



Woman in a bar

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GitHub Repository: [stefaniamak/3D-graphics](https://github.com/stefaniamak/3D-graphics)

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Overview

The general idea of the project, is a woman sitting in a bar with the whole city as a view, flipping her hair away. In this project it was required to include

1. The 3D space
 2. The models
 3. The animation
- Additionally we are to include an image of the final project.

3D Space / Environment

A **Three-dimensional space** was created in this project, as an environment revolving and influencing the main object. In my space, I included a bar located in a big city full of lights.

City

Buildings

Texture

The city was created by multiple rectangles on both sides of the road. I created an image through photoshop emulating windows with the light open.

Later on I placed the finished image into my project, as texture to one building. To avoid windows at the top of the building, I unwrapped the texture (automatically, because it is a rectangle) and manually painted grey at the top of the building.

Afterwards I copied the material (thus the texture) from one building to the rest; you do that by *multi selecting all blank buildings first with shift key > shift+select the building with the material > control+L > Materials*.

Image 1.1: Photoshop file and exported PNG.

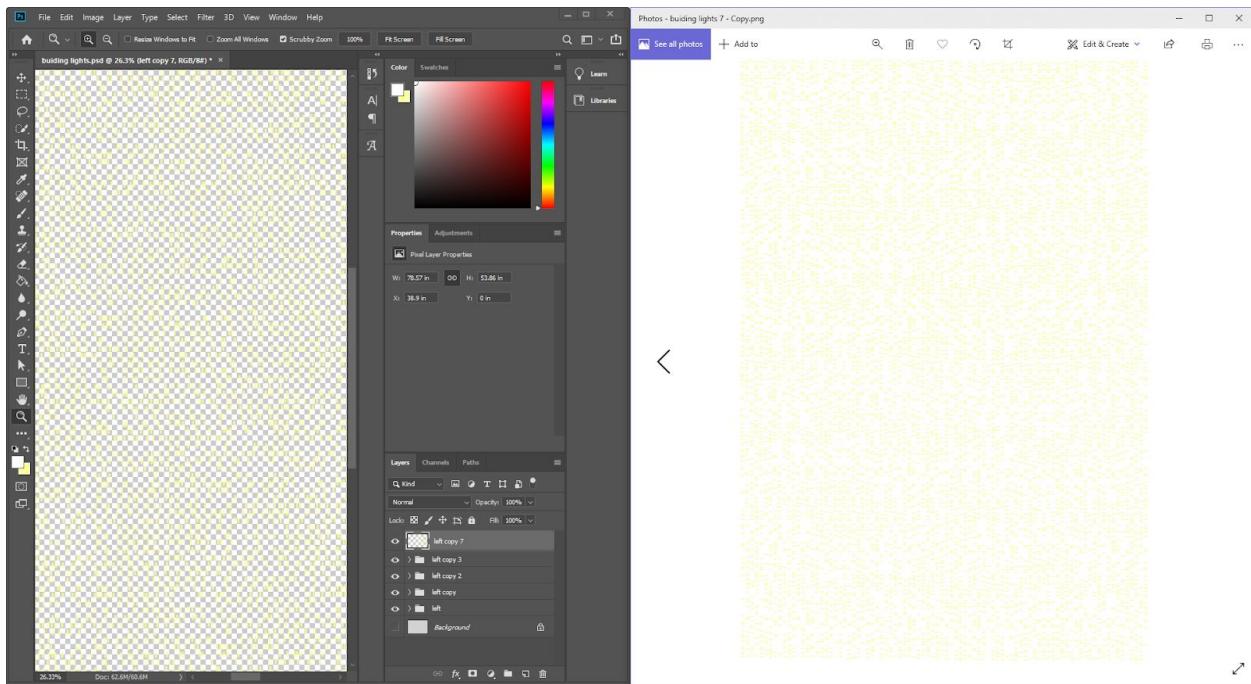
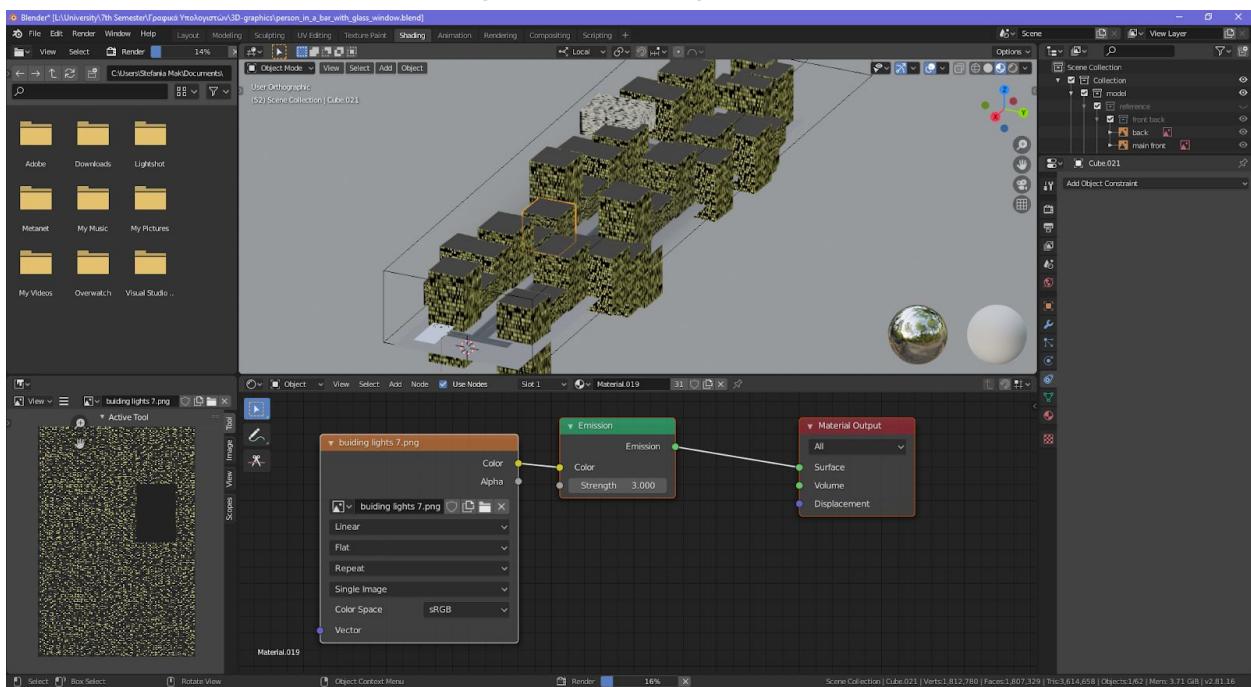


Image 1.2: The building's texture



Light

Each “window” on the texture extracts light. I will describe it in more detail at the *3D Space / Environment > Lights Sources > Buildings’ Windows*.

Road and Sidewalk

Both the road and the sidewalk was not taken too much into consideration, because thanks to the fog, these objects were almost invisible. The road consists of multiple rectangles with this [road texture](#) as a material, while the sidewalk is a single object, having this [cobblestone texture](#) repeated on top.

Image 1.3: The road

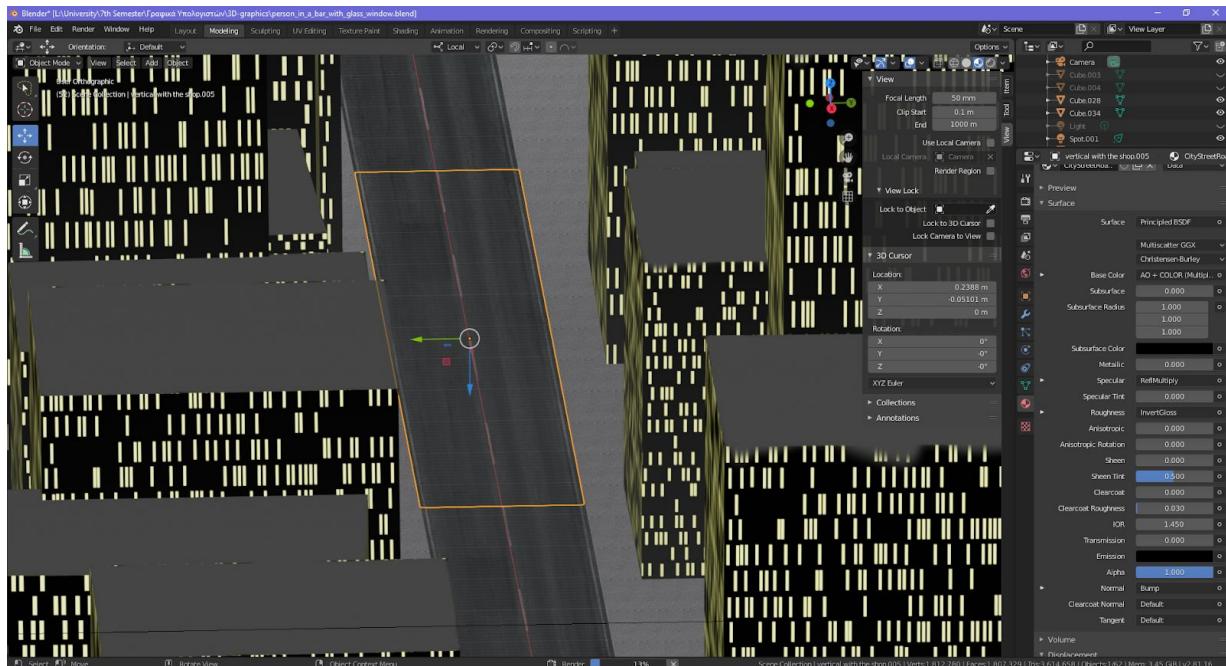
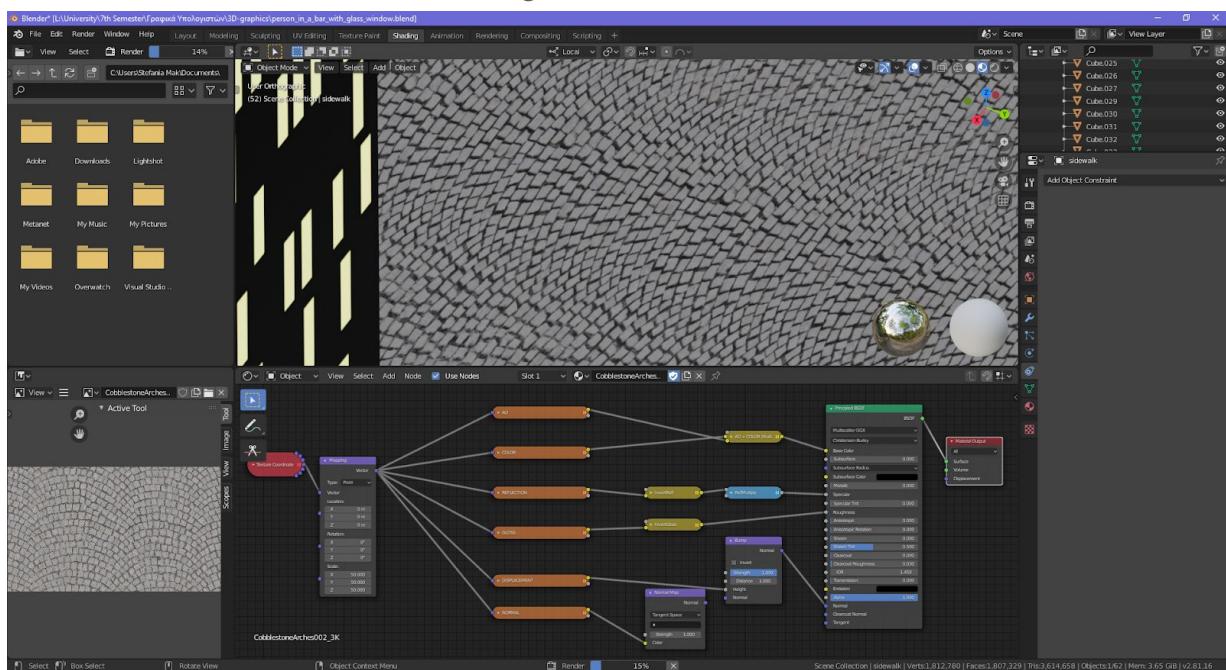


