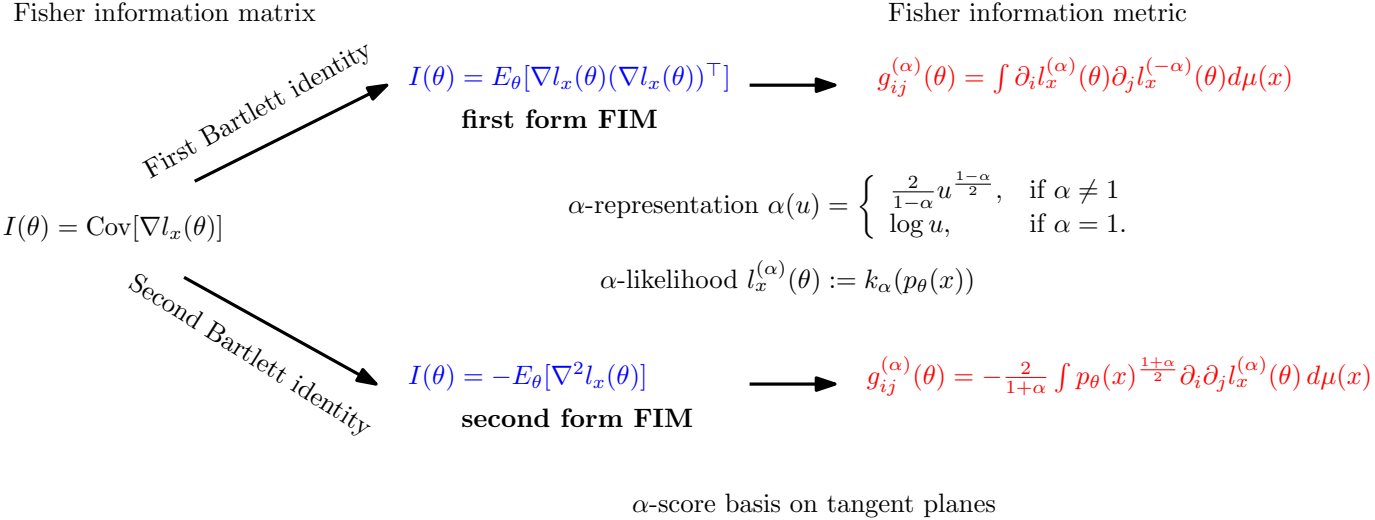
Fisher information matrix
Fisher information metric
First Bartlett identity
$I(\theta) = E_\theta[\nabla l_x(\theta)(\nabla l_x(\theta))^\top]$
$g_{ij}^{(\alpha)}(\theta) = \int \partial_i l_x^{(\alpha)}(\theta)\partial_j l_x^{(-\alpha)}(\theta) d\mu(x)$
first form FIM
$I(\theta) = \mathrm{Cov}[\nabla l_x(\theta)]$
α-representation $\alpha(u) = \begin{cases} \frac{2}{1-\alpha} u^{\frac{1-\alpha}{2}}, & \text{if } \alpha \neq 1 \\ \log u, & \text{if } \alpha = 1. \end{cases}$
α-likelihood $l_x^{(\alpha)}(\theta) := k_\alpha(p_\theta(x))$
Second Bartlett identity
$I(\theta) = -E_\theta[\nabla^2 l_x(\theta)]$
$g_{ij}^{(\alpha)}(\theta) = -\frac{2}{1+\alpha} \int p_\theta(x)^{\frac{1+\alpha}{2}} \partial_i \partial_j l_x^{(\alpha)}(\theta)\, d\mu(x)$
second form FIM
α-score basis on tangent planes