University of Groningen

Statistical methods for studying the evolution of networks and behavior

Schweinberger, Michael

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2007

Appendix A
Guide to R functions

To examine the Markov chain Monte Carlo (MCMC) output of the computer program `Siena` (Snijders, Steglich, Schweinberger, and Huisman, 2006) for maximum likelihood (ML) and Bayesian estimation, the R functions `siena_mle` and `siena_bayes` can be used, respectively. The R functions input files generated by `Siena` and output, among other things, trace plots and MCMC lag $1, \ldots, 100$ autocorrelations of sampled entities (see Chapters 4 and 5), and, in the Bayesian case, in addition 95% posterior intervals, histograms, and Gaussian kernel density estimates of the marginal posterior densities of the parameters.

The R functions `siena_mle` and `siena_bayes` can be downloaded from the website `http://stat.gamma.rug.nl/stocnet`, and can be used in R as follows:

(1) Load the R function:

— ML estimation: `source("siena_mle.r")`.

— Bayesian estimation: `source("siena_bayes.r")`.

(2) Call the R function:

— ML estimation: `siena_mle(project_name, full_output, no_random_effects, no_actors)`.

— Bayesian estimation: `siena_bayes(project_name, full_output, no_random_effects, no_actors)`.

The arguments are:

— `project_name` (string): the name of the `Siena` project that is to be examined; note that calling `siena_mle` or `siena_bayes` presumes that `Siena` carried out ML or Bayesian estimation of the project `project_name`, respectively.

— `full_output` (0 or 1): 1 indicates that the full output is desired, while 0 indicates that selected output is desired.

— `no_random_effects` (non-negative integer): the number of actor-dependent weights (parameters) in the model.

— `no_actors` (positive integer): the number of actors.

Examples are provided by `siena_mle("alcohol", 1, 3, 50)` and `siena_bayes("alcohol", 1, 3, 50)`.