

R en movimiento: una revisión de los paquetes para analizar movimiento dirigida a usuarios y desarrolladores

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LatinR - Set. 2019



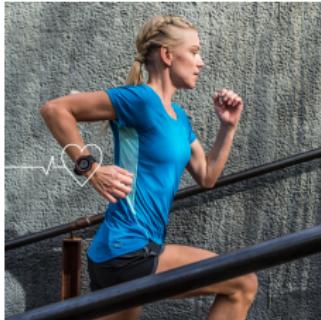
recio.joo@ufl.edu

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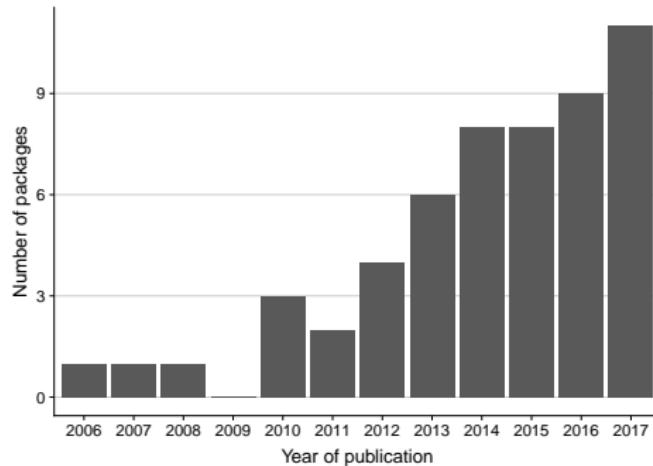
The context



The context



Tracking packages: created to process or analyze tracking data



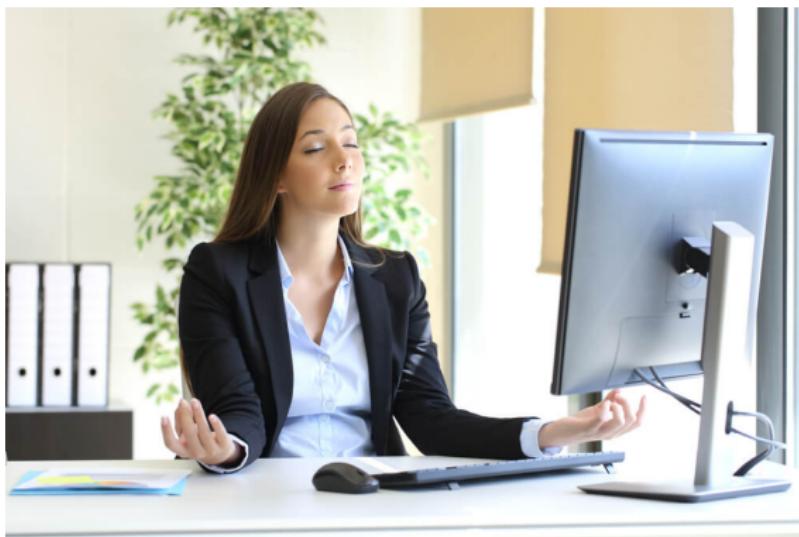
The context

- A lot of packages!
- Some redundancy
- Documentation is not always great
- Some not really maintained anymore

