Berk Kırık

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KENDIM HAKKINDA

I am a dedicated Senior AI Engineer with over 5 years of experience, specializing in Machine Learning and Deep Learning algorithms within microservices architectures, with a focus on Kubernetes and embedded systems. My expertise is centered around designing and deploying scalable, AI-driven solutions in cloud-native environments, particularly within the financial and healthcare sectors. I possess a robust background in developing machine learning models for microservices-based systems and have actively engaged in refining authentication and authorization mechanisms to ensure secure and efficient access control.

With practical skills in technologies such as Kafka, Redis, PostgreSQL, and Oracle, I excel at creating high-performance, data-intensive applications. I am also proficient in DevOps practices, utilizing Kubernetes for seamless deployment and scaling. My objective is to apply my software development skills to construct innovative and reliable solutions that contribute to business success.

İŞ DENEYIMI

Tiga Information Technologies Inc. - Türkiye, Ankara

İş kolu veya sektör Insan Sağlığı Ve Sosyal Çalışma Faaliyetleri | **Departman:** Artificial Intelligence | **İnternet sitesi:** https://www.tigahealth.com/

Data scientist

[08/2021 - 09/2023]

Device & Sensor Integration: Developed a multi-device sensing pipeline using **ESP-32 WiFi modules** and **Raspberry Pi** boards to gather real-time data from motion, environmental, and location-based sensors. Focused on reliable data capture and wireless communication for continuous monitoring in edge environments.

Data Processing & Synchronization: Implemented timestamp synchronization, noise filtering, and data normalization techniques (e.g., **Min-Max scaling**, **Z-Score standardization**) to ensure high-quality input for downstream ML tasks. Designed preprocessing workflows to handle missing data, sensor drift, and latency in real-time systems.

Feature Engineering & Dimensionality Reduction: Applied feature extraction methods such as **Principal Component Analysis (PCA)**, **Fast Fourier Transform (FFT)**, and **Linear Discriminant Analysis (LDA)** to enhance signal separation between user activity classes. These techniques helped improve model interpretability and reduce computational overhead.

Machine Learning & Deep Learning Models: Trained a diverse set of models—including **Decision Trees**, **SVM** , **Random Forest**, and **Convolutional Neural Networks (CNNs)**—to classify user activities from sensor streams with high precision. Used **XGBoost and ensemble approaches** to enhance generalization and mitigate overfitting in real-world use cases.

Backend API Development with Django & FastAPI: Designed and built backend services using **FastAPI** for real-time inference APIs and **Django** for managing user data, authentication, and application logic. Developed RESTful endpoints to support mobile and web apps, integrating AI models into live systems. Implemented data logging, feedback loops, and results visualization to support both end users and clinical reviewers. Ensured high performance and low latency across distributed environments.

Mobile App Deployment & Real-Time Feedback: Built mobile app interfaces that embedded trained models

to deliver **real-time alerts, personalized activity tracking**, and adaptive feedback. Ensured seamless inference on-device by optimizing model size and latency for mobile deployment environments.

Model Fine-Tuning & Performance Optimization: Applied deep learning optimization strategies including **transfer learning**, **hyperparameter tuning**, and **data augmentation** to improve robustness and reduce false positives. Focused on refining CNN and NLP-based architectures to suit real-world healthcare constraints and variability.

Validation & Evaluation Techniques: Used **k-fold cross-validation**, **Grid Search**, and **Random Search** to systematically evaluate and optimize model performance. Emphasized consistent evaluation across diverse users and activity scenarios to ensure model generalizability.

Graph-Based Behavioral Analysis & Data Mining Utilized **Neo4j**, **GraphQL**, and **Pandas** to model and query user behavior patterns through graph-based analysis. Extracted actionable insights from streaming sensor data and applied advanced data mining to support decision-making in healthcare and activity monitoring contexts.

Im-Par - Almanya, Frankfurt am Main

İş kolu veya sektör Finans Ve Sigorta Faaliyetleri | **Departman:** Shared Services - AI | **E-posta:** info@im-par.de | **İnternet sitesi:** https://im-par.de/

Data scientist Team Lead / Backend Engineer

[09/2023 - 01/09/2025]

ML Model Development & NLP Automation

Led the **full lifecycle of machine learning pipelines** designed to validate financial message formats such as **ISO 20022 and SWIFT MT/MX**. Built **NLP-driven systems in Python** to automate the generation of compliant message structures, **reducing manual intervention** and **improving overall accuracy and process efficiency** . Focused on building **scalable, maintainable models** suitable for production in **regulated environments**.

LLM Fine-Tuning, Generative AI & RAG Integration

Directed the **fine-tuning of large language models** for specific use cases in **financial compliance, fraud detection, and message classification**. Applied techniques like **transfer learning, prompt engineering, and hyperparameter tuning** using **Hugging Face and PyTorch**.

