

Exploiting Fast Independent Component Analysis Based Algorithm for Equalization of Impaired Baseband Received Signal

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Abstract : A technique using Independent Component Analysis (ICA) for blind receiver signal processing is investigated. The problem of the receiver signal processing is viewed as of signal equalization and implementation imperfections compensation. Based on this, a model similar to a general ICA problem is developed for the received signal. Then, the use of ICA technique for blind signal equalization in the time domain is presented. The equalization is regarded as a signal separation problem, since the desired signal is separated from interference terms. This problem is addressed in the paper by over-sampling of the received signal. By using ICA for equalization, besides channel equalization, other transmission imperfections such as Direct current (DC) bias offset, carrier phase and In phase Quadrature phase imbalance will also be corrected. Simulation results for a system using 16-Quadrature Amplitude Modulation(QAM) are presented to show the performance of the proposed scheme.

Keywords : blind equalization, blind signal separation, equalization, independent component analysis, transmission impairments, QAM receiver

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