

# Zihan Yu

London, UK | zihan.yu125@imperial.ac.uk | +44 7900370465

## Education Experience

**Imperial College London, MSc Renewable Energy with Artificial Intelligence and Data Science** Sept 2025 – Sept 2026

Core Modules: Numerical Programming in Python, Computational Maths, Data Science and Machine Learning, Deep Learning.

**University of Liverpool, BSc in Computer Science** Sept 2023 – May 2025

Grade: First Class Honors Degree

Core Modules: Computer Vision, Biocomputation, Knowledge Representation and Reasoning, Complexity of Algorithms, Database Development , Advanced Artificial Intelligence, Linear Algebra .

**Xi'an Jiaotong-Liverpool University, BSc in Information and Computing Science** Sept 2021 – May 2023

## Selected Research Experience

**Survey of Large Language Models in Critical Care Medicine,** Nov 2023 – Sep 2024  
National Institute of Health Data Science, Peking University

- Conducted a systematic literature review on LLMs (e.g., GPT, Mamba) in critical care.
- Analyzed their roles in disease prediction, medical record analysis, and decision support.
- Proposed improvements for real-time data processing and integration with clinical systems.  
**Contribution:** Literature collection and analysis; co-authored paper accepted by JMIR Medical Informatics(JCR Q1).

**An Ethical and Robust AI Development Framework: Assessing Correctness and Detecting Fakes,** Oct 2024 – Aug 2025  
Research Assistant

- This study proposes a Deepfake detection framework based on Vision-Language Models, leveraging VLM's strengths in multimodal feature extraction and fusion. The framework is designed to automatically detect fake content and generate explanations of forged features. Detection performance is optimized through prompt engineering, with adversarial samples and multimodal data augmentation incorporated to enhance robustness.  
**Contribution:** Build benchmark and generate deepfake video; co-authored arXiv 2025 paper(submitted to AAAI 2026)

**Multi-Source Data Fusion for Remote Sensing Change Detection,** Sep 2023 – July 2024  
University of Liverpool

- With the continuous development of models, the demand for larger datasets has significantly increased. We attempted to merge multiple datasets from different sources to create a large-scale dataset. However, due to domain differences among these datasets, directly merging them often fails to achieve desirable results.
- In our research, we used the ChangeFormer as a baseline model and integrated dynamic

convolution modules to enhance the performance of change detection model.

## **Single-Image Restoration and Enhancement**, University of Liverpool    June 2023 – Aug 2023

- We proposed a novel image restoration and enhancement model by integrating ResNet and GAN. This model learns the mapping from low-level image features to high-level semantic features, enabling detail and texture enhancement without introducing additional noise. Using quantitative image quality evaluations, such as Peak Signal-to-Noise Ratio (PSNR) and Structural Similarity Index (SSIM), we validated the model's effectiveness in improving image clarity and detail resolution.

## **Selected Internship Experience**

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### **Gree Electric Appliances (Nanjing) Co., Ltd., Java Development Intern**                      Jun 2024 – Sep 2024

- Developed the backend services for the company's critical material scanning system using the SpringBoot framework integrated with MyBatis-Plus. Implemented CRUD functionalities for material scanning records, conducted unit and interface testing, and successfully deployed the system to the server.
- Learned Spring Security for access control and used SpringBoot to implement user management functionality in the administrator module of the KPI assessment system. Built a responsive user interface with the Vue2 framework using a component-based development approach, integrating with the backend via RESTful APIs.
- Gained a solid understanding of company business processes and performed complex queries and data processing using SQL. Supported daily data push tasks, exported anomaly data, and generated data reports to meet customized requirements from other departments.

## **Publications**

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- Tongyue Shi, Jun Ma, **Zihan Yu**, Haowei Xu, Minqi Xiong, Meirong Xiao, Yilin Li, Huiying Zhao and Guilan Kong. "Large Language Models in Critical Care Medicine: A Scoping Review" accepted by **JMIR Medical Informatics**.
- **Zihan Yu**, Tianxiao Li, Yuxin Zhu and Rongze Pan. "Exploring Foundation Models in Remote Sensing Image Change Detection: A Comprehensive Survey" [arxiv.org/abs/2410.07824](https://arxiv.org/abs/2410.07824) (2024): n.pag.
- Haiquan Wen, Yiwei He, Zhenglin Huang, Tianxiao Li, **Zihan Yu**, Xingru Huang, Lu Qi, Baoyuan Wu, Xiangtai Li and Guangliang Cheng. "BusterX: MLLM-Powered AI-Generated Video Forgery Detection and Explanation" [arxiv.org/abs/2505.12620](https://arxiv.org/abs/2505.12620) (2025): n.pag.
- Wenlong Mao, **Zihan Yu**, Yizhe Zhou. "DRFormer: Dynamic Replay-Driven Transformer for Domain-Incremental Learning in Brain Tumor Segmentation." In: **ICIC 2025**, Lecture Notes in Computer Science (LNCS), vol 15851, Springer. [https://doi.org/10.1007/978-981-96-9849-3\\_40](https://doi.org/10.1007/978-981-96-9849-3_40) (2025): in press.

## **Technologies**

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**AI Frameworks:** Pytorch, HuggingFace Transformers, scikit-learn, OpenCV

**Language & Qualifications:** Chinese (Native); English (Fluent);