# Kerem Keptig

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## EDUCATION

**Julius-Maximilians-Universität Würzburg** — Würzburg, Germany
*M.Sc. in Artificial Intelligence & Extended Reality* — *Oct 2024 – Oct 2026 (Expected)*

**Middle East Technical University** — Guzelyurt, Cyprus
*Bachelor's degree in Computer Engineering* — *Sep 2019 – Jun 2024*

- **Relevant Coursework:** Programming Language Concepts, Software Engineering, Data Structures and Algorithms (C), Probability & Statistics, Image Processing, Data Mining, Software Development with Scripting Languages (Python), Wireless Communications and Network, Linear Algebra

## WORK EXPERIENCE

**Software Developer Intern** — Jul 2023 – Sep 2023
*CloudCan* — *Remote – Istanbul*

- Designed and deployed scalable RESTful APIs using Python and Flask on Azure App Service, delivering high-performance endpoints that processed **thousands of requests per minute**.
- Conducted extensive testing and debugging with Postman, optimizing **API response times by 30%**, enhancing **user experience** and backend **efficiency**.
- Architected and maintained a secure, high-availability PostgreSQL database, streamlining **data storage, management**, and **querying processes** for **rapid data access**.

**Student Assistant** — Apr–Jun 2022 / Apr–Jun 2023
*Middle East Technical University Northern Cyprus Campus* — *Part-time – Cyprus, Guzelyurt*

- Answered student queries related to their practical programming exercises
- Explained the topics in **C++, Haskell, and Prolog** programming languages

**Software Developer Intern** — Jul 2022 – Aug 2022
*Demirören Teknoloji* — *Remote – Istanbul, Sisli*

- Developed and automated a high-performance IMDb web crawler using **Python** on **AWS**, via **EC2** and **Lambda** to ensure scalability and fully automated data collection.
- Implemented optimized data extraction processes, storing results efficiently as **CSV files in an S3 bucket**, allowing quick and organized data access for analysis.
- Utilized **multi-threading** across multiple servers, resulting in a **16x increase in data extraction speed**, significantly enhancing processing efficiency and reducing wait times.

## PROJECTS

**OCR Quality Assessment for Historical German Texts | Source Code** — **ReactJS | Python**

- Built and evaluated OCR quality assessment methods for historical and dialectal German texts using **supervised regression** and **LLM-based unsupervised approaches**
- Developed a **Random Forest regression model** using **Scikit-learn**, **PyTorch**, and **Transformers**, combining semantic embeddings with handcrafted structural features.
- Achieved a **Pearson correlation of 0.94** with manually annotated ground truth scores
- Created an **interactive GUI** with **Flask**, **ReactJS** to visualize OCR outputs, error overlays, and quality scores.

**ML-Based Gesture-Controlled Slide Navigator | Source Code** — **Python**

- Designed a **machine learning framework** from scratch for gesture recognition, including backpropagation and modular optimizers.
- Implemented real-time gesture tracking using **OpenCV** and **MediaPipe**, supporting custom gestures such as Pinch/Spread, Point, and Flip Table.
- Applied **PCA-based dimensionality reduction** and extensive hyperparameter tuning to improve recognition accuracy.

**MRI Coil Configuration Optimization Hackathon** | Source Code             **Python**
- Participated in the 2025 Spring School on *Physics-Informed Machine Learning for Medical Sciences* Hackathon, tackling MRI coil configuration optimization.
- Implemented phase/amplitude tuning algorithms to maximize $B_1^+$ field homogeneity and minimize peak SAR, using precomputed electric/magnetic field data.
- Achieved **2nd place** among 7 teams with up to **65% improvement** in homogeneity and **430% improvement** in SAR-constrained tasks.

**Autism Pre-screening Web App** | Source Code             **JavaScript** | **Python**
- Integrated a webcam-based eye-tracking system for **real-time data** using **WebGazer.js**.
- Extracted and computed key gaze metrics to feed into predictive ML models (**Random Forest** and **Logistic Regression** using **Scikit-learn**) for ASD likelihood assessment.
- Built the web platform using **Flask**, **HTML/CSS**, and **SQL** for data control and prediction.

## TECHNICAL SKILLS

**Languages**: Python, Java, SQL (PostgreSQL, MySQL), C++, C, MATLAB, Haskell, Prolog, Verilog-VHDL

**Developer Tools**: AWS, Azure, Docker, Git, Postman

**Libraries/Frameworks**: Flask, PyTorch, Transformers, Scikit-learn, OpenCV, MediaPipe, ReactJS

## Achievements

2nd Place, 2025 Spring School Hackathon on Physics-Informed Machine Learning for Medical Sciences
METU High Honor List 2023-2024 (Spring)
METU Honor List 2023-2024 (Fall)
METU Honor List 2022-2023 (Fall)
METU Honor List 2021-2022 (Spring)
METU Honor List 2021-2022 (Fall)

## Language Skills

Turkish (Native)
English (Fluent)
German (Beginner)

## References

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