1 Course Description

Computational Geometry is the study of the representation and storage of geometric data and relationships, and the design, implementation and analysis of computational algorithms that operate on geometric data to answer questions of practical interest.

In this directed individual study course, a series of special topics in computational geometry will be considered. We will begin by considering the decomposition or analysis of a geometric object into simpler objects. We will pose the question of whether a tour of a country can be designed that visits each city exactly once, although not every pair of cities has a direct connection. We will look at search methods, which can rapidly determine the location of a point. We will learn about methods of projection, which include the ways that a 3D object can be represented by a 2D image. Sampling methods will be presented, which can choose a point at random from a given geometric object. Finally, we will cover the idea of interpolation, which allows geometric objects, including a signature or a face, to become mathematical formulas.

The final portion of the course will involve work on a project selected and designed by the student on a related topic on computational geometry. This project will be more extensive in scope than the previous assigned topics, and the student will be expected to work independently, and to prepare a more detailed report to accompany the completed program. As a separate task, the student will be expected to present the design, implementation and results of this final project in an oral report.

2 Course Objectives

At the end of this course, the student will

- be exposed to some of the fundamental ideas, problems and methods of computational geometry;
- be able to describe, in an oral report, the steps involved in a geometric algorithm;
- be able to describe, in a written report, the data structures and procedures necessary to implement a particular geometric algorithm;
- be able to write computer programs that implement the geometric algorithms considered in the course;
- be able to create graphic images that illustrate geometric algorithms.

3 Grading Policy

The course is letter-graded. The course grade will be based on six programs and reports associated with the assigned topics, and a final project chosen and designed by the student in consultation with the instructor. The final project will be written up in a formal report. An oral presentation of the final project is also required, to be presented in the form of slides on the large-screen projection system.
<table>
<thead>
<tr>
<th>Assignments</th>
<th>Unit Weight</th>
<th>Total Weight</th>
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<tbody>
<tr>
<td>Assigned Topics (6)</td>
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<td>60%</td>
</tr>
<tr>
<td>Final Project</td>
<td>30%</td>
<td>30%</td>
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<tr>
<td>Oral Report</td>
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<td><strong>Total</strong></td>
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4 University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

5 Academic Honor Policy

The Florida State University Academic Honor Policy outlines the Universitys expectations for the integrity of students academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to . . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University. (Florida State University Academic Honor Policy, found at http://dof.fsu.edu/honorpolicy.htm.)

6 Americans with Disabilities Act

Students with disabilities needing academic accommodation should:

- register with and provide documentation to the Student Disability Resource Center; and
- bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/

7 Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation statement, this syllabus is a guide for the course and is subject to change with advance notice.