Case Study Prospectus

Steve Powers

1. Title

Using ChatGPT to develop ShinyApps for rapid visualization of species occurrence databases

2. General research question

Where do different species occur?

3. Objective(s)

i. Attempt to build a simple ShinyApp that successfully downloads and visualizes occurrence data from public databases for a species selected by the user

ii. Document and understand how ChatGPT responses can vary for the same prompt

iii. Document and understand which kinds of prompts lead ChatGPT to produce useful code vs. not useful code

4. Approach

I will expand on the ChatGPT conversation in example #7 "Write a shiny app" from the Supplementary of Merow et al. (2023), which uses R (R Core Team 2024). To start, I will take the verbatim prompt from Merow et al. (2023), and enter it 12 times in independent chats to generate a range of ChatGPT responses for comparison. For record-keeping purposes, each ChatGPT response will be saved to a separate .txt file, and each code sequence generated will be saved to a separate .R file. I will then explore whether revised prompts, new prompts, or longer conversations can coax ChatGPT to produce more complete code and a functional Shiny app. I will document any of my own revisions to ChatGPT-generated code that were necessary to produce functional code and a working ShinyApp.

5. Selected References

Merow C, Serra-Diaz, JM, Enquist, BJ, & Wilson AM. 2023. AI chatbots can boost scientific coding. Nature Ecology & Evolution, 7(7), 960–962. <https://doi.org/10.1038/s41559-023-02063-3>

Perkel, JM. 2023. Six tips for better coding with ChatGPT. Nature, 618(7964), 422–423. <https://doi.org/10.1038/d41586-023-01833-0>

R Core Team. 2024. R: A Language and Environment for Statistical Computing. from <https://www.r-project.org/>