MIMO GENERALIZED DECORRELATING DISCRETE−TIME RAKE RECEIVER (ThuAmOR2)

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Abstract :

In this paper, we introduce a generalized decorrelating discrete−time RAKE receiver for MIMO systems (MIMO GD−DTR). The MIMO GD−DTR system is a combination of two other advanced MIMO RAKE reception methods: the jointly decoding generalized rake receiver (JD−GRAKE) and the MIMO decorrelating discrete−time RAKE reception (MIMO D−DTR). The JD−GRAKE has been proposed for correlated interference suppression in MIMO systems and it is obtained from the single antenna generalized RAKE receiver (G−RAKE). The MIMO D−DTR, which is obtained from the single antenna decorrelating discrete−time RAKE (D−DTR) system, improves the performance in the presence of channel estimation errors in diffuse channels. The MIMO GD−DTR combines the complementary advantages of both the JD−GRAKE and the MIMO D−DTR. It suppresses the interference, and takes into consideration the imperfect channel state information at the receiver. Our results show that the performance of the discrete−time version of the MIMO JD−GRAKE could be worse than a conventional RAKE receiver, when there are channel estimation errors in the system, whereas proposed MIMO GD−DTR provides gains up to 1.7 dB at a bit error rate of 10−2 in 3 transmit 3 receive antenna system (3x3).

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