ECE 8823a, Spring 2011

Course Project

The course project is worth 40% of your final grade, and will involve an in-depth investigation of a topic of your choice. The project can either involve advanced study of a theoretical concept of interest or software implementation of a cutting-edge algorithm (or a combination of both).

The project will be done in groups of two. There are 4 things you need to produce:

1. A short ($\leq$ 1 page) proposal describing the project and what you expect to accomplish. Email this to me as a txt or pdf attachment by **5pm on Wednesday March 30**.
2. A short ($\leq$ 1 page) progress report. Email this to me as a txt or pdf attachment by **5 pm on Wednesday April 13**.
3. A 20 minute presentation given by both members of the group. These are scheduled for the last day of class on **Wednesday April 27**.
4. A 6 page paper describing the problem and the results. This is due **5pm on Friday May 6**. This deadline is firm, as grades need to be submitted shortly after this.

In addition, there should be a working demonstration of any code that is produced.

I would also like each group to arrange a (short) meeting with me to discuss their project. This meeting should take place some time after the proposal is submitted but before the progress report is due.

Possible topics include (these are just suggestions, you are encouraged to come up with your own topic):

- Advanced nonlinear approximation
- Tree-based compression algorithms
- Wavelets and multifractals
- Adaptive geometrical representations for images: bandelets
- Geometrical filter banks: contourlets
- Digital implementation of curvelets
- Fast Fourier transforms for non-uniformly spaced data and applications
- Harmonic analysis of analog-to-digital converters
- Curvelets and image reconstruction/restoration
- Compressed sensing applications
- Compressed sensing reconstruction algorithms