Image 1.4: The sidewalk

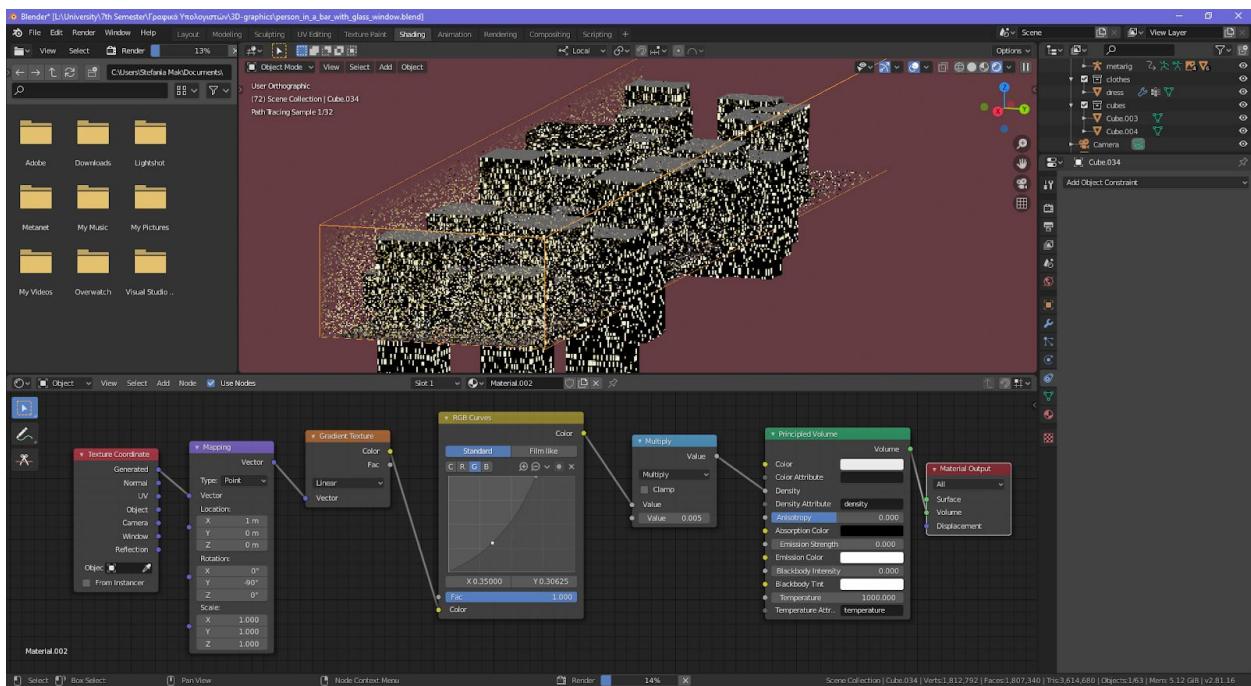


Fog

There is a thick fog covering the town from the bottom to the top. The steps followed to achieve that effect are:

1. Create a cube.
2. Scale it as big as the meters you want your fog to cover.
3. Create new material to the object.
4. Replace the default texture with "Principled Volume".
 - a. Change the color accordingly.
 - b. Change the density accordingly.
5. Add "Gradient Texture", "Texture Coordinates" and "Mapping". With these nodes, you create the gradient effect having thicker fog at the bottom, and lighter at the top. Click > Control + Shift to adjust that feature.
6. Add RGB Curve node, to smoothen out the transition from thick fog to light fog.

Image 1.5: The steps above applied to my project.

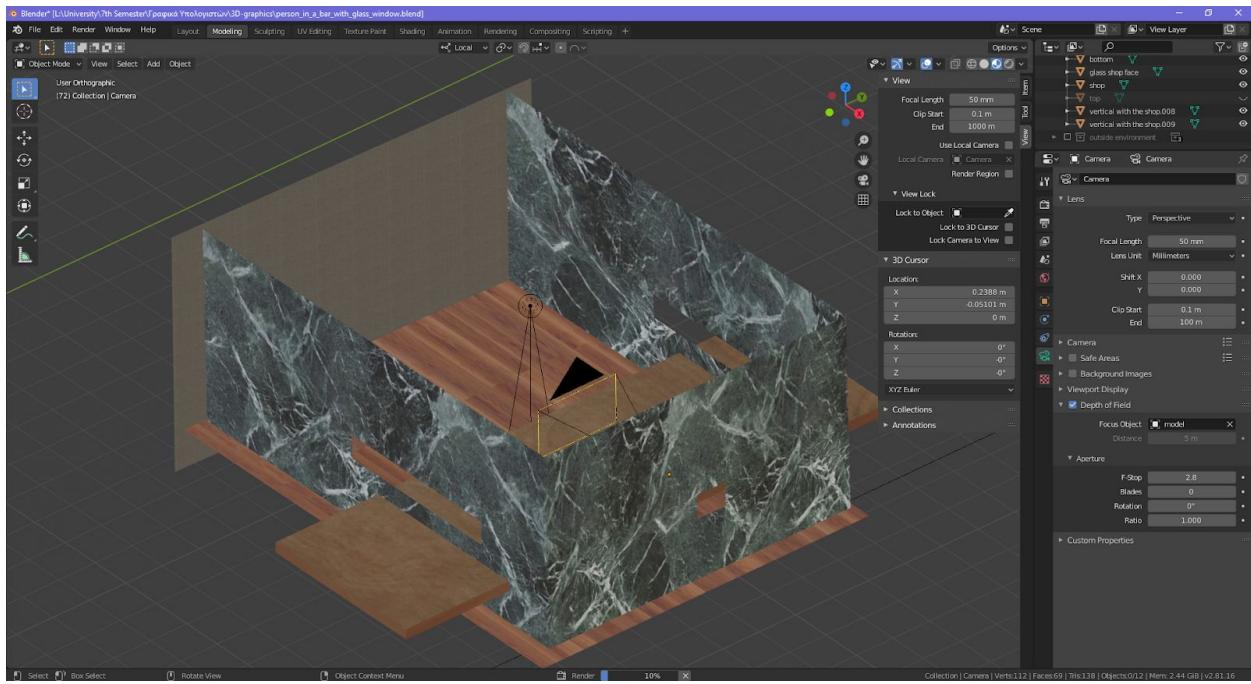


Bar

Walls and Floor

Simple room with wooden floor, marble walls and semi-glass ceiling. All are simple designs with simple textures on them. None is visible through the camera, so less attention was paid on them as well.

Image 1.6: The bar from the outside, whithough the sealing.



Windows

There are 4 windows located at each side of the room.

