

Interactive Graphics

Homework 1

Online April 10th, 2018

Deadline: **Tuesday May 1st, 2018 (midnight, Rome time zone)**

Tasks to do

The homework must be completed alone. Each student should do its own homework. Download the file Homework1.zip from the course homepage in Piazza

<https://piazza.com/uniroma1.it/spring2018/1044398/home>

After unzipping you will find this file, and 2 directories, one (Common) contains the required libraries, and one contains the files to modify (Homework1.html and Homework1.js). 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 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. This file should be submitted in PDF format and its name should be student ID number (numero di matricola). If you do not have a Sapienza student ID number, use your last name.

How to submit the homework

After you finish completing all the tasks, create a zip file CONTAINING ONLY THE TWO SOLUTION FILES WITH THE ORIGINAL NAME (Homework1.html and Homework1.js) AND THE PDF DOCUMENT (<student_ID_number>.pdf), do NOT include the Common directory and this file. The name of the zip file should again be your student ID number (numero di matricola). If you have a uniroma1.it email account please fill in this form (requires logging in your uniroma1.it email account):

<https://goo.gl/forms/Se4zfGhe3LxZIWFO2>

and upload there the zip file (STRONGLY PREFERRED SOLUTION). Otherwise, put it in any other sharing website and send me (marco.schaerf@uniroma1.it) the link. As a last resort, send me the zip file as an attachment in email. **Don't post solutions on Piazza.** Use Piazza only for questions and clarifications.