

# JiaWei Lee

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I am Joe Lee, a software developer with 3 years of experience at Turing-Drive, dedicated to researching and implemented path planning, system integration and GNSS positioning, Coding skills on C++, C, Python, The developed algorithm operates on buses and golf carts.

## Skills

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**Languages:** C/C++, Python, Shell scrip  
**Frameworks:** ROS, ROS2  
**OS:** Linux, Window  
**Developer Tools:** Git, Docker, VS Code, Vim, Cmake,  
**Libraries:** Eigen, Opencv, Pandas, NumPy, Matplotlib  
**Hardware:** NVIDIA Jetson, Raspberry Pi, Arduino

## Education

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**National Yunlin University of Science and Technology**

Yunlin, Taiwan

*Department of Electrical Engineering*

*Sep. 2017 – Jun 2019*

- LiDAR Pedestrian Detection and Trajectory Tracking Based on Morphological Extended-Jump-Distance Clustering Segmentation and Its Intelligent Patrolling Security Robot Application

**National Formosa University**

Yunlin, Taiwan

*Department of Electrical Engineering*

*Sep. 2015 – Jun 2017*

## Professional Experience

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**Turing Drive Inc**(C++/C, Python, ROS, Shell, Linux, Path Planning, GNSS)

Taipei, Taiwan

*Software Engineer*

*Nov 2019 – Present*

- Understood motion planning algorithms and tuned parameters, including trajectory smoothing, generation of kinematically-feasible and collision-free trajectories, and obstacle cruising and avoidance
- Collaborated with algorithm engineers to design and implement motion velocity optimization algorithm using objective function and constraints generated through speed profile generation
- Upgraded the autonomous driving system to ROS2 and refactored the system-level integration architecture and the path planner module. Currently, it is running on various testing platforms
- Refactored and optimized the path planning module, resulting in a 60% increase in execution speed; Integrated camera obstacle detection to enable dynamic obstacle avoidance and side turn warnings. Automatic turn signals are implemented based on curvature calculation, and turning speeds are adjusted, This module is used for buses operating on open roads with mixed traffic flow.
- Refactored the state machine code in the path planning and integrated vector map with camera obstacle detection to add bus stop recognition, traffic signal recognition, and AEB (Automatic Emergency Braking). This module is used for buses operating on the semi-open dedicated bus lane on Taipei's Xinyi Road during nighttime
- Designed and implemented a GNSS parser that can flexibly adjust the parsed content based on different vehicle requirements, it's applied in various vehicle modules
- Designed and implemented a path planning module with a logger system, which automatically records the required data during the autonomous driving process using the switch of the autonomous driving system, This reduces on-site debugging and parameter tuning time by 50%
- Implemented leg detection and integrated it into the autonomous driving system for golf carts

## Selected Projects & Awards

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**Smart trash can**(C++/C, ROS, Navigation Stack, SLAM, Opencv, PCL)

Sep 2017 – May 2019

- Implemented SLAM module, leg detection module and navigation module, integrating sensors and the robot chassis to achieve an autonomous patrol security robot. It won a Silver Medal at the Korean Invention Awards and also achieved good results in domestic software competitions
- Researched point cloud clustering and geometric features of point clouds, Used Adaboost to implement leg detection and achieved pedestrian tracking through Kalman filtering. The detection performance is excellent in open spaces.
- Researched and Developed 2D LiDAR SLAM algorithm and Navigation Stack in ROS