Xingjian Zhang

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EDUCATION

National University of Singapore **Aug 2024 – Jan 2026**

- M.Sc. in Mechanical Engineering. GPA: 4.5/5.0 Advisor: *Prof. Guillaume SARTORETTI*
- Research Interest: Multi-agent deep reinforcement learning, Human-Robot Interaction, GenAI
- Relevant Coursework: Machine Learning in Robotics, Machine Vision, Autonomous Mobile Robotics

Harbin Institute of Technology **Sep 2020 – Jun 2024**

- B.Eng. in Automation, Shenzhen Campus, Advisor: *Prof. Hongwei Zhang*
- Relevant Coursework: Modern Control Theory, Advanced Language Programming (C/C++), Data Structure, Fundamentals of Digital and Analog Circuits, Machine Vision, etc.
- **Outstanding student of Year 2020 - 2021**

NUS Research Institute **Sep 2023 – May 2024**

- Exchange Student, GPA:4.0/4.0, Advisor: *Prof. NEE Yeh Ching*
- Relevant Coursework: Robot Mechanics and Control, Automation in Manufacturing, Fundamentals of Product Design and Development.

INTERNSHIP

SMART, Massachusetts Institute of Technology (MIT) **Jan 2025 – Jun 2025**

- ***Research Intern*** at ***Mens, Manus and Machina (M3S)***
- Leveraged Transformer architectures within a Generative Adversarial Imitation Learning (GAIL) framework to predict sequential personal educational and career trajectories based on expert demonstrations.

RESEARCH EXPERIENCE

COMPASS: Cooperative Multi-Agent Persistent Surveillance **Jul 2024 – Present**

MARMOT Lab, National University of Singapore ***Graduate Project***

- Developed COMPASS, a novel spatio-temporal attention network using Multi-Agent Reinforcement Learning and Gaussian Processes on graph structures for persistent surveillance of dynamic targets.
- Achieved effective multi-agent coordination via centralized training (PPO with a centralized critic), demonstrating superior performance in uncertainty reduction, scalability, and robustness compared to baselines in simulated environments (mainly AirSim in UE5).

Hand-tracking and Object Detection for Verification in Assembly **Sep 2023 – May 2024**

Control Lab, NUS Research Institute ***Final Year Project***

- Combined a gesture-recognition system based on LSTM model and an object-detection system based on YOLO, utilizing the idea of FSM to achieve stage positioning and error detection during assembly.
- Introduced concept of control and feedback, utilizing the environment exposure as the main parameter to adjust the various parameters in actual detection.

Collaborative Motion Control of Dual Robots **Dec 2021 – Dec 2022**

WT Robot Lab, Harbin Institute of Technology ***Research Assistant***

- Deployed real-time trajectory tracking algorithms, utilizing Cartographer under Ubuntu with Gazebo and Rviz to obtain real-time maps, providing path planning schemes based on A * and MPC.
- Realized pose estimation through Kalman filter based on IMU, with following solution and optimization.
- Designed a chassis for a medium-sized wheeled robot, built a communication scheme between sensors and processors of the robot through CAN and I2C.

PUBLICATION

XINGJIAN ZHANG*, YUTONG DUAN, et al. **Learning-based Stage Verification System in Manual Assembly Scenarios.** International Conference on Smart and Advanced Manufacturing; 2024. (Published)
RUI ZHAO, XINGJIAN ZHANG*, et al. **Attention-Based Learning for 3D Informative Path Planning.** International Conference on Intelligent Robots and Systems (IROS); 2025. (Submitted)
XINGJIAN ZHANG*, et al. **COMPASS: Cooperative Multi-Agent Persistent Surveillance using Spatio-Temporal Attention Network**. (In progress)

HONORS

Mathematical Contest in Modeling of America in 2022 (MCM) **Finalist (*Top 1.3% Global*)**

- Established a model offering racing strategies for any type of riders under various factors affecting including energy limit, aggressiveness in the past, weather sensitivities (wind directions and strength) and target deviation robustness.

The 16th National Smart Car Competition **National First Prize**

- Completed underlying driving code based on Infineon mm32, comprehensively applied 2 PID control schemes for internship of 3-wheeled small vehicle upright and smooth operation.
- Designed and implemented a DNN-based model detecting special elements inside the racing track, model accuracy after debugging is significantly better than traditional visual solutions.

The 21st National University Robot Competition ROBOCON **National Third Prize**

- Participated in the design, control and calibration of PTZ, completed the communication between the motors (mainly DJI M3508) inside the transmission mechanism and PTZ, filtered the transmitted signals through different algorithms.

Some other provincial and in-campus awards

LEADERSHIP & ACTIVITIES

- ***Provincial representative*** of the Principal Conference 2021.
- ***Producer*** of Shenzhen Campus 20th Anniversary Song, which is admitted to HIT History Museum.
- ***Organizer*** of Shenzhen Campus 20th Anniversary Commemorative Evening
- ***Organizer*** of the Special Performances of the Electroacoustic Department in 2020, 2021
- ***Host*** of the 16th National Smart Car Competition
- ***Vice Chairman*** of the Shenzhen Campus Student Art Troupe
- ***Accompanying translator*** in the China International Wine Expo in 2019

SKILLS

Language: IELTS 7.0 (6.5)
Programming: Python, C/C++, MATLAB
Software & Tools: ROS, PyTorch, TensorFlow, OpenCV, SolidWorks, Gazebo, SPSS, R, Git…
Hardware: Arduino, Raspberry Pi, Multiple Motors and Sensors, Basic Mechanical Design
Hobbies: Music production, Swimming.