Progress Report of Course Project

Project title: Musical Instrument Detection

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Objective:

To investigate timbre features of different musical instruments and model them via various existing methods for classification. As an extension, we can combine multiple models and/or develop new ones for better and more robust performance.

Motivations:

Humans can easily decide the instrument when listening to a piece of music, and if experienced, can even enumerate all instruments in a symphony, which is difficult for computers yet. On the other hand, music is a global language which can even be understood by the illiterate, and it can express delicate emotions in a mystic way. In this project, we are trying to enhance the understanding of music in the view of science.

System Description:

It is obvious that spectral characteristics are main features of a musical instrument. But in practice, we have noticed that different instruments have not only different spectral features, and different notes of the same instrument also vary in spectrum. So we use different models and try to determine the key features that human tell instruments apart.

Methodology:

Now used for feature extraction: STFT, cepstrum, MFCC, LP coefficient.

For classification: Not decided yet.

More models/methods may be added.