Sertaç Akalın

Computer Engineer | Applied AI & Computer Vision
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Summary

Computer Engineering graduate (B.Sc., 2026) building applied AI systems from data to deployment. Built a YOLOv8-based traffic-violation detection system (first-author paper published at IDAP 2026) and a LangChain/RAG mobile app backed by FastAPI, Docker, and Google Cloud Run.

Technical Skills

Programming: Python, Java, SQL
AI & Computer Vision: PyTorch, LangChain, RAG, Ultralytics YOLOv8, ByteTrack, OpenCV, PaddleOCR, Shapely; object detection, multi-object tracking, transfer learning, model evaluation
Data & Research: dataset collection and annotation (Roboflow), quantitative evaluation, real-video field testing
Backend & Deployment: FastAPI, REST APIs, JWT, PostgreSQL, MySQL, SQLite, Docker, Google Cloud Run
Tools: Git, GitHub Actions (CI/CD), Maven, Postman, Swagger, Gradio

Projects

Hatched Area Violation Detection | github.com/sertacakalin/hatched-area-violation-detection
Graduation thesis project | YOLOv8, ByteTrack, OpenCV, Shapely, PaddleOCR, SQLite, Gradio

- Built an end-to-end system that detects vehicles entering hatched road areas in fixed-camera Istanbul traffic video (YOLOv8m, ByteTrack, state machine, plate recognition); public code and dataset (Roboflow Universe).
- Built the dataset independently (3,897 source frames, 9,353 images); fine-tuned YOLOv8m with motorcycle oversampling and copy-paste: 0.773 mAP50 on the re-audited test set (COCO baseline: 0.376).
- Reduced false alarms with a temporal state machine (multi-frame confirmation, exit hysteresis, spatial deduplication against tracker ID churn); ran plate recognition only on confirmed violations (KVKK).
- Evaluated the full system on 11 real traffic videos: 0.889 precision, recall, and F1; detector inference takes about 9.3 ms per frame on a Tesla T4.

Palmystra — AI-Powered Mobile App | *FastAPI, LangChain, RAG, computer vision, SwiftUI*

- Built a full-stack iOS application that combines computer vision with a LangChain-based RAG pipeline to generate personalized readings from a palm photo.
- Implemented authentication, rate limiting, and automated backend tests; containerized the service with Docker and deployed it to Google Cloud Run.

Experience

Software Engineering Intern, FEV Türkiye Jan 2026 – Jun 2026 (6 months)

- Developed Python/FastAPI backend services for SOVD (Service-Oriented Vehicle Diagnostics), an external project delivered to **Jaguar Land Rover / Tata**.
- Designed and implemented REST-based diagnostic service endpoints used in vehicle-diagnostics workflows.
- Worked daily with engineering teams across Germany and India in an Agile/Scrum environment, including stand-ups, code-oriented collaboration, and enterprise development processes.

Java Backend Developer Intern, CodeFirst Jan 2025 – Apr 2025 (4 months)

- Developed RESTful APIs for a Spring Boot microservice system using a layered Controller–Service–Repository architecture, JWT-based authentication, and Spring Data JPA database operations.
- Used Git, Docker, and Maven for version control, environment management, and builds; tested and documented APIs with Postman and Swagger.

Publications

[1] S. Akalın and H. Gümüşkaya, "Computer vision-based detection of vehicles violating hatched road areas in Istanbul traffic," Int. AI and Data Processing Symp. (IDAP 2026), doi: 10.1109/IDAP71869.2026.11727955. First author.
[2] M. F. Şen, H. Gümüşkaya, and S. Akalın, "A deployable dual-mode vision framework for adaptive intersection control and traffic analytics," IDAP 2026, doi: 10.1109/IDAP71869.2026.11727898. Best Applied Research Paper (co-author).
Official program (Session S5, Sep. 5, 2026): idap.inonu.edu.tr/program. Extended journal versions are in preparation.

Education

İstanbul Arel University, B.Sc. in Computer Engineering (English) | 2022 – 2026
Associate Degree in Web Design and Coding | 2020 – 2022
Languages: Turkish (native); English (B2+): English-medium degree, thesis and project documentation in English
Military service: completed