



ENVIRONMENT DESIGN PRESENTATION

(ACCA4032)

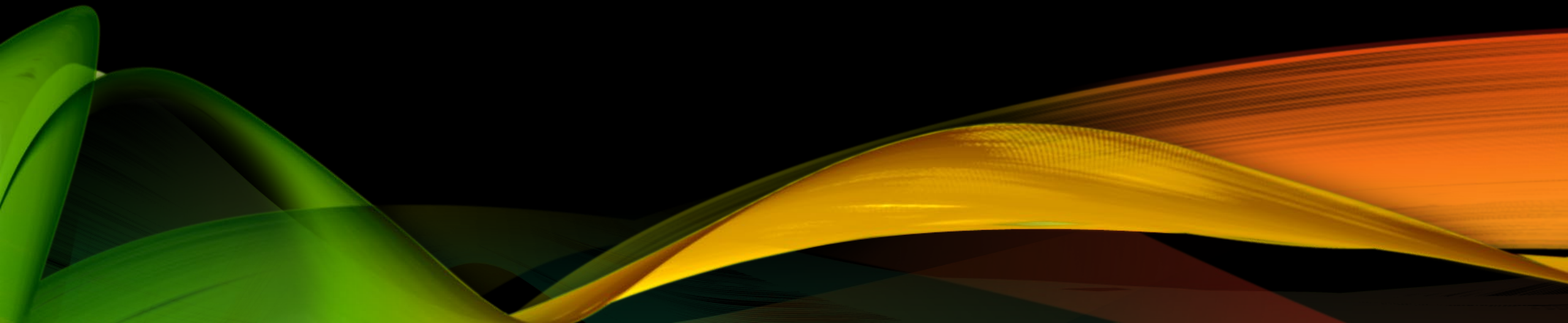
Michael Dawe (2206831)

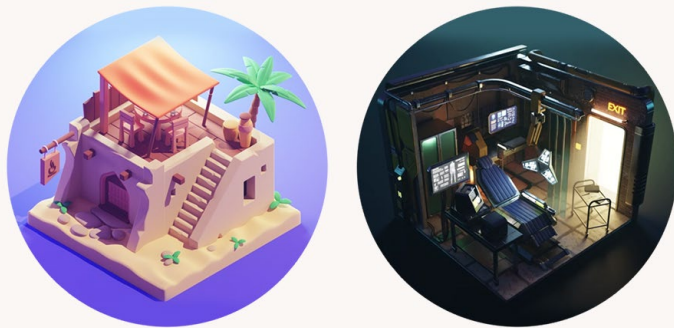


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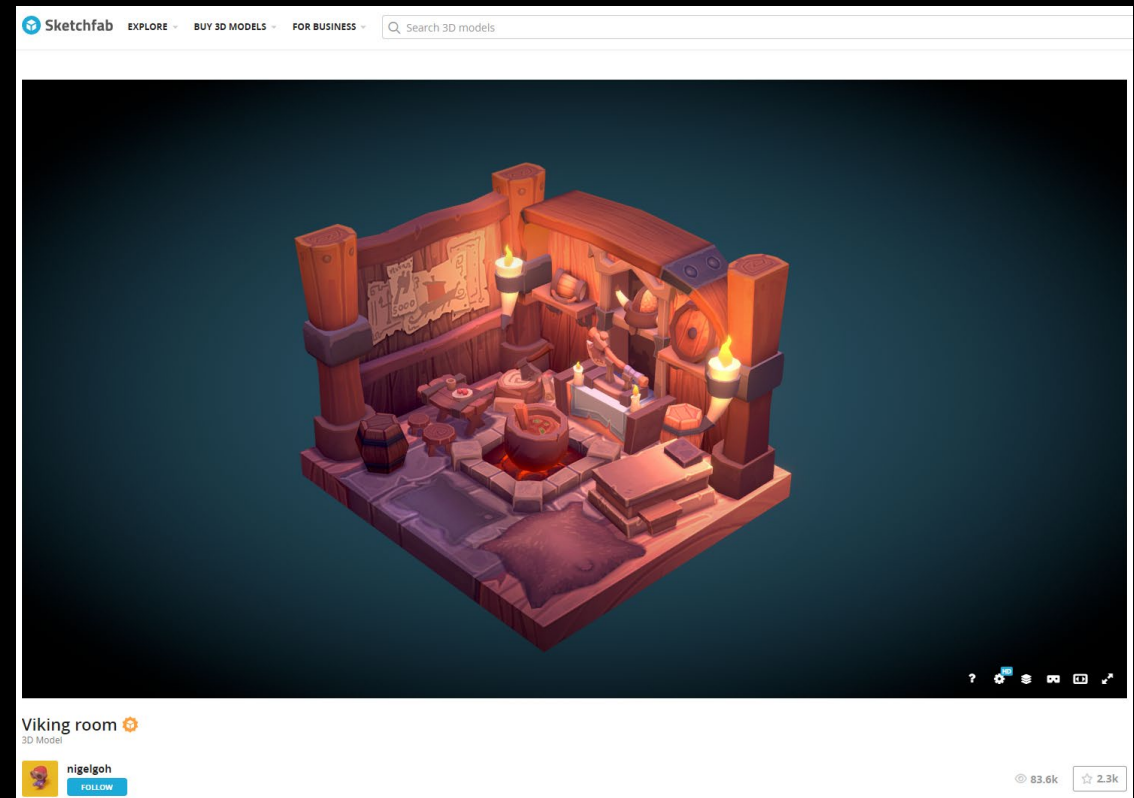
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Stylistic Inspiration

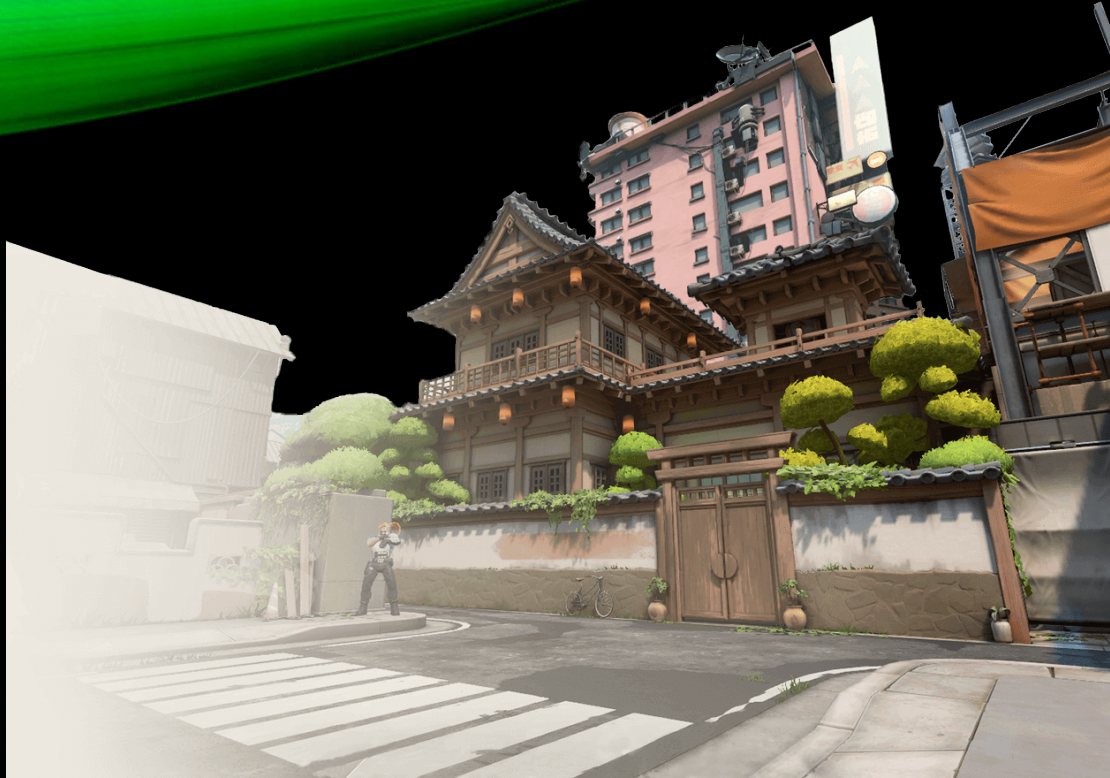




Original Inspiration from the course Moodle page.[1]



An interior scene with painted textures.[2]

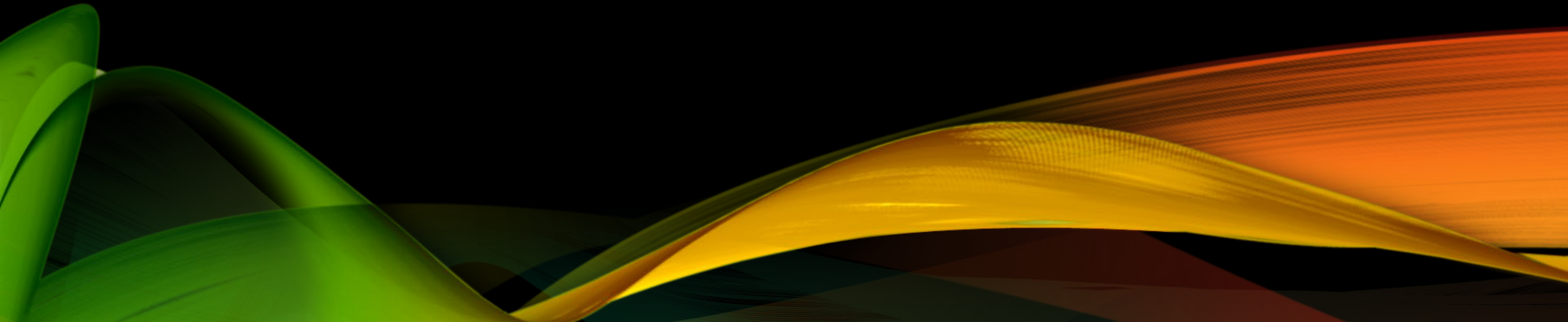


Example of art in Valorant.[3]



An Example interior published by the Blender Foundation.[4]

Research and Resources





I used Maya for 3D modeling and scene composition.[5]



I used Rough Animator on Android for animated texture work.[6]



I used Infinite Painter on Android for texture work.[7]



I used Arnold to render my scene.[9]



I also used Adobe Photoshop for texture work.[8]



I used Unreal Engine to show my scene in a game environment.[10]

I used LinkedIn Learning to research Maya and Photoshop techniques:



Maya 2023 Essential Training

With George Maestri · Liked by 295 users

Duration: 3h 59m · Skill level: Beginner · Released: 7/25/2022

The main resource I used for Maya.[11]



