Hayden Outlaw

Mathematics and Data Science

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Work Experience

2023-Present — **Machine Learning Intern**, *National Center for Atmospheric Research*, Boulder, CO
Streamlined distributed neural network used to decompress cloud particle algorithms in TensorFlow to improve performance and decrease computational load, as a part of the NCAR Computational and Information Systems Lab.

2023-Present — **Data Science Equity Researcher**, *Tulane Data Analysis Institute*, New Orleans, LA
Developing more streamlined and computationally efficient mechanisms for hiring equity audit studies of automated hiring and screening resume review algorithms to ensure non-discrimination in hiring practices.

2021-Present — **Convex Optimization Researcher**, *Tulane Mathematics*, New Orleans, LA
Researching graphicalLasso covariance assignment algorithm, specifically computing the probability of incorrect maximum likelihood correlation assignment in sample covariance matrices.

2021-Present — **Station Engineer**, *WTUL 91.5 New Orleans*, New Orleans, LA
Responsible for the hardware and software architecture of the station, including website management, hardware repairs, music archiving, troubleshooting, and sound system design.

2021-2021 — **Biomathematics Researcher**, *Georgia Institute of Technology*, Atlanta, GA
Participated in biomathematical modeling accelerator internship utilizing NetLogo and other agent-based simulation tools to design biological and ecological models in conjunction with teams from Northwestern, Brown, Clemson, Tulane, Georgia Tech, and University of Florida.

Skills

Mathematics
Studied extensively in statistical inference, probability, abstract algebra, number theory, and calculus, with a specialization in convex optimization and statistical analysis. Fluent in proof construction, arithmetic calculations, and the use of computational notebook software such as Wolfram Mathematica and Jupyter.

Machine Learning
Capable of building a wide variety of classification and regression algorithms in PyTorch, TensorFlow, and SKLearn, as well as benchmarking performance, tuning, and evaluating performance as part of a larger system. Well versed in practical implementation as well as machine learning theory and model complexity.

Data Science
Extremely experienced in Python-based data science, notebook use, and model design. Capable at every step of the data pipeline, from data collection and cleaning to model design to analysis, including a high-level knowledge of technical probability and statistics, and machine-learning skills.

Cloud Computing
Able to design, deploy, manage, query, and administrate cloud computing resources, environments, and databases through Microsoft Azure, Amazon Web Services, and Google Cloud.

Languages

2020-Present — **Python** — *Skilled Conda and Conda-Forge environments, NumPy, SciPy, Pandas, and packages, machine learning resources such as PyTorch, TensorFlow, and SKLearn, as well as Jupyter and other notebook presentations*

2023-Present — **R** — *Capable of analyzing data, computing statistics and sampling distributions, as well as generating visuals and implementing analytical automated programs.*

2021-Present — **Java** — *Familiar with Java development and IDE systems, including UML diagramming, javadoc exports, and pseudocode presentation.*

2021-Present — **C** — *Studied operating system development and resource virtualization systems in LINUX and LINUX-like machines*

2021-Present — **SQL** — *Capable using SQL queries to retrieve, define, and arrange data sets from varioius databases. Familiar with Microsoft SMSS and MySQL Workbench for database use and administration.*

2022-Present — **JavaScript** — *Able to utilize Javascript and p5.js to create interactive artwork and animations for digital presentation.*

Education

2020-2024 — **BS Mathematics/Computer Science**, *New Orleans, Louisiana*
Bachelors in Mathematics and Computer Science from Tulane University of Louisiana with a focus on statistics and data science, and machine learning.

Background

I am a mathematics and computer science student from Boulder, Colorado presently living in New Orleans, Louisiana. I have a passion for the use of data to solve problems, and I am dedicated to exploring how these concepts are connected to the people and world around us. In my spare time I play trombone; DJ at a local radio station; study philosophy, Spanish, and German; and volunteer around the city of New Orleans.