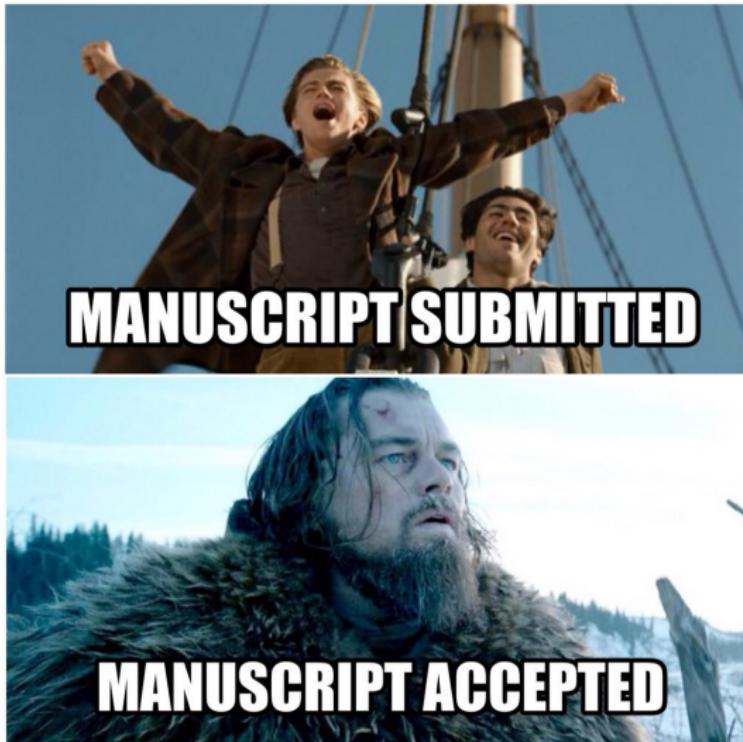


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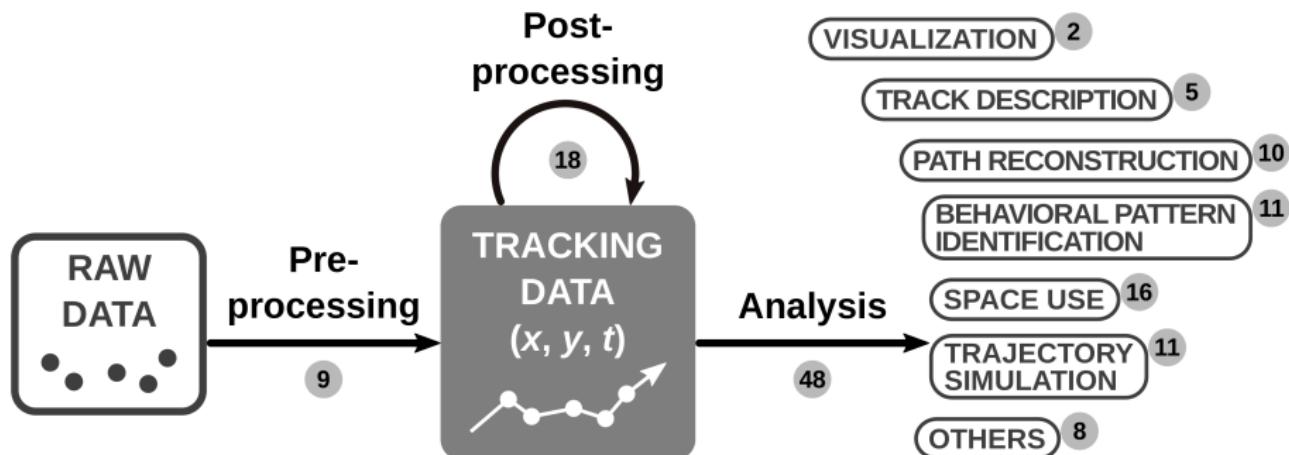


