# Sherif Fathey Mohamed


Robotics Software Engineer

ROS 2 | Autonomous Navigation | SLAM

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## Professional Summary


Robotics Software Engineer with 2+ years of experience developing and deploying autonomous mobile robot systems. Specialized in ROS 2-based autonomy, with proven experience in navigation, localization, and system integration.

Open-source contributor to Nav2, with a custom costmap plugin featured in its official documentation.


## Professional Experience

**Arche Robotics**

Software Robotics Engineer (Full-Time) Feb 2025 – Present | Turkey (Remote)

- Developed an AprilTag-based autonomous docking system using ROS 2 and Behavior Trees, enabling automated charging workflows.
- Designed Behavior Tree-based autonomy workflows integrating Nav2 navigation, task scheduling, and system health monitoring with fault handling.
- Extended the Nav2 Virtual Costmap Layer plugin with per-element cost configuration and runtime control interfaces for dynamic navigation management.
- Implemented SLAM and localization pipelines using `slam_toolbox`, AMCL, and EKF-based sensor fusion to improve robot localization and state estimation.
- Integrated Gazebo simulation with `ros2_control` and developed deployment tools to streamline robot configuration, testing, and deployment.
- Enhanced a Debian-based CLI tool for automated robot configuration and deployment.

**Arabian Robotics and ROS Meetup** Feb 2024 – Present

Lead Robotics Instructor & Technical Mentor (Voluntary)

- Led hands-on training and mentoring programs covering ROS/ROS2, Linux, and advanced robotics concepts for engineers.
- Designed and delivered practical workshops on ROS communication interfaces, URDF modeling, Gazebo simulation, and BehaviorTree.CPP implementation.

**VALEO Automotive** Sep 2023 – Jan 2024

Graduation Project Mentor

- Mentored the development of a real-time Driver Monitoring System using MediaPipe, achieving 95% accuracy in drowsiness detection and face recognition on Raspberry Pi 5.
- Guided the integration and embedded deployment of facial recognition for vehicle access control, including mobile alert functionality and performance optimization.

## Core Competencies

**Autonomous Robotics & Navigation:** ROS 1, ROS 2, Nav2, MoveIt 2, SLAM, AMCL, Localization, Path Planning, Behavior Trees, SMACH, Sensor Fusion (EKF), Multi-Map Navigation, Autonomous Docking.
**Simulation & Hardware:** Gazebo, URDF, NVIDIA Jetson, Raspberry Pi, LiDAR, RGB-D Cameras, IMU, Arduino.
**Programming Languages:** C++17, Python 3, JavaScript, TypeScript, Bash.
**Desktop & GUI Development:** Qt, React, Electron, Vite, Tailwind CSS.
**Web Development:** HTML, CSS, WebSocket.
**Development Tools & Platforms:** Git, CMake, Docker, GitHub Actions, Debian, Cubic, Ubuntu, Linux,

## Education

**Ain Shams University**, M.Sc. in Mechanical Engineering (Mechatronics and Robotics Engineering) 2025 – 2027

**Sinai University**, BSc. Mechatronics Engineering 2019 – 2024

## Projects

**BTick** Oct 2026 Video, BTick Docs

- Developed an open-source, real-time monitoring and debugging platform for BehaviorTree.CPP v4, featuring interactive tree visualization, execution tracking, and multi-protocol support for BTick, Groot2, and Nav2.
- Implemented interactive debugging capabilities, including breakpoints, step execution, runtime port modification, live Blackboard editing, and fault injection without stopping tree execution.

**VirtuLayer** Aug 2026 Live Demo, Github

- Developed a web-based editor for creating and managing virtual costmap layers in ROS 2 navigation systems, with interactive map editing tools for defining virtual regions and geometric elements.
- Implemented YAML configuration generation to export virtual layer definitions for integration with the Nav2 Virtual Costmap Layer plugin.

**Nav2 Virtual Layer** Jan 2026 Video, Nav2 Docs

- Developed a custom Nav2 Costmap Layer plugin that integrates configurable virtual regions and geometric elements into the navigation costmap.
- Implemented per-element cost configuration and runtime control interfaces, enabling dynamic updates to virtual navigation constraints without restarting the navigation stack.

**SDF2MAP** Oct 2025 Video , Github

- Developed SDF2MAP, a tool for extracting environment geometry from Gazebo Simulation Description Format (SDF) files and converting it into 2D occupancy grid maps.
- Implemented map generation and export capabilities to support integration with ROS 2 navigation workflows and Nav2.

**ElevoRaBot** Aug 2025 Video

- Developed a multi-floor autonomous navigation system for mobile robots, integrating elevator operations with ROS 2 and Nav2.
- Implemented Behavior Tree-based task coordination to manage navigation between floors, elevator interactions, and autonomous mission execution.

**Multi-Map Navigation System** Apr 2025 Video , Github

- Developed a ROS multi-map navigation system with an Action Server to manage map selection and switching during autonomous robot operation.
- Integrated SQLite for map metadata management and implemented localization transitions to support navigation across multiple environments.