

# Adam Rehman

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## Skills

**Machine Learning & Data Science:** PyTorch, OpenCV, Scikit-Learn, Huggingface, XGBoost, Pandas/**Polars**

**Programming Languages:** Python, C, C++, SQL, Verilog

**Hardware & Embedded Systems:** FPGAs, Embedded C/C++, ESP32, Arduino, ARM STM32

**DevOps & Tools:** Containers (Docker), Git, CI/CD, Linux/Unix, Static Analysis Tools

## Experience

**Engineering Intern (Embedded)**, Arm – London, UK

Apr 2022 – Jun 2022

- Engineered, implemented, and rigorously unit-tested secure low-level modem firmware in **C** on an **STM32 (Arm Cortex-M)** platform, ensuring robustness and safety.
- Executed comprehensive system integration tests, achieving **100% data transmission accuracy** and reliability under complex real-world conditions.
- Integrated a **CI/CD** pipeline using **GitHub Actions** to automate builds and unit testing, significantly improving code quality and team velocity.

## Projects

**Full-Waveform Inversion (FWI) for Geophysical Imaging**

Kaggle & Yale/UNC-CH ML Competition

- Engineered a machine learning solution for a complex geophysical imaging problem.
- Utilized **deep learning** (U-Net) and signal processing techniques to invert seismic waveform data, demonstrating proficiency in handling non-standard, large-scale scientific datasets.
- Achieved a highly competitive result in a specialized domain, showcasing strong problem-solving and technical adaptation skills.

**Fraud Detection with XGBoost**

Personal Project (Kaggle Dataset)

- Trained and fine-tuned an **XGBoost** classifier for highly imbalanced credit card fraud data, specifically optimizing the F-beta score ( $\beta = 20$ ) to heavily penalize high-cost false negatives.
- Successfully increased model **Recall from 73.9% to 95.7%** (44/46 fraud cases detected) by strategically adjusting the classification threshold to 0.0035.
- Achieved this high-impact detection rate by prioritizing loss prevention over minimizing false alarms, resulting in a necessary trade-off of Precision at 4.6%.

**Generative AI for Image Inpainting (MEng Research Project)**

Research Project (Imperial College London)

- Developed and refined a novel methodology for improving GenAI image inpainting algorithms by integrating secondary AI mask generation.
- Explored and benchmarked different **Diffusion Model** architectures to accurately fill masked regions of an image using contextual information.

## Education

**Queen Mary University of London** – MSc Artificial Intelligence

2025 - 2026

- Specializing in **Multimodal AI** (Image, Audio, Language models) and Deep Learning Architectures. Predicted Classification: 1st (Distinction).
- Thesis:** Computer Vision Project (Selection Process).

**Imperial College London** – MEng Electronic and Information Engineering (Hons)

2020 – 2024

- Final Classification:** 2:2

- Thesis: Developed a GenAI model for image object removal and inpainting using natural language prompts, achieving state-of-the-art visual coherence for masked regions.
- Relevant Modules: Computer Architecture, Maths 4 Machine Learning, Large Dimensional Data Processing.