◆Title

ZF Beamforming for MISO Interference Channels without Crosstalk CSI

◆Lecturer

Prof. Kai-Kit Wong, University College London, England

◆Abstract

Despite achieving the capacity for interference channels (IFCs), interference alignment requires global channel state information (CSI) at every transmitter, which is not only hard to manage, but consumes a huge amount of feedback capacity. The objective of this talk is to address the distributed beamforming optimization problem for the multiple-input single-output (MISO) IFC in which only a local CSI feedback from the intended receiver to its corresponding multi-antenna transmitter exists. We propose a step-by-step analytical construction for the sum-rate optimal zero-forcing (ZF) solution where at each step an optimizing transmitter analytically constructs its beamforming vector based on the changes in its (scalar) local interference observation due to a reporting transmitter, while the rest remain fixed. The proposed scheme can be managed by a twin-token approach. Results reveal that the proposed approach achieves the sum-rate of the MISOIFC at high signal-to-noise ratio (SNR) and is fast, requiring only K(K-1)(6M-3K+2)/2 steps, with M denoting the number of antennas per transmitter and K the number of transmitters.

◆Presenter Biography

Kai-Kit Wong received the BEng, the MPhil, and the PhD degrees, all in Electrical and Electronic Engineering, from the Hong Kong University of Science and Technology, Hong Kong, in 1996, 1998, and 2001, respectively. He is Professor of Wireless Communications at University College London, United Kingdom. Prior to this, he took appointments at the University of Hull, UK and the University of Hong Kong, and also visiting positions at Alcatel-Lucent, Holmdel, US and the Smart Antenna Research Group at Stanford University. His current research interests center

around game-theoretic cognitive radio networks, cooperative communications, physical-layer security, massive MIMO and energy-harvesting wireless communications.

Dr Wong is Fellow of IEEE and IET, and is Senior Editor of IEEE Communications Letters and IEEE Wireless Communications Letters, and also serves in several other editorial boards.