

# Perspectives on Bayesian Statistics in the Life Sciences

## Schedule Day 2 (7<sup>th</sup> April)

Moderated by Dr. Richard D. Morey

09:00 - 09:30	Preworkshop with tea and coffee
09:30 - 10:00	Bayesian Basics
10:00 - 10:15	Break
10:15 - 11:15	Simple Bayesian Parameter estimation
11:15 - 11:30	Break
11:30 - 12:00	Lab 1
12:00 - 13:00	Lunch Break (food will be provided)
13:00 - 14:00	MCMC
14:00 - 14:15	Break
14:15 - 15:15	Interactive lecture: The BUGS language
15:15 - 15:30	Break
15:30 - 16:00	Lab2
16:00 - 16:15	Break
16:15 - 17:15	Chain Diagnostics

Please register on: <https://www.eventbrite.co.uk/e/perspectives-on-bayesian-statistics-in-the-life-sciences-day-two-tickets-31874695071>

# Installing necessary software

All software for the workshop is free and easy to obtain. You will need three pieces of software:

## R

R is the statistical software we will use for the workshop. You can obtain R from the website: Comprehensive R archive network (<http://cran.r-project.org/>). Download the appropriate file for your operating system and install it.

## JAGS

JAGS (Just Another Gibbs Sampler) is the software that we will use for Bayesian analysis. We will call this software from R, but to use it it needs to be installed on your system.

You can download the appropriate file from the JAGS SourceForge page (<http://sourceforge.net/projects/mcmc-jags/files/latest/download?source=files>).

The manuals can be found here: JAGS manuals (<https://sourceforge.net/projects/mcmc-jags/files/Manuals/3.x/>).

## Rstudio

RStudio is a front-end for JAGS that will make using R substantially easier.

You can download it for your operating system from the RStudio website: (<http://www.rstudio.com/ide/download/desktop>).

## JAGS flexdashboard

I have created a simple interface for JAGS that I use for teaching.

You can get it from my github page: (<https://github.com/richarddmores/EssexSummerSchoolBayes>). Click the green “Clone or download” button, then click “Download zip”. Save it somewhere convenient.

## Installing R packages

There are a few R packages that will be needed. Once you've installed the software above, open RStudio and paste the following code into the R console (by default, lower left corner) while connected to the Internet.

```
install.packages(c('rjags','mcmc','coda','MCMCpack','flexdashboard','pscl','multilevel'),dependencies=TRUE)
```

After this command has completed, paste the following code into the console:

```
library(rjags)
```

```
## Loading required package: coda
```

```
## Linked to JAGS 4.2.0
```

```
## Loaded modules: basemod, bugs
```

If you see the output above with no errors, then JAGS is installed properly (though your version of JAGS may be different from the one above).

## Learning about R

The workshop assumes a basic knowledge of R. If you have never used R before, it will help to review the basics. Fortunately, there are many tutorials on the web that will help bring you up to speed. Here are a few of them:

- R Tutorial by Kelly Black, Department of Mathematics and Computer Science, Clarkson University (<http://www.cyclismo.org/tutorial/R/>)
- Codeschool Try R (<http://tryr.codeschool.com/levels/1/challenges/1>)
- CRAN Introduction to R (<http://cran.r-project.org/doc/manuals/R-intro.html>) See especially parts 1, 2, 4, 6, and 12
- Learning Statistics with R for Psychologists (<https://health.adelaide.edu.au/psychology/ccs/teaching/lsr/>)

## Getting in touch and support on Yammer

We have created a chat channel on the free social network [Yammer](#). Just sign up with your Cardiff University e-mail address to use this service. To get in touch with us, e.g. for support with the installation, or questions before or after the workshop, simply join our channel "cardiffbayes" or e-mail us from your Cardiff University e-mail address to [cardiffbayes@gmail.com](mailto:cardiffbayes@gmail.com) so we can add you to the channel.