

Multiple-Access in Large MIMO Systems

by Prof Li Ping

Abstract

Wireless data traffic has been growing in a phenomenal speed in the past decade due to the proliferation of smart phones. Reducing cell size is a conventional way to meet the demand, but deploying new base stations can be very costly. Other alternative techniques, such as relay networks and cooperative communications, are too complex for practical applications. Besides, they can only provide limited gain.

A large MIMO system involves a very large number (tens or even hundreds) of antennas at each BS, serving many simultaneously active users in the same time-frequency resource. The concept of large MIMO may lead to a paradigm shift in system design and implementation.

This talk will provide an overview on the multiple-access techniques in large MIMO and outline the related rationales and feasibility. We will discuss the research progress related to antenna correlation, multi-user signal processing and base station cooperation. Our focus is on multiple-access techniques that are mostly suitable to large MIMO systems. These new techniques are promising in realizing the potential gains of large MIMO.

Biography

Prof Li Ping received his Ph.D. degree at Glasgow University in 1990. He lectured at Department of Electronic Engineering, Melbourne University, from 1990 to 1992, and worked as a research staff at Telecom Australia Research Laboratories from 1993 to 1995. Since January 1996, he has been with the Department of Electronic Engineering, City University of Hong Kong, where he is now a professor of information engineering. Prof Li Ping received the IEE J J Thomson premium in 1993, the Croucher Foundation Award in 2005 and a British Royal Academy of Engineering Distinguished Visiting Fellowship in 2010. He served as a member of the Board of Governors for IEEE Information Theory Society from 2010 to 2012 and he is a fellow of IEEE.