

CS125: Introduction to 3D Computer Animation
 Prof. Barbara Meier
 Fall 2009
 Final Project

Calendar (grey means something for the FP is due)

	Mon	Tues	Wed	Thu	Fri
Oct	26 Class	27	28	29	30
Nov	2 Class	3	4 Written proposals due	5	6
	9 Class	10	11 Class	12 Group meetings with Barb TBA	13 Group meetings with Barb TBA
	16	17	18 In class: Oral project presentation	19	20
	23 10am Handin: fp_progress1 report In class: Show current progress	24	25 No class	26 Thanksgiving	27
Nov/ Dec	30 Class	1	2 In class: Show animatic and current progress	3	4
	7 10am Handin: fp_progress2 report In class TBA: Groups meet individually with Barb and TAs	8	9 Last class: Show final low res render	10	11
	14	15 Projects due at 9am	16 10am Handin: fp_final report Group critiques with Barb and TAs	17 4pm Screening in Lubrano and party	18

Goals and introduction

The final project will bring together all the skills you have been learning in this course. This handout describes the Production phase of your projects, starting where the Preproduction final project handout left off.

Production

I dream my painting and then paint my dream. - Vincent Van Gogh

Production is the “doing” part of the process. During this phase, you will create your models, animation, shaders, and lighting. This phase requires lots of communication among team members since everyone’s work will depend on each other.

The milestones in the production phase are creating an animatic or story reel followed by the deadlines each group sets for itself. Each group will show new progress during the four classes noted in the calendar at the top of this handout.

Animatics

Technically, the animatic is the last step in preproduction. An animatic is a series of storyboard images recorded as a movie. You will scan your storyboards and import them into Premier, the program you will use to edit your animations (or Final Cut if you prefer and have access to it). Do not use After Effects because it doesn’t play nicely with sound and will hurt you down the line. You should adjust the amount of time that each image appears to correspond to how long that action will take in the final piece. In order to get the most out of the animatic, you might want to add a few more inbetween drawings in sections that are not well defined so you can better see how it will play out.

The animatic is a blueprint for production. You should plan on making several iterations. Pitch these to your friends who are not familiar with the story. With some narration, they should get a good sense of what it will be like to see your final movie. When you are satisfied with the animatic, you will know exactly what shots you need to make. Of course, you can make adjustments, but it is usually much easier to work out cuts, camera angles, and ballpark shot length when you are working with the storyboard images. During production, you will be dropping your shots-in-progress into the animatic to see how everything cuts together.

As you assemble the animatic, you might discover you need more close-ups or long shots. This is the time to figure this out. You will also figure out the overall length of your piece and may find that you need to cut or simplify some shots to fit in your time budget.

It is easy at this stage to just plop your storyboards into Premier without much thought. The most successful films in this course are ones in which the group members put a lot of thought into the animatic. If you address problems here, you will have much clearer sailing the rest of the time. Feature films typically stay in the story reel phase for a year or more!

Production

Modeling

Begin by making a list of all the models you will need and prioritize them according to which will be needed first – the characters and what they need to interact with – and what can wait till later or even be cut. If you are planning on rigging any models, do these first. Rigging is an iterative process and you'll want to start early. Agree on units and a scale for the models so that they fit together in the scene. You will also want to have some naming conventions and group parts of objects that are made of the same material or that need to be animated. The modelers should create initial materials that are named correctly and have a color similar to the final look. Initially, the models will be used in animated scenes without shaders, but they need to be distinguishable. For complex models, you may have two versions – a lower res “proxy” for quick tests, and the high res one for final rendering.

Divide the models among your group members according to their skills and other responsibilities. While some people are finishing up models, others may have moved on to shaders or animating.

Do not spend too much time on modeling. It is possible to make a good animation with simple models. Within a week, you should have good enough models to start block scenes.

