Abdullah Ahmed Alzahrani

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SUMMARY

ML Engineer with a foundation in Electrical Engineering, focused on deploying research-grade models to production in computer vision and deep learning, backed by strong theoretical and practical ML expertise.

SKILLS

ML Frameworks: TensorFlow, PyTorch, Scikit-learn;
Coding languages: Python, C++
Data handling: SQL, Pandas, and Matplotlib
Model deployment/version control: FastAPI, Render, Streamlit, GitHub, SVN

EDUCATION

Bootcamp: Building and Deploying AI Models (In-Person)
Tuwaiq Academy · Riyadh, Saudi Arabia · Mar 2025 – May 2025

Bachelor of Science in Electrical Engineering (Focus Area: Machine Learning)
Rensselaer Polytechnic Institute (RPI) · Troy, NY · Sep 2020 – Dec 2024

CERTIFICATIONS

Databases and SQL for Data Science with Python
Stanford - Coursera: Sep 2024

Machine Learning Specialization
IBM - Coursera: May 2024

PROJECTS

Gharsa [Capstone Project]
Tuwaiq Academy · abodeza.github.io/projects/gharsa/ · May 2025 – May 2025
· **Tackled the challenge of leaf disease detection under limited data** by combining classical vision techniques with foundation models in a modular, high-precision CV pipeline.
· **Built an end-to-end CV pipeline** to localize and classify five leaf diseases using **OpenCV**, Meta's **SAM**, and a **fine-tuned CLIP**.
· **Authored a robust color-masking stage** in OpenCV (HSV thresholds + morphology) to highlight candidate disease pixels; supplies a high-recall seed for later segmentation.
· **Implemented a greedy bbox-clustering + padding algorithm** that guarantees non-overlapping crops >=256 px, for consistent downstream tasks.
· **Fine-tuned CLIP (ViT-B/32) on ~500 leaf images**, achieving **>90% balanced accuracy** across all classes.

Predictive Refrigerant Leak Modeling in VRF Systems [Capstone Project]
Rensselaer Polytechnic Institute, State Energy Agency, and a Private Energy Firm · Aug 2024 – Dec 2024
· **Led the development of an ML pipeline** to detect refrigerant leaks in VRF HVAC systems, enabling EPA compliance via a sensor-free solution.
· **Designed and trained a neural network classifier** to detect undercharge levels with **91.15% accuracy** on unseen data, based on **features extracted from 200+ diagnostic parameters**.
· **Simulated 10–20% leak scenarios** via correlation analysis with analogous HVAC technologies.
· **Maintained a tight client feedback loop** through regular meetings, aligning deliverables with evolving requirements.

Quantum-Inspired Machine Learning Using Tensor Networks [CSCI-4961 Final Project]
Rensselaer Polytechnic Institute May 2024 · May 2024 – Aug 2024
· **Explored an underexamined research direction** by bridging advancements in tensor networks from quantum physics and classical ML.
· **Reproduced the results from a paper by Google** applying tensor networks for low-rank approximation in ML, achieving 98% accuracy on MNIST.
· **Optimized parameterized quantum circuits**, reaching 74% accuracy on binary classification tasks.
· **Utilized RPI's IBM Quantum System One** to run the tests on a real quantum computer, managing the shortcomings of NISQ hardware.