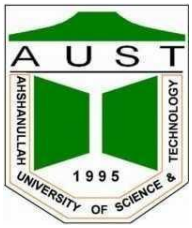
Ahsanullah University of Science & Technology
Department of Computer Science & Engineering



A desktop with accessories

Computer Graphics Lab (CSE 4204)

Project Final Report

Submitted By:

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Project Requirements:

1. Monitor with Texture

- **Modeling**: Design a 3D model of a monitor.
- **Texture**: Apply high-quality textures to the monitor, including the bezel, stand, and back surface.
- **Dynamic Screen Texture**: Implement the functionality for the screen texture to change dynamically, which could represent different images, videos, or animated textures.
- **Lighting Effects**: Incorporate reflections and other lighting interactions on the monitor's surface as light moves.

2. CPU with Texture

- **Modeling**: Create a 3D model of the CPU with accurate dimensions.
- **Texture**: Apply detailed textures to the CPU case, such as metal, plastic, or glass materials.
- **Interaction with Light**: Ensure the CPU model reacts realistically to the dynamic lighting changes.

3. Camera Movement

- **Camera Animation**: Program the camera to move around the desktop in a smooth motion, capturing different angles of the monitor and CPU.
- **Focal Points**: The camera should focus on different features as it moves, such as the monitor screen, textured details on the CPU, or lighting effects.

4. Lighting Animation

- **Light Rotation**: The light source will rotate around the table causing dynamic shadows and reflections.
- **Light Interaction with Materials**: Ensure the textures react realistically to the light changes, with proper shading and reflection effects.
- **Adjustable Lighting**: Implement the ability to adjust the speed and intensity of the light rotation.

Software Platform:

1. **VSCode(Visual Studio Code)- Version 1.90.2**
   Visual Studio Code (VS Code) is used for writing and debugging the project's code. Its support for JavaScript, along with features like IntelliSense, Git integration, and a wide range of extensions, provides an efficient development environment.

2. **Node.js- Version 20.15.1**
   Node.js is utilized for server-side development, allowing us to run JavaScript code outside the browser. Its rich library of modules facilitates file system I/O, network communication, and data streaming, ensuring robust performance for our 3D application

Project Features:

The project incorporates several advanced features to create an interactive and visually appealing 3D scene

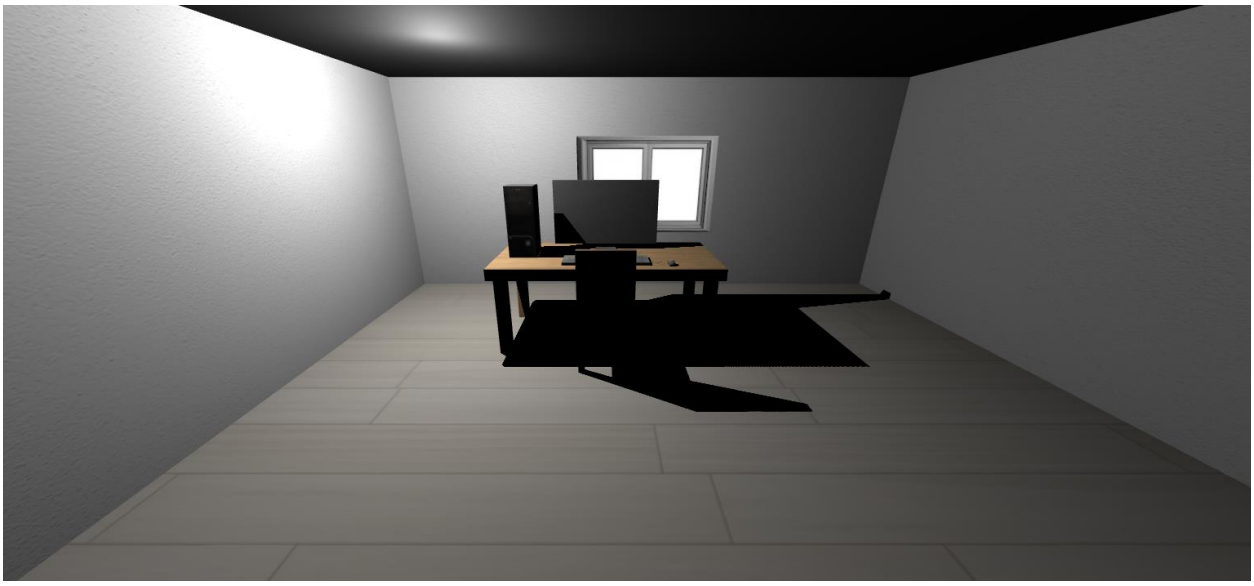
- **Room Environment:** A 3D room with textured walls, floor, and ceiling.
- **Table Setup:** A textured table with legs and multiple objects, including a CPU, keyboard, mouse and monitor.
- **Chair Model:** A 3D chair positioned in front of the table.
- **Textured Window:** A separate textured window on the front wall.
- **Monitor with Interchangeable Textures:** The monitor screen texture changes based on mouse interaction.
- **Camera Controls:** Orbit controls to move and rotate the camera around the scene and it is based on keyboard interaction.
- **Custom Textures:** Each object (walls, table, CPU, monitor, etc.) uses custom textures for realism.