Staging and animation

As simple models become ready, you should start blocking out the movement for each shot. In the entertainment industry, layout artists and animators add a few frames (handle) to the beginning and end of each shot so that you can make subtle editing decisions. 8-30 frame handles are typical. You do not have to do this, but it is easier to do it at the beginning than to try to add length later. The initial layout will include the correct camera angle and move and the characters in their rough positions. Make a new camera for each scene that is appropriately labeled that will be the camera view that will be rendered. This way, you can move around the scene using whatever camera you want (typically the “persp” camera), without having to reset the scene camera every time. In the next pass, models that will move in the scene should have their movements blocked out – but only translations, scales, and rotations of the entire object.

The next pass will include the large movements of the individual models. At this point, the animation should “read.” The final pass will include more subtle body motion and facial expression. Each pass should be evaluated as to whether the staging is working and the animation is expressing the story point of the scene. Most animation tests can be done with simplified models, simple shaders, default lighting, and playblasts or simple renders. After each significant test, the shot should be dropped into the animatic. This will ensure that continuity is preserved.

Shading and Lighting

Design lighting after locking down staging and before shading. Figure out the broad strokes for the lighting (mood, palette, etc.), then for each location, design master lighting. This is the overall lighting that will be present in every shot that occurs in this location. Then shot-specific lighting and character lighting can be designed. It is important to maintain continuity across shots in the same location, so the character lighting should be carefully designed not to disturb the overall feeling of the shot. You may not even get to character lighting.

After getting the basic lighting in place, work on shaders. You will know exactly how much effort is needed based on how well you can see the objects.

For tests, you will be creating individual frames, playblasts, and low res movies. As you go, render some high res (640x480) frames so you can calculate how much time you need for rendering. Rendering is more than clicking the Batch button. Plan time for determining render settings: quality level, filtering, ray-tracing options, etc. You will also need to troubleshoot renders to fix problems with models, shaders, lighting, or the rendering options. This is a non-trivial task and may require TA support, which can become a scarce resource near the deadline. Consider using render layers for complex shots or for ones in which the camera does not move so you aren't rendering the unchanging background multiple times.

Effects and Compositing

If you include effects in your animation, be sure to plan enough time to integrate these with the 3d work. You may need to render multiple layers and use alpha channels to get effects to appear behind or between objects. You can also use compositing to enhance your 3d elements by changing the qualities of the shadows, the color, saturation, sharpness and grain of the rendered elements, etc.

You are encouraged to find 2D solutions to problems that would be too complex to implement in 3d. For example, more interesting backgrounds can be created by using 2d matte paintings.

Post production

This is where it all comes together, or the assembly phase of the production. Make sure you leave enough time to finesse the editing and sound. You might want to show your piece to a test audience to make sure everything is clear. You will have seen it so many times at this point, you will have no idea of what you are looking at.

Titles and credits.

Premier has nice features for making credits and does the rolling automatically. Remember your piece is not long and the audience does not want to see you thank your dog for his undying support for two minutes. For student works, it is customary to include the school where you made the film. Also, don't forget to add a copyright. To

be valid this has to include the word or symbol, the year, and the names of those who own the copyright.

Editing

Editing is your last chance to make the animation work. At this point, you have to forget your favorite individual parts of the work and sacrifice them if needed for the good of the whole piece. You will have the handles (extra frames on each shot) to work with for fine tuning. Remember it is usually better to make cuts during action. The animation seems to come to a dead stop if you wait to cut until all movement has stopped. The same applies for the beginning of the shot. In general, movement should be in progress when you cut to a new shot.

Sound

If possible, you should keep adding sound to the animatic as you go. See the Final Project Tips Google doc for more detailed info on making soundtracks. For a student project, you may use copyrighted sound material without permission, but you will not be able to submit your work to any contest or festival. You will still be able to use it for job interviews and private showings. You could also try to find a music student to create a soundtrack for you, but you will have to have a locked down version of your edit early enough.

Handing the project in

We will not use the usual hand in script for the final frames of your animation because the data will be too large to move around. The best thing is to email me where I can find your frames and soundtrack in your cs125_project directory. If you render elsewhere, make sure you get your final frames and soundtrack loaded into your project directory. I do not want a CD or DVD of your frames; you need to load them on to the CS Dept computers yourselves.