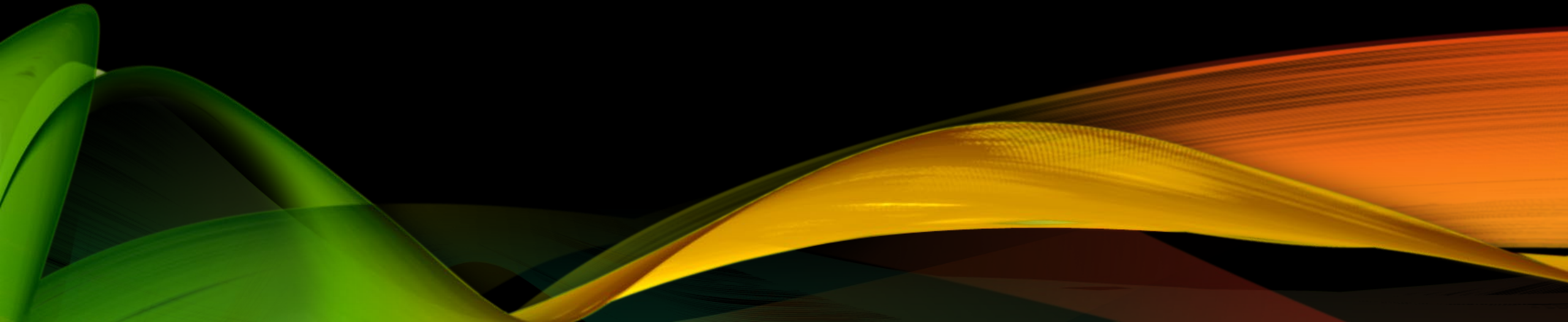
Photoshop 2022 Essential Training

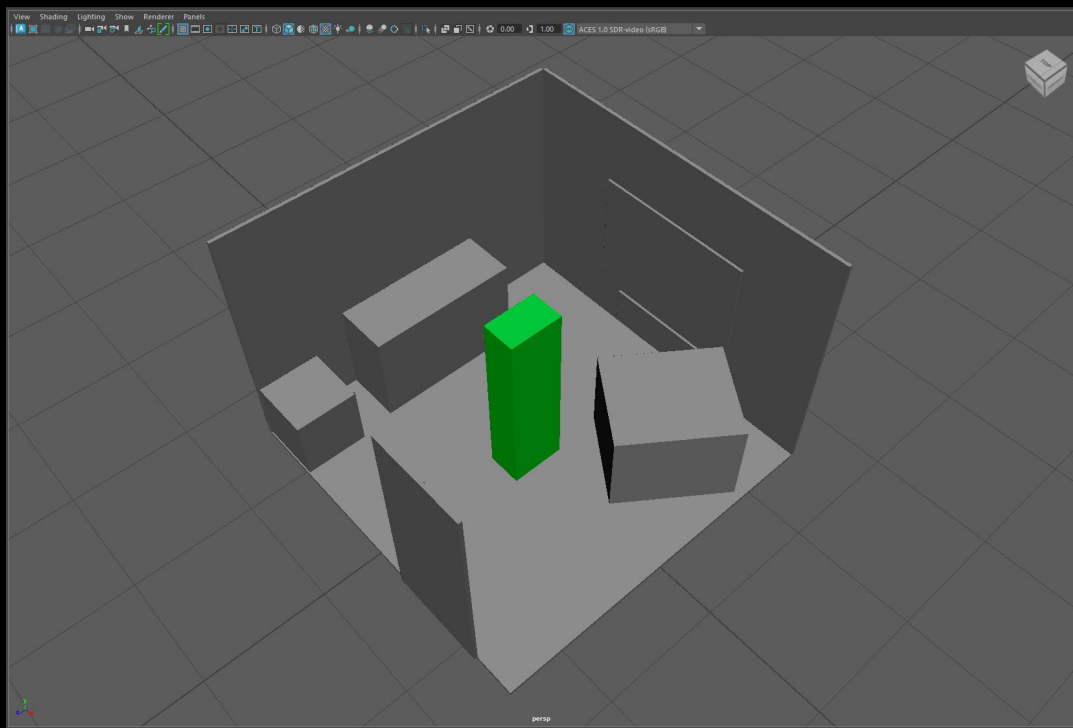
With Julieanne Kost · Liked by 2,452 users

Duration: 9h 7m · Skill level: Beginner · Released: 11/5/2021

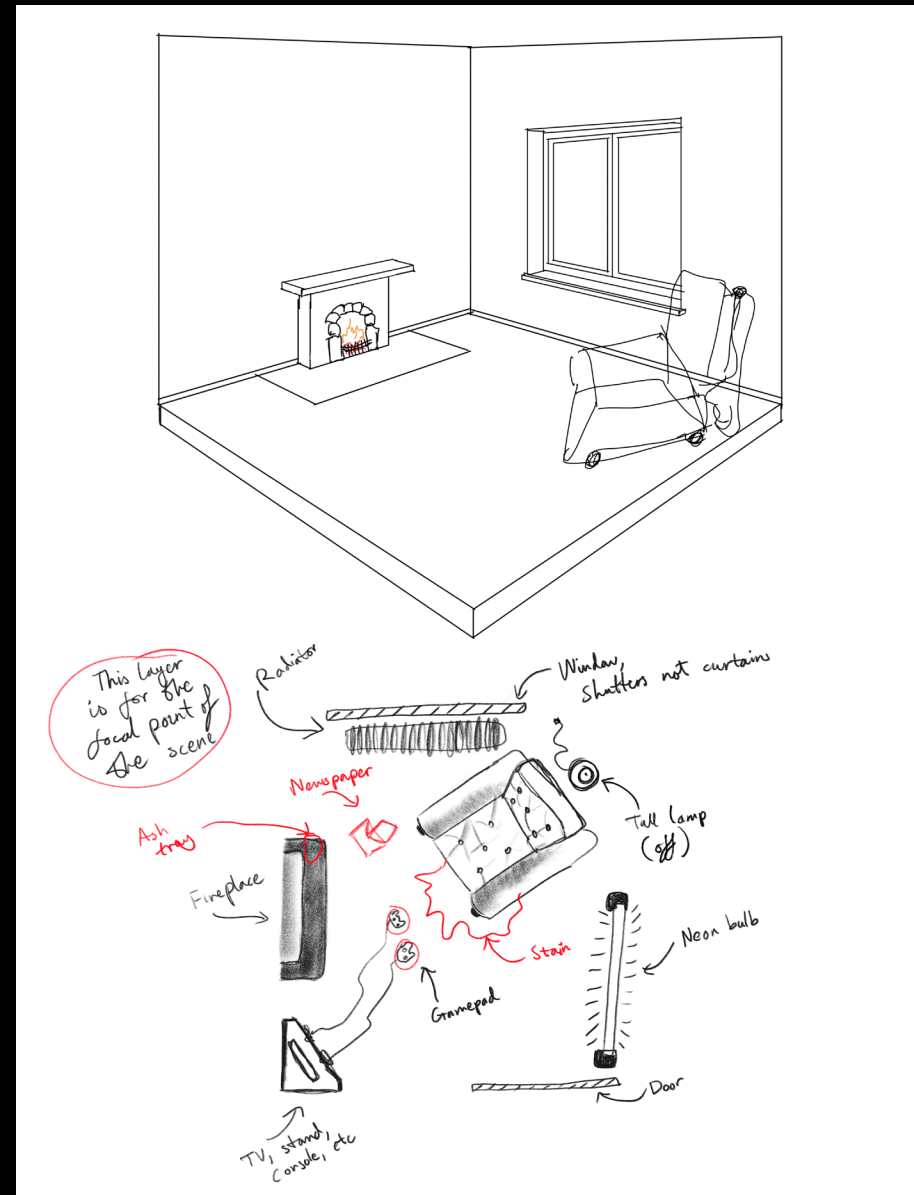
The main resource I used for Photoshop.[12]

Diorama Layout



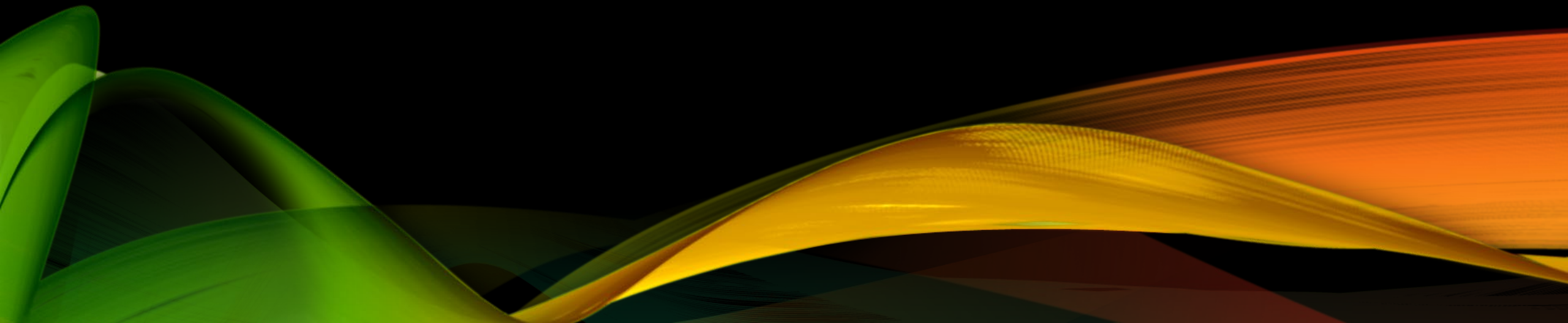


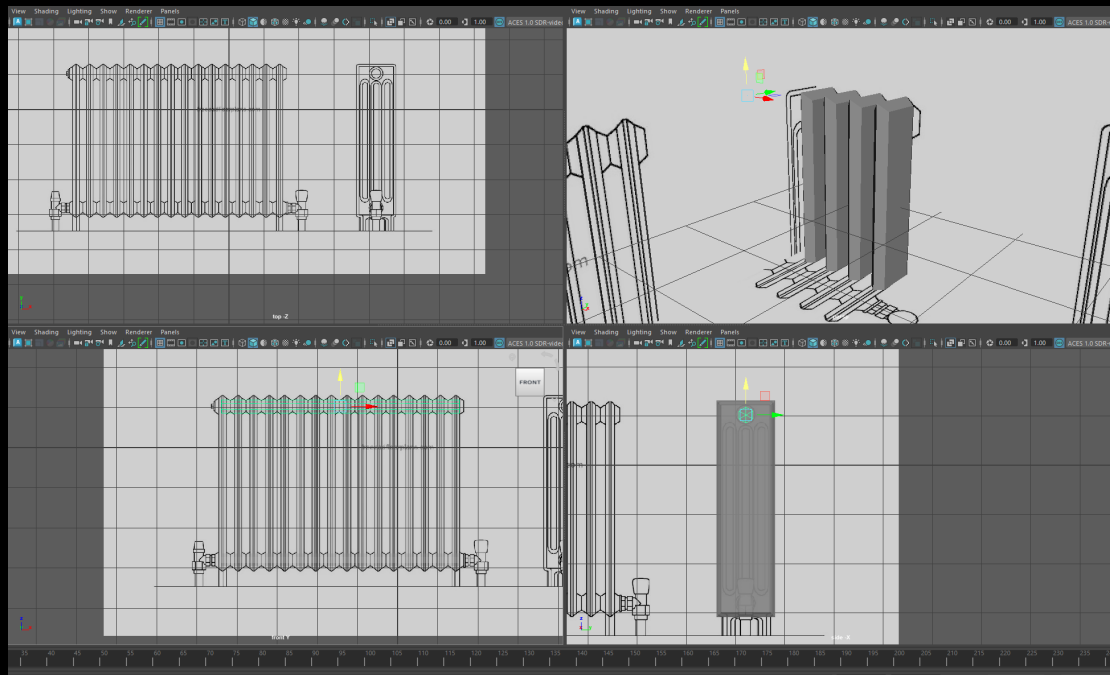
My original whitebox scene, the green cube is set to the average dimensions of a human.



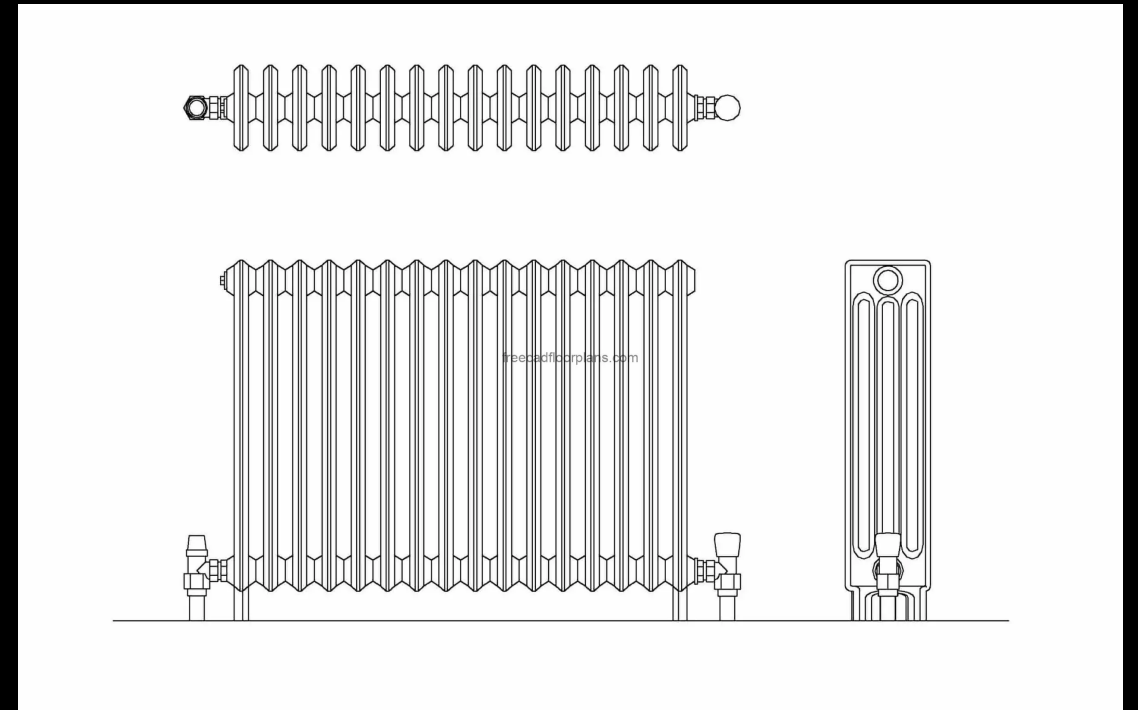
My early concepts for the scene layout.

