Real Time Graphics Programming Project Report

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1 Overview

This project implements a 3D environment using OpenGL, allowing users to navigate within 3 square rooms connected by corridors. Inside the rooms various 3D objects are placed, each rendered with a different material based on shaders that showcase various types of noise with different parameters, all freely adjustable by the user thanks to the dedicated UI.

2 Project Details and Design Choices

2.1 Technologies

The following technologies were selected to ensure efficient rendering, cross-platform compatibility, and streamlined development for the project:

- OpenGL Modern Pipeline (Version 3.3+):
  OpenGL's modern shader-based architecture was chosen to leverage direct control over vertex and fragment processing. By utilizing GLSL shaders, the pipeline enables complex procedural effects while maintaining high performance.

- GLFW (Graphics Library Framework):
  GLFW provides robust window management and input handling, ensuring consistent behavior across operating systems, also its event-driven architecture simplifies interaction with user inputs.

- GLM (OpenGL Mathematics):
  GLM mathematics library is optimized for graphics programming. It offers essential data types (e.g., vectors, matrices) and prebuilt functions for common transformations (e.g., translation, projection).

2.2 Architecture

3   Algorithms and Techniques

4   Implementation Details

5   Performance Evaluation

6   Conclusion