ET3112 Homework 7 on Fitting

Ranga Rodrigo

February 18, 2023

1. The following is a code snippet to generate a noisy line. Use least-squares line fitting to fit a line.

```
m = 2 # Line equation: y = m*x + c. m is the slope. c is the intercept.
c = 1
x = np.arange(1,10, 1)
n = 2.*np.random.randn(len(x))
o = np.zeros(x.shape)
# o[-1] = 20
y = m*x + c + n + o
```

2. Use total least squares to fit a line. Experiment with high values of the gradient m.

3. Use RANSAC to fit a line. Experiment on the effect of outliers by setting $o[-1] = 20$.

4. Fit Houghlines to the Soduko image in Fing. 1.

Figure 1: Image for Houghlines

5. Fit Hough circles to the coins image in Fing. 3.

Figure 2: Images for Hough circles.

6. Use generalized Hough transform to match the template with the image.

Figure 3: Images for generalized Hough transforms.