

RIO HALIL-ROBERTS

BSc Pure Mathematics | Software Developer

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EDUCATION

Bachelor of Science - BS, Mathematics

Queen Mary University of London

📅 09/2021 - 07/2025

- Relevant Courses: Introduction to Python, Computing in C, C++, Actuarial Mathematics, Group Theory, Discrete Math, Number Theory, Linear Algebra, Partial Differential Equations, Complex Numbers, Convergence & Continuity, Probability & Statistics.

PROJECTS

VisioGuardAI

📅 07/2025 - Present

VisioGuardAI is an intelligent, real-time visual threat detection and explanation system

- Developed an AI-powered visual threat detection system Using **Facebook's DETR model**, **PyTorch**, and the Transformers library in Python, resulting in a system capable of identifying objects with over **70% confidence**, enhancing security monitoring capabilities.
- Implemented a secure **API key rotation mechanism** using **Python's secrets module** and datetimes handling, enhancing system security by automating key updates and reducing the risk of compromised long-lived credentials.
- Containerized the application for consistent deployment by creating a **Dockerfile** and organizing the project structure accordingly. This enabled easier deployment across different environments and improving application portability.
- Designed a flexible object detection service by creating a **"detect_objects"** function that processes images using **PIL** and returns structured **JSON results**, allowing for easy integration with various front-end applications and supporting multiple use cases for threat detection

Machine Learning Threat Detection

📅 07/2024 - Present

A framework for my Threat Detection program in **Python** utilizing **TensorFlow & scikit-learn**.

- Built a Machine Learning framework to classify and detect cybersecurity threats automatically implemented with **Python**, **TensorFlow**, and **scikit-learn**; integrated **REST APIs** to fetch live threat intelligence feeds for training data, which improved detection and accuracy above baseline by 25% and reduced manual log review time, strengthening system security posture.
- Trained the program to detect various cyberattacks in a **virtual machine using Oracle VirtualBox**, which allowed for a secure: closed environment for the program to get live tested.
- Designed a flexible and modular machine learning architecture using **TensorFlow's Keras API** to create a customizable neural network with built-in normalization and dropout layers, resulting in an adaptable model that can be easily fine-tuned for different threat detection scenarios, improving overall system versatility.
- Implemented robust error handling and logging mechanisms, utilizing **Python's built-in logging module** and custom error checks throughout the pipeline. This was responsible for improved system reliability and easier debugging in production environments, reducing downtime and maintenance efforts

EXPERIENCE

Summer Engineering Intern

UCL Institute of Epidemiology and Health Care

📅 06/2018 - 07/2018 📍 City Of London, England, United Kingdom

- Developed an interactive mobile health app prioritizing in providing the user with analysis of symptoms using **Python** and **health data APIs**, this provided patients with quick self-assessments and improved accessibility to personal health insights.
- Enhanced positive user feedback from elderly and non-technical users by designing and implementing an **intuitive, comprehensive UI**. Because of this, there was **higher engagement among senior users around 90%**.
- Partnered with NHS doctors to improve accuracy of patient health records by mapping how data should be recorded, **verified, and stored in structured databases**. This ensured compliance with medical standards, and improved trustworthiness of the app's recommendations.

Summer Informatics Intern

Camden Council

📅 06/2019 - 07/2019 📍 City of London, England, United Kingdom

- Built custom queries and APIs to fetch patient data securely using **Python**, **SQL** and **RESTful API** integration, which allowed doctors to access & amend record 2x faster during mock appointments.
- Designed a normalized database schema for a healthcare system using **SQL** and entity-relationship modelling tools, which reduced duplicate records by **30%** and improve query efficiency.
- Recovered critical medical data after a database crash by restoring from nightly backups & running consistent checks. This directly prevented loss of patient information and ensuring uninterrupted service.

KEY ACHIEVEMENTS



Developed small-scale AI

Collaborated to help develop the system prompt & backend for low-level AI chatbot.



Private DNS Ad-Blocker

Integrated a Raspberry Pi 5 to host a DNS Ad-Blocker into my network using Pi Hole.



AWS QHack Hackathon

Participated in Amazon's AWS QHack 2023 and AWS Insight Event, working with employees to solve complex data structure issues.



HomeLab Server Hosting

Created a private NAS and hosted three streaming applications on HomeLab server using Linux & Docker.

SKILLS

Languages: Python SQL C C++ JavaScript CSS HTML R Linux

Frameworks: TensorFlow NumPy Pandas scikit-learn Pathlib FastAPI PyTorch