Modelling





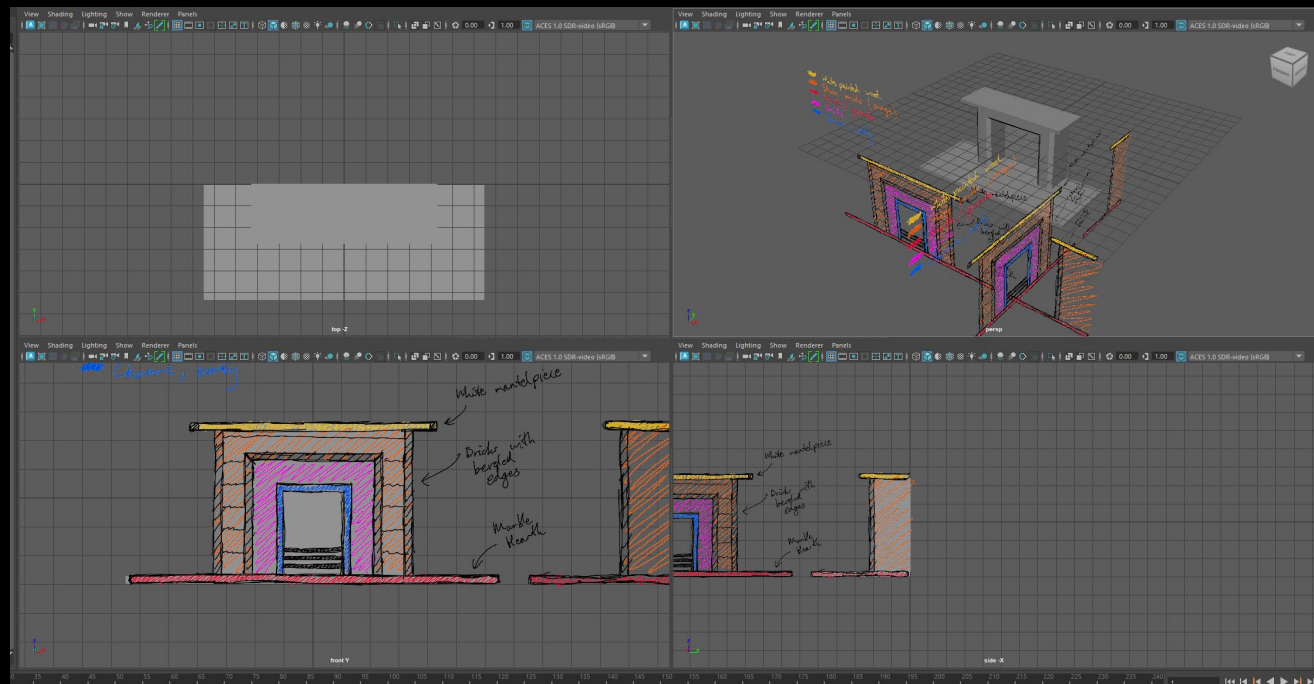
Screenshot of Maya orthographic views used for modeling the radiator.



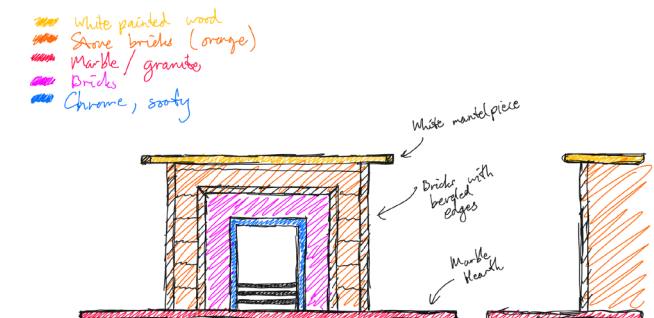
I used a radiator plan from freecadfloorplans.com.^[13]



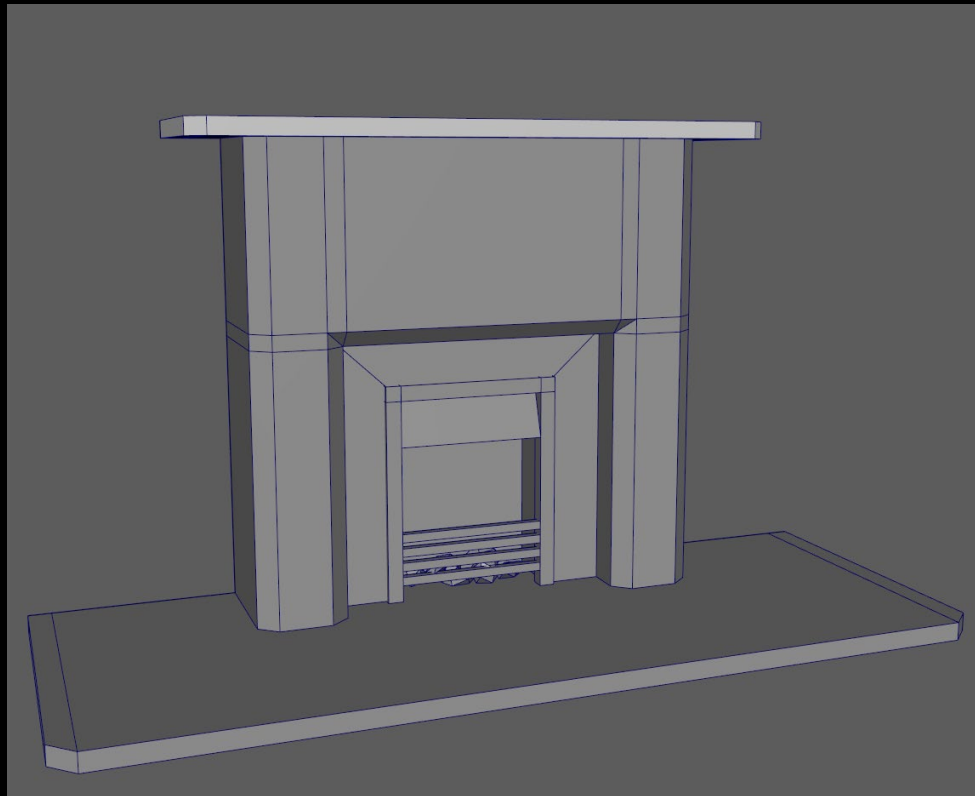
Inspiration for the fireplace.[14]



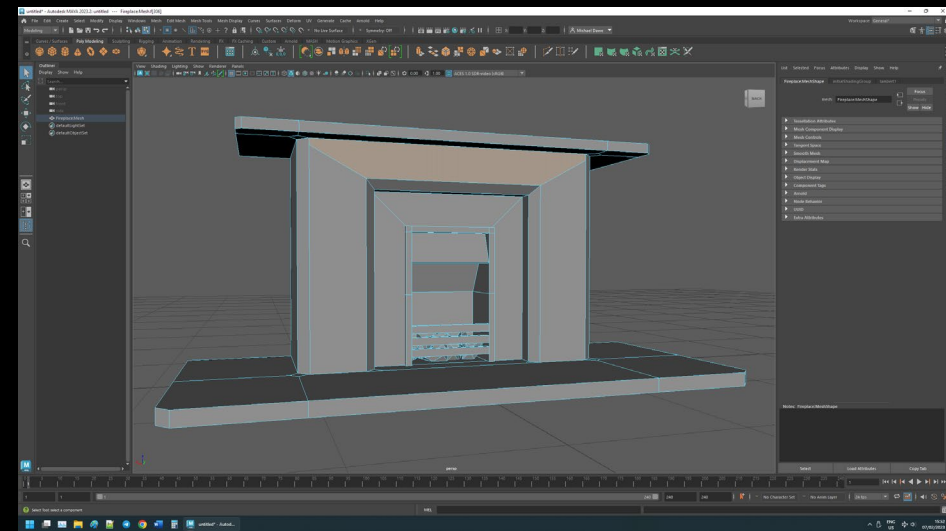
Modeling the fireplace.



My orthographic drawing for the fireplace.



Final fireplace model.

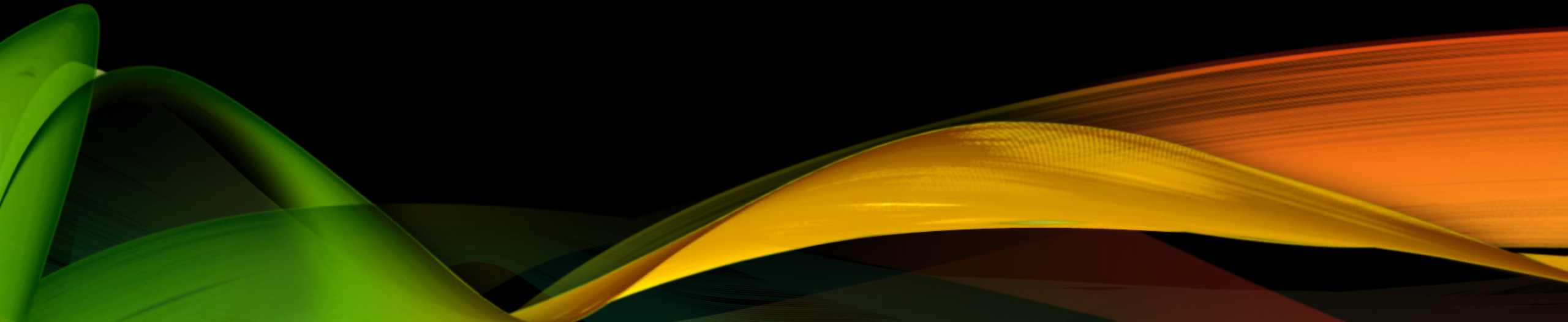


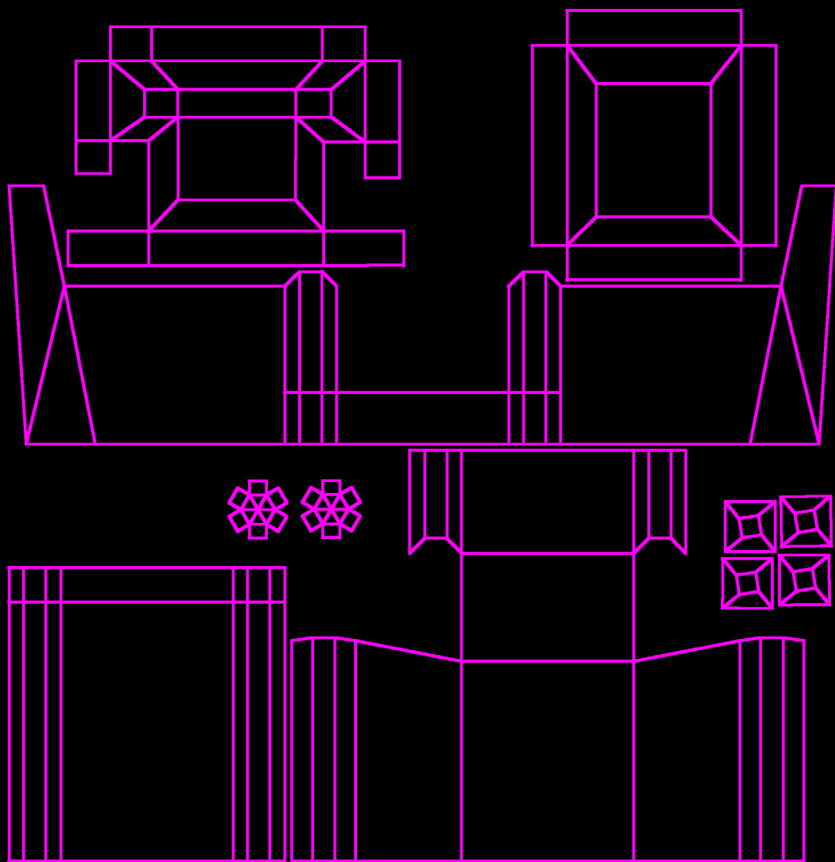
First edition fireplace 3D model.

Some of my models went through multiple revisions, this was one of my first models, and as such the original version (above) proved very hard to UV unwrap and contained a combination of tris, quads, and n-gons, due to my use of the bevel tool on some of the edges and not others.

