**Design Statement – Spider Model and Animation**

For this project I set out to produce a 3D spider model and a walking animation to use in a game I was calling ‘Spiderlich’ at the time. I referred to images of European domestic house spiders, tegenaria domestica, while shaping the spider model using 3D Studio Max. I gained familiarity with some of the tools of the program in the process. I combined base 3D shapes repositioning vertices as I went to represent the spider’s shape. In order to ensure the model was largely symmetrical I used mirroring. After I had made final adjustments to the model, I rigged it, adding bones to be used during animation. Then to create the walking animation I referred to videos of spiders as well as this unattributed [clip](https://www.youtube.com/watch?v=GtHzpX0FCFY). I placed target vertices for the feet at different keyframes of the animation to coordinate the movements of the legs and attempted to simulate a motion of lifting and reaching forward with one set of feet while simultaneously pushing backwards with the other set of feet.

I then created a scene in Unity, added the spider model to it, as well as an animator object to handle the animation, and a cube to test physics capabilities. Finally I wrote a script in C# to establish the movement behavior that the spider would walk to locations where the player right-clicked using the walking animation. Additionally, in the process of writing this script I added statistics for debugging.

In working on this project I gained experience working in 3D Studio Max and learned a few new techniques to aid with model production, such as mirroring. I spent a lot of time making adjustments to the model, sometimes positioning individual vertices, and that practice has definitely contributed to my comfort using the program. I also learned about 3D model rigging and animation within 3D Studio Max as well as integrating such animations into a Unity game using an animator object. In sum, working on this project I gained invaluable experience developing 3D models, and learned about the process of rigging and animating 3D models.

**List of Files:**

Video -

<https://www.youtube.com/watch?v=cpFHuYHj-84>

Spider Model\* -

<https://github.com/toadSTL/LCAD_Application_Portfolio/blob/main/Spider_ModelAndAnimation/07_Brown.FBX>

Spider Movement Scene\* -

<https://github.com/toadSTL/LCAD_Application_Portfolio/blob/main/Spider_ModelAndAnimation/08_Brown.zip>

**Design Statement – Tabletop RPG Collection**

This is a collection of pieces I have produced over the last few years for tabletop roleplaying games. It includes a set of blueprints I produced as a hand-out for a game I ran; a map of a shanty town I used in a game I ran; and character art I created for a player character that I played.

The design of the mechanical figure depicted in the blueprints is reverse engineered from a piece titled Steampunk Dinosaurs by an artist with the handle Sumerky on deviantart.com. The scale I chose for the figure, each grid square of the image representing a 5 ft square, is intended to be convenient for use within the D&D combat system. After sketching the figure, I used loose lines, leaving some circles along the neck and tail incomplete, and the annotations to indicate that within the setting the document was hand-made.

The map is of a shanty-town in the Shadowfell, an alternate plane of existence in the universe of Dungeons and Dragons (D&D) characterized as bleak and desolate. To produce the map first I sketched a layout, and painted gentle hills of gray dirt. To depict the buildings, I layered shades of brown in lines perpendicular to a primary axis, these elements intended to indicate roof slats and a crossbeam, respectively. The benches as well as four tower structures, and a few of the buildings are duplicated layers rotated and in cases transformed.

To depict the character, I first sketched the figure, gathering reference images as needed for particular elements. Then I did line-work to render the character in a cartoon style. I introduced flat colors and different values for parts of the jacket to indicate shadows. Next, I rendered the face, with special attention to the eyes and the shadows downward side of the face.

All three pieces were created using Photoshop and my Wacom Cintiq pen display. While creating these pieces I gained familiarity and expertise with photoshop. I familiarized myself with additional keyboard shortcuts and features, including image adjustments, filters, and certain textured brushes. In particular I learned to refine the edges of a selected area, which was useful in adding color to the character. I also benefited from the practice drawing with the Cintiq and have since been able to improve my shortcut layout with the Cintiq’s built-in buttons to expedite my workflow. Ultimately my work on these projects has expanded my knowledge of Photoshop and the Cintiq, while helping to maintain and improve my skills at drawing.

**List of Files:**

Blueprint Handout Side - <https://raw.githubusercontent.com/toadSTL/LCAD_Application_Portfolio/main/TabletopRPGCollection/02_Brown.jpg>

Blueprint Handout Above –

<https://raw.githubusercontent.com/toadSTL/LCAD_Application_Portfolio/main/TabletopRPGCollection/03_Brown.jpg>

Town Map -

<https://raw.githubusercontent.com/toadSTL/LCAD_Application_Portfolio/main/TabletopRPGCollection/04_Brown.jpg>

Character Art - <https://raw.githubusercontent.com/toadSTL/LCAD_Application_Portfolio/main/TabletopRPGCollection/05_Brown.jpg>

**References:**

<https://www.deviantart.com/sumerky/art/Steampunk-dinosaurs-259622817>

**Design Statement – Farm Game Prototype**

This project was intended to be a prototype for a future game somewhat similar to Stardew Valley and its predecessors in the Harvest Moon series. The goal for the prototype was to replicate the core functionality of Stardew Valley. The pixel art used in this prototype is variously sourced, and is not my own work. The player sprite is from Harvest Moon for the DS and was obtained from a webpage listed in the references below, along with references for the inventory items, and the tile-set. I performed preprocessing as needed for all of this pixel art, creating a tile-map formatted for the Godot engine, and cleaning up and scaling sprites. I was very pleased also to find an active community of developers making tutorials for the Godot Engine, some of which I used to help implement this project. I have listed references to those tutorials I used as well.

To implement the game, first I created a scene for the player, with an animated sprite, and wrote a script to handle player behavior. This and other scripts for this project were written in gdscript, a proprietary scripting language for the engine which is similar to Python. At first it was simply a WASD movement scheme. Next, I created animations from the sprite sheet for the player walking and running and added the ability to hold the SHIFT button to run. For the inventory, each of the menus, and the items, I created scenes and scripts to handle behavior. Finally, I created a scene to demonstrate the functionality that I had implemented, and went on to implement spoofed z-axis jumping and a platform onto which the player could jump.

In creating this prototype I learned a great deal about Godot since it was my first project using the engine. Within Godot I learned to animate sprites, script behavior in gdscript, use TileMaps, use signals to communicate between game objects, creature UI elements and much more. Having practiced with other engines like Unity, in learning about Godot I also learned about game engines generally. For example, in the process of dealing with animation handling I encountered the idea of a ‘blend space 2d’ in Godot, which is similar to the ‘blend tree’ in Unity, and used it to handle different directions for the ‘same action’, i.e., walking east vs. walking west. Noting this similarity will convince me to look for similar features in other engines I use. Through developing this prototype, creating the game objects and integrating their behavior, ultimately, I broadened my gameplay programming skills.

**List of Files:**

Video -

<https://www.youtube.com/watch?v=j6vK4RtBaBU>

Game Prototype Demo\* -

<https://github.com/toadSTL/LCAD_Application_Portfolio/blob/main/FarmGamePrototype/09_Brown.zip>

**References:**

Art -

Player Sprite: <https://www.spriters-resource.com/ds_dsi/hmdscute/sheet/43936/?source=genre>

Terrain: <https://szadiart.itch.io/craftland-demo>

Items: <https://shubibubi.itch.io/>  
Gameplay -

Z-axis Jumping:

<https://www.youtube.com/watch?v=jgf-95jgBHI&ab_channel=sco_otr>

Inventory System:

<https://www.youtube.com/watch?v=FHYb63ppHmk&list=PLY1jY0hbmKxBvcEHa0k5Aw8_MKoB6jrRU&ab_channel=Arkeve>