Romeo Garcia Jr.

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PROFESSIONAL EXPERIENCE

Application Engineer, ***Apptronik*** – *Austin, TX* July 2025 – Present

- Supported mechanical design, integration, and validation workflows for humanoid robot systems by modifying large-scale Onshape assemblies with 2,000+ components and preparing robot models for downstream analysis and testing.
- Implemented hands-on mechanical and electrical improvements to the A2 wheeled-base prototype, improving robot reliability and serviceability during testing and operation.
- Evaluated A2 wheelbase tipping limits under static, acceleration, and deceleration loading cases to inform safe operating constraints and improve deployment reliability.
- Designed an executive-approved static display stand for gantry-less humanoid operation, including mechanical analysis, bolt selection, and safety considerations for user-facing demonstrations.
- Conducted pre-deployment validation and acceptance testing of robot systems, rigging setups, data workflows, and customer use cases to identify and close readiness gaps before field operation.
- Debugged hardware failures across hands, actuators, and harnesses, restoring robot functionality and communicating failure observations back to engineering teams for design and reliability improvements.

Test Engineering Intern, ***Aeromutable Corporation*** – *San Diego, CA* June 2022 – Sep 2022, June 2023 – Sep 2023

- Built a Python-based real-time data acquisition tool and analyzed full-scale experimental data to identify performance trends and support field operational adjustments.
- Designed and sourced test hardware, including fuel-consumption measurement devices and reliable power-system components.

Course Assistant**,** ***ME 170A/B/C Mechanical Engineering Capstone Design –*** *Stanford, CA* Sep 2024 – June 2025

- Advised student teams on mechanical design, system integration, prototyping, ethics, and technical communication for real-world engineering systems.

Research Intern, ***CHARM Lab*** – *Stanford, CA* Jan 2023 – Mar 2023

- Developed an Arduino-based human-interface system using directional vibrotactile cues to guide motion, connecting sensing, actuation, and human motor response.

PROJECT EXPERIENCE

CNC Design and Manufacturing of Bottle Opener and Ice Press March 2024 – May 2024

- Designed and CAM-programmed a Tron-inspired bottle opener (FEA-verified) and an aluminum ice press with organic surfaces, using Fusion 360's Form, Design, and Manufacturing tools, and fabricated parts on a Haas CNC.

Cleaning Assistant Robot for the Elderly (C.A.R.E) (CS225A), *Stanford University* March 2025 – Jun 2025

- Designed and validated an assistive torso-cleaning robot using a Franka arm, RGB-D perception, force sensing, and compliant control to safely maintain gentle contact during human-centered cleaning tasks.

Embedded Autonomous Mobile Robot (ME 218B), *Stanford University* Jan 2025 – Mar 2025

- Designed and programmed an embedded autonomous robot using dual PIC32 microcontrollers with SPI communication, integrating real-time sensor processing, distributed motor control, a four-bar linkage lift, and a magnetic end effector to pick, transport, and deposit objects with reliable calibration and task execution.

ROS-Based Autonomous Exploration and Object Detection (CS 237B), *Stanford University* Sep 2024 – Dec 2024

- Developed a ROS2 autonomy stack for TurtleBot navigation, integrating A* path planning, frontier exploration, mapping, perception, and RViz visualization in a structured test environment.

EDUCATION

Stanford University, *Stanford, CA*
M.S. in Mechanical Engineering – Mechatronics, Robotics | June 2025
B.S. in Mechanical Engineering – Product Realization | June 2024

SKILLS

Simulation & Robotics: ROS2, RViz, MuJoCo, Isaac Sim, URDF, MJCF, USD, robot workcells, teleoperation
Mechanical Design: Onshape, SolidWorks, Fusion 360, CAD, CAM, FEA
Hardware & Prototyping: sensors, actuators, harnesses, 3D printing, CNC machining, soldering, Arduino, Raspberry Pi, PIC32,
Programming: Python, C/C++, MATLAB, Git