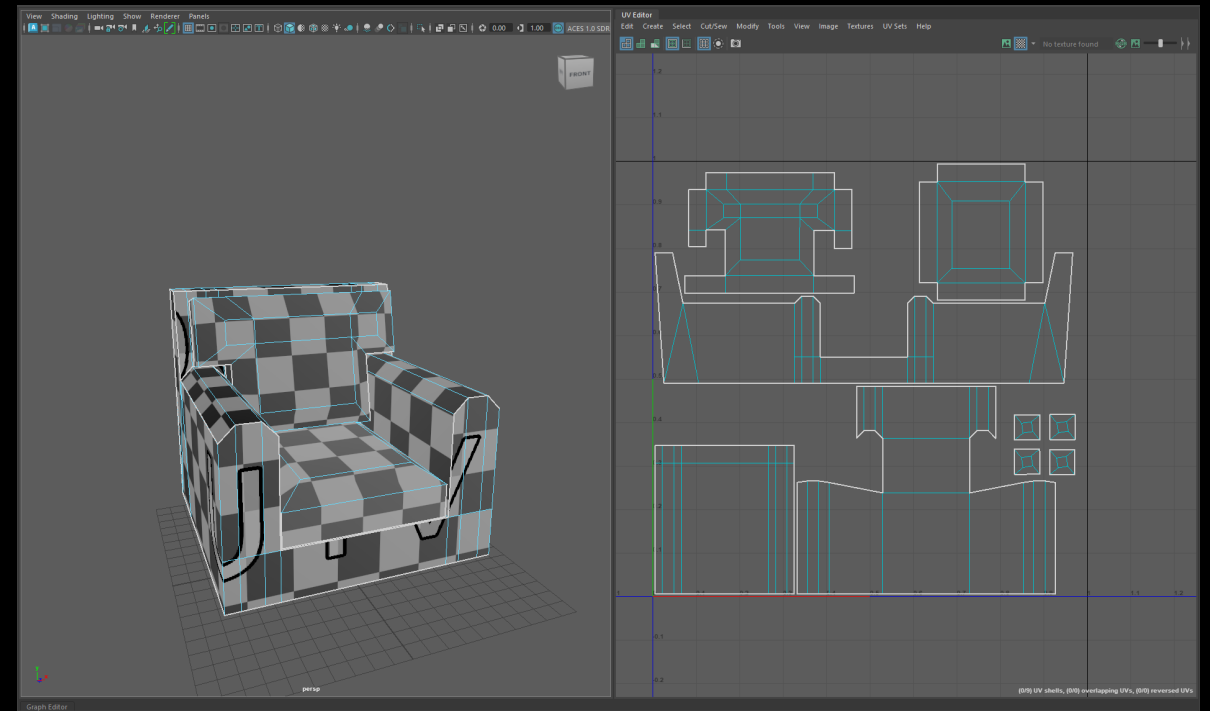
The fireplace model on the right was re-made from scratch, and is largely made up of quads, although there are some tris, for example on the beveled inner corners. All geometry was made using extrusion and the edge loop tool, and it was UV unwrapped in the same sitting as being modeled.

UVs and Textures





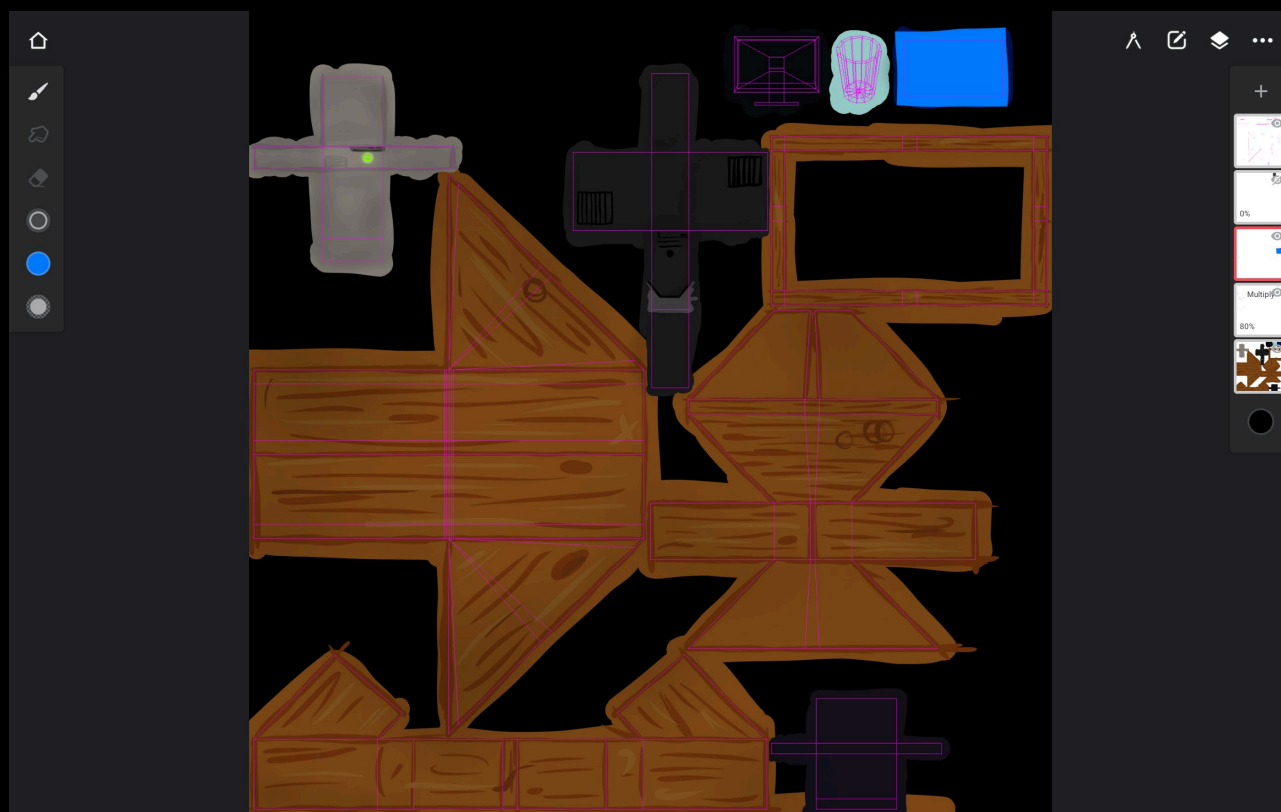
UVs ready to move to texturing.



An example of a UV map made for the armchair.

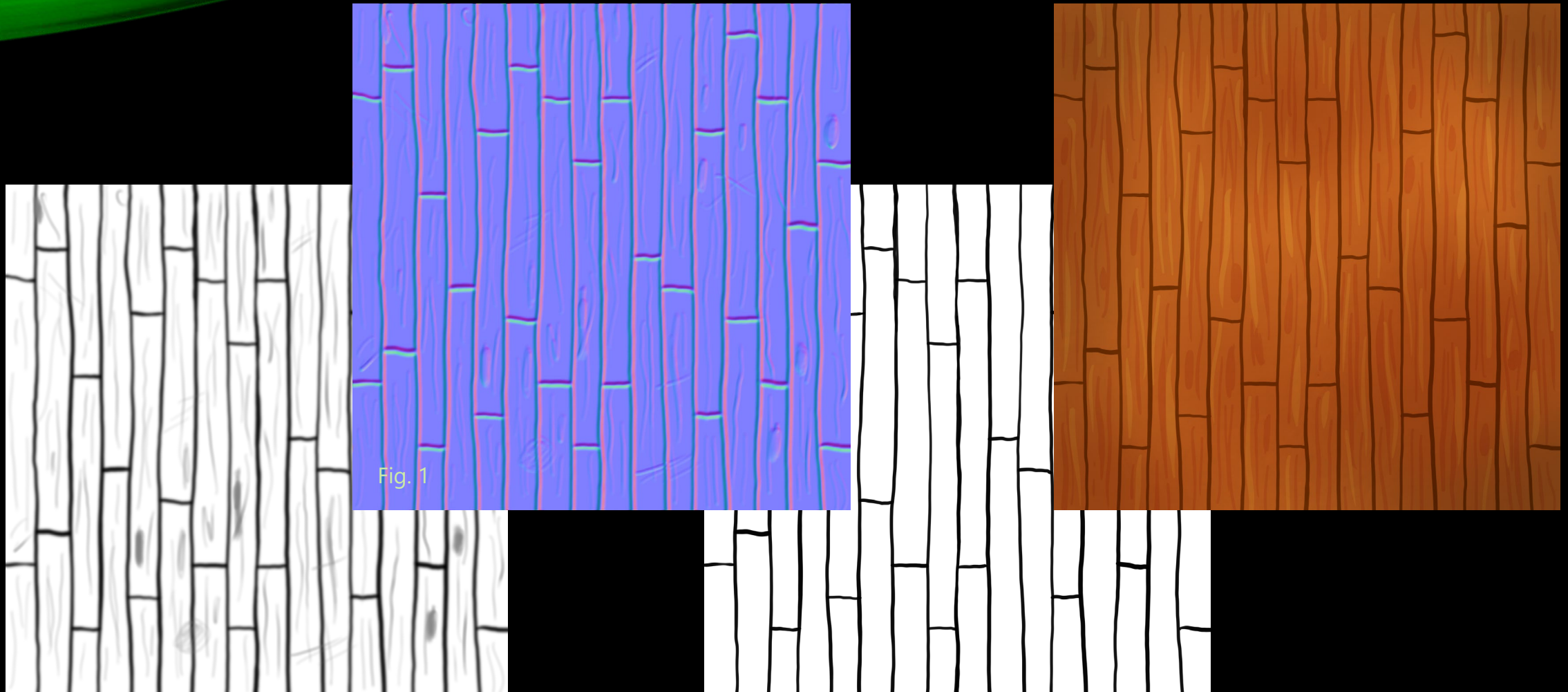


Making the texture for the TV stand / corner table.



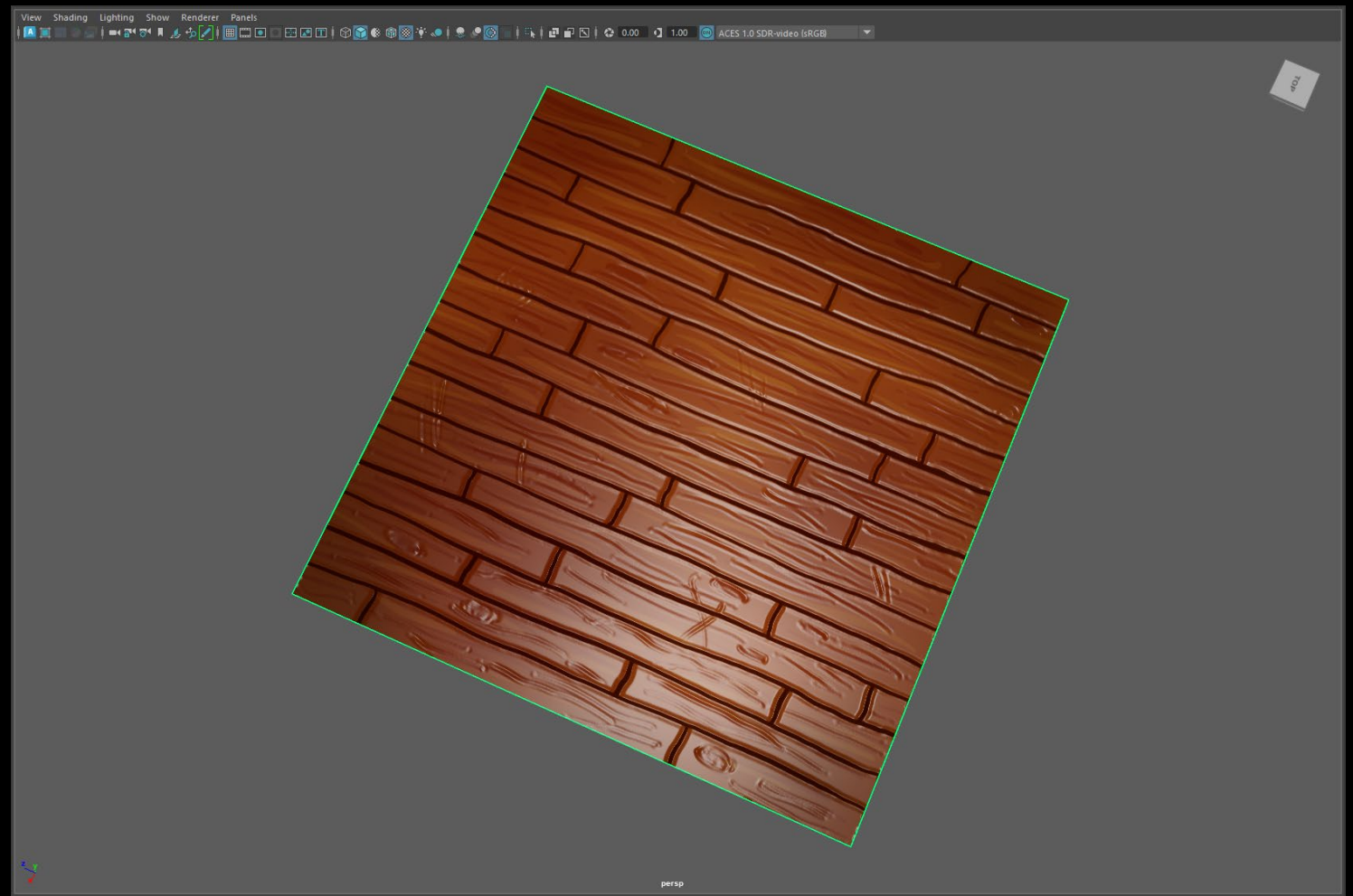
Screenshot showing all layers of the texture.

