

## MAXIMUM LIKELIHOOD WITH HEURISTIC DETECTORS IN LARGE MIMO SYSTEMS FOR EFFECTIVELY RECEIVING BITS

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### ABSTRACT

We propose low-complexity detectors for large MIMO systems with QAM constellations. These detectors work at the bit level and consist of three stages. In the first stage, ML decisions on certain bits are made in an efficient way. In the second stage, soft values for the remaining bits are calculated with multi iteration concept. In the third stage, these remaining bits are detected by means of a heuristic programming method for high-dimensional optimization that uses the soft values (“soft-heuristic” algorithm). We propose two soft-heuristic algorithms with different performance and complexity. We also consider a feedback of the results of the third stage for computing improved soft values in the second stage.

**KEYWORDS:** Genetic Algorithm, Heuristic Programming, ICI Mitigation, Large MIMO Systems, MIMO Detection, Multiple-Input Multiple-Output Systems, OFDM