Inference

- Observe data and infer the values of the parameters that generated them
  - Often based on likelihood $p(x^o \mid \theta)$
  - Bayesian approach $p(\theta \mid x^o) \propto p(x^o \mid \theta)p(\theta)$
  - Maximum likelihood $\arg\max_{\theta} p(x^o \mid \theta)$
- When data generating process (simulator) is defined as a set of rules to draw $x \sim p(x \mid \theta)$ it is often infeasible to formulate the analytical likelihood $p(x^o \mid \theta)$

Inference without likelihood

- Use the capability to draw simulated data conditioned on the input parameters
- Likely true parameter values are thought to produce data that are *similar* to the observed data