ABSTRACT

This chapter presents the design of a finite impulse response (FIR) filter using the Wiener approach and compares it with a least mean squares (LMS) design. The Wiener filter is synthesized by computing the optimum weights from the signal characteristics. For the LMS filter, the optimum weights are obtained iteratively by minimizing the mean square error (MSE) of an error signal that is the difference between the filter output and the output of an ideal filter that meets the design specifications exactly. Results from the MATLAB computer simulations show that both methods give filters that meet the design specifications in terms of cutoff frequency and linear phase response. The presentation gives an alternative design methodology for FIR filters and is also suitable for illustrating the properties of the LMS algorithm as an approximation to the Wiener approach.