# Yixuan Huang

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## Education

**University of Michigan** *Ann Arbor, MI*
M.S. in Robotics *Aug. 2026 – Present*
Robotics Department

**Wuhan University of Technology** *Wuhan, China*
B.S. in Electronic Information Engineering *Sep. 2022 – Jun. 2026*
School of Information Engineering

## Research Interests

Robot learning for manipulation and navigation: generative policies, where the learned model is the object of study rather than a replaceable component inside a classical method. Three things in particular—policies that stay reliable across long, multi-step tasks; operation that repeats rather than working once in a demonstration; and sim-to-real transfer to real hardware. Grounded in a classical background—task and motion planning, multi-arm rearrangement, geometric and combinatorial constraint satisfaction—together with a perception toolchain and an undergraduate background in electronics and embedded systems.

## Research Experience

**Rutgers University** *New Brunswick, NJ*
Research Intern, Algorithmic Robotics and Control Lab (remote) *Jun. 2025 – Dec. 2025*
*Topics: Multi-arm tabletop multi-object rearrangement planning and optimization*
Advisor: Prof. Jingjin Yu

- From a high-level problem posed by the advisor, independently developed the formulation and the model, wrote the pseudocode and the implementation, explored algorithmic approaches, and produced a systematic set of simulation results.
- Made object dependencies, temporary buffer space, action count, execution time, and arm availability explicit planning variables, so that rearrangement with occupied goal positions became analyzable at the combinatorial level.
- Characterized the trade-offs among completion time, buffer usage, and arm utilization across randomly generated instances.

**Shanghai Artificial Intelligence Research Institute** *Shanghai, China*
Research Intern, R&D Group; also affiliated with MindSpore Shanghai *Jul. 2025 – Oct. 2025*
*Topics: Robot control, RGB-D acquisition, 3D reconstruction, and point-cloud analysis*
Mentor: Dr. Tianrui Shen

- Responsible for robot-arm and mobile-platform control and for multi-view RGB-D acquisition with Intel RealSense cameras, in a plant-sensing system for controlled indoor agriculture, a project run with the Shanghai Academy of Agricultural Sciences.
- Built a COLMAP-based reconstruction pipeline covering multi-view data preparation, sparse and dense reconstruction, and point-cloud inspection; led the leaf-area estimation and root measurement work with colleagues.
- Wrote the layer around the platform's existing navigation stack: motion commands, pose handling, and the coordination that made every captured frame carry the pose it was taken from.
- Occlusion, specular leaf surfaces, and plant geometry that changed during capture forced a reorganization of the system around the information the downstream measurement required rather than around reconstruction quality.
- Packaged the acquisition and reconstruction workflow into two reusable toolkits, so that later

plant-monitoring experiments started from a pipeline rather than from a script.
- Chaired the institute's online seminar on cloud computing with Brazil's National Laboratory for Scientific Computing (LNCC).

## Selected Projects

**Histopathology Classification and Knowledge Distillation** *2024*

*PyTorch, CNNs, ResNet18, Teacher–Student Distillation*

- Compared a two-block CNN trained from scratch against an ImageNet-pretrained ResNet18 on PathMNIST, nine classes of colorectal histology tiles: 77.23% against 81.91% test accuracy under an identical budget.
- Built each experiment so that exactly one thing changes—the data, preprocessing, optimizer, batch size, and epoch count are shared by both arms—so that a difference in the final number has one candidate explanation rather than several.
- Trained a half-width student on MNIST twice, once against a teacher's outputs and once without, and read the gap: 98.72% against 98.64%, with the teacher at 98.81%.

**Handwritten Chinese Sentence Recognition Using CNN-CTC** *2024*

*CNN, BiLSTM, CTC, Sequence Modeling*

- Built an end-to-end recognizer for handwritten Chinese text lines that requires no character-level segmentation and no frame-level alignment labels.
- Combined CNN visual features with BiLSTM sequence modeling and a CTC transcription layer over a character set of several thousand classes.

**Autonomous Driving at CUEPIAC 2023** *2023*

*C++, Perception, Decision, Path Planning, Vehicle Control*

- Led a four-person team and wrote the perception, decision, planning, and control stack—about 3,900 lines of C++ against the competition's 51Sim-One simulator, with no learned components and no library planner.
- Treated the scoring rules as an explicit objective, trading task completion against time cost across car-following, junctions, crosswalks, cut-ins, lane changes, and one long continuous track.
- Awarded First Prize, second place nationwide.

## Hardware Projects

**Pocket Frequency Meter** *2025*

A four-digit direct-count frequency meter on an STC89C52RC, covering C51 firmware, schematic, and a two-layer board.

**Electronic Password Lock System** *2025*

A combination lock on a Xilinx FPGA in VHDL: a scanned matrix keypad, a multiplexed display, user passwords beside an administrator password, and an alarm only the administrator can clear.

**Electronic Circuit Design** *2022 – 2024*

Five circuits carried from a first sketch to a schematic, a simulation, and a board, in 74-series logic, on an AT89C51, and on an STM32.

## Awards & Honors

**Outstanding Graduate, Class of 2026** *2026*

Wuhan University of Technology

**Academic Excellence Scholarship and Outstanding Student Award** *2023 – 2025*

Wuhan University of Technology, awarded in each of three years

**First Prize, China Undergraduate Engineering Practice and Innovation Ability Competition** *2023*

Second place nationwide, autonomous-driving simulation track

## Technical Skills

**Programming & Tools:** Python, C/C++, Java, MATLAB; Linux, Git, ROS, CUDA, LaTeX
**Machine Learning:** PyTorch, NumPy, CNNs, knowledge distillation
**Perception & 3D Vision:** Intel RealSense, RGB-D capture, COLMAP, point clouds, OpenCV, Open3D
**Hardware & Embedded Systems:** Microcontroller firmware, FPGA and HDL, circuit design, PCB layout

## Leadership & Service

**Student Leadership, Wuhan University of Technology** *Sep. 2022 – Jun. 2025*
Student Affairs Director and Class President, School of Information Engineering;
member of the university Student Union

## Certifications

**Machine Learning Specialization** *2024*
DeepLearning.AI and Stanford University, Coursera
**Fundamentals of Accelerated Computing with CUDA C/C++** *2024*
NVIDIA Deep Learning Institute