

Hannah J. Back

(563) 396-4578 ▪ hannahback@gmail.com ▪ <https://hannahjbs.github.io/portfolio/>

Skills

Programming Languages: Python; R; SQL; SAS; Java; qGIS

Programming Skills: git & version control; object-oriented programming; algorithm design; data cleaning

Data Visualization: matplotlib; ggplot2; seaborn

Statistics: high-dimensional data; bootstrapping; classification and cluster analysis; flexible & non-parametric modeling; statistical learning

Communication: technical report writing; data storytelling; documentation; ppt presentation

Experience

Undergraduate Researcher – Geography Department, University of Iowa, IA

Sept. 2022 – Present

- Leveraging multi-spectral satellite imagery for cost-effective remote detection of algae blooms
- Designing image processing methods to flexibly handle different types of satellite imagery
- Performing spatial and temporal analysis of lake “greenness” to see where and when blooms occur
- Displaying shifts in algae distribution during a season with gifs of calculated “greenness”

Biostatistics Intern – National Institute of Environmental Health Science (NIEHS), Durham, NC

May 2023 – Aug. 2023

- Created methods to explore shape heterogeneity of dose-response curves in large toxicology testing datasets
- Implemented a flexible, shape-constrained semi-parametric model in R to bin different chemicals by shape
- Devised an adaptive bootstrapping algorithm to improve computational efficiency by 25%
- Assessed new model performance against traditional logistic regression methods

Quantitative Research in the Life and Social Sciences Program – Arizona State University, Tempe, AZ

May 2022 – Aug. 2022

- Designed a simplified model of Earth systems to quantify relationship between emissions and temperature change
- Implemented the model with inter-coupled ordinary differential equations in Python using object-oriented programming
- Predicted the temperature changes from various emissions pathways
- Published manuscript as first author in Global Environmental Change-Advances

Education

B.S. Data Science, University of Iowa, Iowa City, IA

Expected Dec. 2024

Relevant Coursework: Statistical Learning, Automated Reasoning, Probability and Statistics, Algorithms, Data Structures, Geographical Databases