Thesis Course Syllabus

Course Information

Course Prefix and Number: CS 7496

Course Name: Computer Animation

Instructor: Ha, Sehoon

Course Description

This course aims to understand the basic principles behind modern kinematic and physics-based animation techniques. This course requires basic knowledge of linear algebra, vector calculus, computer graphics, and object-oriented programming. Python experience is also encouraged since homework materials will be distributed in Python. It focuses on the math and algorithms behind computer animation techniques instead of the practical use of animation tools, such as Maya, Blender, and/or Unity. Course topics include keyframe animation, differential equations, particle dynamics, 3D orientation, rigid body simulation, collision and contact, character animation, inverse kinematics, motion capture, motion control, and reinforcement learning.

Course Learning Outcomes

By enrolling in this course, students will:

1. Practice mathematical concepts and algorithms for kinematics and physics-based animations.
2. Implement interactive animation tools in Python.
3. Describe the pipeline of character animation, from motion capture to inverse kinematics.
4. Outline general concepts of control and learning algorithms.

Required Course Materials

No textbooks or materials are required. Resources for research and study are determined in consultation with the instructor, including lecture notes and online materials such as 'Physically Based Modeling: Principles and Practice'.

Grading Policy

This course is graded based on the following distribution:

- Programming Projects (6 total): 65%

- Quizzes: 20%
- Midterm Exam: 5%
- Final Exam: 10%

A grade of Satisfactory (S) indicates that the student has made acceptable progress in their research and coursework, consistent with the requirements of the degree program.

Attendance Policy

This course is 100% web-based and asynchronous. While there are no scheduled class meetings, students conduct independent research and study under the supervision of the instructor. The frequency and format of student-advisor contact are determined by mutual agreement via platforms like Discord, Ed Discussion, and Canvas.

Academic and Research Honesty/Integrity Statement

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review the Student Code of Conduct and the Academic Honor Code. Students are expected to perform research and programming assignments in an ethical and responsible manner. All students are required to abide by the principles of academic integrity while performing work for this course.

Core IMPACTS

Not applicable.

Accommodations for Students with Disabilities ---

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Expectations of Advisors and Advisees

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The university articulates some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.