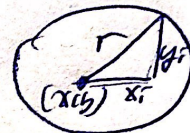Cüneyt EREM

Sheikh Mashrur Farzana

Md Emdazul Haque

1]

a) *0.5/1*

Line = we need at least 2 points because 1 point is passed by infinite number of lines

circle = 1 point cannot be drawn and 2 points create line so that we need at least 3 points which do not lien on a straight line to be unique order than line

Explain! why do 2/3 suffice ...

b) total least square

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

0.5/1

x_{cy} = center
r = radius

c) to find min $p^T A^T A p$ s.t. $\|p\| = 1$, we can apply Lagrangian multiplier such that

0/2

$$\min L(p, \lambda) = p^T A^T A p - \lambda(\|p\| - 1)$$

$$\frac{\partial L(p, \lambda)}{\partial p} = A^T A p - \lambda p = 0 \quad \text{④}$$

$$\frac{\partial L(p, \lambda)}{\partial \lambda} = \lambda p = 0 \quad \text{②}$$

What?

by ① we can say that we can find eigenvector p of eigenvalues of A because it is independent from $\|p\|$ so it should not need becoming 1.

i can not read this.

0.5 + 0.5 + 0

Theoretical Part

Assignment 3) Fitting Circles
a) 0.5/1
b) 0.5/1
c) 0/2

1/4

Practical Part

Assignment 1) Detecting Circles Using RANSAC
a) 0.5/1 (3 points are not guaranteed to be different)
b) 1.5/2 (have to use inliers_best)
c) 1/1
d) 2/2

Assignment 2) Detecting Circles Using the Hough Transform
4/4

9/10