**Computer Graphics exam project descriptions**

*Version 1.0, 2nd May 2022.*

To each registered team / student, a project will be assigned by the teachers of the course. The available project topics are listed in a different document, *which will be **published separately***.

Projects must be done in teams of two students. Under very motivated circumstances, party of one or of three students will be allowed: the expected distribution of number of team members is: 10% single person, 80% two people groups, 10% three people groups – i.e. in a group of 200 students, 10 are expected to do the project individually, 160 in 80 groups of two, and 30 in 10 groups of three. All team members will have to discuss the project in the **same** exam date. Remember however that this year, as am experiment, project and assignments can be discussed in separate sessions: if someone cannot prepare the assignments, might come for the project discussion, and she will be allowed to complete the exam in a future session. *Exception will be possible only for **VERY MOTIVATED AND SPECIAL** circumstances*.

A link to a Google form will be provided to register for the project: there you will be able also to specify your curriculum, your other team members, and select up to three preferred project topics. *The **link** will be available **in the Beep page of the course***. I will do my best to assign you one among your choices, but keep in mind that the projects will be equally distributed. If you only select the most popular ones, there is the risk that none of them could be assigned to you, and a different one will be given.
Please keep in mind that for group projects, each member will have to register individually using the Google form: this helps confirming that every participant of the group is indeed interested in doing the project with the other members of the party.

Registration for the projects will be open until mid-January 2023. For the first few weeks, the results of the assignments will be shown on Beep using the Personal Code (8 digits, starting with 1) and regularly updated. Students who will register later will need to contact me directly via mail using the official teacher-student communication channels for knowing the results of their request.

Each project must be done in C++ using Vulkan. Different requests can be discussed (i.e. using Direct X 12, or a Vulkan to Python Bridge), but must be explicitly allowed before the exam. You are allowed to start from some of the example code / assignments given during the course. You can even start from sources publically available on the web: however, in this case, you will be required to know exactly what every line of that code does.

You are allowed to use third party libraries and helpers such as *Vulkan.hpp (https://github.com/KhronosGroup/Vulkan-Hpp/blob/master/vulkan/vulkan.hpp)*, but ***not** complete 3D engines*. Your code will need to have sections where: it explicitly loads the geometries and the textures, sets the shaders (which must be written by yourself), sets the vertex formats and the uniforms, creates the graphics pipeline, and records the draw-call in the command buffers to finally show the scene on screen.

Each project will require a set of 3D assets to be completed. Standard assets will be provided on the Beep page of the course to simplify your work. However, the use of different assets is encouraged and will be positively evaluated during the presentation.

Personal project topics are also encouraged: in the topic selection form, you will have the possibility of requiring a personal theme. In this case, however, the topic must be discussed with the teacher, and accepted before starting working on it.