

学术报告会

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Towards Frequency Reuse: From Optimal to Scalable Device-to-Device Communications

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Abstract:

Proximity based applications are becoming fast growing markets suggesting that Device-to-Device (D2D) communications is going to be an essential part of future mobile data networks. Thus studying the scalability of D2D communications is of paramount importance to accommodate future traffic demands. D2D communications has been proposed to improve the performance of mobile data networks by allowing devices to communicate directly without relaying traffic to the BS. In this presentation we will introduce cutting-edge research in D2D communications. We will discuss key design aspects of D2D discovery to enable proximity-based communications. Then we will introduce the fundamental performance limits for D2D communications, which serve as the performance bench mark for practical D2D designs. In addition we will present several practical resource management and power control schemes and show that D2D has a huge potential in improving both network spectrum and energy efficiency, thus effectively expand the spectrum and energy capacity region for wireless networks. Finally scalable D2D communications with the lowest complexity possible will be introduced. We will show that while different levels of CSIs can be utilized to improve network performance, it's possible to achieve rather good performance without any CSI, thus enabling high-performance proximity applications without incurring any additional implementation cost in the air interface.

Biography:

Guowang Miao received a B.S. and M.S. degree from Tsinghua University and a M.S. degree and Ph.D. degree from Georgia Institute of Technology, Atlanta, GA, USA. He once worked in Intel Labs as a research engineer and Samsung Research America as a Senior Standards engineer. In 2011, he won an Individual Gold Award from Samsung Telecom America. He joined KTH Royal Institute of Technology in Feb 2012 as an assistant professor and then starting from Feb 2015, he is a tenured associate professor in the same institution. His research interest is in the design and optimization of wireless communications and networking. He is the lead author of "Energy and Spectrum Efficient Wireless Network Design", a book published by Cambridge University Press. He has published more than fifty research papers on premier journals or conferences, had several patents granted, and many more patents filed. He has been a technical program committee member of many international conferences and is on the editorial board of several international journals. He was an exemplary reviewer for IEEE Communications Letters in 2011.