Binghong Chen

Mechanical Engineering, College of Engineering
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Education

Carnegie Mellon University — Pittsburgh, PA, USA
Master of Mechanical Engineering - Research — *Aug. 2025 – Present*

- **GPA:** 4.0/4.0
- **Core Courses:** Modern Control Theory, Visual Learning and Recognition, Embodied AI safety

Zhejiang University — Hangzhou, China
Bachelor of Engineering in Agricultural Engineering — *Sep. 2021 – Jul 2025*

- **GPA:** 3.83/4.0
- **Core Courses:** Calculus, Linear Algebra, Probability and Mathematical Statistics, Principle of Automatic Control, Base of Mechanical Design, Electrical and Electronic Engineering, Fundamentals of C Programming

Selected Publications

(* indicates equal contribution, Google Scholar)

- Fanghao Wang*, **Binghong Chen***, Alois Knoll, Mingchuan Zhou, et al. "STTRL-DVO: Transformer-based Reinforcement Learning for Robust Dynamic Target Tracking in Cluttered Environments", *IEEE Transactions on Robotics (TRO)*, 2026

Preprints & Manuscripts Under Review

(* indicates equal contribution)

- Yaru Niu, Zhenlong Fang, **Binghong Chen**, Hao Zhang, Chen Qiu, H. Eric Tseng, Jonathan Francis, and Ding Zhao, "Learning Versatile Humanoid Manipulation with Touch Dreaming", arXiv Preprint 2026
- Qiming Wu, Xinbo Chen, **Binghong Chen**, Fanghao Wang, Sibo Hao, Mingchuan Zhou, Limin Zeng "Towards Autonomous Robot-Assisted Minimally Invasive Surgery: a Dexterous Wristed Robotic Kit (DWRK) for Surgical Tasks", Under Review

Research Experience

Safe AI Lab, Carnegie Mellon University — Sep 2025 – Present
Research Assistant, Supervisor: Prof. Ding Zhao — *Pittsburgh, PA, USA*

➢ ***EgoX:An Unified Framework for Cross-embodiment Policy Learning*** *(Under preparation for CoRL)*

- Aim to build a framework for cross-embodiment learning including VR-based teleoperation, data collection, model training and build an open-sourced cross-embodiment dataset for G1 humanoid, Locoman and XArm7.
- Responsible for co-leading the project.

➢ ***Learning Versatile Humanoid Manipulation with Touch Dreaming***

- Develop a whole-body humanoid manipulation system that combines VR teleoperation with an RL-based whole-body controller. Introduce Humanoid Transformer with Touch Dreaming (HTD), which includes future hand-joint-force prediction and EMA-supervised tactile-latent prediction for contact-aware representation learning. We evaluate five humanoid manipulation tasks spanning insertion, rigid-object reorientation, deformable-object handling, tool use, and bimanual loco-manipulation.
- Assisting in data collection and task design.

➢ ***Real World RL finetuning for robotic manipulation policy*** *(In Progress)*

- Extent Egox framework with RL in the real world to achieve reliable policy execution. Explore what a scalable and efficient design for RL finetuning is, including human corrections and DAgger-style offline RL.
- Responsible for leading project.

Dessight Biomedical Company May 2025 – Jul 2025
Research Intern *HangZhou, China*

➢ ***Object Manipulation with Bimanual Wristed da Vinci Research Kit***

- Realized the automatic operation of multiple tasks on our independently developed microsurgical robot platform with several benchmark algorithms, including ACT, Diffusion Policy, DP3. Combine high-level policy and motion planner for fast and stable response.
- Responsible for validating IL pipelines for real robot and building RL simulation environment in SOFA and Isaac Sim for deformable object manipulation.

Robotic Micronano Manipulation Lab, Zhejiang University Mar 2024 – Apr 2025
Research Assistant, Supervisor: Prof. Mingchuan Zhou *HangZhou, China*

➢ ***Capturing Dynamic Target with a Magnetic Microgripper via RL*** *(TRO Conditionally Accepted)*

- Design a magnetic microgripper capable of 2D planar movement, object capture and transportation. Proposed a Transformer-based RL framework to help microgripper navigate within a constrained environment with lots of dynamic obstacles and capture the dynamic target.
- Responsible for designing, implementing and fine tuning the network framework and designing experiments.

➢ ***Bio-inspired Magnetic Microrobot****(In Progress)*

- Design a magnetic microrobot inspired by the locomotion mechanism of fish capable of navigating in 3D space. The future work is about model-based RL for navigation through narrow environment.
- Responsible for the mechanical design and fabrication of the microrobot.

Adaptive Robotic Control Lab, the University of Hong Kong Aug 2024 – Oct 2024
Summer Intern, Supervisor: Prof.Peng Lu *Hong Kong S.A.R, China*

➢ ***Fault-tolerant Control for Quadrotor via a Fast RL Approach*** *(Deprecated)*

- Trained a small drone to stabilize and track trajectory with a completely fault rotor via RLtools, a C++ RL library for accelerating the training process. Succeeded in simulation but failed in reality.
- Responsible for implementation RL in simulation and deploying network on Crazyflie.

Projects

Student Agricultural Robotics Competitions | *Mechanic Design, Embedded System* Sep 2023 – Dec 2023

- Deploy Yolo on Jeston Nano for object identification. Build PID controller for navigation on STM32 or Arduino.
- Won first place award in 2024 ASABE Student Robotics Competition about trimming leaves, Anaheim, USA and the second prize in China agricultural robot competition about cutting off strawberries, Wuhan, China.
- Responsible for mechanical design of the end-effectors and building controller for navigation and specific motion.

LCM-LoRA Distillation for Multi-View Diffusion | *Generative Model* Nov 2025 – Dec 2025

- Try LCM-LoRA distillation for SPAD to generate multi-view images of an object quickly.
- Responsible to implement DMD2 for SPAD.

Teaching Experience

24351 Dynamics | *Course Assistant, Carnegie Mellon University* Jan 2026 – Apr 2026

Technical Skills

Programming Skills: Python, C/C++
Specific Skills: ROS, Matlab, STM32, Solidworks, Arduino
Tools: Pytorch, Numpy,Jax, Flax, Isaac Sim, XML etc.
Hobbies: Long Distance Running, Fitness, Piano, Cooking, Table Tennis