Alp Sezer Orak

Senior Embedded Software Developer, Vilnius

Firmware for cellular GNSS trackers, BLE sensors and a health smartwatch.

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$ cv

Career

2022 – now

Senior Embedded Software Developer · Teltonika Telematics, Vilnius

- Platform maintainer and release owner for cellular GNSS tracker firmware: about 140 release tickets driven (firmware and app), base updates across about 15 customer branches. alporak.com/work/the-job
- Redesigned modem recovery and the RTOS task watchdog as one staged recovery, tested on five modem types. alporak.com/work/modem-recovery
- Cut MQTT record latency p90 from 4.06 s to 0.12 s for a large fleet. alporak.com/work/mqtt-latency
- Designed signed device unlock, salted password hashes and downgrade protection. Moved TLS to TLS 1.3, and built the EU CRA SBOM pipeline. alporak.com/work/security
- Built dual-APN networking and LTE-M recovery sequences together with modem vendors. alporak.com/work/ram-budget
- Traced 700 trackers sending zero coordinates to a fix flag that moved before NMEA was stable. alporak.com/work/zero-coords
- Found a GNSS race that left the receiver off for 5.5 h. GNSS commands went from 45 s to 3 s. alporak.com/work/gnss-honesty
- Bisected offline record loss on the device to a merge commit, and fixed an older delete edge case. Delivery went from 1 of 11 packets to 11 of 11. alporak.com/work/offline-loss
- Fitted 400 polygon geofences and a 10,000-entry driver ID list into trackers short of RAM. With the full list, boot went from about 100 s to under 30 s.
- Co-developed a React Native BLE sensor app with 14 store releases. alporak.com/work/cold-chain
- Built and own the device inventory app for R&D and QA test hardware, used company-wide since June 2026. alporak.com/work/inventory-app
- Smartwatch (C++): motion-tolerant heart rate, an event-log platform and an on-device test harness.
- Firmware for a heavy-vehicle tracker line, and tracker firmware that reads EN 12830 cold-chain recorders for their certification.
- About 567 tickets implemented, about 313 investigated and at least 25 research estimates. Vendor cases with modem and chip makers. Regularly stood in as team lead.

2019 – 2022

Electronics Engineer · DvM IoT Solutions, Ankara

- Ultra-low-power temperature monitor on ESP8266 that runs a year on one battery, using tuned deep sleep and I2C sensors.
- NB-IoT vibration analysis on LPC1517 with on-device FFT, for predictive maintenance.
- Modular low-level drivers and sensor integration for LPC1769, and a move of the legacy communication stack to Mbed OS with multithreaded Ethernet and a cloud link.
- Took part in CE certification, and designed the enclosure and a breakout board for its safety and EMI requirements.
- Firmware updates over the air and over USB. alporak.com/work/dvm

2015 – 2019

B.Sc. Electrical & Electronics Engineering · Eskişehir Technical University

- Thesis, in a team of four: a ground station that detects drones in no-fly zones with YOLOv3, and a drone that catches them. It won 1st place at the university project fair. alporak.com/work/thesis
- Erasmus+ exchange at VSB Technical University of Ostrava, 2017–18.

Daily C · C++17/20 · Python · RTOS: Nucleus, Zephyr, Keil RTX · Cellular modems, AT, PDP, FOTA · GNSS, NMEA · BLE · MQTT, TLS · J-Link, GitLab CI

Regular CAN, OBD-II, tachograph · RS232/485, Modbus, 1-Wire · I2C, SPI, UART, ADC · mbedTLS, TLS 1.3 · CppUTest, Ceedling, pytest · Ghidra, Wireshark, sniffers · Docker

Used on projects TypeScript, React Native · Kotlin, C#/.NET · FastAPI, Node.js · Mbed OS, FreeRTOS · Altium, KiCad · Fusion 360

Selected work

21 → 0 **One reset, two bugs, one of them in a closed library** `alporak.com/work/bt-leak`

5.5 h **GNSS off for 5.5 hours, and a cold start that lied** `alporak.com/work/gnss-honesty`

4.06 s → 0.12 s **Why did locking a car take 10 seconds?** `alporak.com/work/mqtt-latency`

7.8 h → 100 s **The 100-second timeout that became 7.8 hours** `alporak.com/work/one-constant`

8.2 → 5.5 bpm **Heart rate that fell apart when you walked** `alporak.com/work/heart-rate`

108,755 **Writing my own trace decoder** `alporak.com/work/trace-decoder`

All 24 write-ups: alporak.com/#work