**-** Introduction

**-** What is Bayesian Analysis?

**-** Thinking Bayesian

**-** Bayesian vs Frequentist

**-** Tools for Probabilistic Programming in Python (benchmark: *PyMC3* vs *TensorFlow Probability*)

**-** Quick Demo: (Bayesian) Switchpoint Analysis (*PyMC3*)

**-** Quick Demo: (Bayesian) Switchpoint Analysis (*TensorFlow Probability*)

**-** Questions?

Introduction

* Introduce myself
* Introduce the talk:
  + General purpose of the talk
  + Importance of statistics/prob in ML/DL (Lasso, Ridge, Robust | Assumptions (MSE assumes variance=1))
  + Why is BA something important to know?

Bayesian Analysis

* Bayesian intuition (thinking Bayesian | robustness-data trade-off)
* Statistical prerequisites
* Bayes’ Theorem (2 eqns)
* Computational methods (which and why? MCMC, Gibbs Sampling, HMC)
* Solutions for the optimisation problem (Metropolis-Hastings Algorithm)

Tools for PP (benchmark)

* PyMC3 (description, library overview, Theano?)
* TensorFlow Probability (description, library overview, layers, connection to TFcore)
* Which one to choose?

Bayesian Regression for Finance (PyMC3)

* Sample dataset
* Bayesian Linear Regression (show code)
* Show summary

Bayesian Regression for Finance (TFP)

* Sample dataset
* Bayesian Linear Regression (show code)
* Show summary

Conclusions

* Usability
* Support
* Code length

Questions?