

Xinwei Ju's CV

CONTACT

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EDUCATION

University College London, Hawkes Institute

12/2022-12/2027

PhD in Computer Science

Studentship Sponsor: UCL Computer Science Departmental Funds 504450

Imperial College London, Hamlyn Centre

10/2021-10/2022

MRes in Medical Robotics and Image Guided Intervention

Thesis: *Menuai: Restaurant food recommendation system via a transformer-based deep learning model.*

Core Courses: Image Guided Intervention; Medical and Surgical Imaging; Minimally Invasive Surgery; Sensing, Perception and Neuroergonomics

Nanjing Normal University

9/2017- 6/2021

BEng in Electrical Engineering

Core Courses: Analog and Digital Electronics; Electrical Design

PUBLICATIONS

KFS⁴LAM: Adaptive KeyFrame Selection with Structure-Aware Mapping for Endoscopic Gaussian Splatting SLAM.

Xinwei Ju, Zhehua Mao, Tianyi Song, Danail Stoyanov, Sophia Bano, and Francisco Vasconcelos. *Under review.* [Project Page]

Track2Map: Online Deformable SLAM with Motion-Aware Pose Optimization in Robotic Surgery.

Tianyi Song, Sierra Bonilla, **Xinwei Ju**, Evangelos Mazomenos, Danail Stoyanov, Adam Schmidt, Omid Mohareri, Sophia Bano, and Francisco Vasconcelos. *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)* (2026). [Paper] [Project Page]

Multi-Modal Monocular Endoscopic Depth and Pose Estimation with Edge-Guided Self-Supervision.

Xinwei Ju, Rema Daher, Danail Stoyanov, Sophia Bano, Francisco Vasconcelos. *International Journal of Computer Assisted Radiology and Surgery*, 21, 1207–1215 (2026). [Paper] [Project Page]

SegCol Challenge: Semantic Segmentation for Tools and Fold Edges in Colonoscopy Data.

Xinwei Ju*, Rema Daher*, Razvan Caramalau*, Baoru Huang, Negin Ghamsarian, Shunsuke Kikuchi, Atsushi Kouno, Hiroki Matsuzaki, Danail Stoyanov, and Francisco Vasconcelos. *arXiv preprint arXiv:2412.16078* (2024). [Paper] [Project Page]

Mismatched: Evaluating the Limits of Image Matching Approaches and Benchmarks.

Sierra Bonilla*, Chiara Di Vece*, Rema Daher*, **Xinwei Ju***, et al. *ECCV Workshop*

on Map-free Visual Relocalization (2024). [Paper]

EVEN: An Event-based Framework for Monocular Depth Estimation at Adverse Night Conditions. Peilun Shi, Jiachuan Peng, Jianing Qiu, **Xinwei Ju**, et al. *IEEE ROBIO* (2023). [Paper]

MenuAI: Restaurant Food Recommendation System via a Transformer-based Deep Learning Model. **Xinwei Ju**, Frank Lo, Jianing Qiu, et al. *arXiv preprint* (2022). [Paper]

Clustering Egocentric Images in Passive Dietary Monitoring with Self-supervised Learning. Jiachuan Peng, Peilun Shi, Jianing Qiu, **Xinwei Ju**, et al. *IEEE BHI* (2022). [Paper]

TECHNICAL SKILLS

- **Research Areas:** Surgical Computer Vision, 3D Reconstruction, Visual SLAM, Gaussian Splatting, Depth and Camera Pose Estimation, Semantic Segmentation, Self-Supervised Learning.
- **Programming & Deep Learning:** Python, PyTorch, CUDA.
- **Research Engineering:** Git, Docker, Linux, HPC Computing, GPU Server Administration.
- **Data & Experimentation:** Dataset Curation, Preprocessing Pipelines, Model Training and Evaluation.

WORK EXPERIENCE

Postgraduate Teaching Assistant 10/2023-Present

Department of Computer Science, UCL

- COMP0128 Robotic Control Theory and Systems,
- COMP0137 Machine Vision,
- COMP0233 Research Software Engineering with Python.

Digital Research Technical Champion

11/2025-Present

STEP-UP Programme by UCL, IC and KCL

- Conduct research engineering surveys, workshops, tutorials in department.

Postgraduate Teaching Assistant

11/2023-5/2025

Academic Communication Centre, UCL

- Academic writing tutorials and workshops with undergraduate students.

ACTIVITIES & TRAINING

Science of Surgery

04/2025

Hawkes Institute, UCL

- Team lead of the Surgical Robotics Vision group during the annual Open Day.

Research Software Engineering (RSE) Summer Workshop

06/2025

Centre for Advanced Research Computing, UCL

- Built products for research software engineering.
- Collaborative coding skills in reproducible workflows, data management, version control, testing, and sustainable software development.

Certified Carpentries Instructor

09/2026

The Carpentries

- Certified instructor and delivery of research and programming workshops.
- Teach reproducible workflows, version control, testing, and sustainable software development.