

# Xu Zongsi (许宗嗣)

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The University of Hong Kong, HKSAR, China

## EDUCATION BACKGROUND

### The University of Hong Kong

09/2024-Expected 11/2025

*School of Computing and Data Science*

- Master of Science in Electronic Commerce & Internet Computing
- Relevant Course: Machine learning for business and e-commerce, Knowledge graphs, Financial fraud analytics, Internet infrastructure technologies, Website engineering, Blockchain and cryptocurrency, etc.

### Beijing Institute of Technology

09/2020-06/2024

*School of Computer Science, & Technology*

- Bachelor of Engineering in Software Engineering, last two years GPA: 3.7/4
- Relevant Course: Reinforcement Learning, Deep Learning and Computer Vision, Artificial Intelligence and Robot Ethics, Almost Human: Mind, Brain and Artificial Intelligence, Mathematical Analysis for Engineering, Linear Algebra, Probability and Mathematical Statistics, etc.
- Skills: Python, Java, common data structures, design patterns, machine learning basics and algorithms, Linux, PyTorch, and some development tools (git, conda, etc.).
- Awards and Honors:
  - Beijing Institute of Technology Undergraduate Scholarship (Top 20% of Grade) 06/2023
  - 3rd Prize of the 8th China International "Internet +" College Student Innovation and Entrepreneurship Competition in Beijing 08/2022
  - Bronze Prize of "Challenge Cup" Capital University Entrepreneurship Program Competition-"Youth Creation Beijing" 05/2022

## PROJECT EXPERIENCE

### Online Transaction Fraud Detection

09/2024 – 01/2025

*Independent project, supervised by Dr. Vivien Chan*

- Focused on addressing financial fraud in e-commerce to enhance the accuracy of transaction anomaly detection, while independently managing the entire case study that included data preprocessing, feature engineering, model building, evaluation, and results analysis.
- Effectively resolved class imbalance issues using SMOTE and ROSE techniques.
- Built various models including Logistic Regression, Random Forest, XGBoost, and LightGBM, ultimately selecting the LightGBM model to achieve a recall rate of 95.45% and an AUC of 99.84%.
- Wrote efficient and maintainable code, enhancing model training and data processing efficiency through parallel computing and logging.

### Multi-Model Intelligent Text Keyword Extraction System

08/2023 – 09/2023

*Group project, supervised by Associate Prof. Xiaolin Zhao*

- Designed and implemented an intelligent text summary system that automatically extracts keywords from article titles and abstracts, enhancing the understanding and summarization of text information.
- Participated in the planning of the technical route and built a hybrid model combining extractive and generative approaches, utilizing advanced natural language processing techniques including KeyBERT, Sentence Transformer, BERT, and T5 models.
- Responsible for data preprocessing and tokenization, as well as the end-to-end implementation and training of the T5 model, optimizing the model architecture and hyperparameters, achieving satisfactory results after only 3 epochs of training.
- Model evaluation results showed that the Rouge-1, Rouge-2, and Rouge-L metrics reached 0.6345, 0.5038, and 0.5282, respectively, in the third epoch, validating the model's effectiveness in the summarization task.

### Cambridge University Machine Learning Summer Project

07/2023 – 08/2023

*Group project, supervised by Prof. Pietro Liò*

- Participated in the Cambridge University deep learning summer project, focusing on deep reinforcement learning; explored multi-agent learning algorithms across different environments.
- Reproduced the Multi-Agent Deep Deterministic Policy Gradient (MADDPG) algorithm in the Simple Adversary environment and studied the effect of agent numbers on convergence speed and stability, finding optimal stability at 21 agents.
- Designed and implemented comparative experiments inspired by the Rainbow algorithm, assessing target network strategies versus the Double Deep Q-Network (Double DQN). The results demonstrated that Double DQN significantly enhanced convergence speed, optimizing the overall learning process.

- Co-authored a group project paper on agent numbers and strategies effectiveness in multi-agent systems, achieving a score of 71% in the summer program (the highest in my group) and a "First Class" classification in the UK grading system.

### Deep Learning and Computer Vision Semester Project

09/2022 – 12/2022

*Independent project, supervised by Associate Prof. Guangyu Gao*

- Designed and implemented a waste classifier using the ResNet model to improve classification accuracy and reduce resource waste. The project also enhanced understanding of transfer learning techniques with ResNet.
- Collected a dataset of 16 waste categories and preprocessed the images for uniformity and standardization, incorporating data augmentation techniques to enhance the dataset.
- Conducted experiments using ResNet34 and ResNet50 models through transfer learning, accelerating network convergence by leveraging pretrained weights. During training, techniques such as Batch Normalization and Dropout were applied to mitigate the risk of overfitting.
- The final model achieved an accuracy of 90% on the training set, while the performance on the test set was 61%, indicating a significant overfitting phenomenon during the training process.

## INTERNSHIP

### Beijing Academy of Quantum Information Science

08/2023 – 01/2024

*Research Intern at Quantum Computation Department*

- Proposed a quantum convolution kernel design based on variational quantum circuits and developed a universal quantum convolution layer, successfully integrating it into classical CNN architectures such as VGG, GoogLeNet, and ResNet.
- Developed and evaluated various hybrid models, including a simple model named HQCCNN-2, which achieved 84.45% accuracy on the FashionMNIST dataset, surpassing the traditional CNN's 80.72%. This demonstrates the effectiveness of the quantum convolution layer in improving model performance.
- Tested on a real quantum computer further validated the effectiveness of the hybrid model, demonstrating the viable integration of quantum computing with deep learning, and highlighting the potential for leveraging quantum properties to enhance model performance.

## COMPETITIONS EXPERIENCE

### 3rd Prize of the 8th China International "Internet +" College Student Innovation and Entrepreneurship Competition in Beijing

08/2022

*Zhongke Ushield: Deep Learning-based Face Privacy Protection Authentication System*

- Responsible for constructing a localized facial feature extraction engine based on MobileFaceNet, ensuring feature extraction is completed on end devices (such as mobile phones and cameras), guaranteeing that raw data does not leave the domain and is not stored, thus enhancing user privacy protection while improving recognition efficiency.

### Bronze Prize of "Challenge Cup" Capital University Entrepreneurship Program Competition-"Youth Creation Beijing"

05/2022

*Smart Orchard*

- Responsible for the development of the fruit detection, ripeness prediction, and pest identification system, using deep convolutional neural network (CNN) technology for intelligent monitoring of crop growth conditions.
- Applied advanced object detection algorithms such as Faster R-CNN and YOLO to achieve high precision in apple detection and ripeness assessment, with an accuracy rate exceeding 90%, significantly enhancing the intelligence level of orchard management.
- Built and trained a dedicated dataset containing various pest samples, optimizing pest detection accuracy through data preprocessing (such as image normalization and resizing) and data augmentation techniques (like rotation, flipping, and noise addition), enabling the real-time monitoring system to accurately identify over 80% of pests, providing effective scientific maintenance recommendations to help farmers reduce crop losses.

## EXTRACURRICULAR ACTIVITIES

- Vice President, Cyber Security Club, Beijing Institute of Technology 09/2021-09/2022
- Backbone, the Integrated Media Center of the Student Union of Beijing Institute of Technology 10/2020-06/2021