CS128: Intermediate 3D Computer Animation
Course Missive
Spring 2007

Staff
Professor: Barbara Meier
CIT 307; office hours by appointment
bjm@cs.brown.edu

HTA: Mike Frederickson
UTA: Marshall Agnew
TA email: cs128tas@cs.brown.edu
Website: www.cs.brown.edu/courses/cs128

Hours and Location
Class: J Hour, Tu/Th 1-2:50 CIT 367
TA hours, in MS lab: see course website for hours

Course description
In this course we will continue work begun in CS125 with deeper exploration of the core technical and artistic aspects of 3D computer animation. In the first half of the course, students will do a series of tutorials and animation assignments in which they will learn basic character modeling, character rigging and skinning, animation, shading, and lighting techniques. In the second section of the course, students will independently explore one or possibly two of these areas in more depth. The products of this phase will be used in the last part of the course which will be devoted to creating an animated scene. Students may work alone or in pairs on the project. The scene should be a very polished piece of no more than one minute in duration. Students will read and discuss technical texts as well as works on artistic motivation and critique. We will view and discuss related animated films. The emphasis of class time will be on critique of ongoing student work.

A comparison to CS125

CS125 provides an overview of the animation pipeline including script/story writing, production planning, modeling, shading, lighting, animation, compositing rendered images with 2D effects, and editing. CS125 students apply this knowledge to the creation of a short film. CS128, on the other hand, has a narrower focus which allows deeper study of the core elements of 3D animation: modeling, rigging, animation, shading, and lighting. The project for CS128 is smaller in scope, but should be much more polished than the typical CS125 final project. In short, in CS128 students will follow more narrowly defined projects in order to learn specific procedures and workflow. While there may be a little less artistic freedom, we hope there is considerably less floundering. There will some policy and mechanics differences between the two courses as well, so please check the assessment and collaboration sections carefully.
Aims

This course has three specific aims: (1) to help you become self-sufficient in learning the technical aspects of computer animation; (2) to encourage you to view the process and product of animation as artistic and personal expression, not just a technical exercise; and (3) to develop your ability to critique and improve work in progress.

Objectives

To achieve the aims above, students will be able to do the following by the end of the semester:

• Model and rig a simple biped character
• Create strong poses with a rigged character
• Believably animate a character with motivation and personality in a simple scene
• Use lighting principles to practically and artistically light a scene of medium complexity
• Create shaders to depict a variety of surface types
• Create a portfolio-quality animated sketch
• Critically and technically analyze a work in progress, both orally and written, for your own and other students’ work
• Further develop their personal relationship to the medium of animation both through expression in one’s work and viewing of other student’s and professional work

Prerequisites and CS curriculum

The Computer Science Department is committed to multi- and cross-disciplinary study and welcomes students who would like a taste of computing as well as those who are interested in the full course meal. This course is open to CS concentrators, non-concentrators, RISD students, and graduate students. CS students who have taken CS123 or CS224 will find this course to be a creative application of the graphics algorithms explored in those courses. While it is designed as a follow on to CS125, students who have not taken CS125 but who have equivalent experience through self-study, a similar course, or a related job are welcome to submit a portfolio for admittance consideration.

Course Content Overview

First section: 8 weeks
• Basic study in modeling, rigging, animation, shading, and lighting
• 1-2 week assignments in above areas
Second section: 2-3 weeks
• Mini-proposal of in-depth study area
Individual exploration in this area with aim of creating elements useable for the final project; students will be guided appropriately depending on their chosen area; this can be considered the development and preproduction phase for the final project.

Formal proposal of final project

Third section: 3-4 weeks

Final project: create a one minute animation sketch individually or in pairs

Critiques

We are expecting a full class of twenty students and have a fairly short class period, so we will be running critiques a little differently than in CS125. The TAs and I will look at the handins in advance and choose common problems and themes to address in critique. We will try to show all of the work quickly at the beginning of the class period and then move on to addressing the problems. In particular when we are working with more technical material, we will focus the discussion on these issues. To streamline the process, we ask that you address any technical issues you are having in your written evaluation for each handin.

Texts

The following texts are required:


We will have readings and/or tutorials from these texts. They will be available through library reserve or on the website, but you may want to get your own copies.

