

Ömer Emre MUTLU

Lead Software & Embedded Systems Engineer

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German work permit · Turkish nationality · Born 08 Jul 1999 (Istanbul)



Full-stack software, AI, and embedded systems engineer experienced in shipping conversational agents, audio/telephony platforms, and industrial IoT products from concept to production. I own architecture, implementation, and DevOps for microservice deployments while guiding teams and customers through the full delivery cycle. Passionate about open-source tooling, resilient cloud infrastructure, and bridging hardware with modern AI to solve real business challenges.

CORE COMPETENCIES

Full-Stack & AI Platforms	Architecting Angular/React front ends, Node.js/Python services, and PostgreSQL/MySQL data layers with Retrieval-Augmented Generation, TensorFlow, PyTorch, Scikit-Learn, Vector DBs, and Azure/OpenAI integrations.
Cloud & DevOps	Designing containerized microservices on Docker, AWS, NetCup VPS, Portainer; automating CI/CD pipelines, GitHub/Gitea flows, Secrets/Env management, and observability for production agents.
Telephony Systems	Building audio agents with Asterisk PBX, VoIP/SIP trunking, ARI, AudioSocket, IVR flows, and WebSocket integrations across WhatsApp, Telegram, Email, and voice channels.
Embedded & Hardware	Developing ESP32/STM32 firmware in ESP-IDF/CMake, integrating ModBus, CAN, USB, Ethernet, and designing KiCAD/Altium circuits with redundant power, sensing, and protective electronics.
Tools & Methods	Linux/Debian server ops, MinIO/S3 object storage, Agile project leadership, B2B stakeholder management, advanced CAD (Fusion 360, SolidWorks), and rigorous documentation/testing practices.

EXPERIENCE

Current Feb 2024	Lead Software Engineer / Architect, SAGEL AI, Aachen, Germany <ul style="list-style-type: none">Lead the full-stack design of Sagel AI's conversational platform (Angular/React front ends, Node.js/Python microservices, PostgreSQL).Build and deploy text/audio agents across WhatsApp, Email, Telegram, and bespoke telephony flows powered by Asterisk (VoIP/SIP, ARI, IVR).Implement containerized infrastructure, CI/CD automation, and production monitoring while steering customer onboarding, sales, and delivery. <div>AngularNode.jsPythonPostgreSQLAsteriskVoIPCI/CDAI</div>
Feb 2024 Oct 2022	Embedded Systems Engineer, SCHARCO ELEKTRONIK GMBH, Wuppertal, Germany <ul style="list-style-type: none">Developed ESP32/STM32 firmware in ESP-IDF/CMake and integrated smart modules with the company cloud platform.Delivered Angular UI features surfacing embedded capabilities and telemetry to customers and service teams.Implemented ModBus, CAN, USB, Ethernet stacks and maintained GitHub-driven workflows for production deployments. <div>ESP32STM32Embedded C++AngularModBusCANCANCloud</div>
Feb 2024 Jan 2022	Embedded Hardware Engineer, SPACE TEAM AACHEN E.V., Aachen, Germany <ul style="list-style-type: none">Designed redundant power electronics, fuse detection, and parachute release circuitry for the STAHR rocket program.Modeled STM32F4/CAN subsystems with KiCAD/LTSpice, including converters, LDOs, and protection topologies. <div>KiCADLTSpiceSTM32F4CANCANPower Electronics</div>

Oct 2022
Mar 2020

Hardware / Software Developer, FRAUNHOFER IPT, Aachen, Germany

- Engineered embedded devices for production lines, from PCB design (2–4 layers) to mechanical enclosures in Fusion 360/SolidWorks.
- Programmed STM32/ESP32 firmware, IoT stacks (HTTP/MQTT), and Python/Jupyter analytics for manufacturing data.

Embedded C++ Python PCB Design IoT Firmware

LANGUAGES

Turkish (native)



German (C1)



English (C1)



TECHNICAL STACK

Angular / React



Node.js / Python



AI/ML (TensorFlow, PyTorch, RAG)



Docker / AWS / VPS



Asterisk / VoIP



C/C++



ESP32 / STM32 Firmware



KiCAD / Altium



PostgreSQL / MySQL



GitHub / Gitea / CI-CD



EDUCATION

2024 – current M.Sc. Computer Engineering, RWTH Aachen University (EQF 7). Focus on distributed systems, AI agents, and secure cloud platforms.

2018 – 2024 B.Sc. Electrical Engineering, Information Technologies & Computer Engineering, RWTH Aachen University (EQF 6).

+ HIGHLIGHTED PROJECTS

Ollama Agent Kit

SEP 2025 – OCT 2025

github.com/EmreMutlu99/Ollama-Agent-Kit

Open-source Node.js toolkit for building memory-enabled AI agents on top of Ollama, complete with conversation threads, JSONL memory, and pluggable tool calls so teams can embed local LLM agents quickly.

Stack: Ollama Node.js AI Agents

System Logger Microservice

2025

github.com/EmreMutlu99/System-Logger-Microservice

Plugin-based production logging platform that persists events in a database and exposes them via a lightweight front end, giving factories centralized observability without vendor lock-in.

Stack: Node.js Microservices Observability

Surface Defect Detection Demo

JUN 2025

github.com/EmreMutlu99/Digital-Image-Fault-Detection

Textile-inspection demo featuring a U-Net model for pixel-level defect segmentation plus a Flask UI to upload images and compare original vs. predicted defect masks in real time.

Stack: Python Computer Vision Flask UNet

IoT Smart Button (ESP8266)

APR 2025 – MAY 2025

github.com/EmreMutlu99/IOT-Smart-Button-ESP8266

Low-power Wi-Fi “Call Me” button for shops/restaurants with hardware design, firmware, and cloud hooks for rapid deployment.

Stack: ESP8266 IoT Hardware

GrabCAD Open Source Portfolio

JAN 2022 – CURRENT

grabcad.com/emre.mutlu-19

Collection of precision CAD models—from antique handles to 3D-printer calibration tools—showcasing craftsmanship in mechanical design and manufacturability.

Focus: CAD Mechanical Design

PUBLICATIONS

2025 • An Organizational Framework for Distributed Software Development with Remote Workers

Presents a secure, scalable framework for managing remote software teams using VPS infrastructure and containerized services to deliver reliable workflows across distributed contributors.

Publisher: EMC Ltd. Author: Ömer Emre Mutlu

2024 • A Modular Cloud Application Architecture: Self-Hosting with Containerized Microservices Using a Central Node and Edge Services

Describes a self-hosted cloud blueprint for SMEs that balances on-prem control with the flexibility of containerized microservices deployed across central and edge environments.

Publisher: EMC Ltd. Author: Ömer Emre Mutlu

2023 • Development and Evaluation of an Input Stage for Signal Adaptation to Perform Current and Voltage Measurements

Thesis work for the Institute for Automation of Complex Power Systems detailing an isolated measurement stage compliant with DIN EN 60664-1 and DIN EN 61010-1 requirements.

Journal: RWTH Aachen University Author: Ömer Emre Mutlu Volume: 86

“ REFERENCES

Armin Tavakolian

Founder, TavaTech GmbH

Phone: (+49) 15731780022

Former supervisor at Fraunhofer IPT and recent consulting client for CI/CD initiatives.

Michael Weitauer

Head of Engineering &

Product Management

Scharco Elektronik GmbH

Phone: (+49) 1791240545

Managed Emre during embedded/cloud platform development.

Dr. Hürriyet Yilmaz

Founder, Lermonos Vineyards

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Sagel AI customer overseeing omnichannel booking agent rollout.