

# Ye (Henry) Mao

[github.com/ye-mao](https://github.com/ye-mao) | [linkedin.com/in/ye-mao](https://www.linkedin.com/in/ye-mao) | [ye-mao.github.io](https://ye-mao.github.io)  
[ye.mao21@imperial.ac.uk](mailto:ye.mao21@imperial.ac.uk) | (+44) 7961178087

## Education

---

**Imperial College London | PhD in Computer Vision and Machine Learning** 2023 - Present

Supervisor: Prof Krystian Mikolajczyk

Scholarship: President's PhD Scholarship.

Research Interests: 3D Understanding, Vision-Language Model, Open-Vocabulary Learning

**University of Cambridge | MPhil in Artificial Intelligence and Medical Imaging** 2022 - 2023

Supervisor: Prof Stephen Price

Research Interests: Diffusion Model, Image Super-Resolution, Cross-Modal Image Synthesis

Thesis: Super-Resolution of Real-World Brain MRI using Conditional Diffusion Probabilistic Models

**Imperial College London | MSc in Applied Machine Learning** 2021 - 2022

*Top 1* Overall Grade 81% | *Top 1* Thesis Grade 87%

Thesis Supervisor: Dr Jesus Rodriguez-Manzano

Thesis: Domain Adaptation for Digital PCR Multiplexing

**King's College London | BSc in Computer Science with Robotics** 2018 - 2021

*Top 1* Overall Grade 82% | *Top 1* Thesis Grade 81%

Thesis Supervisor: Dr Grigorios Loukides

Thesis: String Sanitisation Algorithm Development

## Selected Publications

---

- [1] **Y Mao**, et al. Hypo3D: Exploring Hypothetical Reasoning in 3D  
Under Reviewed by the International Conference on Machine Learning – **ICML**, [[GitHub](#)] [[Paper](#)]
- [2] **Y Mao**, et al. OpenDlign: Open-World Point Cloud Understanding with Depth-Aligned Images  
Accepted by the Conference on Neural Information Processing Systems – **NeurIPS 2024**, [[GitHub](#)] [[Paper](#)]
- [3] J Jing, **Y Mao**, et al. Match Stereo Videos via Bidirectional Alignment  
Under Reviewed by the IEEE Transactions on Pattern Analysis and Machine Intelligence – **TPAMI**, [[GitHub](#)] [[Paper](#)]
- [4] J Jing, **Y Mao**, et al. Match-stereo-videos: Bidirectional alignment for consistent dynamic stereo matching  
Accepted by the European Conference on Computer Vision – **ECCV 2024**, [[GitHub](#)] [[Paper](#)]
- [5] **Y Mao**, et al. Disc-diff: Disentangled conditional diffusion model for multi-contrast mri super-resolution  
Accepted by the Medical Image Computing and Computer Assisted Intervention – **MICCAI 2023**, [[GitHub](#)] [[Paper](#)]
- [6] J Lan, **Y Mao**, et al. Cola-diff: Conditional latent diffusion model for multi-modal mri synthesis.  
Accepted by the Medical Image Computing and Computer Assisted Intervention – **MICCAI 2023**, [[GitHub](#)] [[Paper](#)]
- [7] **Y Mao**, et al. Deep Domain Adaptation Enhances Amplification Curve Analysis for Single-Channel Multiplexing in Real-Time PCR  
Accepted by the IEEE Journal of Biomedical and Health Informatics – **IEEE JBHI**, [[Paper](#)]

## Work Experience

---

**Research Assistant | Centre for Antimicrobial Optimisation | Imperial | UK** Sep 2023 - Present

- Self-supervised pretraining to learn robust representations from clinical and simulated PCR curves for target identification.
- Developed transfer learning methods to bridge domain gaps between digital PCR, qPCR, and LAMP machines.

**Teaching Assistant | EEE Department | Imperial | UK** Sep 2023 - Present

- Courses: Deep Learning (Year 4), Machine Learning (Year 3), and Computer Vision (Year 4).
- Responsibilities: Grading exams and coursework, providing feedback, and giving tutorials.

**Research Assistant | Brain Tumour Imaging Lab | Cambridge | UK** Oct 2022 - Sep 2023

- Developed DisC-Diff and CoLa-Diff, both of which were accepted at MICCAI 2023. These are pioneering diffusion models designed for multi-contrast brain MRI super-resolution and missing MRI sequence synthesis.