Window 1: Glass Partition

A glass window covered in small raindrops. For the glass effect, the settings over material were:

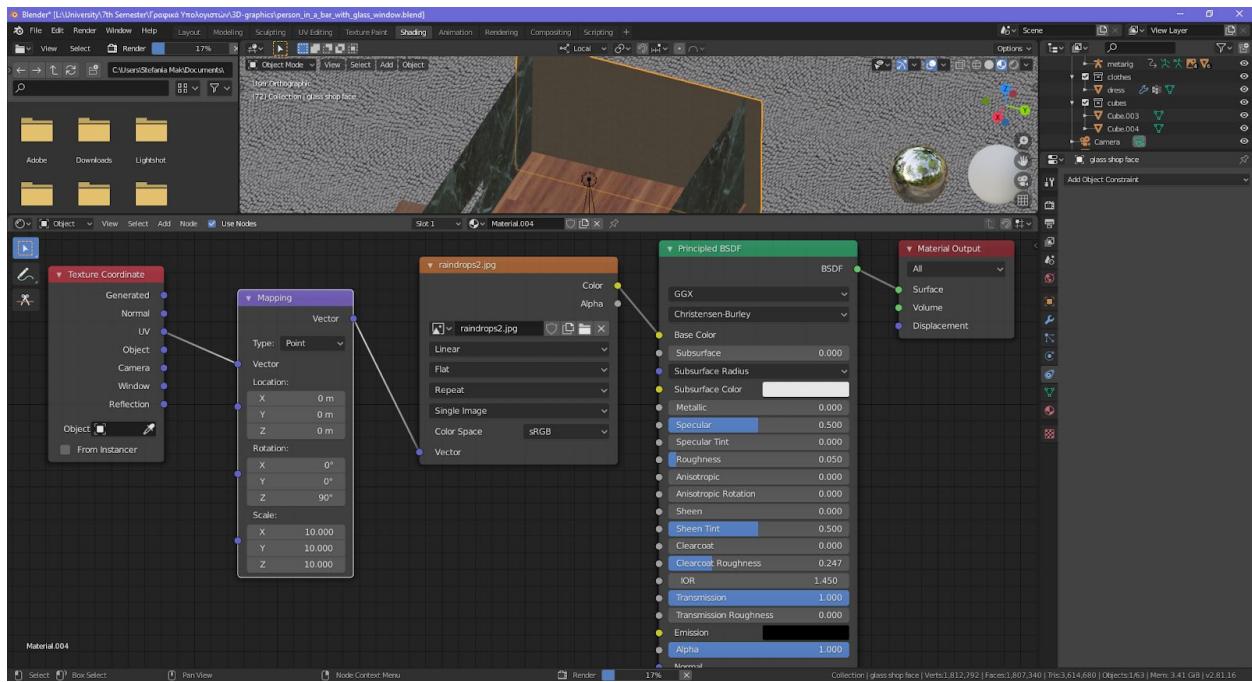
- Surface > Principled BSDF
- Transmission > 1
- Roughness > 0.050

While for the raindrops, I used an online image which I erased the background to leave only the raindrops on. Then, I placed it as *Base Color*, then repeated the pattern on top of it.

Window 2-4: Simple windows

These windows are just rectangle holes within the walls that are not visible through the rendered image/animation.

Image 1.7: Glass window shading editor.



Table

A simple rectangle with wooden texture low in roughness.

Background image

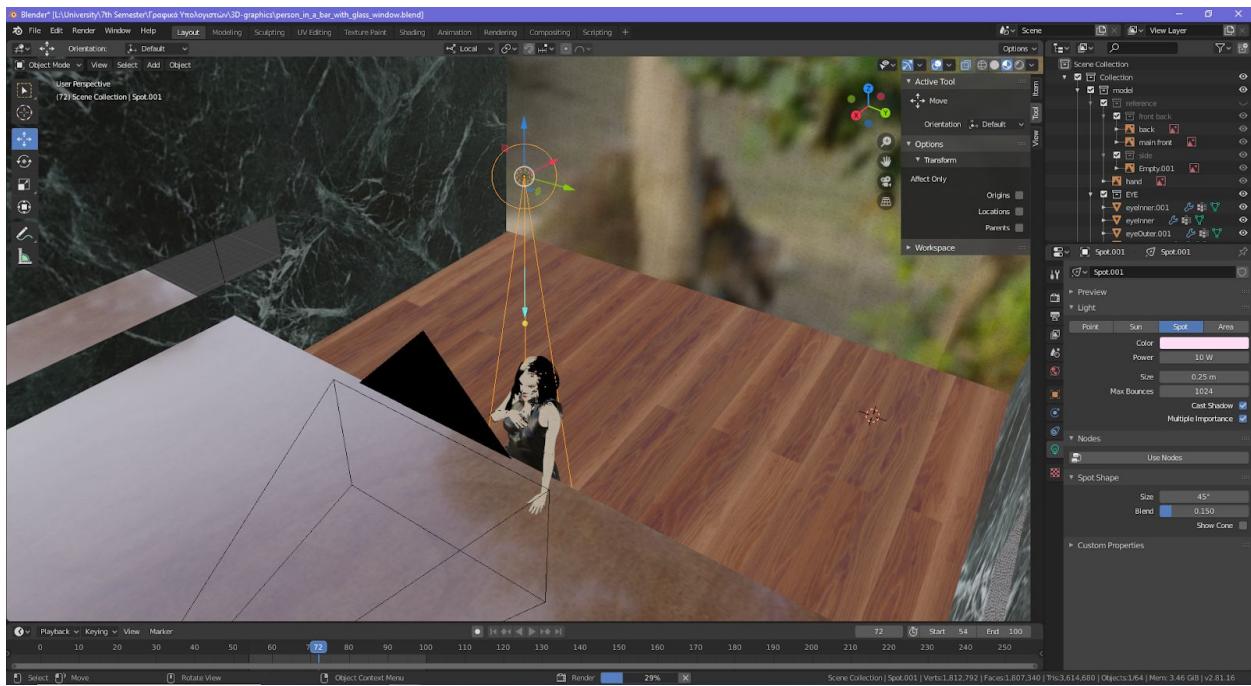
The image used is [Satara Night](#). I thought that this background complimented perfectly the bar theme and matched with lighting in the town.

Light Sources

Spotlight above model

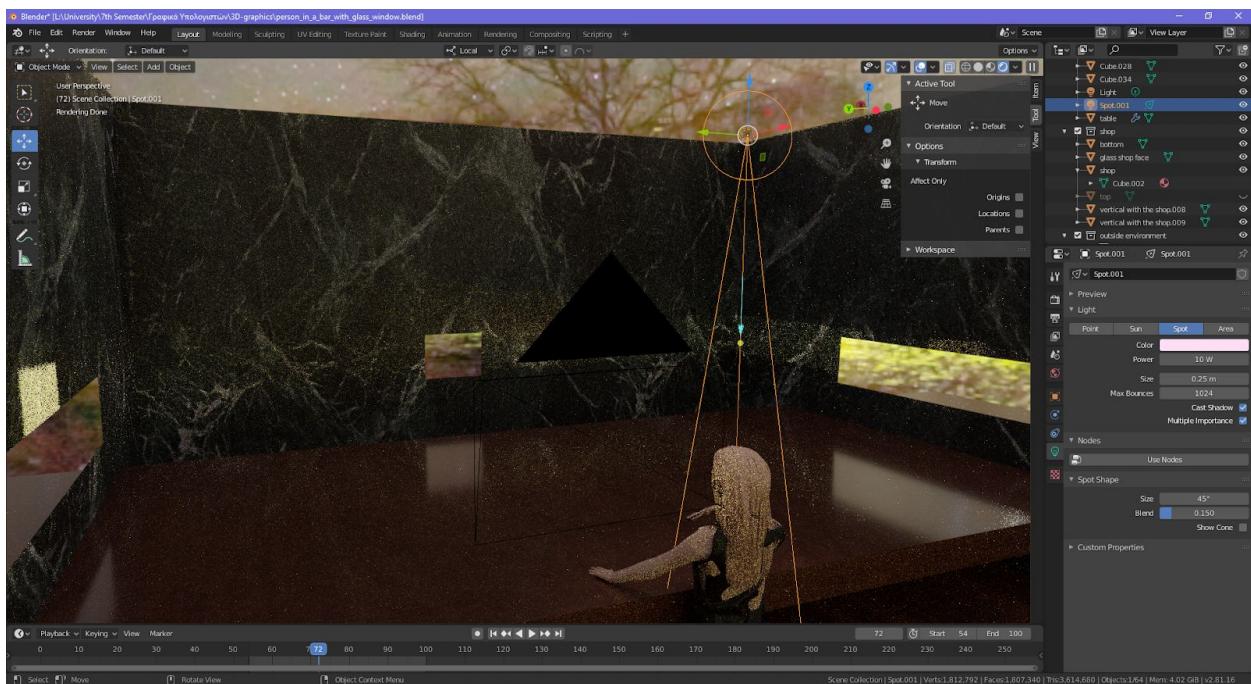
A small spotlight, placed on top of the main model, imitating the bar's small light.

Image 1.8: Spotlight above model.



Background's lighting

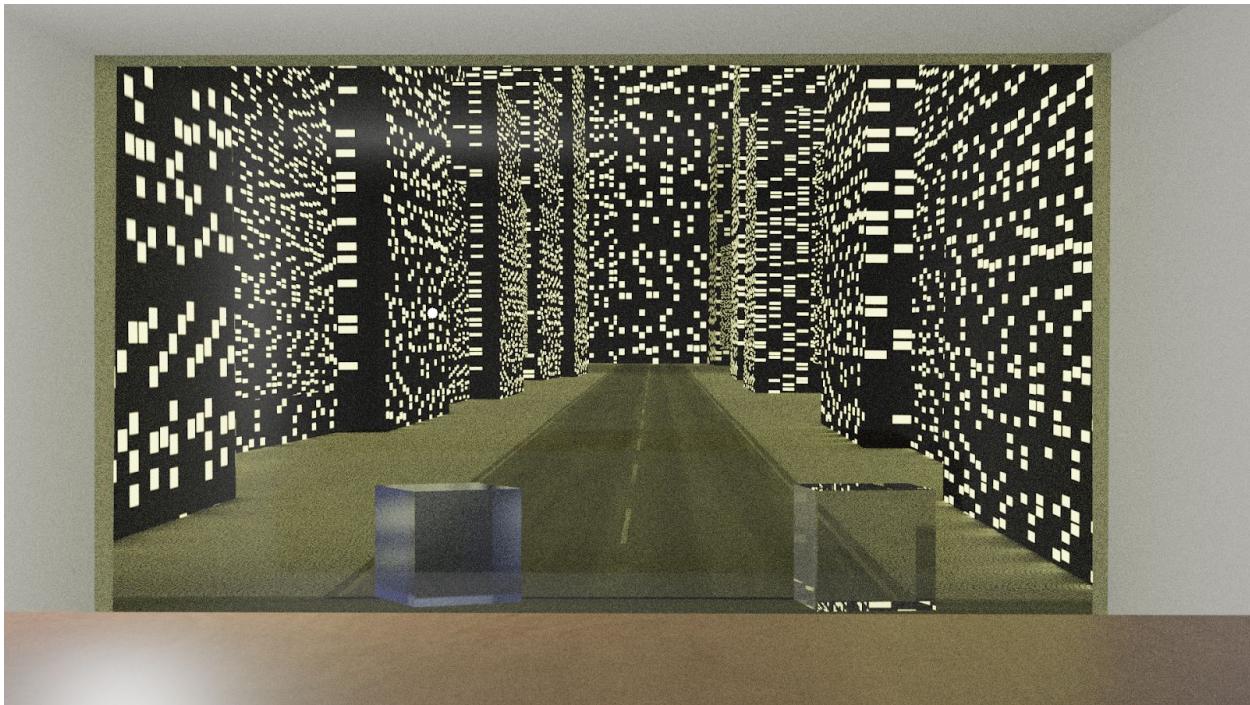
The background used provides a yellowish-light, which pass through the windows of the bar and fall on the objects inside.



