Iterative power control algorithm for maximum data rate sum in cellular networks with distributed implementation

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Abstract:

Transmission power control is an important topic in resource allocation of cellular wireless communication systems. Optimal transmission power provides good connection quality while eliminating unnecessary interference and therefore realizes high data rates. In this paper, we present an iterative algorithm to maximize the sum of data rates of all links in the cellular network. In each iteration, the transmission power is updated to optimize the network performance based on other users' transmission powers of the last iteration. This algorithm shows a fast convergence rate and is able to implemented distributively. Its global optimum and convergence can be
demonstrated using fixed point theorem. A numerical example is given at the end of the paper which shows a 21.9% improvement compared to the current path loss based power control method.