Chapter 9 Connecting One Belt One Road Countries via Wireless Sensor Network

Kwok Tai Chui *City University of Hong Kong, Hong Kong*

Wadee Alhalabi King Abdulaziz University, Saudi Arabia & Effat University, Saudi Arabia

> **Ryan Wen Liu** Wuhan University of Technology, China

> > Patricia Ordóñez de Pablos University of Oviedo, Spain

ABSTRACT

The economy of China grows rapidly due to the advent of wireless networks. The networks provide connection between nodes (sensors, gateways, systems, people, etc.) for data transmission and communication seamlessly. This is a crucial element to achieve sustainable economics. It is worth mentioning that wireless communication is the optimal solution compared with wired communication given the fact that China has a huge land area and the largest population in the world. Traditional wireless technologies like 4G, Bluetooth, ZigBee, ISA 100.11a, and WirelessHART have been well addressed in literature. In this chapter, the focus is moved to 5G, LoRa, IEEE 802.11 af, ah, ax, and ay. Selected applications health monitoring, toxic gas monitoring, connected target coverage problem, and mobile crowd sensing are discussed in detail. Geographic routing, wireless charging, and wireless coexistence are challenging issues that need to be addressed in the near future.

DOI: 10.4018/978-1-5225-8980-8.ch009

Copyright © 2019, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

INTRODUCTION

Everybody and object are interconnected via wireless communications seamlessly. It is crucial element because wired communication has restriction on connectivity. When it comes to China, the massive land mass creates fundamental challenge for wired communication (particularly fiber-optic communication). This is the reason for the largest number of mobile users in the world. The level of digital infrastructure construction of many countries along the Silk Road is relatively low, which provides big chance for mobile communication equipment, fixed-line broadband upgrades, data centre and cloud platform. In addition, the development level of each country's information industry varies so companies can implement a niche market strategy and expand the profit margin. China's telecommunications industry is relatively sound and capable of providing complete solutions and cost-effective products. It has enterprises with international competitiveness which can be a basis for enhancing international communications connectivity.

Every growing of data provides tremendous opportunities for data analytics. In doing so, different types of sensors must be utilized to collect the data continuously and has good streaming rate. The world has changed rapidly and it seems that existing wireless protocols cannot fulfil the entire requirement for desired applications, that's why many new protocols have been released or soon to released and they have been addressed in this chapter. To realize the potential of evolving wireless sensor network technologies and software architectures we need to move away from traditional approaches towards an adaptable service oriented hybrid architecture, which should ideally run on the plate for wireless sensor devices, to minimize redundant protocol stack overhead.

One Belt One Road (OBOR) strategy is a key policy initiated by China. It targets on achieving innovation and social inclusive economic growth for sustainability (Visvizi, Lytras, Damiani, & Mathkour, 2018). A key characteristic in China (and many underdeveloped countries) has numerous villages (rural areas) and are migrating towards main cities. Smart villages and cities services have gained attention not only increase people's quality of life bringing but also facilitating foreign business (Lytras, & Visvizi, 2018; Visvizi, & Lytras, 2018).

The contribution of the chapter is (i) an up-to-date state-of-the-art is presented in the field of emerging wireless standards as the supporting elements of fast and reliable data transmission; (ii) key applications are discussed which are hot research topics; and (iii) challenges are highlighted as future research work to build sustainable OBOR network. 19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-

global.com/chapter/connecting-one-belt-one-road-countries-

via-wireless-sensor-network/227139

Related Content

Ethical Consumerism: Contextual Issues of Ethical Decision-Making Processes: An Exploratory Study

Ebtihaj A. Al-A'aliand Abdul Redha Al-Sarraf (2020). *Sustainable Business: Concepts, Methodologies, Tools, and Applications (pp. 1434-1450).* www.irma-international.org/chapter/ethical-consumerism-contextual-issues-of-ethical-decision-making-processes/232858

Bibliometric Analysis of Publications on Gastronomy Tourism

Vipin Singhand Amrik Singh (2024). *Promoting Sustainable Gastronomy Tourism and Community Development (pp. 81-94).* www.irma-international.org/chapter/bibliometric-analysis-of-publications-on-gastronomy-

tourism/342697

Climate Change Situation in Kenya and Measures Towards Adaptive Management in the Water Sector

Joan Mwihaki Nyika (2020). International Journal of Environmental Sustainability and Green Technologies (pp. 34-47).

www.irma-international.org/article/climate-change-situation-in-kenya-and-measures-towardsadaptive-management-in-the-water-sector/258052

Corrosion of Aluminium Alloy in Seawater and Development of Green Corrosion Inhibitor for Marine Applications

Wan Mohd Norsanni Wan Nik, Oladokun Sulaiman Olanrewaju, F. R. Zulkifli, M. F. Ahmadand R. Rosliza (2014). *Marine Technology and Sustainable Development: Green Innovations (pp. 146-156).*

www.irma-international.org/chapter/corrosion-of-aluminium-alloy-in-seawater-and-developmentof-green-corrosion-inhibitor-for-marine-applications/84521 Exploring the Perception and Observation of Youth on Leadership Towards Sustainable Development: A Case Study of Dhaka City, Bangladesh

Nayma Iftakharand Khalid Md Bahauddin (2022). *International Journal of Social Ecology and Sustainable Development (pp. 1-12).* www.irma-international.org/article/exploring-the-perception-and-observation-of-youth-on-leadership-towards-sustainable-development/282751