Test 2 - No.2

DEDP 2017-2018

Consider detection of a signal with two possible values:

- $s_0 = -1$ (hypothesis H_0), affected by noise with zero-mean uniform distribution;
- $s_1 = +1$ (hypothesis H_1), affected by noise with zero-mean triangular distribution.

The receiver takes a single sample r. The likelihood functions $w(r|H_0)$ and $w(r|H_1)$ are shown below. The probabilities of the two hypotheses are:

$$P(H_0) = \frac{1}{3}, \quad P(H_1) = \frac{2}{3}$$

a. (2p) Find the values h_1 and h_2. Justify.

b. (2p) What is the detected signal using **Maximum Likelihood criterion**, if the sample is $r = 0.8$? Justify.

c. (3p) Compute the probability of **miss** and the probability of **false alarm**, for the **Maximum Likelihood criterion**. (*Hint*: Don't forget about the probabilities $P(H_0)$ and $P(H_1)$).

d. (3p) Find the threshold value T for the **minimum probability of error criterion**.

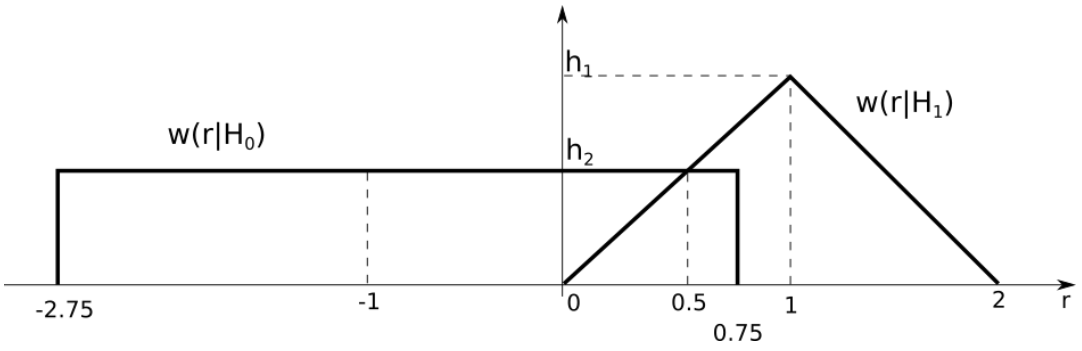

Figure 1: Likelihood functions