CS633 3D COMPUTER ANIMATION
Spring 2015
TR 3:30 - 4:45 pm (FPAT 263)

Course Description: (Prerequisites: CS335 or CS535)

This course presents algorithms and programming techniques for specifying and generating motion for graphical objects. It addresses practical issues and provides accessible techniques and straightforward implementations. It is not intended for animators using off-the-shelf animation software, nor does it address the issue of *computer-assisted animation*, i.e., the computerization of conventional hand-drawn techniques. This course is primarily concerned with 3D computer animation.

Motion specification techniques in two categories: *interpolation and basic techniques* and *kinematic control of articulated figures*, are studied and discussed. The interpolation and basic techniques category consists of ways in which the computer is used to fill in the details of the motion once the animator specifies the required information, such as *key framing* and *path following*. kinematic control of articulated figures generate motion using a set of rules or constraints that specify *what* is to be done instead of *how* is to be done. Model-specific applications are also surveyed. These are grouped into two general areas: *real-world processes simulation* and *figure modeling (human figure modeling* and *facial modeling)*. The graphics library used in this course is OpenGL.

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Office hours: TR 5:00pm - 6:00pm

and by appointment

Text: Computer Animation: Algorithms and Techniques, 3rd Edition (2012)

Author: Rick Parent (Publisher: Morgan kaufmann)

ISBN: 978-0-12-415842-9

References: Character Animation with Poser Pro, 1st Edition (2009)

Authors: Larry Mitchell

Publisher: Cengage Learning

OpenGL Programming Guide, 2nd Edition
by M. Woo, J. Neider and T. Davis (Publisher: Addison Wesley)

Grading Policy:

Projects (1-3)**		75%
Homework (4-5), Presentations, Attendance		25%

** Projects must be done in C or C++ using OpenGL as the GUI.

Late Penalty:

I will accept programs and homework up to two days late for a penalty of 40% (20% each day overdue). Programs and homework more than two days late will not be considered for a grade.

Scale:

Undergraduate Students		Graduate Students	
85 -100	A	88 -100	A
75 - 84	B	78 - 87	B
65 - 74	C	68 - 77	C
55 - 64	D		
0 - 54	E		

Plagiarism and Cheating:

Plagiarism and **cheating** are serious academic offenses. The minimum penalty for those academic offenses is final grade E in the course. The university regulations pertaining to this matter can be found at

http://www.uky.edu/StudentAffairs/Code/

Of particular relevance is Part II, SELECTED RULES OF THE UNIVERSITY SENATE GOVERNING ACADEMIC RELATIONSHIPS, Section 6.3 that can be found at

http://www.uky.edu/StudentAffairs/Code/part2.html

(These rules in particular say:

6.3.1 PLAGIARISM All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors or the

matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the face, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it be published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student and the student alone.

When a student's assignment involves research in outside resources or information, the student must carefully acknowledge exactly what, where, and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

6.3.2 CHEATING Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. Any question of definition shall be referred to the University Appeals Board.)

I want to emphasize that in this class students are allowed to discuss ideas and are allowed to help others by explaining concepts and possible solutions. However, all the work that is submitted must be performed by the students individually. Any sharing of electronic files, printouts and other materials developed by the students is not allowed. If any fragments of text appearing in books, journals, conference proceedings, web pages, etc. are used, students must provide appropriate citations. Any help from others must also be acknowledged.

Course Contents:
• Introduction
• Technical Background: spaces and transformations, orientation representations
• Interpolating Values

• Interpolation-Based Animation

• Kinematic Linkages

• Motion Capture

• Physically Based Animation

• Modeling and Animating Human Figures

• Facial Animation

Important Dates:

Last day to withdraw from a course 3/7/15 (Friday)

Spring Vacation 3/16/15- 3/21/15

Last day of classes 5/1/15 (Friday)