More textures, demonstrating diffuse, specular, height, and normal maps, I also used emission maps on the fireplace and tv screen etc.



The normal map (Fig. 1) was created using an online tool.[15]

Normal map applied to the floor, I didn't think it worked with my painted textures, so I didn't use it in the end, but I still used the specular mask.



The normal map applied to the floor.

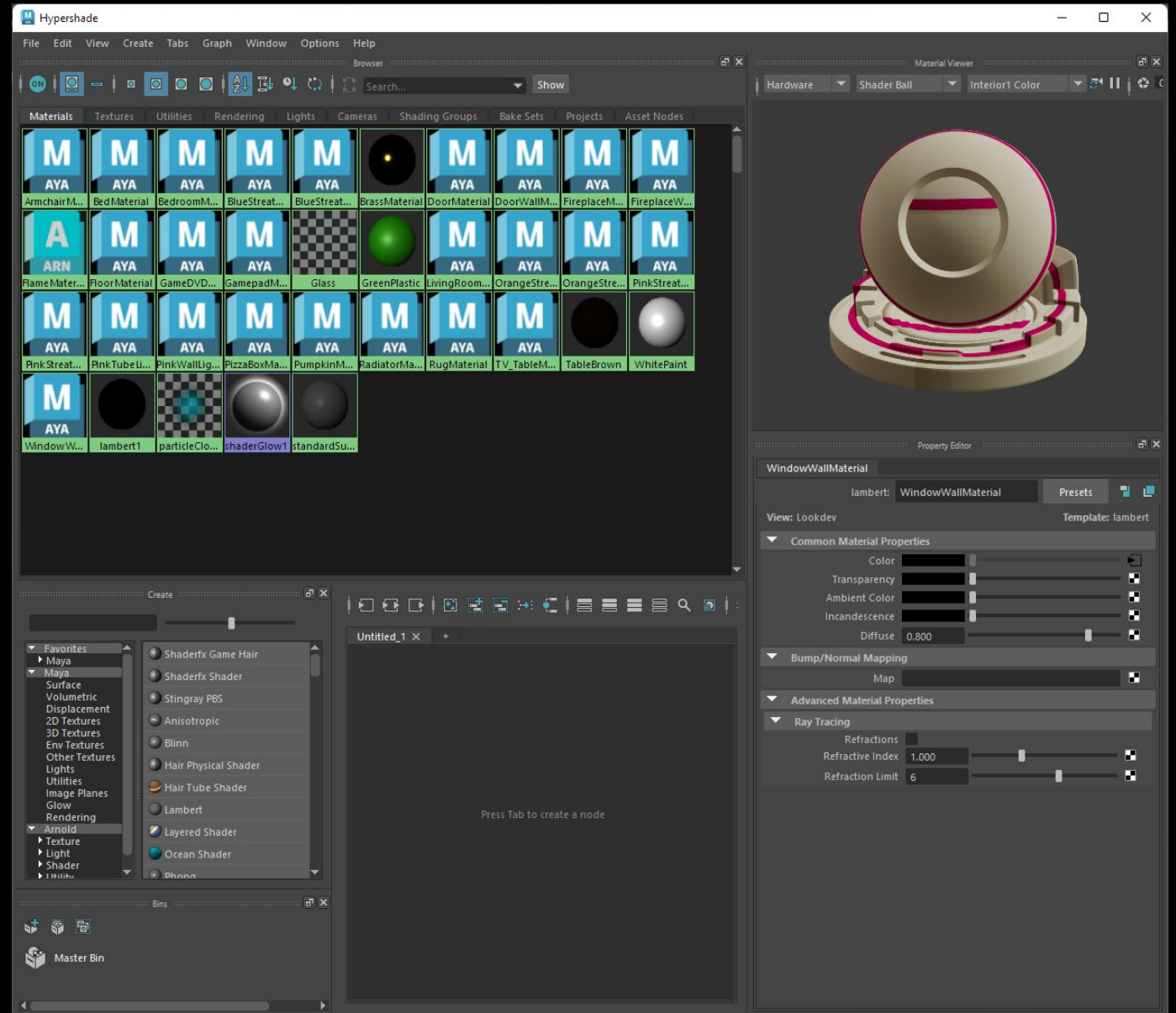
Material Examples:

Walls – Lambert material with color channel connected to a texture node.

Floor – Blinn material to allow specular reflections.

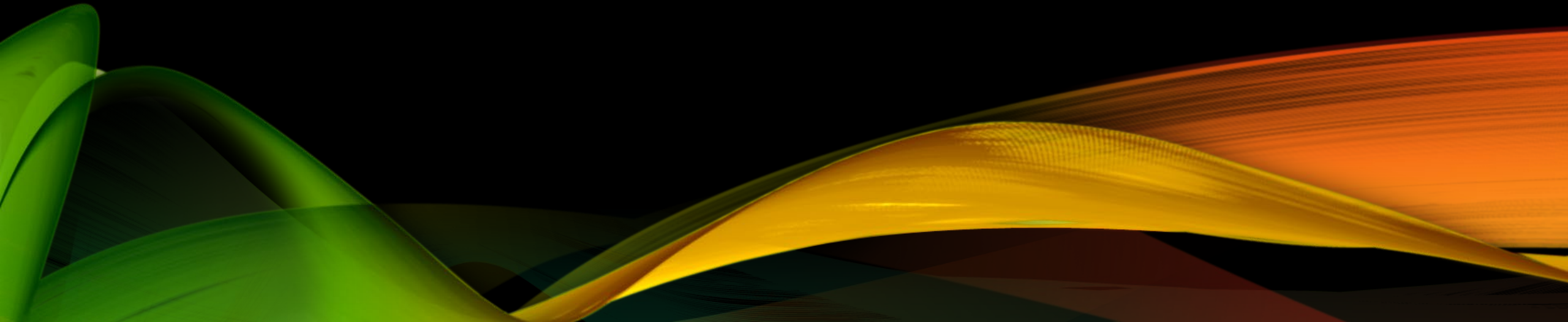
Brass and Glass – Standard Surface material, to allow more control of shininess and transparency.

Flames – Ai Standard Surface material (Arnold optimized material) to get alpha maps and PNG sequence working.



Screenshot of Hypershade window in Maya.

Prototyping

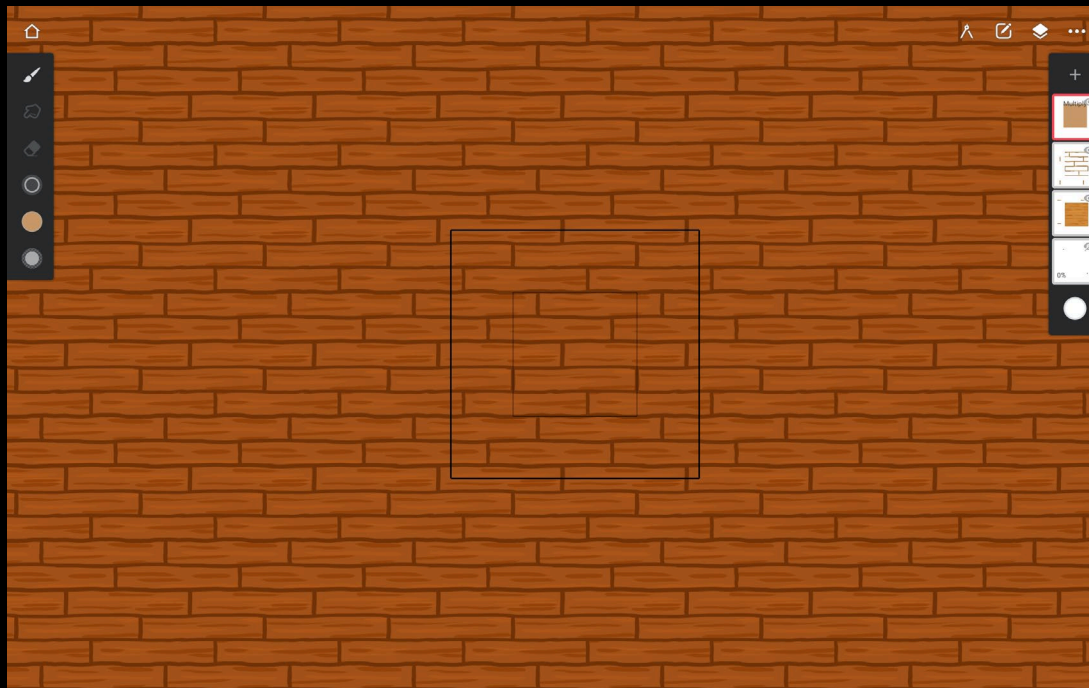


As noted earlier, some of my models went through multiple revisions, my master scene also went through two iterations.

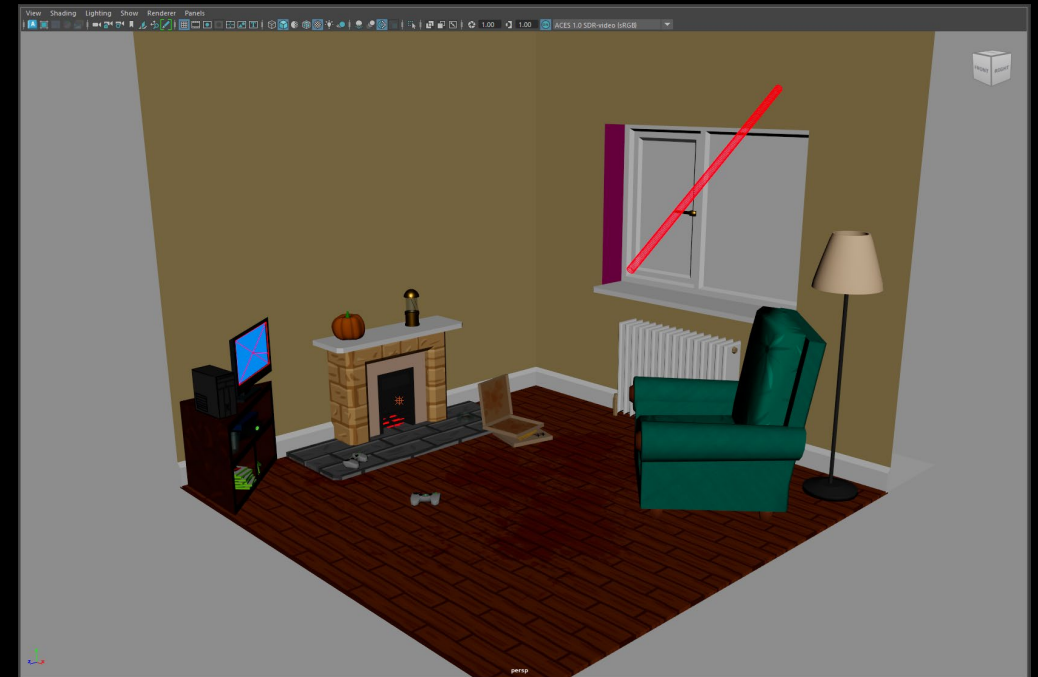
There are a couple of things to note about this:

The texture on the floor is tiled.

The original fireplace model is used, and it did work (at least in Maya).



Drawing tiling textures in Infinite Painter, the image is within the inner most black square.



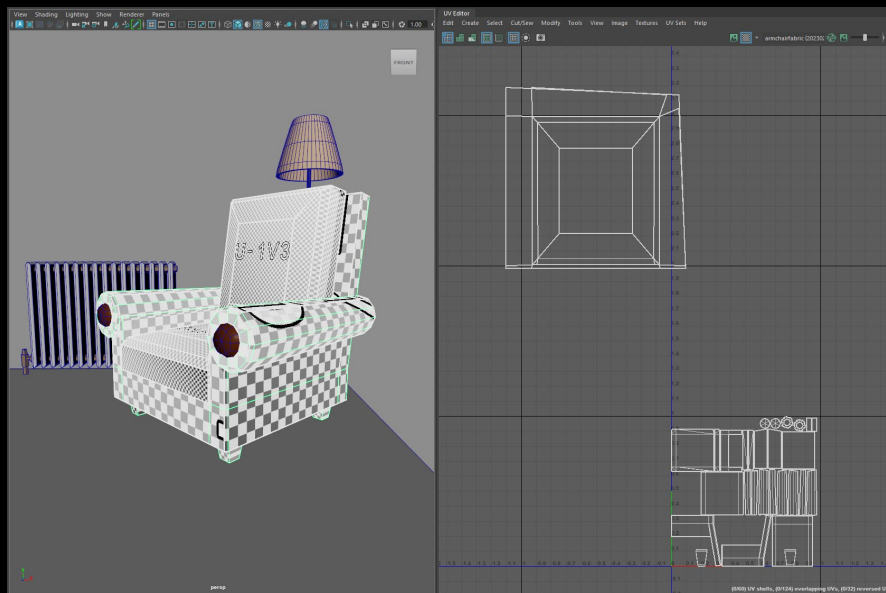
Prototype 1 in the Maya viewport.

