

NUS Simulations and Modelling Workshop schedule

as at 30 October 2018

Note

The first three days will be an introduction to the principles of modelling and simulation and to the basic tools available for simulations in R packages. We will illustrate these with common scenarios encountered in wildlife research.

We expect participants to be involved with a wide range of different projects, with equally varied scenarios of interest. On Days 4 and 5 they will be able to work in groups on various topics. Participants are encouraged to bring their own research questions to the workshop. Group work will be interspersed with plenary discussions of what was learned and what issues were encountered. On the last day, we will deal again with technical issues in coding and running simulations in R.

Proposed work flow

Time slot	What we do	Comments
Before the workshop begins	<p>Before the Workshop participants are asked to:</p> <ul style="list-style-type: none"> Successfully complete an R Skills Review; this is a prerequisite for acceptance for the Workshop. Download and install the necessary software and R packages. Download and preview the workshop materials. Send in one PPT slide to introduce themselves; these are compiled and used for the “Introductions” session. 	
Thurs 8 Nov Day 1 Principles of simulation	<ol style="list-style-type: none"> 1. Why modelling is important and simulations are useful (PPT) 2. Introductions (PPT / round-the-room) 3. Housekeeping, times, code of conduct. 4. Stages in carrying out a simulation exercise 5. Example: sample size for a simple study 6. Criteria for design selection: accuracy, bias, and confidence interval coverage; boxplots and bee-swarm plots. 	
Fri 9 Nov Day 2 Occupancy example	<ol style="list-style-type: none"> 1. Occupancy estimation: trade-off between number of sites and number of replicate observations 2. Models with covariates: can we recover true values? 3. Encapsulating the data simulation code in a function. 4. How reliable is AIC for model selection? Multiple models for each simulated data set. 	
Sat 10 Nov Day 3 Parallel processing and Bayes	<ol style="list-style-type: none"> 1. Concept of parallel processing. 2. Implementing parallel processing in R with the ‘foreach’ package (Occupancy example revisited.) 3. Bayesian estimation when using simulations. 4. Decision on scenarios to investigate in groups. 	
Sun 11 Nov	Rest day	

<p>Mon 12 Nov Day 4 Group work</p>	<p>Review of key points from first 3 days. Groups work on their own scenarios. Plenary discussions of progress and issues before lunch and at the end of the day.</p>	
<p>Tues 13 Nov Day 5 Group work</p>	<p>Groups continue to work on their own scenarios. Plenary discussions of progress and issues before lunch and at the end of the day.</p>	
<p>Wed 14 Nov Day 6 Review and conclusion</p>	<ol style="list-style-type: none"> 1. Review of group work with sharing and explanation of the code produced. 2. General lessons learned about R coding, the value of simulations, and specific outcomes. 3. Review of the workshop and participant feedback. 4. Presentation of certificates and closure. 	