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 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.

The University of Texas at Austin *Conferred May 2024*

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.
- 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.
- Presented comprehensive research findings, 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.

SKILLS

Technical Skills: Proficient in programming languages including R, Python, MATLAB, Swift, HTML/CSS, and SQL. Experienced with data science and machine learning libraries and frameworks such as scikit-learn, TensorFlow, PyTorch, Pandas, NumPy, Matplotlib, Seaborn, and Plotly. Skilled in SQL databases (Postgres, SQLite). Proficient with software development tools and best practices, 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 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.