

A Solution to the Wiener Filter Using Cepstral Analysis

MSEE Scholarly Paper by Scott Rodkey

Advisor: Dr. Yariv Ephraim

Friday, July 18, 2008, 3:00pm

Science and Technology II Room 230A

Abstract

The Wiener filter is an important signal processing technique that minimizes the mean-squared error between the estimate of a noisy observed signal and its actual value. However, finding a closed-form solution of the Wiener filter can become extremely complicated beyond basic filtering problems due to the spectral factorization required. This paper presents an alternative method for performing spectral factorization by using the cepstrum calculated from the data. A brief derivation of the Wiener filter is presented, followed by an overview of the cepstrum and its application to the innovation-based form of the Wiener filter equations. Finally, examples are shown applying this filter to various datasets.