Project Proposal:

MIDI File Synthesizer

Team Members:

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Description:

We would like to make a system which takes MIDI files as inputs and produces sound. A MIDI file contains instructions for playing music such as note pitch and tempo. We will figure out how to process MIDI files on the FPGA and have the FPGA produce the appropriate frequency wave and send it to an attached speaker.

There are several types of waves/oscillations: square, sine, sawtooth, and triangular. Some such as sine will require the use of a digital-analog converter. We need to investigate whether the Spartan3 FPGAs that we have have DACs already.

Feature Sets:

Green:

-Load MIDI file onto FPGA

-MIDI data processing

-Square wave generation

Yellow:

-Sine & other wave generation

-Producing audio output

-Wave filters

Things that could go wrong:

-FPGA doesn’t have a built-in DAC:

Either buy a DAC/FPGA or stick to waves that can be produced digitally

-FPGA can’t preload MIDI file:

Stream the MIDI file from PC over a serial connection

Two next steps:

-Find out how MIDI files are structured

-Investigate whether Spartan3 FPGA has built-in DAC