

Yusuf Guenena

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EDUCATION

Wayne State University

M.S. Robotics Engineering (Intelligent Control) | GPA: 4.0

Detroit, MI -- Expected May 2027

American University of Sharjah

B.S. Electrical Engineering | Minor: Computer Engineering | Best Senior Design Presentation Award

UAE

SKILLS

Robotics & Autonomy: ROS 2 (Humble/Jazzy), ROS 1, Nav2, SLAM, ros2_control, multi-sensor fusion, costmap layers, tf2, Gazebo, URDF, lifecycle nodes

Perception & ML: PyTorch, YOLOv8, OpenCV, RGB-D depth fusion, 3D position estimation, LSTMs, computer-vision pipelines, sim-to-real transfer

Controls & Embedded: C++17 real-time control loops, finite-state machines, closed-form inverse kinematics, PID, industrial robot integration, robotic welding cells, PLC I/O & safety interlocks, SPI/I2C/UART, embedded Linux, Jetson Orin

Languages & Tools: C++17, Python 3, MATLAB/Simulink, Bash | Git, CMake, Linux, Docker, RViz, Fusion 360, 3D printing

EXPERIENCE

CARES Lab, Wayne State University -- Graduate Researcher

Detroit, MI | Jan 2025 - Present

ROS 2, ROS 1, da Vinci Research Kit (dVRK), C++, Python, surgical robotics

- Built VR-teleoperation and learning-based control experiments in simulation with dVRK-compatible action and observation interfaces, so policies trained in sim transfer directly onto the physical surgical robot.
- Co-authored a research paper with the lab's principal investigator on natural-language voice control of robots, contributing the cross-platform study that showed the offline speech-to-command pipeline validated on the da Vinci surgical robot carries over to a legged quadruped robot.

Spike Electric Controls -- Manufacturing & Automation Engineering Intern

Houston, TX | Jun-Jul 2026

- Became the robotics resource for a controls-integration shop standing up its first automated welding-robot cells, owning the integration engineering it had no dedicated robotics engineer for: work-cell layout, tooling and fixture interfaces, and the safety-interlock and I/O handshake between the robot controller and panel logic.
- Programmed and commissioned robotic weld paths and cycle sequences on live hardware, tuning motion, reach, and process parameters until the cell ran repeatable production welds, turning the manufacturing engineers' process intent into reliable robot behavior.
- Designed the industrial control panels behind the automation from one-line diagrams to fabrication-ready schematics, wiring diagrams, layouts, and bills of materials to UL 508A standards, resolving design-for-manufacturability issues with the floor to tighten the design-to-assembly handoff.

City Solar -- Automation Intern

Dubai, UAE | Jan-May 2025

- Drove the automation of the engineering team's weekly reporting pipeline, building a web data-entry tool that wrote field technicians' records straight into the reporting database and designed out the manual technician-to-engineer handoff entirely; also converted legacy 2D drawings into 3D models.

3W Networks -- Systems Engineering Intern

Dubai, UAE | Aug-Oct 2022

- Owned electrical load calculations for industrial oil and gas infrastructure and drove the factory-acceptance-test drawing review, keeping cross-functional technical documentation aligned across engineering teams.

ICONIC Plus Control Systems -- Electrical Engineering Intern

Dubai, UAE | Jun-Aug 2021

- Designed a KNX building-automation system integrating sensors, actuators, and control hardware across multiple subsystems, and built the operator interface used to commission and monitor it live.

PROJECTS

GO2 Seeing-Eye Dog -- Full Autonomy Stack (M.S. Thesis)

github.com/yusufdx/GO2-seeing-eye-dog

C++, Python, ROS 2, Nav2, SLAM, LiDAR, RGB-D, IMU, GPS, Jetson Orin

- Architecting a complete outdoor autonomy stack on a physical quadruped robot, fusing LiDAR, depth, inertial, and GPS into a single localization and motion-planning system that holds up outside the lab on embedded GPU compute.
- Designed the safety-critical perception layer that reads stairs, curbs, drop-offs, and narrow passages from depth imagery and steers the planner around them in real time, then extended it with audio-visual grounding so the robot can infer who is calling it and navigate to that person under hard safety constraints.

GO2 Perception-to-Navigation -- 3D Object Tracking

github.com/yusufdx/ros2-go2-nav2-yolo

Python, ROS 2, YOLOv8, PyTorch, RGB-D, OpenCV

- Took object detection from raw data to a deployed model running on a physical robot outdoors, owning the full pipeline end to end: collection, labeling, training, and on-robot inference.
- Built the 3D perception path that lifts 2D detections into metric positions in the robot's own frame, then closed the loop so the robot replans around moving targets in unstructured terrain.

Phoenix -- Closed-Loop Sim-to-Real Learning for a Quadruped

github.com/yusufdx/go2-phoenix

Python, Isaac Lab, Reinforcement Learning, ROS 2, ONNX, Jetson Orin

- Built a training loop that carries a walking policy from simulation onto the physical robot, records the failures that only appear on hardware, and retrains against them, so every deployment sharpens the next policy instead of restarting the tuning process.
- Trained a standing controller that succeeded in all 32 simulated trials, shipped it through an automatic safety layer that verifies the deployed model matches the trained one, then ran the full pipeline live on the robot and traced the remaining gap to a motor slew-rate limit the simulator had never reproduced.

HELIX -- Self-Healing ROS 2 Middleware

github.com/yusufdx/helix

Python, ROS 2, Lifecycle Nodes, CycloneDDS, FastAPI

- Built fault-detection-and-recovery middleware that watches a live robotics system and acts on anomalies as they happen, benchmarked at 46,000 samples per second with sub-millisecond latency.
- Designed the automatic recovery layer (restart, reroute, escalate) on a lifecycle-node architecture with a persistent fault history for post-mortem analysis and adaptive response.

RADAR -- Medical Telepresence Robot

github.com/yusufdx/RADAR-Telepresence-Robot

Python, ROS 2, MAX30102, Qt6, OpenCV, TurtleBot3, SLAM

- Built a modular medical telepresence robot end to end: teleoperation, live pan-tilt video, onboard pulse and SpO2 monitoring, and a custom operator console for a remote clinician.