Computer Vision, fall 2019

Exercise 3, 25.9.2019

Ex 3.1

Calibrate your own camera using one of the most sophisticated open source calibration toolbox created for Matlab and found here:

http://www.vision.caltech.edu/bouguetj/calib_doc/index.html

1. Print the calibration template found via this link http://www.vision.caltech.edu/bouguetj/calib_doc/htmls/own_calib.html
2. Take at least 10 images using your own camera, e.g. your smartphone camera
3. Follow the instructions for doing your own calibration
4. What are the calibration parameters for your camera?

Ex 3.2 Line detection and vanishing point computation.

1. Detect edges in the images Corridor1.jpg and Corridor2.jpg using Matlab's Canny edge detector and find as many lines as possible among the edges by implementing yourself a Hough line detector based on the method presented at the lectures.
2. Compute vanishing points for lines in approximately vertical direction and direction orthogonal to the image plane (along the corridor). You are free to decide which kind of a computation algorithm to design, but justify your selection. How do you agree with the computed vanishing point locations? If you think they are in a wrong location despite sophisticated computation, what could be a problem?
3. Compute how much the camera has rotated between the two images using the equations provided in the lecture notes in Lecture 2. E.g. https://tutcris.tut.fi/portal/files/7748951/ruotsalainen.pdf Chapter 4, gives you advise on the relationship between vanishing point locations and camera rotation if needed. You'll need also the calibration files Calib_Results_GoPro.* for this task.