

AULA 6

ESTIMADOR DE
Máxima

VEROSSIMILHANÇA

$$X_1, \dots, X_n \sim f(\theta)$$

$$X = x \quad f_n(x|\theta)$$

↑

ou

$\theta \in \mathcal{L}$

maximize

$$P_{\theta}(X = \underline{x})$$

———— 1) ————

• EMV (EXponential)

$$X_i \sim \text{EXP}(\theta) \quad \boxed{117}$$

$$f(x_i | \theta) = \theta \exp(-\theta x_i)$$

4. d. p.

$$f_n(\underline{x}|\theta) = \theta^n \exp(-S\theta)$$

$$S = \sum_{i=1}^n x_i \quad \theta \in \mathbb{R}^+$$

$$\hat{\theta}_{EMV}$$

$$\max_{\theta \in \mathbb{R}^+} f_n(\underline{x}|\theta)$$

$$1) 1) \theta \in \mathbb{R}^+ \quad \theta^n \exp(-S\theta)$$

2101-1 V L

$$\log L(\theta) =: l(\theta)$$

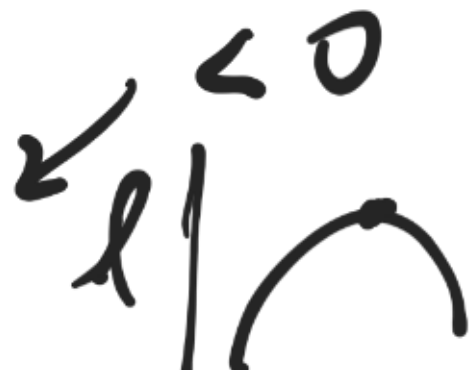
$\hat{\theta}_{\max}$

$\log \theta$
monotonic

$$l(\theta) = n \log \theta - \frac{S}{\theta}$$

$$\frac{dl}{d\theta} = \frac{n}{\theta} - \frac{S}{\theta^2} = 0$$

$$\frac{d^2 l}{d\theta^2} = -\frac{n}{\theta^2} < 0$$



$$\frac{1}{\theta}$$

$$A$$

$$0.10$$

$$\frac{d\ell}{d\theta} = \frac{\theta}{n} - S = 0$$

$$\hat{\theta} = \frac{n}{S} = \frac{1}{\bar{x}_n}$$

$$\hat{\theta}_{EMV} = \frac{1}{\bar{x}_n} \quad \square$$