Opened: Tuesday, 18 November 2025, 9:00 AM
Due: Friday, 5 December 2025, 11:59 PM

Goal

The goal of the lab is to ***implement*** the 8-point algorithm, to estimate the fundamental matrix F.

Please, read carefully the text below before starting and download the material.

1) Implement the following functions:

1. 8-point algorithm function (version 1) -- A Matlab function function [F] = EightPointsAlgorithm(P1, P2) implementing the following steps:

1. Write down the matrix A (see the slides...)
2. Compute the SVD decomposition of A
   [U, D, V]=svd(A);
   and select as solution f the last column of V.
   Reshape the column vector f so to obtain a matrix F (see function reshape)
3. Force the rank of F to be 2:
   - Use again the SVD to decompose the matrix
     [U, D, V] = svd(F)
   - Set D(3,3)=0
   - Recompute the final F: F=U*D*V^T.

2. 8-point algorithm function (version2) -- A Matlab function function [F] = EightPointsAlgorithmN(P1, P2) implementing the following steps:

1. Normalize the points using the function normalise2dpts already provided.
   - [nP1, T1] = normalise2dpts(P1)
   - [nP2, T2]=normalise2dpts(P2)
2. Call the function EightPointsAlgorithm on the normalized points
3. De-normalize the resulting F as $T2^T$*F*T1. This is your final F

2) Update the main script to check:

- **the epipolar constraint (x'^TFx=0)** It should hold for all points with the estimated F (both with and without normalization)
- **the epipoles.** To compute left and right epipoles, recall that they are respectively, the right and left null space of F, thus you can simply perform the SVD decomposition of F, F=UWV^T, and then select the last columns of U and V.

3) Acquire and match your own images

IMPORTANT: the images must be acquired under appropriate conditions.

Assignment

You are requested to deliver

- A zip file including the function to compute the fundamental matrix, and all (and only) the files you have updated
- A report in which you discuss your results (NO theory)

Add submission

Submission status

Submission status	No submissions have been made yet
Grading status	Not graded
Time remaining	10 days 14 hours remaining
Last modified	-
Submission comments	Comments (0)