Zachary Bretton

Austin, Texas, USA zhbretton@gmail.com +1 (917) 224-7086 in/zachary-bretton zacharybretton.github.io

SUMMARY

PhD in Cognitive and Computational Neuroscience with 4+ years of experience in applying machine learning and statistical techniques to large-scale datasets, with expertise in Python, MATLAB, SQL, and high-performance computing. Proficient in the full data analysis lifecycle, including data wrangling, feature engineering, model development, and visualization, driving impactful research and data-driven decisions

EXPERIENCE

Graduate Research Assistant, Lewis-Peacock Lab

University of Texas at Austin **August 2019 - August 2024, Austin, TX**

- Conducted advanced research applying machine learning models, specifically using scikit-learn, to analyze large and complex fMRI datasets leading to multiple publications.
- Developed and implemented data-driven solutions for understanding cognitive processes, utilizing advanced statistical techniques such as bootstrapping for data interpretation.
- Utilized Python and Matlab for comprehensive data analysis, preprocessing, and cleaning of fMRI data.
- Leveraged the Texas Advanced Computing Center (TACC), a high-performance computing cluster (HPCC), for running analyses, gaining experience with clusters and Docker for scalable computing.
- Led a team of undergraduate assistants, guiding them in research and career development.
- Designed and executed experimental protocols for fMRI studies, ensuring rigorous experimental design and execution.

Lab Manager / Research Technician, Neural Circuit Lab

Columbia University Medical Center **September 2016 - May 2019, New York, NY**

- Conducted electrophysiological experiments and performed data analysis using custom written Matlab scripts, focusing on neural data from awake-behaving mice.
- Designed and standardized data collection techniques utilizing the Neuralynx system, streamlining the research process.
- Created custom experimental apparatuses using Arduinos, circuitry, and 3D printing to support various research projects.
- Co-developed a model for studying anxiety in mice and managed various research projects, including Early Life Stress models and Working Memory in a Schizophrenia model.
- Mentored undergraduate teams, directed grant proposal processes, and oversaw lab operational management.
- Applied advanced data analysis techniques to interpret experimental results, contributing to multiple publications.

EDUCATION

Ph.D. in Neuroscience

University of Texas at Austin • Austin, TX • 2024

- Thesis: The neural mechanisms and long-term impacts of working memory suppression

B.A. Biology, Specialization in Neurobiology

Boston University • Boston, MA • 2016

SKILLS

Proficient in Python (NumPy, SciPy, pandas, seaborn, matplotlib, nibabel, nilearn, statsmodels), Matlab, SQL, Unix/BASH, Git, Machine Learning (scikit-learn, TensorFlow)

Skilled in data cleaning (wrangling, transformation, normalization), advanced statistical analysis (bootstrapping), data visualization (Matplotlib, Seaborn), high-performance computing (HPCC, Docker, Singularity, SLURM)