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EDUCATION

The University of Hong Kong, Hong Kong SAR

09/2022 – 12/2023

MSc in Computer Science

- GPA: 3.38/4.3
- Selected Courses: Deep learning, Data mining, Natural language processing, Machine learning in trading and finance, Artificial intelligence of things, Topic in artificial intelligence, Analysis and design of enterprise applications in UML, Introduction to cyber security, Financial fraud analytics, Distributed ledger and blockchain technology

Wuhan University, China

09/2018 – 06/2022

BEng Computer Science and Technology

- GPA: 3.73/4.0
- Selected Courses: Machine Learning and Pattern Recognition, Introduction to Artificial Intelligence, Computer Graphics, The Design and Analysis of Algorithms, Data Structure, Database Systems, Operating Systems, Computer Networks, Advanced Mathematics, Linear Algebra, Probability and Mathematical Statistics, Discrete Mathematics, Combinatorial Mathematics, Information Processing of Cognitive Processes, Creative Interpretation of Film Masters, Audio-Visual Language, Chinese Modern Drama Masterpieces Intensive Reading, A Guide to Humanities and Social Sciences

PUBLICATION

Qing Xu, Wenwei Kuang, **Zeyu Zhang**, Xueyao Bao, Haoran Chen, and Wenting Duan (2023, October). "SPPNet: A Single-Point Prompt Network for Nuclei Image Segmentation." In *International Workshop on Machine Learning in Medical Imaging* (pp. 227-236). Cham: Springer Nature Switzerland.

<https://doi.org/10.48550/arXiv.2308.12231>

RESEARCH INTERNSHIP

Research Assistant, HKU Metaverse Innovation Lab, Drone-to-Drone Tracking Project

10/2023 – 07/2024

Supervisor: Dr. Loretta Choi & Prof. S.M. Yiu, The University of Hong Kong

- Constructed datasets for model training. I annotated drone-to-drone tracking datasets which are provided by project client. And added self-synthesized data, web-scrape data, also used the data generated by the stable diffusion model to increase the amount of data. The drone dataset contained various conditions including mountains, forests, buildings, rainy, foggy, twilight and so on.
- Used YOLOv8 model as the detection model and the deep-sort model as the tracking algorithm to implement drone tracking. After training the YOLOv8 model using a large amount of training data, the model can obtain good tracking results. Fine-tuned the model in order to have a good performance on edge-computing devices.
- Constructed the tracking model by splicing the CSP DarkNet53 backbone network and the Spatio-Temporal Swin Transformer. This design allows for efficient extraction of spatial and temporal features from the input frames, enabling robust tracking performance. Even in scenarios where the target drone flying into complex backgrounds, the model can still achieve good tracking.
- Deployed the tracking models with good performance to the Raspberry Pi chip of the drone to achieve real-time tracking applications. Evaluated and iterated the models, and tested the tracking effect, metrics, and FPS of the models.

Research Assistant, HKU Metaverse Innovation Lab, 3D Scenes Splicing Project

02/2024 – 07/2024

Supervisor: Dr. Loretta Choi & Dr. Lei Yang, The University of Hong Kong

- Applied 3D Gaussian Splatting to our own custom datasets for 3D reconstruction.
- Conducted literature research to point cloud registration methods.
- Proposed the method for 3D scene splicing: Upsample the Gaussian Scene, calculate the color and opacity of the newly generated points; conduct feature matching to find corresponding similarities; establish a transformation between the two scenes using the identified correspondences, converting them into the same coordinate system.
- Implemented ellipsoid sampling methods for Gaussians. Combined KNN and Gaussian rendering formulas to calculate the colors of the sampling points.

RESEARCH EXPERIENCE

AI Sign Language Generation in Concert

01/2025 – present

Supervisor: Prof. Wai Tong, Texas A&M University

- Project Goal: Develop an AI-driven system to generate real-time American Sign Language (ASL) during concerts, providing accessibility to Deaf and hard-of-hearing audiences.

- Utilized Whisper API for accurate real-time speech-to-text conversion. Integrated ChatGPT API to transform text into ASL gloss. Constructed an ASL lexicon by leveraging the WLASL dataset. Converted ASL gloss into ASL poses.
- Developed a two-channel server socket and built an interface with Unreal Engine to enable real-time ASL performance by a 3D avatar based on live audio input from the client.
- Developed the workflow that enables real-time conversion from speech to text, text to gloss, gloss to ASL poses, and poses to 3D Avatar, improving the accessibility and inclusivity of live performances.

