Title of Thesis: Wavelet-Based Denoising With Applications To Speech Signals

Key Words: Wavelet denoising, Undecimated Wavelet, Trimmed thresholding, Speech enhancement

Summary:

Wavelets provide a powerful tool to represent signals. They allow good resolution in both time and frequency domains. This fact is particularly important when dealing with nonstationary signals. Among many applications, wavelets are currently used for signal denoising. Wavelet denoising attempts to remove the noise present in the signal while preserving the signal's characteristics. It involves three steps: a forward wavelet transform, thresholding, and an inverse wavelet transform, where the data are modeled as observations of a signal contaminated with an additive noise.

In this work, a new method for noise reduction is proposed based on undecimated wavelet transform and trimmed thresholding. The proposed method is applied to speech signals, contaminated with background white Gaussian noise, as a speech enhancement method. Results that measure the performance of speech denoising algorithms using objective and subjective measures show that the proposed method provides good results as compared to other speech enhancement methods.