Curriculum vitae

Alperen Akkurt

Computer engineering, data & applied AI

I am a Computer Engineering master's student at RWTH Aachen with experience in data engineering, Python development and applied AI at Bosch, Mercedes-Benz and ETAS. I enjoy turning complex technical questions into working software—and understanding the hardware beneath it.

Content updated: September 2026

Experience

May 2026 – present · Abstatt, Germany

Bosch

Working Student — Developer

- Support research into robotics and electronics applications for ongoing engineering R&D initiatives.
- Develop an internal platform for analysing research papers with Liquibase, ParadeDB, Prefect and Streamlit.
- Integrate language models and embedding APIs into a RAG-based knowledge wiki to support answers grounded in retrieved material.

Nov 2025 – Mar 2026 · Stuttgart-Echterdingen, Germany

AHMETTUERK / IT AND STRATEGY CONSULTING

Working Student — Developer

- Contributed to an internal ABAP software solution and tool development at the interface between user consulting and development.
- Helped create and revise SAP training videos, applying SAP fundamentals, DAX and Microsoft Office.

Jun 2025 – Oct 2025 · Sindelfingen, Germany

Mercedes-Benz AG

Working Student — Developer

- Extended a Python script for processing and modelling JSON data exported from Mercedes AUTOSAR XML.
- Implemented export of the extended data models to MongoDB.

Sep 2024 – Feb 2025 · Abstatt, Germany

Bosch

Working Student — Data Engineer

- Contributed to a Python-based GenAI pipeline for generating requirement-based test specifications, including extraction and preparation of images from HTML exports.
- Used vision language models to turn image content into searchable text; supported user-test planning and evaluation, refactoring and automated tests.
- Extended a Python Panel dashboard for reusing test specifications, improving filtering and integrating customer-project data with a central specification database.

Feb 2024 – Aug 2024 · Yokohama, Japan

Bosch Corporation Japan

Intern — Engineering Excellence / Software Development

- Developed a Python Streamlit application for meeting-time analysis, integrating Microsoft Entra single sign-on and Microsoft Graph API.
- Configured a Red Hat server for an Automated Valet Parking project and extended AVP viewer and path-planning tooling.
- Produced technical documentation using Markdown and Mermaid in a docs-as-code workflow.

Jun 2023 – Nov 2023 · Stuttgart-Feuerbach, Germany

ETAS GmbH

Working Student — Data Engineer

- Extended a Python framework for extracting JIRA work-item comments and processing REST API responses.
- Loaded data into staging with Talend, normalised arrays and mapped the data to an entity–relationship model.
- Implemented historical data handling in an Oracle data warehouse using Slowly Changing Dimensions Types I and II; worked with SQL analysis and Power BI reporting.

Education

M.Sc. Computer Engineering — RWTH Aachen University

Apr 2025 – present · expected completion Feb 2028

- Master’s studies in progress.

B.Eng. Computer Engineering — Hochschule Esslingen

Completed Feb 2025

- Bachelor’s thesis on efficient and scalable 3D scene representation with Gaussian Splatting.

Technical Assistant training

Sep 2016 – Jul 2017 · Stuttgart

- Technical training.

Selected projects

Gaussian Splatting for 3D scene representation

Bachelor’s thesis

- Developed and optimised a GPU-accelerated Gaussian Splatting pipeline for complex scenes.
- Evaluated the approach against rasterisation and ray tracing, exploring performance, mathematical foundations and potential automotive applications.

Automotive news analysis pipeline

University project

- Combined asynchronous Playwright data collection with spaCy, transformer models and TextBlob for entity and sentiment analysis.
- Used LangChain and Ollama for contextual analysis, Xata for storage and Power BI for interactive visualisation.

CPU design on an FPGA

University laboratory

- Translated instruction-set requirements into an ALU, registers, instruction decoding and finite-state control in synthesizable VHDL.
- Created testbenches and analysed waveforms in ModelSim; used Quartus II for synthesis, implementation, pin assignment and JTAG programming.

Embedded control with HCS12 / Dragon12

University laboratory

- Programmed register-level GPIO, timers, PWM and ADC in embedded C.
- Worked with interrupt service routines and structured peripheral initialisation and driver functions.

Microcontroller and keyboard builds

Academic and personal projects

- Built an Arduino Uno prototype combining temperature sensing with a C++ regression model for shelf-life estimation.
- Assembled and soldered a split keyboard, including microcontroller installation and firmware flashing.

Skills & tools

Data engineering & analytics

Applied in professional work

- Python, SQL, ETL, Talend, Oracle, MongoDB, Power BI, DAX, Panel, Streamlit.
- REST APIs, data modelling, data historisation (SCD I/II), data migration and dashboard development.

Applied AI & research tooling

Applied in professional work

- LLMs, vision-to-text extraction, embeddings, retrieval-augmented generation (RAG).
- Prefect, Liquibase and ParadeDB for research-information workflows.

Software & platforms

Professional experience and listed tool familiarity

- Python, C, C++, Rust, Java, JavaScript, SQL, Shell and ABAP; React.
- Linux, Red Hat Enterprise Linux, Docker, Git, AWS, Azure and Ansible.
- Microsoft Entra SSO, Microsoft Graph API, automated tests and technical documentation.

Machine learning & databases

Project experience and listed tool familiarity

- PyTorch, spaCy, Transformers, pandas, NumPy, scikit-learn and NLP.
- PostgreSQL, MySQL and Xata, alongside professional work with Oracle and MongoDB.

Embedded systems & FPGA

University labs and personal practice

- Embedded C, VHDL, finite-state machines, ALU/datapath design, testbenches and interrupt-driven peripherals.
- Quartus II, ModelSim, MATLAB/Simulink and LTspice; soldering and firmware flashing.

Engineering foundations & collaboration

Coursework and practical collaboration

- Foundations of fault/error/failure analysis, SIL/DAL concepts, fail-safe design and V-model verification.
- Code and design reviews, systematic debugging, technical writing and international teamwork.

Languages

- German — native
- Turkish — native
- English — fluent; self-assessed C2
- Japanese — basic
- Arabic — basic