CS 6550 (Design and Analysis of Algorithms) Fall '10

- **Instructor:** Asaf Shapira

- **Time/Location:** D. M. Smith 104, Tuesday/Thursday 12:00-13:30

- **Office hour and location:** Skiles 262, Please schedule with me.

- **Contact info:** asafico-at-math.gatech.edu

Suggested Reading:

- *Probability and Computing: Randomized Algorithms and Probabilistic Analysis*, by M. Mitzenmacher and E. Upfal (Cambridge, 2005)

- *Algorithm Design*, by J. Kleinberg and E. Tardos (Addison-Wesley, 2005)

- *Approximation Algorithms*, by V. Vazirani (Springer-Verlag, 2001)

- Recent papers to be mentioned in class

Course Objective: Introduce tools and results related to the design and analysis of various types of algorithms.

Tentative List of Topics:

Tools:

- Linear programming and LP duality (Farkas Lemma).

- Fourier analysis.

- Eigenvalues of graphs and their application.

- Semidefinite programming.

- Randomized algorithms.

- Expanders

- VC-dimension

Types of algorithms:

- Geometric Algorithms.

- Online Algorithms.

- Approximation algorithms.

- Semidefinite programming.

- Subexponential algorithms.

- Error correcting codes

- Data Structures

General grading policy: TBD

Homeworks will be assigned, collected and graded on a regular basis. You are strongly advised to (attempt to) solve all the homework problems. You are allowed to discuss your homework assignments with other students, but you are required to write the solutions on your own. In other words, you are **not** allowed to copy another student's solution.
Late submission of HWs is discouraged with a penalty of 20%.

Suggestions:
- Please feel free to ask questions at any time: before, after or during the class.
- Please make use of my office hours.
- Class participation and discussion is highly encouraged.

Academic Dishonesty: All students are expected to comply with the Georgia Tech Honor Code. Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. The institute honor code is available at http://www.deanofstudents.gatech.edu/Honor/honorcode.txt