

Coordinated Interference Canceling Algorithm for Uplink Massive Multiple Input Multiple Output Systems

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Abstract : Massive multiple-input multiple-output (MIMO) is an emerging technology for new cellular networks such as 5G systems. Its principle is to use many antennas per cell in order to maximize the network's spectral efficiency. Inter-cellular interference remains a fundamental problem. The use of massive MIMO will not derogate from the rule. It improves performances only when the number of antennas is significantly greater than the number of users. This, considerably, limits the networks spectral efficiency. In this paper, a coordinated detector for an uplink massive MIMO system is proposed in order to mitigate the inter-cellular interference. The proposed scheme combines the coordinated multipoint technique with an interference-cancelling algorithm. It requires the serving cell to send their received symbols, after processing, decision and error detection, to the interfered cells via a backhaul link. Each interfered cell is capable of eliminating intercellular interferences by generating and subtracting the user's contribution from the received signal. The resulting signal is more reliable than the original received signal. This allows the uplink massive MIMO system to improve their performances dramatically. Simulation results show that the proposed detector improves system spectral efficiency compared to classical linear detectors.

Keywords : massive MIMO, COMP, interference canceling algorithm, spectral efficiency

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