Muhammed Mustafa KAPICI

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Machine Learning Engineer

I am an AI & Software Engineer specializing in **Machine Learning, Deep Learning, Computer Vision, and Large Language Models**, with hands-on experience building scalable, production-ready AI systems end-to-end. I have worked across **space technologies, mobile development, and microservice-based AI platforms**, delivering solutions that combine advanced model architectures with modern engineering best practices.

SKILLS

- Machine Learning
- Deep Learning
- LLM
- RAG
- Computer Vision
- Image Processing
- Python
- PyTorch
- TensorFlow
- LangChain
- OpenCV

WORK EXPERIENCE

Entegre Yazılım • **Konya, Turkey** • **02/2025 - 06/2025**

Software Engineering Intern • **Internship**

Developed a fully functional medication tracking mobile app using React Native & Expo, designed for elderly-friendly usability and offline reliability. Integrated Google Vision OCR for automatic prescription label scanning and built an AI-powered scheduling module using DeepSeek LLM for adaptive reminder generation. Implemented local notification pipelines, modular state management, and prepared the application for multi-user and wearable device integration.

TUBITAK SPACE Technologies Research Institute • **Ankara, Turkey** • **07/2024 - 09/2024**

Computer Vision Intern • **Internship**

Led the development of an astronomical object detection pipeline specialized in Point Spread Function (PSF) analysis for enhancing star and galaxy identification in FITS images. Built a custom Faster R-CNN model with PSF-aware layers and integrated Hough-based feature extraction. Improved detection precision significantly by leveraging distributed training (PyTorch DDP). Implemented SEP and Photutils tools for source extraction and used Weights & Biases for advanced experiment tracking and metric visualization.

Kardelen Yazılım • **Mersin, Turkey** • **07/2023 - 08/2023**

Software Engineering Intern • **Internship**

Contributed to the development of enterprise application modules using C# .NET, Entity Framework, and MSSQL Server. Enhanced database operations, optimized query performance, and collaborated with senior engineers to improve backend reliability. Supported UI and business logic components, ensuring consistency across the software ecosystem.

EDUCATION

Bachelor’s in Computer Engineering & Software Engineering

Toros University • Mersin, Turkey • GPA: 3.14/4.0 • 09/2019 - 06/2025

Completed coursework in Machine Learning, Deep Learning, Data Structures, Operating Systems, and Database Systems. Actively worked on AI-focused research projects including computer vision, time-series forecasting, LLM-based systems, and mobile application development. Participated in university-level engineering competitions and contributed to multiple open-source machine learning projects

PROJECTS

CreditCard-clustering

https://github.com/mmustafakapici/CreditCard-clustering

Developed a full unsupervised learning pipeline for credit-card customer segmentation, achieving high-quality clusters with a **0.89 Silhouette score** and **0.99 Stability**. Implementation included preprocessing (imputation, winsorization, scaling), engineered behavioral features, and dimensionality reduction (PCA, UMAP) using **K-Means, GMM, and HDBSCAN**. Validated results with **DB Index (0.42)** and built an interactive **Streamlit** dashboard for exploration.

IRIS-classification-pytorch-mlflow-MLOps

https://github.com/mmustafakapici/IRIS-classification-pytorch-mlflow-MLOps

Built a production-style **PyTorch** training framework with **MLflow** experiment tracking and **Model Registry**. Added a **FastAPI** inference service with **Prometheus** metrics, Dockerized workflows, Makefile automation and dual frontends (Streamlit + Gradio). Demonstrates a complete **MLOps**-ready lifecycle from **training to deployment**.

Boston-House-prediction-XGBOOST-MLFLOW

https://github.com/mmustafakapici/Boston-House-prediction-XGBOOST-MLFLOW

Architected a high-performance regression pipeline using **XGBoost** for real-world price prediction, achieving a strong **0.94 R^2 score** and a low **MAE of 1.88**. Leveraged **MLflow** for comprehensive experiment tracking and versioned model management, ensuring reproducibility. The system incorporates domain-specific feature engineering, hyperparameter optimization (Best Iteration: 347), and model explainability to deliver deployable, production-ready artifacts.

Gemini-Langgraph (RAG System)

https://github.com/mmustafakapici/Gemini-Langgraph

Developed a full-stack Retrieval-Augmented Generation system using **LangGraph**, **Google Gemini** and **ChromaDB**. Includes a modular document ingestion pipeline, embedding + retrieval workflow, streaming-enabled **FastAPI** backend, a React/Vite frontend, and **Docker**-Compose orchestration. Demonstrates modern **LLM** engineering and production-grade **RAG** design.

