SMART CANDIDATE ADDING: A NEW LOW–COMPLEXITY APPROACH TOWARDS NEAR–CAPACITY MIMO DETECTION (WedAmOR2)

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Abstract : Recently, communication systems with multiple transmission and reception antennas (MIMO) have been introduced and proven to be suitable for achieving a high spectral efficiency. Assuming full channel knowledge at the receiver, so–called sphere detectors have been shown to solve the maximum likelihood detection problem at acceptable complexity. In the context of coded transmission, however, the detector has to generate soft output information for every transmitted bit. Existing detectors provide this by observing a high number of hypotheses about the transmitted symbol, which is computationally expensive. In this paper, we introduce Smart Candidate Adding, a new scheme that performs multiple directed searches to obtain only a small set of symbol hypotheses, but with a good representation of all possibly transmitted bit constellations. Simulation shows that the new approach outperforms conventional schemes, both in terms of detection performance and computational complexity.

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