Runqiu Ye

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EDUCATION

Carnegie Mellon University **Expected Graduation 2027**

Bachelor of Science in Computer Science and Mathematics *Pittsburgh, PA*

- **GPA:** 4.0/4.0
- **Computer Science Coursework:** Machine Learning, Natural Language Processing, Artificial Intelligence, Computer Systems, Data Structures and Algorithms, Functional Programming, Principles of Imperative Computation, Fundamentals of Programming and CS.
- **Mathematics Coursework:** Functional Analysis, Probability Theory, Honor Linear Algebra, Matrix and Vector Calculus, Honor Real Analysis, Honor Abstract Algebra.

SKILLS AND AWARDS

Language/Libraries: C, C++, Python, Java, Fortran, LaTeX, PyTorch, Numpy, Pandas, Matplotlib
Developer Tools: VS Code, Git, Github, Vim, Google Colab, Anaconda, Jupyter Lab
Awards: Summer Undergraduate Research Fellowship, Dean List High Honors, International Young Physicists' Tournament Champion, Princeton University Physics Competition 2nd Place, Chinese Mathematics Olympiads and Chinese Physics Olympiads First Prize

PROJECTS

Handwritten Digits Classifier | *Deep Learning, Convolutional Neural Network* **August 2024**

- Built a **convolutional neural network** to classify grayscale handwritten digits. **Trained with 60000 images** from the MNIST dataset.
- Tested on 400 examples and **achieved 70% accuracy**. Plan to add more symbol and integrate into **equation to LaTeX translator**.

SMS Anti-Spam Classifier | *Machine Learning, Python* **July 2024**

- Created a fine-tuned, well-tested SMS anti-spam classifier using **Naive Bayes** algorithm and **Support Vector Machine**.
- Reached **89% accuracy** with Naive Bayes algorithm and Support Vector Machine on testing set with 700+ examples.

Text Editor in C | *C, Data Structures* **May 2024**

- Developed a **command-line text editor using C** from scratch, deepening understanding of **data structures and terminal operations**.
- Utilized **gap buffer** to hold text and achieve **efficient insertion and deletion**, supporting **syntax highlighting, file editing and saving, custom key bindings, and multiple open buffers**. Plan to write **my own Lisp** and develop **scripting language**.
- Github link: github.com/RunqiuYe/text-editor. Blog post: learnwithrye.blogspot.com.

Classic 8-ball Pool Game with AI | *Object Oriented Programming, AI, Python* **November 2023**

- Recreated classic **8-ball Pool** using Python, leveraging **Object Oriented Programming** and **MVC pattern** for structure.
- Implemented **artifical intelligence** board solver and creating **smooth animation**, making possible **player versus computer**, strategy recommendation, and improved **visual gameplay experience**. Github link: github.com/RunqiuYe/8-ball-pool.

EXPERIENCE

Carnegie Mellon University | *Vector Calculus, Matrix Calculus* **August 2024 – Present**

Teaching Assistant *Pittsburgh, Pennsylvania*

- Taught **Calculus in 3D** to class of 20 people and held **office hours and recitations** on vector and **matrix calculus and linear algebra**.
- **Prepared course material** and graded students' assignments. **Resolved misunderstandings and questions** about course content.

Carnegie Mellon University | *Python, Fortran, Data Analysis, Github* **January 2024 – August 2024**

Undergraduate Research Assistant in Computational Astrophysics *Pittsburgh, Pennsylvania*

- Utilized **Python and Fortran** to develop a **high-precision numerical simulation** for evolution of binary star systems, resulting in simulation of over **1.5 million binary stars** in Pittsburgh Supercomputing Center and **deepened insights of white dwarf formation.**
- Implemented **advanced statistical analysis** with Python to simulation results to study dependency between certain evolution models and binary stars behaviors, leading to **creation of new models** and **70% more consistent results** between different simulations.
- Received **2024 Summer Undergraduate Research Fellowship Awards**. Planned to publish discovery in academic journal.

Nanjing University | *Deep Learning, Neural Networks, Image Processing* **December 2022 – December 2023**

Nanjing University Scholar, China Talented Plan Researcher *Nanjing, China*

- Researched on **automated image segmentation technologies** and application of ultrasonic imaging in atherosclerotic plaques diagnosis. Studied application of **deep learning**, **neural networks**, and **energy curves** to automated image processing.
- Utilizing **neural networks** to process ultrasonic images and identify atherosclerotic plaques sizes, leading to **automated segmentation** of **over 75% images** with **improved results reproducibility**. Accomplished **improvements in diagnosis accuracy and efficiency**.