

# LIN JUNG PENG

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## WORK EXPERIENCE

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**City Science Lab @ Taipei Tech, a cooperation with MIT Media Lab** (Taipei, Taiwan)

**Researcher (Full-time) – Robotics Team**

- **Boston Dynamics Spot** Jun. 2024 - Present  
**TSMC Industry-Academia Research Project:**
  - Utilized Spot's SDK and 3D-LiDAR localization based on ROS2 to enable precise remote control for the robot to navigate to designated locations for automated inspection tasks in industrial environments
  - Developed a map switching system and utilized AprilTag as Spot's initial position in maps to resolve the issue of being unable to load the entire map in a large factory environment
- **Pangolin-Inspired Quadruped Bionic Robot** Jul. 2023 - Present  
**Pioneer Material Precision Technology Industry-Academia Research Project:**
  - Focused on the circuit and control system development using Nvidia Orin Nano as the control computer and multiple Dynamixel servomotors to replicate the pangolin's unique curling ability
  - Enhanced the robot's perception by installing a Realsense D435 depth camera, integrated Nvidia Isaac ROS VSLAM and AprilTag SLAM for precise indoor localization
- **EV $\pi$  (Autonomous Vehicle)** Jul. 2023 - Dec. 2023  
**Foxconn Technology Industry-Academia Research Project:**
  - Aimed at deploying HHEV.OS and test effective communication and functional compatibility with ROS2 system
  - Integrated Foxconn's automotive middleware software HHEV.OS into the EV $\pi$  control system
  - Ensured smooth assimilation into the current ROS2 system architecture while maintaining original functionality and improving overall system performance and reliability through enhanced security**Hardware Circuit Board Production:**
  - Redesigned the EV $\pi$  circuit system architecture to create a layered power supply system driven by a 36V battery
  - Produced various circuit boards needed for the task, including initial schematic design and PCB layout planning
- **Undergraduate Research Opportunities Program (UROP) Mentorship** Jul. 2023 - Present
  - Recruited and mentored undergraduates, taught them application skills and theories of robotics
- **Professional Skills Developed**
  - **Software:** C/C++, Python, Matlab, ROS2, git, Zenoh, HHEV.OS
  - **Hardware:** PCB Design, KiCad, Solidworks
- Teaching Assistant (TA) at Application of AI and Advanced Robot Control Systems class** Sep. 2024 - Present
- Teaching Assistant (TA) at Urban Robotics & AI class** Sep. 2024 - Present

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## EDUCATION

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**National Taipei University of Technology (Taipei Tech)** (Taipei, Taiwan)

Bachelor of Science, Mechanical Engineering Sep. 2019 - Jun. 2023  
Cum. GPA: 3.63/4.0    Last 60 GPA: 4.0/4.0    Class Rank: 2/51    Total Credits: 163

**Academic Excellence Award:** awarded for 4 times, respectively in 2/2022, 6/2022, 2/2023, and 6/2023

**San-Yu Excellence Award:** in recognition for top grades in academics, conduct, and physical education, with no disciplinary actions or absences; awarded for 6 times, respectively in 6/2020, 6/2021, 2/2022, 6/2022, 2/2023, and 6/2023

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## UNDERGRADUATE RESEARCH

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**Development of LiDAR-Based SLAM and Navigation System for Hexapod Robots** Feb. 2023 - Jun. 2023  
MIT-Taipei Tech Collaboration City Science Lab UROP

- **Project Goal:** To develop a system using 2D-LiDAR for SLAM and navigation by integrating camera and AprilTag for precise final target localization and correction
  - Implemented movement control for a hexapod robot using ROS2 as middleware for joystick-controlled movement
  - Utilized Cartographer for SLAM algorithm to create 2D maps to develop autonomous navigation capabilities
  - Applied image processing techniques for camera-based AprilTag detection, to enable final movement correction after Lidar-based navigation to the target point

**The Application of The Drone Combined with Image Processing** Feb. 2022 - Nov. 2022  
In Collaboration with Aeroprobing Inc.

- **Project Goal:** To develop an autonomous drone system for line-following and material transportation.
  - Designed the drone using SolidWorks, constructed the frame with 3D printing and carbon fiber materials, and equipped it with a Pixhawk 4 Mini flight controller and Jetson Xavier NX as the main computer.
  - Utilized ROS as middleware, conducted simulation tests using Airsim, and covered functions like hovering, line following, traffic light detection, beanbag dropping and landing to enable autonomous navigation and task execution

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## COMPETITIONS AND ACHIEVEMENTS/AWARDS

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**2022 TSPE Research Project and Paper Competition** (Taichung, Taiwan) Feb. 2022 - Nov. 2022

- **Advanced to Semi-final;** authored the sections on flight control system and planning algorithms.

**2022 Taiwan TDK Robocon (Aerial Robotics Group)** (Tainan, Taiwan) Feb. 2022 - Nov. 2022

- **Advanced to Semi-final;** realized auto line following, traffic light detection, beanbag dropping, and precision landing

**2022 International PBL Competition Program @ Taipei Tech** (Taipei, Taiwan) Aug. 2022

- **Best Team Award;** a one-week International Collaborative Robotics Competition
  - Utilized an Arduino Mega board combined with a Pixy camera for image processing, two DC motors for movement control, a servo motor for operating a ping pong ball collector, and an ultrasonic sensor for detecting walls and four obstacle zones (sand, grass, white stones, and water) and collecting as many red balls as possible.

**RoboCupJunior CoSpace Rescue Challenge** (Montreal, Canada) **Top 4 in the Semi-final** Aug. 2018

**FIRST Global Challenge Robotics Competition** (Washington D.C., USA) **Rank: 17/163** Jul. 2017

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## INTERNSHIP

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**HIWIN Technologies Corporation** (Taichung, Taiwan) Jul. 2021 - Aug. 2021

- Completed a project titled "*Improvement of Automated Robotic Arm Utilization Rate*", aimed at optimizing the operational processes of production line robotic arms and increasing engineers' willingness and efficiency to use robotic arms for material handling; operated CNC machines, interpreted design blueprints, and learned CNC languages

**Aeroprobing Inc.** (New Taipei, Taiwan) Nov. 2022 - Jan. 2023

- Integrated ROS and Yolov5 to control drones in Airsim for object detection and tracking to simulate drone inspection tasks in factory environments; utilized the Xilinx KV260 FPGA control board as the drone's control computer, and leveraged the Vitis AI system on FPGA to accelerate image processing and AI image recognition

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## CLUB & LEADERSHIP

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<b>Hip-Hop Dance Club @ Taipei Tech</b>	Vice President	Jul. 2020 - Jun. 2021
	Member	Sep. 2019 - Jun. 2023

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## CERTIFICATE

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**SOLIDWORKS CAD Design Associate (CSWA)** Feb. 2021