Jeric Lew Jieyi

Final Year Mechanical Engineering Undergraduate

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Education

National University of Singapore | GPA: 4.88/5.0 Aug 2021 – May 2025
Bachelor of Engineering (Mechanical Engineering), Robotics Specialisation
Minor in Computer Science; Minor in Innovation and Design Program;
Special Program: Tembusu College University Town College Program (2-Year Liberal Arts)

Georgia Institute of Technology | GPA: 4.0/4.0 Jan 2024 – May 2024
Undergraduate Study Abroad (Non-Degree)

Relevant Coursework: *Robotics; Robotics System Design; Perception & Robotics; Machine Learning; Artificial Intelligence; Soft Robotics; Feedback Control Systems; Microprocessor Applications; Data Structures & Algorithms; Programming Methodology I & II*

Research & Professional Experience

Robotics Research Intern @ MARMot Lab – Singapore Aug 2023 – Present
National University of Singapore (NUS) | *Dr. Guillaume Sartoretti* & *Dr. Cao Yuhong*
Deep Learning approaches for Autonomous Robotic Exploration (ARE)

- Researching use of Diffusion models to plan explicit long-term trajectories for single/multi-agent ARE
- Implemented a CNN-based RL (PPO) planner for ARE
- Developed a 2D occupancy grid generator for non-uniform 3D environment, utilizing ROS packages like Octomap, CMU's Autonomous Exploration Development Environment and ETH's GridMap

Robotics Research Intern @ AirLab – Pittsburgh, PA Jun 2024 – Aug 2024
Carnegie Mellon University (CMU) Robotics Institute | *Dr. Sebastian Scherer* & *Dr. Wenshan Wang*
Robust off-road navigation as a part of CMU's Robotics Institute Summer Scholars program

- Applied knowledge distillation techniques to replicate feature extraction of vision foundation models (DINOv2, AM-RADIO) while improving inference speeds and increasing feature resolution
- Optimised LIDAR based geometric feature mapping stack for high-resolution map size by implementing efficient plane-fitting algorithm in C++

Robotics Intern @ DSO National Laboratories – Singapore May 2023 – Aug 2023

- Utilised embedded computers (Jetson Xavier NX) to implement real-time object detection (YOLOv5) and tracking (DeepSORT) with PyTorch and OpenCV.
- Developed software drivers using ROS2 to integrate cameras into a robotic system

Publications

DARE: Diffusion Policy for Autonomous Robot Exploration

Yuhong Cao*, **Jeric Lew***, Jingsong Liang, Jin Cheng, Guillaume Sartoretti
IEEE International Conference on Robotics and Automation (ICRA), 2025 | Video

SALON: Self-supervised Adaptive Learning for Off-road Navigation

Matthew Sivaprakasam, Samuel Triest, Cherie Ho, Shubhra Aich, **Jeric Lew**, Isaiah Adu, Wenshan Wang, Sebastian Scherer
IEEE International Conference on Robotics and Automation (ICRA), 2025 | Project | Video

SHRED: Swift High-Resolution features via Efficient Distillation

Jeric Lew, Matthew Sivaprakasam, Samuel Triest, Wenshan Wang, Sebastian Scherer
RISS Working Papers Journal, 2024 | Poster | Video

A novel application for real-time arrhythmia detection using YOLOv8

Guang Jun Nicholas Ang, Aritejh Kr Goil, Henryk Chan, **Jieyi Jeric Lew**, Xin Chun Lee, Raihan Bin Ahmad Mustaffa, Timotius Jason, Ze Ting Woon, Bingquan Shen
arXiv, 2024

Skills

Programming Languages: Python, C/C++, MATLAB, Java, ARM-7 Assembly

Frameworks/Tools: PyTorch, ROS1/2, CUDA, OpenCV, Arduino

Hardware: SOLIDWORKS, 3D Printing, Machining, Microcontroller, Blender

Concepts: Deep-Learning (ResNet, UNet, ViT, Diffusion, etc), Reinforcement Learning (PPO, SAC, etc), Computer Vision, Planning (A*, D*, RRT*, etc)

Selected Projects

PUMPWISE: ML + IoT Predictive Maintenance for Water Pumps

PUMPWISE aims to monitor pump health by leveraging Machine Learning to detect and classify faults

- Utilised 2D CNN of vibration data to detect and classify anomalous data
- Designed and fabricated data collection test bench with SOLIDWORKS and 3D Printing
- Achieved above 96% accuracy for classifying anomalies and successfully deployed an MVP at a pool

Robotics System Design ft. TurtleBot github.com/Magmanat/r2auto_nav

Undergraduate robotics class with the task to traverse and map a maze and then locating a hot target and firing projectiles

- Sized and chose actuators and sensors for chose design based on literature review and calculations.
- Interfaced thermal camera and NFC reader with ROS2
- Developed navigation and target seeking algorithm using Python with ROS2 and Linux environment

Deep-Learning Pose Estimation for Sports Training github.com/JasonYapzx/sportform

Hackathon entry aimed to promote healthy living by gamifying exercises

- Utilised deep-learning computer vision algorithm (YOLOv8) for human pose estimation to locate joints
- Developed Python scripts with OpenCV to count exercise repetitions and check form of exercise

Teaching

Teaching Assistant, ME1102 Engineering Principles and Practice I — Fall 2024
Teaching Assistant, EG1311 Design and Make — Summer 2022 to Fall 2023
Teaching Assistant, CS1010E Programming Methodology — Fall 2022

Awards and Honors

Best Student in Microprocessor Applications — Fall 2023
Dean's List — Fall **2022**, **2023**, **2024**
NUS Merit Scholarship — Fall 2021