Buildings' Windows

Light extracts from each "window" of the buildings' texture.

Image 1.9: Testing the Light from the buildings.



Camera

Placement

Right in front of the model, with the town peeking from the glass window behind her.

Settings

Depth of Field > Focus Object > model

→ So only the model will stay on focus.

Surface > Emission

→ Option so the building's windows glow.

Models

The main model is a female humanoid figure in a black dress.

Woman

Body

Creating from Scratch

By starting with a simple panel, I expanded and created a humanoid figure from hips and upwards. I used some image References I screenshotted from a video representing this method.

Image 2.1: My final model; in edit mode.

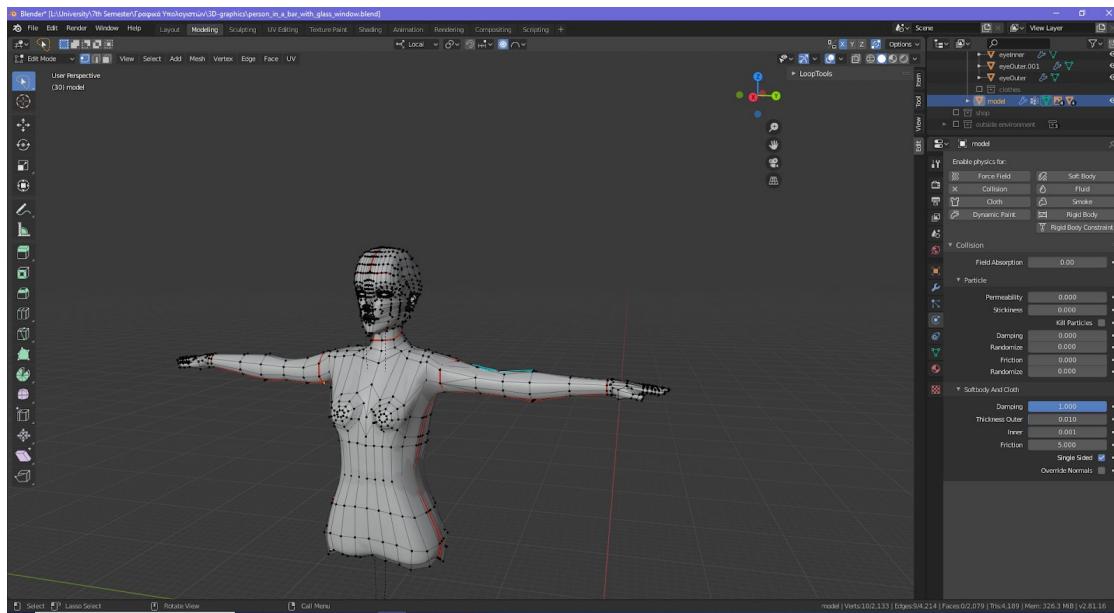


Image 2.2 (Left): Model with Reference

2.3 (Right): Funny batman Loop Cut while designing.

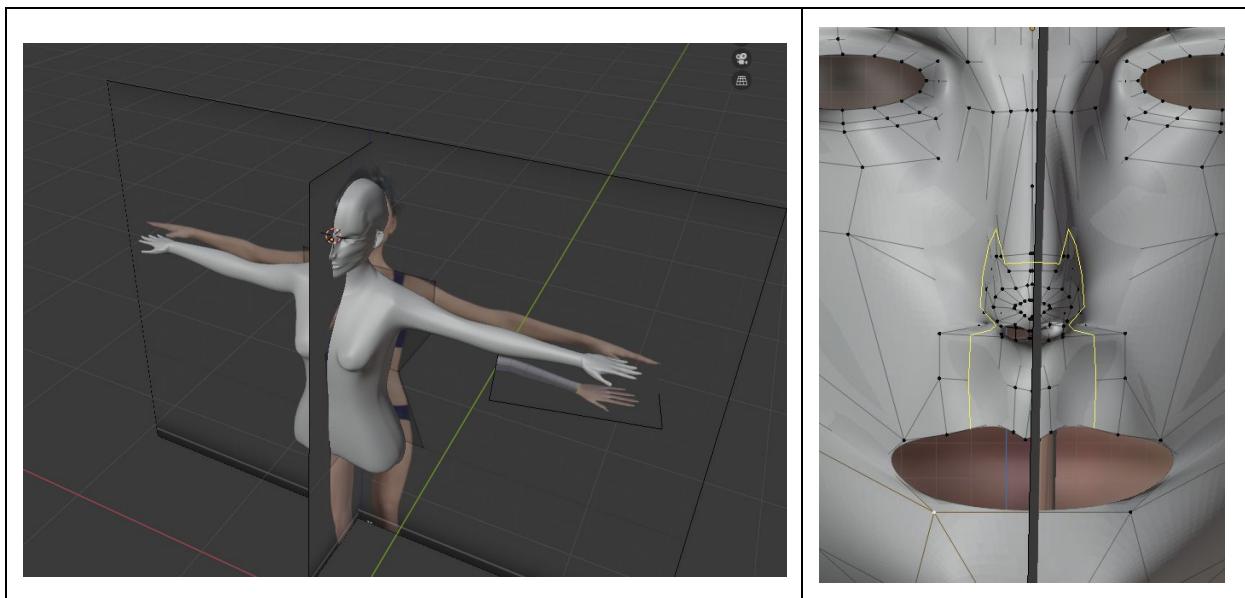


Image 2.4: Front with reference (finished model).

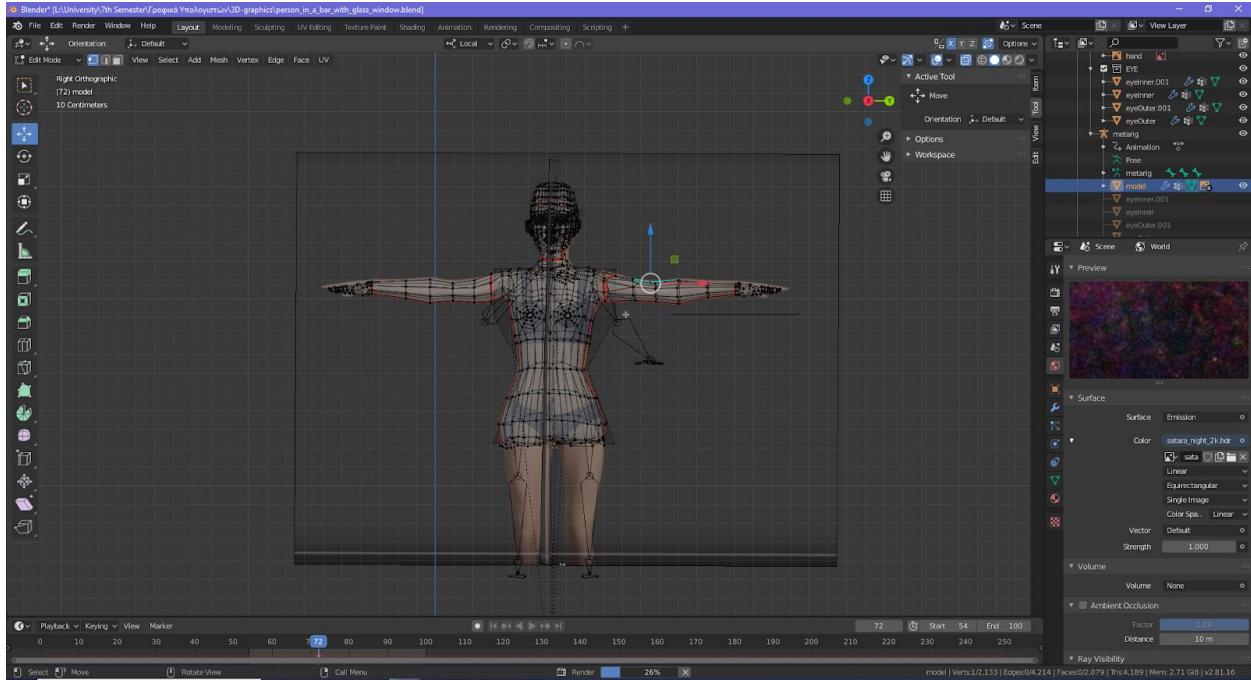
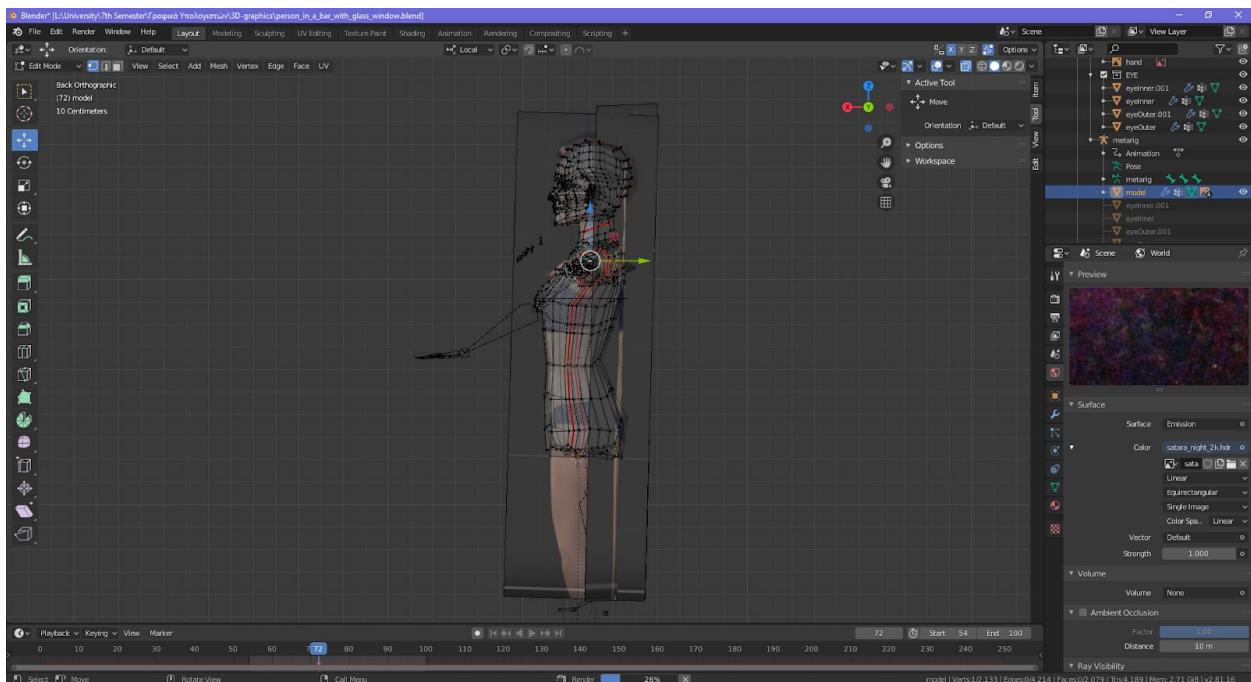


Image 2.5: Side with reference (finished model).

