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Acoustic Echo Cancellation Using Different Adaptive Algorithms

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Abstract : An adaptive filter is a filter that self-adjusts its transfer function according to an optimization algorithm driven by an error signal. Because of the complexity of the optimization algorithms, most adaptive filters are digital filters. Adaptive filtering constitutes one of the core technologies in digital signal processing and finds numerous application areas in science as well as in industry. Adaptive filtering techniques are used in a wide range of applications, including adaptive noise cancellation and echo cancellation. Acoustic echo cancellation is a common occurrence in today's telecommunication systems. The signal interference caused by acoustic echo is distracting to both users and causes a reduction in the quality of the communication. In this paper, we review different techniques of adaptive filtering to reduce this unwanted echo. In this paper, we see the behavior of techniques and algorithms of adaptive filtering like Least Mean Square (LMS), Normalized Least Mean Square (NLMS), Variable Step-Size Least Mean Square (VSLMS), Variable Step-Size Normalized Least Mean Square (VSNLMS), New Varying Step Size LMS Algorithm (NVSSLMS) and Recursive Least Square (RLS) algorithms to reduce this unwanted echo, to increase communication quality.

Keywords : adaptive acoustic, echo cancellation, LMS algorithm, adaptive filter, normalized least mean square (NLMS), variable step-size least mean square (VSLMS)
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