Alvaro Palero Ramirez

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Mechatronics Engineering graduate with a strong foundation in robotics, automation, and programming. I have hands-on experience developing and integrating mobile robotic systems, with a focus on localization, path planning, and perception. I'm seeking opportunities to contribute to robotics teams working on autonomous navigation, SLAM, or sensor fusion, where I can apply and expand my knowledge while supporting real-world development goals.

EDUCATION

Universidad de Ingeniería y Tecnología (UTEC) | Lima, Perú *Mar. 2018 – July 2024*
BSc in Mechatronics Engineering

WORK EXPERIENCE

Procetradi | Project Engineer Trainee *Sept. 2024 – Mar. 2025*

- Developed PLC programs for automation panels controlling butterfly valves in hydroelectric power plants.
- Programmed fault detection and isolation logic for electric power distribution systems.

RESEARCH & PROJECTS

TurtleBot4 Path Planning & Localization *May 2025 - June 2025*
Developed a complete ROS 2 navigation pipeline for waypoint-based navigation using the Nav2 stack.

- Integrated localization with sensor fusion (EKF), fusing IMU and odometry data.
- Gained hands-on experience with lifecycle nodes, costmaps, planners, and initial pose automation.
- **Technologies used**: C++, Python, ROS 2, Nav2, Gazebo, RViz, Git, Encoders, IMU, Lidar.

Beach Cleaning Robot (UTEC x Purdue) *Jan. 2024 - Dec. 2024*
Collaborated with Purdue to design and prototype a tracked robot for beach waste collection.

- Designed the tracked locomotion system of the mobile robot.
- Programmed the robot's localization system and tuned the trajectory control parameters.
- **Technologies used:** ROS, Fusion 360, Linux, 3D printing and mechanical fabrication.

Mobile Robot Prototype for Plastic Waste Collection *Mar. 2023 – July 2024*
Design and implementation of a mobile robot for plastic waste collection as part of my undergraduate thesis.

- Designed and implemented mechanical structures and PD control for trajectory tracking.
- Developed localization using an Extended Kalman Filter (EKF) fusing GPS and IMU data.
- **Technologies used:** ROS, Inventor, Linux, IMU, GPS, 3D printing and mechanical fabrication.

Nano Satellite – CanSat *Mar. 2022 – Aug. 2023*
Air quality data collection project for high-altitude urban areas and participation in an international competition

- Developed a Python ground station for data reception and visualization.
- Led engineering teams to 7th place (of 150+) in an international satellite competition in Brazil.
- **Technologies used:** Python, Flask, Plotly, SQL, Redis, GitHub, Autodesk Eagle, 3D printing, PCB, Arduino.

ADDITIONAL INFORMATION

Languages: Spanish (Native), Italian (Native), English (B2 – TOEFL iBT: 83).
Technical skills:

- **Programming:** Python, C++, SQL, Java, HTML, CSS.
- **Robotics & AI:** ROS 1 & 2, Nav2, EKF, SLAM, path planning, sensor fusion, reinforcement learning.
- **Simulation & Modelling:** Gazebo, RViz, CAD (Inventor, Fusion 360), robot modeling.
- **Sensors:** IMU, GPS, Camera, Lidar, Encoders.
- **Tools:** Git, Linux, Docker, Redis, OpenCV, TensorFlow, Keras, Raspberry Pi, Jetson Nano, Arduino.