Estimation methods for nonlinear state-space models in ecology - DTU Orbit (09/01/2019)

Estimation methods for nonlinear state-space models in ecology

The use of nonlinear state-space models for analyzing ecological systems is increasing. A wide range of estimation methods for such models are available to ecologists, however it is not always clear, which is the appropriate method to choose. To this end, three approaches to estimation in the theta logistic model for population dynamics were benchmarked by Wang (2007). Similarly, we examine and compare the estimation performance of three alternative methods using simulated data. The first approach is to partition the state-space into a finite number of states and formulate the problem as a hidden Markov model (HMM). The second method uses the mixed effects modeling and fast numerical integration framework of the AD Model Builder (ADMB) open-source software. The third alternative is to use the popular Bayesian framework of BUGS. The study showed that state and parameter estimation performance for all three methods was largely identical, however with BUGS providing overall wider credible intervals for parameters than HMM and ADMB confidence intervals.

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Pedersen, M. W., Berg, C. W., Thygesen, U. H., Nielsen, A., Madsen, H.
Pages: 1394-1400
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Ecological Modelling
Volume: 222
Issue number: 8
ISSN (Print): 0304-3800
Ratings:
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.69 SJR 1.084 SNIP 1.088
Web of Science (2017): Impact factor 2.507
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.43 SJR 0.967 SNIP 1.09
Web of Science (2016): Impact factor 2.363
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.43 SJR 1.082 SNIP 1.097
Web of Science (2015): Impact factor 2.275
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.7 SJR 1.132 SNIP 1.341
Web of Science (2014): Impact factor 2.321
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.53 SJR 1.148 SNIP 1.318
Web of Science (2013): Impact factor 2.326
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.28 SJR 1.045 SNIP 1.249
Web of Science (2012): Impact factor 2.069
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.34 SJR 1.186 SNIP 1.128
Web of Science (2011): Impact factor 2.326
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.085 SNIP 1.125
Web of Science (2010): Impact factor 1.769
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.31 SNIP 1.249
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.355 SNIP 1.292
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.353 SNIP 1.37
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.229 SNIP 1.551
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.451 SNIP 1.311
Scopus rating (2004): SJR 1.055 SNIP 1.092
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.174 SNIP 1.247
Scopus rating (2002): SJR 0.906 SNIP 1.097
Scopus rating (2001): SJR 0.967 SNIP 0.994
Scopus rating (2000): SJR 0.968 SNIP 0.921
Scopus rating (1999): SJR 0.896 SNIP 0.85
Original language: English
DOIs:
10.1016/j.ecolmodel.2011.01.007
Source: orbit
Source-ID: 275820
Research output: Research - peer-review : Journal article – Annual report year: 2011