

Homework 2: RANSAC homography estimation

Due in class Thu Jun 7, 2018

Goal: In this assignment you will become more confident in Octave and experiment with automatic robust homography estimation with OpenCV.

Problem 1: RANSAC for H

1. Get the DLT and Gold Standard algorithms for H estimation demonstrated in class up and running, and understand the code.
2. Modify the code to add some outliers to the data set and demonstrate that the Gold Standard method performs poorly with outliers.
3. Implement a RANSAC loop with the DLT and GS routines as subroutines in order to perform RANSAC estimation of H.

Problem 2: Homography estimation

1. Take two pictures of a planar scene from different perspectives.
2. Use online tutorials to get SURF features for the two images and show the putative correspondences.
3. Use the OpenCV routine `findHomography()` with the RANSAC option to get a homography and remove outliers.
4. Take a look at the source code for `findHomography()` and find out how it decides how many iterations of RANSAC to execute.

What to turn in. Turn in a writeup no longer than 4 pages in PDF format showing your images and code, explaining your procedure, showing the resulting data, and answering the last question about the source code. It is not required, but I would recommend that you use \LaTeX to write up your solution, to get some early practice.