

Seminar 3

①

$$\Delta_0(t) = -6$$

$$\Delta_1(t) = -2$$

$$b_2(t) = 2$$

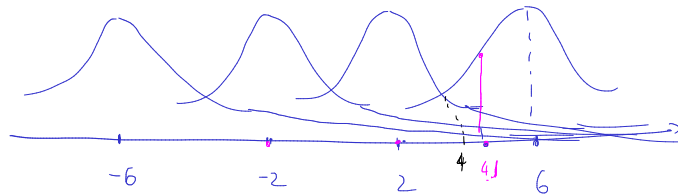
$$\Delta_3(+)=6$$

$$\mathcal{N}(\mu=0, \sigma^2)$$

$$\mu: \quad 4.1, 6.6, -5.2, 1.1, 0.3, -1.5, 7, -7, 4.4$$

A sequence of eight hand-drawn arrows illustrating a progression of complexity. The first arrow is a simple vertical line with a single head. The second and third arrows are similar but have slightly more defined heads. The fourth and fifth arrows have two heads, one at the top and one at the bottom. The sixth arrow has three heads, one at the top and two at the bottom. The seventh and eighth arrows have four heads, one at the top and three at the bottom, with the heads becoming more distinct and pointed.

6 6 -6 2 2 -2 6 -6 6 s-a transmis



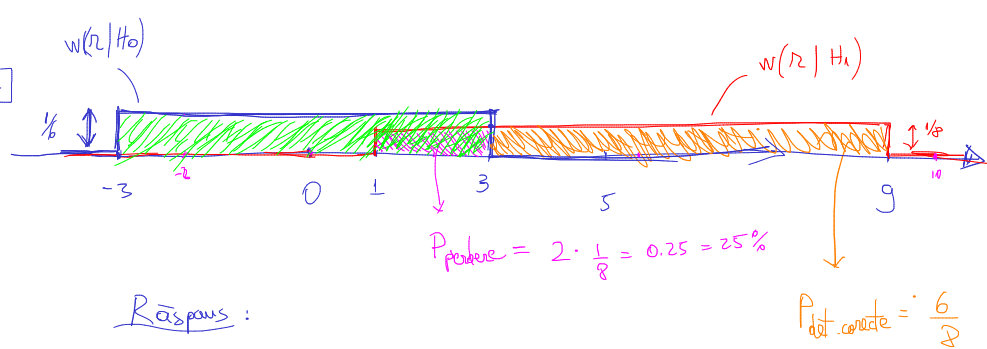
2

$$H_0: \Delta_0(t) = 0$$

$$H_0: D_1(t) = 5$$

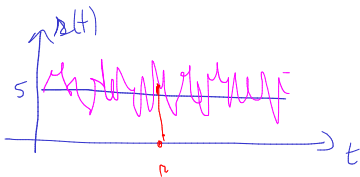
$$u[-3, 3]$$

$$u \in [-4, 4]$$



$$R = S(t) + z_{\text{quant}}$$

$$= 5 + U[-9, 9] \rightarrow (4, 9)$$



Raspans:

$$R_0 = [-3, 3]$$

$$R_1 = (3, 9)$$

Indizes in $\text{nat} \left([9, \infty) \cup [-\infty, -3) \right)$

$$b). \quad P(D_0 | H_0) = P(r \in R_0 | H_0) = \underbrace{1}_g = \int_{-3}^3 w(r|H_0) dr$$

