

Canberk Sezgin

 Canberk Sezgin |  Canberk Sezgin |  Portfolio |  cnbrkszgn81@gmail.com |  +90 (553) 417 44 03

SUMMARY

A versatile Software Engineer and ML Researcher who architects production systems across the full stack — from cross-platform mobile apps to neural networks. Proven experience includes deploying software actively used by **200+ businesses**, conducting federally-funded AI/ML research in high-energy physics at ENRG, and delivering enterprise software for established corporations. Fluent in Python, Flutter/Dart, and TypeScript.

WORK EXPERIENCE

Undergraduate Researcher & Software Engineer – Fermilab / ENRG Lab

Feb 2024 – Present

- Conducting applied AI/ML research at a U.S. national laboratory (Fermilab) in high-energy physics, focusing on ML-driven particle detection and classification within neutrino physics.
- Trained and benchmarked 20+ ML classification models (XGBoost, LightGBM, Random Forest, ensemble) to separate Cherenkov and scintillation photons in a WbLS detector; achieved 95%+ accuracy, ~6% improvement over classical methods.
- Performed Geant4 Monte Carlo simulation of a custom neutrino detector (21 PMTs, cylindrical WbLS geometry); engineered photon arrival time, energy, and PMT coordinate features for ML pipeline input.
- Contributed to TÜBİTAK 1001 and BAP projects (FBAU-2023-12325, FBA-2022-12207, FBG-2022-11499, FDS-2021-11525); research published on arXiv ([arXiv:2406.09191](https://arxiv.org/abs/2406.09191)).
- Created the [ENRG Neutrino Atlas](#), a platform indexing 12,000+ neutrino projects from 160+ experiments globally, with interactive filters and geographic mapping for discovery.

Software Engineer (Internship x2) – BILSOFT Software Computer Trade Ltd.

Jul 2024 – Aug 2024 & Jan 2026 – Feb 2026

- Developed and maintained enterprise accounting software actively used by 200+ commercial clients; contributed to performance optimization and bug resolution across two internship periods.
- Designed and built BilsoftSmartAjanda, a cross-platform AI-powered productivity suite integrated into BILSOFT's ecosystem and actively used by 200+ businesses.
- Integrated Groq Cloud API (Llama 3) for natural language task management; built a synchronized Daily/Weekly/Monthly calendar engine with SyncFusion Flutter Calendar.
- Implemented Singleton and Repository design patterns for service layer architecture; JWT-based authentication and secure session persistence via shared_preferences.
- Engineered a gamification engine with a custom XP/Rank algorithm; implemented secure authentication (Tax ID, Username, Password) and push notification system.

Technologies: Flutter, Dart, Groq Cloud API (Llama 3), REST API, MySQL, JWT

Contract Software Engineer – Kuantum Teknolojileri

Jul 2024 – Present

- Contributed to key milestones in a TÜBİTAK-funded R&D project pitched in Silicon Valley, accelerating mobile application delivery using Flutter and Dart.
- Developed a mobile application for Düzce University using Flutter and Dart; integrated backend API support to enhance functionality and performance.

Technologies: Flutter, Dart, REST API, Arduino

Network Intern – Posco Assan TST

Aug 2025 – Sep 2025

- Configured and troubleshoot Cisco Catalyst 2960S/3560/multilayer switches; upgraded Cisco IOS using SolarWinds TFTP and XMODEM following ROMMON recovery.
- Implemented VLANs, Port Security (sticky MAC), SSH v2, Inter-VLAN routing, Spanning Tree (PVST+), and Port-Channel (LACP) for redundancy and segmentation.
- Designed a multi-site WAN topology (Kocaeli–Istanbul–Korea) using Cisco Packet Tracer with EIGRP and DHCP; applied NAT, ACL, and CEF for optimized routing.

Technologies: Cisco IOS, SolarWinds, VLAN, EIGRP, LACP, SSH

Software Engineer – CAL TÜBİTAK, Düzce Metropolitan Municipality

Apr 2019 – Oct 2020

- Developed a Python-based application graphing optimal plant growth conditions; placed 1st in the Düzce region (TÜBİTAK).

Technologies: Python

FELLOWSHIPS

TÜBİTAK STAR, 2209 & ERÜ BAP Fellowships

2025 – Present

- Awarded the TÜBİTAK STAR, TÜBİTAK 2209, and ERÜ BAP fellowships for research in data acquisition systems.
- Graduated as the valedictorian of the 2022–2023 academic year and awarded an outstanding achievement scholarship (3.72 GPA).

