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MIMO techniques for 5G wireless networks

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Multiple antennas have proved to be a key enabler for 5G wireless networks. In this talk, we will review a number of fundamental aspects of multiple input multiple output (MIMO) systems as well as the advanced MIMO techniques to be deployed in high-demanding 5G networks. First, we will discuss multiplexing gain versus diversity gain which is the fundamental trade-off MIMO systems. Then, two techniques, group wise space time block code (GSTBC) and lattice-reduction based detection, are discussed to demonstrate the achieved diversity/multiplexing gains. By employing a diagonal structure, GSTBC allows affordable complexity at the receiver while still retaining certain diversity gain advantage. The second technique is based on lattice reduction method to enable optimal signal detection at the receiver where high data rate is targeted. Finally, we will discuss the Massive MIMO technique that will be used for 5G architecture, where hundreds or thousands of antennas will be deployed.

Biography

Huan X Nguyen received his BSc degree at the Hanoi University of Science and Technology (Vietnam) in 2000. He then pursued his PhD at the University of New South Wales (Australia) during 2003-2006. Since then, he has worked in various posts at several universities in the UK. He is currently the Senior Lecturer at School of Science and Technology, Middlesex University (London, UK). His research interests include PHY security, energy harvesting, MIMO techniques, network coding, relay communication, cognitive radio, and multi-carrier systems. He is a Senior Member of the IEEE. He is currently serving as Editor of the KSII Transactions on Internet and Information Systems.

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