3D Modeling & Animation

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Academic Integrity

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The latest version of this can be found here:
https://www5.njit.edu/policies/sites/policies/files/NJIT-University-Policy-on-Academic-Integrity.pdf

Objective

This class will be a hands-on, project focused course. This course is going to go into great depth on how 3D technology works, and specifically how to use the tools of the 3D modeling industry to create 3D assets and content for games and other media. Students will work on several small bi-weekly projects as well as two larger midterm and final projects. Each designed to challenge students to learn specific 3D skills

Use of Artificial Intelligence

All work submitted is expected to be the result of your efforts and your efforts alone. Use of AI is not permitted for submitted works.

Modality

This course is offered in-person once a week for 3 hours, with in-person office hours. A Discord server has been set up for this course as a supplemental way to communicate with your teams and the professor. The course also uses canvas to provide major announcements, a place to host the syllabus, and for the submission of assignments and documentation for the project. You are responsible for keeping up to date with your email, discord, and canvas.

Grading

- Bi-weekly Milestones (there are about 4): 20%
- Mid Term Modeling Challenge: 15%
- Mid-Term Project : 20%
- Final Modeling & Animation Challenge : 20%
- Final Project : 25 %

Course Materials

- Blender (available for free on any operating system: blender.org)
- GIMP (Free) or Photoshop (Not Free!)
- Canvas
- Discord
    - MIXR Lab: https://discord.gg/VGVQ3nrG5Y
    - Class: https://discord.gg/VZMcQTJJxA
- Youtube- Full of tutorials!
- Google Image Search

Submission Criteria

All students are required to maintain a project thread on Canvas. This thread is where students will post their project submissions for the bi-weekly and midterm / final projects. The Midterm and Final Challenges will be submitted through their respective assignment pages on canvas. All bi-weekly submissions, midterm and final projects should be zipped up and uploaded to the project thread. The zip file must contain:

- Your name in the filename
- The Name of the Submission in the filename
- Final Renders / Animations (PNG and MP4 preferred)
- Blend Project File (.blend)
- GIMP / Photoshop project file (xls / psd) if applicable
- Relevant additional files

Late Policy

Any projects that are submitted late will have a penalty of 1 point (of its percent value towards your final grade) per day late. Any project more than 7 days late will not be considered for grading. No exceptions.

Midterm Project

Pick one of your favorite games / movies / or shows. Find or take a screenshot of one iconic scene from your chosen subject and attempt to recreate it in blender. Your scene must contain at least 1 character, no less than 3 props, and at least 3 different lights. The scene / setting / room must be modeled as well, but only so far as what is on camera. You must demonstrate at least 3 different material effects (transparency, glow, particle hair, etc).

Final Project

You will once again pick a scene from one of your favorite movies / shows / games (it can be the same one, but pick a different scene) and this time you will need to animate the scene. The requirements from the midterm will still apply, and additionally your scene needs to also have armature and/or shape-key animations, as well as one advanced feature (geometry nodes, cloth physics, etc). Get professor approval before committing to the advanced feature.

Student Outcomes:

- Be able to identify the key components of a 3d model
- Be able to model objects in 3D
- Be able to create viable UV Maps in 3D
- Use the node system to create custom shaders and textures
- Create basic keyframe Animations
- Create Armatures for 3D Meshes
- Animate armatures
- Create objects with low polygon counts
- Export and Import with common formats
- Embed Metadata for use with game and interactive media systems
- Work off of reference art and turnarounds
- Basic Texture Painting

Milestones

- Week 1: Course Overview / Vocabulary
- Week 2: Blender Survival basics
- Week 3: Mesh modeling tools
    - Assignment 1 - Model a Prop (from a game / movie / tv show)
- Week 4: Materials and Lighting
    - Assignment 1 due
    - Assignment 2 - UV Map and Texture paint your Prop
- Week 5: UV Mapping Texture Painting
    - Assignment 2 Due
- Week 6: The Node Editor
- Week 7: Rendering & Render Engines
- Week 8: Midterm Project Due / Midterm Modeling Challenge Assigned
- Week 9: Animation Basics
    - Assignment 3 - Animate a Rube Goldberg Device
- Week 10:Armatures and Rigging
- Week 11: Weight Painting and Keyframe Interpolation
    - Assignment 3 Due
    - Assignment 4 - Animate your own version of the Pixar Lamp
- Week 12:Shape Keys
- Week 13:Final Modeling Challenge
    - Assignment 4 Due

- Week 14: Soft Body Physics
- Week 15: Final Project Presentations