ELECTRICAL & COMPUTER ENGINEERING SEMINAR

"Beamforming in wireless relay networks"

by

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Abstract

This work aims at improving network reliability by relay beamforming. Instead of the commonly used total power constraint on relays and the transmitter, we use a more practical assumption that every node in the network has its own power constraint. A two-step amplify-and-forward protocol with beamforming is used, in which the transmitter and relays are allowed to adaptively adjust their transmit power and directions according to available channel information. For networks with full channel information at the relays and the receiver, the beamforming problem is solved analytically with a complexity that is linear in the number of relays. Distributive strategies are proposed in which, with the aid of a low-rate broadcast from the receiver, a relay needs only its own channel information to implement the optimal power control. Simulated performance shows that network beamforming achieves full diversity and outperforms other existing schemes. Then, networks whose relays have only partial channel information are considered.

Please contact Prof. Mahmood Azimi, azimi@engr.colostate.edu, with any questions.