Computer Animation - Algorithms and Techniques

CSCI 712 (Fall 2015)

PROJECTS

A list of projects for this semester can be found [here](#).
The schedule for midterm / final presentations can be found [here](#).

Introduction

This course will investigate a number of programmable algorithms for computer animation. The field of computer animation is quite broad, far broader than can be covered in a 15 week course. Some topics will be covered in depth (those being the subject of the assignments), others will not. The project is a means for a student to investigate one of these other topics by implementing the technique in software.

The best learning comes from doing, thus the project you choose will be a most important means for getting familiar with one area, aspect, or technique of computer animation.

One can get started on picking a project by asking the question, "What would I like to do with animation?" Your project should be an attept to realizing whatever answer you came up with for this question.

Note that if you have an idea for a project but are unsure how you might go about doing it, please see the instructor early during the quarter and, together, we can see what we can work out.

Team projects are acceptable, however, the complexity of the project should reflect the number of members of the team and all team members are expected to contribute equally to the final project. There can be no more than 3 members on a team.

Ultimately, this project will provide an opportunity for each of you to get experience with whatever it was that interested you enough about Computer Animation to sign up for this course. So choose wisely and have fun!

Project Ideas

Below is a list of animation topics with the extent to which they will be covered in this course. Topics covered in depth will have a programming assignment associated with them. Enhancing the assignement to include a more advanced algorithm may be an acceptable project.

- <u>Topics that will be covered in depth (Assignments given)</u>
  - Keyframing / Interpolation
  - Rigid Body Dynamics

- Articulated Figure Motion
    - Forward Kinematics
    - Inverse Kinematics
    - Motion Capture
- Group Behaviour
    - Flocking
    - Particle Systems

- Topics that will be covered brielfly (Good fodder for projects)
    - Advanced character animation
        - Use of genetic algorithms
        - Procedural Gesturing
        - Levels of Control
    - Facial Animation
    - Automatic Camera Control

- Topics that will not be covered
    - Animated Lighting
    - Animation of Natural Phenomenon (Fire, Smoke, Plants)
    - Animating surfaces
        - Soft objects
        - Cloth Animation
        - Hair and Fur

Note that this is not an exhaustive list. There are certainly many other areas of computer animation that you might consider.

A list of projects completed for previous offerings of this course can be obtained by clicking on the links below:

- Fall 2013 (2131)
- Winter 2011-12 (20112)
- Winter 2010-11 (20102)
- Winter 2009-10 (20092)
- Spring 2009 (20083)
- Winter 2008-9 (20082)
- Winter 2007-8 (20072)
- Winter 2006-7 (20062)
- Winter 2005-6 (20052)
- Winter 2004-5 (20042)
- Winter 2003-4 (20032)
- Spring 2003 (20023)

Project Deliverables

- **Proposal** - The proposal is a short document that describes the project to be undertaken.

- **Mid-Quarter presentation** - A quick 3-5 minute presentation that indicates your progress in completing your project. It is appropriate to include any unexpected problems you have run into, and any changes in the project scope based on these problems.

- **Project Code** - This is the bulk of your work...essentially the implementation of your project.

- **Final Report** - This is a written summary of the project. The report should be written as if you were going to pass the work on to another person.   The report should have enough details so that one, upon reading it, will have a clear idea of what you set out to do, how you went about doing it, and what you didn't get to.   It should be detailed enough so that the reader will be able to knowledgably start working on your code base after reading it.   Format for the report will be discussed in class around the middle of the quarter.

- **Presentation / Demonstration** The final exam for this course will be demonstration of the final projects during finals week and Week 10.

- **Peer Review** - Students will also be given the opportunity to review each presentation via Peer Review

- **Team Member Evaluations**   - For team projects, each member of the team will have the opportunity to rate the effectiveness of the other team members and give feedback on the effectiveness of the team as a whole.   Teammate evaluation forms will be available via mycourses.

Project Grading

The project will be graded on a 100 point system with the various parts of the project having the following weights:

	Points	Due Date:
Proposal	10	Sept 11
Mid-Quarter Presentation	20	Oct 12-16
Documentation/Report	20	Finals Week
Code	20	Finals Week
Presentation	20	Week 16 Finals Week
Peer Reviews	10	Finals Week
Team Evaulations	+/- bonus points	FInals Week

It is extremely important to continue to make progress as the course progresses. If you forsee

any problems with meeting deliverable deadlines, and see the instructor well in advance (at least one week) of the deadline that might be missed we can attempt to work out alternate arrangements. Late submissions without prior permission or notification will be heavy penalized.

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last updated 08/18/2015