

IEEE Communications Society Distinguished Lecturer Tour by

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Day 1: Cellular based V2X Communications

Time: October 10, 6pm - 8pm
Location: Room 105/106, 101 Astor Place New York, NY 10003

Abstract

A wide variety of work has been done in vehicle-to-everything (V2X) communications to enable various applications for road safety, traffic efficiency and passenger infotainment. Although IEEE 802.11p used to be considered as the main technology for V2X, new research trends nowadays are considering cellular technology as the future of V2X due to its rapid development and ubiquitous presence. This tutorial surveys the recent development and challenges on 4G LTE and 5G mobile wireless networks to support efficient V2X communications. In the first part, we highlight the technical motivations of 4G LTE for V2X communications. In the second part, we explore the LTE V2X architecture and operating scenarios being considered. In the third part, we discuss the challenges and the new trends in 4G and 5G for supporting V2X communications such as physical layer structure, synchronization, resource allocation, security, multimedia broadcast multicast services (MBMS), as well as possible solutions to these challenges. Finally, we discuss some open research issues for future 5G based V2X communications.

Day 2: Data-driven Network Intelligence for Anomaly Detection

Time: October 11, 6pm - 8pm
Location: Room 210, Shepard Hall, 259 Convent Ave, New York, NY 10031

Abstract

Data-driven network intelligence will offer a robust, efficient, and effective computing system for anomaly detection in cyber security applications. In this talk, we first summarize the current development and challenges of network intelligence for anomaly detection. Based on the current development, we present a data-driven intelligence system for network anomaly detection. With the support of extended computing, storage, and other resources to the network edge, fog computing is incorporated into the design of the system. The proposed system consists of three types of major components: edge enabled infrastructure, AI engines and decision platforms. Edge enabled infrastructure provides efficient and effective computing resources for parallel computing and data storage. AI engines produce optimal learning models for threat detection, and enable online machine learning for efficient model update. Decision platforms offer real-time network monitoring, anomaly detection, and threat mitigation. We demonstrate that the envisioned data-driven network intelligence system achieves high detection accuracy, and provides robust computational performance for cyber security.

Biography



Yi Qian received a Ph.D. degree in electrical engineering from Clemson University, South Carolina, USA. He is currently a professor in the Department of Electrical and Computer Engineering, University of Nebraska-Lincoln (UNL). Prior to joining UNL, he worked in the telecommunications industry, academia, and government. Some of his previous professional positions include serving as a senior member of scientific staff and a technical advisor at Nortel Networks, a senior systems engineer and a technical advisor at several startup companies, an assistant professor at University of Puerto Rico at Mayaguez, and a senior researcher at National Institute of Standards and Technology. His research interests include communications and systems, and information and communication network security. More specifically, he has research and industry experience in wireless communications and systems, information assurance and network security, sensing and sensor networks, vehicular communications, smart grid communications, broadband satellite communications, optical communications, high-speed communications and networks, and the Internet of Things.

Prof. Yi Qian is a Fellow of IEEE. He was previously Chair of the IEEE Technical Committee for Communications and Information Security. He was the Technical Program Chair for IEEE International Conference on Communications 2018. He serves on the Editorial Boards of several international journals and magazines, including as the Editor-in-Chief for IEEE Wireless Communications. He was a Distinguished Lecturer for IEEE Vehicular Technology Society. He is currently a Distinguished Lecturer for IEEE Communications Society.

PDH/CEU Credits

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