Dr. Stefan Popp

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EXPERIENCE

All projects done in the function of a research scientist

Ant movement experiments 08/2017 - 08/2023

- Published 4 first-author peer-reviewed scientific articles with wide reach.
- Created a complete **data pipeline** from correcting and stitching 4 4K videos through automated movement tracking to data cleaning and statistical analysis.
- Processed and cleaned 40 mil data points using custom **MATLAB** code and **bash** routines, including interactive data visualization for semiautomatic **data cleaning**.
- Answered original research questions using **statistical models** such as GLMMs, MCMCs, and correlograms.
- Presented findings at 11 (+3 online) academic conferences with consistently positive feedback

Swarming model 09/2018 - 07/2022

- Published a peer-reviewed paper in collaboration with researchers from 3 other institutions.
- Co-created an agent-based model of swarming in MATLAB and analyzed results in R.

Comparison of data processing methods 05/2022 - now

- Created a dataset of hundreds of trajectories using MCMCs for comprehensive comparison of the accuracy and repeatability of 10 resampling methods used in movement ecology.
- Created an analysis pipeline to deal with highly-dimensional data structures
- Gave recommendations for the use of such methods for different contexts. Also recreating parts of this analysis in **MySQL** and **Power BI**.

Models of movement strategy efficiency 12/2023 - now

- Produced an agent based mechanistic model of systematic search strategies in MATLAB and **Python**.
- Analyzing the efficiency of 5 strategies based on specific metrics in dozens of simulated environments to propose the adoption of one of these strategies in robotic search swarms.

Machine learning data analysis 09/2021 – 06/2022

- Created a portfolio of analyses and models explaining ant search behavior using **dimensionality reduction**, **ARIMA**, and **Random Forests**. Assisted in the application of a **GAN** specialized for trajectory data.
- Presented analyses in **Jupyter** notebooks
- Co-led a team of 6 computer scientists and mathematicians.

EDUCATION

University of Arizona 08/2017 - 08/2023

***PhD**, Ecology & Evolutionary Biology* *Tucson, AZ*

- Thesis title "Ant search strategies for resources of unknown location"
- Graduate representative, 2x Galileo Circle Scholarship, mentored 21 research assistants & taught 400+ students

University of Würzburg 09/2011 - 07/2017

***BSc. & MSc.**, Biology* *Würzburg, Ger*

- 1 collaborative first-author publication & contribution to a further one

SKILLS & INTERESTS

- **Skills** answering questions with data; data visualization; report writing; critical thinking; *bolded in Projects*
- **Interests**: bike packing; language learning; snowboarding; mushroom growing; Electronic Dance Music