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; 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 | 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
In Submission to IEEE International Conference on Robotics and Automation (ICRA), 2025

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
In Submission to IEEE International Conference on Robotics and Automation (ICRA), 2025

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 | arXiv

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
AY22/23 & AY23/24 Dean's List	Fall 2022 and Fall 2023
NUS Merit Scholarship	Fall 2021