

Welcome to 3D Foundations. The objective of this class is to take you through the entire CG production pipeline, in order to create a small, six-second movie. We will teach you, on a fundamental level, each phase of the production pipeline, creating all of the individual assets you will need to complete your movie. In the process you will learn, on a basic level, all about each phase, the order in which they take place and how they work together to produce a final product, your animation short.

Here are a few frames of an example of a final movie:



I know you may be asking yourself “What exactly does it take to make this movie?” Here is a breakdown of each of the phases of the production pipeline, the assets that must be created and what the requirements of each of these assets are. We will describe the assets and the associated requirements in greater detail, following the list below.

PIPELINE OVERVIEW

Pipeline Phase	Asset to be created
Pre-Visualization	Storyboards
Modeling	a Prop and a Character
Texturing	UV mapped Character Head
Rigging	a fully Rigged Character
Animation	a fully Animated Character
Lighting	a fully Colored Scene, Lit
Rendering	144 Still Images of your animation (imagine a flip-book)
Compositing	export a Quick Time Movie (.mov) of your final scene

Now we are going to break down each phase and explain the requirements for each asset of that phase.

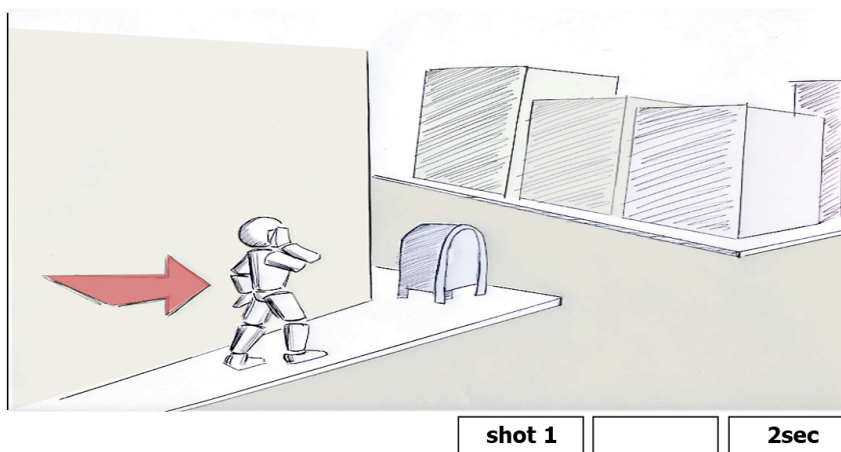
PRE-VISUALIZATION

Project: STORYBOARDS

For the pre-visualization phase, you will be selecting an animation idea from the 'animation ideas' document and drawing Storyboards, detailing exactly what your story is, how you plan to tell it and from what angle you plan on 'filming' your animation from.

Storyboard Requirements:

3DF Storyboard



character walks along sidewalk, talking on cellphone, oblivious

Select animation idea from 'Animation Ideas' document

Draw Storyboards (first submit rough boards, upon approval, re-draw and submit Final Storyboards on final storyboard template that we provide)

Technical requirements:

1. One camera angle for entire project (stationary)
2. 2-3 drawn frames depicting project
3. Show depth (perspective)
4. Include shadow information (shading to show volume, light direction)
5. Include written description of details pictured in each frame
6. Number shots (shot 1, shot 2 etc.)

Important aspects

1. Your entire project is based on your Storyboards, take your time and do them as well as you are able. The issues you resolve here will save you time and effort later
2. Once we approve your Storyboards, they are our 'contract'. You must deliver a final movie that executes exactly what you intended to do. There is a significant portion of your grade that is based upon whether or not your final movie matches your Storyboards