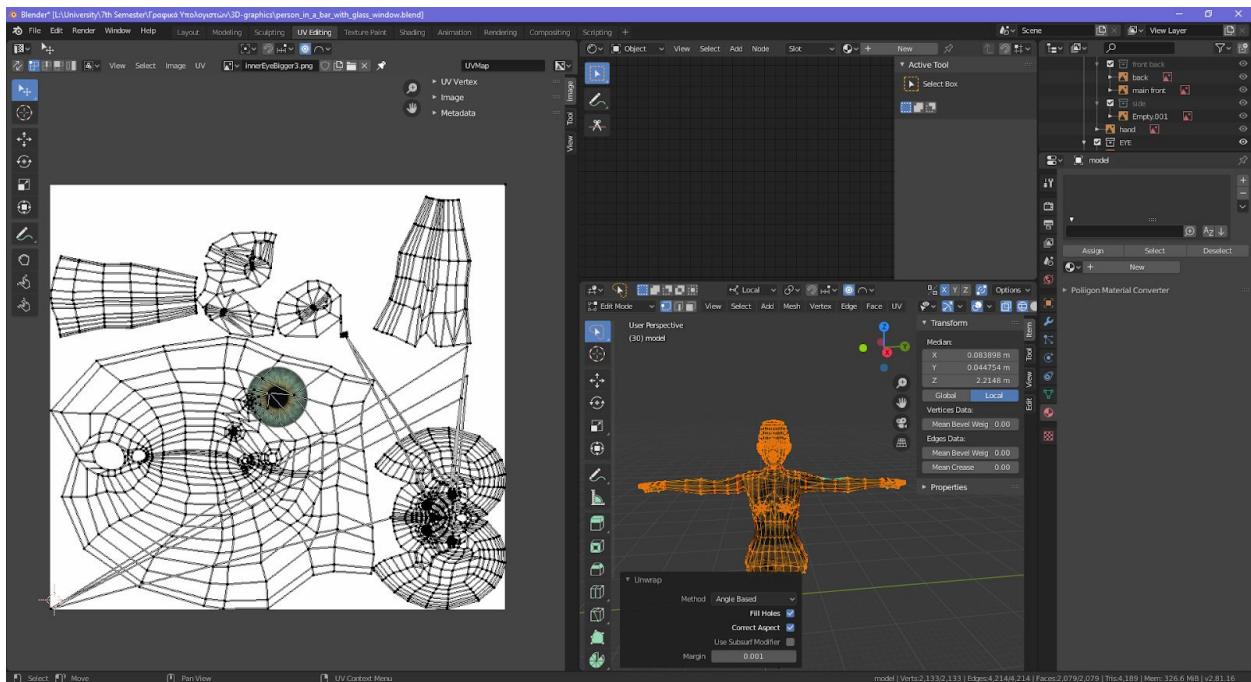


Skin / Shading

Unwrapping

I went and Unwrapped the Texture of the model by [Control + E] > *Mark Seam* all around the model. Sadly though, the outcome did not work out.

Image 2.6: Side with reference (finished model).



For that reason, I decided to draw right on top of the model, in an auto generated UV Map. I used my Wacom tablet and computer Mouse and draw on both texture and model directly.

Image 2.7: Rendered model with Texture.



Image 2.8: Mid-way drawing the texture.

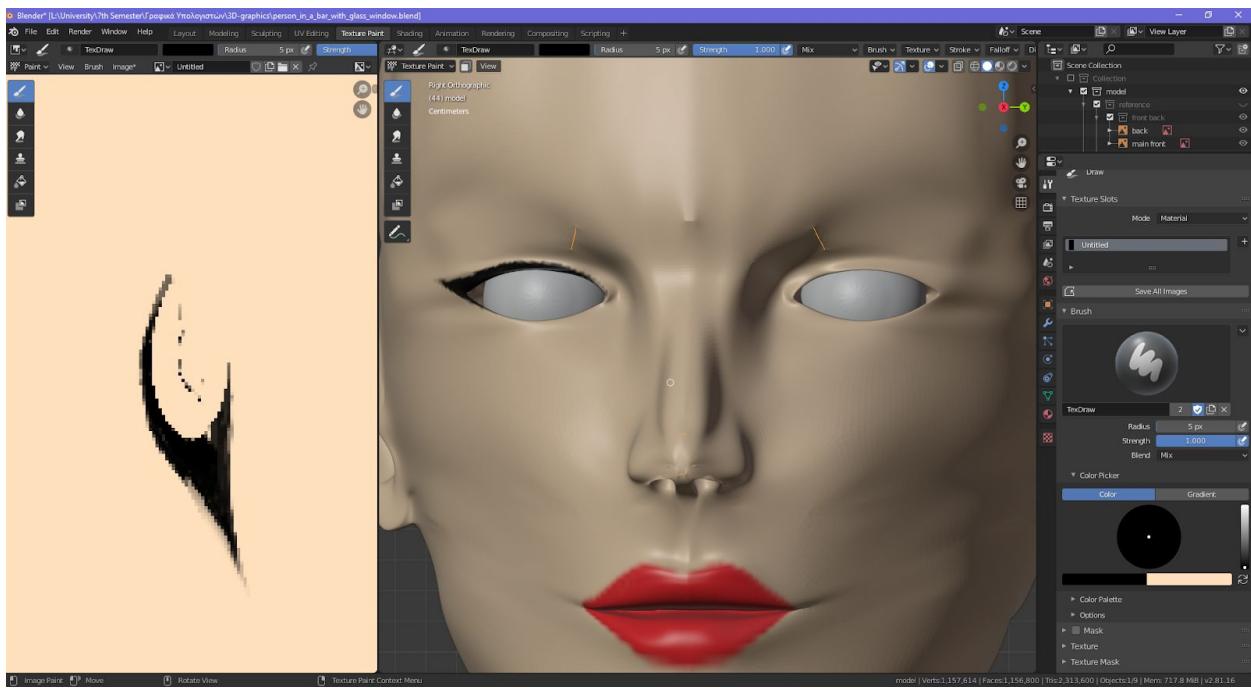


Image 2.9: Finished painted Texture.

