

Melih Pak

Computer Engineering Student | Computer Vision & Machine Learning

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PROFESSIONAL SUMMARY

Final-year Computer Engineering student at Kocaeli University with hands-on experience in Computer Vision, Machine Learning, and Pattern Recognition. Applied deep learning (PyTorch, TensorFlow, Vision Transformer, YOLO) to image classification and object detection problems, with statistical model evaluation (accuracy, precision, recall, F1-score, ROUGE). Built a leak-free evaluation pipeline and ONNX deployment for a UAV wildfire detector. Strong foundation in algorithms, data structures, 3D geometry, and coordinate transformations, with practical experience in Agile/Scrum teams. Familiar with ONNX and Triton Inference Server for model optimization and serving; entry-level knowledge of Generative AI, LLM fine-tuning, and Reinforcement Learning.

TECHNICAL SKILLS

AI & Computer Vision: Computer Vision, Pattern Recognition, Machine Learning, Deep Learning, OpenCV, YOLO, Vision Transformer (ViT), DINOv2, PyTorch, TensorFlow, CUDA, Robotics, Sensor Data Processing

GenAI & Model Serving: ONNX, ONNX Runtime, Triton Inference Server; entry-level: Generative AI (Diffusers, LoRA, GANs, Transformer models), LLM Fine-Tuning, Reinforcement Learning, Self-Learning Agents

Programming Languages: Python (advanced), JavaScript (intermediate), Java, SQL, C/C++ (foundational)

Data & Libraries: NumPy, Pandas, NLTK, NetworkX, Spring Framework, Feature Extraction, Big Data Analytics

Tools & Infrastructure: Git, Linux CLI, CVAT, Jira, Azure DevOps, PostgreSQL, Docker (basic), Sockets, REST API (entry-level), RBAC

Mathematics & Methods: Linear Algebra, 3D Geometry, Coordinate Transformations, Numerical Optimization, Agile/Scrum, Algorithm Design, Concurrent Programming, Model Evaluation (Accuracy, Precision, Recall, F1-Score), Data Labeling & Annotation

WORK EXPERIENCE

Intern | Soylu Bilim & Teknoloji

Sep 2026 – Present

Intern | Rasyotek Human Resources Informatics Inc. (Remote)

Jun 2026 – Jul 2026

Technologies: Agile/Scrum, Jira, SDLC, B2B/B2C Requirement Analysis

- Developed features for an enterprise Human Resources (HR) software product within an Agile/Scrum team; tracked tasks through the Software Development Life Cycle (SDLC) using Jira.
- Analyzed Business-to-Consumer (B2C) and Business-to-Business (B2B) business models to define software requirements for two distinct customer segments.

Intern – Image Processing / Computer Vision | Ordulu Teknoloji, Ankara

Jul 2025 – Sep 2025

Technologies: Python, OpenCV, YOLO, CVAT, NumPy, Pandas, Linux CLI

- Contributed to the development of a real-time image processing pipeline for Turkish Airlines (THY) airport camera systems using Python, OpenCV, and a pretrained YOLO model; implemented image preprocessing, filtering, and object detection modules.
- Used CVAT to label and annotate image data for model training and evaluation; supported data processing with NumPy and Pandas, analyzing footage frame-by-frame.
- Evaluated model outputs in the ~80–90% accuracy range using precision and F1-score metrics, and reported misdetections; collaborated with the team to propose improvements and support algorithm tuning.
- Performed basic development and file/process management in a Linux CLI environment.

PROJECTS

Wildfire & Smoke Detection from UAV Imagery

GitHub repository

Technologies: Python, YOLO11, DINOv2, ONNX Runtime, OpenCV, PyTorch, Google Colab

- Found that 93% of the official FASDD_UAV test images (3,894 of 4,181) had a near-duplicate in train/val; rebuilt a leak-free, scene-level split with pHash + DINOv2 similarity graphs and a data-driven threshold, and held out an entire fire event (Heinola) for testing only.
- Ran six controlled YOLO11 experiments; diagnosed scene memorization (fire mAP50 0.85 on train vs 0.35 on val) and fixed it with augmentation and de-duplicated extra data, raising test mAP50 from 0.47 to 0.56 and fire-frame detection from 78% to 90%.
- On the unseen fire, the model finds smoke in 94% of frames with 0% false alarms (baseline: 12% false alarms).
- Deployed with ONNX Runtime only (~32 ms per frame on CPU) and a 3-of-5-frame temporal alarm filter; verified box-for-box against Ultralytics inference with a unit test.

MultiZoo Image Classification

Technologies: Python, PyTorch, Vision Transformer (ViT), Data Augmentation, CUDA

- Reviewed Vision Transformer (ViT) literature and technical documentation to inform architecture selection, then trained a ViT-based model from scratch on a multi-class image dataset covering 20+ animal classes.
- Prevented overfitting through hyperparameter optimization (batch size, learning rate, dropout), EarlyStopping, and data augmentation, achieving ~90%+ accuracy; delivered a live inference interface with accuracy, precision, recall, and F1-score reporting.

Graph-Based Text Summarization System

Technologies: Python, NetworkX, NLTK, TF-IDF, Cosine Similarity

- Converted source documents into sentence graphs and implemented extractive summarization using cosine similarity and a 5-parameter scoring algorithm (named entities, numerical data, node connectivity, title words, TF-IDF); validated output quality with ROUGE metrics.

Kelime Mayınları – Mobile Word Game

Technologies: Mobile SDK, Client-Server Architecture, Sockets, Real-time Sync

- Built a two-player mobile word game with socket-based real-time synchronization over a client-server architecture; created a 15x15 dynamic game board, Scrabble-style scoring, and a custom word validation engine.

Restaurant Management Simulation

Technologies: Java, Multithreading, Concurrency, Resource Optimization

- Simulated restaurant operations with synchronized threads; used Mutex- and Semaphore-based synchronization to prevent race conditions and deadlocks, and eliminated process conflicts through a cost-benefit-based resource optimization model.

Course Registration Matching System

Technologies: Python, PostgreSQL, Tesseract OCR, Custom Matching Algorithm

- Designed a normalized database and used OCR to parse transcript documents and import student data; built a role-based application featuring weighted student scoring formulas and a 3-stage automated assignment algorithm.

FitLife – Online Fitness Coaching Platform

Technologies: Web Development, Cloud Database, RBAC (Role-Based Access Control)

- Designed a web platform with a 3-tier Role-Based Access Control (RBAC) architecture for Admin, Trainer, and Client roles; enabled secure delivery of personalized plans through cloud database integration.

EDUCATION

Bachelor's Degree in Computer Engineering | Kocaeli University

2019 – Expected 2027

- Relevant coursework: Object-Oriented Programming, Data Structures and Algorithms, Artificial Intelligence, Algorithm Analysis, Mathematics for Robotics (3D geometry and coordinate transformations).

CERTIFICATIONS

- Altın Kariyer Akademi – Artificial Intelligence Training
- Claude AI (Anthropic) – AI-Assisted Development and Prompt Engineering