$$P(D_1 | H_0) = P(R \in R_1 | H_0) = \int_3^5 w(R | H_0) = 0$$

$$P(D_0 | H_1) = P(r \in (-3, 3) | H_1) = \int_{-3}^3 w(r | H_1) dr = 0.25$$

$$P(D_1 | H_1) = P(r_t(3,5) | H_1) = \int_{-\infty}^9 w(r_t | H_1) dr = 0.75$$

$\bullet P(H_0)$

$\bullet P(H_0)$

$$P(\#_1)$$

$$P(H_1)$$

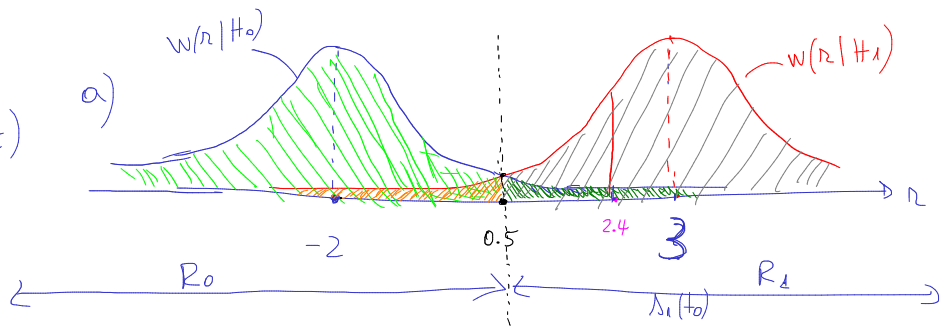
(3) $H_0: \Delta_0(t) = -2$

$H_1: \Delta_1(t) = 3 \cdot \sin\left(2\pi \frac{1}{4} t\right)$

$\mathcal{N}(\mu=0, \sigma^2=2)$

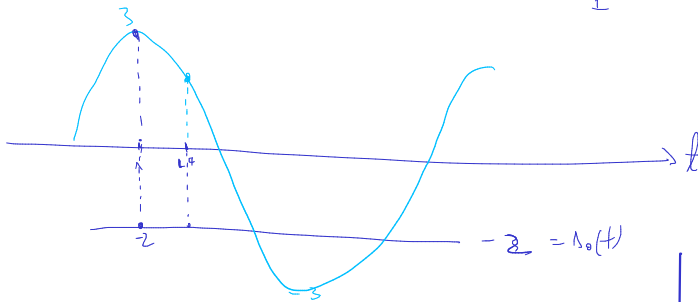
$r: t_0 = 1$

$r = 2.4 = r(t_0)$



b). ML: $r = 2.4 \Rightarrow D_1$

c). ML: $R_0 = (-\infty, 0.5)$
 $R_1 = (0.5, \infty)$



d). ML: $P(D_0 | H_0) = P(r \in (-\infty, 0.5) | H_0) = \int_{-\infty}^{0.5} w(r | H_0) dr = F(0.5) - \underbrace{F(-\infty)}_0 =$

$= \frac{1}{2} \left(1 + \operatorname{erf} \left(\frac{0.5 + 2}{\sqrt{2} \cdot \sqrt{2}} \right) \right) = 0.96 \quad \left(\begin{array}{l} \cdot P(H_0) \\ \cdot P(H_0) \end{array} \right)$

$P(D_1 | H_0) = \int_{0.5}^{\infty} w(r | H_0) dr = 0.04$
 alarmă falsă

$P(D_0 | H_1) = \int_{-\infty}^{0.5} w(r | H_1) dr = F(0.5) - \underbrace{F(-\infty)}_0 = F(0.5) = \frac{1}{2} \left(1 + \operatorname{erf} \left(\frac{0.5 - 3}{\sqrt{2} \cdot \sqrt{2}} \right) \right) = 0.04 \quad (\cdot P(H_1))$

$P(D_1 | H_1) = \int_{0.5}^{\infty} w(r | H_1) dr = \underbrace{F(\infty)}_1 - \underbrace{F(0.5)}_{0.04} = 0.96 \quad (\cdot P(H_1))$
 det. corectă

e). $t_0 = 1.4$

$\Delta_1(t_0) = 3 \cdot \sin\left(2\pi \frac{1}{4} \cdot 1.4\right) = 2.42$

$P(D_0 | H_0) = \int_{-\infty}^{0.21} w(r | H_0) dr$

$P(D_1 | H_0) = \int_{0.21}^{\infty} w(r | H_0) dr$

