

Benjamin D. Zhao

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Education

Georgia Institute of Technology | Atlanta, GA
Bachelor of Science in Neuroscience, Minor in Computer Science

August 2022 – May 2026
GPA: 3.9

Work Experience

Data Analytics Intern

May 2024 – Present

Reese Lab, National Institutes of Health

Bethesda, MD

- Developing and optimizing multiple neural network models for high-accuracy semantic segmentation using MATLAB, incorporating preprocessing, data augmentation, model training, and performance evaluation.
- Improving overall accuracy of segmentation tasks through iterative modifications and hyperparameter tuning
- Analyzing and creating 3D Models of Cryo-EM tomograms using IMOD, while maximizing efficiency of the cross-platform suite for 3D reconstruction and modeling of microscopy images with electron microscopy data
- Utilizing advanced light and electron microscopy techniques to investigate the structure and function of the post synaptic density (PSD) and protein transport in axons

Research Assistant

May 2023 – Present

Pathology Dynamics Lab

Atlanta, Georgia

- Curated and analyzed extensive data sets for a Natural Language Processing (NLP) Drug Repurposing Project, ensuring data integrity and relevance for research purposes
- Revised and enhanced the schema of the NLP Drug Repurposing Project, implementing improvements to enhance model stability and accuracy, while reading hundreds of medical abstracts and mapping information. Improved model stability by 25%.
- Handled data according to Institutional Review Board (IRB) and data use standard agreements
- Collaborated closely with team members to develop a comprehensive data analysis pipeline, performed advanced statistical analysis, and conducted text mining to extract valuable insights for the research endeavor

Leadership Experience

Bits of Good/Hack4Impact | Marketing Specialist

January 2023 – Present

- Directed the seamless transition to a new newsletter platform, spearheading all aspects of publication management, resulting in a 140% increase in engagement and readership among the club's target audience
- Created archive for old organization email campaigns, hiring resources, and semester updates, ultimately decreasing number of repeated questions in messaging platform by 80%

Mock Trial | Treasurer/Competitor

August 2022 – Present

- Spearheaded the planning and execution of financial strategies, including cost-saving measures and efficient allocation of funds, contributing to the team's successful participation in competitions while maintaining a balanced budget. Strategies resulted in 67% increase for school funded budget compared to previous fiscal year
- Competed actively as a member of the Georgia Tech Mock Trial Team, engaging in intensive case reading and preparation, and honing persuasive communication strategies while navigating complex legal scenarios

Neuroscience Student Advisory Board | Board Member, Web Developer

August 2022 – Present

- Designed and implemented a public archive for Neuroscience students to store relevant internship opportunities, highlight neuroscience-related research breakthroughs, and build an alumni network

Projects

Artificial Neuron and Simple Neural Network Modeling

- Modeled artificial neurons, with voltage gated sodium channels and a life-like refractory period to fire action potentials, which simultaneously respond to both excitatory and inhibitory inputs
- Modeled a simple neural feedforward neural network with layers of connected neurons that generalize data

Echolocation and Parallel Processing Modeling

- Modeled CF/CF, FM/FM, and DSCF areas that simulate the corresponding calls emitted by bats during echolocation, while accounting for and measuring Doppler Shift effects on neural activity
- Conducted extensive literature review on bat auditory pathways (CF/CF, FM/FM, and DSCF areas) to accurately model the echolocation pathways and theorize applications for visually impaired individuals

Skills

Coding Languages: Java, Python, HTML, Swift

Interests: Chess, game theory, UI/UX, photography