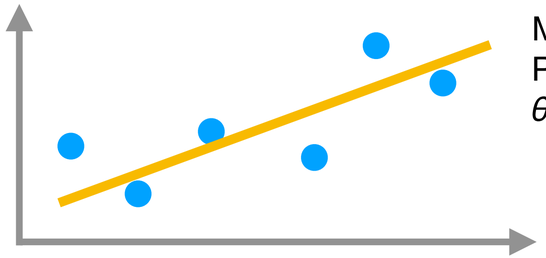
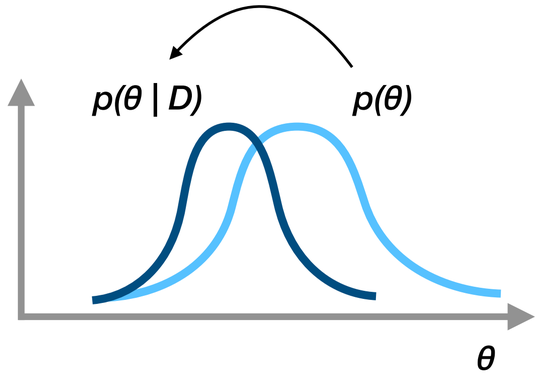
Introduction

Bayesian inference for some data *D*



Model *M* with Parameters $\theta=(\theta_1, \theta_2)$

Prior belief, updated by Data = Posterior

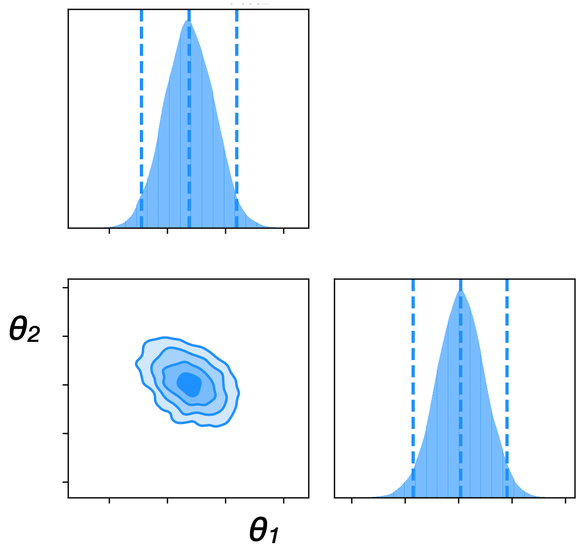


Parameter estimation by Bayes' theorem

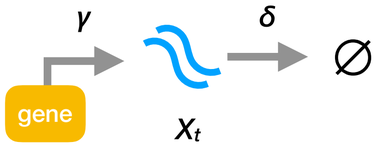
$$p(\theta \mid D) = \frac{p(D \mid \theta) \cdot p(\theta)}{p(D)}$$

$$\propto p(D \mid \theta) \cdot p(\theta)$$

$$\text{Posterior} \propto \text{Likelihood} \cdot \text{Prior}$$



Poisson example



Constitutive gene expression

$$X_{\text{steady state}} \sim \text{Poi}(\frac{\gamma}{\delta}) = \text{Poi}(\lambda)$$

$$\text{with } \lambda = \frac{\gamma}{\delta}$$