Other issues in my original scene:

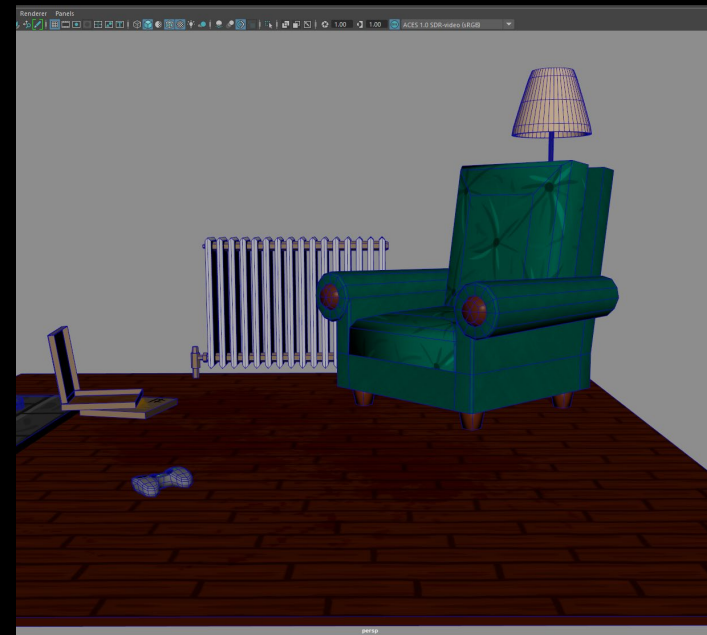
Odd normals on the armchair (I tried changing shading between flat and smooth, but ended up remodeling the armchair.).

Suboptimal UVs.

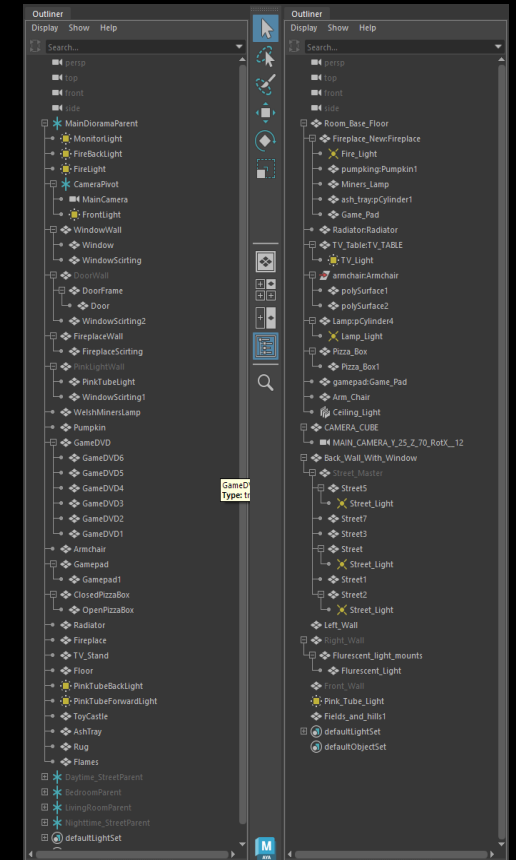
Suboptimal naming conventions.



UVs on the original armchair model (they're not the worst from prototype 1).

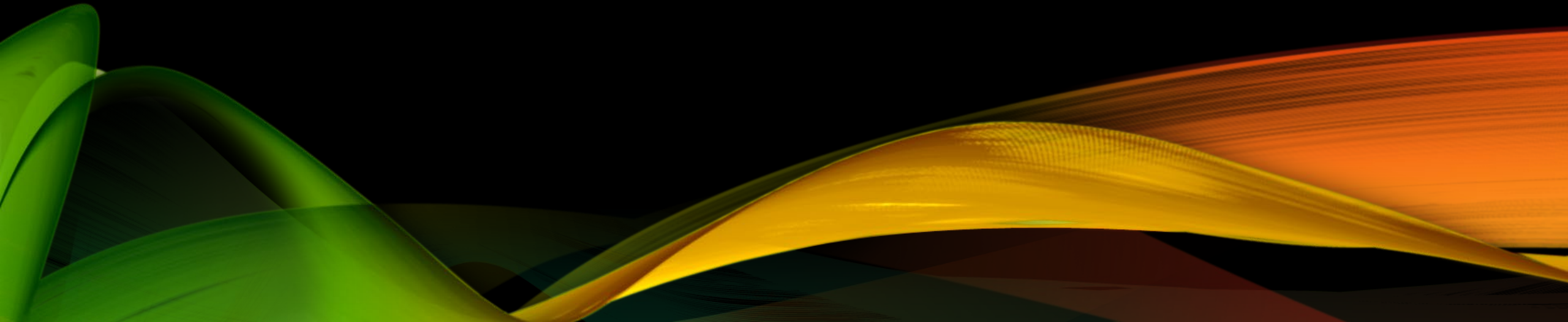


Odd normals on armchair model in prototype 1.



Examples of the outline in the final scene (left) and the first prototype (right).

The Title



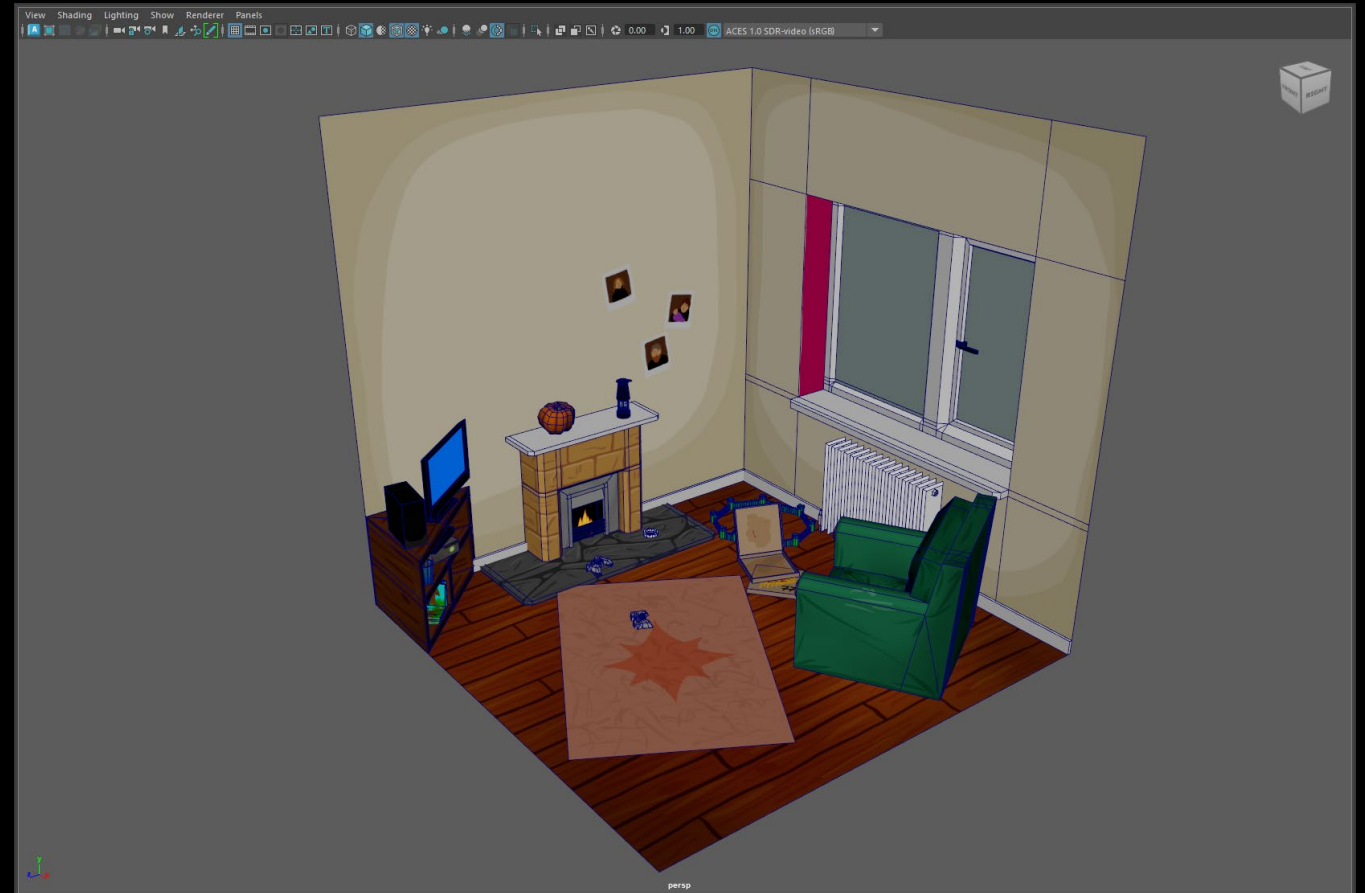
"HOME?"

This scene is supposed to be somewhat attractive and relatable, but also raise questions.

It depicts a room which has marks from many people's lives – the photos on the wall depict a family, the games controllers suggest young people play in the room, the ashtray by the fireplace suggests that older people rest here, the castle set in the corner suggests younger children play here.

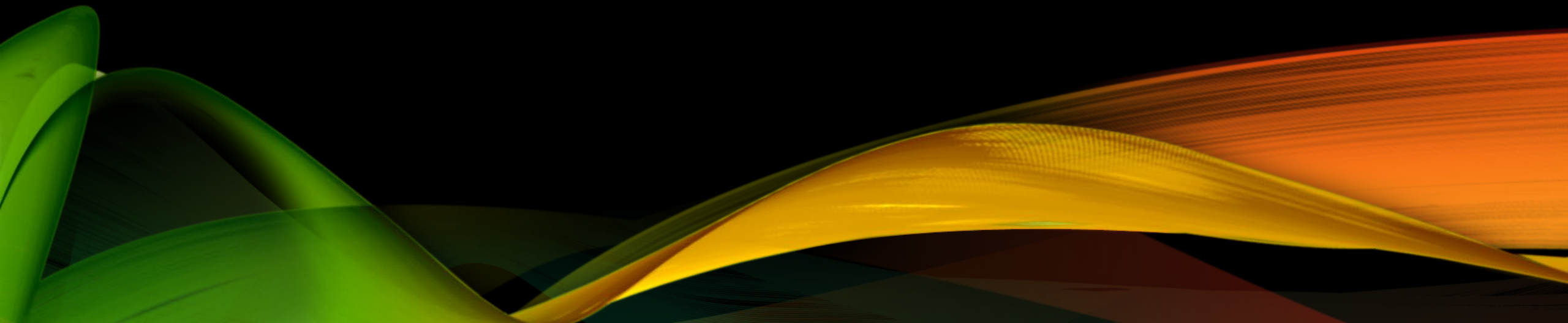
It raises questions too – why is nobody in the room? What's outside the window? What's on the TV? Who lives here? Are they happy? What games are on the shelves? Why is there a pumpkin on the mantelpiece?

What tales would the walls tell, if they could talk?



The finished scene in the Maya viewport.

Rendering





A still shot rendered in the Arnold renderer

Note the specular reflections in the glass. The TV monitor appears brighter in the window than it does viewed directly, and the fireplace appears to be fully illuminated while just the flames are visible in the direct view.

This is due to either a limitation in Arnold or more likely my knowledge of Arnold.

I used dedicated light objects to illuminate the scene, which do not get rendered. However, their specular reflections do. Therefore, in the window we are "seeing" the light objects on top of the visible objects.



The scene rendered in the Unreal Engine[n]

This is done to show that my geometry is fully compatible with the game engine.



