



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**Fog Computing and Networking: A Key Pillar for
Current 5G Engineering to future 6G Research**
by
Prof. T. Russell Hsing
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Date : 13 April, 2018 (Fri.)
Time : 11:00am – 12:00noon
Venue : Room 1009, William M.W. Mong Engineering Building
The Chinese University of Hong Kong

Abstract

Pushing processing and storage into the “cloud” has been a key trend in networking and distributed systems in the past decade. In the next wave of network architecture and technology advance, the cloud is now descending to be diffused among the client devices, often with mobility too: the cloud is becoming “fog.” For example, more than just faster speed, many IoT emerging services need to be cognitive of end-user application needs. Questions on fairness, robustness, privacy, security, and efficiency need to be revisited. Furthermore, empowered by chips such as Atom and emergent communication protocols, each client device today is powerful in computation, in storage, and in communication. Yet client devices are still limited in battery power, global view of the network, and mobility support. Recognizing the gap between “Cloud” and “Things,” both IEEE and OpenFog Consortium have stepped up their efforts on filling the “Cloud-to-Thing” continuum through growing its activities in fog computing/networking, communications, storage and control, i.e., “Fog.” Most interestingly, the collection of many Fog-based Networks in a crowd presents a highly distributed, under-organized and dense network.

The goal of starting the Fog Computing & Networking research is to investigate the optimization of resources that are virtualized, pooled, and shared unpredictably. Fog Networking revisits the role of clients in network architectures, more than just an end-user device, but also as an integral part of the control plane that monitors, measures, and manages the network. This is rewriting the traditional practice of using heavy-duty and dedicated network elements for network measurement and management. Fog Computing & Networking combine the study of mobile communications, fog-based radio access network (F-RAN) in future 6G wireless, distributed systems, and big data analytics into an exciting new area. Based on our preliminary research, it shows that many new emerging services (such as V2V in Vehicular Telematics Services, Industry 4.0 and e-Healthcare Services) could be realized and implemented easily and economically. It could be also served as core engine to enable many Services in Internet of Things (IoT) applications. Both of Future Research Directions and the ICT Convergence for Entrepreneurs in the area of Fog Computing and Networking will be discussed in this talk. From Technology aspect, this talk will discuss current views on how to identify potential road blocks and then solve these technical challenges for 6G wireless in the future. A few emerging services (such as V2V in vehicular telematics, Industry 4.0, and AR/VR applications) in the 6G-based network environment will be presented in this talk too.

Biography

Prof. T. Russell Hsing, Life Fellow of the IEEE and Fellow for the British Computer Society (BCS) and SPIE, is now Chair Professor of National Chiao Tung University in Taiwan, Guest Professor of Peking University in China, International Advisor for the Joint Fundamental Research Lab. (Peking University and Princeton University) on Communications Technology, Adjunct Professor with the Arizona State University in US, Visiting Professor with the IIT Bombay in India and the Singapore University of Technology Design (SUTD) in Singapore, and the Chinese University of Hong Kong. Currently he serves as Board of Director for the OpenFog Consortium in US, Board Advisors for four high-tech start-ups via academic spin-offs in US and Taiwan. He has been designing and teaching 3-credit undergraduate and graduate courses in Technology Entrepreneurship and Technology Commercialization for students, faculty members and local industry people (since 2014) and another new course of “Network Economics” (start from 2017). He has been Academic Advisor for the Next Generation Mobile Networks (NGMN) Alliance in Germany since March 2014. His current research efforts are concentrating on Wireless 5G, Internet of Things, Network Economics, Fog Networking & Computing, and Technology Entrepreneurship.

**** ALL ARE WELCOME ****

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