

Project 2 - Computer Graphics

Requirements

Realization of a graphics application in C (C++) using the OpenGL libraries and programmable rendering pipeline using vertex shaders and fragment shaders.

Specifically, it is need to realize a navigable scene in 3D graphics, in which interactions with the user and the management of collisions with the camera are foreseen.

Requirements to be satisfy:

- a) The modeling of the geometry must take place both through the assembly of primitives (cubes, pyramids, spheres, cylinders, cones, toruses) and by importing three-dimensional models in .obj format from outside.
- b) It is necessary to be able to select each object, modeled using the primitives, with the click of the mouse on the graphic window and to be able to change the materials and the type of shader to be used for coloring. The obj models imported from outside will be colored using the information contained in the .mtl (material) file.
- c) Implement via shaders
 - the Phong and Blinn Phong lighting model using interpolative shading
 - the Phong and Blinn Phong lighting model using Phong-type shading
 - The cartoon shader.
 - Texturing of primitives.
- d) Add a cubemap to the scene
- e) Move in the scene using the trackball, with the mouse passive event and with the wasd keys to move forward, backward, left and right in the scene.

Delivery of the project by 18 December 2022.

Date of the written test on the theoretical topics of the course: **Monday 19 at 9-12 in room 2.12**

Oral presentation of the project via Powerpoint presentation: **Monday 19 December starting from 2 p.m.**