

MELEK MEMİŞ

Embedded Systems & Avionics Engineer

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SUMMARY

I am a Mechatronics Engineer with hands-on experience designing embedded flight-control systems, PCB hardware, and real-time firmware for aerospace and robotics applications. Completed an internship developing STM32-based flight control boards and a custom MAVLink communication library; independently designed and built a Ground Station Software and a real-time RTOS flight-control system used in national rocket competitions. Comfortable working across the full hardware-software stack, from schematic design to interrupt-driven embedded C.

EDUCATION

B.Sc. in Mechatronics Engineering

2021 – 2026

Düzce University

TECHNICAL SKILLS

Languages: C, C++, C#, Python

Embedded / RTOS: STM32, ARM Cortex-M4/M7, ESP32

Tools: Git/GitHub, Visual Studio, Solidworks, Fusion 360, STM32CubeIDE, Altium Designer

EXPERIENCE

Embedded Systems Intern

Feb 2026 – May 2026

Soylu Aerospace Technology Inc. — Düzce, Turkey

- Designed and developed an STM32-based Flight Control Unit (FCU) and Power Distribution Board (PDB) from scratch.
- Prepared ArduPilot hardware definition (hwdef) files to integrate the custom flight controller with ArduPilot firmware.
- Developed a platform-independent MAVLink-based communication library in C for cross-system telemetry and control.
- Contributed to ROS/MAVROS-based autonomous drone control by implementing high-level mission command handling (e.g., go-to-location, corridor traversal) and safety validation logic, converting user-defined parameters into safe flight commands.
- Participated in VTOL flight tests and represented the company at the SAHA EXPO 2026 defense and aerospace fair.

Avionics Team Lead / Board Member

Oct 2023 – Sept 2025

Aviation and Space Technologies Community

- Led avionics subsystem development for national rocket competitions, covering flight control software and ground station infrastructure.
- Built an STM32F407 + FreeRTOS real-time flight control system with a multi-task architecture handling IMU, barometer, GPS, LoRa telemetry, and SD logging concurrently; implemented DMA + UART Idle Line Detection for GPS parsing and per-sensor Kalman filtering to prevent false parachute-deployment triggers.
- Designed a custom binary telemetry protocol over LoRa and a C# Windows Forms ground station application for real-time flight data visualization.
- Placed 8th nationally at Teknofest High-Altitude Rocket Competition (2025) and 10th nationally at Teknofest Mid-Altitude Rocket Competition (2024).

Mentor

Dec 2024 – May 2025

Deneyap Technology Workshop — Düzce, Turkey

- Provided technical mentorship and system design guidance to students developing AI-themed engineering projects.

PROJECTS

STM32-Based FCU + 6S Power Distribution Board Stack

2026

- Designed a 216 MHz ARM Cortex-M7 flight control board with a dual-IMU architecture (BMI088 + ICM-42688-P), CAN bus, 5 UART lines, microSD logging, and 8 PWM outputs.
- Designed a companion power distribution board regulating 6S input to 5V and switchable 9V/12V rails, with INA240A1-based current sensing.

- Split power and signal circuits across two physically stacked boards to reduce EMI-induced sensor noise; both boards conform to a 30.5×30.5 mm standard mounting footprint.

STM32 + FreeRTOS Real-Time Flight Control Software

2025

- Built a multi-task RTOS architecture processing IMU, barometer, GPS, LoRa telemetry, SD logging, and flight-phase control concurrently on a single-core STM32F407.
- Implemented DMA + UART Idle Line Detection for interrupt-driven, low-overhead GPS data acquisition.
- Applied Kalman filtering with per-sensor tuning to reduce noise and prevent false parachute-deployment triggers; logged flight data to SD card via FATFS with safe closure on power loss.

Multi-Board CubeSat Communication & Power Monitoring Software

2026

- Designed a 4-board distributed embedded architecture (onboard computer, communication, sensor, and ground station boards).
- Implemented CAN bus inter-board communication and a LoRa downlink for data transmission.
- Team placed 1st at IREC (International Rocket Engineering Competition).

Ground-Up Real-Time Autopilot in C

2026

- Developing an independent, MAVLink-compatible autopilot for resource-constrained hardware without dependency on ArduPilot/PX4, with the official MAVLink C library integrated into a modular architecture.
- Building and testing a physical dual-motor PID control rig as a first validation step ahead of full flight testing.

Autonomous LiDAR-Mapping Rover with Robotic Arm

2025-2026

- Designed a grid-mapping navigation system with a custom TF Luna LiDAR mount and a cost-effective IMU-controlled rotation routine used in place of a slip ring.
- Integrated a robotic arm with forward kinematics; awarded TÜBİTAK 2209-A research project funding.

CERTIFICATIONS

- STM32F4 Discovery Board: ARM Programming from Scratch to Advanced Level — Udemy

LANGUAGES

- Turkish — Native
- English — C1
- Japanese — A2