Examples

Modelling

DRME

2024 01 20

Introduction: Ecological Research

- Basic problem: Understanding processes not directly observable.
- Representation: Models with parameters (θ) and latent states.
- Observations (y): Quantities that we can observe.
- Objective: Discover the probability distribution of unobserved θ given observed data ($\theta|y$).

Representation of Unobserved Processes

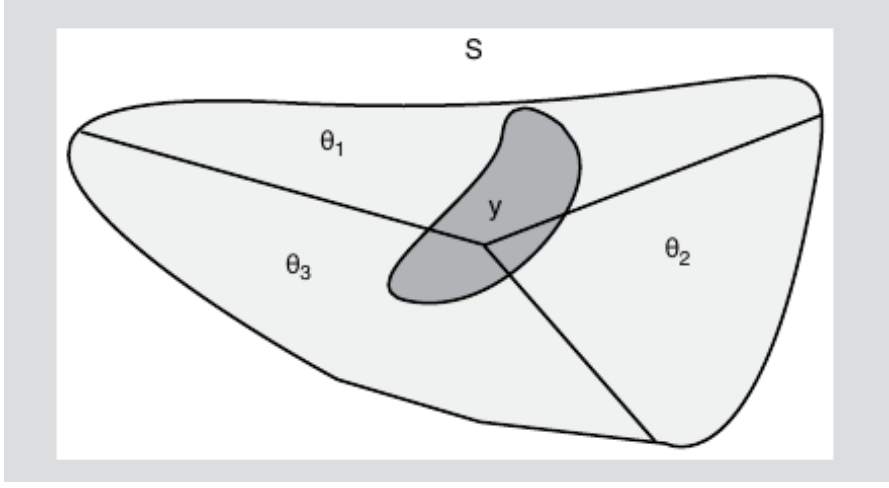
- Models consist of parameters (θ) and latent states.
- Notation: θ.
- Observations (y): Treated as random variables before observation.

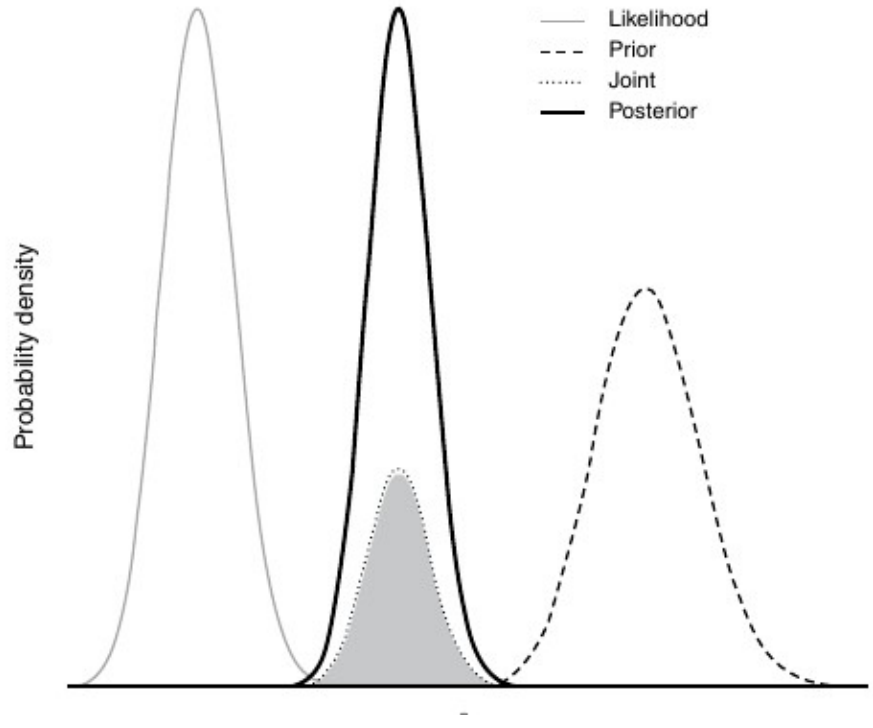
Probability Distributions

- Data before observation: Random variables.
- Probability distribution of observing data given θ: $[y|\theta]$.
- θ as a random variable: Governed by probability distribution $[\theta]$.

Objective: Discovering $\theta|y$

- Discovering the probability distribution of unobserved θ given observed data.
- Notation: $\theta|y$.


S
θ1
y
θ2
θ3


Likelihood
Prior
Joint
Posterior
Probability density