Test 3 - No.2

DEDP 2017-2018

Consider the received signal

$$r(t) = \underbrace{A \cdot t}_{s(t)} + noise,$$

where A is unknown, and the noise has Gaussian distribution $\mathcal{N}(0, \sigma^2 = 1)$. The receiver takes three samples at times $t_1 = 1, t_2 = 2, t_3 = 3$, with values $r_1 = 5$, $r_2 = 7$, $r_3 = 8$.

a. Considering that either $A = 0$ (hypothesis H_0) or $A = 10$ (hypothesis H_1), decide which is the detected value, using Maximum Likelihood decision criterion.

b. Considering that A can be anything, estimate the value A using Maximum Likelihood estimation.