Ahmed Al-Hmouz

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PROFILE

Motivated fourth-year Artificial Intelligence student at the University of Jordan with strong experience in Python, machine learning, deep learning, and computer vision. Skilled in developing intelligent systems using modern AI frameworks, with additional hands-on experience in FastAPI backend development, UI/UX design using Figma, and robotics software development using ROS2.
Currently conducting graduation research focused on EEG multi-class classification, applying deep learning techniques to analyze neural signals and improve model accuracy for brain–computer interface applications.
Passionate about computer vision, AI research, software engineering, and user-centered design, with a strong drive to build impactful, research-driven solutions.

EDUCATION

Oct 2022 - present
Bachelor's Degree, **Artificial Intelligence**, University of Jordan
GPA: 3.74

SKILLS

- Machine Learning
- Deep Learning
- AI Research
- Python (TensorFlow, PyTorch ,openCV)
- Back-end development with FastAPI
- Communication
- Organization
- Leadership

COURSES AND CERTIFICATIONS

PROGRAMMING & SOFTWARE ENGINEERING

- Programming in C++, Java, Python
- Data Structures and Algorithms
- Back-End Development (FastAPI, REST APIs)

DATABASES

- Database Management Systems (MySQL)
- NoSQL (MongoDB)

AI & DATA SCIENCE

- Machine Learning
- Deep Learning
- Data Mining
- Mathematics for Machine Learning
- Statistics

DESIGN & TOOLS

- Design with Figma

PROJECTS

EEG Multi-Class Classification & EEG-VQA Research, In Progress

Collaborating with Dr. Tamam Al-Sarhan (University of Jordan) on developing deep learning models for understanding and interpreting EEG signals. Working on two major research directions:

- EEG Multi-Class Classification: Building and optimizing neural network models to classify EEG recordings into several cognitive and motor states, including data preprocessing, signal filtering, and architecture design.
- EEG-VQA (Wave-to-Language): Exploring the application of Visual Question Answering techniques to

EEG waveforms to generate meaningful text-based interpretations of brain signals.

Contributing to model development, experimentation, evaluation, and the preparation of research materials supporting advancements in AI-driven brain computer interface systems.

Exploring GAN Variants for Balancing Imbalanced Datasets

GitHub: https://github.com/KshKsh0/GANsproject

Conducted an in-depth study on using Generative Adversarial Networks (GANs) to address class imbalance in both image and tabular datasets. Compared multiple GAN architectures including **Vanilla GAN, DCGAN, WGAN, WGAN-GP, and CTGAN** to evaluate their ability to generate high-quality synthetic samples and improve downstream classifier performance.

- Analyzed imbalance in **FashionMNIST** (image) and **fraud detection** (tabular) datasets.
- Implemented and trained several GAN architectures for synthetic minority-class generation.
- Evaluated model stability, distribution matching, and augmentation quality using metrics such as precision, recall, and F1-score.
- Observed that **WGAN** improved recall for image data, while **WGAN-GP** achieved the highest recall for fraud detection but with a precision trade-off.
- Used TensorBoard for training visualization and conducted classifier evaluation (ResNet-18, Random Forest) on augmented datasets.

Tech stack: Python, PyTorch, NumPy, Matplotlib, TensorBoard

Fluentia

GitHub: https://github.com/TisTis0004/Build-with-AI-2025

- Collaborated with **Fares Hatahet** and **Adnan Sawalha** to develop **Fluentia**, an AI-powered accessibility platform designed to simplify digital reading for individuals with cognitive conditions.
- Contributed to building the browser extension and PDF reader powered by **Google Gemini AI**, enabling transformation of complex text into clearer, more accessible, and personalized formats.
- Helped design support for four accessibility profiles **Dyslexia, ADHD, Aphasia, and Autism** — through adaptive text views and integrated text-to-speech functionality.
- Focused on enhancing inclusivity, usability, and real-world impact through AI-driven accessibility solutions.
- **Tech stack:** Google Gemini AI, JavaScript, Python, FastAPI

HONORS & AWARDS

Document-Based RAG System

Developed a lightweight Retrieval-Augmented Generation (RAG) system capable of extracting answers from uploaded documents and rewriting responses using a Hugging Face language model. Implemented document parsing, chunking, and vector-based retrieval to generate accurate, context-aware answers.

- Built a retrieval pipeline to index document content and return the most relevant text segments.
- Integrated a Hugging Face model to refine, rewrite, and enhance the generated responses.
- Designed the system to support flexible document input and efficient information retrieval.

Tech stack: Python, Hugging Face Transformers, vector retrieval

Joke Generation Model Fine-Tuning

Fine-tuned a Hugging Face language model on a curated jokes dataset to improve humor generation and style adaptation. Focused on optimizing the model's ability to produce coherent, context-aware, and stylistically consistent jokes.

- Prepared and cleaned a jokes dataset for supervised fine-tuning.
- Trained and evaluated a transformer-based model using Hugging Face tools.
- Improved output quality by adjusting hyperparameters, training settings, and dataset formatting.
- Experimented with prompt design to control humor style and structure.

Tech stack: Python, Hugging Face Transformers, PyTorch

Rock–Paper–Scissors AI (MediaPipe + OpenCV)

GitHub: https://github.com/KshKsh0/RPS-using-mediaPipe

Developed an interactive Rock–Paper–Scissors game that uses real-time hand-gesture recognition and adaptive AI prediction models to anticipate the player's next move. Implemented gesture detection using MediaPipe Hands and built multiple behavior-learning strategies that adapt to user patterns over time.

- Implemented **real-time gesture detection** using MediaPipe and OpenCV.
- Developed three adaptive AI prediction models:
    - **Exponential Decay Frequency Model:** Learns recent player habits using exponentially weighted move frequencies.
    - **Markov Chain–Based Prediction Model:** Predicts the next move using a first-order Markov transition matrix.
    - **N-Gram Sequence Prediction Model:** Detects short recurring move sequences and predicts the most likely continuation.
- Built a full game loop with countdown phases, visual feedback, scoring, and responsive UI overlays.
- Structured the project with modular components separating AI logic, gesture detection, and game management.
- Designed for lightweight, fast performance using pure Python.

Tech stack: Python, OpenCV, MediaPipe, NumPy

HACKTHONS

Build with AI Hackathon 2025 — 7th Place

Participated as part of Team **NeuralNotWork** in the Build with AI Hackathon 2025, achieving **7th place** among competing teams. Recognized for strong innovation, teamwork, and effective application of artificial intelligence to real-world challenges.