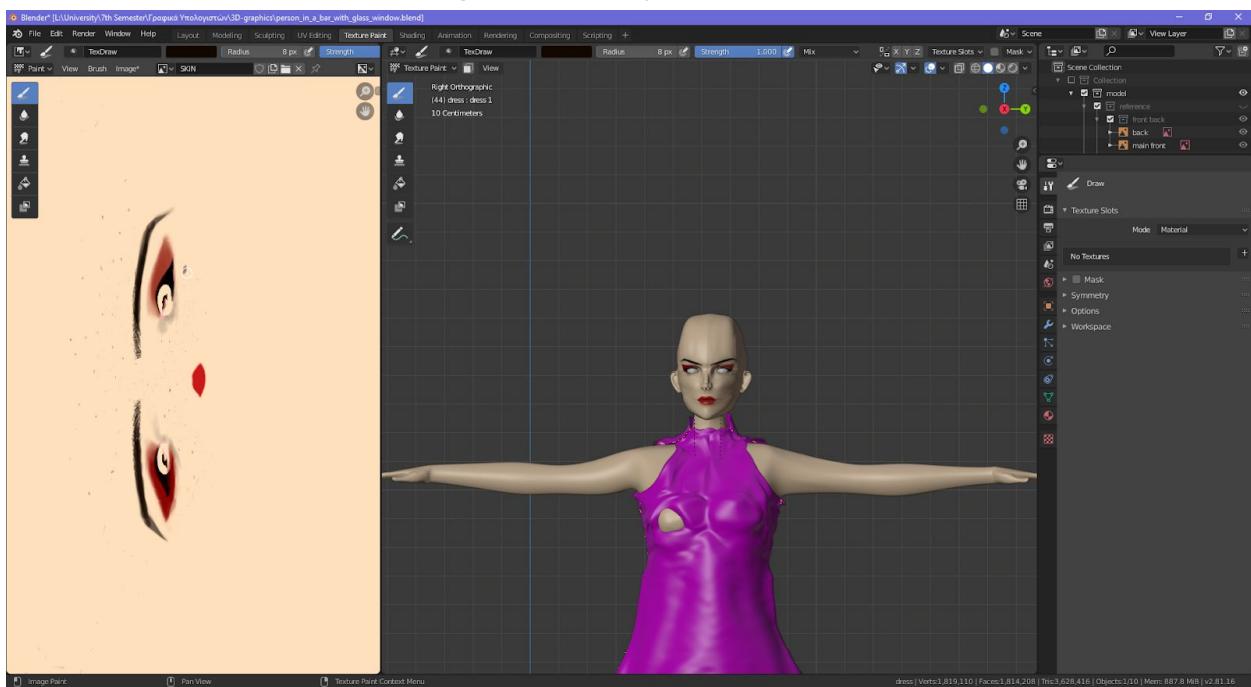
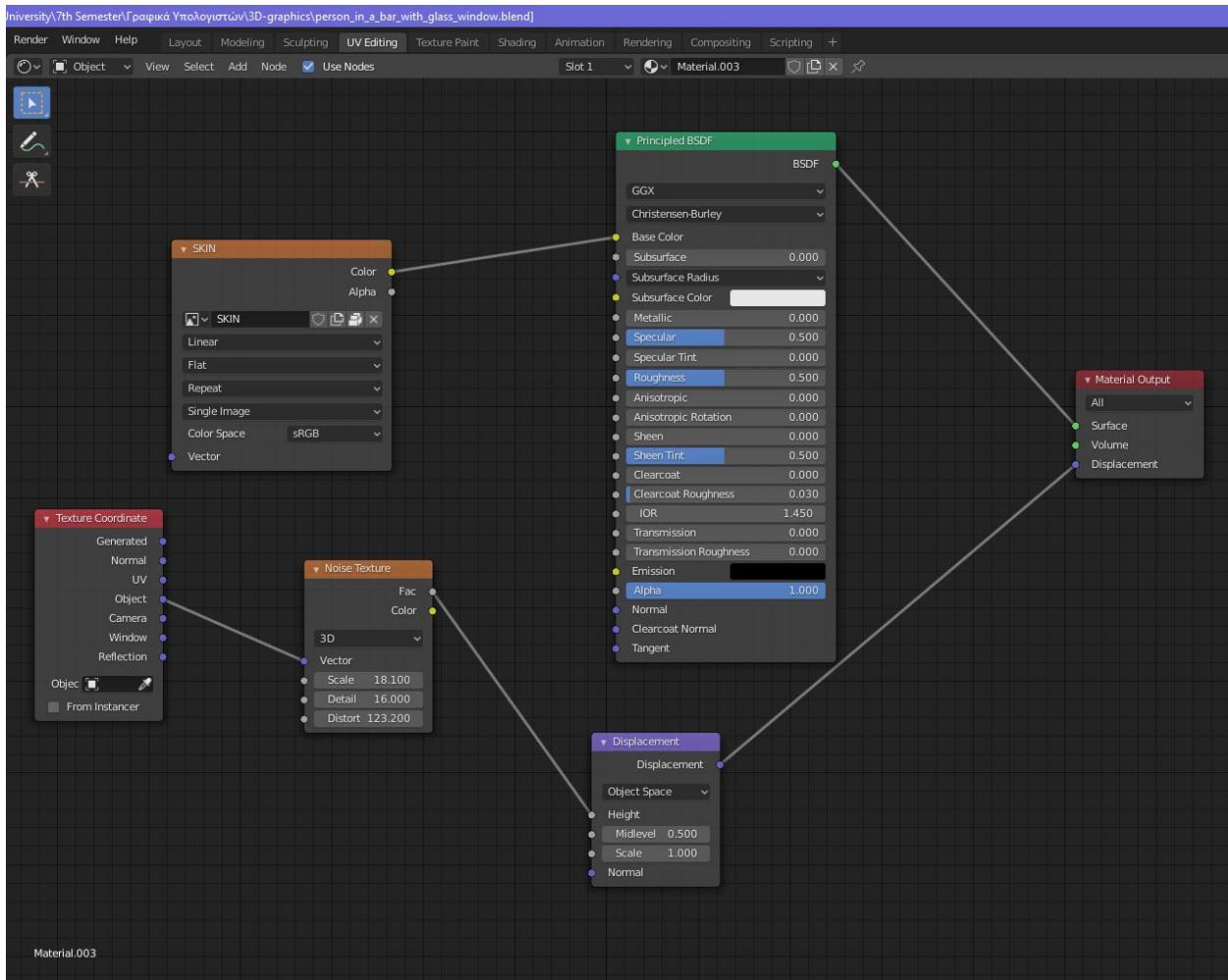


Image 2.10: Nodes to sign the model with the texture.



Eyes

For the eyes I used four spheres; two for each eyeball, the inner and the outer layer. The inner layer, the first sphere, is where the color of the eye is placed; while the outer layer is a glass material style, to imitate the eye's gloss.

Starting off with the inner sphere, I flattened a small part of it, and placed the eye texture after I unwrapped the sphere's UV. Then it was a tough fight to place the texture correctly on top of the 2D eyeball's image I downloaded from the internet (*Check Image 2.11*).

After finishing up with the inner sphere, I worked on the outer one. This sphere required only 3 changes:

1. Scaling the object up just a little bit.
2. Popping out the front part.
3. Changing the material to glass.

Image 2.11: Unwrapped inner layer eyeball.

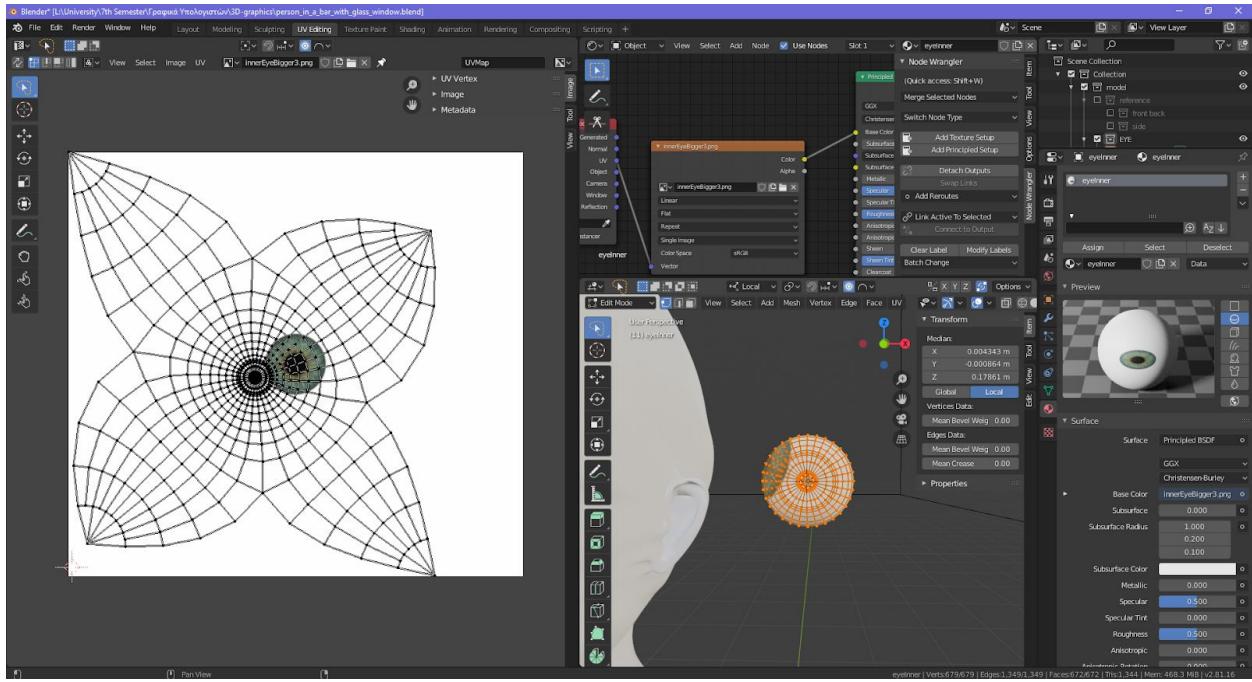


Image 2.12: Close-up to realistic eyes.



Hair

The model has straight, mid-length, blond hair. To achieve this look, I:

1. Added particles and make them > hair.
2. Chosen the part of the hair the particles shall be placed at, by creating a group of selected nodes.
3. Applied hair physics and children.
4. Combed the hair.

My two issues with this process, were:

1. Having the hair face a straight line.

2. Having very chaotic hair, even after combing it down

Image 2.13: Issue 1.

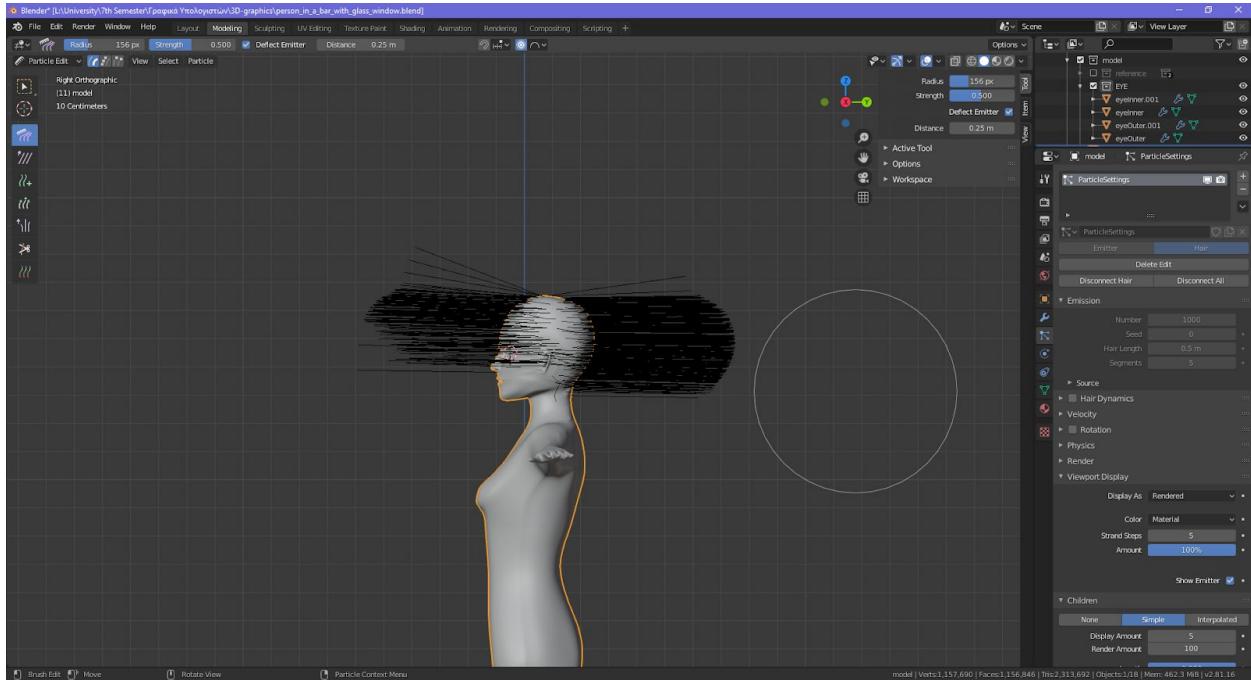


Image 2.15: Issue 1 - Desired result (solved).

