Kemal Kaan Keseroğlu

kaankeseroglu@gmail.com ◇ (+90) 535 064 2994 ◇ Istanbul, Turkey
kaankeseroglu.com ◇ github/kaankeseroglu

Work Experience

SK Teknoloji Mar. 2025 – Present
R&D Team Lead Istanbul, Turkey

- Leading full-cycle hardware development of autonomous mobile robot platforms: mechanical CAD, E-Plan electrical design, component selection, BOM, wiring harness design, control panel assembly, and field commissioning
- Owning the **Symphony** modular hardware platform — a proprietary family of autonomous vehicle conversion modules (see Hardware Portfolio below)
- Managing cross-functional coordination on concurrent robotics projects deployed at Mercedes-Benz, Arçelik, Ülker, and Colgate production facilities

SK Robotik Mar. 2021 – Mar. 2025
R&D Engineer Istanbul, Turkey

- Executed end-to-end autonomous conversion of Yale ERP-30VL, Jungheinrich ETV-216, and Still LTX-70 platforms — responsible for mechanical design (35–50 custom parts per project, FEA-validated), full E-Plan electrical schematics, BOM, wiring harness, panel assembly, and field commissioning
- Reverse-engineered OEM CAN-bus systems using BUSMASTER: captured and decoded CAN frames to map throttle, braking, and steering message sets; designed passive inline intercept PCBs (KiCad) to route target signals to the autonomous control system while passing remaining signals through to the OEM ECU
- Designed industrial control panels from scratch: safety-rated PLC, power contactors, relays, terminal blocks, fanless PC, CAN-bus interface, managed Ethernet switch, Wi-Fi client, and multi-rail DIN power supply — all selected against IP, vibration, thermal, and protocol requirements
- Defined communication architecture per platform by integrating CAN-bus, RS-485, RS-232, Profinet, EtherCAT, DeviceNet, IO-Link, and Ethernet/IP based on OEM interfaces and real-time constraints
- Configured SICK safety systems end-to-end: safeRS3 radar, nanoScan3, microScan3 scanners; programmed FX3CPU safety PLC (GMOD, Gateway, XTIO, Safety Encoder, Profinet modules) in SafetyDesigner; designed safety zones, zone switching logic, and performed PL calculations per EN ISO 13849
- Contributed to ROS-based autonomy stack: multi-sensor SLAM (gmapping, `hector_slam`, cartographer, `hdl_graph_slam`), localization (AMCL, `hdl_localization`), `move_base` navigation with costmap tuning and recovery behaviors, sensor fusion via `robot_localization` EKF (LiDAR, radar, IMU), and URDF/Xacro from SolidWorks
- Selected and commissioned motor drives (Leadshine, Roboteq, ZLTECH): torque-based motor sizing via field measurement and regenerative braking configuration with braking resistors
- Supported CE certification under Machinery Directive (2006/42/EC): coordinated with third-party body and prepared technical documentation for risk assessment and compliance audits
- Designed hardware for an OpenCV-based face recognition terminal deployed at Turkish border crossings: custom PCB (KiCad) with Raspberry Pi 40-pin flex interface, dual optocoupler circuits, relay, power LED driver, and dry contact I/O

KME Teknoloji 2023 – Present
Co-founder & Developer Istanbul, Turkey

- Developing modular ESL management systems (Flutter, Next.js) with BLE-based hardware communication, real-time monitoring, and business process digitalization

Hardware Product Portfolio — Symphony Modular Platform

All modules designed end-to-end: SolidWorks Sheet Metal enclosures (K-factor calculation, DXF + bend instructions to fabricators), E-Plan schematics, KiCad PCBs, component selection, BOM, and field integration.

