

Yuxiang Xie

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Portfolio: peter-cuhk.github.io/portfolio/

Summary

Robotics & AI engineer training at CUHK-Shenzhen (GPA 3.82 / 4.0, Top 5%) focusing on surgical robot autonomy and embodied intelligence.

Build end-to-end planning and perception systems, transforming lab research into reliable demos and community-facing products.

Education

The Chinese University of Hong Kong, Shenzhen — BEng Electrical and Computer Engineering | Sep 2024 – Present

GPA 3.82 / 4.0 · Dean's List · Undergraduate Research Awards recipient.

Research focus on robot planning and control in complex environments with learning-driven perception.

Research Experience

Medical Robotics Lab, CUHK-Shenzhen — Research Assistant | Shenzhen, China | 2024 – Present

Build autonomy and perception stacks for surgical manipulators under Prof. Fangxun Zhong and Prof. Yunhui Liu, uniting motion planning with learning-driven vision.

Prototype suturing assistance workflows and LiDAR-guided fleet coordination showcased in lab demos with reproducible evaluation metrics.

Peking University — Embodied AI Visiting Student | Beijing, China | 2024

Collaborated with cross-lab cohorts on policy learning for embodied agents, emphasizing planning, control, and perception.

Produced knowledge notes and talks that inform student robotics communities and course materials.

Projects

Surgical Robot Autonomy Pipeline

Fused learning-based perception with ROS 2 motion planning inside CoppeliaSim; ran trajectory optimization with collision-free guarantees in cluttered scenarios.

Developed metric harness for accuracy, latency, and recovery benchmarking adopted by the research group.

Object Detection Driven Robot Arm Tracking

Deployed customized YOLOv8 model with TensorRT acceleration, powering low-latency closed-loop tracking in simulation.

Tuned inference and control to hit responsive manipulation targets for high-speed arm motion.

Eye-to-Hand Pose Estimation & Stacking

Delivered 6D pose estimation using an eye-to-hand camera configuration, automating precise stacking tasks.

Co-optimized perception latency and control accuracy to boost task success reliability.

Monocular Endoscopic Depth Estimation

Combined Depth Anything predictions with optical-flow refinement for millimeter-precision depth recovery in endoscopic scenes.

Validated reconstruction accuracy against calibration phantoms to meet surgical research benchmarks.

Leadership & Impact

Independent Entrance Coaching Platform — Founder | China (Remote) | 2022 – Present

Built profitable guidance business connecting elite mentors with students, achieving RMB 80K+ monthly revenue.

Led a 20+ mentor network, automated client intake, and expanded reach through Rednotes and TikTok growth funnels.

World Internet Conference (Wuzhen Summit) — Media & Communications Volunteer | Wuzhen, China | 2023

Produced photography, video edits, and PR assets that expanded multi-channel audience reach.

Coordinated with media teams to streamline publication workflows under tight event timelines.

Honors & Activities

Columbia University Honor Program Member.

Top Ten Students, Tongxiang Senior High School.

Language: Mandarin (native), English (IELTS 6.5).

Extracurricular: Level 9 Hard-tip Calligrapher; National Second-Class Athlete (Swimming); Member, Tongxiang Photographers Association.

Technical Skills

Programming

Python & Lua for robotics scripting

MATLAB for control and simulation

CoppeliaSim scripting & ROS 2 integration

JavaScript / TypeScript for dashboards

Tools & Platforms

PyTorch, OpenCV

Git, Notion, Figma

CoppeliaSim for robotics simulation and development

Domain Expertise

Robot motion planning & control in complex spaces

Learning-driven perception for surgical settings

Depth estimation in surgical scenes

Forward & inverse kinematics, PID tuning, model predictive control (MPC), trajectory smoothing