

Implementation of a Programmable Linear MMSE Detector for MIMO-OFDM

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Abstract

This paper presents a linear minimum mean square error (LMMSE) symbol detector for MIMO-OFDM enabled mobile terminals. The detector is implemented using a programmable baseband processor aimed for software-defined radio (SDR). Owing to the dynamic range supplied by the floating-point SIMD datapath, special algorithms can be adopted to reduce the computational latency of detection. The programmable solution not only supports different transmit/receive antenna configurations, but also allows hardware multiplexing to obtain silicon and power efficiency. Compared to several existing fixed-functional solutions, the one proposed in this paper is smaller, more flexible and faster.