Hannah Back, Data Scientist

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EDUCATION

University of Iowa, Iowa City, IA
B.S., Data Science, Dec. 2024
GPA: 3.55

EXPERIENCE

Research Assistant, Geography
University of Iowa, Iowa City, IA
Aug. 2022 – July 2024

- Developed Python code to create a cost-effective, remote detection method of algae blooms from satellite imagery
- Used machine learning methods, specifically random forest regression, to combine predictive power of satellite data and in-person chlorophyll measurements.
- Designed object-oriented, modular code to process multiple geospatial image formats efficiently
- Produced dynamic data visualizations, such as animated GIFs, to show seasonal changes in water quality.

Summer Internship Program, Biostatistics
National Institute of Environmental Health Sciences, Durham, NC
May 2023 – Aug. 2023

- Analyzed performance of two statistical models (logistic regression vs. semi-parametric splines) for use in large toxicological datasets
- Optimized a bootstrapping algorithm by implementing adaptive sampling, reducing runtime by 25%
- Built logistic regression model in R to generate predictions, confidence intervals, and interpretable parameters
- Adapted a shape-constrained spline model to classify dose-response curves as “increasing”, “decreasing”, “concave”, or “convex” using simultaneous hypothesis testing

Research Experience for Undergraduates (REU)
Arizona State University, Tempe, AZ
June 2022 – Aug. 2022

- Developed climate models in Python to simulate methane emissions scenarios and their impact on global temperature
- Used inter-coupled differential equations to capture relationships between emissions, permafrost, and climate feedback loops.
- Cleaned and integrated multi-source environmental datasets (weather, atmospheric, land use) for model inputs
- Conducted scenario analysis to evaluate policy-relevant mitigation outcomes

PUBLICATION

Back, H., May, R., Sree Naidu D., Eikenberry S. (2024). Effect of methane mitigation on global temperature under a permafrost feedback. *Global Environmental Change Advances*, 2(100005).

SKILLS

Programming: Python, R, SQL, Git, Java, SAS
Data Science & ML: scikit-learn, regression, random forest, neural networks, k-NN, PCA, LDA
Data Engineering / Handling: pandas, PySpark, dplyr, large dataset processing
Visualization: Matplotlib, Seaborn, Plotly