Speech Intelligibility Improvement Using Variable Level Decomposition DWT

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Abstract : Intelligibility is an essential characteristic of a speech signal, which is used to help in the understanding of information in speech signal. Background noise in the environment can deteriorate the intelligibility of a recorded speech. In this paper, we presented a simple variance subtracted - variable level discrete wavelet transform, which improve the intelligibility of speech. The proposed algorithm does not require an explicit estimation of noise, i.e., prior knowledge of the noise; hence, it is easy to implement, and it reduces the computational burden. The proposed algorithm decides a separate decomposition level for each frame based on signal dominant and dominant noise criteria. The performance of the proposed algorithm is evaluated with speech intelligibility measure (STOI), and results obtained are compared with Universal Discrete Wavelet Transform (DWT) thresholding and Minimum Mean Square Error (MMSE) methods. The experimental results revealed that the proposed scheme outperformed competing methods