture for such systems.

The paper "Agatha: Predicting Daily Activities from Place Visit History for Activity-Aware Mobile Services in Smart Cities" by B. Kim et al. presents a place-history-based activity prediction system called Agatha for activity-aware mobile services in smart cities. The system predicts the user potential subsequent activities that will be very likely performed knowing those performed before or activity-related contextual information such as visit place and time. To predict the activities, a causality-based activity prediction model using Bayesian networks is developed assuming that what you have done so far influences what you will do next. The experiments performed using real data coming from a large dataset confirm the effectiveness of the proposed approach.

The paper "Experiencing Commercialized Automated Demand Response Services with a Small Building Customer in Energy Market" by E.-K. Lee investigates experimental utilization of Automated Demand Response (ADR) services, which is under focus recently, to meet the gap between theoretical concepts and realize implementations of OpenADR. In particular, it aims at balancing the power demand with the supply via active interoperation amongst Smart Grid participants. The authors implemented an ADR testbed and conducted preliminary experiments, also deploying it on a small commercial facility to investigate different features of the service.

The paper "A Framework and Classification for Fault Detection Approaches in Wireless Sensor Networks with an Energy Efficiency Perspective" by Y. Zhang et al. proposes a framework for fault detection in WSN, considering an energy efficiency perspective. In particular, it focuses on message exchanging as the most energy-consuming part of the network, to propose a classification for fault detection methods used to categorize and compare existing approaches.

The paper "An Intelligent Power Outlet System for the Smart Home of the Internet of Things" by T. M. Fernández-Caramés proposes an intelligent power outlet system for remote control, power monitoring, and prevention of fire and electrocution in smart home environments. It is based on a smart power socket system which can be controlled wirelessly and through the Internet and can be used to control current consumption and avoid overconsumption and electrical fires and shocks. A simple testbed is used to demonstrate the suitability of the proposed solution. The results obtained by the experimental analysis show the effectiveness of the approach.

The paper "Design of Building Energy Autonomous Control System with the Intelligent Object Energy Chain Mechanism Based on Energy-IoT" by S. Park et al. proposes both three-layer architecture and a mechanism for energy saving in the IoT context, by controlling the communication between devices. Experimental results show that the proposed solution is comparable in terms of energy efficiency to two conventional systems, while providing more effective control mechanisms for energy optimization of hyperconnected object in IoT environment.

Acknowledgments

We would like to thank all the authors who submitted their works to this special issue, irrespective of whether their papers have been accepted or not. We are also thankful to all the reviewers, who carefully evaluated the papers providing constructive comments to the authors to improve the quality of their papers. Without their hard and valuable work, it would not have been possible to select these special issue high quality papers within the given time bounds.

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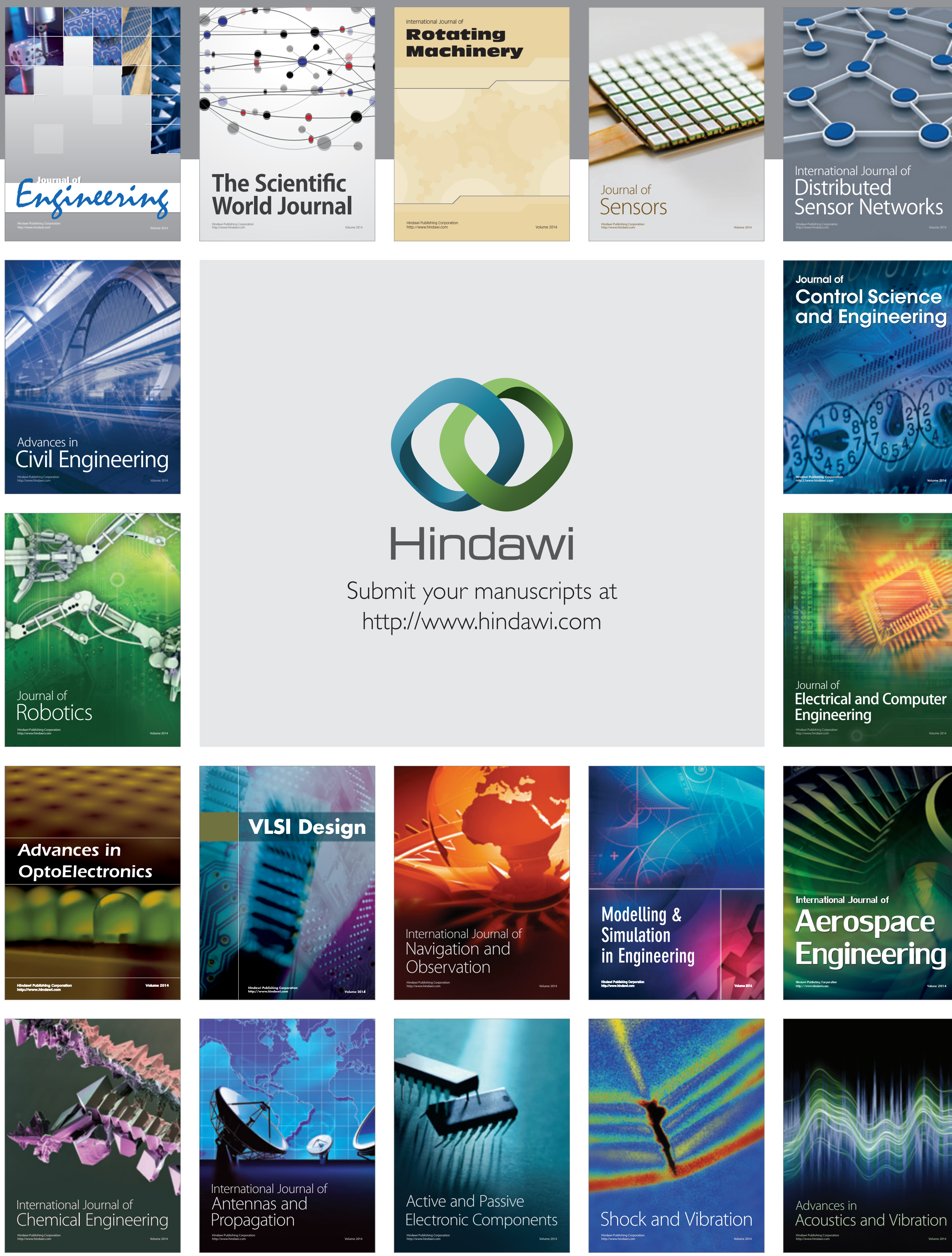

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