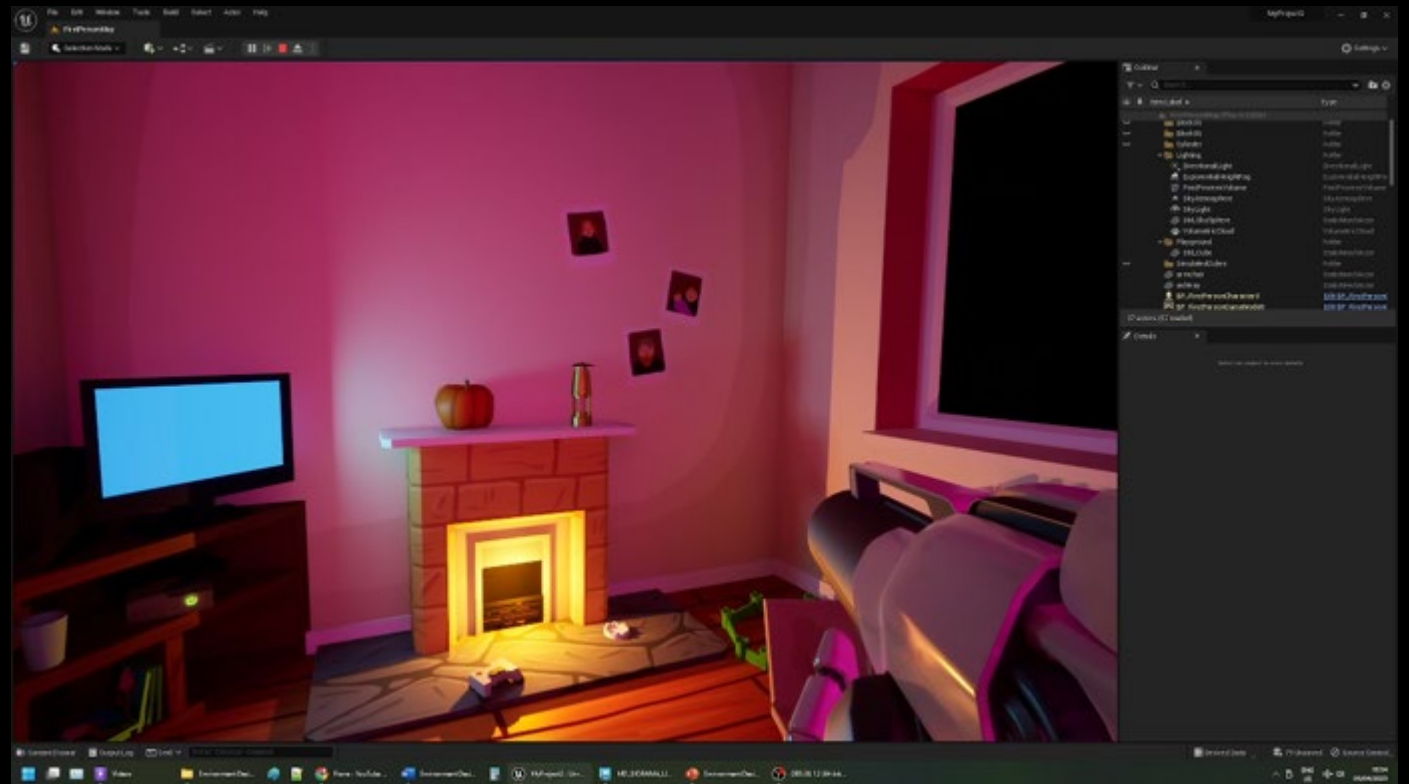
My diorama in the first-person template provided with Unreal Engine.[10]

Okay, so drag and dropping a whole scene in one FBX file doesn't seem to work.

I imported each model separately and changed materials a bit.

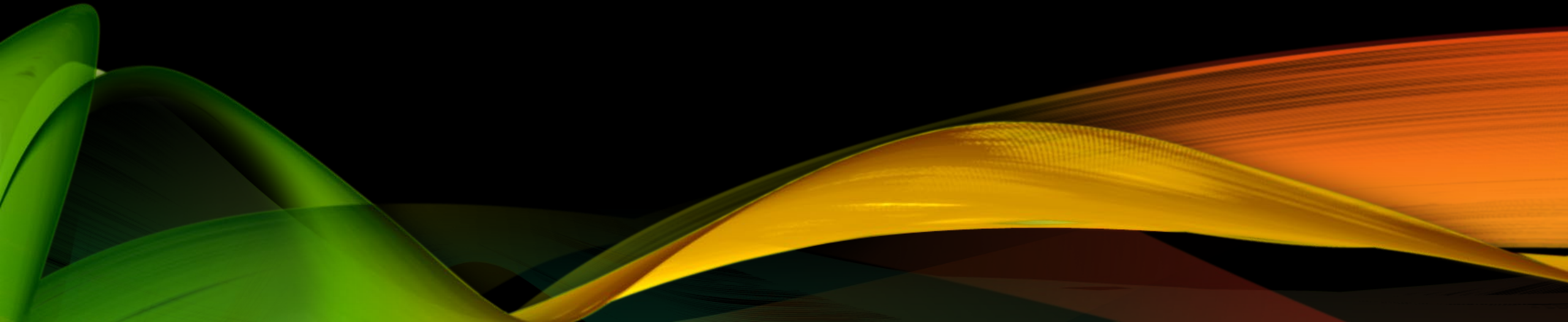


My scene in the Unreal Engine first-person template.[10]



My scene in Unreal Engine using the first-person template.[10]

Animation



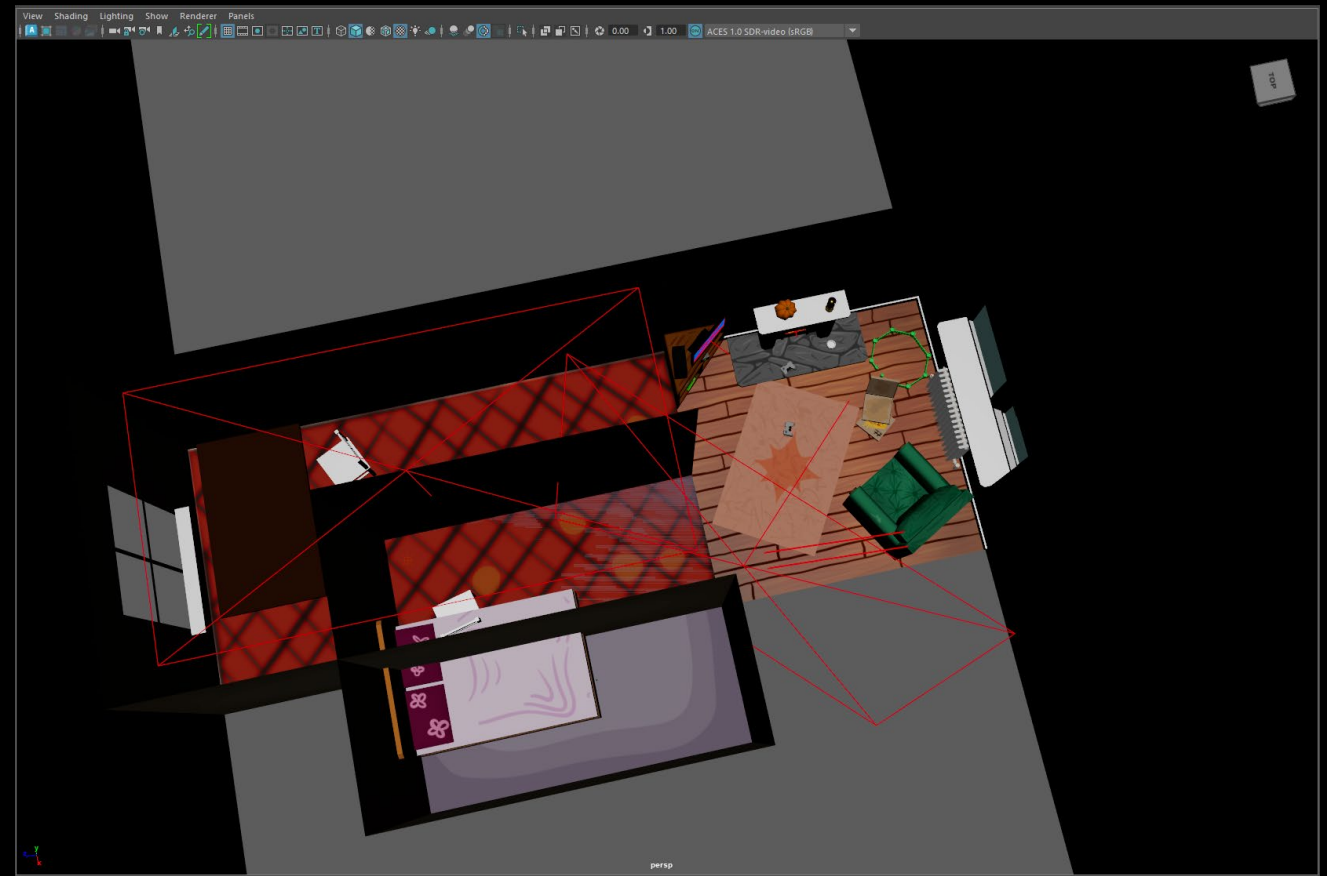
I wanted to animate the scene because I wanted an excuse to use some trickery with the exterior of the diorama and wanted to use an animated texture.

I was inspired by an old idea I had about computer games before I actually knew how they worked. I used to think that you could have multiple rooms or corridors inside each other, because I thought the maps were built out from a point with each wall being relative to the last.

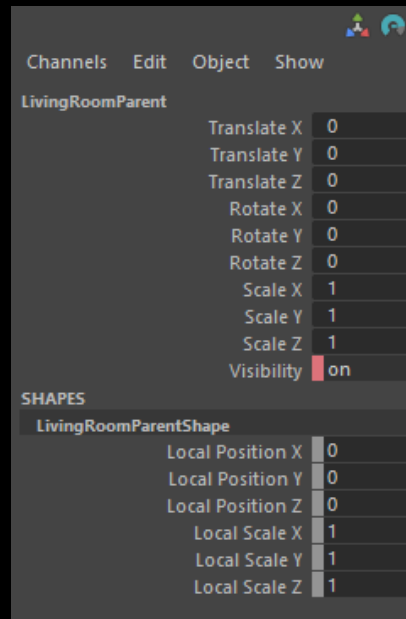
Now I know that they are built within a 3-dimensional array of positions, and therefore cannot intersect without special code.

Some games, particularly horror games, do use these mechanics, for example *September 7th* has a doll that moves while the player is in another room, doors that become walls, a corridor that changes length, and etcetera.[16][17]

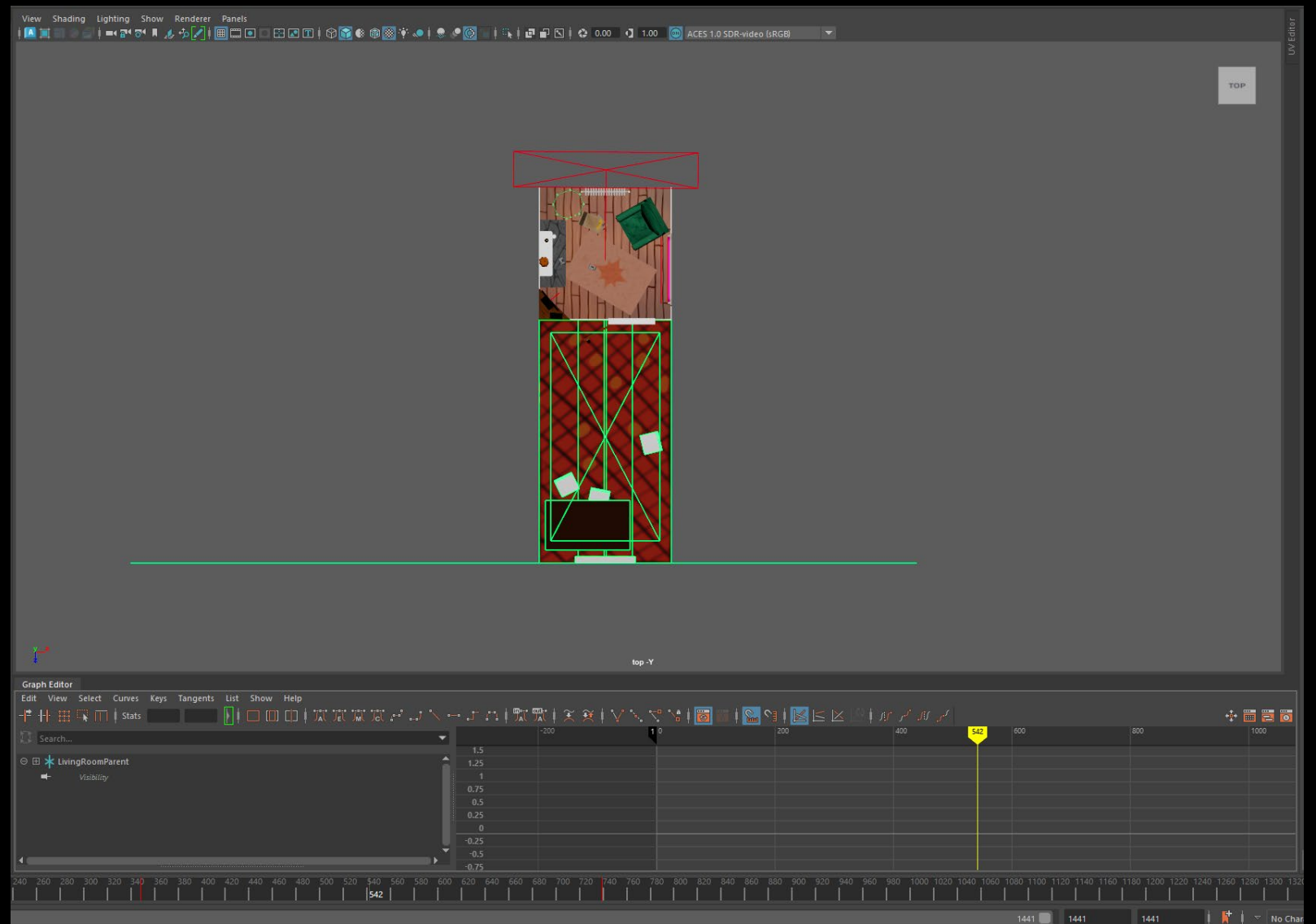
In this scene I have played with changing items behind the camera, so the dining room and bedroom are in the same 3D space, and so are the day and night streets.



