THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

A Fractional Programming Approach to Coordinated User Scheduling and Spectrum Sharing
by
Professor Wei Yu
University of Toronto, Canada

Date   :   **5 January, 2017 (Thur.)**
Time   :   **2:00pm – 3:00pm**
Venue   :   **Room 833, Ho Sin Hang Engineering Building**
             The Chinese University of Hong Kong

Abstract

Interference management is a key challenge for both cellular and device-to-device (D2D) communication networks, in which multiple transmitter and receiver pairs may arbitrarily interfere with each other with full frequency reuse. In this talk, we introduce a distributed spectrum sharing strategy called FPLinQ to alleviate inter-link interference by coordinating link schedule decisions throughout the network. Scheduling in the general setting is a challenging combinatorial optimization problem. In this talk, we devise a fractional programming (FP) approach to derive a reformulation whereby the integer variables are determined analytically in each iterative step. The resulting FPLinQ algorithm enables an iterative and distributed optimization of link schedule with provable convergence. The proposed strategy can be extended to include joint link scheduling and power control. The proposed strategy can further be used for interference aware uplink scheduling and beamforming in cellular networks. As compared to the existing works such as FlashLinQ, ITLinQ and ITLinQ+, a main advantage of the proposed strategy is that it does not require tuning of design parameters; it further shows significant performance advantage as compared to the benchmarks in maximizing the sum rate and the network utility.

Biography

Wei Yu (S'97-M'02-SM'08-F'14) received the B.A.Sc. degree in Computer Engineering and Mathematics from the University of Waterloo, Waterloo, Ontario, Canada in 1997 and M.S. and Ph.D. degrees in Electrical Engineering from Stanford University, Stanford, CA, in 1998 and 2002, respectively. Since 2002, he has been with the Electrical and Computer Engineering Department at the University of Toronto, Toronto, Ontario, Canada, where he is now Professor and holds a Canada Research Chair (Tier 1) in Information Theory and Wireless Communications. His main research interests include information theory, optimization, wireless communications and broadband access networks.

Prof. Wei Yu currently serves on the IEEE Information Theory Society Board of Governors (2015-17). He is an IEEE Communications Society Distinguished Lecturer (2015-16). He served as an Associate Editor for IEEE Transactions on Information Theory (2010-2013), as an Editor for IEEE Transactions on Communications (2009-2011), as an Editor for IEEE Transactions on Wireless Communications (2004-2007), and as a Guest Editor for a number of special issues for the IEEE Journal on Selected Areas in Communications and the EURASIP Journal on Applied Signal Processing. He was a Technical Program co-chair of the IEEE Communication Theory Workshop in 2014, and a Technical Program Committee co-chair of the Communication Theory Symposium at the IEEE International Conference on Communications (ICC) in 2012. He was a member of the Signal Processing for Communications and Networking Technical Committee of the IEEE Signal Processing Society (2008-2013). Prof. Wei Yu received a Steacie Memorial Fellowship in 2015, an IEEE Communications Society Best Tutorial Paper Award in 2015, an IEEE ICC Best Paper Award in 2013, an IEEE Signal Processing Society Best Paper Award in 2008, the McCharles Prize for Early Career Research Distinction in 2008, the Early Career Teaching Award from the Faculty of Applied Science and Engineering, University of Toronto in 2007, and an Early Researcher Award from Ontario in 2006. He is recognized as a Highly Cited Researcher by Thomson Reuters.

Prof. Wei Yu is a Fellow of IEEE. He is a registered Professional Engineer in Ontario.

** ALL ARE WELCOME **

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