22C : 196 : 001 **Computational Geometry**
Spring 2013

Class Schedule

The course meets 9.30–10.45 am Tuesday and Thursday at 218 MLH (MacLean).

Instructor and Office Hours

Kasturi Varadarajan: 101D MacLean Hall, 335-0732, kasturi-varadarajan@uiowa.edu
Office hours: To be announced.

Course Web Page

`www.cs.uiowa.edu/~kvaradar/sp2013/cg/cg.html`, which is also where your ICON page for this course points.

Departmental Information

Department of Computer Science, 14 Maclean Hall. The office of the DEO, Prof. Alberto Segre, is located here.

What this Course is About

The first part of the course will focus on the following topics, and we will spend approximately one week per topic.

- Line Segment Intersection
- Polygon Triangulation
- Orthogonal Range Searching
- Point Location
- Voronoi Diagrams
- Arrangements
- Delaunay Triangulations
- Convex Hulls
- Quadtrees

A good reference for this is *Computational Geometry, Algorithms and Applications*, by de Berg, Cheong, van Kreveld, and Overmars. Our library has an electronic subscription (and hard copy subscriptions as well, if you can grab them).

The second part will cover the following topics:

- Epsilon Approximations, Nets, and Discrepancy
- Nearest Neighbor Search in High Dimensions
- Clustering: the k-means algorithm
- Coresets
- The perceptron algorithm

References for the second part will be posted subsequently.

Prerequisites

We will assume effectively an exposure to an undergraduate data structures course, so that when we talk about algorithms, you are comfortable at seeing how they might translate into programs. This also means you have seen the mechanics of analyzing the running time of simple algorithms. It helps to have also been exposed to an undergraduate algorithms course.

Grading

The grading will be based on about seven homeworks (40 percent), a midterm (25 percent), and a final (35 percent). The homeworks will either be problem sets or programming assignments.

The policy on late homeworks is that you have a quota of three days for the entire semester that you may use for late submissions. So for example, there will be no penalty if you submit the third homework a day late, the fifth two days late, and the rest of the homeworks on time. Once you use up your quota of three days, any homework submitted late will not be accepted and you will get 0 points for that homework.

When you submit a homework X days late, your quota gets decreased by X irrevocably. You can only be late by an integer number of days – if you submit 10 hours after the deadline, for example, your quote is depleted by one day.

Exam Dates

Dates for the midterm and final will be announced.

Collaboration

No collaboration is allowed on the exams. For homework problems, collaboration is alright. We even encourage it, assuming each of you has first spent some time (about 30 minutes) working on the problem yourself. However, no written transcript (electronic or otherwise) of the collaborative discussion should be taken from the discussion by any participant. It will be assumed that each of you is capable of orally explaining the solution that you turn in, so do not turn in something you don't understand.

Course Accounts

You will be assigned an account on the computer science department machines shortly, if you do not already have one. In addition, you will need your HawkId and password to access information about this course on icon and to submit the programming assignments.

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook.

Accomodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements.

Academic Fraud

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Academic Fraud section of the Student Academic Handbook.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook.