

ME 135 SPRING 2008

ASSIGNMENT 2: DIGITAL RECORDING AND PLAYBACK

Due: Thursday, February 14

Background

Originally designed for operating laboratory instrumentation, LabVIEW is particularly adept at collecting, manipulating, and displaying data. This data can be supplied by anything from optical encoders to temperature sensors to microphones.

Your group is working on a project to bring DJ'ing to the masses by implementing the audio mixing entirely in software. One of the key features of this product is the ability to record an audio sample and play it back after different effects have been applied.

Task

Use LabVIEW to emulate a digital recorder, acquiring and playing back audio samples of variable length. A very basic example showing how to use these Express VI's has been provided online. Note the use of dynamic data to and from the Express VI's and the importance of converting that data to an array of waveforms before data manipulation can take place.

The features for playback must include

- 1) playing the sample at normal, half, and double the original speed,
- 2) selecting the part of the sample you want to play, that is, removing the beginning and the end such that only the desired section is played back,
- 3) playing back the sample multiple times in succession, and
- 4) analyzing the frequency content of the sound through the use of a Fast Fourier Transform.

You should be able to play the same sample back under different conditions without having to re-record the audio. Alternatively, if you do not have access to a microphone, perform the above operations on a WAV file, as demonstrated in the example file.

Deliverables

As always, write a quick start guide to explain how to use the software and a power use guide to describe the structure of your program so that it can be modified. Or make sure that your front panel and block diagram are so thoroughly commented that such documentation is unnecessary. Keep in mind that the more intuitive the interface and the code, the shorter the documentation needs to be.