

JANMESH PATEL

Robotics Software Engineer | C++17 | Python | ROS 2 | Linux | Teleoperation | Embedded & Networking

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U.S. Permanent Resident | No Sponsorship Required | Open to Relocation and Customer-Site Travel

PROFESSIONAL SUMMARY

Robotics software engineer building and debugging end-to-end robot systems across C++17, Python, ROS 2, Linux, embedded systems, sensors, networking, and real hardware. Built low-latency teleoperation and safety-bounded motion systems; optimized video and network performance under jitter and packet loss; integrated LiDAR, cameras, LTE/Wi-Fi, charging, firmware, and electronics on autonomous mobile robots. Combines field integration experience with founder-level R&D ownership and rapid prototype-to-test execution.

SELECTED ROBOTICS PROJECTS

Low-Latency Robot Teleoperation & Constrained IK Stack | C++17, ROS 2, Jetson Orin Nano, RealSense D435, Isaac Sim

Oct 2026

- Built a 100 Hz marker-driven Franka teleoperation stack across Jetson Orin Nano and Isaac Sim, achieving 65 ms p50 / 117 ms p95 camera-to-arm response, 10.1 ms p99 control-loop period, and zero overruns across logged sessions.
- Diagnosed unstable Wi-Fi (43.4 ms average ping, 85 ms jitter), moved control traffic to USB-C networking (0.35 ms average, 0.21 ms jitter), and reduced command-to-motion p50 from 158 ms to 30 ms through step-response testing and drive retuning.
- Designed deterministic safety supervision for e-stop, stale robot state, following error, joint limits, marker loss, and controlled ramp-down; injected delay, jitter, 5-20% packet loss, and total link cuts with latched recovery behavior.
- Added operator video and synchronized episode capture; JPEG reduced bandwidth from 30.8 to 0.98 Mbit/s with about 1.4 ms encode/decode cost while logging camera, joint, command, pose, and safety-state data.
- Implemented custom Franka FK/Jacobian and damped-least-squares IK with adaptive singularity damping, null-space joint-limit avoidance, velocity limits, and automated gtest validation.

Terrain-Aware Autonomous Navigation & Vehicle Safety Stack | ROS 2, C++, Python, Nav2, CAN, Isaac Sim

Sep 2026

- Built a C++ Nav2 costmap plugin converting 3D LiDAR into slope, roughness, height-step, and obstacle costs, plus a Python safety arbiter for autonomy/teleoperation, e-stop, localization/odometry health, timeouts, controlled stopping, and event logging.
- Implemented simulated CAN/DBC drive interfaces with CRC-8, rolling counters, heartbeats, ECU watchdogs, fault injection, explicit re-arm behavior, and gtest/pytest evaluation; terrain-aware configuration cut median recoveries from 20 to 3 and route time from 318 to 113 s.

PROFESSIONAL EXPERIENCE

Aetherion Robotics | Founder

Mar 2026 - Present

- Self-funded robotics R&D across NVIDIA Isaac Sim, autonomous ground-vehicle concepts, sensor-driven experiments, navigation risk, motion planning, and system-level validation; own technical direction from concept through test.
- Designed R&D PCBs/schematics, performed board bring-up and Jetson Orin Nano integration, and troubleshoot interfaces across electronics, firmware, sensors, communications, and software.

Clearpath Robotics by Rockwell Automation | Robotics Specialist & R&D Technician

Jan 2024 - May 2025

- Tested and troubleshooted autonomous mobile robots with ROS 2/Linux, isolating failures across software, firmware, communications, sensors, drivers, power, and electromechanical hardware.
- Integrated LiDAR, cameras, long-range Wi-Fi/LTE, wireless charging, and customer-specific hardware on Husky A300; performed LiDAR roll/pitch/yaw calibration, multi-sensor alignment, and supported firmware/driver adjustments.
- Assembled PCB/electromechanical systems to ± 0.0762 mm and improved assembly efficiency by 50% through tooling and workflow changes.

ADDITIONAL ENGINEERING & LEADERSHIP

Embedded & Robotics Systems Development | Professional Development

Aug 2025 - Feb 2026

- Built STM32/FreeRTOS and Embedded Linux projects covering deterministic multitasking, synchronization, SPI+DMA logging, telemetry, fault handling, task profiling, pthreads, Linux PWM, signal handling, and finite-state-machine control; verified zero memory leaks on BeagleBone Black with Valgrind.

The Roar Robotics | Electronics & Programming Head / Robocon Integration Lead

Sep 2018 - Jun 2021

- Led firmware/electronics integration for 10+ members using STM32, Arduino, Raspberry Pi, sensors, actuators, UART/I2C/SPI, state machines, and custom PCBs; team reached Robocon national finals and earned 50+ competition wins.

TECHNICAL SKILLS

Programming & Systems: C++17, C, Python, Linux, Git, Eigen, multithreading, gtest, pytest, real-time systems, latency/jitter profiling | **Robotics & Control:** ROS 2, Nav2, Isaac Sim, Gazebo, teleoperation, FK/Jacobian, DLS IK, motion planning, SLAM, navigation, AMRs | **Embedded & Integration:** Jetson Orin Nano, STM32, FreeRTOS, Embedded Linux, CAN/DBC, TCP/UDP, SPI, I2C, UART, DMA, PCB/schematic design, board bring-up, oscilloscope, logic analyzer | **Sensors & Data:** RealSense D435, LiDAR, cameras, OpenCV, Fast DDS, chrony, rosbag2/MCAP, TensorFlow exposure

EDUCATION

University of Guelph | MEng, Systems and Computing

Jan 2022 - Apr 2023

G H Patel College of Engineering & Technology | BE, Mechatronics, Robotics & Automation Engineering

Aug 2017 - Jun 2021