Ellen Zhang

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

Objective

MIT senior and rising Master's student (2026) in Artificial Intelligence and Mathematics, seeking a UTA position for Spring 2025 in programming, algorithms, or AI. Passionate about mentoring students through recitations, office hours and grading.

Qualifications

- **Teaching Skills:** Experience leading recitations, mentoring students, and grading coursework. Previous roles as a Calculus Teaching Assistant for MIT Interphase for 2 summers and Lab Assistant for 6.1010 (Fundamentals of Programming).
- **Programming Skills**: proficient in Python, TypeScript, JavaScript, Java, Lisp. Experienced with ML libraries (PyTorch, TensorFlow, Sklearn), data science tools (NumPy, Pandas, Matplotlib, SciPy, MongoDB, SQL), and web development (Git, React, MongoDB, CSS, HTML).
- **Mathematical & Statistical Skills**: Strong foundation in linear algebra, statistics, probability, and discrete math.
- **Personal Attributes**: Motivated, responsible, patient, collaborative, with excellent problem-solving skills.

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**: 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 Experience

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

- Led recitations and provided academic support to students, improving their comprehension of calculus concepts.
- Planned and presented technical concepts, and received positive feedback from students.
- Assisted with grading, exam reviews, and weekly office hours.

MIT 6.1010 Fundamentals of Programming - Lab Assistant **Fall 2023**

- Helped students debug errors and think through code, and taught good coding practices.

Work & Research Experience

MIT Computer Science & Artificial Intelligence Laboratory – Undergraduate Research Scholar **Fall 2024**

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

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

- Collaborated with a multidisciplinary team of researchers to develop a multi-modal audio generator.
- Developed scripts for evaluating semantic and acoustic representations, using PyTorch and advanced ML methodologies.
- Rresearched neural audio codecs, focusing on Residual Vector Quantization, Self-Supervised Learning, and Spectrogram manipulation, contributing to state-of-the-art developments.

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

- Developed a power grid model for Puerto Rico using Python, improving system efficiency by 87% through advanced data analysis and optimization.
- Addressed data inconsistencies and conducted research on algorithmic decision-making under uncertainty.

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, utilizing full-stack development skills using JavaScript, MongoDB, React, and CSS/HTML.