

A NOVEL ADAPTIVE CHANNEL EQUALIZER USING TMS320C6713 PROCESSOR

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Abstract

In wireless communication systems, the key objective of the channel equalizer is authentic recovery of data symbols. Least Mean Square (LMS) algorithm and its normalized version have been widely used in adaptive channel equalization. These algorithms give significant mean square error (MSE) that leads to low convergence speed. This paper proposes Variable Step-size Least Mean Square (VS-LMS) adaptive algorithm which adjusts the coefficients of the channel equalizer at each iteration. In the proposed algorithm, maximum value of power spectral density (PSD) is used in changing the step-size parameter. This method minimizes effect of old data samples on the step-size parameter. Simulation study using MATLAB 7.0 shows that VS-LMS algorithm gives better convergence and less mean-square-error than LMS algorithms. Implementation of the VS-LMS algorithm using TMS320C6713 DSP processor is considered. Optimization of the VS-LMS algorithm is also carried out. It has been observed that after optimizing the program, the execution time and memory requirement of the proposed algorithm reduces by 212 milli-seconds and 17 Kbytes respectively.

Keywords: Adaptive equalization, VS-LMS, step-size, code optimization, signal processing