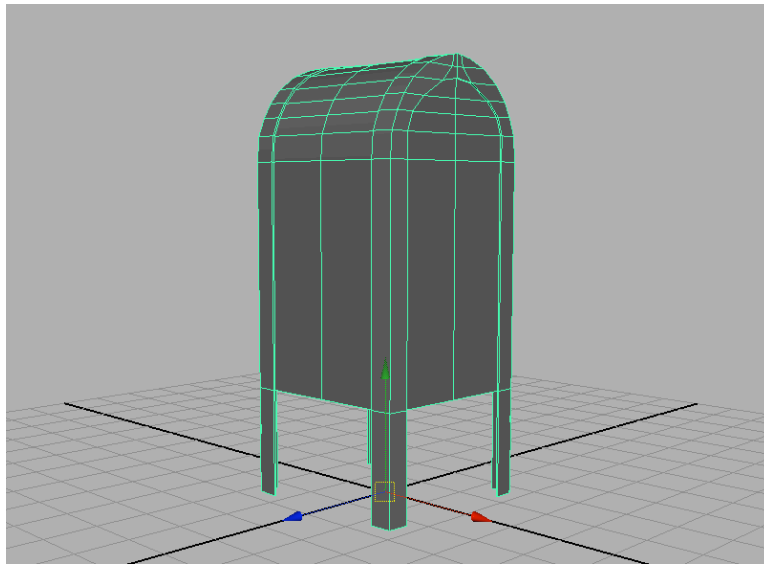
MODELING

Modeling Project 1 & 2: PROP1, CHARACTER

In the modeling phase, you will be building a Prop and a Character. A Prop is an inanimate object (hard surface) that exists within your scene. Your story does not have to directly involve the Prop, but it can be clearly seen in your Storyboard. Your Character is the main character in your story idea.

HARD SURFACE MODELING

Prop1 Requirements:



Model a 300-500 Polygon object (Prop)

Must be Seamless (one object, not combined/grouped series of objects)

All Quads (no triangles, n-gons)

Reference Image to work from

Must resemble reference images for that object

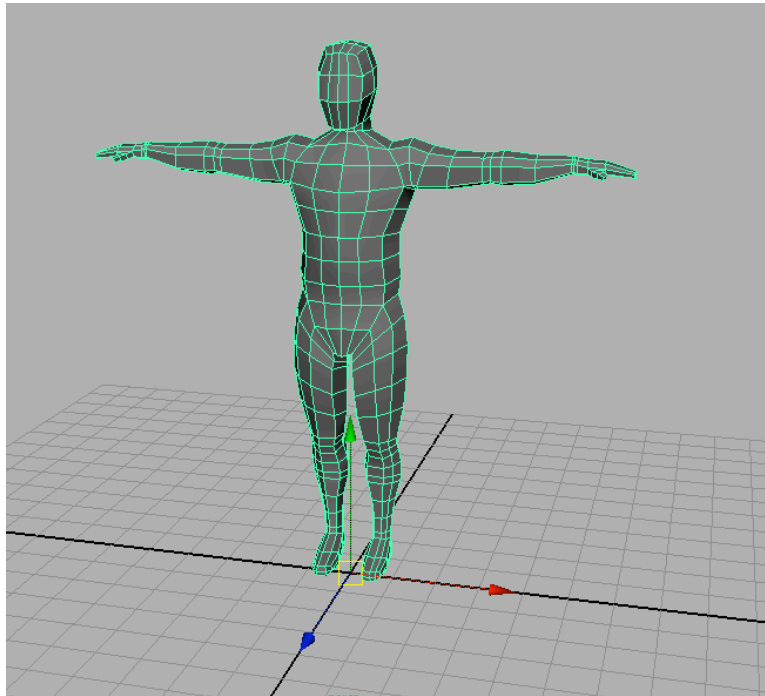
Efficient use of edges

Technical requirements:

1. Delete History
2. Freeze Transformations
3. Proper Scale
4. Center Object, Place on Grid, Move Pivot Point to Origin
5. Display in Wireframe
6. Center Object in all four Views
7. Save as .ma file 'Prop1'

ORGANIC MODELING

Character Requirements:



Model a 500-800 Polygon Character

Must be Seamless (one object, not combined/grouped series of objects)

All Quads (no triangles, n-gons)

Good shape/form

Clean edgeflow

Technical requirements:

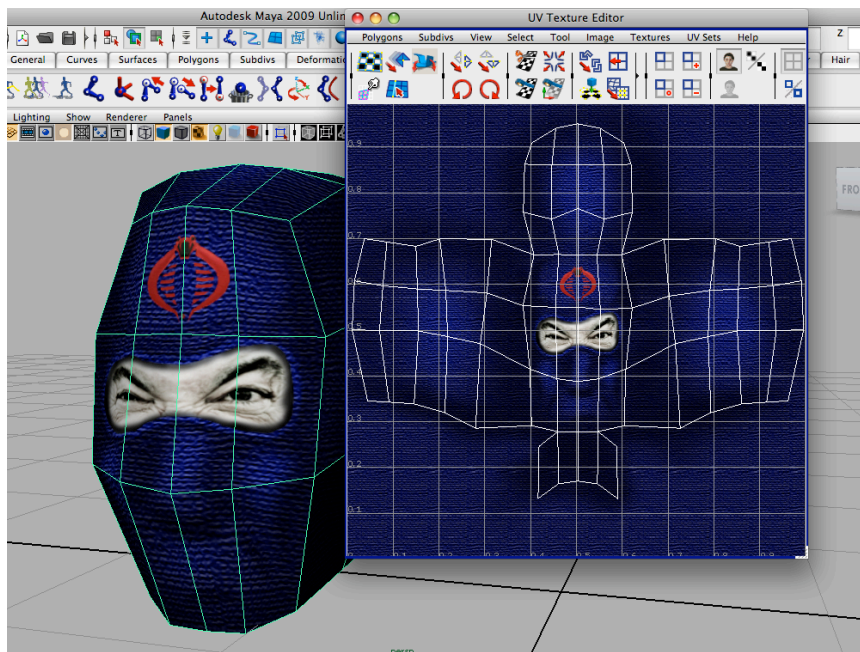
1. Delete History
2. Freeze Transformations
3. Proper Scale
4. Center Object, Place on Grid, Move Pivot Point to Origin
5. Display in Wireframe
6. Center Object in all four Views
7. Save as .ma file 'charMod'

TEXTURING

Project: TEXTURING

For the Texturing project you will be removing the head from your character, UV mapping the Head, Exporting a UV Snapshot out of Maya and importing it into Photoshop, Painting a texture (using both hand painted and photo-manipulated elements), re-importing that texture map into Maya and applying it to the head geometry. This textured head will not appear in your movie, it is merely an exercise.

Texture Requirements:



UV map Character Head
Paint Texture in Photoshop
Apply texture to geometry

Technical requirements:

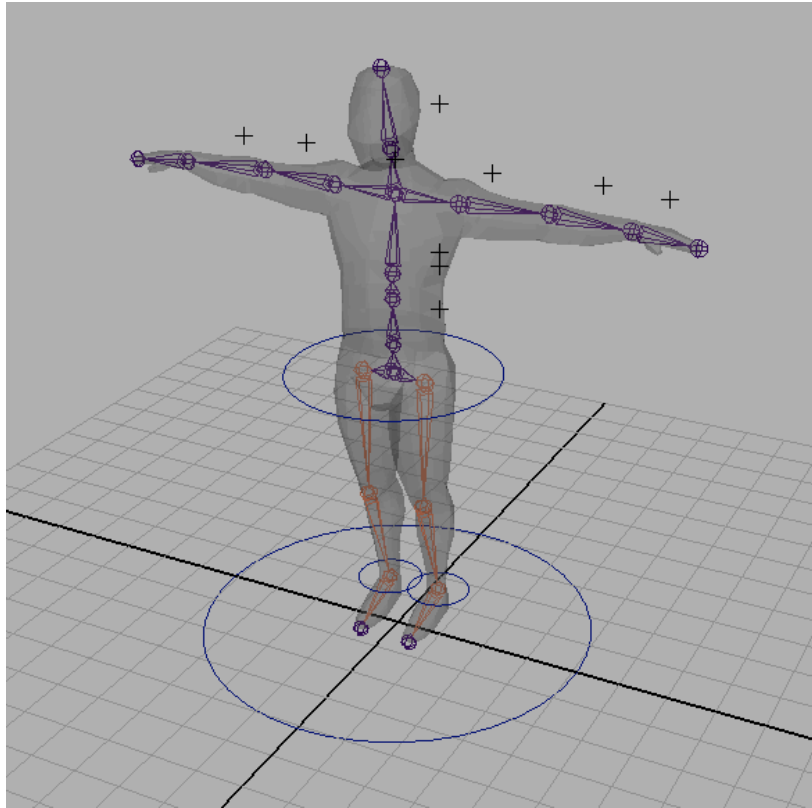
1. UV layout must be good (good orientation, minimal seams, no stretching of textures)
2. At least three layers utilized in Photoshop
3. Render head geometry in Maya, save image as .tif
4. Save Photoshop document (.psd) with all layers visible

RIGGING OR SET UP

Project: RIGGING

For the Rigging project you will be building the rig for your character. The rig is the skeleton that allows you animate your Character (charMod). You will build the joints and iconic controls and parent the 'puppet-style' geometry of your Character to the rig.

