TU BRAUNSCHWEIG
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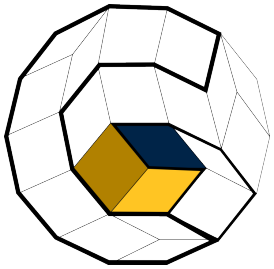


June 4, 2018

Real-time Computer Graphics, Summer 2018
Assignment 5

Present your solution to this exercise on Thursday, June 7, 2018.

The exercises are going to take place in the CIP pool, room G40 in Mühlenpfordstraße 23. Please make sure your solutions compile and run on the CIP pool computers. Note that you need a y-number, which can be obtained at the Gauß-IT-Zentrum, to use the computers. If for some reason you are not able to attend the exercise, you may send your solution to ecg@cg.cs.tu-bs.de instead.

This exercise and the corresponding version of the framework can be found on the lectures website (`http://www.cg.cs.tu-bs.de/teaching/lectures/ss18/ecg/`).

Theoretical Tasks

5.1 Viewports (10 Points)

Review the functionality of viewports and answer the following questions:

- What is defined by the viewport?
- Is a viewport always required?
- Describe possible uses for viewports. What are the advantages or disadvantages of using viewports?

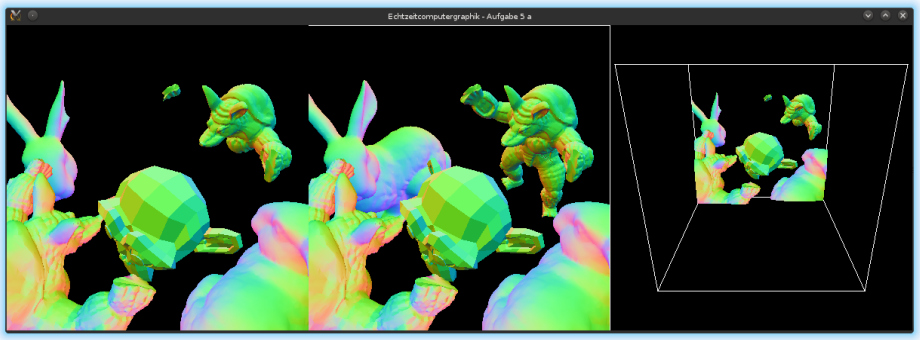
5.2 Short Presentation (Extra credit 10 Points)

Prepare a 5min talk about an interesting topic related to the current lecture. Send your topic proposal via email to ecg@cg.cs.tu-bs.de at least 24 hours before the presentation.

Practical Tasks

5.3 Multi Viewport and Camera Transformation (40 Points)

In this task you will use 3 viewports to show a scene, visualize the viewing frustum in world coordinates and show content of the normalized device space. Make yourself familiar with the Viewport-Class (`gl/OGLViewport.h`) and complete the code in `ecg_ex05_a` and `gl/ViewportFreeCameraControler` . A simple testscene is provided and already setup for rendering in viewport0. Add the scene and a wireframe box (which is used to visualize the frustum) to the second and third viewport with the required transformation.
In the end your result should look similar to this:



5.4 Further Geometry (10 Points)

Take a look at the `gl/oglobject/OGLWireBox` and implement a simple grid object which fills the scenes xz-plane with a grid. Allow for different spacing and number of lines per axis. Add your grid to any of the previous exercises or create a new application to test it.

5.5 Coding (Extra credit 10 Points)

Present one of the following:

- a bug in the framework
- a helpful test case to solve an exercise
- the implementation of an additional feature
- a nice demo using the current framework

Note that a short documentation is required and code has to be handed in. Please report bugs immediately (via email) so they can be fixed as soon as possible.