



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

FACULTAD DE INGENIERÍA

Computación gráfica e interacción
humano computadora



Final Project

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GROUP: 05

SEMESTER: 2026-1

DELIVERY: November 25, 2025

USER MANUAL



INDEX

Content

1.- Goals	3
2.- Choice of Software used.....	3
3.- Movement in the environment.....	5
Camera translation	5
Camera Rotation	7
4.- Animations	9
First animation.....	9
Second animation.....	9
Third animation.....	10
Fourth animation	11
Fifth animation.....	12
Lighting system	13
5. – References.....	15

1.- Goals

- The student will apply and demonstrate the knowledge acquired during the course by creating a 3D recreation in OpenGL.
- The objective is to recreate the facade of the protagonist's house from the game "Grand Theft Auto: San Andreas".
- The student will implement four animations, each of which must be contextualized within the environment.
- The student will also create keyboard inputs so that the user can interact with the generated 3D environment.

2.- Choice of Software used.

Blender

To model the house's facade, I used Blender. I decided to use it to model and texture the entire facade I created. Although other modeling programs exist, I preferred Blender because it's free, easy to install, and doesn't require creating an account before using it. There was also plenty of online content that provided the fundamentals of how to use the program. Furthermore, my friends who were also taking this course were going to use Blender to model their own facades, so we could support each other with any problems that might arise.

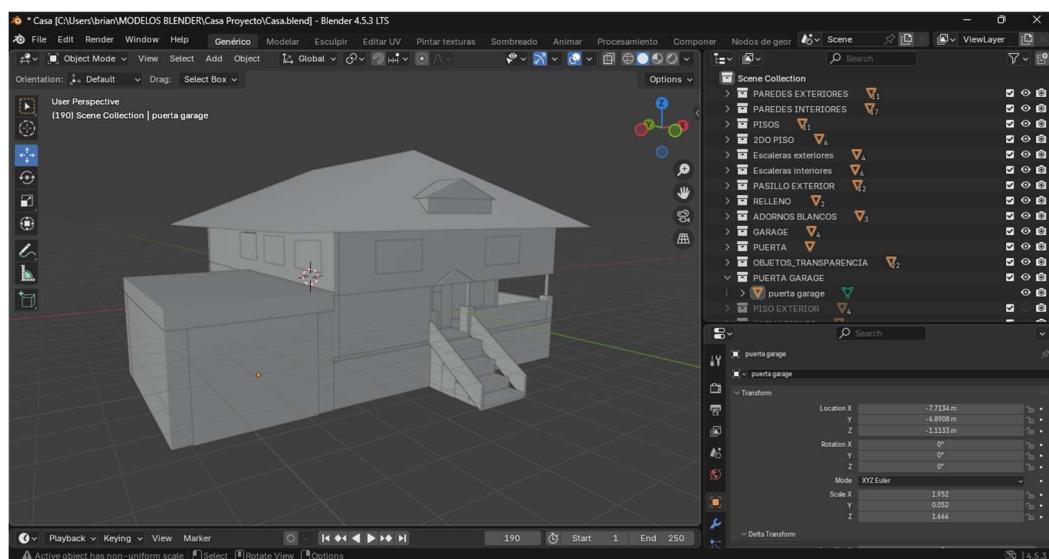


Image 1.1 – Modeling the facade in Blender.

Gemini PRO Image Generator

To texture a facade or any other model, you need images of a certain pixel size, so downloading images from the internet can be time-consuming, and you don't always find images with the specifications you need. That's why I decided to use Gemini PRO's image generator. I simply described the texture image I wanted and also provided an image from the game to give it a better understanding of what I wanted it to create.

The only problem I encountered was that Gemini took increasingly longer to generate the texture images I requested, and sometimes the image it generated was completely different from what I asked for or what I provided as a reference.

