Ahmed Imam Shah *Machine Learning Engineer*

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PROFESSIONAL SUMMARY

Machine Learning Engineer with 3+ years of experience in Deep Learning, Computer Vision, and Computational Pathology. Proven track record of deploying scalable ML solutions in healthcare and physics simulation. Expertise in PyTorch, MLOps, and unsupervised representation learning. Passionate about solving real-world problems using AI-first strategies. Seeking challenging roles in AI R&D or applied ML teams.

KEY ACHIEVEMENTS

- Developed deep learning models for breast and colorectal cancer lymph node classification.
  Achieved **98% sensitivity** and **94% F1-score**, deployed in digital pathology pipelines.
- Accelerated high-energy physics simulations by **100×** via AI-based regression and generative models (CNNs, VQ-VAEs).
- Built an unsupervised multi-object tracking system using Slot Attention.
  Achieved **85% ARI** on synthetic video benchmarks.
- Reproduced object-centric learning models (SAVI, Slot Attention, PixelCNN) using PyTorch and Julia.
  Matched official benchmarks and validated on synthetic datasets.
- Selected as an **AI Fellow** at KUIS AI Center.
  Graduated with **high honors** from Koç University, recognized for academic excellence.

PROFESSIONAL EXPERIENCE

04/2022 – present
Istanbul, Türkiye · Remote

Machine Learning Engineer
Virasoft Corporation

- Developed and deployed deep learning model for lymph node metastasis detection in breast and colorectal cancer (PyTorch), achieving **98% sensitivity** and **94% F1-score** on CAMELYON-16 and In-house dataset.
- Automated digital pathology pipelines for whole slide image analysis, removing manual annotation via segmentation models trained on BCSS dataset.
- Optimized large-scale image analysis using HPC infrastructure, enabling parallel processing of 1000+ WSIs with **70%** reduction in runtime.

12/2023 – 03/2025
Perugia, Italy · Remote

Artificial Intelligence Consultant (Contract)
Beamide S.r.l.

- Integrated deep learning modules (VQ-VAE, CNNs) into particle interaction simulators for high-energy physics, improving accuracy and inference speed 100x.
- Modeled scintillator energy deposition using regression networks, supporting precision research in radiative particle behavior.

12/2021 – 04/2022
Istanbul, Türkiye

Artificial Intelligence Instructor (Part-time)
Global AI Hub

- Designed and reviewed curriculum content for Python and Deep Learning modules for "10million.AI" , reaching 1000+ global learners.

09/2020 – 09/2023
Istanbul, Türkiye

Graduate Research Fellow
KUIS Artificial Intelligence Center

- Conducted groundbreaking research in visual attention models for object tracking and segmentation within synthetic videos, employing advanced unsupervised representation learning techniques.

EDUCATION

09/2020 – 09/2023
Istanbul, Türkiye

M.S. Computer Science and Engineering
Koç University
CGPA: 3.81 (High Honors)
Core Electives:
- Computer Vision with Deep Learning
- Deep Unsupervised Learning
- Medical Image Analysis
- Parallel Programming
- Computer and Network Security

Thesis: Unsupervised Multi-Object Discovery and Tracking using Memory-Augmented Slot Attention
Supervisors: Prof. Dr. Yücel Yemez and Prof. Dr. Aykut Erdem

01/2016 – 06/2020
Ankara, Türkiye

B.S. Electrical and Electronics Engineering
Bilkent University
CGPA: 3.36 (Honors)
Core Electives:
- Neural Networks
- Introduction to Robotics
- Introduction to Machine Learning
- Computer Data and Organization

02/2019 – 06/2019
Krakow, Poland

Erasmus+ Exchange Program
AGH University of Science and Technology
Core Electives:
- Digital Image Processing and Vision Systems
- Computer Networks
- Digital Signal Processing
- Modern Computer Architectures

CERTIFICATIONS & ONLINE COURSES

Completed 11/2023

MLOps | Machine Learning Operations Specialization
Duke University | Coursera
Tools: MLflow, SageMaker, Azure ML, Hugging Face

Completed 11/2021

Applied Data Science with Python Specialization
University of Michigan | Coursera
Covered Applied ML, Data Visualization, Text Mining, Social Network Analysis

Completed 11/2021

AI Product Management Specialization
Duke University | Coursera
Topics: ML Project Management, Human Factors, Foundations of ML

Completed 11/2021

Data Science Ethics
University of Michigan | Coursera

Completed 12/2020

Responsible Conduct of Research for Engineers
Collaborative Institutional Training Initiative

SELECTED PROJECTS

Slot Attention-Based Object Tracking (PyTorch)

Developed an unsupervised multi-object discovery and tracking model using Slot Attention. Achieved over 85% ARI on CLEVR video benchmarks; aligned with SAVi paper results.

SAVI & PixelCNN Reproduction (PyTorch/Julia)

Reproduced key object-centric learning models (SAVI, PixelCNN, Slot Attention) in PyTorch and Julia. Validated consistency with published performance metrics for synthetic object tracking and image generation.

Visual-Inertial Vehicle Navigation (OpenCV, Python)

Built a localization system combining inertial navigation and visual odometry, designed for GPS-denied environments. Used by Ardic Labs in simulated testbeds.

SKILLS & TOOLS

Programming Languages
Python, Julia, C++, SQL, Bash

Deep Learning Frameworks
PyTorch, TensorFlow, Knet, Scikit-learn

MLOps & Platforms
Docker, Jupyter, Google Colab, HPC, SageMaker

Libraries & Utilities
OpenCV, NumPy, Pandas, MLflow, Hugging Face

Dev Tools
Git, Linux, VSCode

Machine Learning Concepts
Unsupervised Learning, Object-Centric Learning, Slot Attention, Transformers, GANs

LANGUAGES

English ●●●●●
Urdu ●●●●●
Turkish ●●●○○
German ●●○○○

PUBLICATIONS

06/06/2025

New radiation shielding material studies for space-borne and earth-based application using MRADSIM software toolkit
Journal of Instrumentation
Authors: Nora Ciccarella, Seda Gurgen Avsar, Ali Behcet Alpat, Giovanni Bartolini, Talifujiang Wusimanjiang, Lucia Salvi, Stefano Gigli, Haider Raheem, Ahmed Imam Shah, Ugur Gokmen, Sema Bilge Ocak

17/11/2024

MRADSIM (Matter-RADiation Interactions SIMulations)
International Astronautical Congress (IAC)
Authors: Ali Behcet Alpat, Giovanni Bartolini, Talifujiang Wusimanjiang, Haider Raheem, Ersin Huseyinoglu, Raziye Bayram, Arca Bozkurt, Deniz Dolek, Lucia Salvi, Ahmed Imam Shah, Nora Ciccarella, Yakup Bakis, Stefano Gigli

17/11/2024

IRADCAL: A Monolithic Inorganic Scintillator And Thin Scintillators To Measure Low Energy Electron, Proton And Heavy Ion Albedo Spectrums From Lunar Surface
International Astronautical Congress (IAC)
Authors: Ali Behcet Alpat, Arca Bozkurt, Giovanni Bartolini, Raziye Bayram, Ahmed Imam Shah, Lucia Salvi, Yakup Bakis, Ersin Huseyinoglu, Talifujiang Wusimanjiang, Haider Raheem, Deniz Dolek, Nora Ciccarella, Stefano Gigli