

~~Ex~~ Examples of Fisher information & UMVU estimators

	$u(x; \theta)$	$I_x(\theta)$	UMVU
$N(\mu, b^2)$	$\frac{1}{b^2}(x-\mu)$ $\frac{1}{b^2}(x-\mu)$	$\frac{1}{b^2}$	
$N(\mu, b^2)$ (iid)	$\frac{n}{b^2}(\bar{X}-\mu)$	$\frac{n}{b^2}$	\bar{X} for μ

$N(a, \sigma^2)$	$-\frac{1}{2\sigma^2} + \frac{1}{2\sigma^4}(x-a)^2$	$\frac{1}{2\sigma^4}$	
$N(a, \sigma^2)$ (iid)	$-\frac{1}{2\sigma^2}$ + $\frac{n}{2\sigma^4} \hat{\sigma}^2$	$\frac{n}{2\sigma^4}$	$\hat{\sigma}^2$ for σ^2

Location-scale

$$\frac{1}{\sigma} p\left(\frac{x-\mu}{\sigma}\right) \quad \frac{\frac{2}{\mu} p\left(\frac{x-\mu}{\sigma}\right)}{p\left(\frac{x-\mu}{\sigma}\right)} \quad \frac{1}{\sigma^2} \int_{-\infty}^{+\infty} \frac{(p(z))^2}{p(z)} dz$$

Cauchy (μ, b^2)

$$\frac{1}{2b^2}$$

~~$\alpha x^{\alpha-1}$~~

$$\alpha x^{\alpha-1} \mathbb{I}(0 \leq x \leq 1) \quad \left. \begin{array}{l} \frac{1}{\alpha} + \log x \\ \text{(iid)} \quad \frac{n}{\alpha} + \sum_{i=1}^n \log X_i \end{array} \right\}$$

$$\frac{1}{n} \sum_{i=1}^n \log X_i \quad \text{for } -\frac{1}{\alpha}$$