Ellen Zhang

Cambridge, MA · ellen660@mit.edu
https://github.com/ellen660 · https://www.linkedin.com/in/ellenzhang660/

Objective

Rising MENG student in Artificial Intelligence and Mathematics, previously LA for 6.101 and UTA for 6.4110, and calculus teaching experience through Interphase EDGE. Seeking a Graduate TA position for Fall 2025 in programming, algorithms, or AI.

Education

Massachusetts Institute of Technology **GPA 4.9/5.0** **Class of 2025 (BS), Class of 2026 (MS)**

- **Bachelor of Science** in Mathematics and Artificial Intelligence
- **Courses**: NLP, Computer Vision, 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.
- **Undergraduate Teaching Assistant** for Representation, Inference, and Reasoning in AI **(Spring 2025)**, Lab Assistant for Fundamentals of Programming in Python **(Fall 2023)**, Calculus Teaching Assistant for MIT Interphase **(Summer 2022)**

Qualifications

- **Programming: debugging/writing interpretable code,** proficient in Python, TypeScript, Java/ **ML libraries**: PyTorch/ **Data science**: NumPy, Pandas, matplotlib, SciPy / Other: Git, React, SQL, MangoDB, CSS, HTML.
- **Personal Attributes**: Enjoys problem-solving, responsible, quick learner, collaborative

Work & Research Experience

MIT CSAIL – Health and AI – Undergraduate Research Scholar **Fall, Spring 2025**

- Conducting research to train deep learning models on breathing signals to diagnose orthostatic hypotension.
- Using hospital data, conduct data processing, visualization, and statistical analysis using numpy, pandas and matplotlib.
- Training and optimizing generative and transformer-based models such as RVQGAN and Vision Transformer in PyTorch to process large datasets.

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

- As a multidisciplinary team, researched and developed a hierarchical audio codec that captures both semantics and low-level acoustic features, culminating in submission to Interspeech 2025.
- Contributed to model metric evaluation and probing the quality of semantic and acoustic representations.
- Conducted in-depth research and reading on state-of-the-art research in neural audio codecs, focusing on RVQGANs, a method of self-supervised learning.

Sandia National Laboratories – Resilient Energy Systems – Technical Intern **Summer 2023**

- Developed a power grid model for Puerto Rico using Python, improving system efficiency by 87% through data analysis, visualization and k-means clustering techniques.

MIT CSAIL – Document Processing Research Lab – Undergraduate Researcher **Spring 2023**

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

Projects

- **Reinforcement Learning for Generative Art** (2024): Experimented with techniques to guide reinforcement learning agents to behave more like humans when generating art including differentiable strokes and modified reward functions.
- **Emojiville** (2024): Investigated the ability of various language models such as BERT, GPT and Word2Vec in capturing emoji sentiment and part of speech by training probing models on embeddings of Twitter data.
- **StarBattle** (2023): Built an interactive website in Javascript using client-server architecture, complete with graphics.
- **Web-Lab Project** (2021): Designed and developed a journaling website hosted on Heroku, implementing full-stack development skills using JavaScript, MongoDB, and CSS/HTML.
- **Poker-Bots Project** (2022): Engineered a strategic poker bot using Python. Implemented k-means clustering on over 100,000 poker hands.