Berke Uğur Aksakal

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Profile

I am a master's student focused on applied artificial intelligence systems combining computer vision, sensor data processing, and real-time robotics applications, with hands-on experience from long-term industry internships and AI-driven development projects.

Projects

AI-Based Vision-Controlled Robotic Hand (Bachelor's Final Thesis)

- Designed and implemented a 3D-printed robotic hand controlled through real-time computer vision, enabling interaction between human hand gestures and robotic movement. Developed the full vision-to-actuator pipeline using **Python**, **OpenCV**, **YOLOv8**, **Roboflow**, and **Arduino**, including gesture detection, serial communication, and a safety mechanism for automatic grip release.

Performance Comparison of Traffic Light Detection using YOLO Versions (Internship Project)

- Conducted a comparative study of object detection models for traffic light recognition during an 8-month internship. Prepared and labeled custom datasets with **Roboflow**, trained and evaluated models using **Python**, **YOLOv3**, **YOLOv8**, and **OpenCV**, and presented the results at the IEEE TUAC 2023 conference after acceptance for publication.

Smart Water Meter Monitoring and Data Processing System (Internship Project)

- Developed a desktop monitoring application for smart water meter data processing and visualization. Built the interface using **Python** and **Tkinter**, implemented automated JSON monitoring with **Watchdog**, and managed background services via **Subprocess**. Enabled real-time analysis of operational parameters such as voltage, credit, and battery status.

LiDAR-Based Mapping and SLAM System (Long-Term Internship Project)

- Developed a LiDAR data processing and mapping pipeline focused on real-time environment perception. Implemented data acquisition and simulation workflows using **Python** and **Gazebo**, and applied **SLAM** algorithms to perform localization and mapping for navigation analysis.

AI-Powered Fitness Tracking Mobile Application (Course Project)

- Developed a cross-platform fitness tracking application as a course project at **Deggendorf Institute of Technology**, focused on workout logging and personalized recommendations. Built the user interface using **Flutter** and **Dart**, integrated **Firebase** for data storage and synchronization, and implemented analytics-driven recommendation logic using **Python**.

Education

Master's Degree in Artificial Intelligence for Smart Sensors and Actuators 2025 – Present
Deggendorf Institute of Technology, Germany

Bachelor's Degree in Electrical and Electronics Engineering 2020 – 2025
Afyon Kocatepe University, Afyon, Türkiye

Skills

Programming: Python, C++, Dart (Flutter), Arduino, JavaScript, HTML/CSS, MATLAB

AI / Computer Vision: YOLO, OpenCV, SLAM, TensorFlow, PyTorch, scikit-learn, NumPy, Pandas, Matplotlib

Tools & Platforms: Linux, Git, Gazebo, Roboflow, Firebase

Languages

Turkish (Native)
German (A2, enrolled in B1 course)
English (B2)