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SPEECH ENHANCEMENT BASED ON COMBINATION OF SPECTRAL SUBTRACTION AND BIONIC WAVELET TRANSFORM

VIJAYKUMAR D. SHINDE[1], C. G. PATIL[2] AND SACHIN D. RUIKAR[2]

[1] Student, ME (VLSI & Embedded Systems) Department of E & TC,
Sinhgad Academy of Engineering, Kondhwa(Bk), Pune – 48, India.
[2] Assistant Professor, Department of E & TC,
Sinhgad Academy of Engineering, Kondhwa(Bk) Pune – 48, India

Abstract

The proposed speech enhancement system combining the spectral subtraction and wavelet thresholding techniques together is used to reduce the additive noise. The objective of this paper is to research the flexibility and efficiency of the wavelet types and levels to the noises. Large amount of experiments were implemented in different schemes according to the types of the wavelet function, thresholding criterions and the modifying manners for the noise wavelet coefficients. By the use of the Bionic Wavelet Transform andthreshold function, this paper presents animproved wavelet-based speech enhancement method, Due tothe integration of human auditory system model into the wavelet transform, the main advantage of theproposed method is that the over thresholding of speech segments which is usually occurred inconventional wavelet-based speech enhancementschemes can be avoided. Then it can track thevariation of noisy speech without the estimation of the a priori knowledge of SNR. As a consequence, theenhanced speech quality of the proposed method can be increased substantially from those of conventionalapproaches.

Keywords : Bionic Wavelet Transform, Speech Enhancement, Spectral Subtraction, Threshold Selection, Wavelet Denoising.