The context

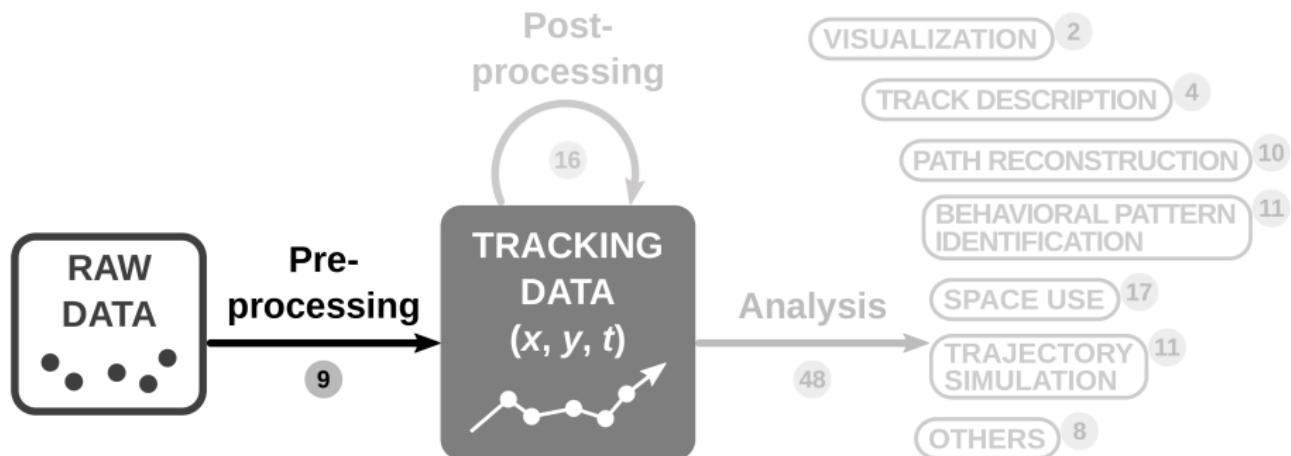


<https://arxiv.org/abs/1901.05935>

Tracking workflow

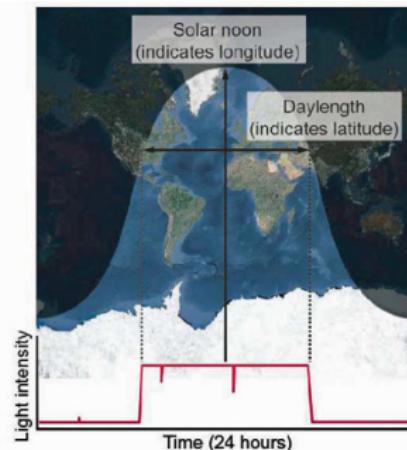


Pre-processing



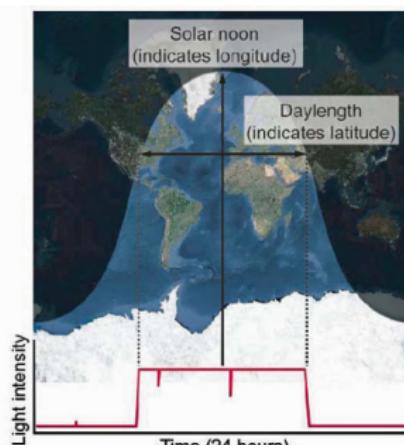
Pre-processing

E.g. Light level geolocator data



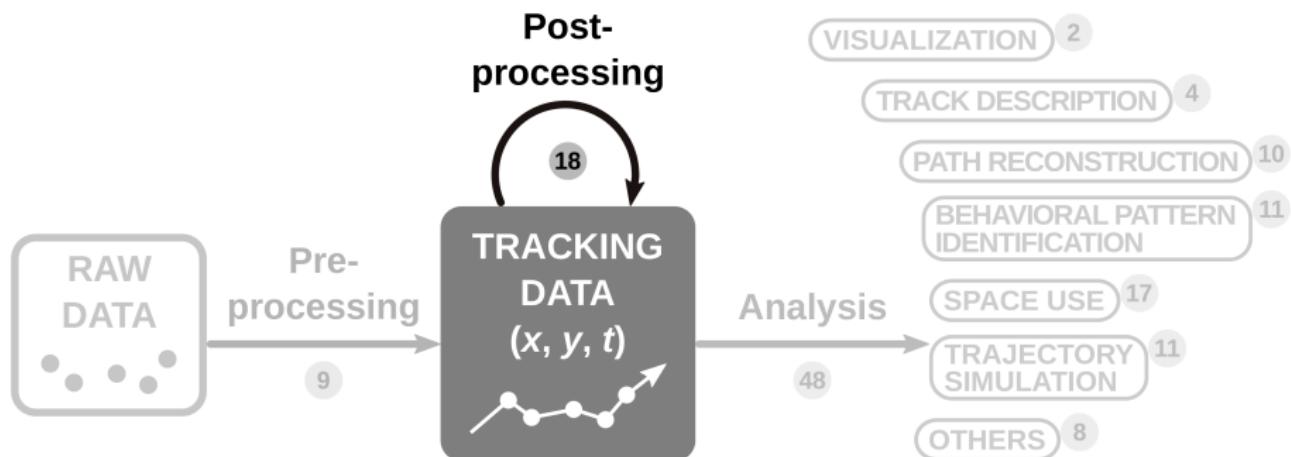
Pre-processing

E.g. Light level geolocator data



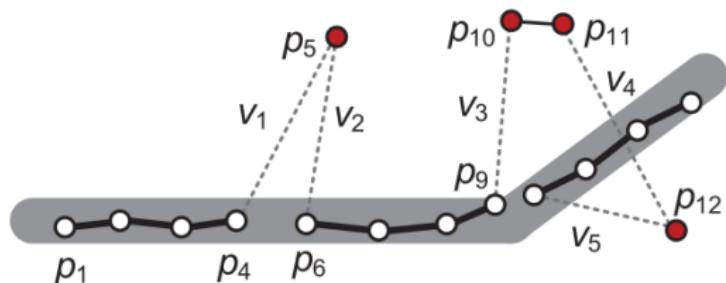
Packages: GeoLight, probGLS, FlightR, trackit, TripEstimation/SGAT, Twilight Free, telemetr, animalTrack, TrackReconstruction

