Bishop_3D

This project renders a 3D model of a chess bishop using OpenGL and C++. The bishop's profile is derived from a 2D image and uses cubic spline interpolation for a smooth, accurate representation.

Project Structure

- **bishop.cpp:** The main C++ source file containing the OpenGL rendering code, user interaction logic (keyboard, mouse), and integration with the edge function.
- **edge_function.cpp:** C++ implementation of the cubic spline edge function. This function takes a normalized height (y-coordinate) as input and returns the corresponding normalized edge distance (x-coordinate) to define the bishop's profile.
- **edge_function.h:** Header file for the edge function, declaring its signature.
- **contour_equation.py:** Python script used to extract the contour from an image (`Contours/chess-bishop-illustration.png`), normalize the edge points, perform cubic spline interpolation, and generate the `edge_function.cpp` and `edge_function.h` files. This script automates the process of converting the image contour to a usable C++ function.
- **Contours/:** Folder containing the source images used for contour extraction. Notably, `chess-bishop-illustration.png` is the primary image used in this project.
- **Rendered_Model_Pics/:** A folder intended to store screenshots or rendered images of the 3D bishop model.
- **ReadMe.txt:** This file.

Building and Running

1. **Dependencies:** Ensure you have OpenGL and GLUT (Freeglut) libraries installed.
2. **Compilation:** Compile `bishop.cpp` using a suitable C++ compiler (e.g., g++). Make sure to link the necessary OpenGL and GLUT libraries. Example:

```
g++ bishop.cpp -o bishop -lglut -lGL -lGLU
```