عنوان مقاله:

Compensation of Loudspeaker Nonlinearity Distortion in Acoustic Echo Cancellation Using a New Serial Structurebased Adaptive Combined Neural Network-Finite ImpulseResponse (NN-FIR) Filter

محل انتشار:

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خلاصه مقاله:

Some applications such as hands-free telephony and video-conferencing still suffer from acoustic echo problem seriously. Because loudspeaker nonlinearity distortion degrades the performance of conventional adaptive Acoustic Echo Canceller (AEC) filters. In this paper, we proposed a novel serial structure-based adaptive combined Neural Network (NN) - Finite Impulse Response (FIR) filter with relatively low computational complexity to challenge with the loudspeaker nonlinearity. This new filter consists of a conventional FIR filter serially with a two-layer Tapped Delay line Neural Network (TDNN) filter, in order to model both the linear portion of the acoustic environment impulse response and to cope with the nonlinear distortion effects of loudspeaker. Back Propagation (BP) and Standard Normalized Least Mean Square (NLMS) algorithms adapt the NN and FIR filters, respectively. Numerical results from computer simulations are presented which prove the excellent performance of the proposed adaptive filter against very high loudspeaker nonlinear distortion for AEC applications.

کلمات کلیدی:

Acoustic echo cancellation; loudspeaker nonlinearity distortion; adaptive FIR filter; taped delay line neural network

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