



Stan

Stan provides portable tools for applied Bayesian statistical modeling, inference, and visualization. It features a modeling language, math library, inference algorithms, evaluation, visualization, and interfaces in a variety of languages such as but not limited to R, Python, Julia.

Stan is an extensible, cross-platform, tool for applied statistical modeling and inference. Stan provides exact and approximate methods for full Bayesian inference, allowing users to calibrate the uncertainty in their estimates.

Its models are "white box" models in that the Stan language allows analysts to directly express their knowledge of relationships between observations and underlying latent variables, and thus build interpretable models of complex phenomena.

APPLICATIONS

Stan is used in a wide variety of domains including quantum physics, astrophysics, chemistry...

Corporate enterprises, government agencies, and non-profits worldwide.

Legendary Entertainment uses it to analyze marketing campaigns for blockbuster movies.

Novartis and other pharmaceutical companies for pharmacological modeling and clinical trials. All Covid vaccines were developed using Stan.

Uber's time-series analysis tool, Orbit and Facebook's open-source forecasting tool, Prophet.

PLANNED FEATURES

- + Improve expressiveness of the Stan language:
Add closures, complex data structures
- + Improve speed of MCMC sampler: Better adaptation
- + Stan Math Library: Additional matrix operations (Remove dependency on R packages, standardizing and expanding the functionality of Python interface).
- + Stan Curricula: Such as teaching materials, slides, and notebooks. In addition: quiz materials, suggestions for projects for high school students, undergrads, and professionals (e.g., data scientists).

PROJECT NEEDS

Extend Stan math library matrix operations (Estimation is 3 months of development time is depending on locality)	\$25-\$50K
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Compile to other probabilistic backends: Pyro, JAX (Estimation is 3 months of development time is depending on locality.)	\$25-\$50K
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Build custom interface, e.g. survey data analysis, along the lines of Prophet, Orbit	\$50K
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Support for (online) Stan training course	
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For more information on Stan, including our governance structure and project roadmap, please visit:

<https://mc-stan.org/>

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