Interactive Graphics

Homework 1

Online April 7th, 2019
Deadline: **Sunday April 28th, 2019 (23.59, Rome time zone)**

Tasks to do

The homework must be completed alone. Each student should do its own homework. Start by creating your own repository in the GitHub Classroom of the course by clicking on this link https://classroom.github.com/a/_RS8wLpg, please enter the **email you used to register in Piazza.** If you are not registered in Piazza https://piazza.com/uniroma1.it/spring2019/1044398/home please register and then post a message on Piazza with your email saying you cannot register in GitHub Classroom. After registering in GitHub Classroom, start by cloning or downloading this repository https://github.com/marcoschaerf/hw1 which contains the files needed for the homework. Please **do not change the names of the files**, modify their content.

You need to modify the files so to obtain the following effects.

1. Add a button that changes the direction of the current rotation.
2. Move the transformations matrices from the shader to the Javascript application, so that the ModelView and Projection matrix are computed in the application and then transferred to the shader.
3. Include a scaling (uniform, all parameters have the same value) and a translation Matrix and control them with sliders.
4. Define an orthographic projection with the planes near and far controlled by sliders.
5. Define a perspective projection, introduce a button that switches between orthographic and perspective projection. The slider for near and far should work for both projections.
6. Introduce a light source, replace the colors by the properties of the material (your choice) and assign to each vertex a normal.
7. Implement both the Gouraud and the Phong shading models, with a button switching between them.

Describe your solution in a short PDF document (2-3) describing your solution, the document should include a brief description of the techniques used, the advantages and disadvantages of the proposed solution, the features of your solution.

How to submit the homework

All homeworks MUST be uploaded to the **GitHub Classroom** of this assignment https://classroom.github.com/a/_RS8wLpg, including the **documentation**. After all the files have been completed and the documentation has been included go to the settings of the repository (last tab to the right) and activate **GitHub Page**s with **Source** the main branch. Verify that your homework loads correctly by clicking on the link after **Your site is published at:**.
Don't post solutions on Piazza. Use Piazza only for questions and clarifications.