Post-processing

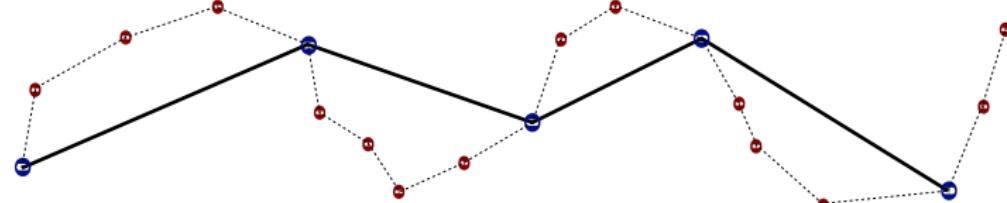


Post-processing

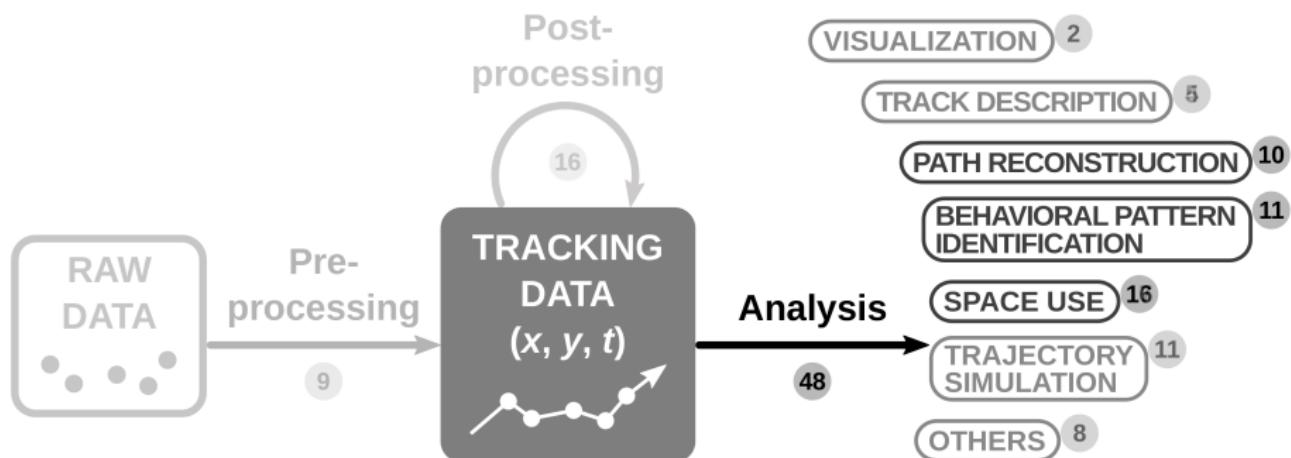
Cleaning (argosfilter, SDLfilter, T-LoCoH, TrajDataMining, trip)



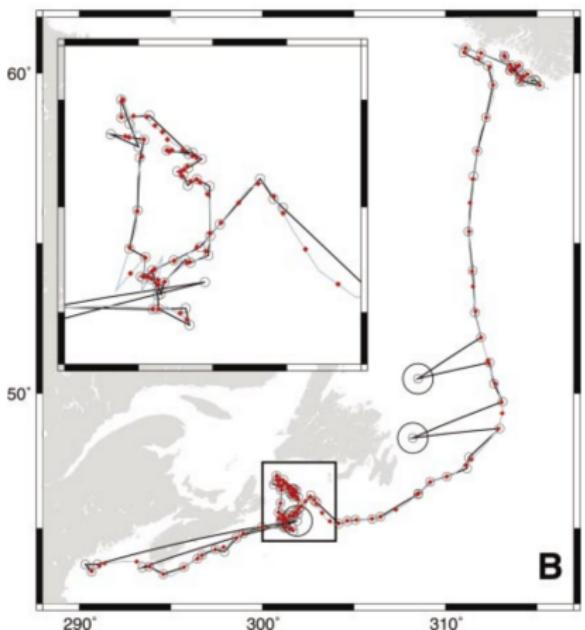
Compression (adehabitatLT, amt, trajectories, trajr, TrajDataMining, rsMove)



Analysis



Path reconstruction



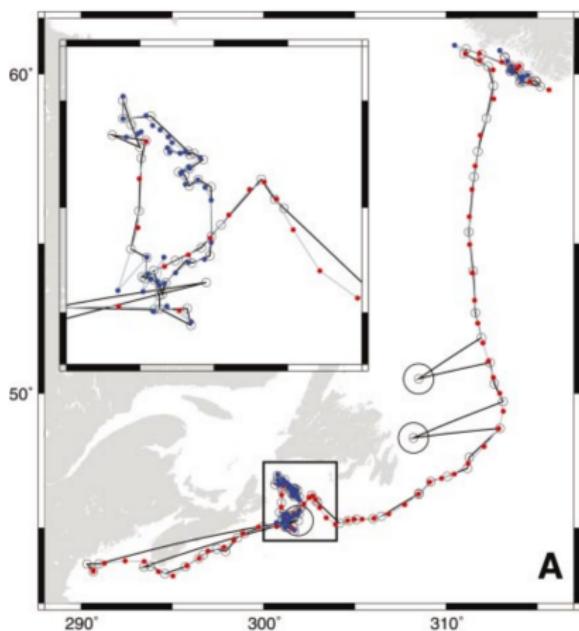
Purposes:

- Correct errors
- Finer data resolution
- Regular time steps

Remember: model means assumptions!

Packages: HMMoce, kftrack,
ukfsst/kfsst, argosTrack, bsam,
crawl, ctmcmove, ctmm, BayesianAnimalTracker, TrackReconstruction