- **symphonydrive** — Central control enclosure for forklift/tow tractor autonomous conversion; houses safety PLC (SICK FX3CPU), fanless PC, CAN-bus interface, managed switch, and multi-rail PSU; interfaces to OEM via inline intercept PCBs. Deployed on Yale, Jungheinrich, and Still platforms.
- **symphonysense** — Compact Ethernet I/O gateway bridging M12 industrial sensors to the ROS stack over standard Ethernet; eliminates point-to-point sensor wiring.
- **symphonycamera** — NVIDIA Jetson-based AI vision module with integrated camera and onboard inference (lane detection, pedestrian recognition); custom enclosure with thermal management.
- **symphonysteer** — Vehicle-agnostic steering actuator: stepper motor with CNC-machined custom gears and GT-profile belt transmission; torque and ratio sized per vehicle via field measurement. Motor driver and power electronics designed in KiCad.

Key Deployments

Mercedes-Benz Aksaray 2023–2025
Still LTX-70 tow tractor autonomous conversion (CAN-bus, RS-485, Ethernet); full mechanical CAD (35+ parts), E-Plan schematics, SICK safety config, CE certification.

Arçelik 2022–2024
Yale ERP-30VL forklift conversion (CAN-bus, RS-485, Profinet, Ethernet); SICK nanoScan3/microScan3 + FX3CPU safety logic, PL calculation.

Jungheinrich ETV-216 2022–2023
Reach truck conversion (CAN-bus, EtherCAT, RS-232, Ethernet).

Ülker Gebze 2024–2025
22-vehicle autonomous forklift fleet; hardware replication, 433 MHz RF vehicle-to-infrastructure door triggering, fleet coordination software support.

MA9-SC 2025
Custom autonomous cleaning robot (3,000 m^2): chassis CAD (Fusion 360, FEA), E-Plan schematics, embedded software (path planning, coverage optimization, auto-charging).

MA9-PS 2025–Present
Autonomous solar field survey robot built from scratch: mechanical CAD, Arduino embedded control, regen braking with braking resistor, tablet monitoring app.

Education

Istanbul Commerce University — B.Sc. Mechatronics Engineering 2016–2021
Handan Hayrettin Yelkikanat Anatolian VHS — Electrical & Electronics Technology 2011–2015

Skills & Languages

Mechanical: SolidWorks (Part, Assembly, Sheet Metal, FEA, Technical Drawing), Fusion 360, DXF flat pattern + bend instructions, 3D Printing (FDM/SLA — PLA, PETG, ABS, Nylon), CNC-machined custom gear design, wiring harness design, DIN-rail panel layout, powder coat specification
Electrical & Electronics: E-Plan (schematics, cable numbering, terminal diagrams), KiCad (schematic + PCB layout), industrial panel design & assembly, inline signal intercept PCB design, component selection & BOM management
Industrial Protocols: CAN-bus (reverse engineering via BUSMASTER, frame decode, message injection), RS-485, RS-232, Profinet, EtherCAT, DeviceNet, IO-Link, Ethernet/IP, MQTT, OPC-UA, 433 MHz RF, BLE, M12 sensor interfaces
Safety Systems: SICK sensors (safeRS3, nanoScan3, microScan3), FlexiSoft PLC (FX3CPU, GMOD, Gateway, XTIO, Safety Encoder, Profinet modules), SafetyDesigner, safety zone design, PL calculation (EN ISO 13849), CE Machinery Directive documentation
Drives & Power: Stepper/servo selection & sizing, drive commissioning (Leadshine, Roboteq, ZLTECH), regenerative braking, GT-belt transmission design
Robotics (ROS): SLAM (gmapping, `hector_slam`, cartographer, `hdl_graph_slam`), localization (AMCL, `hdl_localization`), `move_base` navigation, sensor fusion (`robot_localization` EKF), URDF/Xacro, LiDAR/radar integration
Software: Python, C/C++, Linux/Bash, Git, Dart (Flutter), TypeScript (Next.js), Arduino, NVIDIA Jetson, Raspberry Pi
Languages: Turkish (Native), English (Professional Working Proficiency)