HKU MSc Final Year Project: Medical Image Analysis Based on Deep Learning Methods 02/2023 - 08/2023

Supervisor: Prof. Ping Luo, The University of Hong Kong

- Standardized the label format of various medical image datasets and converted mask to NumPy format. Analysed datasets.
- Improved three prompts based on Segment Anything Model: point prompt, box prompt, text prompt.
- Improved SAM with automatically generated bounding box prompt. Implement YOLOv8 model in the object detection module to automatically generate bboxes for SAM's box prompt input. The constructed YOLO_SAM model achieved good segmentation accuracy and improved the efficiency and applicability of medical segmentation tasks.
- Wrote the paper *SPPNet: A Single-Point Prompt Network for Nuclei Image Segmentation*, which has been accepted by MICCAI-MLMI 2023.
- Proposed and achieved three architectures for nuclei image segmentation: SPPNet, YOLO_SAM model, Mask GroundingDINO, and compared model performance and metrics on different medical image datasets. Summarized and organized all experimental results and completed the Final Year Report.

WHU Undergraduate Graduation Project: Image Annotation Algorithm Based on Object Segmentation Network 12/2021 - 06/2022

Supervisor: Prof. Jing Li, Wuhan University

- Modified the Polygon-RNN model using the modified Swin Transformer as the backbone network and performed image annotation on the Cityscapes dataset.
- Modified the network architecture of each stage of Swin Transformer, and merged the output feature maps of each stage of the Swin Transformer network through skip connections, so that it contains both low-level corner information and high-level semantic information. A complete network model is obtained by splicing the modified backbone network and the RNN prediction network.
- Achieved better image annotation results than the original Polygon-RNN model on the Cityscapes dataset by the modified model. Designed ablation experiments in two different ways: 1. without shifted window; 2. using the padding method to fill the shifted boundary window. Organized experimental models and data and wrote graduation essay.

Video Inpainting Research in NERCMS of Wuhan University 10/2020 - 04/2021

Supervisor: Prof. Jing Xiao, Wuhan University

- Conducted literature research to investigate existing video inpainting methods, including traditional, deep learning, optical-flow, and 3D convolutional neural network methods.
- Collected mainstream video inpainting datasets and achieved improved video inpainting effects by modifying the Onion-Peel Network.

Stanford Remote Research: Image Style Transfer and Image Processing Based on Deep Learning Technology 07/2020 - 08/2020

Supervisor: Dr. Zhicheng Zhang, Stanford University

- Achieved image denoising via methods such as traditional convex optimization (by employing PCA and SVD), machine learning (by employing SVM), and deep learning (using convolutional autoencoders).
- Overcame obscure denoising effects by adjusting parameters, adjusting the ratio of selected feature values, and observing the PSNR and SSIM values of the result images.
- Realized image style transfer, employed VGGNet19 model to build the neural network, used Gram Matrix to measure style loss.

SELECTED AWARDS IN COMPUTER SCIENCE

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| • Class C scholarship for Outstanding Students of Wuhan University for four years | 2018-2022 |
| • American College Students' Mathematical Contest in Modeling (MCM/ICM) (Honorable Mention Award) | 03/2020 |
| • Wuhan University Zero Cup Web Design Competition (Excellence Award) | 07/2019 |
| • Wuhan University College Student Innovation and Entrepreneurship Training Project: "Development of a Two-dimensional Retouching System Based on AI" | 06/2019 |

SELECTED AWARDS IN FILM & DRAMA

For Short Film *Comet Spleen* (Director/Scriptwriter/Editor):

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| • Excellent Award of the Hong Kong International Youth Film Festival | 04/2025 |
| • Honorable Mention of the Hollywood New Directors | 03/2025 |
| • Honorable Mention of the Greece International Film Festival | 03/2025 |
| • Finalist of the 58th WorldFest-Houston International Film Festival | 04/2025 |

- Finalist of the Paris Women CineFest 04/2025
- Finalist of the Moscow Asian Film Festival 03/2025
- Official Selection of the Munich New Wave Short Film Festival 03/2025
- Official Selection of the Shanghai International Short Week Summer Script Competition 08/2024

- Outstanding Original Script Award of Wuhan New Youth Drama Festival 06/2022
(‘An Evening of the Plum Rain Season’) (Scriptwriter)
- First prize of the “New China 70 Years and struggle for a New Era” Film Contest 12/2019
(‘Daybreak’) (Director)
- Third Prize in the Drama Contest at the Wuhan University Golden Autumn Arts Festival 11/2019
(‘The Last Dialogue in the Tanjong Kedai Forest’) (Director)

OTHER SKILLS

Professional Skills: Python, C, C++, C#, Pytorch, TensorFlow

Languages: English (IELTS 7.0), Chinese (native speaker)