Behavioral pattern identification



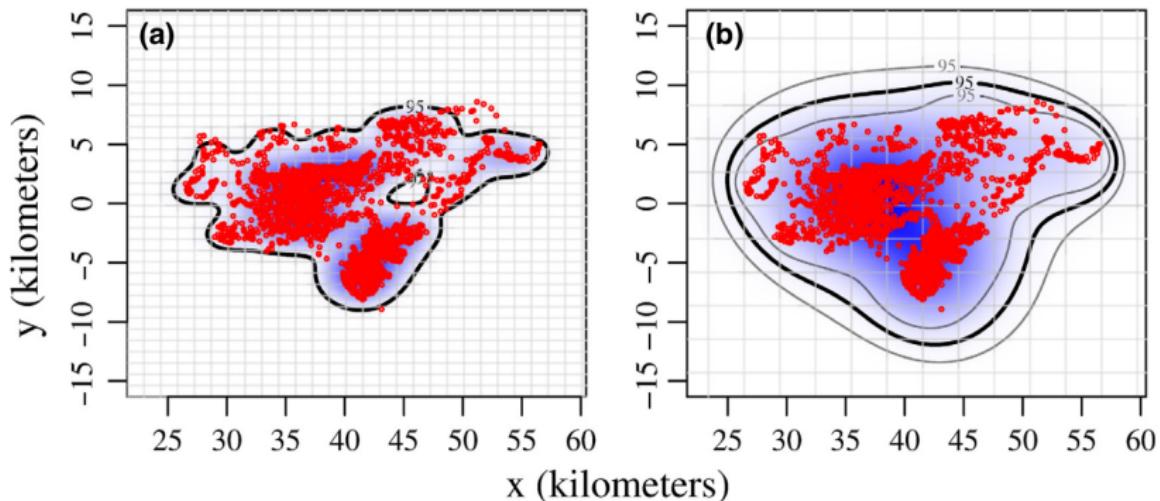
Purpose:

- Proxy of behaviors through the observed movement patterns

Remember: model means assumptions!

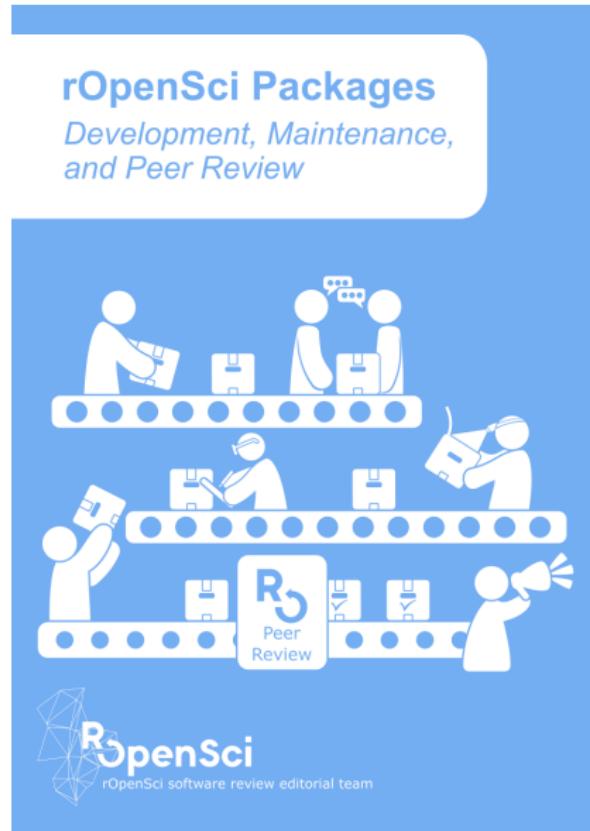
Packages: EMbC, m2b, adehabitatLT, segclust2d, bcpa, marcher, migrateR, bsam, lsmnsd, momentumHMM, moveHMM

Space use



Packages: adehabitatHR, amt, move, rhr, BBMM, ctmm, mkde, move, movementAnalysis, T-LoCoH, hab, ctmcmcmove, feedr, VTrack, moveNT, recurse, rsMove

