

ABSTRACT

Some people have an instinct that can help them to recognize and understand basic tone of a musical instrument accurately but the others who do not understand the basic tones, eager to learn. So we need a tool to facilitate them in identifying and studying basic tones of a musical instrument. Instrument that was chosen as basic tone frequency generator in this Final Project is a violin. Violin is an instrument which sounds coming from the strings that is swiped by a bow. The reason why violin used in this present study is because not many people are familiar with the basic tones which are generated by this instrument.

The working principle of this application is to detect a violin's basic tone frequency which will be adapted to practice the test on the database. The result of basic tone frequency detection has been compared by using the three feature extraction methods: SSC (Statistical Signal Characterization), ZCR (Zero Crossing Rate) and the combined method. This application system based on K-Nearest Neighbor classification which serves to match the experimental code that was captured by instrument microphones, with the tone of practice that have been stored in the database. The tone is detected originating from the original basic tone (without noise) and with additional noise.

The method has the best performance with the highest accuracy in detection of basic tone, in the offline phase is ZCR (Zero Crossing Rate) method and combined method, with each specifications: threshold = 0.3, framing ZCR = 15 frames, can produce 100% accuracy at the level of SNR = 30 dB and 40 dB. As for 10 times experiments with each basic tone frequency at the online phase with ZCR method, it has obtained the highest system accuracy by 100% and lowest accuracy by 0%.

Keywords: basic tone frequency of violin, database, instrument microphones, noise, SSC (Statistical Signal Characterization), ZCR (Zero Crossing Rate), K-Nearest Neighbor