

Progress Report WP2

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Deliverable 2.1.2

Selected transceiver algorithms and corresponding complexity/ performance tradeoffs

Contents:

- Channel-matrix preprocessing techniques for tree-search based MIMO and MU detection algorithms and their impact on computational complexity
- Analysis and comparison of tree-search algorithms for MIMO and MU detection
- Complexity of soft-output MIMO and MU detection algorithms
- Complexity analysis of iterative MIMO and MU detection

Status of Task 2.2: VLSI Architectures and VHDL Library of Reference Designs

Development of low-complexity VLSI architectures for relevant algorithms and compilation of a library of VHDL reference designs

Status

The MASCOT MU-MIMO library of reference designs is in good shape (already implemented more than 5 designs)

Algorithms already implemented within MASCOT:

- Circuits for MIMO and MU detection
- Circuits for lattice reduction and MU-MIMO precoding
- Circuits for MIMO channel-matrix preprocessing

Status of Task 2.2: Candidate Algorithms for Library of Reference Designs

- Algorithms for tree-search based MIMO and MU detection
- Lattice-reduction algorithms for MU-MIMO precoding
- Circuits for channel-matrix preprocessing
- K-best decoding
- List sphere decoding
- Iterative decoding
- LR for precoding using Brun's algorithm [Seethaler and Matz]
- LLL algorithm
- (Sorted) QR-decomposition
- Interpolation-based QR decomposition for OFDM
- Singular value decomposition

Suggestions or comments on the list are appreciated

Tentative table of contents D2.1.2

Selected transceiver algorithms and corresponding complexity / performance tradeoffs

- List of transceiver algorithms and their area of application
- Brief description of the implementation challenges and tradeoffs for each type of algorithm
- Detailed description of the algorithms and architectures implemented so far