Quality of a package



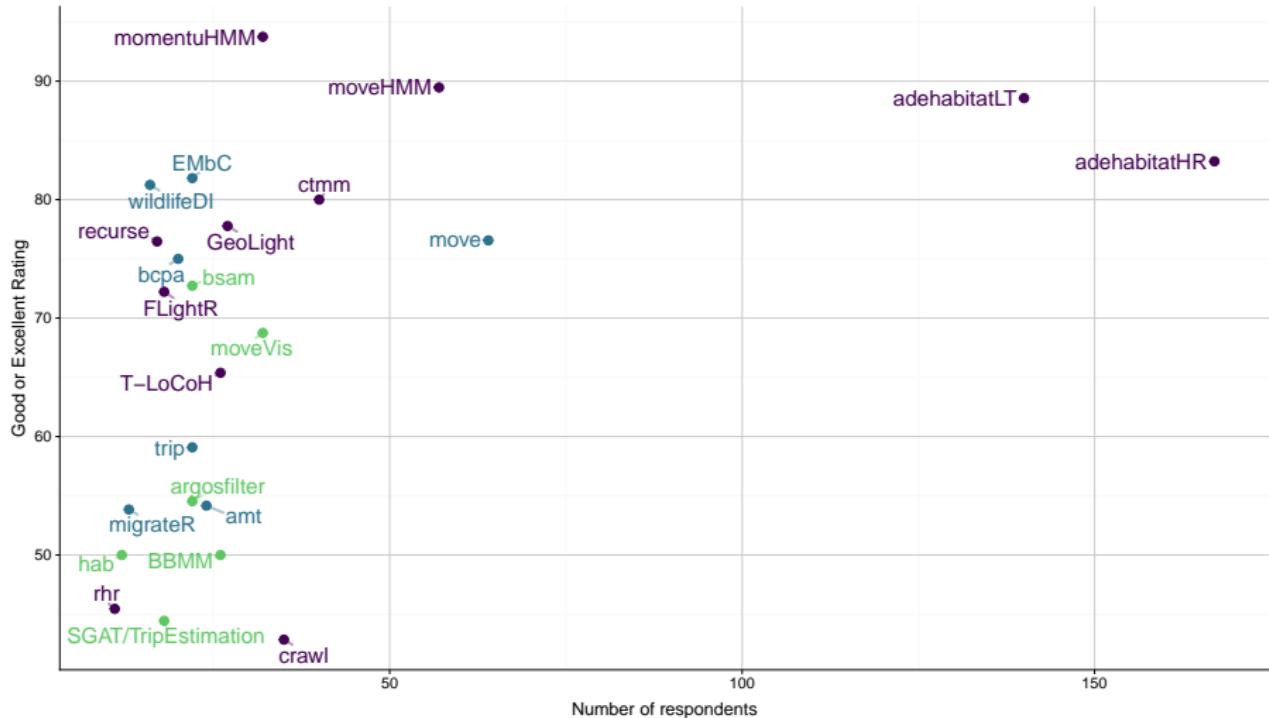
- [https://mablab.org/
post/ropensci/](https://mablab.org/post/ropensci/)
- Usability
- Quality
- Style
- **Documentation**
 - how and why of each function
 - ‘statement of need’: gap/improvement

