Abstract

MIMO (multiple-input multiple-output) technology has brought profound changes to the wireless communication landscape. From the initial goals of maximizing the spatial diversity or multiplexing gain, MIMO research focus has moved on to non-vanishing determinant codes, fast-decodable codes, multi-user MIMO broadcast, MIMO relaying, coordinated multi-cell transmission, even optical MIMO. In this talk, I will review some of the MIMO research works conducted in my group in recent years. They include:

1. Coherent and non-coherent quasi-orthogonal STBC (space time block code) designed for minimum ML decoding complexity
2. High-rate STBC designed for fast decoding on QR-decomposition decoders
3. Uni- and bi-directional MIMO relaying
4. Multi-cell beamforming with improper/non-circular signaling and feedback bit allocation
5. Intensity-modulated orthogonal STBC for optical wireless LAN

Biography

Dr. Yong Liang GUAN (http://www.ntu.edu.sg/home/eylguan/) obtained his PhD degree from the Imperial College of London, UK, and Bachelor of Engineering degree with first class honors from the National University of Singapore. He is now an Associate Professor and the Head of the Communication Engineering Division in the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. He is also an Adjunct Professor of the University of Electronic Science and Technology of China, and a Faculty Associate of the Institute of Infocomm Research, Agency of Science, Technology and Research, Singapore. His research interests broadly include modulation, coding and signal processing for communication systems and information security systems. He has published an invited monograph, a book, 3 book chapters, and over 200 journal and conference papers. He is an Associate Editor of the IEEE Transactions on Vehicular Technology. He has led 11 past and present externally funded research projects on advanced wireless communication techniques, ultra wideband radio, coding for 10Tb/in^2 magnetic recording, acoustic telemetry for drilling application etc., with total funding of over SGD 4.6 million.