

BERAT BARAN BALCI

Electrical-Electronics Engineer (B.Sc., expected Jan 2027) · Robotics & Embedded Systems

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Available full-time from January 2027

PROFILE

Final-year Electrical-Electronics Engineering student building an autonomous mobile robot with ROS 2, LiDAR and depth cameras in the automation lab of the University of Ferrara. Hands-on experience across the full autonomous-systems stack: sensors and analog front-ends, embedded firmware (ESP32, flight controllers), edge computing on NVIDIA Jetson, and ROS 2 mapping and navigation. R&D internship at ASELSAN, Turkey's largest defence electronics company. Looking for an engineering role in robotics, industrial automation or embedded systems.

TECHNICAL SKILLS

Robotics & Autonomy: ROS 2 (Jazzy), Nav2 (MPPI), slam_toolbox, AMCL, RViz2, Gazebo, ros2_control

Perception & AI: LiDAR (Hokuyo), Intel RealSense D435, Point Cloud Library (PCL), OpenCV, TensorFlow, scikit-learn

Embedded & Hardware: NVIDIA Jetson Orin Nano, Raspberry Pi, ESP32 (micro-ROS), Arduino, Pixhawk / Orange Cube, analog signal conditioning (AD620), hardware-in-the-loop testing

Programming & Tools: C/C++, Python, Linux (Ubuntu), Docker, MATLAB

Languages: Turkish (native) · English (B2) · Italian (beginner, studying)

EXPERIENCE

University of Ferrara – Automation & Robotics Lab

Sep 2026 – Jan 2027

Erasmus+ R&D Trainee, RIGA-AT project

Ferrara, Italy

- Developing a ROS 2 (Jazzy) navigation stack for the KELO Robile omnidirectional robot on an NVIDIA Jetson Orin Nano: slam_toolbox mapping, AMCL + Marvelmind indoor localization, Nav2 (MPPI) navigation.
- Integrated a Hokuyo URG-04LX LiDAR and an Intel RealSense D435 depth camera; designed a layered safety system with LiDAR and depth collision monitors, a velocity gate, a watchdog and a position-divergence monitor.
- Packaged the stack as a Docker image with a simulator, record/replay tools and a documented commissioning procedure (github.com/beratbalcibaran/kelo_docker).

ASELSAN & ASELSAN NET

Jun 2026 – Jul 2026 · Jul 2025 – Aug 2025

R&D Engineering Intern (two 2-month internships)

Ankara, Turkey

- Observed and supported R&D workflows in military communications, satellite communications and electronic warfare systems.
- Gained exposure to defence-grade design constraints (e.g., IP67 sealing) and to the verification discipline required for mission-critical electronics.

PROJECTS

AGROSPHERE – Autonomous Agriculture Ecosystem (TÜBİTAK 1812 grant)

Project Lead

- Led the system architecture of an agricultural platform combining a multispectral drone and a custom ground robot (UGV).
- Designed the electrical wiring and hardware layout of the mobile base and built 3D mechanical models in Blender; built the project's web platform for stakeholders.

Heavy-Duty Autonomous Ground Vehicle (UGV) – Hardware & Systems Engineer

Jan 2024 – Aug 2025

- Built an autonomous ground vehicle for payload transport with a carrying capacity of up to 300 kg.
- Designed the perception layer with LiDAR and environmental sensors; NVIDIA Jetson Orin Nano for high-level computing, Arduino/ESP microcontrollers for low-level motor and actuator control.

Autonomous UAV Systems – Embedded Developer

Nov 2025 – Feb 2026

- Developed software for Orange Cube / Pixhawk flight controllers to run autonomous flight missions.
- Implemented sensor fusion (Extended Kalman Filter) and navigation logic in C++ and Python.

EOG-Based Human-Computer Interface – Hardware & Firmware

Sep 2024 – Jan 2025

- Assistive device that lets people with motor disabilities control a computer cursor with eye movements and blinks.
- Designed the analog front-end (AD620 instrumentation amplifier, notch and band-pass filters) and real-time DSP firmware on ESP32 in C++.

Real-Time Speech Emotion Recognition

Raspberry Pi · Python · scikit-learn

- Embedded system that classifies emotions from voice tone using an MLP model on 322 acoustic features (Librosa), with voice activity detection and LCD/LED feedback.

EDUCATION

Hitit University – B.Sc. Electrical-Electronics Engineering

2024 – Jan 2027 (expected) · Çorum, Turkey

Akdeniz University – B.Sc. Electrical-Electronics Engineering (transferred)

2021 – 2024 · Antalya, Turkey