

Project for a bachelor or master thesis: **Analyzing Research Practices and Reproducibility**



The aim of this thesis project is to investigate **current research practices** among scientists, particularly focusing on practices such as p-hacking, HARKing (Hypothesizing After Results are Known), and reproducibility of published studies. With the increasing focus on transparency and openness in science, this project will provide valuable insights into researchers' approaches to **data integrity and reproducibility**. The analysis will primarily be conducted in R (or similar), and the findings are expected to contribute to ongoing discussions on fostering FAIR (Findable, Accessible, Interoperable, and Reusable) and Open practices within the working group **Experimental Interaction Ecology (EIE) and the German Centre for integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig**, where the project is based.

Project components

1. Survey development and analysis



- Design and conduct a survey among researchers about common practices like p-hacking, HARKing, and other methods that may impact data integrity [1].
- Analyze the survey data to identify trends, common practices, and variations in attitudes toward these practices.

2. Reproducibility analysis [optional and adjustable]



- Select published research papers of selected researchers.
- Try to reproduce their analysis based on available data and methods sections.
- Document challenges that you came across in the reproducibility process, providing an overview of factors that may hinder or facilitate reproducibility.

3. Literature review on FAIR and Open practices (FAIR/O)



- Conduct a literature review to assess methods and tools for FAIR/O practices in research (e.g. [2]).
- Synthesize findings to provide recommendations on best practices and potential pathways to improve compliance to FAIR and Open principles.

Why Join? This project offers the chance to contribute to important discussions on scientific rigor and ethics, with practical experience in data analysis, reproducibility efforts, and research transparency. Ideal for students interested in meta-science, open science initiatives, or anyone passionate about improving research practices. Prior knowledge about open research or questionable practices such as HARKing are not required.

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References:

- [1] Fraser, H., Parker, T., Nakagawa, S., Barnett, A., & Fidler, F. (2018). Questionable research practices in ecology and evolution. PloS one, 13(7), e0200303. <https://doi.org/10.1371/journal.pone.0200303>
- [2] Lowndes, J. S. S., Best, B. D., Scarborough, C., Afflerbach, J. C., Frazier, M. R., O'Hara, C. C., ... & Halpern, B. S. (2017). Our path to better science in less time using open data science tools. Nature ecology & evolution, 1(6), 0160. <https://doi.org/10.1038/s41559-017-0160>