

Amin Ahmed G

Chennai, India — +91 8122241705 — aminahmedg2005@gmail.com — [GitHub: Amin-Ahmed-G](https://github.com/Amin-Ahmed-G) — [LinkedIn: amin-ahmed-g](#)

PROFESSIONAL SUMMARY

Detail-oriented Robotics & Automation engineering student (Expected 2027) with practical experience in ROS 2, Gazebo simulations, and low-latency systems programming in Rust and C++. Proven capability in designing real-time network watchdogs, tuning PID control loops on STM32 microcontrollers, and deploying warehouse automation solutions.

EDUCATION

B.E. Robotics and Automation — Anna University Expected 2027
Coursework: Control Systems, Embedded C, Robot Kinematics, Sensors & Instrumentation, Microprocessors

TECHNICAL SKILLS

Frameworks: ROS 2 (Jazzy, Humble), Gazebo, Nav2, SLAM, MoveIt
Languages: C, C++, Python, Rust, Bash
Hardware: STM32, Raspberry Pi, ESP32, Lidar, PID Control, UART/I2C/SPI
Design: Fusion 360, SolidWorks, EasyEDA, KiCad
Tools: Linux, Docker, Git, STM32CubeIDE, CODESYS

WORK EXPERIENCE

- Karthikesh Robotics (KKR)** — Chennai 2026 — 20 Days
- Developed Gazebo (gz) simulations and autonomous mobile robot (AMR) project configurations for multi-robot navigation and controller testing.
- Robonetics Automation Solutions LLP** — Chennai 2025 — 21 Days
- Worked with JAKA cobots, picked up SolidWorks basics, and saw how AGV/AMR systems are deployed in a real warehouse environment.
- Drone Technology Internship** — NSIC Technical Services Centre, Chennai 7 Days
- Assembled and disassembled an agricultural drone frame; did basic CATIA modeling and learned UAV construction fundamentals.

PROJECTS

- RoboShield: RTPS/DDS Security Watchdog** — Rust, libpcap 2026 / Ongoing
- Developed a low-latency, out-of-band Network Intrusion Detection System (NIDS) in Rust to inspect raw RTPS/DDS packets.
 - Designed a zero-allocation, endianness-aware parser that extracts participant GUIDs and topic ParameterLists from UDP streams.
 - Achieved an average processing latency of **1.36 microseconds** ($\approx 734k$ packets/sec), supporting strict real-time control loops.
 - Implemented sliding-window rate tracking to detect high-frequency topic floods and unauthorized publisher injection.
- AMR Leader-Follower Formation Control** — ROS 2 Jazzy, Gazebo Harmonic, C++ 2025
- Engineered a multi-robot AMR formation control system in ROS 2 Jazzy with 20 Hz C++ (rc1cpp) breadcrumb tracking and TF2 transform buffering.
 - Implemented real-time 2D LiDAR obstacle avoidance using artificial potential fields (repulsive and tangential forces) with hysteresis filtering.
 - Integrated robot_localization EKF sensor fusion, Nav2 AMCL localization, and gz_ros2_control kinematic loops in Gazebo Harmonic.
- ROS 2 Mobile Robot Simulations** — mecanum_bot & two_wheel_robot 2025
- Modeled, simulated, and configured controller architectures for differential drive and mecanum wheeled mobile robots in ROS 2 Jazzy and Gazebo Harmonic.
 - Integrated LiDAR sensor plugins, configured joint state broadcasters and diff-drive controllers, and implemented Python-based waypoint followers.

LEADERSHIP

- Event Organizer** — Line Follower Robot Competition 2024
- Wrote the rulebook and designed the track for our university LFR competition.
- Linux System Optimization** Ongoing
- Set up and maintained my own Ubuntu/Hyprland environment tuned for robotics work — low latency, minimal overhead.