EELE 577 Reports **Spring 2013**

The reports are DUE at the start of class on Monday, April 22, 2013.
No late reports will be accepted.

Guidelines

Choose a general topic from the list below, OR propose a similar topic, and get my approval.

The "deliverable" for this project is a written report (hardcopy) summarizing your findings and demonstrating your new knowledge with suitable digital simulation results.

Find 4-6 *authoritative* published papers and/or books that contain relevant research results for your topic. Find a textbook or tutorial paper that includes a reasonably complete literature summary. Read and understand each source. Get additional information as necessary. If you find relevant web sites, be sure the information is fully reliable and double-check any sources.

Write your report at a level suitable for your peers: smart ECE graduate students who have a DSP background, but probably do not already know the details of your topic. The report must be carefully organized, include full and complete references, prepared with a word processor for neatness, proper spelling, etc. The report must include relevant figures, diagrams, tables, and simulation results.

My expectation is that the reports will be perhaps 8-10 pages. Reports should be printed with a high quality printer, 1" margins, and page numbers.

Topic Ideas

Quantization:
- Modern design of a/d and d/a circuits
- High quality sample rate conversion
- The use of dither to linearize a quantizer

Practical Implementation:
- Comparison of FPGA implementations to conventional DSP chips
- Benchmarks for comparing different DSP architectures
- Floating point vs. fixed point issues

Filter Design:
- Comprehensive review of an optimized filter design procedures (e.g., McClellan-Parks)
- Examination of coefficient quantization sensitivity for several filter structures
- Parametric filters
- Savitsky-Golay smoothing filters

Adaptive Signal Processing:
- Delay estimation and beamforming
- Linear prediction
- Adaptive interference canceling

Time-Frequency Analysis:
- Applications of the short-time Fourier transform
- Wavelet transforms
- Spectral estimation

Synthesis:
- Signals and waveforms
- System simulation (modeling a physical system)