



**THE CHINESE UNIVERSITY OF HONG KONG**  
 Department of Information Engineering  
*Seminar*

**Fog Computing & Networking:  
 A New Paradigm for 5G and IoT Applications**  
 by  
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 Chair Professor, National Chiao Tung University, Taiwan

**Date : Oct. 18, 2016 (Tue.)**  
**Time : 10:00am - 11:00am**  
**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, 5G wireless networks need to be cognitive of end-user application needs. Questions on fairness, robustness, privacy, 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,” IEEE has stepped up its efforts on filling the “Cloud-to-Thing” continuum through growing its activities in fog computing, 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 5G, distributed systems, and big data analytics into an exciting new area. Based on our preliminary research, it shows that new emerging services (such as V2V in Vehicular Networks and Telematics Applications, 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.

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, Adjunct Professors with the Arizona State University in US, and the Chinese University of Hong Kong. He has been teaching a course of “Technology Entrepreneurship: Curiosity, Opportunity, Risk, and Money” at POSTECH (Korea) in 2012, National Chiao Tung University (Taiwan) since 2013, and Peking University (China) since 2014. Currently he is Board Member for the OpenFog Consortium, Advisory Board Member for four high-tech start-ups in US (DataMi, Inc.; Smartply Inc.; and IoT Eye, Inc.) and Taiwan (ePass2UInc.). He has been Academic Advisor for the Next Generation Mobile Networks (NGMN) Alliance since March 2014. His current research efforts are concentrating on Wireless 5G, Internet of Things, Network Economics & Neutrality, Fog Network & Computing, and Technology Entrepreneurship. Within the IEEE Communications Society, Prof. Hsing was member (2006-2008) and chair (2010-2011) of the Fellow Evaluation Committee, and a member of the Award Committee (2010-2012). He was founding chair (2010-2012) of Sub-TC on Vehicular Networks and Telematics Applications for the IEEE Communications Society. Within the IEEE, he was a member (2008-2010)/ Chair (2010-2011)/Past Chair (2012) for the IEEE Kiyo Tomiyasu Award Committee, and then the IEEE Eric Sumner Award Committee (2010-2012). He has been a member for the IEEE Fellow Committee since 2012, the Strategic Planning Committee in 2013, and Chair for the IEEE Technical Field of Award (TFA) Council & Member for the IEEE Award Board since 2015.

\*\* ALL ARE WELCOME \*\*