UCI-heart-disease-predictor (MLP / XGBoost / Logistic Regression)

https://github.com/mmustafakapici/UCI-hearth-disease-predictor--MLP-XGBOOST-LR

Engineered a robust clinical decision-support system utilizing a comparative model pipeline (**XGBoost vs. MLP vs. Logistic Regression**) for structured heart-disease data. Conducted rigorous feature engineering and hyperparameter tuning, resulting in a **best-in-class 100% precision and recall**. Leveraged stratified CV to ensure generalization, with **XGBoost emerging as the top-performing model (Mean CV: 1.0)**, supported by comprehensive confusion matrix analysis and deployable probability calibration

Crypto-forecaster-LSTM-GRU-Transformer

https://github.com/mmustafakapici/crypto-forecaster-LSTM-GRU-Transformer

Built a high-frequency **time-series** forecasting engine for crypto markets using **LSTM**, **GRU** and **Transformer** architectures. Includes automated market data ingestion, technical-indicator generation, volatility analysis, **S2S** modeling, **hyperparameter optimization** and full backtesting simulations tailored for financial prediction tasks.

EuroSAT-Classification-Swin-ConvNeXt

https://github.com/mmustafakapici/EuroSAT-Classification-Swin-ConvNeXt

Designed an end-to-end satellite image classifier using **state-of-the-art** architectures (**Swin Transformer**, **ConvNeXt**). Features mixed precision, warm-up **cosine LR scheduling**, weighted sampling/**Focal Loss** for imbalance, patch-based inference, TTA, and a deployable Gradio UI. Demonstrates advanced CV techniques on **remote sensing** data.

Astro-psf-detection-resnet

https://github.com/mmustafakapici/astro-psf-detection-resnet-v4.0

Engineered a deep-learning pipeline for astronomical **PSF detection** using a customized **ResNet** backbone. Workflow includes simulation-driven **augmentation** (blur, atmospheric distortion), domain-adapted preprocessing, fine-tuning, and morphological post-processing. Shows capability in bridging **astrophysics** and convolutional networks.

mkyz (Python ML Library)

https://github.com/mmustafakapici/mkyz

Created a lightweight, pip-installable library that simplifies ML workflows: **preprocessing utilities**, **classification/regression/clustering models**, **automated evaluation metrics**, and integrated plotting. Designed for rapid prototyping and educational or experimental ML tasks.

CERTIFICATIONS

Yapay Zeka Uygulamaları: Langchain, RAG, LLM Orkestrasyonu
Udemy

Deep Learning with Keras and TensorFlow
IBM

Deep Learning with PyTorch
IBM

Introduction to Deep Learning & Neural Networks and PyTorch
IBM

Introduction to Deep Learning & Neural Networks with Keras
IBM

LLMOps & ML Deployment: Bring LLMs and GenAI to Production
Udemy

LLMs Mastery: Complete Guide to Transformers & Generative AI
Udemy

Foundations of Project Management
Google

Machine Learning with Python
IBM

(100+ Saat) Aranan Programcı Olma Kamp Kursu| Python,Java,C#
Udemy

A-Z™ | Projelerle Yapay Zeka ve Bilgisayarlı Görü | +20 Saat
Udemy

Quantum Programlama: Sıfırdan İleri Seviyeye
Udemy

Time Series
Kaggle

Computer Vision
Kaggle

Intro to Deep Learning
Kaggle

Advanced SQL
Kaggle

Data Visualization
Kaggle

Feature Engineering
Kaggle

Intermediate Machine Learning
Kaggle

Intro to Machine Learning
Kaggle
Intro to SQL
Kaggle
Pandas
Kaggle
Python
Kaggle
React Native - IOS & Android Mobil Uygulama Geliştir 2023
Udemy
Azure DevOps : Sıfırdan İleri Seviye
Udemy
Deep Learning A-Z™| Python ile Derin Öğrenme
Udemy
Hızlandırılmış React Kursu (Türkçe-2024-Güncel)
Udemy
Keras İle Derin Öğrenmeye Giriş
BTK Akademi
Python ile Makine Öğrenmesi
BTK Akademi
R ile Veri Bilimine Giriş
BTK Akademi
Veri Bilimi ve Makine Öğrenmesi Atölyesi - Bootcamp 2022
BTK Akademi
Veri Bilimi İçin Python ve Tensorflow
BTK Akademi
Working with Microservices in Go (Golang)
Udemy
Yazılım Test Uzmanlığı Eğitimi: Sıfırdan İleri Seviye
Udemy
Yüksek Trafikli Yazılım Mimarisi
Teedo