ASHLEY ZHANG

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EDUCATION

Massachusetts Institute of Technology *Class of 2026*

- **Candidate for B.S. in Mathematics, Candidate for B.S. in Computer Science and Engineering**
- Relevant Coursework: Design & Analysis of Algorithms, Machine Learning, Fundamentals of Programming, Probability & Random Variables, Honors Linear Algebra, Differential Equations, Number Theory, Microeconomics; Spring 2024: Software Construction, Computer Vision, Statistics, C & Assembly

EXPERIENCE

Full-Stack Software Engineer Intern @ Sunona *Jul 2023 - Dec 2023*

- Built an encrypted, HIPAA-compliant, token authentication-based login page using Django and React
- Optimized API call and audio processing pipeline to speed up GPT-3.5/4 text generation operations by 70%
- Supported frontend through HTML/CSS, worked extensively with AWS (VPC, EC2, RDS, and Secrets Manager)

Instructor @ Inspirit AI *Jun 2023 - Aug 2023*

- Taught core machine learning and data science concepts and guided creation of neural network models utilizing Python, PyTorch, Hugging Face, and TensorFlow
- Led projects addressing problems in finance, disaster relief, and criminal justice using NLP models including BERT, GloVe, and Word2Vec

Jane Street First Year Trading and Technology Program | New York, NY

- Used Python to code a bot trading bonds, arbitrages, and ETFs, placed 4th out of 20 teams in trading competition
- Learned about quantitative technology models, applied statistical and game theory strategies to artificial markets

Citadel Securities Datathon | Boston, MA

- Utilized NumPy/Pandas/Folium to analyze dozens of datasets investigating decline in BART revenue
- Implemented optimization methods to design a new fare price algorithm for the transit system to mitigate unfair fees

RESEARCH

Physics Informed Neural Networks (PINNs) under Prof. Camilla Cattania *Sep 2023 - Present*

MIT Department of Earth, Atmospheric & Planetary Sciences

- Fine-tuning parameters for PINNs to output satisfactory results for more general and complex initial conditions
- Refining training times and sampling ranges for PINNs to implement new linear loss function
- Developing epoch adjustments to implement transfer learning techniques

Machine Learning Applied to Crustal Deformation under Prof. Silvia Ullo *Jan 2023 - Present*

Department of Engineering at University of Sannio (Benevento, Italy)

- Integrating research at MIT EAPS to include InSAR data as a metric to improve converge time of loss functions
- Corresponding findings with researchers at European Space Agency in Rome

MIT Computer Science & Artificial Intelligence Laboratory (CSAIL) *Apr 2023 - Jul 2023*

- Implemented Python and OpenAI API to design simulator algorithm to replicate human-subject studies
- Conducted literature review on Turing Experiments, LLM distortion, and prompt design

AWARDS & HONORS

3x American Invitational Mathematics Exam (AIME) Qualifier, 2x Math Prize for Girls Qualifier, AMC 10 Distinction (top 5%), Member of New Jersey All-State and Central Jersey Regional Orchestra (2018 - 2021)

ACTIVITIES

MIT Symphony Orchestra (Section Leader), Society of Women Engineers (Membership Board Member), Undergraduate Society of Women in Mathematics (Treasurer), MIT Cello++ (Ensemble Director)

SKILLS & INTERESTS

Python (NumPy, Pandas, PyTorch, Django, REST APIs), Java, C, JavaScript (Node.js, React), HTML/CSS, MATLAB, Machine Learning, Cello/Ukulele, Video Editing, Running, Swimming