CSC3081 Computer Graphics Programming (2023/24)
Individual Project Proposal

Department of Statistics and Computer Science
Faculty of Science
University of Peradeniya

NOTE: *The Proposal should be a maximum of 2 pages in length.*

Name	R.M.G.R. Rathnayaka
Registration No	S/20/139
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1. Project title:

Provide a clear and brief description of your project. This is the working / draft title for the project.
3D Interactive Virtual Museum: Art, Science, and Culture Showcase Using OpenGL

2. Brief overview of project:

Provide a brief overview of your project.
This project aims to develop a compact, interactive 3D virtual museum using the OpenGL. The museum will contain a set of visually distinct exhibition rooms, for example, an art gallery with paintings, a sculpture hall, a science and inventions exhibit, and a small space for cultural items. Users will be able to freely walk through the museum, look at the exhibits from different angles, and move between themed galleries. The environment will feature museum-style lighting, basic object animations such as rotating sculptures or a swinging pendulum, and display information panels, all designed to enhance realism and user engagement.

3. Project details:

Section outline:

- The objectives of the project:
- Project Significance:
- Project Scope and Limitations:

Project Objectives:

- To design and build an engaging yet manageable 3D virtual museum with several themed exhibition rooms.
- To provide intuitive camera controls and navigation so users can easily explore the galleries and closely inspect exhibits.

- To model and display a carefully selected collection of museum pieces, including 2D paintings, 3D sculptures, small science exhibits like a solar system model, pendulum, and several cultural artifacts.
- To add interactive features, such as rotating specific sculptures or starting/stopping simple science animations, and toggling focused spotlights on artworks.

Project Significance:

- The museum provides an accessible and fun way for users to explore educational content in an interactive 3D space.
- It serves as a well-rounded showcase of fundamental computer graphics skills like object construction, lighting, camera movement, and animation.
- Completing this project will also be a valuable addition to a graphics programming portfolio, demonstrating practical capabilities with core OpenGL techniques and interactive design.

Project Scope:

- The museum will include three to four interconnected rooms, such as an art gallery, a sculpture hall, a science room, and a different culture item collection area.
- Each room will contain around 4 or 5 exhibits for example, paintings (with textures), simple geometric sculptures, small science displays (like a model solar system or a pendulum demo), and cultural objects such as vases or masks.
- Expected features include keyboard and mouse navigation, smooth camera controls, the ability to turn exhibit spotlights on or off, animation of select objects, and on-screen information panels that can be toggled per room.
- Lighting will use a combination of general room illumination and focused spotlights, enhancing both realism and user experience.
- Simple textures will be used to add interest to paintings, information panels, exhibit pedestals, and some artifact surfaces.

Project Limitations:

- No external 3D models will be imported. All content will be crafted using OpenGL built-in geometry and transformations.
- The project targets desktop environments only, and will support keyboard controls (no touch or VR).
- The scientific exhibits feature basic animations for demonstration, rather than physics-accurate simulations.
- There will be no advanced user interface elements or sound. Information is shared through simple overlays or textured panels.