Critiques and progress

“A deadline is negative inspiration. Still, it's better than no inspiration at all.” –Rita Mae Brown

One of the goals of the final project is to practice working on a large project with many intermediate progress deadlines. This mimics the process in a production environment in which you would be showing your supervisors your progress on a daily basis. The project grade is based both on the final product and on the process.

Four of the classes during the project will be devoted to critiques and you must have new work to show. Some class time will be devoted to presenting current progress to the class.

Other time will be spent in group meetings in the lab with Barb and the TAs to address problems in more depth.

For each in-class critique, each group should form a dated progress directory/folder from which they can show their work. Please be respectful of everyone's time and have your work ready to go. A 3-minute delay while you find your stuff is over an hour of wasted people-time.

Individual evaluations (REPORTs) are to be handed in from every student three times during the project (2 during, 1 at the end). These describe your current progress and problems or challenges you might be facing. The progress evaluations, including those in class and those handed in, contribute to your final grade. We do not want you to wait and pull something off in the last few days because that short circuits the entire idea of getting feedback as you go (not to mention it isn't really doable).

Late Project Policy – VERY IMPORTANT

You must have a working version of your project to turn in by the deadline. We are told “our project is taking longer than we anticipated to render” by most final project groups. This is not a valid excuse.

Late projects will not be accepted without a Dean's note. If your group does not turn in a project, you will get a grade of NC in CS125, unless there are exceptional circumstances as reported by a Dean. There is a small grace period after the deadline for catastrophes, but this is only a few hours and you should not count on it as working time. You are welcome to continue working on your piece after the deadline within the constraints of lab and computing resources, but you will be evaluated on the project you turn in by the deadline.

If you have fallen behind on other assignments and can't finish everything by December 17, do the final project first. You can discuss taking an Incomplete with me, but there must be exceptional circumstances. You may not take an Incomplete for the final project, because it is impossible to replicate the experience of the group project and critiques after the semester ends.

Project Evaluation and Design Criteria

The final project is worth 40% of your final grade. The breakdown for the parts of the project is as follows:

Milestone	percentage of grade
written story & rewrite	5
written proposal	5
group meeting with Barb	5
in-class proposal presentation	5
preparation and delivery for in-class critiques (4)	16 (4 each)

intermediate individual evaluations (REPORTs) (2)	4
final individual written evaluation	5
final group critique with Barb and TAs	5
final product	50

The content of final projects is graded similar to other projects and is assigned a group grade. In extreme cases, a positive or negative factor can be added to the group grade to reflect above or below average contributions, but this is the exception. Students should document their contributions as they go. This can be an informal list of tasks, such as “drew the storyboards, modeled the teacup, animated the dog, designed the clock shaders.”

The most important goal of the final project is to create a *finished and polished* piece. A well-executed simple piece is far better than a rough or partially finished one. Staying up all night for five nights in a row and failing all of your other classes does not factor in your evaluation. You probably will not end up making the piece you set out to.

The following criteria will be used for evaluation of the product:

- All the members of the group contributed to the project in a productive way.
- The piece is visually unified as a whole – each piece of the design contributes to the story and look of the animation.
- The story or non-narrative structure makes sense and moves the viewer from beginning to end.
- Creative and appropriate use of available tools.
- Personal expression. The piece is meaningful and provides a window into the creators’ worlds/minds.
- Technical proficiency in modeling, shading, lighting, and animation. You will be evaluated on these in a similar way that your individual assignments were evaluated.
- Cinematic consideration. The piece uses camera angles and movement and lighting in a way that furthers the story.
- Aesthetic consideration. Thought has been given to artistic principles such as composition including arrangement and kinds of forms, depth, positive and negative space, balance; color; texture; timing.
- Level of polish. The animation does not have missing or slap-dashed pieces. The editing works and the piece includes appropriate titles and credits.

Last Tips

"They're funny things, Accidents. You never have them till you're having them." – Winnie-the-Pooh

Save often.

Put files that are done in a “frozen” directory. If you work on non-CS dept computers, use a back up system. *Most groups that have worked outside CS have lost major parts of their projects and days of work due to hardware or human failure.* The CS dept computers are automatically backed up hourly and daily making file recovery much easier.

The CS125 Google Site has many more project tips under “Final Project Tips.”