´e
$X : \Omega \to R^n$
$\{f_\theta : \theta \in \Theta\}$
$\Theta \subset R$
$Y := t(X)$
$\theta \in \Theta$
$g(\theta) := E_\theta Y$

$$_\theta(Y) \frac{g'(\theta)^2}{I_X(\theta)} forall \theta \in \Theta.$$

Y
unbiased
$g(\theta) = \theta$
$g'(\theta) = 1$

$$_\theta(Y) \frac{1}{I_X(\theta)} forall \theta \in \Theta.$$

$=$

$$\frac{\mathrm{d}/\mathrm{d}\theta(\log f_\theta(X))}{Y - E_\theta Y} \in$$

R
$\theta \in \Theta$

This theorem provides a lower bound on the variance of unbiased estimators of θ *in general, we cannot get estimators with arbitrarily small variance.*

$X_1, ..., X_n$
$X = (X_1, ..., X_n)$
$I_X(\theta) = nI_{X_1}(\theta)$
$E_\theta Y = \theta$
$_\theta(Y) 1/(nI_{X_1}(\theta))$
$\theta \in \Theta$
$g(\theta)$
Y
t
X
$\theta) =$

$$\frac{\mathrm{d}}{\mathrm{d}\theta} \int_{R^n} f_\theta(x) t(x) \, \mathrm{d}x =$$