Incremental Rate Maximisation Power Loading with BER Improvements

Waleed Eid, Waleed Al-Hanafy, Mohamed Nuri Hussin, and Stephan Weiss
Associate Professors

Abstract

This paper aims to maximise the rate over a MIMO link using incremental power and bit allocation. Two different schemes, greedy power allocation (GPA) and greedy bit allocation (GBA), are addressed and compared with the standard uniform power allocation (UPA). The design is constrained by the target BER, the total power budget, and fixed discrete modulation orders. We demonstrate through simulations that GPA outperforms GBA in terms of throughput and power conservation, while GBA is advantageous when a lower BER is beneficial. Once the design constraints are satisfied, remaining power is utilised in two possible ways, leading to improved performance of GPA and UPA algorithms. This redistribution is analysed for fairness in BER performance across all active subchannels using a bisection method.

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