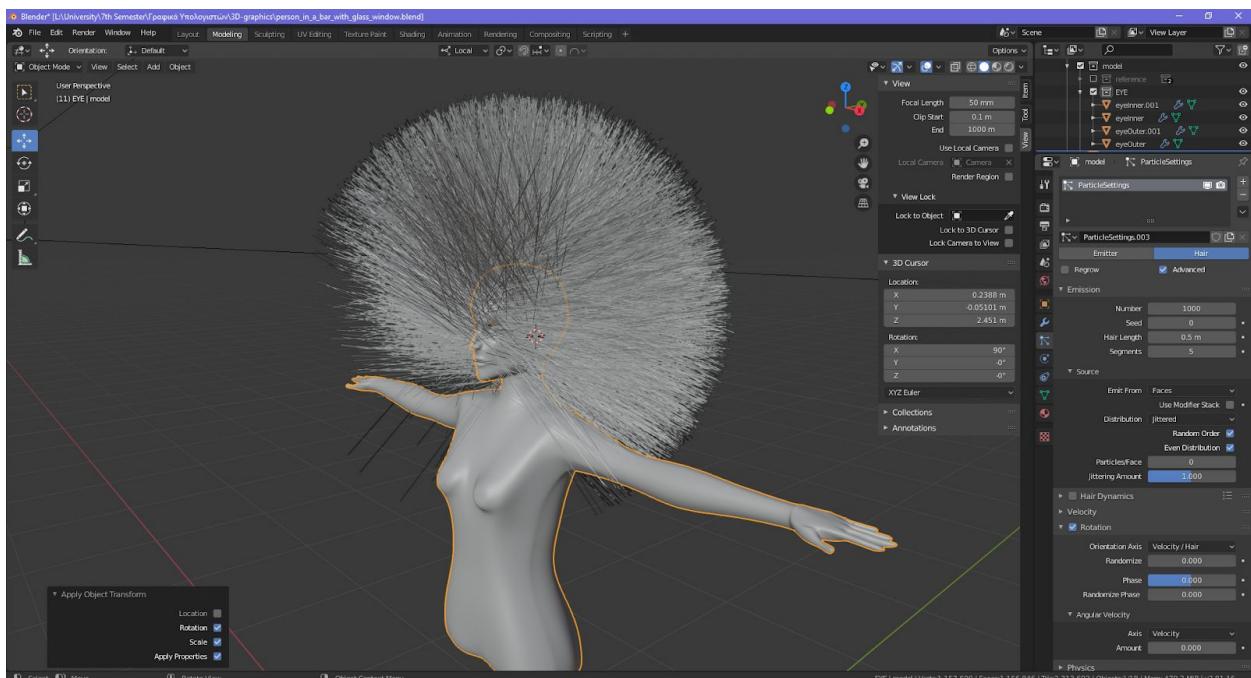


Image 2.14: Issue 2.

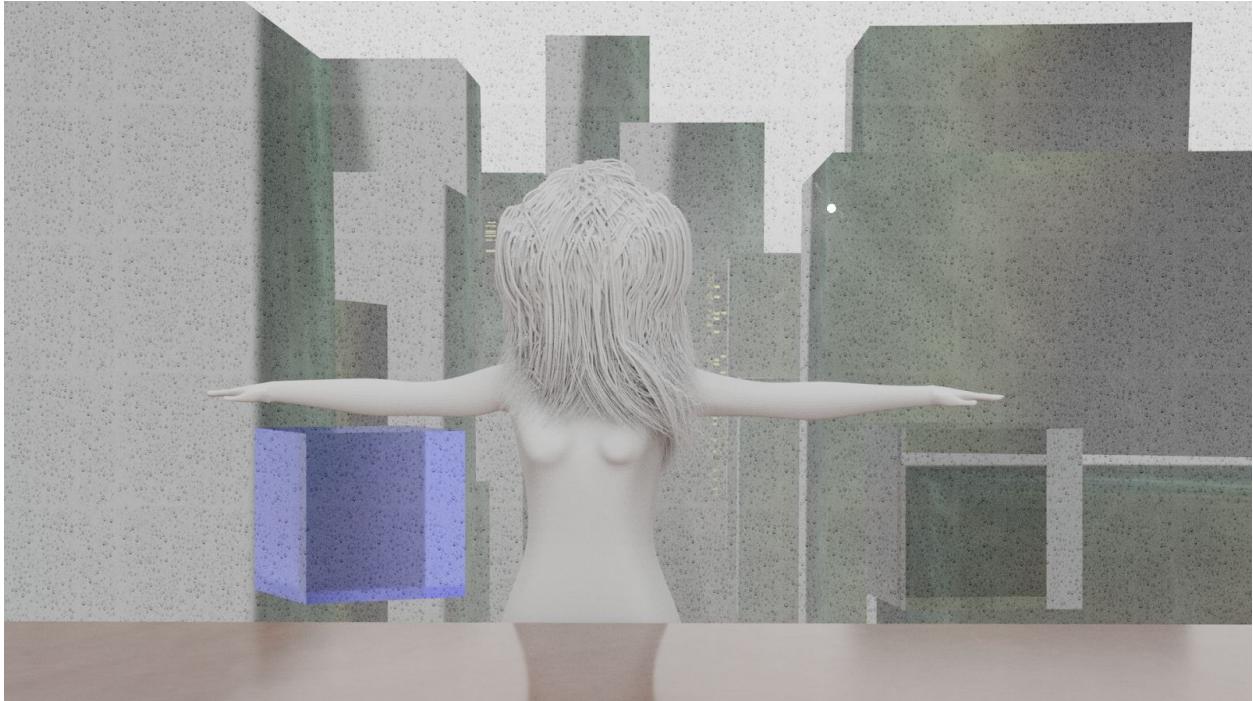
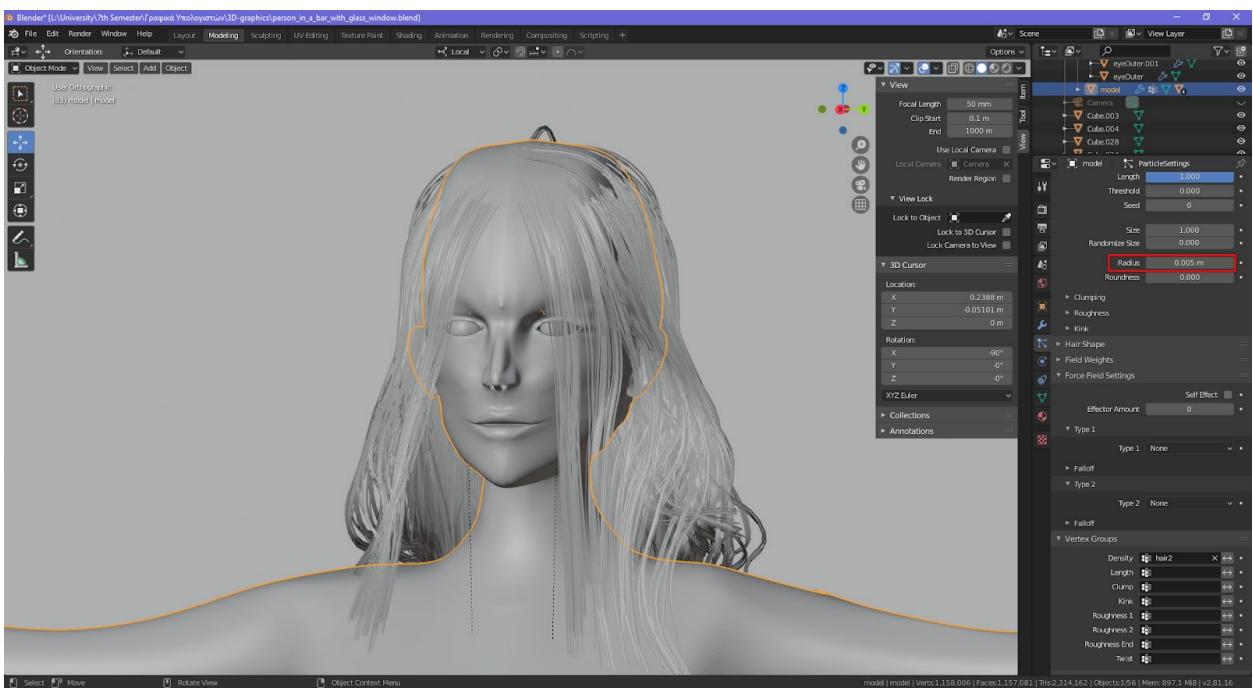


Image 2.15: Issue 2 - Desired result (solved).



The solution to these issues were two:

1. The normals at the back of the head were facing inwards (*solved issue 1*).
2. The children hair strings were too many (*solved issue 2*).

Dress

The dress was created from scratch by me as well. I:

1. added a panel in front of the model, gave it the desired structure,
2. Copied and placed it behind the model as well
3. Connected the parts where the dress must be connected
4. Applied cloth material

The problems with this object were numerous. The dress kept going through the model, the silhouette was unflattering (it looked like a garbage bag), and most importantly, I spend hours looking for why the stitches didn't close up like every tutorial.

After changing a bunch of settings over and over, I managed to make it work in an extend. The stitches either didn't close up completely or over stitched (leaving spare fabric outside the stitch), but I managed to reach a desirable result.

Image 2.16 (Left): Dress looking like garbage bag.

Image 2.17 (Right): Finished Design.



