**Project Assignment**

In ECE 6324 you will be graded on the completion of a project as well as the other assignments and exams. The project will count as approximately 1.5 of the other assignments, but should take about as long as the other assignments. It is just an opportunity to work a more complex problem with commercial analysis tools.

The assignment can be an antenna simulation using electromagnetic simulation software such as: CST Microwave Studio, ANSYS HFSS, COMSOL Multiphysics, or Remcom XFDTD. If you want the greatest level of assistance from me, use Microwave Studio.

The assignment could alternatively be an antenna problem solved using a general purpose technical computing environment such as MATLAB or Mathematica.

Project write up should be brief (less than three pages), but include the following content.

1. Problem statement.
2. Description of solution: MATLAB code, simulation setup parameters, and/or equations being solved or compared.
3. Labeled figure(s) showing the key results, with figure captions explaining results.

**Example projects:**

**Antenna current patterns**  
Simulate the antenna of your choice and find the current pattern/distribution. Create comparison plots of the simulation vs ideal current pattern. If easily done, make several comparisons. For example, for a dipole antenna, compare the half-wave, full-wave and 3/2-wave current patterns.

**Simulated antenna optimization**  
Parameterize the antenna of your choice with two or three variables (e.g. antenna length, wire diameter, element spacing, current phase, etc.). Perform an optimization of these variables to obtain best performance in terms of a chose performance specification (e.g. gain, side lobe level, input impedance, etc.).

**Feed location**  
Simulate the antenna of your choice with a parameterized feed location. Find the dependence of the current pattern or input impedance on feed location, and compare with theory.

**Large Array (MATLAB or Mathematica solution)**  
Compute and plot the array factor for a large array. Compare a brute force optimized excitation with some standard distributions such as: uniform, binomial and Dolph-Chebyshev.