Xuanzhi Liu

MASTERS STUDENT

Shenzhen, China

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Education

University of New South Wales

- M.S. in Information Technology
- Key Courses: Neural Networks & Deep Learning, Computer Vision, Extended AI
- Graduation Project: AI Comment Moderation RAG and Classification modelling (High-Distinction Project)
- GPA: 3.47/4.0

Guangdong University of Finance & Economics

B.S. in Computer Science

- Key courses: Data Structures, Database Systems, Discrete Mathematics, Linear Algebra, Machine Learning
- Honors: Outstanding Undergraduate Thesis
- GPA: 3.13/5.0

Experience

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

Research Intern

- Prototyped a 6D pose estimation system for precision robotic assembly using a ResNet-based regression network, achieving 2mm spatial accuracy in structured environments.
- Integrated YOLO detection with structured-light 3D scanning to estimate object pose in real-time, improving grasp success rate on deformable and reflective packages.

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences Research Intern

- Led the development of a robotic sorting system by combining instance segmentation with structured-light 3D reconstruction, and integrated it with a manipulator for deformable package handling.
- Built a visual inspection pipeline using Mask R-CNN to detect surface defects on industrial products, improving accuracy and consistency in quality control.

Projects

Industrial Inspection with Mask R-CNN and Structured Light

Research Intern

- Developed a 3D inspection pipeline combining structured-light scanning and Mask R-CNN for accurate product detection and segmentation.
- Extracted object count, height, and pose from RGB-D data to enable automated quality control.
- System designed for deployment on production lines, with stable performance on reflective and irregular components.

Food Package Recognition and Sorting System

First Author

- Developed a vision-based recognition system for deformable, reflective food packages using Mask R-CNN and structured-light 3D reconstruction.
- Extracted object contours and depth maps by fusing RGB and structured-light point cloud data, enabling robotic sorting based on spatial location.
- Built a custom dataset and trained an instance segmentation model with surface-adaptive data augmentations.
- Work was presented at IJCRAI 2023 (oral), received a Chinese invention patent (CN116213306A), and won the Outstanding Undergraduate Thesis Award.

Publications & Patents

Conferences

Liu, Xuanzhi (First Author), Jixin Liang, Yuping Ye, Zhan Song, and Juan Zhao. "A Food Package Recognition and Sorting System Based on Structured Light and Deep Learning," *Proceedings of the 2023 International Joint Conference on Robotics and Artificial Intelligence (IJCRAI)*, pp. 19-25, 2023 (Oral Presentation, overall acceptance rate: 30%).

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Patents

Liu, Xuanzhi et al., "An automatic visual recognition method and sorting system," Chinese invention patent, Application for Publication No. *CN116213306A*, 2023.

Skills

JUNE 15, 2025

ProgrammingPython (Pandas, PyTorch, Numpy, OpenCV, Scikit-learn), C/C++, Shell, SQL, JavaDevelopment ToolsGit, Linux, Docker, Conda, LaTeX, Markdown, Colab

Sydney, Australia Sept 2023 - June 2025

Guangzhou, China Sept 2019 - June 2023

Shenzhen, China Sep 2022 – Feb 2023

Shenzhen. China

Dec 2024 - Jan 2025

Shenzhen, China

Shenzhen, China

Oct. 2022 - Feb. 2023

Sep 2022 – Feb 2023