

Madeline Dabney

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EDUCATION

Rice University

Expected December 2025

Master's Degree, Statistics with a concentration in Statistical Computing and Data Mining

- Completed rigorous coursework in statistical inference, regression analysis, and advanced statistical methods, building a strong foundation for data science applications.
- Engaged in data science projects, including analyzing Austin Police Department performance across council districts, identifying key areas for operational improvement, and analyzing voice measures as predictors of Parkinson's disease progression.
- Conducting a machine learning project on neural biomarkers to predict cognitive decline, integrating statistical theory with real-world applications.

The University of Texas at Austin

Conferred May 2024

B.S., Neuroscience with a concentration in Computational Neuroscience

- Developed and executed a quantitative neuroscience project in MATLAB to model switching dynamics during perceptual bistability, including data analysis and psychophysics experiments.
- Applied neural computation and modern data analysis techniques using Python to explore signal processing, stochastic neural encoding, and machine learning methods.
- Participated in courses emphasizing neural systems, experimental design, and computational tools, equipping me with advanced problem-solving and analytical skills.

Certificate, Elements of Computing with a concentration in Software Engineering and Computational Science

- Contributed to the development and deployment of a dynamic website (similar to IMDb for comic books) using Python, HTML, CSS, JavaScript, SQL, and PostgreSQL, leveraging GCP and RESTful APIs.
- Designed an iOS planner app for individuals with cognitive decline symptoms using Swift, Firebase, and Xcode.
- Completed projects in scientific computing, including mathematical investigations of Sun-Jupiter Lagrange Points and analyses of the Google Page Rank algorithm.

WORK EXPERIENCE

Outlier AI, Remote

June 2024 – Present

Freelance Artificial Intelligence Trainer

- Collaborated in 15+ projects testing AI models with complex mathematical and Python coding challenges, aiming to identify and rectify model errors.
- Developed targeted prompts to “break” models and verify performance in solving advanced problems in linear algebra, geometry, and calculus.
- Collaborated with teams to contribute to enhancements in major platforms like OpenAI and Wolfram Alpha, refining AI accuracy and robustness.

RESEARCH EXPERIENCE

Undergraduate Research Assistant & Peer Mentor

January 2022 – May 2022

Department of Integrative Biology, UT Austin

- Led team research projects with publishable outcomes, coordinating efforts among 3 core team members and mentoring 30+ peers in lab protocols and experimental techniques.
- Conducted extensive data analysis and visualization using R (ggplot2, dplyr) to process behavioral trial data, compute statistical metrics (p-values, quartiles), and identify trends.
- Designed and executed innovative experiments including the Barnes Maze aversive learning paradigm and sociability assays in *Gambusia affinis* fish, yielding actionable insights into spatial learning and behavioral patterns.
- Presented comprehensive research findings at UT Austin Undergraduate Research Forums (2022 & 2023), engaging with academic peers and judges to discuss methodologies, data insights, and potential future research directions.
- Articulated complex experimental and analytical processes in a clear, accessible manner, demonstrating strong data storytelling and technical communication skills.
- Research Projects:
 - **Aversive Route Learning & Its Effect on Anxiety/Boldness in *G.affinis* Fish**-Developed research design and led data collection using behavioral assays to assess spatial learning and anxiety responses, generating publishable results.
 - **Heterospecific and Conspecific Mate Choice in *G.affinis* Females**-Designed sociability assays to evaluate mate preferences, analyzed data trends, and provided mentorship in experimental execution and data analysis.
 - **Aversive Route Learning in *G.affinis* Fish**-Implemented aversive learning paradigms to generate sex-differentiated data on problem-solving abilities and reversal learning in spatial tasks.

PRESENTATIONS

- **Madeline Dabney**, Madison Montoya, Julian Padilla, Cassandra Rocha. Aversive Route Learning and its Effect on Anxiety/Boldness in *G.affinis* Fish. Poster presentation delivered at the University of Texas at Austin Undergraduate Research Forum, Austin, TX, April, 2023.
- Mowna Ravipati, Nhu Nguyen, **Madeline Dabney**. Aversive Route Learning in *G. affinis* fish. Poster presentation delivered at the University of Texas at Austin Undergraduate Research Forum, Austin, TX, April, 2022.

SKILLS

Programming Languages: Proficient in programming languages including R, Python, MATLAB, Swift, HTML/CSS, and SQL.

Data Science and Machine Learning: Familiar with libraries and frameworks such as scikit-learn, TensorFlow, PyTorch, Pandas, NumPy, Matplotlib, Seaborn, and Plotly.

Database and Software Management: Skilled in SQL databases (Postgres, SQLite) and software development tools including Git, GitLab CI, and automated testing frameworks.

Data Analysis & Visualization: Expert in statistical modeling, time series analysis (statsmodels), and creating impactful visualizations using tools like ggplot2, dplyr, and interactive platforms.

Soft Skills: Strong attention to detail and analytical thinking, effective technical writing, and data storytelling. Adept at explaining complex concepts clearly, leading teams, mentoring peers, managing project deadlines, and connecting technical work to business outcomes.

Languages: Native proficiency in English; advanced proficiency in Spanish; limited proficiency in Korean and Russian.