The University of New South Wales

Faculty of Engineering

School of Electrical Engineering & Telecom

Invited Talk

Statistical Delay QoS Provisionings in Wireless Networks: Effective Capacity and QoS-Driven Resource Allocations

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Date: 23 April 2010, Friday
Time: 2:00 p.m. – 3:00 p.m.
Venue: G3, Electrical Engineering Building

Abstract

In this talk we focuses on the statistical delay-QoS guarantees in wireless networks by using the effective capacity/bandwidth theories, and address the methodologies of cross-layer modeling and optimization based QoS-driven resource allocations. Specifically, we start with the theory of statistical QoS guarantees built on the Large Deviation Principle. Describing the statistical QoS guarantee techniques, we introduce the dual principle between the effective capacity and effective bandwidth, which characterize the wireless-channel capability and the traffic loads as functions of the delay-QoS, respectively. Using the effective capacity as the layer-interfacing tool, we study the cross-layer modeling and the optimized QoS-driven resource allocation schemes for several types of wireless networks and wireless communications systems, and their applications. We also discuss the future research directions in these areas.

Biography

Xi Zhang received the Ph.D. degree in electrical engineering and computer science (Electrical Engineering-Systems) from The University of Michigan, Ann Arbor, USA. He is currently an Associate Professor and the Founding Director of the Networking and Information Systems Laboratory, Department of Electrical and Computer Engineering, Texas A&M University, College Station. He was with the Networks and Distributed Systems Research Department, AT&T Bell Laboratories, Murray Hills, NJ, and with AT&T Laboratories Research, Florham Park, NJ, in 1997. He has published more than 170 research papers. He received the U.S. National Science Foundation CAREER Award in 2004 for his research in the areas of mobile wireless and multicast networking and systems. He received the Best Paper Awards in the IEEE Globecom 2009 and the IEEE Globecom 2007, respectively. He also received the Best Paper Award from the IEEE WCNC 2010. He received the TEES Select Young Faculty Award for Excellence in Research Performance from the Dwight Look College of Engineering at Texas A&M University, College Station, in 2006.

Prof. Zhang serves as an Editor for the IEEE TRANSACTIONS ON COMMUNICATIONS, an Editor for the IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS, an Associate Editor for the IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, a Guest Editor for the IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS for the special issue on “Wireless Video Transmissions”, an Associate Editor for the IEEE COMMUNICATIONS LETTERS, and also a Guest Editor for the IEEE Wireless Communications Magazine for the special issue on “Next Generation of CDMA versus OFDMA for 4G Wireless Applications”. He is also an Editor for JOHN WILEY’S JOURNAL ON WIRELESS COMMUNICATIONS AND MOBILE COMPUTING, an Area Editor for ELSEVIER’s Journal on Computer Communications, an Editor for WILEY’S JOURNAL OF COMPUTER SYSTEMS, NETWORKING, AND COMMUNICATIONS, and an Associate Editor for JOHN WILEY’S JOURNAL ON SECURITY AND COMMUNICATIONS NETWORKS, and is also serving as a Guest Editor for JOHN WILEY’S JOURNAL ON WIRELESS COMMUNICATIONS AND MOBILE COMPUTING for the special issue on “next generation wireless communications and mobile computing”. He has frequently served as the Panelist on the U.S. National Science Foundation Research-Proposal Review Panels.

Prof. Zhang is serving or has served as the Technical Program (TPC) Chair for IEEE Globecom 2011, TPC Vice-Chair for IEEE INFOCOM 2010, TPC Co-Chair for IEEE INFOCOM 2009 - Mini-Conference, TPC Co-Chair for IEEE Globecom 2008 - Wireless Communications Symposium, TPC Co-Chair for the IEEE ICC 2008 - Information and Network Security Symposium, Symposium Chair for IEEE/ACM International Cross-Layer Optimized Wireless Networks Symposium 2006, 2007, and 2008, respectively, the TPC Chair for IEEE/ACM IWCMC 2006, 2007, and 2008, respectively, the Poster Chair for IEEE INFOCOM 2008, the Student Travel Grants Co-Chair for IEEE INFOCOM 2007, the Panel Co-Chair for IEEE ICCCN 2007, the Poster Chair for IEEE/ACM MSWiM 2007 and IEEE QShine 2006, Executive Committee Co-Chair for ACM QShine, the General Chair for ACM QShine 2010, the Publicity Chair for IEEE/ACM QShine 2007 and IEEE WirelessCom 2005, and the Panelist on the Cross-Layer Optimized Wireless Networks and Multimedia Communications at IEEE ICCCN 2007 and WiFi-Hotspots/WLAN and QoS Panel at IEEE QShine 2004. He has served as the TPC members for more than 70 IEEE/ACM leading conferences, including IEEE INFOCOM, IEEE Globecom, IEEE ICC, IEEE WCNC, IEEE VTC, IEEE/ACM QShine, IEEE WoWMoM, IEEE ICCCN, etc.

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