Documentation

Survey: 225 users

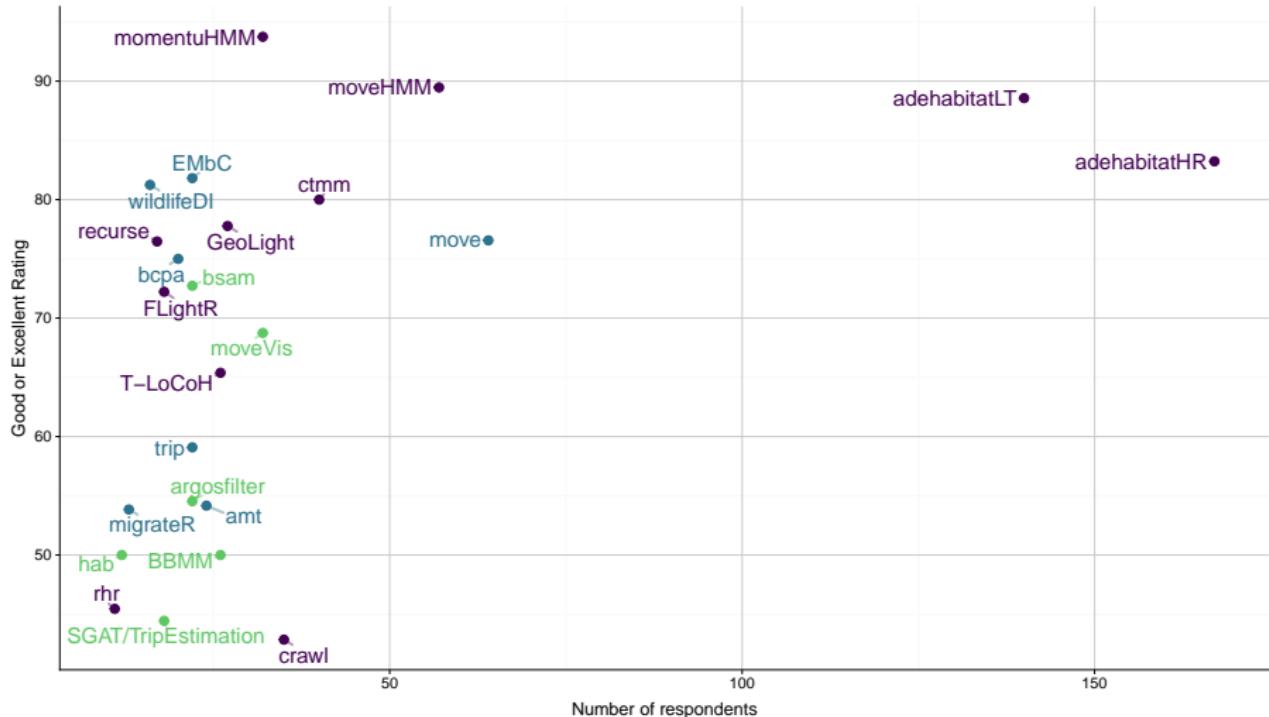
Documentation

Survey: 225 users 10 pkgs over 75 % good/excellent documentation



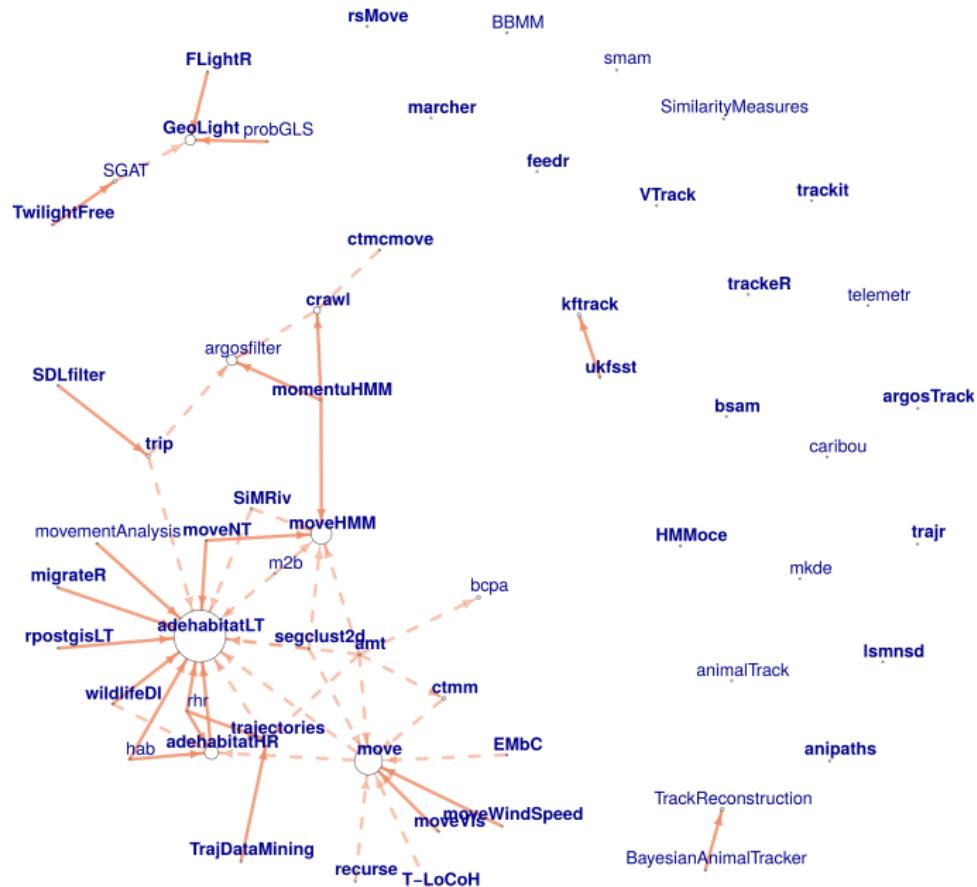
Documentation

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Users have a responsibility as well!!!

The R movement community



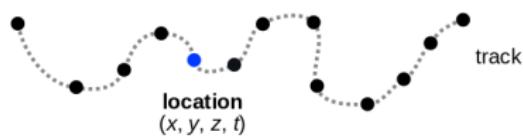
Next steps for the community

This review highlighted need to standardize trajectory data processing

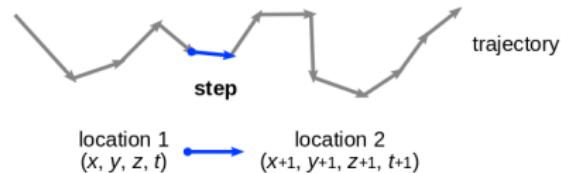
Real world



Tracking data



Movement data



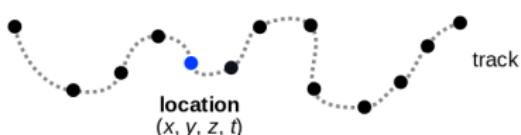
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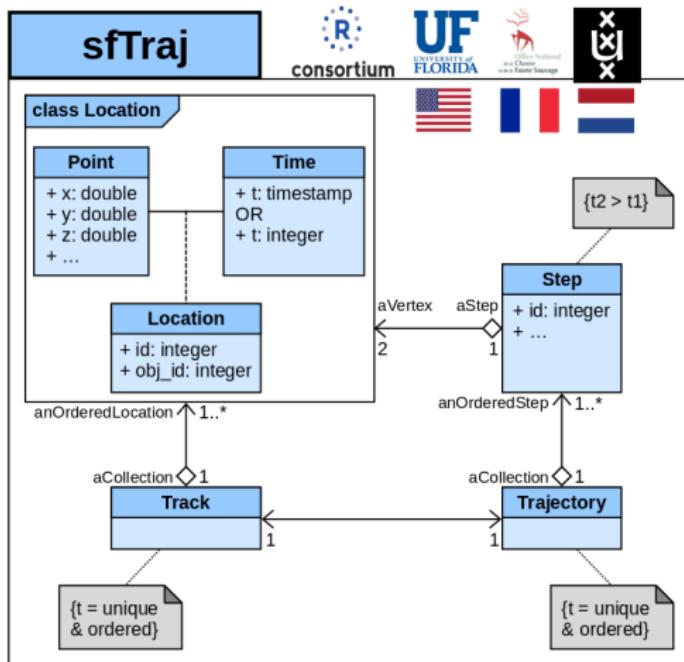
Real world



