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November 18th, 2014

Final Proposal for Final Project

Dexter and I are working together to create a program that analyzes audio files and extracts labled samples of clips that could be used for various type of drums.

The system is supervised machine learning utilizing feature based classification. A .wav file is imported into the program and is reduced to mono. The mono signal has any DC bias removed, is half-wave rectified and then normalized. After the preprocessing is takrn care of we check for onsets in the file.

First the program detects onsets. Second performs feature analysis to determine if the onset is a percussive sound or tonal sound. If the onset is classified as percussive the algorithm then cross checks it agains its known drum profiles and labels the onset if it qualifies. The program labels the onset as the according category of drum hit and then goes onto the next onet. The program runs through the entire clip and labels all onsets and categorizes them. If we get that working we would also like to have the program then go back into the clip and export the labeled drum hits. This most likely will be implemented by ‘cutting’ 100ms or so before the onset is labeled until the next detected onset. The files would then be labeled according to its cataogory and its originating file.

In my machine learning homework I implemented SVM for my supervised learning and figured I would expand upon that code. Not wanting to reinvent the wheel I decided to do some research before setteling on my features and firm implementation. I was lucky enough to stumble on quite a few papers written on drum recognision and extraction.

There, fantastic paper written in 2005 by Koen Tanghe, Sven Degoeve and Bernard De Baets out of Ghent University in Belgium. The paper titled An Algorith for Detecting and Labeling Drum Events in Polyphonic Music explains they attempt to do just that.