Information Systems Technology and Design (ISTD)
PhD Oral Defense Public Seminar

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Massive MIMO and HetNet: Random Matrix Theory meets Stochastic Geometry

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Venue: Think Tank 20 (building 2 level 3 room 2.305)

Abstract: Nowadays, the demand for wireless mobile services is copious, and will continue increasing in the near future. As the spectrum resource is generally limited, a common consensus to attain higher capacity is through spatial densification, i.e. deploy more antennas per unit area. Approaches to densify the network can be classified into two categories: Massive multiple-input-multiple-output (MIMO) system and heterogeneous network (HetNet). While massive MIMO tend to aggressively expand the antenna arrays at macro base stations (MBS), HetNets are created by successively overlaying the conventionally big MBSs with densely deployed lower power small access points. Each of these technologies has great advantage stand-alone, but we wonder how the "big" MIMO and "small" cells can co-exist with each other, and if a marriage between them could be happy enough to bring along further improvement to the wireless network. To that end, in this talk we explore several advanced methods to enhance the physical layer performance of massive MIMO system, and its combination with HetNet.

Speaker Bio: Hao Yang (Howard) received the BEng degree in communication engineering from Harbin Institute of Technology, Harbin, China, in 2012 and the M.Sc. degree in electronic engineering from Hong Kong University of Science and Technology, Hong Kong, in 2013. He is currently working towards the PhD degree at the ISTD Pillar of SUTD, under the supervision of Prof Tony Q S Quek. He has also held research appointment at the University of Texas at Austin, USA, in 2015, under the supervision of Prof Jeffrey G Andrews.

His research interest has been focused on the analysis of heterogeneous cellular networks and massive MIMO system using tools from stochastic geometry and random matrix theory. He received the IEEE WCSP Best Paper Award in 2014.