Furkan Yakal

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Professional Summary

Data and AI oriented software engineer with a Master's in Informatics from the Technical University of Munich and a dual background in Computer Science and Industrial Engineering. Experienced in building production grade analytics and software systems across BMW Group and EY, with cloud experience in designing scalable data pipelines, automating deployments, and delivering dashboards that support business decisions. Passionate about turning complex problems into practical, measurable solutions, and looking to apply solid engineering fundamentals and a business minded, data driven approach to challenging real world systems.

Education

2022 – 2025 **Informatics M.Sc.**, *Technical University of Munich*, *GPA: 2.0*

2017 – 2022 **Computer Science B.Sc & Industrial Engineering B.Sc. (Double Major)**, *Koç University*, *GPA: 3.53/4.00 (1.4 in German Scale)*

2020 **Informatics B.Sc**, *Technical University of Munich*
Erasmus+ Exchange Program

Professional Experience

Apr 2025 – Sep 2025 **Data Engineering Working Student**, *BMW Group*, Munich

- Designed and deployed over 10 production Airflow DAGs ingesting ESG and macroeconomic data from 7 external APIs (Eurostat, FRED, NASA, NOAA, Treasury, World Bank, Yahoo Finance) into AWS DocumentDB, consolidating previously fragmented sources into a unified query layer for the operational risk team.
- Provisioned reproducible AWS infrastructure with Terraform and Docker, reducing environment setup from hours to minutes and supporting parallel ETL execution across staging and production.
- Automated data quality validation in Python for ORiON operational risk datasets, detecting inconsistencies across approximately 20,000 records per cycle and generating Excel management reports for risk stakeholders, cutting manual reporting effort by 90%.
- Built a cross market dividend planning pipeline with an interactive React dashboard, replacing a manual Excel workflow and reducing analyst reporting time by 80% per cycle.

Sep 2024 – Mar 2025 **Software Engineering Intern**, *BMW Group*, Munich

- Shipped and maintained a Dash analytics application surfacing clickstream insights on the BMW website to product and UX stakeholders, accelerating weekly review cycles.
- Engineered Python based clickstream ETL transforming raw event data into analytical tables serving approximately 300,000 sessions per day on the Germany market.
- Maintained CI/CD pipelines (GitHub Actions) enabling zero downtime deployments and automated test execution on every merge.
- Architected the application's serverless data and compute backbone on AWS (S3, SageMaker, Lambda, Step Functions, Glue, EC2, RDS), enabling on demand scaling without operational overhead.

Oct 2023 – May 2024 **ML Engineer**, *VESTIGAS ▪ TUM Interdisciplinary Project*, Munich

- Developed a Python pipeline leveraging LLMs (Gemini, GPT-3.5, GPT-4) for automated structured data extraction from PDFs and images, benchmarking accuracy, latency, and cost across providers, and productionized it as a service consumed by VESTIGAS internal tooling.
- Trained a custom document extraction model using Azure Document Intelligence and integrated it into the production pipeline.

Dec 2020 – Jun 2021 **Data Analytics Consultant**, *EY*, Istanbul

- Automated e-document validation workflows in Python and Alteryx Designer for clients, processing invoices and ledgers and reducing manual review effort by an estimated 70%.
- Delivered technology driven consulting on e-invoice and e-ledger compliance reviews, supporting audit teams in tax and regulatory engagements.
- Led an ERP reconciliation initiative, matching customer invoice data with ERP system records via SQL and improving financial close accuracy.
- Developed an RPA pipeline in Blue Prism with automated captcha handling, account creation, login, and document export across multiple client portals, saving the audit team approximately 120 hours per year.

Jun 2020 – Aug 2020 **Data Science Intern**, *Havelsan*, Istanbul

- Built Python predictive maintenance models on the "Bosch Production Line Performance" dataset, forecasting component failures with gradient boosted trees and ensemble methods.

Jun 2019 – Aug 2019 **Software Developer Intern**, *Vircon Group Technologies*, Istanbul

- Built Albatros, a social media analytics tool: integrated the Instagram API in Python, developed ingestion and preprocessing pipelines, and managed MongoDB and Redis datastores.

Projects

A Resilient Matrix Assembly Layout Design for Mixed-Model Vehicle Production: Modeling and Mitigation of Stochastic Disruptions,
Master's Thesis ▪ *Informatics*, Grade: 1.3

- Formulated the Resilient Matrix Assembly Layout Problem (RMALP), a novel stochastic mixed integer linear programming model incorporating task level disruptions in mixed model vehicle production.
- Implemented the model in Python with Gurobi, ran computational experiments on benchmark datasets adapted from the assembly line balancing literature, and produced data visualizations of the results.
- Demonstrated that RMALP reduces reconfiguration costs by more than 50% versus static models, quantifying the value of proactive disruption aware layout planning.

AI Book Generator

- Built a Next.js web application that generates 30 page books from a user provided topic, exposing the first 2 pages as a free preview before purchase.
- Developed a Python content generation service that orchestrates LLM calls, structures chapters, and assembles the final PDF, served to the frontend through a REST API.
- Integrated Stripe Checkout and webhook handlers for secure payments; designed serverless infrastructure on AWS (Lambda, S3, API Gateway) for PDF rendering and storage.

NLP-KG Web Application, *Demo*

- Enhanced an NLP paper search platform with personalized profiles, recommendations, and knowledge graph exploration; implemented semantic search with Weaviate and Neo4j.
- Integrated a GPT powered chatbot for paper recommendations and natural language queries.
- Built full stack features with MongoDB, Next.js, and TypeScript, including the user facing UI.

ASE Delivery

- Designed a DHL style parcel pick-up station system for the Advanced Software Engineering course at TUM.
- Modeled data relationships and integrated MongoDB as the persistence layer across services.
- Orchestrated microservices with a CI/CD pipeline and implemented backend business logic in Java with Spring Boot, exposing REST APIs.

Skills

Programming	Python, Java, JavaScript/TypeScript, SQL, Bash
AI & Machine Learning	LLMs (GPT, Gemini), LangChain, Hugging Face, PyTorch, TensorFlow, scikit-learn, pandas, NumPy, Jupyter, Azure Document Intelligence, Gurobi
Data & Backend	Airflow, PySpark, Spring Boot, FastAPI, Flask, REST APIs, React, Next.js, Dash, Streamlit
Cloud & DevOps	AWS (S3, SageMaker, Lambda, Step Functions, Glue, EC2, RDS, API Gateway, DocumentDB), Azure, Terraform, Docker, GitHub Actions, CI/CD, Linux, Git, pytest, Agile/Scrum
Databases	PostgreSQL, MongoDB, AWS DocumentDB, Firebase, Redis, Neo4j, Weaviate
Languages	English (Fluent), German (Intermediate), Turkish (Native)