

Yuchen Hou

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DoB: June 2003



EDUCATION BACKGROUND

National University of Singapore

Master of Science in Electrical Engineering

Singapore

Aug 2025 – Now

- **Research Experience:** Core member of the **NUS CORE Lab (COntrol, Robotics & Artificial IntElligence)**, focusing on **Embodied AI** and autonomous robotic decision-making.
- **Research Focus:** Perception and planning for aerial robots based on **Vision-Language Navigation (VLN)**, and the application of **End-to-end Reinforcement Learning** in complex 3D environments.

Nanjing University of Aeronautics and Astronautics

Bachelor of Engineering in Electronic and Communication Engineering

Nanjing, CHINA

Sept 2021 – Jul 2025

- **GPA:** 88/100
- **Key Courses (With Scores):** Advanced Mathematics (96), Probability Theory and Mathematical Statistics (97), Random Signal Analysis (97), Microwave Technology and Antenna (97), Fundamentals of Communication (95), Complex Function (99).

INTERNSHIP EXPERIENCE

Honor Device Co., Ltd.

VLA Algorithm Engineer (Intern)

Shanghai, CHINA

Jun 1 – Aug 31, 2026

- Working on Honor's self-developed **Omega humanoid robot**: teleoperation data collection, replay, training, and on-robot deployment.
- Conducting **online RL** algorithm research for **Vision-Language-Action (VLA)** models on custom manipulation tasks:
 - Implemented **smooth human-teleoperator takeover** during autonomous rollouts, including the autonomy–teleoperation **transition state machine**.
 - Built the intervention-driven **online-learning data pipeline**: on-robot data recording, full local disk persistence, and automatic upload to the development server.
 - Closed the loop over a **distributed learning architecture**: onboard **AGX/NX** boards (topic publishing, command execution, data collection), an **x86 host** as the **Actor** (model inference, streaming actions to the robot), and a development server as the **Learner** (data aggregation, training, checkpoint dispatch) — a complete **online SFT / online RL** pipeline.
 - Researching **RECAP**-style ($\pi_{0.6}$) **offline RL** combined with **noise-space fast adaptation** (DSRL-like): learning corrective noise from human-intervention data to rapidly imitate takeover behaviors before a new checkpoint finishes training, substantially raising success rates on tasks uncovered by offline training, and further adapting the algorithm to **loco-manipulation** tasks.

Huawei Norbert Wiener Research Center

Research Intern

Singapore

Mar 2026 – May 2026

- Developed backend **deep learning** models for **short-range radar** signal processing.
- Conducted research on downstream tasks including **human pose estimation** and **indoor mapping/SLAM** from radar data.

Movel.AI

Robotics Software Intern

Singapore

Dec 2025 – Jan 2026

- On-site validation and **factory deployment** of autonomous navigation for **forklift robots** in real warehouse environments (**ROS2**).

RESEARCH EXPERIENCE — 2 PAPERS ACCEPTED TO IROS 2026

LangGap: Diagnosing and Closing the Language Gap in Vision-Language-Action Models

First Author NUS CORE Lab

Oct 2025 – Jun 2026

- Status: **Accepted to IROS 2026.**
- Preprint: [arXiv:2603.00592](https://arxiv.org/abs/2603.00592)
- Discovered that state-of-the-art VLA models achieve high benchmark scores but **ignore language instructions**, revealing a gap between performance and true understanding.
- Designed systematic **semantic perturbation** evaluation framework to expose language grounding failures.
- Proposed **multi-task same-scene training** approach and constructed augmented dataset for fine-tuning.

Zero-Shot Indoor Object Navigation for Autonomous Drones Using Dual-Policy Reinforcement Learning

Team Member NUS CORE Lab

Jun 2025 – Jun 2026

- Status: **Accepted to IROS 2026.**
- Preprint: [arXiv:2601.15614](https://arxiv.org/abs/2601.15614)
- Developed a dual-mode visual navigation system based on **end-to-end Reinforcement Learning**, utilizing **RGB-D sensor** input.
- Engineered the policy to autonomously switch between **'Exploration'** and **'Target-driven Navigation'** modes based on target visibility.
- Trained the agent from scratch to master a **discrete action space**, including complex maneuvers like take-off, navigation, and landing.

Vision-Language Navigation on Autonomous Drone

Team Member NUS CORE Lab

Jun 2025 – Feb 2026

- Status: **Nearing completion.**
- Built a robust pipeline to generate various **3D paths** in the **Habitat simulator**.
- Overcame the challenges of the simulator initially designed only for ground robots by designing a robust **3D navigation algorithm** and obstacle detection method.
- Trained a strong and general policy for **drone navigation**.

Frontier Based Autonomous Exploration Vehicle Design with ROS2 and Lidar

Team leader NUAA

Sep 2024 – Apr 2025

- Led a team of two members to develop an autonomous exploration system using **ROS2** and **LiDAR** technology.
- Implemented **SLAM** algorithms including **Cartographer** and **Navigation2**, achieving real-time mapping and path planning.
- Integrated **YOLOv11** for object detection.
- Successfully deployed the complete system on an **embedded hardware platform**.

SKILLS & AWARDS

Applied Skills

- **Programming & Systems:** **Python** (Proficient), **Linux (Ubuntu)**, Shell scripting.
- **AI Frameworks & Simulation:** **PyTorch** (DRL policies), **Habitat**, **AI2-THOR** (Complex 3D environments).
- **Robotics Development:** **ROS2** (Nodes, Comm), **SLAM** (Cartographer, Nav2), **YOLO** integration.

Research Capabilities

- **Academic & Theory:** **Sim-to-Real Transfer**, Embodied AI Architectures, **RL Algorithms**.
- **Literature & Writing:** Tracking top-tier conferences (**CVPR/IROS/ICRA**), Academic Paper Writing.

Languages

- **English (Proficient):** IELTS Overall 7.0 (Reading: 8.5, Writing: 7.5, Listening: 6.5, Speaking: 6.0).
- **Mandarin:** Native Speaker.

Awards

- Second-class Scholarship (2024) and Third-class Scholarship (2021, 2022, 2023) at Nanjing University of Aeronautics and Astronautics (NUAA).