Project Parameter Estimation, 2020 HS
Block 1 „Scanner Calibration“
Assignment 2, September 25, 2020

Tasks

The following tasks are to be accomplished as group work within assignment 2 of this block until October 2, 2019, 8 am:

1. Define the adjustment model for the implementation of TLS calibration according to the procedure outlined in Lichti (2007) under the following conditions (partially differing from those in the paper):

    a. 4 APs to be estimated: a_0, b_1, b_2, c_0
    b. N (>= 10) OPs available, coordinates perfectly known in external coordinate system
    c. s (>= 1) scans with different scanner location and setup
    d. all EOs unknown, but assumption that the scanner is approximately upright

    Explicitly write down this model (handwritten note is ok) indicating all terms which you need.

2. Define the software architecture of the Matlab implementation to be developed. Explicitly write down (in terms of expected input, output and main tasks) blocks within the software which can and will be developed individually. Draw a diagram showing how these blocks are interlinked. Also describe and document the overall input (in terms of data files and user input) and the overall output (in terms of result files and possible on-screen output).

3. Assign blocks to the members of the group such that each member works on certain blocks individually. Prepare a diagram of the software architecture indicating also in the graphics who is responsible for which blocks and activities.

4. Implement and test these blocks individually, as far as you get until Oct 2. Each block should at least have been started such that particular challenges or problems can be identified and discussed next time in class. Use the data provided in the zip-file PPE2020_TLS_Testdata.zip to develop and test your software. In particular, make sure that the software reads the OP coordinates and the scan data from files with a structure/syntax like the ones given in the zip file. For the final class of this block you will receive input files to be processed; the files will have the same structure/syntax as the ones given here.

5. If there is enough time left, put the blocks together.

Next class

On Oct 2 (i) we will discuss the status of your work (be prepared to present the status by sharing the screen with scans/pictures of equations/diagrams drawn by hand or slides, or whatever you deem appropriate), (ii) we will discuss problems which you encounter and we will try to solve them.