Animations

Character Rigging

The steps I followed to add rigs to my model:

1. Installed the “Regify” add-on.
2. Added a basic human rig -> Add > Armature > Human (Meta-Rig).
3. Scaled the rig according to my model and placed the bones accordingly.
4. Connect the mesh with the rig: *Select the model > shift select the armature > right click > parent > Armature Deform > With Automatic Weights*.
5. Do the same as 4, but instead of the model, I chose the eye layers.
6. Enter Pose Mode and check if everything is connected correctly.

I did check the connection through Pose Mode, but later on Animation I found quite some minor miss-placements.

Image 3.1: Step 2.



Image3.2: Step 6.



Animation

Animator gives you the ability to pose your model in different timestamps, making an animation. The animation I decided on, was the model to swipe her hair backwards with her left hand. I hoped to achieve collision between the hand (model) and the hair, as the hair was set to stay on top of the model.

I started animating by selecting a timestamp (usually the 1st timestamp, but I chose a later one in which the dress was stitched together), and made pose. I *selected all the bones and muscles of the armature that I moved > clicked i > Rotation and Placement*; this way I saved that pose to that specific timestamp. I moved some timestamps forward and repeated the process.

When running the animation, the model moved from pose to pose smoothly, generating the middle poses from one pose to the other.

- *Issue:* I have a major issue, in which the hair do not follow the scalp, if it's position is changed through the armature (it follows the head correctly when moving the model in other modes). I did not manage to find a solution, so I avoided moving the head too far from the original position. My original plan was to have the model lean forwards while snapping her hair back, but changed it because of this issue.

Image3.3: Animation.

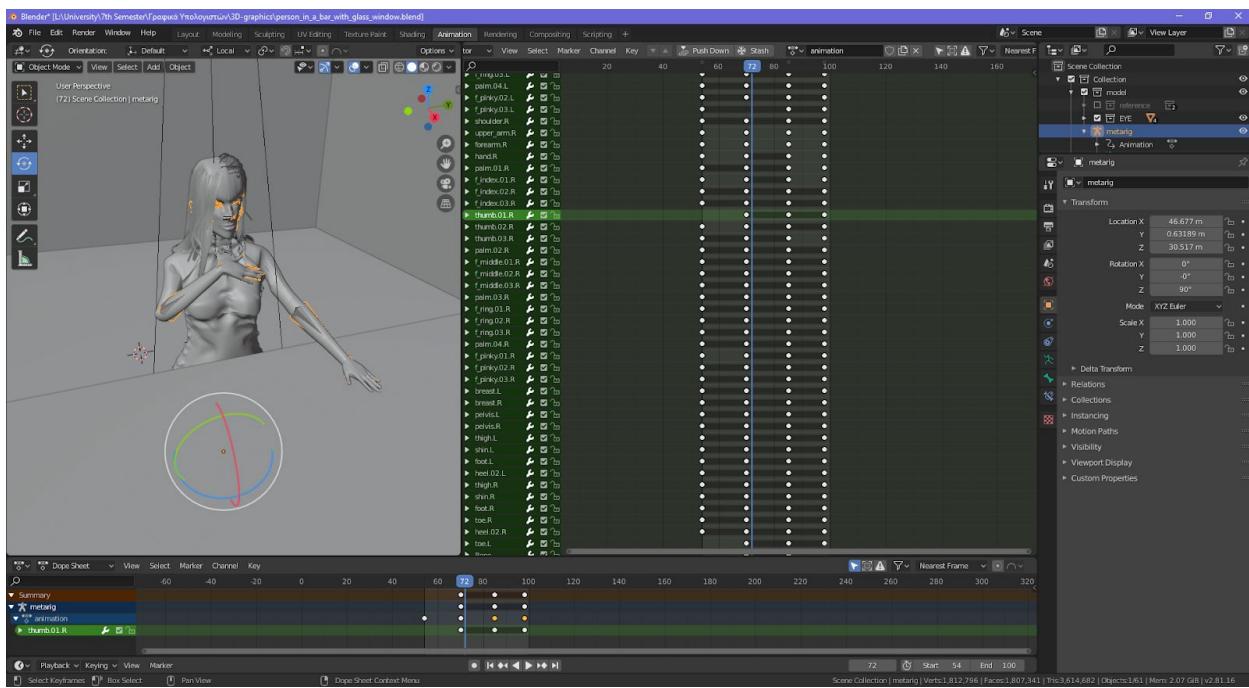
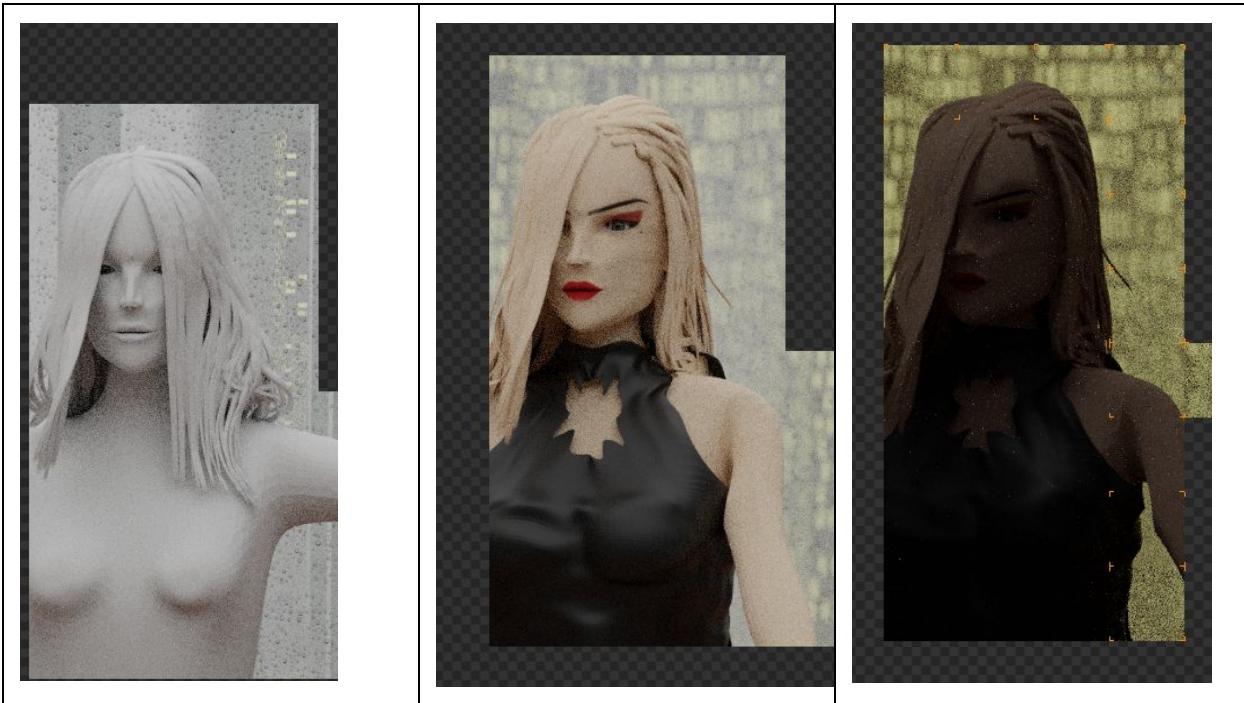
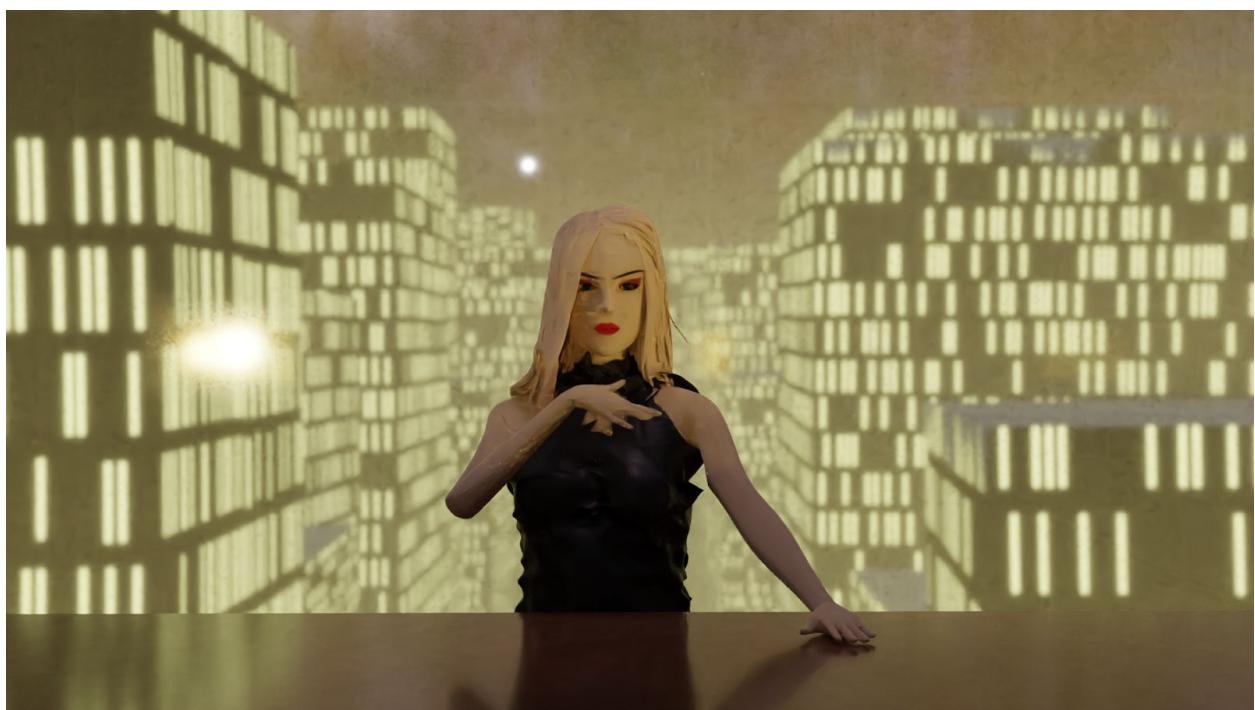


Image Renders





Bibliography [YouTube Videos]

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2. [Female Character Blender 3d modeling. Part 1 - Body](#)
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