

Subject Area: Musical Analysis/Modification
TJHSST Senior Research Project Proposal
Computer Systems Lab 2009-2010

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1 Purpose and scope of the research project

I hope to be able to analyze music, by input of some electronic music file, such as MP3 or WAV. Analyze, in this case, means determine some basic information about the speed of the music (BPM) and the key it's in, etc. I also hope to be able to have the user modify the music file in some fundamental (shifts of key and the like) way. The user will be able to see the different "tracks" of the piece (different instruments and melody lines).

2 Background

I need to have a good understanding of how C++ works. Also, I need to know musical composition, and how virtual music files are put together. The reason for knowing these things is so I can perform the operations stated above in the fastest time. With bigger music files, the analysis portion of this project could take a long time, so I need to be able to optimize the process. I know some previous research has been done in this area, by some TJ students and other researchers.

3 Procedure

I am using C++ for this project. Later on in the project, I want to make a GUI for editing the musical structure and/or displaying information about the music. I find that the best-looking GUIs can be made with OpenGL, etc. Even if this means I have to have a separate GUI program for each OS, it shouldn't be that hard, except for the specific functions that are different for every OS. In the way of file manipulation, C++ makes it easy to read in the basic binary structure of files, and the way different music formats are structured needs this type of IO functionality to make this type of project work.

4 Results

The results of my project will hopefully be, given a music file input, output of information about the musical structure of the piece and other fundamental information about it. The user can, if they wish, modify the file in some way, and save that to another music file which they can then play.