

ABSTRACT

Reverberation is the acoustic noise that emerges in an indoor room, it's a collection of sound reflection and diffraction from the walls and objects contained within a room. When an instrument is played in a room like a hall, a collection of echo mix with the original sound so that it will change the spectral characteristics of the original sound and voice that sounded not only the original sound, but sound effects that have been affected by reverberation. This reduces the convenience of the listener to enjoy the music. Cause of the characteristic of reverberation is correlated with original signal, it is difficult to remove so it need the right dereverberation technique to reduce reverberation effect.

In this final project, there will be a research about dereverberation process using synthesis analyzing method of Discrete Wavelet Transform analysis (DWT) and the Short Time Fourier Transform (STFT), with the use of multimicrophones system in three types of rooms : small, medium and large. DWT process is used to decompose signal into two signals that has different frequency, low and high frequency and that is in time domain. STFT process is used to change the domain of the result of DWT signal into frequency domain and to get gain value. After the gain is given to the result of STFT signal, then the domain will be changed again by synthesis of STFT process. Last, that signal will be reconstructed with the high-frequency signal that is the result of DWT process by using synthesis of DWT. Finally, the dereverberated signal is obtained.

From this research, it results that the system can work well for piano instrument in medium room with the decrement of Mean Square Error value is 70%, the increment of Direct to Reverberation Ratio and Early to Total Sound Energy value respectively are 9dB and 8dB from its reverberated signal. For violin instrument, the system can work well in small room with the decrement of Mean Square Error value is 32%, the increment of Direct to Reverberation Ratio and Early to Total Sound Energy value respectively are 4,2dB and 8,1dB from its reverberated signal. While for combination of both instrument, the system can work well in small room with the decrement of Mean Square Error value is 45%, the increment of Direct to Reverberation Ratio and Early to Total Sound Energy value respectively are 6,6 dB and 9,2dB from its reverberated signal.

Keywords : reverberation, music, multimicrophone, Discrete Wavelet Transform (DWT)