

OPTIMIZATION SEMINAR SERIES

Device-to-Device Multicast in Underlay Cellular Networks

Speaker: Dr Ajay Bhardwaj

Date: October 26, 2020

Time: 10:00 am MST

Where: This is a virtual event

Abstract: Supporting ever increasing number of mobile users with data-hungry applications, running on battery limited devices, is a daunting challenge faced by the telecommunications community. Underlay device-to-device (D2D) communication, which allows physically proximate mobile users to directly communicate with each other by reusing the spectrum, without going through the base station, holds promise to help tackle this challenge. In a cellular network, underlay D2D communication offers opportunities for spectrum reuse and spatial diversity which may lead to enhanced coverage, higher throughput, and robust communication in the network. Further, for applications such as weather forecasting and live streaming, which may require the same chunks of data distributed to geographically proximate users, D2D multicasting may provide better utilization of network resources compared to D2D unicast or Base Station (BS) based multicast. However, extensive deployment of underlay D2D multicast in a network may cause severe co-channel interference due to spectrum reuse, and rapid battery depletion of the multicasting D2D nodes due to higher transmit power required to mitigate co-channel interference and facilitate data relaying. Therefore, in this talk, we will focus on some of the challenges and their solutions to support D2D multicast communication in underlay cellular networks.

Bio: Dr. Ajay Bhardwaj is a postdoctoral fellow at Indian Institute of Technology Kanpur, India, where he is working on the synergetic effect of massive MIMO and device-to-device communication. He received his Ph.D. in wireless networks from Indian Institute of Technology Mandi, India, where he worked on feasibility and resource management for device-to-device (D2D) multicast communication in underlay cellular networks. Prior to Ph.D., he completed his Master degree from Indian Institute of Information Technology Allahabad, where he worked on network selection schemes in heterogeneous wireless networks. Specifically, he provided a mechanism for personalized handover for seamless roaming in heterogeneous wireless networks. His research interests are massive MIMO enabled with device-to-device communications, cooperative localization, and simultaneous wireless information and power transfer. He is a member of IEEE communication society.

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