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**Blind equalization using parallel Bayesian decision feedback equalizer.** (English)

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Summary: The purpose of this paper is to propose a new method for blind equalization using parallel Bayesian decision feedback equalizer (DFE). Blind equalization based on decision-directed algorithms, including the previous proposed Chen's blind Bayesian DFE [see *S. Chen, S. McLaughlin, P. M. Grant and B. Mulgrew*, Fast blind equalization based on a Bayesian decision feedback equaliser, *Electron. Lett.* 29, 891-893 (1993)] cannot give the correct convergence without the suitable initialization corresponding to the small inter-symbol interference. How to find the suitable initialization becomes the key for the correct convergence.

Here, the "start" vector with several states is used to obtain several channel estimates which are the initial channel estimates in the proposed method. In these initial channel estimates, the best one which has converged toward the correct result in some degree must exist. The decision-directed algorithm for parallel blind Bayesian DFE is purchased from these initial channel estimates respectively. Evaluating the Bayesian likelihood, which is defined as the accumulation of the natural logarithm of the Bayesian decision variable, the correct channel estimates corresponding to the maximum Bayesian likelihood can be found.

Compared with Chen's blind Bayesian DFE, the proposed method presents better convergence performance with less computational complexity. Furthermore, the proposed algorithm works satisfactorily even for channels with severe inter-symbol interference and in-band spectral null, while Chen's blind Bayesian DFE fails.

#### MSC:

94A12 Signal theory (characterization, reconstruction, filtering, etc.)

62P30 Applications of statistics in engineering and industry; control charts

Cited in 2 Documents

#### Keywords:

inter-symbol interference; blind equalization; parallel Bayesian decision feedback equalizer; maximum Bayesian likelihood

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