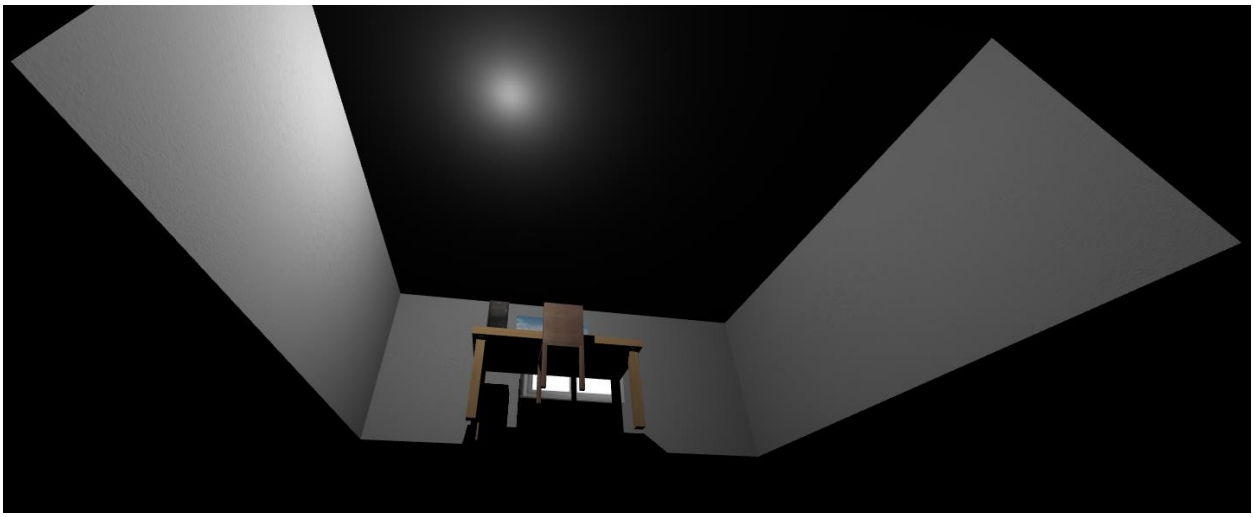
Attach a table with all your required/additional features and classify them into three categories: Implemented, Partially Implemented and Not Implemented.

#	Features	Status
1	Room Environment	Implemented
2	Table Setup	Implemented
3	Lighting	Implemented
4	Textured Window	Implemented
5	Camera Controls	Implemented
6	Custom Textures	Implemented
7	Mouse Model	Implemented

Table 01: Project Feature Table

Snapshots: The snapshots of the project is given below:





Contribution:

20200104035 (Aurprita Mahmood): Implementation of the project, structuring the 3D models, designing the scene, and setting up the ambient, report writing.

20200104036 (Meherin Sultana): Implementation of the project, structuring the 3D models, designing the scene, modeling the keyboard, monitor and mouse, report writing.

Future Work:

This project will use custom shaders to make materials like glass, metal, and plastic look more realistic, while improving lighting effects. The lighting will change based on what's happening in the scene or the time of day, creating a more immersive feel. Background music and sound effects will be added to make the experience even better. Simple animations, like more furniture or adding a door will make the environment feel more alive. Altogether, these features will create a more dynamic and engaging 3D scene with smooth visuals and sound.