

# Seminar 11

## DEDP

1. Fit a linear function  $y = ax$  (i.e. estimate  $a$ ) through the following data points  $(x_i, y_i) = (1, 1.8), (2, 4.1), (2.5, 5.1), (4, 7.9), (4.3, 8.5)$ , assuming the noise is  $\mathcal{N}(0, \sigma^2 = 1)$ 
  - a. use Maximum Likelihood (ML) estimation
  
2. A received signal  $r(t) = a \cdot t^2 + noise$  is sampled at time moments  $t_i = [1, 2, 3, 4, 5]$ , and the values are  $r_i = [1.2, 3.7, 8.5, 18, 25.8]$ . The noise distribution is  $\mathcal{N}(0, \sigma^2 = 1)$ . Estimate the parameter  $a$ .
  - a. use Maximum Likelihood (ML) estimation
  
3. A received constant signal  $r(t) = \Theta + noise$  is sampled 3 times, and the values are  $r_i = [1.2, 2.7, 2.2]$ . The noise distribution is uniform  $U(-1, 1)$ . Estimate the parameter  $\Theta$  using Maximum Likelihood estimation.