MUHAMMED KUMCU

COMPUTER ENGINEER

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SUMMARY

Computer Engineering graduate from Marmara University. I build projects in Natural Language Processing (NLP) and Automatic Speech Recognition (ASR), with a focus on producing reproducible datasets and models for Turkic languages and on bridging academic research with engineering practice. I have experience in database administration (SQL) and high-performance database architectures. I develop scalable, end-to-end data solutions with Python and modern web tools.

EDUCATION

Marmara University ..... **2022 – 2026**
B.Sc. in Computer Engineering — GPA 82.9/100

PUBLICATIONS

E. Aydın, M. Kumcu, "TurkmenFST: A Comprehensive Rule-Based Morphological Analysis and Generation System for the Turkmen Language," 14th International Conference on Computer Processing of Turkic Languages (TurkLang 2026), Astana, Kazakhstan, May 2026.

WORK EXPERIENCE

Database Administrator (Part-time) — Neova Sigorta (Insurance) ..... **09.2025 - 06.2026**
- Handled user access management, system monitoring, and alarm tracking/resolution.
- Performed SQL Server installations, stored procedure development, and query optimization.

IT Support Specialist (Part-time) — Symrise AG ..... **07.2025 – 09.2025**
- Provided technical support, resolving hardware, software, and network issues.

Student Assistant (Part-time) — Marmara University ..... **11.2024 – 06.2025**
- Supported administrative processes at the department secretariat.

IT Software Developer Intern — Turkiye Katilim Sigorta (Insurance) ..... **08.2024 - 10.2024**
- Developed APIs and a web application with .NET.
- Prepared web service documentation and completed technical training.

PROJECTS

TurkMedSTT — Turkish Medical Speech Recognition (Graduation Project — funded by TUBITAK 2209-A)
Developed two-stage LoRA fine-tuned ASR models for general and medical Turkish on top of Whisper Large V3; on an independent test set, reduced Word Error Rate (WER) by 34.7% and Character Error Rate (CER) by 58.6% (relative). Built a benchmark comparing 20 open ASR models under a common protocol, plus an AcoSemantic evaluation measuring semantic preservation. Published the models, datasets, and interactive leaderboard/demo apps on Hugging Face.
(Stack: Python, PyTorch, Whisper, LoRA/PEFT, Hugging Face, Gradio)
Github: github.com/muhammedkumcu/turkmedstt - Hugging Face: huggingface.co/turkmedstt

Turkmen & Chuvash Morphological Analysis and Lexicon Project:
Developed rule-based morphological engines that analyze and generate word forms for the Turkmen and Chuvash languages. Compiled a morphologically tagged lexicon of 30,000+ entries (the largest open-source lexicon for Turkmen) and integrated this backend into a Python-based web interface, releasing an interactive NLP platform where users can query word stem–affix analyses in real time.
(Stack: Python, JavaScript, Flask, NLP)

Multimodal Deepfake Detection System:
Developed a multi-task deep learning detection system on the FakeAVCeleb dataset that fuses video (Xception), audio (Wav2Vec 2.0), and lip-sync streams via late fusion. Measured each modality's contribution through an ablation study and ran it end-to-end with a Flask-based demo.
(Stack: Python, PyTorch, Xception, Wav2Vec 2.0, Flask)
Github: github.com/muhammedkumcu/multimodal-deepfake-detection

PulsarMetric — Health-Tech Startup (Co-founder):
A two-branch digital health startup: ECG signal analysis (arrhythmia detection) and an ECG training platform for medical students (e.g., for TUS, the Turkish Medical Specialty Exam). Led model development and the web-based demo; contributed to architecture planning and infrastructure decisions. The startup was accepted into the Yildiz Kasifleri (Yildiz Technical University) and IBB Tech Istanbul NOVA (Istanbul Metropolitan Municipality) entrepreneurship programs.

Personnel Management Application:
Built a personnel management system with JavaFX and OOP: centralized employee records (CRUD), payroll calculation, and dynamic search. Used file-based persistence (File I/O) to deliver detailed personnel reporting and digitize operational processes.
(Stack: Java, JavaFX, OOP, File Handling)
Github: https://github.com/muhammedkumcu/PersonelOtomasyonu-JavaFX

TOBB Agency Web Service Application:
Developed a SOAP web service that queries detailed insurance-agency information from the TOBB database with XML-based data exchange. Designed a web interface on top of it providing agency search, listing, and detail views.
(Stack: C#, .NET, SOAP/XML, Web Services)

Fintech UI/UX Design:
Designed mobile app screens and prototypes in Figma for a fintech startup, focusing on a clean, user-friendly, modern interface.
(Stack: Figma, UI/UX Design, Prototyping)
Github: https://github.com/muhammedkumcu/FIMU-Mockup-with-Figma

SKILLS

Programming Languages: Python, SQL (T-SQL, PL/SQL), C#, Java, JavaScript

AI & Data Science: NLP, ASR, Whisper, LoRA/PEFT, Computer Vision, Multimodal Deep Learning, PyTorch, Deep Learning

Databases & Backend: MS SQL Server, Oracle Database, Database Administration & Optimization, SOAP Web Services, XML, .NET

Tools & Design: GitHub, Hugging Face, Gradio, Flask, SSMS, VS Code, Figma, Google Colab

CERTIFICATES & TRAINING

- Linux Fundamentals 101,201,301,401 - Turkcell **2026**
- SQL Server Training - Neova Sigorta **2025**
- Oracle Database Training - Neova Sigorta **2025**
- Antiteknik Workshop - Entrepreneurship Program **2025**
- Finansgenc - Financial Literacy Program **2024**
- Harvard CS50 - Introduction to Computer Science **2023**

REFERENCES

References available upon request.