Integrated **Generative AI solutions into production workflows**, enabling **automated message construction** and **domain-specific chatbot interactions**. Developed **Retrieval-Augmented Generation (RAG) pipelines** combining **custom vector stores (FAISS)** with LLMs to **improve contextual relevance, accuracy, and explainability** for **regulatory support and decision-making tools**.

Graph-Based Fraud Detection & Data Mining

Built and deployed **graph-based systems** to detect fraud within **large-scale financial datasets**. Used **Neo4j and GraphQL** to identify patterns such as **hidden relationships and suspicious activity**. Applied **link prediction, clustering, and anomaly detection algorithms**. Combined **graph analysis** with **traditional data mining using Pandas and Spark** to **surface real-time, actionable insights**.

Backend Platform Engineering (Golang + Python)

Designed and led the development of a **cloud-native banking platform**, using **Golang for performance-critical services** and **Python/Django for AI orchestration and API logic**. Focused on **system modularity, horizontal scalability, and resilience**. Worked closely with **globally distributed Agile teams** to ensure that **backend architecture supported evolving AI workloads, compliance requirements**, and **business goals**.

Microservices Architecture with gRPC & REST

Built a **production-grade microservices ecosystem** using a combination of **Golang and Python**. Used **gRPC for fast internal communication** and **REST APIs for secure external integrations**. Deployed **KrakenD as an API gateway** to manage **traffic flow, request aggregation**, and **system observability**. Integrated **Keycloak for enterprise-grade security**, supporting **RBAC and ABAC** for **fine-grained access control and regulatory compliance**.

Kubernetes Infrastructure & DevOps Automation

Developed and maintained a **Kubernetes-native infrastructure** to run **backend and ML workloads reliably** across cloud and hybrid environments. Used **Golang to build custom Kubernetes operators/controllers** to handle **dynamic orchestration and autoscaling**. Automated deployments and infrastructure management using **shell scripts, cron jobs**, and **GitOps-driven CI/CD pipelines**, leading to **faster releases, improved system resilience**, and **enhanced operational visibility**.

Agile Team Leadership & Cross-Functional Collaboration

Acted as the **Lead for the Data Science team**, overseeing **deliverables across multiple Agile squads**. Led **sprint planning, daily standups, retrospectives**, and **collaborated across teams** including data science, engineering, and product. Encouraged a culture of **fast iteration, knowledge sharing**, and **continuous improvement**, resulting in **accelerated development of AI-powered features and platforms**.

Etiya - Türkiye

Senior AI Engineer

[01/09/2025 - Mevcut durum]

Code Generation Fine-tuning

Used LoRA to fine-tune large code models on Hugging Face, boosting domain-specific code completion accuracy by 40% while cutting training costs by 90%. Only 0.1% of model parameters needed for customization, with A/B testing for seamless adapter swapping.

Multi-Tenant NER System

Built a scalable Named Entity Recognition platform serving multiple enterprise clients with tenant-specific isolation, automated model selection based on SLAs, and sub-200ms inference latency.

Guardrail System

Integrated Guardrails AI, NeMo Guardrails, and custom layers to block 89.2% of harmful outputs. Includes PII detection at 97% accuracy across 15+ categories, explainable AI with SHAP, a full-stack monitoring app (React/FastAPI/PostgreSQL), Redis caching for <50ms response times, and Prometheus/Grafana observability — all on a microservices architecture handling 5K+ concurrent requests.

Enterprise RAG System

Production pipeline processing 500K+ documents with hybrid search (vector + BM25), advanced chunking, query rewriting (HyDE), cross-encoder re-ranking, and RAGAS evaluation. Achieved 92% recall@10, reduced hallucinations by 45%, and optimized to sub-3 second responses with support for 20+ file formats.

Agentic AI Development

Multi-agent orchestration using LangGraph/CrewAI with ReAct and Plan-and-Execute patterns across 25+ tools. Includes autonomous code review agents, multi-agent collaboration (researcher/analyst/writer/critic), episodic + knowledge graph memory, LangSmith tracing, self-healing pipelines at 99.2% task completion, and guardrail integration for safe autonomous operation.

EĞITIM VE STAJ

Computer Engineering MSc.

Ankara University [01/02/2026 - Mevcut durum]

Şehir: Ankara | **Ülke:** Türkiye

Biomedical Engineering

Ankara University [31/08/2018 - 31/05/2024]

Şehir: Ankara | **Ülke:** Türkiye

İnternet sitesi: http://bme.eng.ankara.edu.tr

Istanbul Unıversity

Computer Programming [08/2022 - 07/2024]

Şehir: İstanbul | **Ülke:** Türkiye

İnternet sitesi: https://www.istanbul.edu.tr

DIL BECERILERI

Anadili(leri): türkçe

ıngilizce

DINLEME: B2 **OKUMA:** C1 **YAZMA:** B2

KONUŞMA ÜRETIMI: B2

KONUŞMALI ETKILEŞIM: B2

almanca

DINLEME: A1 **OKUMA:** A2 **YAZMA:** A2

KONUŞMA ÜRETIMI: A1

KONUŞMALI ETKILEŞIM: A1

BECERILER

Microsoft Office | Microsoft Office package: Microsoft Word, Excel, PowerPoint, Access

