

How To Produce A 3D Computer Animated Short ~In One Semester~



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*2006 Consortium for Computing Sciences in Colleges
- Northwestern Region*

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Motivation



*2006 Consortium for Computing
Sciences in Colleges - NW*

- It is a fun course that introduces majors and non-majors alike to basic concepts in computer graphics.
- Good for majors to see how software is used by non-programmers.
- May draw non-majors into the major, including women.

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What is course about?



Students use the medium creatively, going beyond just learning the details of the interface.

- The course is not about
 - Learning to use Maya.
 - Making cool animations with lots of explosions.
- This course is about
 - Learning basic concepts in computer graphics and animation.
 - Learning to use this new medium to express ideas and tell stories.
 - Learning the power of teamwork and collaboration.

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Course Structure



First half of the semester:

- Learn concepts in computer graphics (modeling, lighting, textures, animation, cinematography, etc).
- Explore the expressive potential of 3D graphics.
- Learn the software user interface.
- Learn the process of producing an animation.
- Collaborate with musicians.

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Learning to use the Medium



Types of assignments might include:

- Online tutorials to learn basic skills.
- Create a scene that tells a story, creates a mood, or expresses emotion.
- 10 second animation loop (beginning = end).
- Practice collaboration – compose simple image using objects modeled by multiple students in class.

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Concepts and Skills



- Modeling: polygon, subdivision, nurbs, extruding, lofting, revolving
- Animation: keyframe, path, deformers
- Camera
- Lighting
- Materials
- Texture Mapping

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Course Structure



Second half of the semester:

- Work in teams to produce an original animation (maximum 1-2 minutes).

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Production Overview



- Story Development
- Storyboard
- Storyreel
- Character and Scene Modeling
- Animatics, Cinematography
- Animation
- Lighting, Shading, and Texturing
- Post-production

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Comments on Music



- Best if one can find music students willing to collaborate.
 - Music normally composed after animation is complete.
- Alternatively, may use publicly available music.
 - Warning: may need to obtain copyrights in order to play music in public
 - Music must be taken into consideration from beginning.

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Story Development



- Most critical part of process!
- Begin with one or two paragraphs to establish story idea.
- Will it work well as a visual story?
- Keep it simple! Must be doable in one semester.
- Don't expect Pixar quality. Process is more important than product.
- Pitfalls: Character motion too complex, too many difference scenes to model, convoluted story that is hard to tell visually.

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Example: Bully Ball

The Story



A glass named Stretch is hanging out on a table, minding its own business. Along comes an evil ball (BullyBall) that is hell bent on destroying Stretch. BullyBall bounces on the table, hits Stretch, knocking Stretch over the side of the table. Stretch, startled and frightened, falls down to the floor. Much to its surprise though, it simply bounces and pops back onto the table where it started. BullyBall is gone by now. Peace returns.

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Storyboard



- Goal is to tell the story visually.
- Simple stick figures are OK.
- Consider issues of look, style, camera
 - Collect reference material for characters, scenery, etc
- Should be able to give “pitch” consistent with length of animation.

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Storyreel

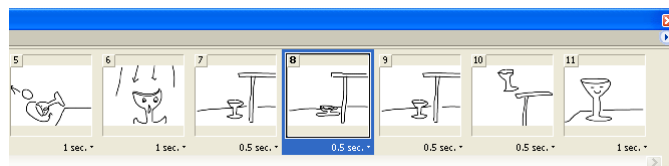
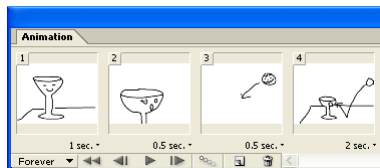
- Goal: Begin to develop rough timing
- Create using storyboards, eg. scanned into computer.
- Use Photoshop, or any simple video editing software to assign time to each storyboard.
- Result: an animation based on storyboards.

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Example: BullyBall

Story Boards and Story Reel

In Photoshop (Image Ready)



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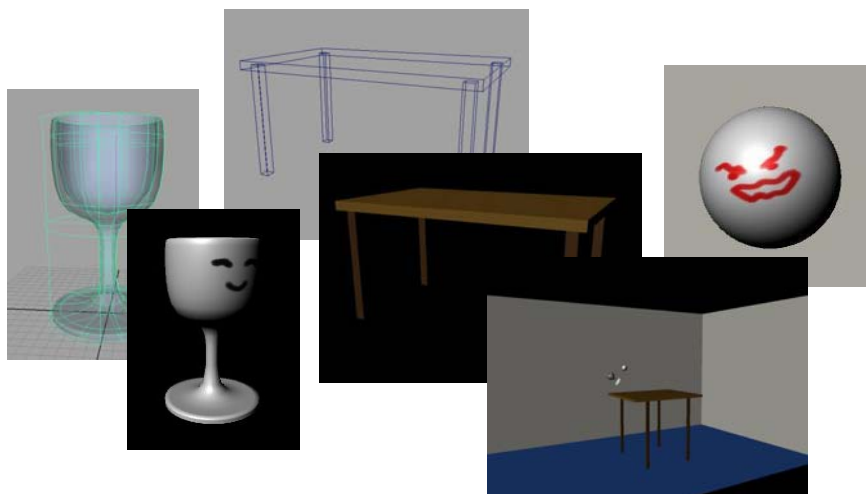
Character and Scene Modeling



