

# Ziye Chen

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## Education

**Boston University**, MS in Artificial Intelligence Sept 2023 – Jan 2025

- GPA: 3.7/4.0
- **Coursework:** Artificial Intelligence, Deep Learning, Natural Language Processing, Image and Video Computing

**Nanjing Tech University**, BS in Mathematics Sept 2019 – June 2023

- GPA: 3.5/4.0
- **Coursework:** Machine Learning, Deep Learning, Mathematical Analysis, Advanced Algebra, Analytic geometry, Mathematical Optimization

## Research Interest

**Large Language Model:** LLM Frameworks, Prompt Engineering, Multimodal LLMs

**Theory of Deep Learning:** Transformer, KANs (Kolmogorov-Arnold Networks)

## Research Experience

**Large Language Models for Mathematical Analysis** Fall 2024

- Developed the DEMI-MathAnalysis dataset, a specialized collection of proof-based problems in mathematical analysis, sourced from *Problems in Mathematical Analysis* by Demidovich and *Problems and Solutions in Real Analysis* by Hata, to fine-tune large language models (LLMs).
- Designed and implemented a guiding framework for LLMs, integrating problem classification, dynamic prompt construction, and a domain-specific Knowledge Base, to improve their ability to generate rigorous and complete solutions to mathematical analysis problems.
- Established a robust evaluation standard using GPT-4o, assessing models based on correctness, completeness, clarity, relevance, and insight, and compared performance across fine-tuned models such as Llama 3.2, Qwen 2.5, and OpenAI's state-of-the-art models.

**P300 EEG Signal Shape-Type Function Research** Spring 2023

- Developed a P300 signal energy detector based on the Neyman-Pearson theorem and GLRT, successfully filtering out white noise and improving signal detection accuracy
- Employed the AMPD algorithm for effective peak detection, identifying significant peaks in EEG data and isolating potential P300 signals
- Implemented clustering analysis with an enhanced correlation distance method, accurately deriving the shape-type function of the P300 signal, which distinguishes between the growth and decline phases

## Project Experience

**Humanity's Last Exam (lastexam.ai)** Spring 2025

- Contributed one or more questions that were **accepted among the top 550** in Humanity's Last Exam, an open initiative measuring how close AI is to expert-level knowledge in mathematics, physics, and more
- Recognized as a listed **author** for my role in advancing AI model evaluation
- Earned a total prize of **\$500** for the accepted questions

**Chinese OCR through a CRNN Architecture with Attention** Spring 2024

- Implemented a Convolutional Recurrent Neural Network (CRNN) architecture, enhancing the contextual understanding of the text
- Enhanced the model with an attention mechanism to improve focus on relevant segments of the input
- Make schematics of the model structure

**Election Narratives through Prompt Engineering with GPT** Spring 2024

- Used Gmail API to extract the required emails from election related email accounts as data
- Creating charts to analyze basic information about political parties
- Used prompt to analyze emails merged every week

#### **UBC Ovarian Cancer Subtype Classification and Outlier Detection**

Fall 2023

- Compressed images by Gem pooling (each image in the dataset is larger than 1GB in size)
- Enhanced image compression techniques and trained an EfficientNet\_b0 model to increase classification accuracy
- Utilized boosting techniques for the model and increased accuracy from 65% to 85% with boosting (Ten independently trained EfficientNet\_b0 models voted results)

### **Technologies**

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**Languages:** Proficient in Python, MATLAB, R, C, Basic in C++, Java, SQL

**Machine Learning:** Proficient in PyTorch, TensorFlow

**Tools:** Visual Studio Code, PyCharm, Github

### **Scholarships And Awards**

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Silver Medal in the “Child Mind Institute — Problematic Internet Use” Kaggle Competition

Nanjing Tech University The First Prize Scholarship in 2022-2023

The First prize of C/C++ Programming in Jiangsu Division of the 11th Lanqiao Cup National Software and Information Technology Talent Contest

The Excellent Award of C/C++ Programming in National Finals of the 11th Lanqiao Cup National Software and Information Technology Talent Contest

### **Other Experience**

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**Vice-Chairman of Programmers Association in Nanjing Tech University**

2020 - 2022

- Organized the Python course for beginners
- Organized the forum for solving programming problems

**Boston University Badminton Player**

**Nanjing Tech University Badminton Player**