Machine Learning,Deep Learning

Data Science | Data Collection, Data Processing, Data Analysis, Data Visualisation | Python (PyROOT, RDataFrame; ML: Keras, TensorFlow) | Git | Python | Deep Learning (Tensorflow, Pytorch(basic), Jax/Flax(basic)) | Machine Learning

Deployment-Development-Microservices

Programming languages: GoLang, C++, Php | Kubernetes, Docker-Swarm | Microservices with Nodejs | Back-end (Flask, Django) | DevOps: AWS, Git. | Design and management of a relational Database

YAYINLAR

[2024]

Advancing Crayfish Disease Detection: A Comparative Study of Deep Learning and Canonical Machine LearningTechniques

Abstract

This study evaluates the effectiveness of deep learning and canonical machine learning models for detecting diseases in crayfish from an imbalanced dataset. In this study, measurements such as weight, size, and gender of healthy and diseased crayfish individuals were taken, and at least five photographs of each individual were used. Deep learning models outperformed canonical models, but combining both approaches proved the most effective. Utilizing the ResNet50 model for automatic feature extraction and subsequent training of the RF algorithm with these extracted features led to a hybrid model, RF-ResNet50, which achieved the highest performance in diseased sample detection. This result underscores the value of integrating canonical machine learning algorithms with deep learning models. Additionally, the ConvNeXt-T model, optimized with AdamW, performed better than those using SGD, although its disease detection sensitivity was 1.3% lower than the hybrid model. McNemar's test confirmed the statistical significance of the performance differences between the hybrid and the ConvNeXt-T model with AdamW. The ResNet50 model's performance was improved by 3.2% when combined with the RF algorithm, demonstrating the potential of hybrid approaches in enhancing disease detection accuracy. Overall, this study highlights the advantages of leveraging both deep learning and canonical machine learning techniques for early and accurate detection of diseases in crayfish populations, which is crucial for maintaining ecosystem balance and preventing population declines.

Keywords:

crayfish ; **disease detection** ; **sustainability** ; **machine learning** ; **deep learning**

Yasin Atilkan, Berk Kirik, Koray Acici, Recep Benzer, Fatih Ekinci, Mehmet Serdar Guzel

Enhancing crayfish sex identification with Kolmogorov-Arnold networks and stacked autoencoders

Crayfish play an important role in freshwater ecosystems, and sex classification is crucial for analyzing their demographic structures. This study performed binary classification using traditional machine learning and deep learning models on tabular and image datasets with an imbalanced class distribution. For tabular classification, features related to crayfish weight and size were used. Missing values were handled using different methods to create various datasets. Kolmogorov-Arnold networks demonstrated the best performance across all metrics, achieving accuracy rates between 95 and 100%. Image data were generated by combining at least five images of each crayfish. Autoencoders were employed to extract meaningful features. In experiments conducted on these extracted features, support vector machines achieved 84% accuracy, and multilayer perceptrons achieved 82% accuracy, outperforming other models. To enhance performance, a novel architecture based on stacked autoencoders was proposed. While some models experienced performance declines, Kolmogorov-Arnold networks showed an average improvement of 3.5% across all metrics, maintaining the highest accuracy. To statistically evaluate performance differences, McNemar's and Wilcoxon tests were applied. The results confirmed significant differences between Kolmogorov-Arnold networks, support vector machines, multilayer perceptrons, and naive Bayes. In conclusion, this study highlights the effectiveness of deep learning and machine learning models in crayfish sex classification and provides a significant example of hybrid artificial intelligence models incorporating autoencoders.

Yasin Atilkan, Berk Kirik, Eren Tuna Acikbas, Fatih Ekinci, Koray Acici, Tunc Asuroglu, Recep Benzer, Mehmet Serdar Guzel & Semra Benzer

Bağlantı: https://www.nature.com/articles/s41598-025-34095-z

SÜRÜCÜ BELGESI

Sürücü Belgesi: B 11/2019 - 11/2029

HOBILER VE ILGI ALANLARI

Swimming

Playing Basketball

Chess-Puzzle

Contribution to Open Source Projects

CERTIFICATIONS

[12/2023 - 12/2023]

Concurrency in Go

Issues by: University of California, Irvine Division of Continuing Education

Bağlantı: https://coursera.org/verify/UZD%20D%20P5EM58E3

AI-For Everyone-1

e-Government Certificate

AI For Everyone-2

e-Government Certificate

Python For Data Science

- Verified Certificate**Issued May 9, 2022**
- Valid Certificate ID **6c34ecb0e64a4a05bd34e98845435b9d**

Introduction To Linux

- Verified Certificate**Issued May 9, 2022**
- Valid Certificate ID **6c34ecb0e64a4a05bd34e98845435b9d**

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