Hamiltonian MC
A novel algorithm for Bayesian inference

- Drs. Gelman, Betancourt and collaborators developed Hamiltonian Monte Carlo methods, a novel approach to computationally implement complex hierarchical Bayesian inference through Monte Carlo simulation.

Stan
Hamiltonian computational implementation for diverse interfaces

- Drs. Gelman, Betancourt and Goodrich developed Stan, a probabilistic programming language to build complex Bayesian models in several enviroments including Stata, Mathlab, Python, Julia and R/Rstudio.

rstan
Stan implementation in the software environment R

- Drs. Goodrich, Gelman, Betancourt and collaborators developed Rstan, a software package to use Hamiltonian Monte Carlo algorithms the open source statistical software enviroment R/Rstudio.

shinystan
Interactive exploration of Markoc chain Monte Carlo simulations

- The team developed the prototype software package, a graphical user interface for interactively exploring virtually any Bayesian model fit using a Markov chain Monte Carlo algorithm. shinystan assist in model tuning and optimization.

rstanarm
Accessible software for complex hierarchical modelling

- The team developed the software prototype rstanarm estimating the common regression models using novel Hamiltonian Monte Carlo algorithms with familiar conventions makes this advanced algorithm accessible to data scientists.