SELECTED PROJECTS

Borsa Dashboard

2025 – Present

Flutter, Dart, Python, FastAPI, TensorFlow, FinBERT, Gemini API, yfinance, SQLite, WebSocket

- Architected a 5-layer modular financial dashboard integrating 3 distinct AI/ML pipelines (LSTM, FinBERT, Gemini 2.5-Flash), reducing new model deployment time by ~40%.
- Engineered a high-frequency WebSocket streaming pipeline achieving <3s latency for real-time BIST, GOLD, and USD ticker updates, eliminating REST polling overhead.
- Developed a Short-Term Price Forecasting Engine (TensorFlow/Keras LSTM) processing 250+ historical data points per ticker, achieving ~82% directional accuracy verified by an internal A/B Testing module.
- Integrated Hugging Face FinBERT to process 20 financial news headlines per analysis in <800ms, generating real-time Bullish/Bearish sentiment scores.
- Built an algorithmic Backtesting Engine running simulations across 10,000+ OHLCV data rows to validate RSI and MACD strategies.

EXYS – Vehicle Expertise & Inspection Management System

Flask, REST API, HTML/CSS, SVG, SQLite/PostgreSQL

- Developed a multi-tenant vehicle inspection and appraisal system actively deployed in production across 3+ auto expertise companies.
- Built Flask/REST API backend infrastructure generating 500+ detailed dynamic PDF inspection reports per month in under 2 seconds each.

BilsoftSmartAjanda – AI-Powered Productivity Suite

Flutter, Dart, Groq Cloud API (Llama 3), REST API, MySQL, JWT

- Developed and deployed an AI-powered Smart Agenda and assistant module integrated into a 200+ business enterprise ecosystem (11M TL capital firm).
- Integrated Groq Cloud API (Llama 3) for natural language task management; engineered synchronized Daily/Weekly/Monthly calendar engine with real-time data consistency.
- Implemented Singleton and Repository design patterns for service architecture; JWT authentication and secure session management via shared_preferences.
- Built a custom gamification engine with XP/Rank algorithm (Stajyer Junior Dev → Senior Mühendis) and confetti visual feedback on task completion.

CosmeticAPP – AI Beauty & AR Styling Advisor

Next.js 15, React, TypeScript, Tailwind CSS, Gemini API, MediaPipe, WASM

- Developed a multimodal AI beauty consultancy application using Google Gemini 1.5/2.5 Flash for skin undertone detection, 12-season color analysis, and face shape classification.
- Implemented millimetric real-time glasses AR overlay using MediaPipe FaceLandmarker with 468 facial landmark points and live perspective adjustment.
- Built an AI-based image segmentation Canvas render engine achieving 95% pixel-level accuracy for hair recolor using MediaPipe ImageSegmenter.
- Executed all AR computations via WebAssembly (WASM) to maximize browser performance and minimize render latency.

Real vs. Fake Image Classification with Explainable AI

Python, PyTorch, VGG19, OpenCV, Scikit-learn, Grad-CAM, Matplotlib

- Developed a deep learning pipeline using PyTorch and VGG19 Transfer Learning to classify real vs. AI-generated images; achieved ~93% test accuracy on 10,000+ images.
- Applied data augmentation (RandomResizedCrop, ColorJitter) and hyperparameter optimization; achieved ~0.91 precision and ~0.94 recall on the fake-image class.
- Integrated Grad-CAM heatmap visualization for Explainable AI (XAI), surfacing which image regions drive model predictions.
- Evaluated model performance using Scikit-learn classification reports and confusion matrices across a balanced 2-class dataset.

TECHNICAL SKILLS

Languages: Python, Dart, TypeScript, JavaScript, Java, C#, C, SQL

Frameworks: Flutter, FastAPI, Flask, Next.js, PyTorch, TensorFlow, Django, Spring, ASP.NET Core

ML/AI: LSTM, FinBERT, VGG19 Transfer Learning, Grad-CAM, XGBoost, LightGBM, Random Forest, Scikit-learn, OpenCV, MediaPipe, Groq Cloud (Llama 3), Google Gemini API

Cloud & DevOps: REST API, WebSocket, real-time data streaming, model deployment, Cloudflare, Linux

Tools: Git, MySQL, SQLite, PostgreSQL, Arduino, Geant4, Cisco Packet Tracer, SolarWinds

EDUCATION

Erciyes University — Bachelor of Computer Engineering

Oct 2022 – Jun 2026