

MUHAMMAD RAYHAN ATHAILLAH (賴瑞涵)

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EDUCATION

National Yang Ming Chiao Tung University

Master of Science in Electrical Engineering

Hsinchu, Taiwan

Aug. 2024 – Sep. 2026

National Taiwan University

Non-degree in Traditional Mandarin

Taipei, Taiwan

Nov. 2023 – May 2024

Sepuluh Nopember Institute of Technology

Bachelor of Engineering in Electrical Engineering

Surabaya, Indonesia

Aug. 2019 – Sep. 2023

EXPERIENCE

Graduate Research Student

Hucenrotia Lab, National Yang Ming Chiao Tung University

Aug. 2024 – Present

Hsinchu, Taiwan

- Custom designed and printed robotic arm parts using a resin-based SLA 3D printer
- Manufactured a working 3D printed ping pong robotic arm prototype using servo motors and an ESP32 microcontroller
- Implemented forward and inverse kinematics algorithms on the robotic arm prototype that could be controlled via vision-based UI
- Developed a fast-moving ping pong ball tracking system using a RealSense D455 camera in 3D space

Part-Time Teacher

Pacific American School

Jan. 2025 – Jan. 2026

Zhubei, Taiwan

- Assisted students in assembling VEX robotics kits and programming them using the VEX controller module
- Assisted students in building robotic arms and programming them using the Arduino IDE
- Taught students in the Algebra 2 course

Artificial Intelligence and Health Technology Robotics Intern

Sepuluh Nopember Institute of Technology

December 2022 – June 2023

Surabaya, Indonesia

- Integrated multi-modal sensors including 2D LiDAR, IMU, odometry, and RGB-D cameras for comprehensive data acquisition
- Implemented Simultaneous Localization and Mapping (SLAM) using Hector SLAM and RTAB-MAP, incorporating Adaptive Monte Carlo Localization (AMCL) for precise robot positioning
- Developed autonomous path planning using A* algorithm to generate optimal, collision-free trajectories in mapped environments
- Designed and tuned motion control systems to execute autonomous navigation with high trajectory tracking accuracy

Multicopter Drone Control and Vision Programmer

Bayucaraka UAV Research Team

Mar. 2020 – May 2023

Surabaya, Indonesia

- Developed autonomous drone flight control systems utilizing the Robot Operating System (ROS)
- Designed and executed complex flight trajectories using Mission Planner and QGroundControl
- Engineered computer vision algorithms in Python and OpenCV for aerial image processing
- Implemented YOLO pre-trained models to perform real-time aerial object detection
- Simulated multi-rotor UAV dynamics and sensor payloads in real-time using Gazebo and ROS

TECHNICAL SKILLS

Programming Languages: Python, C/C++, MATLAB, Bash

Robotics & Control: ROS/ROS2, NVIDIA Isaac Sim, Gazebo, SLAM, Navigation, Kalman Filter, PID

AI & Computer Vision: PyTorch, TensorFlow, OpenCV, YOLO, Object Tracking, RealSense SDK

Hardware & Design: Arduino, ESP32, Raspberry Pi, Sensor Interfacing, Autodesk Inventor, 3D Printing

Tools & Environment: Git, Linux/Ubuntu, Conda, SSH, VS Code, LaTeX