UNIVERSITÄT BERN

3D Geometry Processing
Exercise 1 - Introduction

Handout date: 20.02.2020

Submission deadline: 26.02.2020, 23:59 h

Note

A .zip compressed file renamed to `Exercise`n`-GroupMemberNames.zip` where n is the number of the current exercise sheet. It should contain:

- Hand in **only** the files you changed (headers and source). It is up to you to make sure that all files that you have changed are in the zip.
- A `readme.txt` file containing a description on how you solved each exercise (use the same numbers and titles) and the encountered problems.
- Other files that are required by your `readme.txt` file. For example, if you mention some screenshot images in `readme.txt`, these images need to be submitted too.
- Submit your solutions to ILIAS before the submission deadline.

Coding Exercise (10 pts)

The goal of this exercise is to set up coding environment for the exercises in the course and to get started with Eigen library.

- Download `dgp-exercise1.zip` and extract into OpenFlipper folder.
- Compile OpenFlipper together with the plugin **Plugin-DGPExercise**.
- Read Eigen documentation and solve the small sparse linear algebra system $Ax = b$, where

$$A = \begin{bmatrix} 2 & 3 & 0 & 0 & 0 \\ 3 & 0 & 4 & 0 & 6 \\ 0 & -1 & -3 & 2 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 4 & 2 & 0 & 1 \end{bmatrix}$$

  and $b = \begin{pmatrix} 8 & 45 & -3 & 3 & 19 \end{pmatrix}^T$. You should set up the linear system with Eigen. Choose a proper sparse solver to solve for the variable x and output the result as well as the matrix A and vector b. For the exercise, you will need to fill in the missing code in the `EigenTutorial.hh` and `EigenTutorial.cc` files.