

Intermediate 3D Modeling Hard-Surface Project

Project background

In order to advance your skills in creating inorganic surfaces, you will create either a product visualization or an architectural visualization. In many cases, you will strive for hyperrealism (an idealized representation of reality, with pristine surfaces), which commonly appeals to the advertising market that is quite active in the Twin Cities area. As a potential exception, you may propose the creation of a vintage object or wear-and-tear space, which can appeal to broadcast, film, and videogame markets. In this case, it is essential to establish a narrative of how human, natural, and mechanical interaction has changed the original object or space.

Regardless of what direction you take with this project, you will build your models in Intermediate 3D Modeling, and then texture, light, and render the models in Materials and Lighting. A professional level of quality is expected throughout the process, resulting in a portfolio-quality piece that shows off your prowess in the creation of realistic, inorganic surfaces.

Student outcomes

Through this project, you will:

1. Find or create photographed references of products or spaces
2. Create accurate, orthographic references based on photographic source material or actual objects (such as by illustrating plan and elevation views of an architectural space, or through photographing, flatbed scanning, or illustrating a product)
3. Use orthographic references in 3D software as modeling reference
4. Create accurate 3D forms based on references
5. Create 3D models with clean topology and appropriate mesh density
6. Organize the pieces of the 3D model into logical, pipeline-friendly hierarchical structures and naming conventions
7. Present the 3D scene using appropriate camera/composition and lighting/rendering techniques suitable for examination of an untextured model (in what is sometimes called a “clay” pass)

Project guidelines

1. Start by determining whether you will create an architectural or product visualization. Keep in mind architectural spaces must be *interiors*, and products should generally be a size appropriate for a tabletop studio session (i.e. not much bigger than, for example, an electric guitar ... vehicles are typically not appropriate for this project). Look for examples of high-quality visualizations online to understand where the industry bar is set.
2. Select a specific space or product. Gather, as much as possible, professionally photographed references of your subject. If you propose *designing your own* product or space, gather several references of similar subjects to use in

communicating your intent, and then illustrate your design. At this time, *the instructor must greenlight your project before you proceed.*

3. Before proceeding, create a Maya project directory structure on a storage device such as your removable drive. You can find how to do this online, and doing so is the first step in implementing the all-important task of file management. Once you have created your project, I advise creating an additional project sub-folder named “prepro,” in which you can place your photographic references of your subject. I use this folder for preproduction assets, such as those I find while conducting research, and storyboards I create for animated sequences.
4. The next step is creating orthographic references. *Your references will be submitted for assessment – check the syllabus weekly outline for details.* Please submit your references in a JPEG format.
 - a. *In the architectural case*, you will most likely need to mentally translate the photographed references into a plan view (from the top) and an elevation view (from the side), similar to a blueprint. Attention to scale and proportion is important (e.g. figure out how high should a kitchen island countertop be, or the standard rise and run of a stair), and as such you should research architectural graphic standards. This can be as simple as asking Google what the standard dimensions of a residential door are, for example.
 - b. *In the product case*, you may be able to find telephoto (i.e. long-lens) photographs online that are intended to present the object in a mostly orthographic fashion. If you have access to the actual object, we can photograph it with a telephoto lens, or put it on a flatbed scanner depending on its form. Barring this, you must mentally translate your references into orthographic illustrations from the most useful angles.
 - c. *In the case you are designing your own object or space*, you are required to create a “callout sheet” that shows illustrations of your subject with inset photographs that indicate what various parts of your design are based on. Examples of callout sheets are available on the Internet and may be made available by your instructor as well.
5. Put your orthographic images into the “sourceimages” folder of your Maya project. You will import these into Maya as Image Planes. Placing and aligning these is important! Check Digital Tutors for the course called “10 Ways to Improve Your Modeling in Maya,” which contains a lesson on working with image planes. (If this particular course is not available, there are other online resources available.) Give it a go – then ask your classmates for help, and finally your instructor if a handful of people are struggling.
6. A primary consideration in the assessment of your work is *form*. Through online research and in-class demonstrations, you will develop a variety of

strategies for translating your references into accurate 3D forms. The pieces of your model should feel like they fit together just as in their real-life counterparts, points of movement (like hinges or knobs) should appear functional, appear to be to-scale relative to one another, and so on. One good rule of thumb is that if an object is built from multiple pieces in real life, use the same separate-pieces-assembled-together strategy for your 3D models. This isn't optimal every time, but in many cases it will lead to a better-looking result with less work than trying to do too much with one poly mesh.

7. The assessment of your work will also include *topology*. In addition to good form, a professional model needs good edge flow, appropriate mesh density, mostly four-sided poly faces (“quads”), and other considerations which will not only help ensure good form but also facilitate easier UV mapping, sculpting, rigging and deformation, and more. There are many considerations here, and they will be discussed both in class and in your online research.
8. Another important part of your project assessment is *data management*. In this case, that means you have deleted all construction history from your objects, cleaned up any unnecessary nodes in Hypergraph, organized nodes into hierarchies by spatial or functional association, and named important nodes. Specific considerations will be discussed in class.
9. You will be shown methods for composing, lighting, and rendering your final model. Since it will be untextured, you will present what is sometimes called a “clay” version of the model. Your instructor will give you specific technical requirements for what you will submit for assessment (you will always turn in your final Maya file, but single images or image sequences will also be required).
10. Finally, *professionalism* is important, which includes having your work completed and prepared by the deadline, being present to show your work to the class during critiques, and following instructions for submitting files. You will be expected to follow technical requirements like image resolutions, codecs, and file formats; turn files into particular locations, and use specific naming conventions. This is especially important if you are working toward becoming part of a production pipeline, where many people are working on the same project, assets are handed off from one person to another, and automated processes (such as computer scripts that batch-process files) may be in place to help move the production forward.

Project assessment

You will be provided with a rubric that details how your work will be assessed. It is worth reading through this rubric to get a sense of what is considered professional-quality work, and what falls short.

Please note the weekly outline in the syllabus for important submission deadlines. Remember that submissions are due in a specified location five minutes after the scheduled class start, unless otherwise specified.

For submitting *reference images*:

Dropoff/Shannon Gilley/interMod/hardSurfaceReferences/*lastnameFirstname/*

Files to be submitted: At least two orthographic images, and up to five additional references (photo-based, etc.) in JPEG format

For submitting the *completed project*:

Dropoff/Shannon Gilley/interMod/hardSurfaceFinal/*lastnameFirstname/*

Files to be submitted:

- Your final Maya file
- An image sequence with animated camera and proper lighting/rendering, OR 3-5 still images, depending on your instructor's specific instructions.