Ye Mao

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Research Profile

Final-year PhD candidate at **Imperial College London** with a research focus on 3D computer vision. I am currently a research intern at **Meta Reality Lab** in the Bay Area, working on geometry-aware world foundation models for robot learning. I have authored more than 10 publications at top-tier AI venues, including CVPR, NeurIPS, ICML, ICCV, ECCV, TPAMI, and MICCAI.

Education

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

Supervisor: Prof Krystian Mikolajczyk

Funding: President's PhD Scholarship

Research Interests: World Model, 3D Spatial Perception, Physical AI

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

Supervisor: Prof Stephen Price

Research Interests: Diffusion Model, Medical Imaging, Multimodal Learning

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. Contrastive Language-Colored Pointmap Pretraining for Unified 3D Scene Understanding
Accepted at the European Conference on Computer Vision –ECCV 2026,

[2] **Y Mao**, et al. POMA-3D: The Point Map Way to 3D Scene Understanding
Accepted by the Computer Vision and Pattern Recognition –CVPR 2026 Findings,

[3] R Huang, **Y Mao**, et al. From None to All: Self-Supervised 3D Reconstruction via Novel View Synthesis
Accepted by the Computer Vision and Pattern Recognition –CVPR 2026,

[4] J Jing, **Y Mao**, et al. lite any stereo: efficient zero-shot stereo matching
Accepted by the Computer Vision and Pattern Recognition –CVPR 2026,

[5] L Kreitmann, **Y Mao**, et al. DYNAMIC: A Novel Software Implementation of a Kinetic Model of TaqMan PCR
Accepted by Analytical Chemistry,

[6] J Jing, **Y Mao**, et al. stereo any video: temporally consistent stereo matching
Accepted by the International Conference on Computer Vision –ICCV 2025 Highlight,

[7] **Y Mao**, et al. Hypo3D: Exploring Hypothetical Reasoning in 3D
Accepted by the International Conference on Machine Learning –ICML 2025,

[8] **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,

[9] J Jing, **Y Mao**, et al. Match Stereo Videos via Bidirectional Alignment
Accepted by the IEEE Transactions on Pattern Analysis and Machine Intelligence –TPAMI,

[10] 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,

[11] **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,

[12] 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,

[13] **Y Mao**, et al. Deep Domain Adaptation Enhances Amplification Curve Analysis for Single-Channel Multiplexing **Accepted** by the IEEE Journal of Biomedical and Health Informatics –IEEE JBHI,

Research and Professional Experience

Research Scientist Intern | **Meta Reality Labs** | **Bay Area, US** Mar 2026 - Present

- Developing a world foundation model based on Cosmos that produces physically consistent, multi-view robotic videos and serves as a backbone for world action models and action-conditioned world model, a simulator for policy evaluation, and a data engine for generating robotic rollout data to support policy post-training.
- Setting up the DROID platform for robotic demonstrations using a Franka Panda robot equipped with a Robotiq gripper.

Research Scientist Intern | **Huawei Noah's Ark Lab** | **London, UK** May 2025 - Feb 2026

- Post-trained multi-modal large-language models to improve intuitive physics reasoning on long-horizon videos.
- Designed a physics-aware video sampling strategy using V-JEPA reconstruction error to prioritize informative training videos.

Research Assistant | **Centre for Antimicrobial Optimisation** | **Imperial** | **London, UK** Sep 2023 - May 2025

- Developed self-supervised representation learning methods for target identification from clinical and simulated PCR curves.
- Built transfer learning pipelines to address domain shift across digital PCR, qPCR, and LAMP platforms.

Teaching Assistant | **EEE Department** | **Imperial** | **London, UK** Sep 2023 - March 2026

- Teaching Assistant for Deep Learning, Machine Learning, and Computer Vision and Pattern Recognition.
- Graded exams and coursework, delivered tutorials, and provided feedback to undergraduate and master's students.

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

- Developed latent diffusion-based methods for multi-contrast brain MRI super-resolution and missing-sequence synthesis, leading to two MICCAI 2023 papers.

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

- Teaching Assistant for Foundation of Computing 2 and Robotics Group Project.
- Led lab sessions, marked coursework reports, and supported student project work.

Computer Vision Intern | **Glodon Technology Co., Ltd** | **Beijing, China** Aug. 2019 - Sep. 2019

- 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 Honors and Invited Talks

Imperial President's PhD Scholarship –Top 50 college-wide; full tuition and £26,XXX stipend. 2023 - 2027

The Humanitarian Trust –£1,000 funding to support MPhil Study in Clinical Neuroscience. 2023

Hertha Ayrton Centenary Prize –Highest final-year project grade, Imperial EEE Department. 2022

AML Prize –Highest overall grade in MSc Applied Machine Learning programme, Imperial College London. 2022

Dick Poortvliet Award –1st Place, IEEE Region 8 Student Paper Contest (Imperial Branch). 2022

Peplow Prize –Highest final-year project grade, KCL Informatics Department. 2021

Robotics Prize –Highest overall grade in BSc Computer Science programme, King's College London. 2021

Invited Talk –BMVA Symposium on Multimodal Large Models - Hypo3D. 2025

Academic Service

Conference Reviewer: TPMAI, NeurIPS, ICML, ICLR, CVPR, ICCV, ECCV, MICCAI, BMVC.
Journal Reviewer: IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Medical Imaging.

Technical Skills

- **Programming:** Python (8+ years), C++, Java, Scala, Julia, MATLAB, R.
- **Frameworks:** PyTorch, Hugging Face Transformers, PyTorch3D, Open3D, TensorFlow, timm, OpenCV, NumPy.
- **Tools and Agents:** Claude Code/Codex (Skills and Harness Implementation), Linux, Docker, Git, Vim, UV.