Ellen Zhang

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Objective

MIT senior, rising Master's student (2026) in AI and Mathematics, seeking an UTA in EECS classes to help with classes and provide academic support for peers.

Qualifications

- **Teaching Skills**: experience with planning and leading recitations, mentoring students one on one, and grading coursework.
- **Programming Skills**: proficient in Python, TypeScript, JavaScript, Java, Lisp, SQL / Experience with ML libraries such as PyTorch, TensorFlow, Sklearn / Other: NumPy, Pandas, matplotlib, Git, React, MangoDB, CSS, HTML
- **Mathematical & Analytical Skills**: Strong foundation in linear algebra, statistics, probability, and discrete math / Practical experience in statistical analysis and algorithm design
- **Personal Attributes**: Motivated, responsible, quick-learner, collaborative, and excellent problem-solving skills.

Education

Massachusetts Institute of Technology **Class of 2025 (BS), Class of 2026 (MS)**

- **GPA** 4.9/5.0
- **Bachelor of Science** in Mathematics and Artificial Intelligence
- **Courses**: Computer Vision, Robotics, Machine Learning, Theory of Computation, Representation, Inference, and Reasoning in AI, Design and Analysis of Algorithms, Software Construction, Statistics, Probability, Random Variables, Linear Algebra & Optimization , Differential Equations, Discrete Mathematics, NLP (2024 fall), Signal Processing(2025 Spring)

Teaching, Work & Research Experience

MIT CS & AI Lab - Research Assistant with Dr. Dina Katabi **Fall 2024-2025**

- Conducting research to diagnose orthostatic hypotension using AI transformer models trained on sleep and EEG signals.
- Engaging in data processing, data visualization, and statistical analysis using numpy, pandas and matplotlib to analyze breathing spectrograms and sleep.
- Training and evaluating transformer based models using PyTorch on large scale datasets.

Johns Hopkins Center for Language and Speech Processing – AI Research Intern **Summer 2024**

- Collaborated with a multidisciplinary team of postdocs, PHDs and professors to develop a multi-modal audio generator.
- Planned and implemented scripts for evaluating semantic and acoustic representations in audio tokenization autoencoders, using PyTorch and advanced ML methodologies.
- Conducted research on neural audio codecs, focusing on Vector Quantized Variational Autoencoder, Self-Supervised Learning, and Spectrogram manipulation.

Sandia National Laboratories – Technical Summer Intern **Summer 2023**

- Utilized Python for data analysis and processing to develop a power grid model for Puerto Rico, improving model interconnectivity by 87%.
- Addressed data inconsistencies and conducted research on algorithmic decision-making under uncertainty.

MIT Interphase EDGE – Calculus Teaching Assistant **Summer 2022 / 2023**

- Led recitations and provided academic support to students, improving their comprehension of calculus concepts.

MIT CSAIL – Python Template Builder – Document Processing Research Lab **Spring 2023**

- Automated the extraction of key-value pairs from manufacturing PDFs using Python, streamlining document processing.
- Developed rule-based operations for parsing documents with similar formats, enhancing automation and accuracy.

Projects

- **Poker-Bots Project**: Engineered a strategic poker bot using Python. Implemented k-means clustering on over 100,000 poker hands and applied Monte Carlo simulations and game theory concepts to enhance decision-making algorithms.
- **Web-Lab Project**: Designed and developed a journaling website hosted on Heroku, implementing full-stack development skills using JavaScript, React, MongoDB, and CSS/HTML.

Activites & Interests

Delta Phi Epsilon formal committee Hobbies: Video Games, Sustainability, Dancing, Swimming, Singing