Course Syllabus

CS 6319: Computational Geometry, Spring 2021

Website: http://utdallas.edu/~bar150630/courses/cs6319sp21.html

Professor Contact Information
Benjamin Raichel, Assistant Professor
E-mail: benjamin.raichel@utdallas.edu
Office hours time: TBD.
Office hours will be held online through MS Teams.

Course Pre-requisites, Co-requisites, and/or Other Restrictions
CS 5343

Course Description
This course will cover basic computational geometry topics, such as computing convex hulls, computing Voronoi diagrams and Delaunay triangulations, motion planning, and the main methods for developing geometric algorithms. We will also discuss various geometric data structures for point location and range searching and additional topics at the discretion of the instructor, such as geometric approximation and high dimensional data analysis.

Course Learning Objectives

1. Knowledge of basic geometric data structures such as Voronoi diagrams, quad trees, and range trees.
2. Knowledge of basic geometric algorithms, including line sweep, point location, and convex hull.
3. Knowledge of useful techniques and geometric structures, including duality, arrangements, and Delaunay triangulation.
4. Ability to design and implement a geometric algorithm.
5. Ability to apply computational geometry techniques to real world problems.

Course Modality

This course will be taught in the online course modality. Video lectures will be posted each week to MS Stream. Office hours will be held through MS Teams. Assignments and quizzes will be through elearning.

All content for this course (lecture videos, assignments, quizzes, etc.) are for registered students of this course only. Do not share or publicly post any of these materials.
Textbooks


Grading Policy

- Homework 55%: There will be around 4 or 5 homeworks. Homeworks will be written algorithms questions, though I may include a single coding homework.
- Quizzes 15%: There will be a short quiz posted for every lecture. The intent of the quizzes are to make sure students stay up to date on watching the lectures. 5% is based just on the fraction of quizzes that are submitted on time, and the other 10% is based on the fraction of correct answers.
- Course Project 35%: Each student will be expected to do either a research, implementation, or survey project. The topic is left to the student, though it must relate to computational geometry. Mid way through the semester students will submit a one page project proposal for approval. Projects may be done individually or in groups of two (due to the class size, 2 is the maximum group size).

Note that when determining your final letter grade the numerical value of your score is less important than your score relative to the class average. That said, there is no fixed curve, i.e. if everyone performs well in the class then everyone can get top grades. I encourage students to talk with me about their grade before considering dropping the course.

Course & Instructor Policies

--Students are expected to turn in all of the homeworks on time. No late homeworks will be accepted, unless there is a valid documented reason, i.e. medical or family emergencies.
--Any request for a regrade needs to be made within one week of the assignment being graded. Note that a regrade request means “regrade”, i.e. your score could go down.
--Students are expected to solve problems without the help of outside sources (i.e. “googling the solution”). If for any reason the student does use outside sources, they must cite them clearly, and their solution must still be put in their own words. Failure to cite sources is considered cheating and plagiarism.

COVID-19 Guidelines and Resources

The information contained in the following link lists the University’s COVID-19 resources for students and instructors of record: http://go.utdallas.edu/syllabus-policies.

Class Participation

Regular class participation is expected regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this
course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Materials

The Instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students’ use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Technical Requirements

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage.

Course Access and Navigation

This course can be accessed using your UT Dallas NetID account on the eLearning website. Please see the course access and navigation section of the Getting Started with eLearning webpage for more information. To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage. UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The eLearning Support Center includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication

This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools.
Distance Learning Student Resources
Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student AccessAbility, and many others. Please see the eLearning Current Students webpage for more information.

Server Unavailability or Other Technical Difficulties
The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Comet Creed
This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

Academic Support Resources
The information contained in the following link lists the University’s academic support resources for all students.

Please go to Academic Support Resources webpage for these policies.

UT Dallas Syllabus Policies and Procedures
The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to UT Dallas Syllabus Policies webpage for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.