Syllabus

Instructor: Benjamin Raichel / ECSS 3.701 / benjamin.raichel@utdallas.edu
Class: Tu, Th 1:00-2:15pm / ECSN 2.120

Course Description:
This course covers fundamental topics in algorithm design, which are currently routinely applied in both theory and practice, but which are often not covered in standard algorithms courses. A strong focus will be placed on randomized and approximation algorithms. The course will also cover fundamental algorithms in areas such as machine learning, computational geometry, and big data (such as streaming and dimensionality reduction). Other topics to be covered will be determined by student interests.

Assessment:
Grades will be determined as follows (subject to change at instructor's discretion):
--Homeworks (60%): There will be roughly 3 or 4 homeworks, and everyone is required to do all homeworks. Students are encouraged to discuss problems together, however when it comes time to write solutions down, students should not work together. Homeworks will be challenging and students should come to office hours with questions. No late assignments will be accepted.
--Presentation (30%): Each student will give a presentation in class. Each students will choose a topic related to the course and approved by me.
--Participation (10%): As this is an advanced graduate class, I expect all students to actively participate. I do not plan to take attendance, however, if during the semester few students show up, I will start taking attendance.

Course Outline:
The following rough course outline is subject to change:
--4 weeks: Randomized Algorithms
--4 weeks: Approximation Algorithms
--4 -5 weeks: Miscellaneous (including Computational geometry, Machine Learning, Big Data)
--3 weeks: Student Presentations

Resources:
This list will be updated as the semester progresses.
Randomized algorithms:
--Sariel Har-Peled's notes: http://sarielhp.org/teach/13/b_574_rand_alg/lec/
--"Randomized Algorithms” by Motwani and Raghavan
--"Probability and Computing” by Mitzenmacher and Upfal