March 25, 2024 Theory Working Group Call

Attendees: Tom McLaren, Marcus Lapeyrolerie, Abby Lewis, Alyssa Willson, Jody Peters
Regrets: Caleb Robbins, Shubhi Sharma

Agenda:

1. Learned more about Tom's work with birds and forecasting with the Klamath Bird Observatory

2. Marcus - looking at naive ensemble models and was inspired by Freya's ensemble paper. Dealing with server issues

3. Note from Nick Clark on Slack
    a. Is anyone from the theory group interested in collaborating on a theory - driven forecasting project? To be brief, I'm interested whether functional or comparative information can improve estimates and forecasts of nonlinear trends in multispecies communities. Many of you probably know that we can partially pool no linear functions (see some background here: https://nicholasjclark.github.io/physalia-forecasting-course/day4/lecture_5_slidedeck#1). But it is also possible to use phylogenetic or functional relationships to do this, ie to regularise nonlinear effects for one species toward those from its closest relatives. I'd like to decompose the influences from these relationships on long term trends from large multispecies datasets such as NEON and NA BBS. The models are fairly developed but I'm keen for fresh eyes and contributions, especially from the theory perspective. Please reach out at n.clark@uq.edu.au if interested
        i. Discussion: Reminds Tom of an occupancy model that treats multi-species occupancy where each species is one realization of a random effect
        ii. Royal derazio community occupancy model - occupancy as a hyperparameter and each species gets one estimate and regularize overall occupancy - in that case people are looking at the overall, are looking at the individual. Similar, but doesn't involve the non-linear or additive things in Nick's presentation. But does include using different species
        iii. Not sure if this overlaps or not. If Tom can find the paper, he will add it to Slack

4. Check in with Cole and Shubhi - simulations, weighted permutation entropy and handling data gaps. Save for next time
    a. Check to see if there is any follow up that we need to do asynchronously

5. Check in with Caleb - Using the NEON Forecasting Challenge to explore predictability across variables and scales
    a. Caleb submitted an abstract for ESA!
    b. Save for next time
        i. Check to see if there is any follow up that we need to do asynchronously

6. Marcus - machine learning forecasts and NEON Forecasting Challenge. Any other things to check in about following up on the February call?

7. Blog post idea for code review materials (Jody)
    a. On January call the group talked about Jody drafting the blog post and running it by the group. There is no definite timeline for this, but hopefully within the next month or two
        i. SORTEE group has a lot of energy between code review and seems like there is overlap with EFI
        ii. SORTEE: https://www.sortee.org/
        iii. Has Slack channel - here is the link to join https://join.slack.com/t/sortee/shared_invite/zt-2fnqytett-AND1mTuXBKQWYyWUXKn6YA
        iv. Library of code mistakes: https://docs.google.com/presentation/d/12QN3WUc5v1Df7OArEox2U7I_N_qnHHuwzjCYiI4idC8/edit#slide=id.p
            1. Can add anonymously issues that people have found when their code has been reviewed
            2. E.g., day/time errors, misunderstanding of function
            3. It is structured with the same headings that were in the paper on code review
    b. Abby will see where she is at and may be able to draft some text
    c. Alyssa had a full code peer review in lab and the code has been published and included the peer review documents - original rubric and comments between Alyssa and reviewer.
        i. Has a few more projects
        ii. Would love to be on the other end of reviewing others code to get a feel for the timeline