

Tolgahan Gergin

Mechatronics Engineer



• Kocaeli, Türkiye • +90 545 375 24 12 • tolgahangergin@gmail.com • <https://www.linkedin.com/in/tolgahangergin/>

PROFESSIONAL SUMMARY

Mechatronics Engineer with extensive hands-on experience in autonomous robotics, hardware-software validation, and AI-driven automation systems. Proficient in end-to-end testing of AMRs/AGVs, sensor integration (LiDARs/cameras), ROS ecosystems, PLC and industrial communication networks. Combines a strong technical background in real-time control and predictive maintenance with a proven track record of optimizing industrial processes and deploying production-ready AI solutions.

EXPERIENCE

Autonomous Mobile Robots (AMR) Test Engineer | August 2025 - Present

Bluepath Robotics - Kocaeli, Türkiye

- Configured and programmed SICK safety PLCs for overall vehicle safety logic,
- Tested and calibrated safety and SLAM-based LiDARs (SICK, Hesai, Hokuyo, Leuze) and depth cameras (Intel RealSense D435i).
- Tuned and tested industrial motor drivers and controllers (Kinco, Zapi, Roboteq and miControl).
- Executed charge/discharge, thermal, and inrush current tests on batteries such as Pilsan, Birikim, Yiğit Akü, Inventus, Solion, Trojan and tuned chargers Delta-Q and Zivan SG3/NG3/NG5.
- Debugged and monitored ROS/ROS2 application nodes deployed via BalenaOS, utilizing ROS for live data visualization, error logging, and system diagnostics.
- Executed integration and interoperability tests for VDA5050 compliance, utilizing MQTT to monitor robot communication and managing fleet control via OpenTCS, SYNAOS, and CSS platforms.
- Configured Siemens Scalance and Moxa infrastructure for industrial wireless communication, and conducted comprehensive in-vehicle CAN-bus networking tests across hardware.

Robotics Engineer | March 2025 - August 2025

Onna Robotics - Izmir, Türkiye

- Working on AI-driven robotic systems, focusing on autonomous control, sensor integration, and real-time data processing in industrial inspection applications.

Erasmus+ Engineering Intern | October 2024 - February 2025

HetBot, Lodz University of Technology - Lodz, Poland

- Conducted market research and evaluated suitable LiDAR, camera, and radar sensors for object detection in an outdoor autonomous mobile robot.
- Researched and documented sensor testing procedures for validation and real-world performance assessment.
- Trained and deployed a YOLOv8 model on a Luxonis OAK-D Pro stereo camera for real-time object detection.

Maintenance Trainee | December 2023 - June 2024

Ferrero - Manisa, Türkiye

- Performed maintenance on mechanical and electrical systems in Nutella and Kinder production lines.
- Developed PowerBI dashboards and executed SAP projects for maintenance processes optimization.
- Designed 3D/2D mechanical components using SolidWorks and AutoCAD for production line improvements.

DigiConnect Intern | December 2023 - June 2024

Norm Group - Izmir, Türkiye

- Developed an 'AI-Supported Corporate Memory System' using Python and ChatGPT API (3.5 Turbo & GPT-4) to optimize machine troubleshooting.
- Collected and structured maintenance data from SAP and ProManage for AI model training.

EDUCATION

Master of Science in Robotics Engineering (%100 English) | February 2025 - Present

Izmir Katip Celebi University

Bachelor of Science in Mechatronics Engineering (%100 English) | September 2020 - July 2024

Izmir Katip Celebi University

- Graduated with a Certificate of Achievement, ranking first in the Mechatronics Engineering Department.
- GPA: 3.40/4.00

SKILLS

- **Software & Programming:** Python, MS Excel, SAP, PowerBI, Autodesk Inventor, Simulink-MATLAB, AutoCAD, Siemens SinuTrain, Proteus
- **Robotics & Middleware:** ROS/ROS2, BalenaOS, MQTT, VDA5050, SLAM & Path Planning, Fleet Management (OpenTCS, SYNAOS, CSS)
- **Hardware & Sensors:** SICK PLC, 2D/3D LiDARs (SICK, Hesai, Hokuyo, Leuze), Depth Cameras (Intel RealSense D435i, ZED2), Motor Drivers (Kinco, Zapi, Roboteq, miControl), Batteries (Pilsan, Birikim, Yiğit Akü, Inventus, Solion, Trojan), Chargers (Zivan, Delta-Q)
- **Industrial Networking:** CAN-bus, Siemens Scalance, Moxa
- **Certification:** Matlab Onramp-MathWorks, AutoCAD:Training Set from Zero to Expertise

LANGUAGES

English, B2 - Fluent Speaking and Reading, Proficient in Writing

PROJECTS

Design and Navigation Control of Autonomous Mobile Robots (AMR)

Graduation Project I September 2023 - June 2024

- Implemented MATLAB-Simulink-based PID control on Arduino Mega with BTS7960B motor driver for precise motor control.
- Used ZED2 stereo camera for 3D pre-mapping and YOLO-based object detection in environment.
- Implemented Particle Filter and Triangulation algorithms for real-time localization.
- Applied the A* algorithm for path planning.
- Developed Python-based software running on NVIDIA Jetson Xavier.

2-DOF Serial Arm Control in Real Time

Real Time Control Course Term Project | January 2024 - May 2024

- Developed real-time control using MATLAB App and Simulink with PID tuning for precise motor control.
- Implemented real-time encoder data acquisition via Arduino.
- Achieved high accuracy in end-effector tracking using OptiTrack camera monitoring.

VOLUNTEERING

Tomorrow is Possible Program

Sabancı Group | October 2023 - March 2024

Participating in 'Tomorrow is Possible Program' by Çimsa, Enerjisa, SabancıDx, and Sabancı University, developed digital skills and gained career insights.

R&D Team Member

IKC Racing Formula Student Team | January 2023 - September 2023

Contributed to the development of an electric Formula 1 car as a member of the IKC Racing R&D team.

HOBBIES

- 3D Modelling
- Finance & Investment
- Autonomous Vehicle Technologies