Hayden Outlaw

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⛓ https://outlawhayden.github.io

OBJECTIVE: To leverage an intelligent and creative approach to data science, statistics, and modeling to drive innovative solutions and communicate knowledge.

WORK EXPERIENCE

Tulane Mathematics — *Algebraic Statistics Researcher*   AUG 2021 - PRESENT
- Researched graphLasso covariance estimator, developed novel algorithm to bypass convex optimization using algebraic geometry.
- Successfully numerically modeled a novel probability function, and demonstrated unknown behavior with high confidence and interpretabillity.
- Presented findings in SIAM 2023 Algebraic Geometry conference at Technische Universiteit Eindhoven in Eindhoven, NL in July 2023 on behalf of Tulane University.

National Center for Atmospheric Research — *Machine Learning Intern*   MAY 2023 - AUG 2023
- Streamlined distributed neural network used to decompress cloud particle algorithms in PyTorch, to improve performance and decrease computational load, as a part of the NCAR in Summer Internship in Parallel Computational Science Program and Computational and Information Systems Lab.
- Conducted data management and processing, as well as model training and evaluation in parallel on the NSF Cheyenne and Derecho computers.
- Collaborated with NOAA and NCAR developers, atmospheric scientists, and hardware engineers to ensure a practical, effective, and meaningful model framework.
- Presented findings at NCAR SIPARCS Seminar in August 2023.

WTUL New Orleans 91.5 — *Station Engineer*   AUG 2021 - PRESENT
- Responsible for the hardware and software architecture of Tulane University's college radio station, including website management, hardware repairs, music archiving, troubleshooting, and sound system design.

Tulane University — *Supplemental Instructor*   JAN 2021 - PRESENT
- Assisted in instruction of undergraduate single and multi-variate calculus courses as a part of the Supplemental Instruction program.
- Created review materials, lectures, and resources to help students navigate assignments and exams in conjunction with faculty and graduate assistants.

Georgia Institute of Technology — *Biomathematics Researcher*   MAY 2021 - AUG 2021
- As a part of the Southeast Center for Mathematics and Biology, utilized NetLogo to create an interactive and real-time agent-based model of an savannah ecology system, including agent behavior, atmospheric conditions, and reproduction rates.

SKILLS

Mathematics
- Statistical Inference, Probability Theory, Machine Learning Theory, Stochastic Process Modeling, Natural Language Processing, Algorithmic Analysis, Number Theory, Abstract Algebra

Computer Programming
- Python, R, SAS, Java, C, C++, HTML/CSS, JavaScript, TypeScript, NetLogo, SQL and DBMS Software, HPC/Cloud Resource Management, Git/DVC

Languages
- Fluent Spanish, Novice German

EDUCATION

Tulane University of Louisiana — *BS Mathematics/Computer Science*   AUG 2020 - MAY 2024
Bachelor of Science in Mathematics and Computer Science, minor in Philosophy
GPA: 3.91/4.0 – Advised by Dr. Daniel Bernstein

Selected Projects
- Developed LLM tool to parse local council meeting transcripts from language queries
- Analyzed effects of climate events on rates of police and service calls across different groups and locations across time
- Conducted algorithmic equity analysis on algorithms for job application screening with respect to applicant age

PUBLICATIONS

Hayden Outlaw, Daniel Irving Bernstein. Maximum likelihood thresholds of Gaussian graphical models and graphical lasso. arXiv preprint, 2024 Pending.

Conferences

American Meteorological Society Annual Conference 2024 - Baltimore MD, January 2024 **PENDING**
Tulane University Undergraduate Research Symposium - New Orleans LA, October 2023
National Center for Atmospheric Research SIPARCS Seminar - Boulder CO, August 2023
    Presentation Recording — Poster
SIAM Algebraic Geometry 2023 - Eindhoven, Netherlands, July 2023
    Poster

Background

I am a mathematics and computer science student from Boulder, Colorado presently living in New Orleans, Louisiana. My passion is exploring how data can solve problems and connect people and concepts together by using user-centric tools and cutting-edge techniques. In my spare time I play trombone, DJ at a local radio station, study philosophy, and volunteer around the city of New Orleans.