Gruzver Romario Phocco Cáceres

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Summary

Robotics engineer with hands-on experience in autonomous navigation, robot perception, and multi-robot systems for real-world deployment. Currently building a heterogeneous SAR robot team — quadruped, rover, and thermal UAV — for post-disaster victim detection under a PROCIENCIA national research grant. Core focus: ROS2 navigation stacks, thermal person detection, sim-to-real transfer, and reinforcement learning for autonomous systems. Invited to explore my work at github.com/Gruzver.

Education

Pontifical Catholic University of Peru (PUCP) **August 2019 – August 2024**

Bachelor's Degree in Mechatronics Engineering

High-Performance School (Colegio de Alto Rendimiento) **2015 – 2018**

Secondary Education | Full government scholarship · IB Diploma (HL: Mathematics, Technology & Innovation)

Technical Skills

Robotics & Middleware:

- ROS2, Nav2, MoveIt 2, micro-ROS
- SLAM Toolbox, robot_localization (EKF)
- Ignition Gazebo, Isaac Sim (learning)

Perception & AI:

- Python (Advanced), C/C++ (Intermediate)
- PyTorch, TensorFlow, OpenCV
- Reinforcement Learning, Computer Vision

Hardware & Design:

- RealSense D435, RPLidar, ODrive
- Raspberry Pi, Jetson Nano/Orin
- DJI thermal cameras, Altium, KiCad

Dev Tools: Git/GitHub, Linux/Ubuntu, Docker, Bash **Languages:** Spanish (Native), English (B2)

Research Experience

Research Assistant – Search & Rescue Robotics [github] **Jan. 2026 – Present**

Interdisciplinary Research Laboratory, PUCP *Lima, Peru*

- Built an end-to-end ROS2 pipeline for real-time person detection from thermal drone video: YOLOv8x fine-tuned on ∼5,000 custom thermal frames, multi-object tracking with persistent IDs, and Kalman filter GPS smoothing.
- Developed the complete operator application, integrating thermal video processing, multi-object tracking with persistent IDs, Kalman-filter GPS smoothing, and pixel-to-GPS geolocation using full drone telemetry.
- Ongoing development of a heterogeneous robotic system for post-disaster search and rescue, integrating a thermal drone with a quadruped robot and implementing radio communication protocols for coordinated operation and information exchange between platforms.

Research Assistant – Social Robotics (AMII) [github] **Sep. 2024 – Mar. 2026**

Interdisciplinary Research Laboratory, PUCP *Lima, Peru*

- Designed and deployed the full locomotion system for AMII, a differential-drive social robot: mechanical design, electrical integration, and ROS2 Nav2 stack (AMCL, SLAM Toolbox, EKF, RealSense D435 obstacle avoidance).
- Developed agentic NLP interaction stack enabling autonomous engagement with people in real public environments using LLM-based dialogue.
- Integrated navigation, hardware drivers, and natural language control into a unified deployable system; coordinated live demos at public events.

Work Experience

Lab Supervisor / Teaching Assistant **August 2024 – Present**

Engineering Department, PUCP *Lima, Peru*

- Teaching assistant for Robotics & AI and Mechatronic Design Project courses (Mechatronics Engineering program).
- Developed educational platforms: omnidirectional mobile robot and 4-DOF robotic arm with MoveIt 2 and micro-ROS on Raspberry Pi Pico W.

Design and Product Development Intern **March 2024 – September 2024**
FABRICUM PUCP *Lima, Peru*

- Designed and built a 3D printer with infinite Z-axis printing capabilities; led multidisciplinary team through full hardware and software development cycle.
- Applied CAD modeling (Fusion 360, SolidWorks) and 3D prototyping for iterative mechanical design and validation.

Project Intern – Interdisciplinary Research Laboratory **October 2023 – March 2024**
Faculty of Science and Engineering, PUCP *Lima, Peru*

- Developed TS, a functional Add-In for Autodesk Inventor enabling rapid prototyping workflows; software development with SCRUM methodology.

Innovation Intern – Strategy and Development **January 2023 – June 2023**
Ferreycorp *Lima, Peru*

- Coordinated Sitech's application to ProInnóvate open innovation contest (non-reimbursable funding up to $554,400 USD); process mapping and startup partnership management.

Key Projects

Chaska Rover | *ROS2, MoveIt 2, Pinocchio IK, 3D LiDAR* | For URC/ERC Competitions | github **Oct. 2025 – Present**

- Led design and deployment of a 6-DOF robotic arm: mechanical design, Gazebo simulation, MoveIt 2 motion planning, and AI object detection on hardware.
- Developed multi-mode locomotion (swerve, differential, Ackermann) with velocity-based IK, real-time ROS2 control, and PS5 DualSense teleoperation.

Kit Manipulador | *ROS2, MoveIt 2, micro-ROS, Gazebo, Raspberry Pi Pico W* | github **2024**

- 4-DOF robotic arm with full ROS2 + MoveIt 2 motion planning pipeline, Gazebo simulation, and real hardware integration via micro-ROS on Raspberry Pi Pico W.

PUCP Intelligent Robotics Group | *Reinforcement Learning, AWS DeepRacer, ROS2* **Mar. 2024 – Present**

- Autonomous navigation training with RL on AWS DeepRacer; developed ROS2-controlled arm for autonomous chess playing with CV-based piece detection.

Achievements

AI Competition - Build with Gemma | *1st Place* **2026**

- Achieved **1st place** in Google's AI Competition - Build with Gemma by developing a multimodal edge AI system that transforms a smartphone mounted on a mobile robot into its onboard brain and sensor platform, leveraging the device's camera and integrated sensors for robot control and multi-agent communication in post-disaster search and rescue operations.

RoboCup ARM Challenge | *3rd place* **2026**

- Achieved **3rd place** at the RoboCup 2026 World Championship (Incheon, South Korea), developing an autonomous robot arm pipeline with RGB-D point cloud perception, object classification, and pick-and-place manipulation using MATLAB/Simulink and a UR5e.

AI for Industry Challenge (Intrinsic) | *Top Qualifier* | github **2026**

- Developed a vision-based fiber optic connector insertion policy for a UR5e robot, achieving ˜224/300 in the qualification phase. YOLOv8-Pose keypoint detection, solvePnP 6-DOF pose estimation with multi-camera fusion, and impedance-controlled spiral insertion with F/T snap detection. Additionally explored OpenVLA as an alternative VLA-based policy approach.

Aspire Leaders Program | *Cohort 2, Harvard University* **2026**

- Selective leadership development program at Harvard University for emerging global leaders, focusing on professional growth, systems thinking, and social impact.

Desafíate PUCP | *Innovation Contest Winner* **2022**

- Led team of 4 to win PUCP's health innovation contest with Wayky, an AI virtual assistant for university student wellbeing.

Innova and Business Fest PUCP | *2nd and 3rd Place* **2023**

- Presented AR applications for Interbank (virtual navigation, 2nd place) and Cálidda (pipe/valve detection, 3rd place).