

Illustration of Bayesian Estimation

Bayesian inference: $f(\theta)=?$

$$\hat{f}(\theta) = \sum_{\theta} f(\theta)p(\theta | X)$$

**Posterior
Mean**

$$\hat{\theta} = \sum_{\theta} \theta^* p(\theta | X)$$

Posterior:

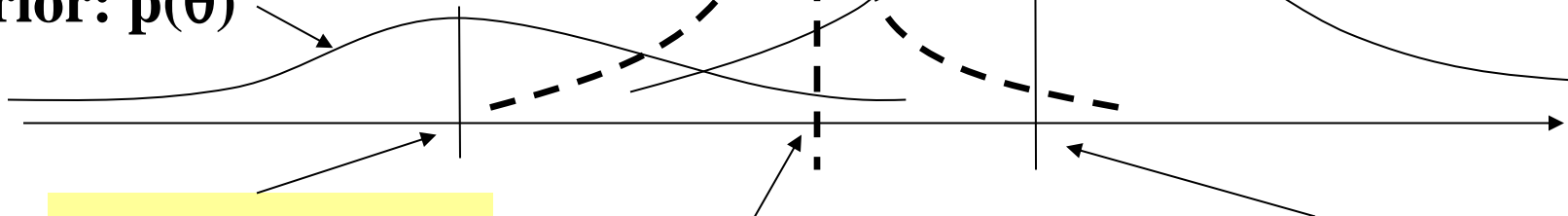
$$p(\theta|X) \propto p(X|\theta)p(\theta)$$

Likelihood:

$$p(X|\theta)$$

$$X=(x_1, \dots, x_N)$$

Prior: $p(\theta)$



θ_0 : prior mode

θ_1 : posterior mode

θ_{ml} : ML estimate