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. Advocate of domain-driven API design, ISO 42010 architecture governance, GDPR-aligned delivery, and Postman-driven quality gates. Passionate about open-source tooling, resilient cloud infrastructure, and bridging hardware with modern AI—using OpenAI Realtime and Chat Completion APIs—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, Postman/Newman API test suites, and observability for production agents.
Telephony Systems	Building audio agents with Asterisk PBX, VoIP/SIP trunking, ARI, AudioSocket, and IVR flows, plus integrating ModBus/CAN peripherals when voice needs hardware context.
Conversational Channels	Orchestrating WhatsApp, Telegram, and email bots via REST/Webhook connectors, leveraging OpenAI Realtime and Chat Completion APIs, and validating flows with Postman/Newman suites.
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), rigorous documentation/testing practices, GDPR-compliant data handling, Domain-Driven Design facilitation, and ISO 42010 compliant architecture documentation.

EXPERIENCE

Current
Feb 2024

Lead Software Engineer / Architect, SAGEL AI, Aachen, Germany
> Lead the full-stack design of Sagel AI's conversational platform (Angular/React front ends, Node.js/Python microservices, PostgreSQL) using domain-driven modeling to keep APIs and services consistent.
> Build and deploy text/audio agents across WhatsApp, Email, Telegram, and bespoke telephony flows powered by Asterisk (VoIP/SIP, ARI, IVR), orchestrating OpenAI Realtime and Chat Completion APIs and validating integrations with Postman/Newman suites.
> Manage and mentor a four-person engineering squad across frontend, platform, telephony, and QA workstreams.
> Implement containerized infrastructure, CI/CD automation, ISO 42010-aligned architecture docs, GDPR-compliant data boundaries, and production monitoring while steering customer onboarding, sales, and delivery.

`Angular` `Node.js` `Python` `PostgreSQL` `Asterisk` `VoIP` `CI/CD` `AI`

Feb 2024
Oct 2022

Embedded Systems Engineer, SCHARCO ELEKTRONIK GMBH, Wuppertal, Germany
> Developed ESP32/STM32 firmware in ESP-IDF/CMake and integrated smart modules with the company cloud platform.
> Delivered Angular UI features and REST APIs surfacing embedded capabilities and telemetry to customers and service teams.
> Implemented ModBus, CAN, USB, Ethernet stacks, maintained GitHub-driven workflows, and authored ISO 42010-style interface contracts for production deployments.

`ESP32` `STM32` `Embedded C++` `Angular` `ModBus` `CAN` `Cloud`

| Feb 2024 | **Embedded Hardware Engineer, SPACE TEAM AACHEN E.V., Aachen, Germany** |
| Jan 2022 | |

- ❯ 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.

KiCAD · LTSpice · STM32F4 · CAN · Power Electronics

| Oct 2022 | **Hardware / Software Developer, FRAUNHOFER IPT, Aachen, Germany** |
| Mar 2020 | |

- ❯ 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**	●●●●○
API Design / Postman	●●●●○		

🎓 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

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   Email: hurriyet.yilmaz@lermonos.com
Sagel AI customer overseeing omnichannel booking
agent rollout.