

EE432 Fall 2011: Final Project

For this final project, work in groups. You will need to:

(1) Turn in a PowerPoint presentation (8-10 slides), use multimedia in the presentation where possible.

(2) Present your presentation to the class during the scheduled final exam time (Tues. Dec 15, 0755). This will be a 10-15 minute presentation, including a live demonstration of your project.

(3) Turn in a ≥ 5 page written report, including figures, in MS Word format (turn in a hard copy). Turn in code also.

(4) Extra Credit: a 40" x 30" or 30" x 40" hard poster (see the Graphics folks in the Library).

0. If at all possible, do a final project in EE432 that supports your senior design project.

Some other ideas:

1. Implement a DTMF decoder that works in the time domain (filtering) rather than being based on the FFT. Test it on a large set of data, including adding noise to your signal to see how robustly your filters work.
2. Use the plucked string filter method to synthesize a guitar playing a musical scale or part of a song. You'll have to look up more of how a plucked string filter works.
3. Implement steganography (the art of hiding digital information). Take a voice clip and imbed it in a song clip or longer voice clip, on a binary level; if you play the song clip, you cannot tell that there is a voice clip hidden underneath. You must also be able to extract the voice clip back out of the music clip. Do several tests.
4. Denoising a signal using filtering. As an idea, record a conversation with a buzzing sound or other loud cyclic noise (maybe a large fan?) in the background. Determine how to remove the background noise to improve the quality of the conversation. Do several tests.
5. Determining the harmonic nature of a single instrument through a wide range of notes, then creating a music signal (i.e., programming a song) to demonstrate that the notes can be created with a computer. This would involve recording an actual instrument playing a set of notes, and analyzing the recording.

You may have some other ideas—the project doesn't have to be MATLAB based, or doesn't have to be a coding project (could be hardware based). Submit your idea to me for approval.