

Introduction

Animal social systems are complex and multifaceted

traditionally, animal social systems are measured using direct observation, telemetry or pit tags interactions, e.g. grooming, aggression, etc, between individuals are quantified by simplified measures and often lacking any indication of the spatial context of the interaction

recently the multilayer has been used to

along with spatial variables, comes a large history of landscape ecology exploring and evaluating sensitivity to scale

here we'll use simulations to evaluate the impact of scale on social and spatial variables to better understand it's impact, implications in ML networks

Multilayer Networks

Multilayer networks combine network layers with interlayer edges

Two main types of multilayer networks exist: multiplex networks and interconnected networks. Layers in multiplex networks consist of the same entities with each layer representing either a different type of interaction (as in multirelational networks) or a different time point or window (as in temporal networks). Layers in interconnected networks consist of the same or different entities with layers representing different subsystems (as in networks of networks), different types of entities (as in intercontextual networks), or different spatial locations (as in spatial networks) (Finn et al. 2019).

Of these, we have identified multirelational networks, networks of networks, intercontextual networks and spatial networks as likely to have spatial and scale considerations

Layers in multilayer networks can be Animal social systems are

What is a network

How does a ML network build on that

Which can include spatial variables

Multifaceted nature of animal social systems many variables having a spatial component including landcover and habitat type fix rate and

spatial variables defined by

Scale

perception of scale

What is scale

in LE lit, how has scale been investigated

Elements of scale relevant to animal social systems, animal movement data, landcover data

Grain is this, extent is this

How might scale influence results

What kinds of spatial scale are there

References

Finn, Kelly R., Matthew J. Silk, Mason A. Porter, and Noa Pinter-Wollman. 2019. “The Use of Multilayer Network Analysis in Animal Behaviour.” *Animal Behaviour* 149 (March): 7–22. <https://doi.org/10.1016/j.anbehav.2018.12.016>.