Abstract

Speech denoising is the process of removing unwanted sounds from the speech signal. In the presence of noise, it is difficult for the listener to understand the message of the speech signal. Also, the presence of noise in speech signal will degrade the performance of various signal processing tasks like speech recognition, speaker recognition, speaker verification etc. Many methods have been widely used to eliminate noise from speech signal like linear and nonlinear filtering methods, total variation denoising, wavelet based denoising etc. This paper addresses the problem of reducing additive white Gaussian noise from speech signal while preserving the intelligibility and quality of the speech signal. The method is based on Savitzky-Golay smoothing filter, which is basically a low pass filter that performs a polynomial regression on the signal values. The results of S-G filter based denoising method are compared against two
widespread enhancement methods, Spectral subtraction method and Total variation denoising. Objective and subjective quality evaluation are performed for the three speech enhancement schemes. The results show that S-G based method is ideal for the removal of additive white Gaussian noise from the speech signals.

References

Speech Enhancement based on Savitzky–Golay Smoothing Filter


Index Terms

Computer Science  
Signal Processing

Keywords

Speech Enhancement  
Savitzky–Golay filter  
Noise removal  
Speech Signal  
Denoising