Summary of the meeting

Ronald Bialozyt

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Abstract

We planed to discuss the next point of Eduardo's project. We started by discussing the paper of Ranc et al. 2022 "Memory drives the formation of animal home ranges: Evidence from a reintroduction". The question is about what to implement next and if this bi-component memory would be something to use in our model. The idea, that the attraction of the home range would suffice to create a sensible home range seemed to be interesting.

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1 Starting idea

The paper we liked to discuss was the one from Ranc et al. (2022). In this paper the importance of bi-component memory usage for home range generation has been emphasised.

Our initial model dealed with something similar. The tamarins know all of their feeding trees with their home range, this makes it to the so called "spatial memory". The second component it called "working memory" and was implemented in this way, that the tamarins do remember on a certain amount of tree they visited last. The first component defines attraction to the trees and the second component defines repulsive to these trees.

So far I could not make out how they (Ranc et al., 2022) actually select from the step length and turning angle distribution the next location.

Still to find out!

2 New modelling exercises

2.1 Optimise Mayara's model using a GA

for the given parameter and variables

- two thresholds for energy budget
- time in tree before change
- action-time
- input_forget
- 50:50 chance of foraging or marking
- change the "choice" in "random-action"

Maybe take marking out

Using a genetic algorithm and the nlrx-package.

2.2 Implement a better "working memory"

In the current model, the working memory just remembers on the last two trees visited (parameter: input_forget). This is definitely to short. The removals of an tree within this memory depends only on the next visit of a tree and has no time component.

2.3 Using a stable "spatial memory"

We will not change the knowledge of the tamarins about the feeding trees in their home range. This would become necessary only in the case that we

would like to simulate changes in the home range location and size.

2.4 Attractiveness of trees and sites

In the paper by Ranc et al. (2022) they used some value for the attraction of the animals to certain cites. The parameters defining this attraction are almost all landscape parameter. There is also the time they spend in this site used to increase the attraction to this site.

We could define some sort of attractiveness be the trunc diameter of the trees. Later on we could think about different attractiveness according to the feeding tree species.

- We will probably need some sort of attraction for each of the activities of the tamarins like foraging and marking.

Not sure yet.

3 References

Ranc, N., Cagnacci, F., and Moorcroft, P. R. (2022). Memory drives the formation of animal home ranges: Evidence from a reintroduction. *Ecology Letters* n/a. doi:10.1111/ele.13869.