Sheet 4 - Model Fitting

Jan Scheffczyk - 3242317
Leif Van Holland - 2563657
Oliver Leuschner - 3205025

November 21, 2019

Practical part

Please find the solution in the accompanying .py file.

Theoretical Part

Assignment 1) Fitting Circles

a)
A line needs two points which can be equal. A circle need three points which cannot be equal and cannot be the same line

b)

$$E = \sum_{i=1}^{n} \left((x_i - x)^2 + (y_i - y)^2 - r^2 \right)^2$$

c) If we do not fix the length p to $|p| = 1$ we get an arbitrary amount of solutions along the eigenvector of A.
By dividing the optimization term through $p^T \cdot p$ it becomes independent of the length of the vector p and only optimizes for the direction.