Thematic Research Training 2018-2019
Artificial Intelligence/Machine Learning(AI/ML) group
Second meeting
Friday 22 February 2019, 10:15-17:00
Edinburgh, King's Buildings, James Clerk Maxwell Building 4325D

An introduction to Bayesian Inference and PyStan for Biologists

The workshop will introduce general concepts for approaching statistical problems from a Bayesian perspective. Topic include; bayesian vs frequentist methodologies, priors, likelihoods and posteriors as the foundations of Bayesian inference and MCMC algorithms with Stan as the modelling language. The day will begin with preview of the basics of probability, then solving simple Bayesian statistical problems and will contain talks by practitioners describing usage of Bayesian methods in current research.

Attendance to the previous AI/Machine learning masterclass is not a required but familiarity with Jupyter notebooks and basic python 3.7 programming (covered in the previous course) is assumed. Also make sure you have installed pystan beforehand with 'conda install pystan' and have the latest version of the python gcc compiler 'conda install gcc'. (assuming you have anaconda installed). If you can understand Randeep's previous workshop python code https://github.com/randeep-samra/ml-workshop then you should be fine with this one.

Schedule

10:15	Coffee on Arrival
10:30-10:45	Introduction to the Workshop
10:45-11:30	Bayesian Basics
11:30-12:30	What is a MCMC and Introduction to PyStan
12:30-13:30	**Lunch**
13:30-14:00	Edward Wallace talk - Bayesian analysis of gene expression
14:00-15:30	My First Bayesian Model
15:30 - 15:45	**Coffee Break**
15:45-16:30	Hypothesis Testing and Post-Posterior Checks
16:30-17:00	Guest Speaker TBC
17:00	**END**

Requirements:

Please make sure you have python 3.7 installed preferably though the anaconda/miniconda distribution (as this means any last minute package installations will be super quick.) You need access to the following packages;

- pystan (with latest gcc compiler)
- seaborn
- numpy
- pandas
- jupyter

If you have anaconda, all of these are easily installed with "conda install <package name>" i.e. conda install gcc