

BM40A0902 3D Computer Vision

Exercise 8

Stereo vision

1. 8-point algorithm (2 points).

Estimate the fundamental matrix from two test images. Download the images of a books scene, files "books1.jpg" and "books2.jpg".

Find the coordinates of nine corresponding points in both images.

Implement the 8-point algorithm described in the lectures slides.

Use eight of your points as input to the algorithm to determine the fundamental matrix F . Check your algorithm using the ninth point by calculating $\mathbf{p}_R^T F \mathbf{p}_L$. This should be small if your algorithm works (but does not need to be exactly zero because there might exist some noise in the point locations).



a) Left image



b) Right image

Figure 1: Stereo image pair for Tasks 1 and 2

2. Epipolar lines and epipoles (2 point).

Using the recovered fundamental matrix F from the previous task, determine the locations of the epipoles. Determine also the right epipolar line corresponding to the ninth point in the left image, and draw the epipolar line on the right image.