

# Lab 6: Two-view projective calibration and 3D reconstruction

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## 1 Introduction

In the lab i tried various techniques related to the application of several concepts of two-view projective geometry to the field of camera calibration and 3D reconstruction.

### 1.1 Exercise: 6.1

The lines were spinning around a center point in the image. The *vgg<sub>F</sub>from<sub>P</sub>* function computes the fundamental matrix from the projections matrices, which we had studied in VMMC-Part 1, afterwards it extracts the epipolar lines.

### 1.2 Exercise: 6.2

Below are the results obtained for the noisy data and for ideal data. The obtained outputs are as expected (similar to ones given in the lab instructions).

Noisy Data:

Residual reprojection error. 8 point algorithm = 16.6713

Pixel error: mean = [ -1.17420 0.60470]

Pixel error: std = [ 4.50151 3.39020]

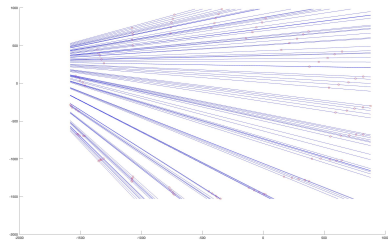
Ideal Data:

Minimum singular value = 2.528e-15

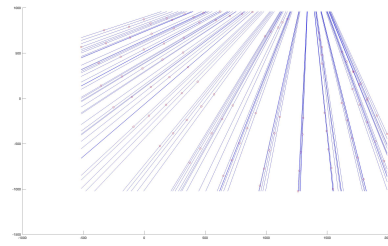
Residual reprojection error. 8 point algorithm = 5.2284e-20

Pixel error: mean = [ -0.00000 -0.00000]

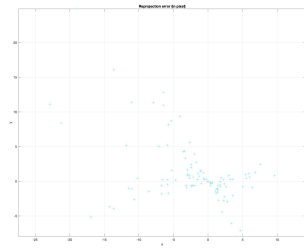
Pixel error: std = [ 0.00000 0.00000]



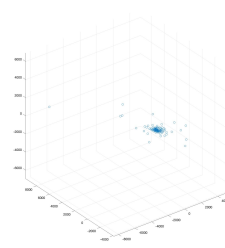
(a) Epipolar lines in the reprojected image 1.



(b) Epipolar lines in the reprojected image 2.



(c) Reprojection error per pixel.



(d) 3D Projective reconstruction