**Teaching Assistant | Informatics Department | KCL | UK** Sep 2020 - June 2021

- Courses: Foundation of Computing 2 (Year 2), Robotics Group Project (Year 2).
- Responsibilities: Lab demonstration, marking coursework reports, and giving tutorials.

- Developed YOLOv3 for defect detection in construction images, achieving 87% mAP on cracks and rebar exposure.
- Implemented DeepLabV3+ for 3D BIM-based material classification, improving F1-score by over 20%.

## Selected Projects

---

### PhD Project 3: Exploring Hypothetical Reasoning in 3D

- Proposed hypothetical 3D reasoning (Hypo3D) task, which evaluates a model's ability to first imagine the current scene state after a context change and then perform reasoning.
- Created Hypo3D benchmark with 7,727 context changes and 14,885 question-answering pairs across 700 scenes. Results show a substantial performance gap between humans and vision-language models; work under review at [ICML 2025](#).

### PhD Project 2: Match Stereo Videos

- Proposed BidaStereo, which achieves robust dynamic stereo matching using a triple-frame correlation layer to align adjacent frames and a motion-propagation recurrent unit to exploit global information across the entire sequence.
- BidaStereo outperforms benchmarks in matching accuracy and temporal consistency; work published in [ECCV 2024](#).

### PhD Project 1: Open-World Point Cloud Understanding

- Introduced OpenDlign, a new Open-World 3D learning framework that enables robust 3D representation learning through multimodal alignment between multi-view depth maps and diffusion-generated images.
- OpenDlign outperforms previous methods in zero-shot and few-shot point cloud classification, 3D detection, and cross-modal retrieval, despite fine-tuning only 6 million parameters; work published in [NeurIPS 2024](#).

### MPhil Thesis: Brain MRI Super-Resolution using Conditional Diffusion Models

- Proposed Disc-Diff, a conditional diffusion model for multi-contrast brain MRI super-resolution. Enhanced by disentangled learning, DisC-Diff effectively captures complementary features from T1 and T2 MRI contrasts.
- DisC-Diff is the first study to explore the diffusion model for brain MRI super-resolution and was previous state-of-the-art; work published in [MICCAI 2023](#).

## Scholarships and Awards

---

<b>Imperial President's PhD Scholarship</b> – Top 50 college-wide; full tuition and £2X,XXX stipend.	2023 - 2027
<b>Hertha Ayrton Centenary Prize</b> – Highest final-year project grade, Imperial EEE Department.	2022
<b>AML Prize</b> – Highest overall grade in MSc Applied Machine Learning programme, Imperial College London.	2022
<b>Dick Poortvliet Award</b> – 1st Place, IEEE Region 8 Student Paper Contest (Imperial Branch).	2022
<b>Peplow Prize</b> – Highest final-year project grade, KCL Informatics Department.	2021
<b>Robotics Prize</b> – Highest overall grade in BSc Computer Science programme, King's College London.	2021

## Reviewer Experience

---

ECCV 2024	MICCAI 2024, 2025	NeurIPS 2024	ICLR 2025
CVPR 2025	ICML 2025	IEEE Transactions on Medical Imaging	

## Skills

---

- Programming Languages: Experienced with Python (7+ years), C++, Java, Scala, Julia, MATLAB, R.
- Machine Learning and Computer Vision Libraries: Proficient in PyTorch (4+ years), TensorFlow, Keras, PyTorch3D, Open3D, Hugging Face Transformers, timm, scikit-learn, OpenCV, pandas, and NumPy.
- Operating Systems and Development Tools: Experienced in Linux, Windows, and macOS environments. Skilled in development tools such as Anaconda, Mamba, Visual Studio Code, Vim, Git/GitHub, Docker, Google Colab, and PyCharm.
- Remote and Collaboration Tools: Skilled in SSH, Linux Screen, TeamViewer, Remote Desktop, Microsoft Teams, Workplace, Zoom, and Slack for efficient remote collaboration and system management.
- Productivity and Documentation: Experienced with Google Docs, Microsoft OneNote/Excel/PowerPoint/Word, Overleaf.
- Languages: Native in Mandarin, fluent in English.

## Interest

---

- Passionate about vocal performance, especially in R&B and Acapella music. Former choir member and band performer.
- Avid traveler who enjoys city walks, discovering cultural landmarks, and visiting museums and art galleries.