Simulation-based Inference

Inverting Simulators

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Overview

- What?
- Why?
- ABC
- SBI
- What if the posterior is not Gaussian?
- A simple example
- A more complicated example
- Outlook

What

is Simulation-based Inference?

- If we know generating factors, we can build a simulator
- But we want to constrain simulator output on observations from real world
- Thus we need realistic values for simulator parameters
- -> inverse problem
- SBI solvers this inverse problem using Bayesian inference

Why

do we need Simulation-based Inference?

How

Approximate Bayesian Computation

- Finding parameters/posterior over parameters with
    - Rejection ABC
    - Markov Chain Monte Carlo ABC
    - Sequential Monte Carlo ABC
    - ...
- Problems
    -

How

does Simulation-based Inference work?