Yuxuan Sun

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EDUCATION

Imperial College London graduation expected in 2027.6
BEng in Computing
Courses: Computing Practical (Haskell, Kotlin), Introduction to Computer Systems, Introduction to Databases, Calculus, Discrete Mathematics, Logic and Reasoning, Mathematics for Machine Learning

Nanjing Foreign Language School (High School), Nanjing, Jiangsu graduated in 2024

AWARDS

Computer Science:
USACO (USA Computing Olympiad) Platinum (Highest Division) ***Rank 32 in the World*** *(2023 US OPEN CONTEST)*
Codeforces Username: sunyx ***Title: Master Rating: 2216***
2018 National Olympiad in Informatics in Provinces Junior Division ***first prize***
2022 National Olympiad in Informatics in Provinces Senior Division ***first prize***
Binary Prediction of Poisonous Mushrooms (Kaggle) ***Rank 95/2422***

Mathematics:
Senior Mathematical Challenge 2022 ***Full Mark***
STEP II&III: ***Grade 1 & Grade 1***

WORK EXPERIENCE

Researcher, *Nanjing*, Jiangsu **Tencent** 2023.6 - 2024.1

- Was selected for the Tencent Aspiring Explorers in Science to research **cryptographic accumulators** under the mentorship of Professor Yu Yu and Hu Yuncong, Shanghai Jiao tong University. Focused on applications in **Public Key and Web Certificate Management**. Reviewed 20+ papers and integrated the chunking algorithm, ordinary, persistent and compressed prefix Merkle trees into a novel approach. Authored a paper titled *Advanced Transparency System*. https://eprint.iacr.org/2024/1788.pdf
- Engaged with Tencent's machine learning R&D team on molecular recognition, gaining insights into integrating basic scientific theories with deep learning. Proposed a computer algorithm solution using the **A* algorithm** to a problem in knots and three-dimensional manifolds.

PROJECTS

AlphaGen

- Led the project under the guidance of Prof. Antoine Cully, Director of the Adaptive and Intelligent Robotics Lab at Imperial College to develop a bot for *generals.io*. The bot collects game data, converts it into a deep learning-friendly format, and utilizes **CNN/ViT, LSTM, and Imitation Learning**.

Image super-resolution

- Implemented **SRGAN** (a Generative Adversarial Network) for a 4x image super-resolution task, generating high-resolution images from low-resolution inputs. Utilized two loss functions: **content loss and adversarial loss**. Applied MSE loss in both image pixel and feature spaces for content loss, and integrated adversarial loss to enhance image realism.

ViolinOS

- Developed an advanced Command Line Tool, with **nearly 8,000 lines of C++ code** in a team of three. Expanded standard CLI functions with additional features like a built-in programming language, calculator, music maker, and games for enhanced efficiency and entertainment. Available on GitHub: https://github.com/sunyxedu/ViolinOS .

MNIST handwritten digit recognition

- Implemented handwritten digit classification on the MNIST dataset using both Softmax Regression and a Multi-Layer Perceptron (MLP) with Euclidean distance and ReLU activation, **without relying on pre-built ML model libraries**. Achieved 74% accuracy with Softmax Regression, and 98% accuracy with MLP.

Others

- Conducted a range of projects, including traditional machine learning algorithm experiments and several NLP tasks, such as translator, Legal Intelligence Q&A and picture talk implementations.
- Did some other projects. (E.g. a cross-platform mobile app automated testing tool based on ChatGPT and Appium. Available on GitHub: https://github.com/sunyxedu/Automated_Testing_Tool)

SKILLS AND INTERESTS

Classic Machine Learning Models: Proficient in regression models, Bayesian learning, decision trees and pruning, KNN, ensemble learning, and support vector machines.
Deep Learning Models: Experienced with multi-layer perceptron, convolutional neural networks, feedback neural networks, transformers, and deep generative models.
Computer Vision: Skilled in using MMDetection and Vision Transformer.
Natural Language Processing: Proficient in identifying and applying models from Hugging Face for various applications.
Programming: Proficient in Python for machine learning and C++ for algorithms.