Maya Press, *Learning Maya 7 | Foundation*, 2005; available on course website

Other use references include:

Articles from *Cinefex*, a journal of visual effects, published quarterly (available in Rock)
Steven Katz, *Film Directing Shot by Shot*, Michael Wiese Productions, 1991
Eadweard Muybridge, *The Human Figure in Motion*, Dover, 1989.
Frank Thomas and Ollie Johnston, *Disney Animation: The Illusion of Life*
Class structure

In the first section of the course, class time will be divided between lecture, demonstration, and discussion/critique. During the second and third sections, more time will be devoted to critique and individual problem solving as well as viewing, analyzing, and discussing professional work. Emphasis toward the end of the third section will be on perfecting and refining projects.

We may offer additional help sessions outside class to bridge the gap between class-time discussion and hands-on software experience. These will be held in the MS lab by TAs who will demonstrate specific procedures and then guide students through hands-on tutorials. These will be held during regular TA hours and will be announced in class in advance.

Assessment and Late Policies

Each assignment will be graded according to how well the design criteria for that project have been met. Evaluation rubrics will be provided with assignments. Evaluations are given orally during class critiques, interactive grading sessions, and through written communications with each student.

The following is an approximate breakdown of the contributions of the course components:
First section: 35%
Second section: 15%
Final Project: 30%
Participation in class discussion and critique: 15%
Non-project-based homework 5%

The class participation grade will be based on attendance and participation in discussions, critiques, in-class exercises, and presentations. Please note that it is a large part of the grade, and can raise or lower the final grade significantly.

To receive a passing grade in this course, students must

1. Participate in class critiques and discussions on a regular basis. I expect you to come to all classes on time having prepared assignments for critique and/or to have read and considered reading assignments carefully.
2. Complete all assignments and the final project.
3. Submit a written evaluation for all assignments and the final project.
4. Write and orally present a proposal for the final project that includes a 1-2 page written description and supporting visual material.
Assignments must be handed in by 10am on their due dates. In-progress works are not graded, but **if work is not turned in on time on a critique day, the assignment will be marked down ½ letter grade.** Assignments are marked down 1/3 letter grade for each 24-hour period late up to one full letter grade. **Assignments that do not include a meaningful written evaluation for critique or final handins will be marked down 1/3 letter grade.** Students may have three “free” late days. These will be applied for maximum benefit in calculating final grades, but will not show up in grades for individual assignments. Extensions on an assignment will only be given for valid *medical or personal emergencies,* and must be supported with a note from Health Services, your doctor, or a dean. Final projects will not be accepted late unless accompanied by a Dean’s or doctor’s note.

**Collaboration**

In the real world of production, nearly all work is collaborative and there is almost always more than one way to achieve the same goal. In this course, we encourage students to discuss approaches with each other. **Unlike CS125, students will often be pursuing the same project and therefore the collaboration policy is tighter.** Students may help each other with general concepts or software questions, but may not verbally or manually debug another student’s work. For example, it is okay to help someone figure out what boxes to check before running a Maya tool. It is not okay to tell them how to lay out and name joints in their character rig. One student may not “drive” the software for another student. Students may critique each other’s work outside of class, but students whose work is being critiqued should figure out how to improve their own work.

Students may not use third party solutions to any assignment with the exception of sound material, images, or movie clips that are incorporated into a larger piece. This includes downloads from the web and scripts, recipes, etc. from any outside source whether they are published or not. For further information, please refer to Brown’s Academic Code. If you are not sure about something, see me before proceeding.

**Software and Hardware**

We will be using Maya 8 to complete most assignments and students should have previous Maya experience equivalent to that acquired in CS125. Students may also use Adobe AfterEffects and Adobe Premier Pro or other compositing or editing software to provide the “glue” for projects. Maya, AfterEffects, and Premier are available in the MS Lab, CIT 167. You may purchase your own copies of this software if you wish. Students may work on their own computers or other university computers where they are permitted, but projects must be handed in to the CS Department file system. If you use your own copy of the software or work outside the MS lab, you do so at your own risk. We will be providing initial Maya files for some assignments and these will be Maya 8 files. Any conversions are your responsibility and your results must work in Maya 8.
Files that reside on the CS Department file system are backed up *every hour* and many students have been saved thanks to this feature. If you work in another environment, take care to backup your work often. No accommodation will be made for computer problems that occur on non-CS Dept. equipment.

**Finally**

Making animation is fun, but it takes a lot of time to do great work. Pixar animators typically animate about 10 seconds in a 40-50 hour work week. That does not include modeling, shading, lighting, or compositing. We do not expect the Pixar level of finesse, but we do expect work to be more polished than that for CS125. As always, expect the software to make you insane at times. We hope your work in this course will continue to develop your appreciation for the great medium of animation and the labor of love that goes into it.