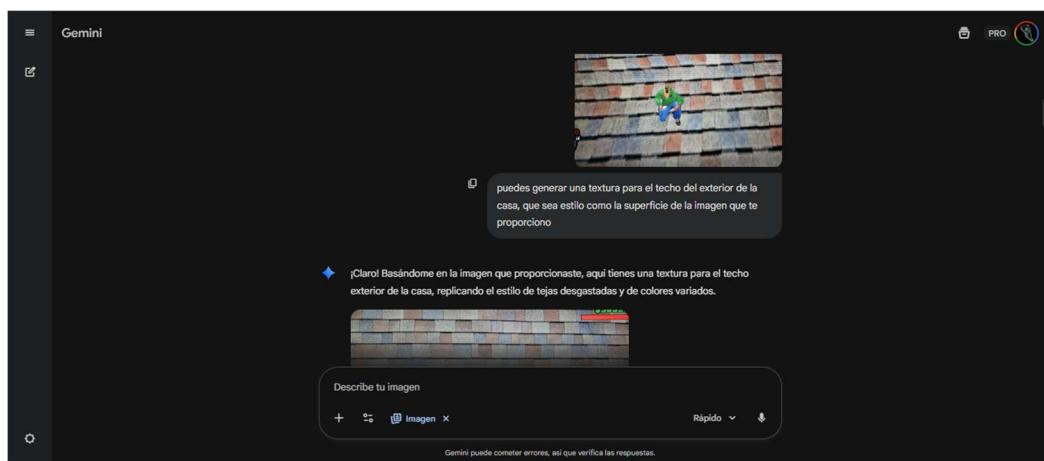


Image 1.2 – generating textures with Gemini PRO.

Gimp

Often, the images generated by Gemini had details I wanted to remove or modify, so I needed to edit them. For this, I used GIMP, an image editing software. I chose this software because it's free, easy to download, and doesn't require an account to use. Furthermore, it's an image editor I've used many times before, so I didn't have to look for resources or references online. It's a very powerful software that allowed me to make all the modifications I wanted to the images, such as adding an alpha channel to images that required transparency, removing watermarks from Gemini images, changing the color of textures, changing the pixel size, or simply changing the image format.

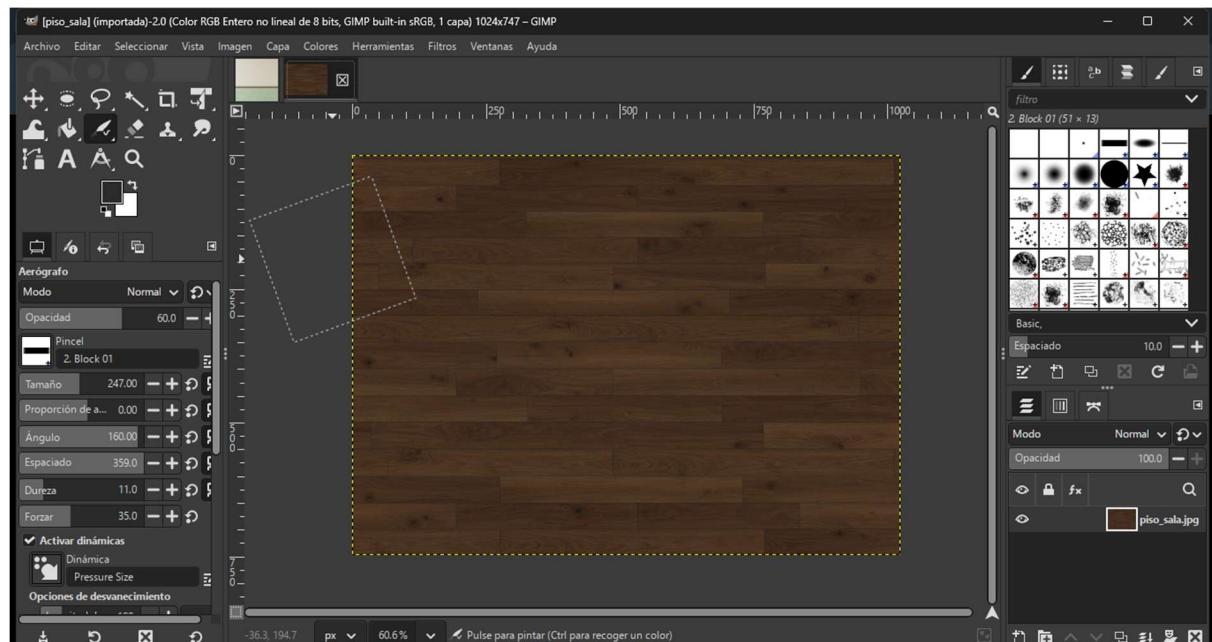


Image 1.3 – editing textures with Gimp.

3.- Movement in the environment

Camera translation

We press the “W” key to move the camera forward.



Image 2.1 – action that occurs when the “W” key is pressed.

