# Introduction to Bayesian Inference using PyStan

**Level:** Intermediate
**Duration:** 12 hours

Despite the promise of big data, inferences are often limited by its systematic structure. Only by carefully modelling this structure can we take full advantage of the data. Stan is a platform for facilitating this modelling, providing an expressive modelling language to implement state-of-the-art algorithms, to draw subsequent Bayesian inferences.

The course will teach participants how to interface with Stan through Python!

## Course Outline

- **Introduction to Bayesian inference**: A brief overview of the main ideas behind Bayesian inference.
- **Markov chain Monte Carlo methods**: A brief overview of Markov chain Monte Carlo methods for Bayesian computation and Hamiltonian Monte Carlo.
- **The Stan language**: An outline of the main components of a Stan program.
- **Using PyStan**: A guide to the use of the Python interface to Stan.
- **Examples**: Including linear regression, Poisson regression and hierarchical models.

## Learning Outcomes

By the end of the two days participants will...

- have a good understanding of Bayesian inference/MCMC methods
- understand how these methods can be applied to their own data
- understand how to apply these methods to their own data using Python's interface to Stan, RStan.

## Prior Knowledge

Participants should be familiar with basic Probability and Statistics including common distributions and regression. Basic Python programming is also required, i.e. writing loops and functions. We do not expect you to have experience with Bayesian Inference or Stan, but some knowledge of the former will be helpful.

## Attendee Feedback

- "I liked the structure of the course - lectures with integrated practical sessions"

## Contact

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