Performance Analysis of Adaptive Noise Cancellation Using Different Algorithm Techniques in Matlab

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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. By way of contrast, a non-adaptive filter has a static transfer function. Adaptive filters are required for some applications because some parameters of the desired processing operation (for instance, the locations of reflective surfaces in a reverberant space) are not known in advance. The adaptive filter uses feedback in the form of an error signal to refine its transfer function to match the changing parameters. Generally speaking, the adaptive process involves the use of a cost function, which is a criterion for optimum performance of the filter, to feed an algorithm, which determines how to modify filter transfer function to minimize the cost on the next iteration. As the power of digital signal processors has increased, adaptive filters have become much more common and are now routinely used in devices such as mobile phones and other communication devices, camcorders and digital cameras, and medical monitoring equipment.

Keywords— Noise, Adaptive filter, Matlab software, LMS, RlS, Kalman algorithm.

I. INTRODUCTION

Adaptive noise cancellation (ANC) techniques for the acquisition of distortion product oto-acoustic emissions (DPOAEs). The efficiency of an ANC algorithm for noise suppression was investigated using three microphones: one placed in the test ear, one in the non test ear for internal noise reference; one near the subject's head for external noise reference. Real-time results indicated that the use of an ANC algorithm in combination with standard averaging methods can reduce noise levels by as much as 10 dB beyond that obtained with standard noise reduction methods and probe attenuation alone.

Noise cancellation means to reduce noise signal from the original signal by comparing with the reference signal and the output in which noise component is present with the desired signal.

One possible way to satisfy such a requirement to obtain a better recording of the desired signal is the use of a simple noise canceller
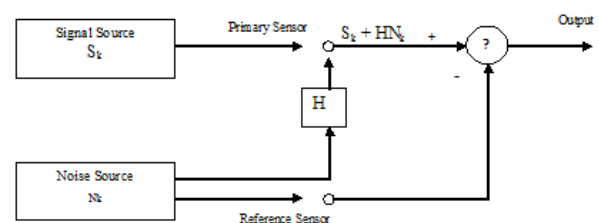

Figure 1 Block Diagram Of Noise Canceller