We press the “S” key to move the camera backwards.



Image 2.2 – action when pressing the “S” key.

We press the “A” key to move the camera to the left.



Image 2.3 – action when pressing the “A” key.

We press the “D” key to move the camera to the right.



Image 2.4 – action when pressing the “D” key.

Camera Rotation

To rotate the camera to any angle, simply move the mouse in the direction you want the camera to rotate.

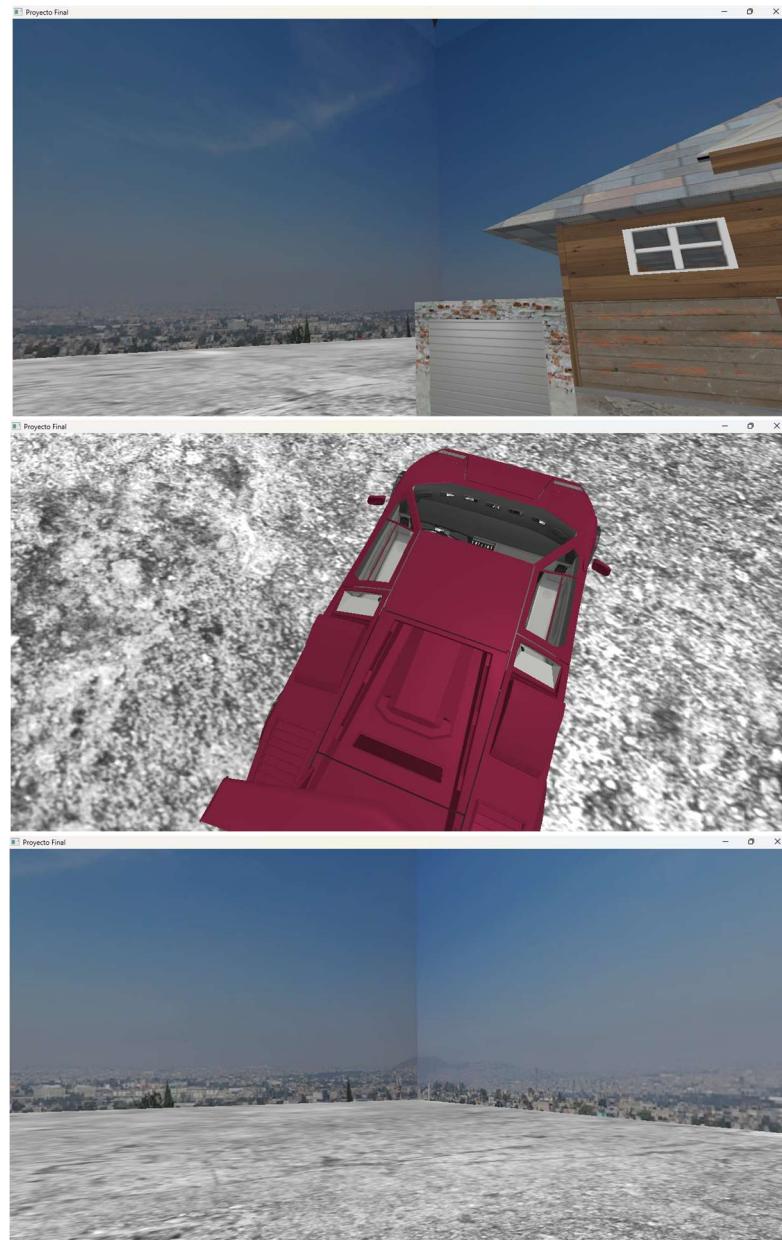


Image 2.5 – actions when moving the “MOUSE” in different directions.

4.- Animations

First animation

To run the first animation, simply press the "C" key, and you will see the curtains open or close as needed. The same key opens or closes the curtains when pressed.

