BME 790: Engineering Programming and Signal Processing
Fall 2013

Final Project
Assigned Wednesday, October 16, 2013
Due: Sign up sheet on Piazza for in-class presentation

For this project you can work individually or in groups of two. Individual presentations are scheduled for 15 minutes, pair presentations scheduled for 30 minutes. Pick a topic of your choice that highlights one Signals and Systems technique you've learned in class. Presentations will be scheduled the last week of term (right before Thanksgiving). Each group will get 30 minutes (15 min/person) to make your point, and I want it to be as focused and directed a point as possible. Each team will need to give a background (on your topic and why it's a good candidate for this Signals and Systems technique), and each group will have a MATLAB simulation component. You all have different interests in biomedical engineering (genetic engineering, imaging, protein synthesis, physics, imaging, etc). Your job for this assignment is to pick a topic of interest to you and show how some technique we've learning in Signals and Systems helps you better understand that topic. Previous groups have analyzed frequency components of a Beattle's song, alcohol absorption, genetic expression of a certain protein, etc. Some group's simulations you've even gotten to see and I generally like to incorporate some into homework problems. That way you can give back to the students who come after you. This is your chance to show me your interests and connect with the material I've been lecturing about for the whole semester - I want to see you shine!
The topics we have/will cover are listed below:

1. Continuous Convolutions
2. Discrete Convolutions
3. Laplace Transforms
4. Fourier Series
5. Fourier Transform
6. Discrete Fourier Transform

Once you have your topic you will be in charge of collecting information to present to the class. Each team member will have 15 minutes to go over their particular section. How you present and divide the material is up to you and your team. Your presentation should have 3 components: 1. Background on the topic to orient us to the problem and why the Signals and Systems tools we learn are applicable, 2. What tool you chose and why it was a good fit for this topic and 3. a MATLAB simulation/demo highlighting your signal processing tool as applied to the topic of interest. I'd like all parts of the project to be connected and fit together as that will produce the most successful presentation. This is your chance to highlight your presentation skills, a chance you don't get that often but is a very useful tool going forward. Your in class presentation will be graded both as a team and individually. Your presentation will be graded using the following criteria, with a separate category for the MATLAB simulation performed:

1. Presentation Style
2. Clarity of Presentation
3. Group cohesiveness
4. Slide Quality
5. Information Presented
6. Creativity
7. Organization

The special project will be worth 100 points, 25 points will be the group score (if presenting in a team) and 75 points will be your individual score. The special project is worth 25% of your grade. I will post the evaluation sheet you will be getting ahead of time. Everyone in class will also be filling out an evaluation of your presentation and your teammate will also provide feedback. The goal is to learn about signal processing tools and how they work in the real world, and give you all a chance to hone your presentation skills. I expect you to meet, and PRACTICE your presentation together! I cannot emphasize this enough.