What is Stan?

- Open source probabilistic **programming language**, **inference algorithms**

- Stan **program**
  - declares data and (constrained) parameter variables
  - defines log posterior (or penalized likelihood)

- Stan **inference**
  - MCMC for full Bayes
  - VB for approximate Bayes
  - Optimization for (penalized) MLE

- Stan **ecosystem**
  - lang, math library (C++)
  - interfaces and tools (R, Python, many more)
  - documentation (example model repo, user guide & reference manual, case studies, R package vignettes)
  - online community (Stan Forums on Discourse)

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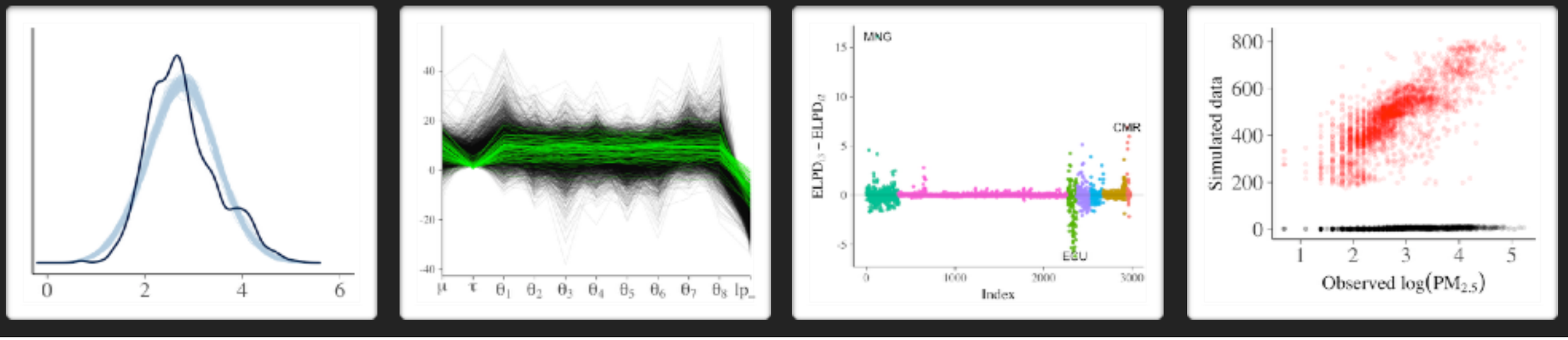
Visualization in Bayesian workflow



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