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**, you only need to modify their content.

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

1. Add the viewer position (your choice), a projection (your choice) and compute the ModelView and Projection matrices in the Javascript application. The viewer position should be controllable with buttons, sliders or menus.
2. Include a scaling (uniform, all parameters have the same value) and a translation Matrix and control them with sliders.
3. Define an orthographic projection with the planes near and far controlled by sliders.
4. 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.
5. Introduce a light source, replace the colors by the properties of the material (your choice) and assign to each vertex a normal.
6. Implement both the Gouraud and the Phong shading models, with a button switching between them.
7. Add a procedural texture (your choice) on each face, with the pixel color a combination of the color computed using the lighting model and the texture

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

How to submit the homework

All homeworks MUST be uploaded to the **GitHub Classroom** of this assignment (NOT ON YOUR PERSONAL GitHub) 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 Pages** with **Source** the main branch. Verify that your homework loads, displays and works correctly by clicking on the link after **Your site is published at:** found in the settings tab.

Don't post solutions on Piazza. Use Piazza only for questions and clarifications. Do not ask for clarifications or comments by email, use only Piazza