Visual-Based Navigation
Solution Exercise Sheet 5
Topic: Real-Time Visual Odometry

Kamysek, Josef-Maria

May 29, 2021

Part 1: Skeleton Code

Inspect the next step function and describe in the PDF file a workflow for the implemented odometry method.

1. Project the landmarks
2. Detect keypoints and descriptors
3. Compute essential matrix
4. Match descriptors
5. Find inliers essential
6. Find matches between landmarks
7. Localize new / next camera in map
8. Add newly detected landmarks
9. Remove old keyframes
10. Perform optimization
11. Change displayed image
12. Compute projections

Part 3: Optimization

1. What is the difference to the optimize function in src/sfm.cpp from the previous exercise?

   Optimization in odometry works in real time, in sfm it does not.

2. What is the functionality of the variables opt finished and opt running?

   These variables indicate whether the optimization is still running or if it has already finished. They are needed in conjunction with threading.

3. What will happen if we remove them?

   If these variables are removed, the threading of the optimization will not work properly.