

# Zuhao Liu

PhD Student, Imperial College London

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## Education

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### Imperial College London

*Doctor of Philosophy (PhD) in Computing*

London, United Kingdom

*Dec 2025 – Present*

Supervised by Tolga Birdal. Research focus: 3D vision, robotics, generative models, and world models.

### Sun Yat-sen University

*Master of Engineering in Computer Engineering*

Guangzhou, China

*Sep 2022 – Jun 2025*

Advised by Prof. Wei-Shi Zheng. Research on video understanding, specifically in video anomaly detection.

### University of Electronic Science and Technology of China

*Bachelor of Engineering in Electrical and Electronics Engineering*

Chengdu, China

*Sep 2018 – Jun 2022*

Advised by Prof. Guotai Wang and Dr. Huan Wang. Research on medical image analysis.

## Work Experience

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### ByteDance – Machine Learning Engineer

Chengdu, China

*Feb 2025 – Dec 2025*

- Optimized user experience and developed models that significantly reduced customer complaint rates, impacting hundreds of millions of users.
- Skills: Recommender Systems, Large Language Models (LLM).

### INSAIT – Graduate Student Researcher (Internship)

Sofia, Bulgaria

*Aug 2024 – Jan 2025*

- Conducted research on trajectory-controlled video generation for object interactions under the guidance of Prof. Luc Van Gool and Dr. Danda Pani Paudel.
- Proposed a novel video generation pipeline (InTraGen) interaction-based generation.

### Baidu, Inc. – Autonomous Driving Engineer (Internship)

Beijing, China

*Jun 2024 – Aug 2024*

- Worked on autonomous vehicles and visual perception systems in the Intelligent Driving Group (IDG).

### NetEase Games – Machine Learning Engineer (Internship)

Guangzhou, China

*Dec 2022 – Nov 2023*

- Led research on image-to-image translation and image generation; results published at ICCV 2023 as joint first author.
- Contributed to diffusion-based image generation models applied in game concept art production.
- Designed and implemented an interactive image cutout model deployed in game projects.

## Publications

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- [1] **Zuhao Liu\***, A. Yanev\*, A. Mahmood, I. Nikolov, S. Motamed, W.-S. Zheng, X. Wang, L. Van Gool, D.P. Paudel. “InTraGen: Trajectory-controlled Video Generation for Object Interactions.” *arXiv*, 2024. [\[arXiv\]](#) [\[Code\]](#)
- [2] **Zuhao Liu\***, B. Cheng\*, Y. Peng, Y. Lin. “General Image-to-Image Translation with One-Shot Image Guidance.” **ICCV**, 2023. [\[arXiv\]](#) [\[Code\]](#)
- [3] **Zuhao Liu**, X.-M. Wu, D. Zheng, K.-Y. Lin, W.-S. Zheng. “Generating Anomalies for Video Anomaly Detection with Prompt-Based Feature Mapping.” **CVPR**, 2023. [\[PDF\]](#)
- [4] X.-M. Wu, D. Zheng, **Zuhao Liu**, W.-S. Zheng. “Estimator Meets Equilibrium Perspective: A Rectified Straight Through Estimator for Binary Neural Networks Training.” **ICCV**, 2023. [\[arXiv\]](#) [\[Code\]](#)

- [5] D. Zheng, X.-M. Wu, **Zuhao Liu**, J. Meng, W.-S. Zheng. “DiffuVolume: Diffusion Model for Volume Based Stereo Matching.” **IJCV**, 2024. [\[arXiv\]](#) [\[Code\]](#)
- [6] **Zuhao Liu\***, H. Wang\*, S. Zhang, G. Wang, J. Qi. “NAS-SCAM: Neural Architecture Search-Based Spatial and Channel Joint Attention Module for Nuclei Semantic Segmentation and Classification.” **MICCAI**, 2020. [\[Code\]](#)
- [7] **Zuhao Liu**, et al. “Automatic Attention Learning Using Neural Architecture Search for Detection of Cardiac Abnormality in 12-Lead ECG.” *IEEE Trans. Instrum. Meas.*, 2021.
- [8] **Zuhao Liu**, et al. “Automatic Segmentation of Organs-at-Risks of Nasopharynx Cancer and Lung Cancer by Cross-Layer Attention Fusion Network with TELD-Loss.” *Medical Physics*, 2021.
- [9] **Zuhao Liu**, et al. “CSAF-CNN: Cross-Layer Spatial Attention Map Fusion Network for Organ-at-Risk Segmentation in Head and Neck CT Images.” **ISBI**, 2020.
- [10] Y. Gao, H. Wang, **Zuhao Liu**. “An End-to-End Atrial Fibrillation Detection by a Novel Residual-Based Temporal Attention CNN with Exponential Nonlinearity Loss.” *Knowledge-Based Systems*, 2021.

## Honours and Awards

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- **Tencent Scholarship**, Tencent 2023
- **First Prize**, Chinese Collegiate Computing Competition 2022
- **Outstanding Graduate**, UESTC 2022

## Skills

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**Programming:** Python, C, C++, Go, JavaScript, Flutter

**Research:** 3D Vision, Robotics, Video Understanding, Generative Models, World Models, Recommender Systems

**Languages:** Chinese (Native), English (Proficient)