

# List of online resources for hmmTMB

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This document lists vignettes and other resources for the R package `hmmTMB`, which include details about its implementation, as well as several step-by-step analyses on various types of time series data. The vignettes are available on Github, rather than directly included in the CRAN version of the package, because generating them takes a long time.

## Preprint

A description of the statistical background, implementation details, and several detailed examples, are provided in the following arXiv preprint: [‘hmmTMB: hidden Markov models with flexible covariate effects in R’](#) (Michelot (2022)).

## Vignettes

- [‘Analysing time series data with hidden Markov models in hmmTMB’](#): Overview of package workflow, using detailed example based on analysis of energy prices. This is a good starting point to learn how to use the package.
- [‘Bayesian inference in hmmTMB’](#): Description of workflow for Bayesian analysis in `hmmTMB`, including specifying priors, and extracting posterior samples.
- [‘Advanced features of hmmTMB’](#): Description of some other useful functionalities, including (semi-)supervised learning, parameter constraints, selection of initial parameter values, etc.
- [‘General dependence structures in hmmTMB’](#): Implementation details for hidden Markov models (HMMs) with non-standard dependence structures, including hidden semi-Markov models, higher-order HMMs, autoregressive HMMs, and coupled HMMs.

- ‘[List of distributions in hmmTMB](#)’: List of observation distributions currently available in `hmmTMB`.
- ‘[Flexible animal movement modelling using hmmTMB](#)’: Description of wild haggis movement analysis, illustrating how non-parametric covariate effects can be included. This includes two different types of movement models: (1) correlated random walks based on step lengths and turning angles, and (2) correlated random walks based on locations directly.
- ‘[Occupancy modelling using hmmTMB](#)’: Analysis of occupancy data set of crossbill from Kéry, Guillaera-Arroita, and Lahoz-Monfort (2013).

## References

Kéry, Marc, Gurutzeta Guillaera-Arroita, and José J Lahoz-Monfort. 2013. “Analysing and Mapping Species Range Dynamics Using Occupancy Models.” *Journal of Biogeography* 40 (8): 1463–74.

Michelot, Théo. 2022. “HmmTMB: Hidden Markov Models with Flexible Covariate Effects in R.” *arXiv Preprint arXiv:2211.14139*.