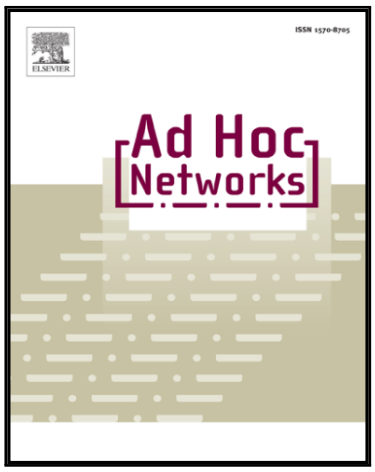

Joint Channel and Power Allocation for Device-to-Device Underlay

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Joint Channel and Power Allocation for Device-to-Device Underlay ☆

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Abstract

Device-to-Device transmission is one of the enabling technologies of 5G, with a potential of significantly improving the spectral efficiency. Spectral reuse in D2D underlay necessitates interference management. A challenge in D2D underlay systems is the increased number of D2D and interfering links and CSI feedback requirement. In this work we propose a solution for D2D channel allocation, which requires only the neighbor information of D2D communicating nodes. We aim to maximize the supported D2D pairs with a constraint on the interference caused at the base station, at each subchannel. We formulate the channel allocation problem as a Mixed Integer Programming (MIP). We also combine it with an iterative power control scheme in order to fit more D2D pairs in the channels. We also propose suboptimal channel + power allocation algorithms and evaluate and compare their performances by simulations. Numerical results reveal that the proposed algorithms perform quite close to the MIP-based solution and power control significantly increases the number of served D2D pairs.

Keywords: Device-to-device (D2D), Cellular network, Underlay, Resource Allocation, Partial CSI, Interference, Power Control, Mixed Integer Programming.

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