E1-56: Stochastic filtering techniques in audio signal processing

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In audio signal processing it is likely that the signal and the noise overlap in their spectra, making the isolation of noise extremely difficult. In order to address this type of problem Wiener & Kalman proposed the theory of optimal filtering.

The paper discusses the theory of optimal filtering of stochastic signals and applies it for a real application such as the denoising of a noise corrupted audio signal. A Kalman filter is designed using the approximation of a white noise model based on a Gauss-Markov process.

The Kalman filter produced an appreciable improvement of the original signal with white noise. The performance of the Kalman filter in the presence of real noise is expected to be as good as that with white noise.