The Cramer-Rao inequality

stats6255point 625.4 - Point estimation

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November 3, 2021

The Cramer-Rao inequality

A version for i.i.d. random variables

Fisher information

Rewriting the Fisher information

The C-R inequality for i.i.d. random variables

$$V_\theta[W] \geq \frac{(\frac{d}{d\theta} E_\theta[W])^2}{nE_\theta\left[\left(\frac{\partial}{\partial\theta} \ln f_\theta(X_1)\right)^2\right]}$$

$$V_\theta W \geq \frac{1}{-nE_\theta\left[\frac{\partial^2}{\partial\theta^2} f_\theta(X_1)\right]}$$

When the assumptions fail

A corollary using the likelihood function