Rig Requirements:



Build rig for your Character (charMod) using FK upper body, IK lower body
Create iconic controls for the legs, hips and master control
Parent Geometry to rig

Technical requirements:

1. Rig must function properly
2. Joints must have transforms 'zeroed out', be aligned and oriented properly and named
3. IK must be placed properly by type
4. Iconic controls must be named, aligned properly, transforms frozen and history deleted

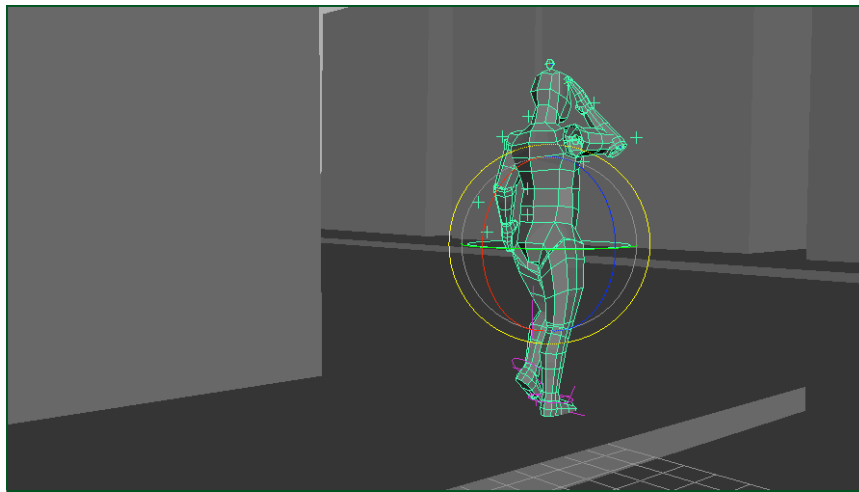
5. At least four selection handles must be created for FK joints
Geometry must be named, transforms frozen and history deleted
6. Save file as .ma (charRig)

ANIMATION

Project: ANIMATION

For the Animation project you will be animating your character, using the rigged 'puppet-style' character you created (charRig). Your animation will be six seconds in length and exhibit proper motion and timing, utilizing the 12 principals of animation.

Animation Requirements:



Six seconds of animation (144 frames)

Clear movement

Good timing of motion

Character must move the entire 6 seconds (cannot die, get knocked out or merely 'twitch' for any duration of time)

Keep character in frame the entire time

Keep flying and 'super ninja jumping' to a minimum

Technical requirements:

1. Animation must match Storyboards visually as well as the written details indicated
2. One camera angle only
3. Save as .ma (charAnim)

SCENE FINISHING

Project: LIGHTING

For the Lighting project you will be lighting your scene using a three point lighting set up and Image Based Lighting (IBL). Your scene must be lit to portray the feel or mood of the story you are trying to tell.

Lighting Requirements:



Must use at least three lights

Must have shadows in your scene

Use Image Based Lighting, if applicable

Color geometry using Hypershade

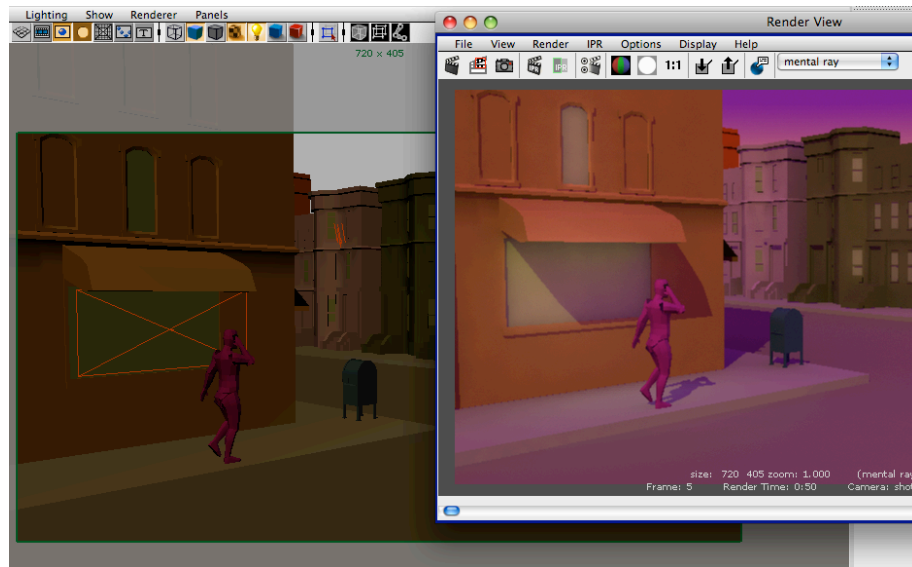
Technical requirements:

1. 3 light minimum
2. Use only Lambert material in scene
3. Good shadows in scene
4. Save as .ma (litScene)

Project: RENDERING

For the Rendering project you will be rendering out your final animation. We will be batch rendering using Mental Ray to create 144 individual frames, which will we will later composite in order to generate a final movie file.

Rendering Requirements:



Render using Mental Ray
Activate Final Gather
Activate Global Illumination
Activate Ray Tracing

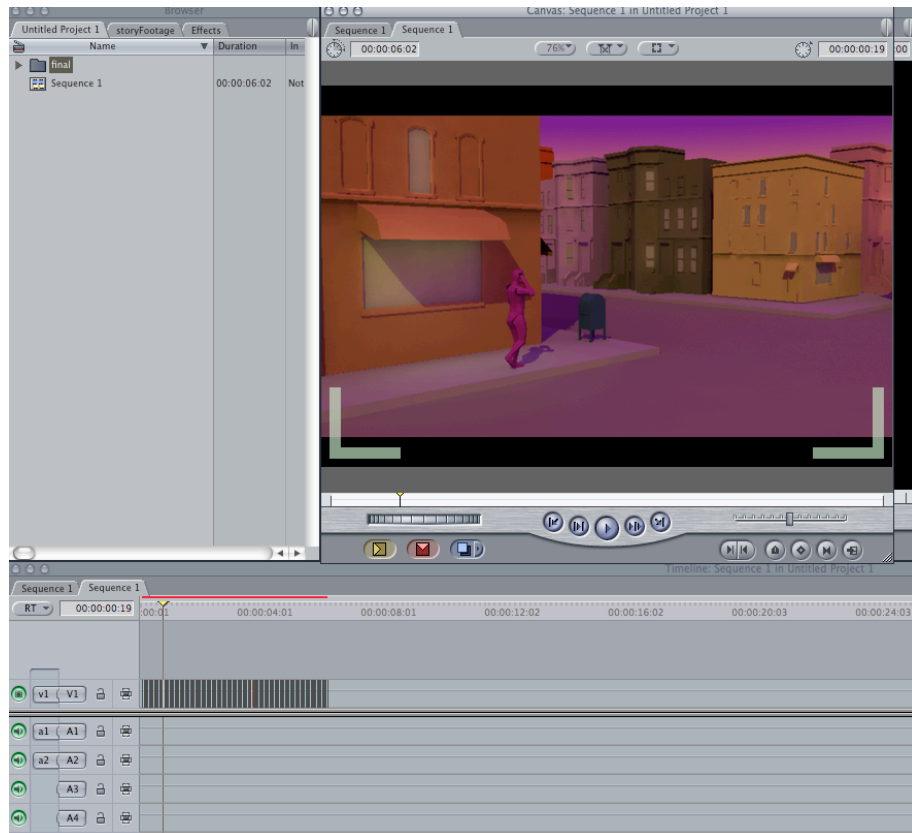
Technical requirements:

1. Resolution must be 720 x 405
2. Use Mental Ray render engine
3. Use Final Gather, Global Illumination and Ray Tracing
4. Generate 144 .tif files using Batch Render
5. Save as .ma (finalRenderScene)

Project: COMPOSITING

For the Compositing project you will be importing your 144 .tif files into Final Cut Pro and exporting them into a Quick Time movie.

Compositing Requirements:



Correct resolution and export settings
Final Quick Time movie must play properly

Pre-Import Settings:

1. Frame Size - 720 x 480
2. Aspect Ratio – Custom
3. Pixel Aspect Ratio – Square
4. Editing Timebase – 24
5. Compressor – H.264

Export Settings (Using Quick Time Conversion:

1. 720 x 405 resolution (Custom setting)
2. 24 frames per second frame rate
3. Best Quality
4. Compression – H.264
5. Multi-Pass checked
6. save Quick Time file as 'Final.mov'

