

Blind Interference Alignment with Diversity

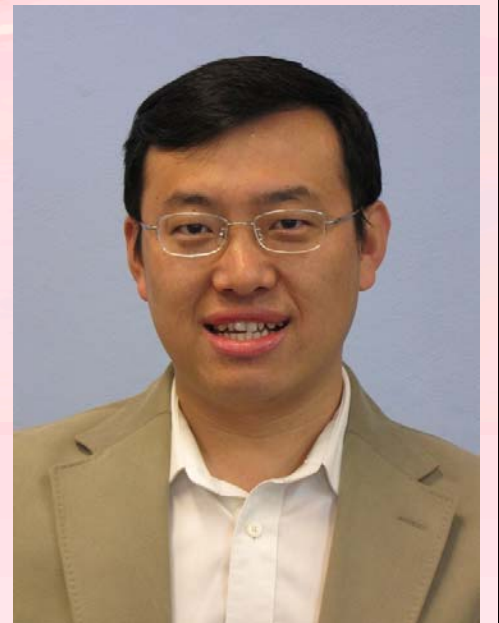
by

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Abstract

Interference alignment has been recently studied as an effective tool to achieve degree of freedom (DoF) of wireless interference channels. DoF is also known as multiplexing gain or capacity pre-log scaling factor and provides a capacity approximation of wireless network in the high signal-to-noise ratio region. However, the interference alignment technique requires channel state information at transmitters (CSIT) for the design of precoder so that the interferences can be aligned at receivers. Blind interference alignment can overcome the limitation of CSIT by adopting pattern reconfigurable antennas at receivers. In this work, the wireless interference channel is investigated from a different perspective and the diversity benefits of wireless interference channels are explored. A space-time coding approach is designed to achieve high diversity gain and high rate for MISO interference channels with reconfigurable receiver antennas. A family of space-time codes is proposed with blind interference alignment to accommodate various needs of diversity-rate tradeoff.

Biography of the Speaker

Wei Zhang received the PhD degree in EE from the Chinese University of Hong Kong in 2005. He was Research Fellow at the Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology (HKUST) in 2006-2007. In 2008, he joined the School of Electrical Engineering and Telecommunications, The University of New South Wales, Sydney, Australia, where he is currently Associate Professor. His research interests include cognitive radio, cooperative communications, space-time coding, and multiuser information theory.

Dr. Zhang received the best paper award at the 50th IEEE Global Communications Conference (GLOBECOM), Washington DC in 2007 and the IEEE Communications Society Asia-Pacific Outstanding Young Researcher Award in 2009. He is an Editor of IEEE Transactions on Wireless Communications and an Editor of IEEE Journal on Selected Areas in Communications (Cognitive Radio Series). He served as TPC Co-Chair of IEEE ICC 2011 - Communications Theory Symposium and TPC Co-Chair of IEEE ICC 2013 - Wireless Communications Symposium. He is Deputy Editor-in-Chief of Transactions on Wireless Spectrum of European Alliance for Innovation.