Jasper Tan Zhen Xuan

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EDUCATION

ETH Zürich — **Department of Mechanical and Process Engineering**
MSc (Robotics, Systems and Control)   *Graduated Jan 2025*
Relevant Coursework: Control Theory, Dynamic Programming, Robot Dynamics, Decision Making, Machine Vision, Machine Learning, Reinforcement Learning.

National University of Singapore — **College of Design and Engineering**
BEng, Honours with Highest Distinction (Mechanical Engineering), GPA: 4.81/5.00   *Graduated May 2022*
Relevant Coursework: Engineering Design, Fluid and Thermodynamics, Structural Analysis, Engineering Design, Quantum Computation, Sociolinguistics.

EXPERIENCE

AICA SA — **Lausanne, Switzerland**
Robotics Engineer (Intern)   *September 2023 - May 2024*
- Developed a six point touch localization program that can localize a mobile robot arm to a rigid object with at least 3 orthogonal faces
- Implemented a pseudo-inverse damping algorithm in C++ for the inverse kinematics velocity controller of serial robots to improve safety near singularities
- Maintained AICA software components for visual pose detection using Aruco and STag fiducial markers
- Improved the flexibility of AICA control algorithms by enabling dynamic parameter updates at runtime

Solustar Pte. Ltd. — **Singapore**
Robotics Engineer   *May 2022 - July 2022*
- Tuned AMCL parameters for improved locomotion of robot in tight, indoor environment
- Designed and maintained supporting structures on a disinfectant robot, including a mechanism to convert wheel power from motor-controlled to free-rolling
- Simulated the disinfectant robot in Gazebo by writing URDF files

National University of Singapore — **Singapore**
Teaching Assistant   *August 2019 - April 2022*
- Engineering Principles and Practices (ME2104) under Prof Sing S.L. from January 2022 - April 2022. I facilitated lab work on electrical circuits and Arduino programming. I focused my efforts on weaker students and making circuitry relevant for mechanical engineering students.
- University Scholar's Seminar (USS2105) under Prof K. Singh from August 2019 - November 2020. I encouraged critical discussions on the epistemology of science and nature.

Institute of Infocomm Research, ASTAR — **Singapore**
Robotics Scientist Intern   *May 2021 - April 2022*
- Implemented multiple LIDAR-based odometry algorithms on both rotating and solid state LIDARs for benchmarking.
- Understand the concepts and implementation of Lidar SLAM algos including LegoLoam, FastLio, LioSam, Lili-Om and etc.

PROJECTS

Autonomous Plate Transfer via Mobile Robots — **SwissCat+ West, EPFL, Switzerland**
Master's Thesis   *July 2024 - Jan 2025*
- Designed a system for multi-agent path planning on a road network to transport chemical plates between lab machines
- Designed an MPC path tracker for differential drive robots
- Designed and built an improved setup of the mobile robot

Reinforcement Learning System for Pouring Liquids — **CREATE Lab, EPFL, Switzerland**
Semester Project   *March 2024 - June 2024*
- Designed a reinforcement learning setup to learn to pour liquids between 2 containers
- Created an interface between ABB's simulation software RobotStudio, the physical bimanual robot setup, and the reinforcement learning agent.

Robotics Systems Lab — **Zürich, Switzerland**
ALMA, Robotics Engineer (Student Volunteer)   *September 2022 - November 2022*
- Modified Alma (Anymal with an arm) URDF for motion planning simulation

Deep Reinforcement Learning for control of Flapping Wing MAV **Temasek Labs, Singapore**
Design Project *January 2021 - May 2021*
- Team leader for a group of 3 students to build and train a Micro Aerial Vehicle (MAV) system.
- Applied deep reinforcement learning (DDPG algorithm) on a handmade MAV system for flight training.

Manufacturing lead of AIAA Design Build Fly Competition *December 2018 – April 2019*
- Designed and manufactured a UAV capable of both short take off (under 3 metres) and dropping payloads while airborne.
- Coordinated and organized a nine people team to manufacture a UAV through understanding of manufacturing technologies and efficient logistics management

ADDITIONAL

- Computer skills: C, C++, MATLAB, Arduino, ROS, Python
- Technical Skills: Laser cutting, 3D printing, CNC Machining
- Awards: Dean's List 2019-2021, Professional Engineering Scholarship 2020, USP President's Honour Roll
- Volunteering: Tutored under-privileged children during COVID-19 pandemic
- University Scholar's Programme (USP): Education that developed skills in writing, critical thinking, analytical reasoning, and research.

PUBLICATIONS

- Scamarcio, Tan, Stellacci, Hughes. (2025). Reliable and robust robotic handling of microplates via computer vision and touch feedback. Frontiers in robotics and AI. 11