foieGras an R package for rapid quality control, behavioural estimation and simulation of animal track data

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Abstract

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1: Introduction

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2: foieGras Overview

The workflow for `foieGras` is deliberately simple, with much of the usual track data processing checks and formatting handled automatically. The main functions are listed in Table 1. When fitting a model, `foieGras` automatically detects the type of tracking data location quality classes designations that are typical of Argos data and that can be added to the data by the researcher for other types of track data. Based on the location quality classes and other, optional information on observation errors contained in the data, `foieGras` chooses an appropriate observation error model for each observation. This capability allows for combinations of different tracking data types, e.g., Argos and GPS, in a single input data frame and fit in a single state-space model.

Data preparation and prefiltering

State-space model fitting

Visualisation and diagnostics

Behavioural estimation

Simulation

Table 1: Main functions for the R package `foieGras`

Function	Description
`fit_mpm`	Fit a Move Persistence Model to location data
`fit_ssm`	Fit a State-Space Model to location data
`fmap`	Plot fitted/predicted locations on a map with or without a defined projection
`grab`	Extract fitted/predicted/observed locations from a foieGras model, with or without projection information
`osar`	Estimate One-Step-Ahead Residuals from a foieGras SSM
`plot.fG_mpm`	Plot move persistence estimates as 1-D or 2-D (along track) time-series
`plot.fG_osar`	Plot One-Step-Ahead Residuals from a foieGras SSM
`plot.fG_ssm`	Visualise the fit of a foieGras SSM to data

3: Examples

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Extending the behavioural model

4: Discussion

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Acknowledgements

Author's Contributions

Data Accessibility

ORCID

Bibliography