Screenshot from Maya showing the bedroom and dining room intersecting.

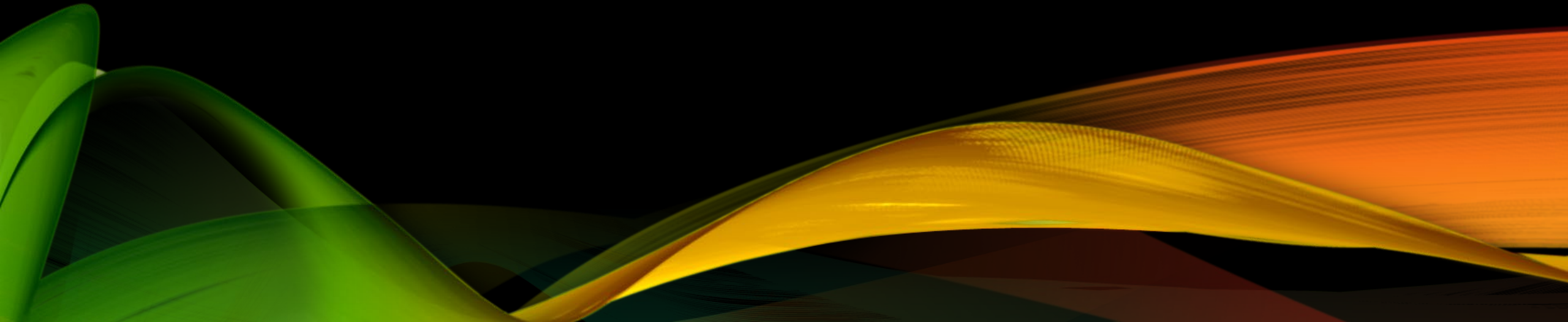


Screenshot showing the visibility keyframed in Maya.



Screenshot from Maya, showing the timeline and graph editor.

Conclusion



I have covered the main points in the development process of my diorama, from the concept to the modeling to the texture work to the rendering, and I have showcased the final result.

Any Questions?





THANK YOU

References:

- [1] R. Morgan et. al., "L4 - Environment Design (ACCA4032)," *UWTSD moodle 2022/23*. [Online]. Available: <https://moodle.uwtsd.ac.uk/course/view.php?id=2164>. [Accessed: 05-Apr-2023].
- [2] nigelgoh, "Viking Room - 3D model by nigelgoh," *Sketchfab*, 02-Nov-2016. [Online]. Available: <https://sketchfab.com/3d-models/viking-room-a49f1b8e4f5c4ecf9e1fe7d81915ad38>. [Accessed: 05-Apr-2023].
- [3] Valorant. [Software], Los Angeles: Riot Games, 2020.
- [4] *Cube Diorama*, Blender Foundation [Online]. Available: <https://www.blender.org/download/demo-files/>. [Accessed: 05-Apr-2023]
- [5] Maya, Version 2023.3, [Software], California: Autodesk, 2023.
- [6] Rough Animator, Version 3.06, Massachusetts: WeirdHat, 2023. [App] Available: <https://play.google.com/store/apps/details?id=com.weirdhat.roughanimator>. [Accessed: 05-Apr-2023]
- [7] Infinite Painter, Version 7.0.38, Infinite Studio, 2023. [App] Available: <https://play.google.com/store/apps/details?id=com.brakefield.painter>. [Accessed: 05-Apr-2023]
- [8] Photoshop, Version 24.0.1, California: Adobe, 2023.
- [9] Arnold, Version 7.1, California: Autodesk, 2023.
- [10] Unreal Engine, Version 5.1.1, North Carolina: Epic Games, 2023.
- [11] G. Maestri, "Maya 2023 essential training online class," *LinkedIn Learning*, 25-Jul-2022. [Online]. Available: <https://www.linkedin.com/learning/maya-2023-essential-training>. [Accessed: 06-Apr-2023].
- [12] J. Kost, "Photoshop 2022 essential training online class: LinkedIn learning, formerly Lynda.com," *LinkedIn Learning*, 05-Nov-2021. [Online]. Available: <https://www.linkedin.com/learning/photoshop-2022-essential-training>. [Accessed: 06-Apr-2023].
- [13] "Cast iron radiator, Free Autocad Block," *Free Cad Floor Plans*, 06-Jun-2022. [Online]. Available: <https://freecadfloorplans.com/cast-iron-radiator-free-autocad-block/>. [Accessed: 06-Apr-2023].
- [14] "White marble fireplace surround: Walton Marble Fireplace," *Designer Fireplaces*, 13-Jan-2023. [Online]. Available: <https://www.marblefireplace.co.uk/product/walton-marble-fireplace/>. [Accessed: 06-Apr-2023].
- [15] C. Petry, "Normalmap-Online," *Github*, 28-Jun-2014. [Online]. Available: <https://cpetry.github.io/NormalMap-Online/>. [Accessed: 06-Apr-2023].
- [16] September 7th, Turkey: Emika Games, 2023.
- [17] jacksepticeye, "Something's in my house...," *YouTube*, 09-Apr-2023. [Online]. Available: <https://www.youtube.com/watch?v=fOsG3B28Wrc>. [Accessed: 10-Apr-2023].

Bibliography:

N. Goh, "Viking room early concept," *Behance*, 11-Jul-2020. [Online]. Available: <https://www.behance.net/gallery/100499471/Viking-room-early-concept>. [Accessed: 06-Apr-2023].

N. Goh, "Vikings on Behance," *Behance*, 07-May-2021. [Online]. Available: <https://www.behance.net/gallery/119054931/Vikings>. [Accessed: 06-Apr-2023].

Riyad, "Fireplaces as focal points," *Ward & Co.*, 03-Jan-2018. [Online]. Available: <https://wardandco.com/blog/fireplaces-as-focal-points/>. [Accessed: 06-Apr-2023].

JoshBackHouse, "Abandoned room diorama 1:12 scale writer's - Etsy UK," *Etsy*. [Online]. Available: <https://www.etsy.com/uk/listing/1092789687/abandoned-room-diorama-112-scale-writers>. [Accessed: 06-Apr-2023].

K. Charyshnikov, "Artstation - old interior diorama," *Artstation*, 15-Feb-2022. [Online]. Available: <https://www.artstation.com/artwork/PeGIBB>. [Accessed: 06-Apr-2023].

lucamarimedia, "Cute pink bedroom diorama isometric 3D stock illustration 1880149327," *Shutterstock*. [Online]. Available: <https://www.shutterstock.com/image-illustration/cute-pink-bedroom-diorama-isometric-3d-1880149327>. [Accessed: 06-Apr-2023].

"Isometric lowpoly interior designs," *Dribbble*. [Online]. Available: https://dribbble.com/tags/isometric_lowpoly_interior. [Accessed: 06-Apr-2023].

H. Villalta, "Mini room low poly," *Blender Artists Community*, 22-Oct-2021. [Online]. Available: <https://blenderartists.org/t/mini-room-low-poly/1334715>. [Accessed: 06-Apr-2023].

"Eastbrook Rivassa 600mm x 833mm traditional two column radiator - gloss white," *Low Cost Plumbing Supplies*. [Online]. Available: <https://www.lowcostplumbingsupplies.co.uk/eastbrook-rivassa-600mm-x-833mm-traditional-two-column-radiator-gloss-white>. [Accessed: 06-Apr-2023].

"IBATHUK: 600 x 1177 traditional cast iron Matt Anthracite double panel horizontal radiator," *Amazon*. [Online]. Available: <https://www.amazon.co.uk/iBathUK-Traditional-Anthracite-Horizontal-Radiator/dp/B01MQCCBKF>. [Accessed: 06-Apr-2023].

"Laksar Olive Green Velvet Wing Armchair," *The Home Department Store*. [Online]. Available: <https://www.housingunits.co.uk/laksar-olive-green-velvet-wing-armchair.html>. [Accessed: 06-Apr-2023].

"Sherlock button armchair," *Next*. [Online]. Available: <https://www.next.co.uk/style/st862359/m33904>. [Accessed: 06-Apr-2023].

"Buy habitat salisbury leather armchair - tan | armchairs | habitat," *Habitat*. [Online]. Available: <https://www.habitat.co.uk/product/3314047>. [Accessed: 06-Apr-2023].

"11 mm xbox One game case, colour: Transparent-green," *Walvis Products*. [Online]. Available: <https://www.walvisproducts.eu/a-46287304/blue-ray-boxes-game-cases/11-mm-xbox-one-game-case-colour-transparent-green/>. [Accessed: 06-Apr-2023].

"CAMBRIAN MINERS LAMP," *Doington Auctions*. [Online]. Available: <https://online.doningtonauctions.com.au/m/lot-details/index/catalog/45/lot/4176>. [Accessed: 06-Apr-2023].

H. Lopes, "White Horse on green grass · free stock photo - PEXELS," *Pexels*, 08-Mar-2019. [Online]. Available: <https://www.pexels.com/photo/white-horse-on-green-grass-1996333/>. [Accessed: 06-Apr-2023].

"Barbie horse adventures: Riding camp," *PlayStation Wiki on Fandom*, 21-Oct-2008. [Online]. Available: https://playstation.fandom.com/wiki/Barbie_Horse_Adventures:_Riding_Camp. [Accessed: 06-Apr-2023].

"Crushed velvet divan bed with open spring memory foam mattress - luxury fabric beds - beds.co.uk - the bed outlet," *Beds.co.uk*. [Online]. Available: <https://beds.co.uk/product/beds-co-uk-new-suede-divan-set-matching-headboard-footboard-hand-tufted-pocket-spring-memory-mattress/>. [Accessed: 06-Apr-2023].

S. Knight, "Nina's house interior - download free 3D model by seducedpigeon (sian knight) (@seducedpigeon)," *Sketchfab*, 05-May-2017. [Online]. Available: <https://sketchfab.com/3d-models/ninas-house-interior-a18c23745fd14b25aa046b7a491f36e8>. [Accessed: 06-Apr-2023].

Stylized Station, "Learning the basics of 3D handpainted textures," *YouTube*, 07-Sep-2020. [Online]. Available: <https://youtu.be/Ekru3VMnR7k>. [Accessed: 06-Apr-2023].

K. Howald, "Animated texture setup...Arnold Edition," *YouTube*, 19-Mar-2021. [Online]. Available: <https://www.youtube.com/watch?v=yeUKilOtmLw>. [Accessed: 06-Apr-2023].

K. Howald, "Animated texture setup...," *YouTube*, 14-Oct-2018. [Online]. Available: <https://www.youtube.com/watch?v=ROqRpCo2PcY>. [Accessed: 06-Apr-2023].

SYIA Studios, "Maya loop animated texture tutorial," *YouTube*, 13-Nov-2019. [Online]. Available: <https://www.youtube.com/watch?v=9XDzkd9bTlw>. [Accessed: 06-Apr-2023].

SARKAMARI, "Denoise with Arnold (noice) in Maya," *YouTube*, 02-Oct-2021. [Online]. Available: https://www.youtube.com/watch?v=YSAcFE_xDs. [Accessed: 06-Apr-2023].

School of Motion, "A guide to after effects masks," *YouTube*, 22-Jul-2020. [Online]. Available: <https://www.youtube.com/watch?v=E0ruESAnQ7s>. [Accessed: 06-Apr-2023].