Performance Analysis of MIMO Assisted Interleave Division Multiple Access System with Multi-user Detection

Abstract

This paper presents the performance analysis of Multi Input Multi Output (MIMO) assisted interleave based multiple-access system. In IDMA, different interleavers are used to distinguish users as against different signature sequence in a conventional code-division multiple-access (CDMA) scheme. The basic principle of IDMA is that the interleaver is unique for the users. In this work, we consider that Interleavers are generated independently and randomly. Also the IDMA technique is extended to multi user MIMO IDMA with multiuser detection. At the receiver, SIC detector is employed. The performance of the system is analyzed for different channel conditions using extensive simulation runs based on Monte Carlo simulation trials. It is shown that the IDMA scheme can achieve near single user performance in situations with very large numbers of users while maintaining very low receiver complexity. Simulation examples are provided to illustrate the advantages of the IDMA.
Reference

- Clemens Novak, Franz Hlawatch, and Gerald Matz, "MIMO-IDMA: Uplink Multiuser MIMO Communications using interleave Division Multiple access and Low –Complexity Iterative Receivers", IEEE ICASSP 2007

Index Terms

Computer Science Communications

Key words

CDMA channel capacity iterative decoding
multi-user detection