Music transcribing program using Fourier transform

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Music transcription is necessary and useful for many musicians around the world, especially for amateur musicians. There are many computer programs that are good at analyzing monophonic music but not for polyphonic music; they have many limitations and cannot analyze the notes accurately. We proposed an algorithm that can analyze both monophonic and polyphonic music. The main algorithm that we used to analyze the music data is the Fourier transform, or more specifically, the Fast Fourier transform, which can separate the original sound wave to a summation of infinitely many sinusoidal waves and convert them into frequency-domain data. Our music transcribing program consisted of two main parts: digital signal processing and graphic user interface. In the digital signal processing part, we also divided our algorithm into two parts: interval determining and pitch analyzing. We used "Word Error Rate," a common method to analyze errors in speech recognition, to calculate the error rate of the results from our program. We found that our program was satisfactory at detecting synthesized monophonic music and moderately acceptable at detecting synthesized polyphonic music. However, our program still needs improvements to be able to work with real music data.

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