Computer Graphics 2021
Preliminary Exercise 1: Installing C++, OpenGL, and LaTeX

Prof. Dr. Martin Hering-Bertram
Hochschule Bremen

The grading for Computer Graphics is based on 2-3 development projects. Each project is composed of weekly exercises with problems to be solved by groups of 2 or 3 students. Solutions need to be uploaded in AULIS or presented by all group members during the laboratory sessions. Every project results in a final presentation and documentation written in LaTeX. The grade is based on the overall performance within these projects, there is no written exam.

Problem 1: Installing OpenGL with C++

OpenGL ist the application programming interface (API) mostly used for graphics programming. For using OpenGL with C++, you can install an integrated development environment (IDE) of your choice. The simplest way is using QT, which also provides a library for GUI development. When using alternative IDEs like Eclipse, you also need a library for opening windows with OpenGL context. When you have worked with OpenCV (Open Computer Vision Library), already, you can try to do this with the HighGui API. There exist also a lot of different ways to use OpenGL contexts. Installation instructions for QT and for OpenCV can be found in AULIS.

Examine the code in the file **oglwidget.cpp** within the **OpenGL_Example** in AULIS. Either, get the project running with QT, or copy the rendering code into your own project using an IDE of your choice. The rendering code uses functions from **OpenGL 3.2**. It is sufficient to install this version. When using the newest OpenGL version, make sure to install the OpenGL 3 compability profile, including the older functions marked as “depreciated” within this version.

For further reading, have a look at the OpenGL RedBook: **http://glprogramming.com/red/**

Problem 2: Getting familiar with C++

C++ software projects are composed of modules ***.cpp** containing the implementation and corresponding header files ***.h** containing the interfaces to other modules. Functions to be used elsewhere need to be declared within these header files and need to be included.

For compiling and linking software projects, the compiler instructions are summarized in a makefile. This can be generated automatically with cmake, which is compatible with many IDEs.

Get familiar with the C++ examples in aulis.

Problem 3: Installing LaTeX

LaTeX will be used to write the final report for every project. In case you have not used LaTeX before, install **MikTeX**. For editing and compiling, it is recommended to install **TeXstudio** or any other TeX editor. Also, a pdf reader is required to view the results.

Compile the example **Template.tex** into a pdf and examine the source code.