

ABSTRACT

Estimation of pitch in tone can not be separated from the music signal analysis. Detection of musical features such as melody and harmony can be detected with the help of the estimated pitch produced by a tone. This final project has created a simulation of the pitch estimation in polyphonic tones using Fast Resonator Time-Frequency Image (RTFI) as the basis for time-frequency analysis. RTFI here was chosen because it can be implemented in the most simple filter banks. Input signal used a signal of polyphonic tones that obtained through the recording, the sound of guitar and piano instruments with tone file storage format is *. wav and 44.1 KHz sampling frequency.

An input audio signal through the process of framing for the first step.. Then transform the implemented in the music signal which has been divided into the frames to frequency domain used *Fast Fourier Transform*. After feature extraction process, the pitch of the signal that is played can be estimated, then the system performance can be analyzed by inserting noise into the original signal and then compares it with the original signal. The system performance can be seen from the MSE and PSNR values obtained.

The simulation results obtained some conclusions. Determination of the number of segmentation frame will affect the value of the parameter. The greater the amount of segmentation that is used can give more accurate of the results. The greater number of frames used obtained the less pitch but the result will be more appropriate. The greater nframe used values MSE tend to decline and the best MSE values obtained on nframe 4096 and SNR 20 dB. For the PSNR value, the greater the value nframe used, the PSNR value will tend to increase. The best PSNR values obtained in nframe 4096 and SNR 20 dB.

Keywords : pitch, Fast Resonator Time-Frequency Image, polyphonic