- Goal: Develop Look and Feel
- Identify Audience
- Establish style, color, lighting
- What do characters look like and how do they move.
- Include only essential elements.

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Example: BullyBall Character&Scene Modeling



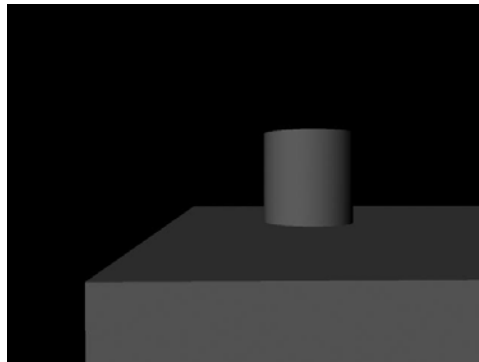
Animatics

- Goal: Refine timing, movement, camera.
- Important to get timing and camera as close as possible.
- Done in animation software, e.g. Maya
- Do not need to have scenes or characters modeled in any detail.

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Example: BullyBall **Animatic**

Timing, Camera, large scale movement



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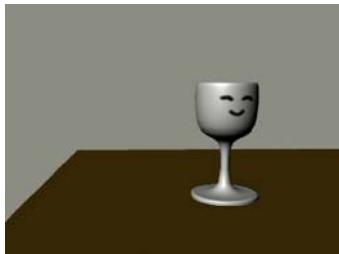
Animation

Start with Animatic:

- Bring in final characters, props, scenery
- Refine movement of characters
- Add Lighting, shading and textures
- Always try to have a “complete” animation (may be mixture of animatic and animation)

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Example: BullyBall Lighting, Shading, & Texturing



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Post-Production



- Use simple video editing software
- Combine scenes and shots.
- Add titles, credits

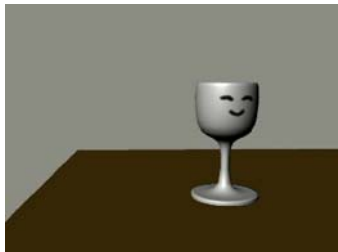
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Example: BullyBall Animation and Post-Production



[click here to see Animations](#)

Animation



with Lighting&Textures&Title



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Organization



- It is important to lay out assign all the tasks beforehand:
 - who does what.
 - when individual tasks are to be completed.
 - *Everyone must always have something to do.*
- **BIGGEST PROBLEM:** Communication among group members:
 - Helps if students share common lab time.
 - Use some class time for group coordination.
 - Establish electronic communications: Email, Blackboard, ...
 - Constant harassment by instructor.
 - Frequent deliverables (presented by group) to identify problems.

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Gantt Chart



Identify who does what when.

Create timeline which will serve as a “contract”.

Students must stick to this schedule.

| Week Beginning: | 17-Oct | 24-Oct | 31-Oct | 7-Nov | 14-Nov | 21-Nov | 28-Nov | 5-Dec | 12-Dec |
|---------------------|--------|--------|--------|-------|--------|--------|--------|-------|--------|
| Story | | | | | | | | | |
| Storyboard | | | | | | | | | |
| Storyreel | | | | | | | | | |
| Concept&Reference | | | | | | | | | |
| Animatics | | | | | | | | | |
| Char Modeling | | | | | | | | | |
| Prop&Scene Modeling | | | | | | | | | |
| Animation | | | | | | | | | |
| Shading | | | | | | | | | |
| Lighting | | | | | | | | | |
| Post processing | | | | | | | | | |
| Music | | | | | | | | | |

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Dividing up Work Among Team Members



- Animatics and Animation are time consuming:
 - Students create a shot list after the storyreel is complete. Animation and animatics of shots should be divided up among team members.
- Other tasks are assigned to different team members.
- *Everyone must always have something to do.*

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Conclusions



Inexperienced students can produce an animation in one semester if you:

- Keep It Simple!
- Maintain good communication among students.
- Establish contract for students to follow.
 - Identify many intermediate deadlines; make sure students stick to them!

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