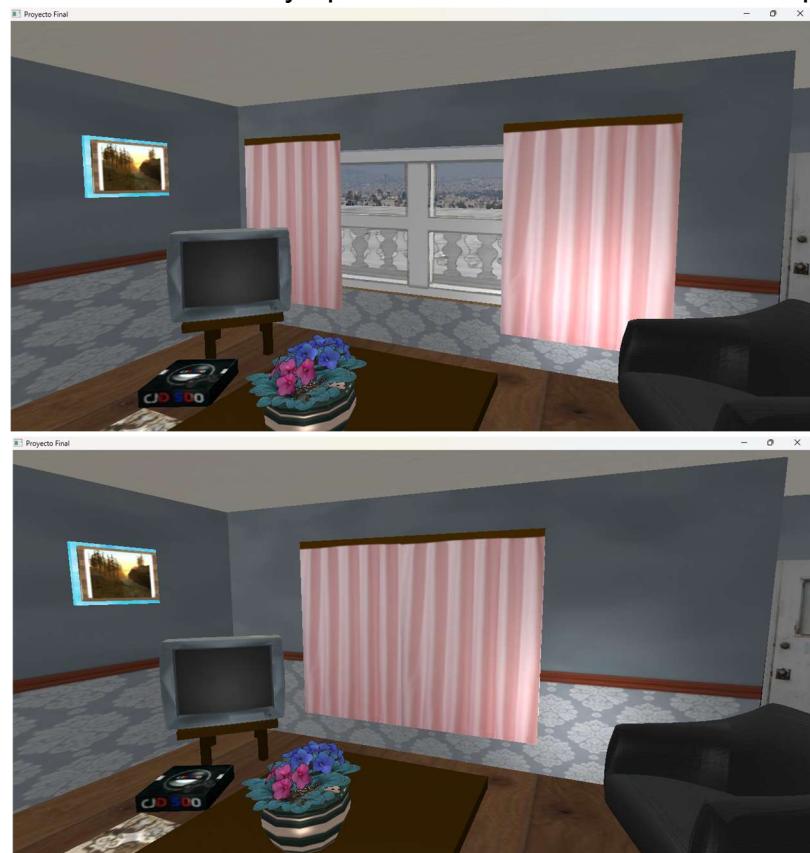


Image 3.1 – actions when pressing the “C” key.

Second animation

The second animation is triggered by pressing the "Z" key, and you will see the white door of the house open or close, depending on the situation. The same key opens or closes the main door of the house.



Image 3.2 – actions when pressing the “Z” key.

Third animation

The third animation takes place outside the house, more specifically, at the garage door. When we press the "X" key, the garage door will open or close depending on the case; the same key opens or closes the garage door.

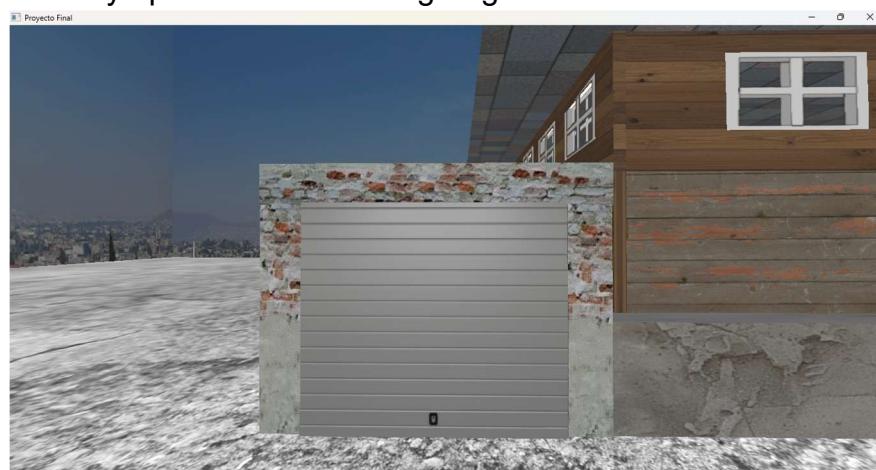




Image 3.3 - actions when pressing the “X” key.

Fourth animation

The fourth animation is executed with the "V" key, and we will see how the red car that is outside the house will begin to move around the house as well as the wheels; the same "V" key can stop the animation.



Image 3.4 - actions when pressing the “V” key.

Fifth animation

The fifth animation is triggered by pressing the "B" key. This animation shows the character inside the house walking along a specific path. You can also stop this animation by pressing the same "B" key.

This animation ends when the character reaches the brown door located on one of the walls.



Image 3.5 - actions when pressing the “B” key.

Lighting system

Finally, we have control of the house's internal lighting system. This allows us to simulate turning the lights on and off in each of the designed rooms. To perform this action, we must press the "SPACE" key, and the rooms will light up or turn off accordingly.





Image 3.6 - actions when pressing the “SPACE” key.



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