Software Tools for High-Resolution Movement Tags Practical 3

9 August 2017

Contents

1 Introduction

The exercises in this practical will help you explore:

- event detection

- numerical summaries of events

- visualising events

- statistical analysis of tag data

- inferring behavioural states from tag data

The practical contains more exercises than you are likely to be able to complete in the time available, but each section is designed to be relatively stand-alone, so please feel free to pick and choose the topics that are most interesting to you.

Data are provided for each example, but please feel free to try to incorporate your own data as time and ambition allow!

2 Summarising Dives

2.1 Exploring a ready-made dataset

Consider a dataset on 272 dives by 15 Cuvier's beaked whales. The data were
collected using DTAGs, and published along with DeRuiter et al. [2013]. The
data are available from `http://dx.doi.org/10.5061/dryad.n77k3`, but we
will load a slightly cleaned-up version of the dataset with more manageable
variable names.

1. If you want practice tidying up the variable names yourself, fetch the
   original text file from the Dryad repository and get to work.

2. Read in the clean data from the file `zc_dives.csv` on your mem-
   ory stick, or from the url `http://www.calvin.edu/~sld33/data/zc_`
   `dives.csv`. The main dataset has one column of whale IDs which
   are strings rather than numeric values. If you would prefer not to
   deal with these in Matlab/Octave, there is a version of the file called
   zc_dives_numeric.csv that omits that column.

   ```
   zc_dives = csvread('zc_dives_numeric.csv',1);
   ```

3. Create a simple box plot of the whole dataset (one boxplot per column,
   since each column of the dataset is one dive summary metric).
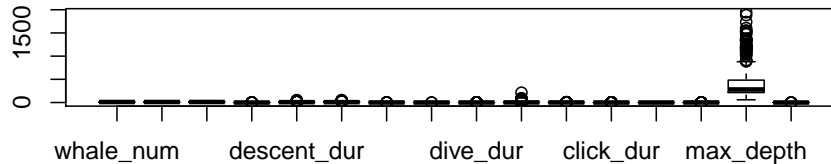
   (a) What do you notice about the data?
   (b) How could the visualization be improved (so you can better see
       patterns in all the variables)? Think creatively and check out the
       help for the boxplot function for more ideas...

References

Stacy L DeRuiter, Brandon L Southall, John Calambokidis, Walter M X Zimmer, Dinara Sadykova, Erin A Falcone, Ari S Friedlaender, John E Joseph, David Moretti, Gregory S Schorr, Len Thomas, and Peter L Tyack. First direct measurements of behavioural responses by Cuvier's beaked whales to mid-frequency active sonar. *Biology letters*, 9(4):20130223, aug 2013. ISSN 1744-957X. doi: 10.1098/rsbl.2013.0223.