

# MUSTAFA SEPEN

## ROBOTICS SOFTWARE ENGINEER | AUTONOMOUS SYSTEMS

mustafaspn@hotmail.com | [sepen.dev](#) | [GitHub](#) | [LinkedIn](#) | Istanbul, Türkiye

### PROFILE

Robotics Software Engineer focused on autonomous navigation, localization and field robotics. Hands-on experience developing autonomous ground and surface vehicles with ROS 2, integrating RTK GNSS, sensor fusion, navigation, embedded motor control and operator tooling. Experienced across the robotics stack from low-level hardware integration to autonomous navigation on physical vehicles.

### CORE SKILLS

|                                   |                                                                                                      |
|-----------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Robotics</b>                   | ROS 2 Humble, Nav2, autonomous navigation, waypoint missions, Pure Pursuit, A*, state machines, TF   |
| <b>Localization &amp; Sensors</b> | RTK GNSS, dual-antenna heading, NTRIP, EKF sensor fusion, robot_localization, IMU, LiDAR, ZED camera |
| <b>Programming</b>                | C++, Python, C, Linux, FastAPI, WebSocket                                                            |
| <b>Embedded &amp; Systems</b>     | ESP32-S3, STM32H7, Raspberry Pi 5, micro-ROS, Ethernet/UDP, motor control, hardware integration      |
| <b>Perception</b>                 | OpenCV, YOLO, CUDA, stereo/depth camera integration                                                  |

### PROFESSIONAL EXPERIENCE

#### Swegeo | Robotics Engineer · Sep 2025 - Present

- Develop autonomous ground-vehicle systems across ROS 2 software, embedded control, localization, vehicle integration and operator tooling, with deployment and testing on physical platforms.

#### Pathfinder - Multi-Platform Autonomous UGV | [GitHub](#)

- Developed one ROS 2 Humble autonomy architecture adapted across three physical UGVs: a tracked skid-steer platform, a 4x4 differential-drive rover and an Ackermann RC crawler, with vehicle-specific kinematics, sensors and tuning.
- Integrated RTK GNSS and dual-antenna heading with IMU data through dual-EKF robot\_localization pipelines; implemented Nav2 waypoint navigation, NTRIP correction handling, micro-ROS motor-control interfaces and a FastAPI/WebSocket mission console for field operation.

#### STM32H7 ROS 2 UDP Link | [GitHub](#)

- Developed and benchmarked a ROS 2-to-STM32H723 Ethernet/UDP motion-control link: 300 µs median C++ host RTT, 600,000 packets at 1 kHz with zero packet loss and zero out-of-order packets.
- Implemented the embedded communications path for deterministic low-latency robot control and measured approximately 28 µs MCU processing time with low MCU CPU utilization.

#### Baykar | Simulation Systems - R&D; · Feb 2025 - Jun 2025

- Developed and evaluated moving-object detection approaches for UAV footage using classical OpenCV methods, including background subtraction and optical-flow experiments, followed by C++/CUDA/OpenGL experimentation.
- Integrated YOLO11n and compared learning-based and classical computer-vision approaches in terms of detection performance, accuracy and real-time suitability.

### SELECTED AUTONOMOUS SYSTEMS & COMPETITIONS

#### Njord - NTNU International USV Competition | Autonomous Systems Team | Norway · Aug 2025 | [GitHub](#)

- Contributed to a ROS-based autonomous surface vehicle for the Njord Challenge using ZED camera data, YOLO, A\* route planning, Pure Pursuit path tracking, mission state machines and ROS sensor/data integration.
- Worked as part of Team Navi, which placed 4th among 11 international teams in Trondheim.

#### Teknofest - Unmanned Surface Vehicle Competition | Finalist · Oct 2024

- Contributed across the autonomous USV stack using ROS, ZED camera and YOLO for perception, A\* for route planning and Pure Pursuit for path tracking; received the Most Original Software Award.

### EDUCATION

#### Bahcesehir University | B.Sc. Computer Engineering - Full Scholarship · 2020 - 2025

GPA: 3.15/4.00 (Honor Degree) | YKS-SAY Rank: 4,753

### EARLIER EXPERIENCE

**Telcoseit | Network Intern** · Jul 2024 - Aug 2024 - Configured and troubleshot Cisco switches, routers and network infrastructure.

**Fortune Mine Games | Game Developer Intern** · Aug 2023 - Oct 2023 - Built a 2D Unity mobile word game with UI, game mechanics and Firebase authentication/database integration.

**Additional:** Paradoks Finance - Content Creator (2020-2022); EMAAR Mall Skyview - Photographer & Editor (2022-2023).

### INTERESTS

Field robotics, autonomous systems, drums, cycling, specialty coffee and reading.