Tracking data



Movement data



<https://github.com/mablab/sftraj/>

Next steps for the community

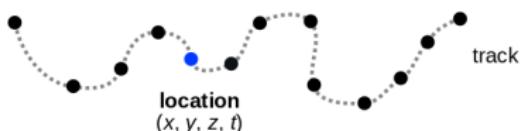
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Real world



moving object

Tracking data



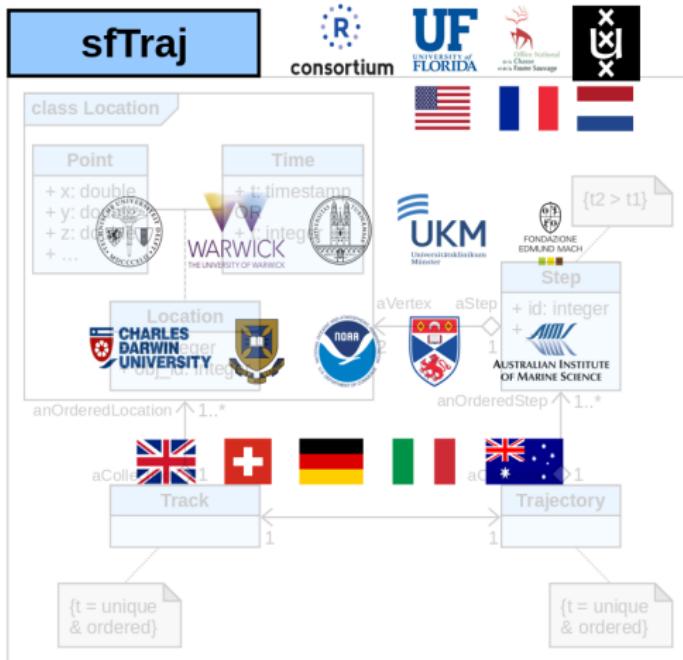
location
(x, y, z, t)

Movement data



step

location 1
(x, y, z, t) → location 2
($x+1, y+1, z+1, t+1$)



<https://github.com/mablab/sftraj/>

Next steps for the community

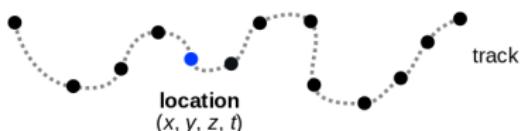
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Real world



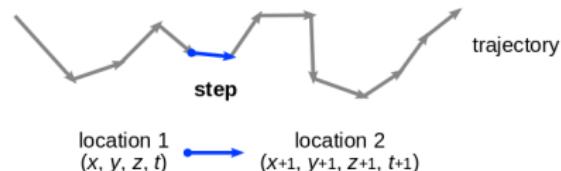
moving object

Tracking data



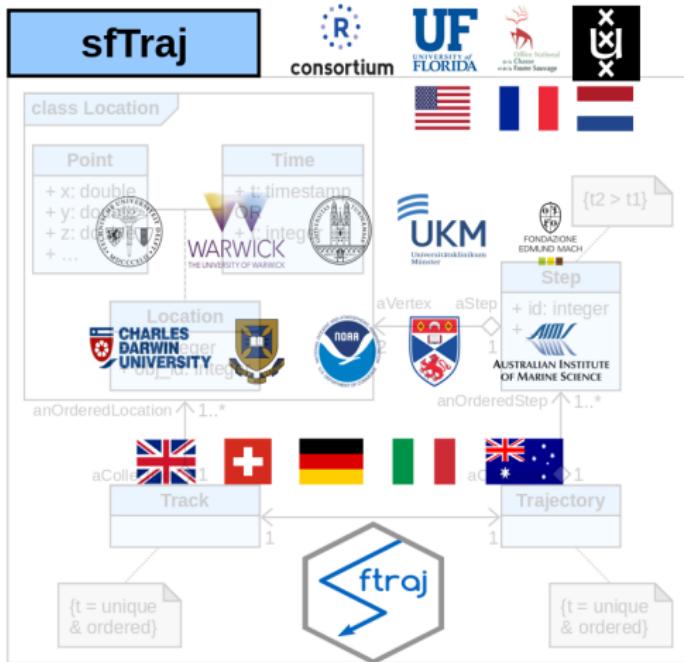
location
(x, y, z, t)

Movement data



location 1
(x, y, z, t)

location 2
($x+1, y+1, z+1, t+1$)



<https://github.com/mablab/sftraj/>

Thanks for your attention



**MOV
ECO**

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🐦 [rocio_joo](https://twitter.com/rocio_joo)