

# MUHAMMAD HAZIM MUHAMMAD KHAIRI SHAM

Machine Learning Engineer | Computer Vision, Predictive Modelling & MLOps

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## SUMMARY

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Machine Learning Engineer specialising in **production ML**, **computer vision** and **cloud-based** data pipelines, with **four years** of freelance and startup product delivery. Built and deployed **predictive modelling**, **forecasting** and **computer vision systems** using **PyTorch**, **LightGBM**, **PySpark**, **AWS Glue**, **SageMaker**, **MLflow**, **Docker** and **FastAPI**. Former Technical Lead for **SportSphere**, where I developed an **automated player-tracking** pipeline using custom object detection and **homography-based** court mapping.

## SELECTED IMPACT

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- Delivered **13+** **production** products across **machine learning**, **web** and **mobile systems** for clients and startups.
- Built an **explainable property-price model** from **53,000 listings**, achieving **0.88 test R<sup>2</sup>** and deploying it with **MLflow**, **Docker** and **FastAPI**.
- Developed a **multimodal forensic model** achieving **96.2% tamper-detection accuracy**, outperforming the strongest single-modality baseline by **18.9 percentage points**.

## PROFESSIONAL EXPERIENCE

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### Horizon Integrated (Early-Stage Startup), Malaysia

FEB2026-JUL2026

*Technical Lead (Part-Time)*

- Built SportSphere's end-to-end computer vision pipeline for sports video analysis while leading product engineering on Google Cloud using Next.js, Firebase and Cloud Functions.
- Trained custom object detection models and built homography-based court/pitch mapping for automated player and ball tracking from camera footage.

### Prosignal Consortium Sdn. Bhd.

MAR 2026-JUL2026

*Intern*

- Owned the Swift-to-Flutter bridge for TuJu's native CarPlay navigation experience, integrating turn-by-turn navigation functionality with its Flutter application.

### Independent Machine Learning & Full-Stack Engineer | Freelance

MAY2021-PRESENT

*Freelance Full Stack Developer*

- Shipped 13+ products to production since 2022, including ML systems for facial expression recognition and PCB defect detection (YOLO v11) and an AR Fitting Room platform (3rd place, national FYP competition).
- Built NadiAir, a Gold + Bronze medal-winning water-quality system combining Random Forest detection with Genetic Algorithm route optimisation.
- Built an end-to-end demand forecasting pipeline on AWS: PySpark feature engineering (lag, rolling averages, calendar features) in AWS Glue ETL, Parquet datasets on S3, and a gradient boosting model in SageMaker Studio validated with a time-based split.

### Ratawanz Resources & Partnership Business Terengganu, Malaysia

MAC2023-OCT2023

*Web Developer*

- Built two Shopify e-commerce stores with payment integration, tripling client sales through SEO and checkout optimisation.

### APMLMS Dungun, Malaysia

SEP2022-FEB2023

*Intern Full Stack Developer*

- Implemented Google Maps integration, OTP verification, and payment gateway integration.

## EDUCATION

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**BSc Computer Science (Hons.)**, Universiti Teknologi MARA (UiTM), Kuala Terengganu **MAC2023-JUL2026**

**Diploma in Computer Science**, Universiti Teknologi MARA (UiTM), Kuala Terengganu **OCT2020-FEB2023**

## CERTIFICATIONS

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### IBM Machine Learning Professional Certificate, Coursera

6-course program covering supervised and unsupervised learning, deep learning and reinforcement learning, completed with a capstone project. [Verify credential](#)

**AWS Certified Machine Learning Engineer - Associate**, Amazon Web Services, Exam scheduled: September 2026

## HIGHLIGHTED PROJECTS

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- **UAV Digital Forensic (PhD Research)**. Forensic pipeline fusing an LSTM telemetry-tamper classifier with a CNN visual-evidence model, reaching **96.2% tamper-detection accuracy**, 18.9 percentage points over the best single-modality baseline, explained via SHAP/LIME.
- **PropIntel MY (Property Price Prediction)**. Cleaned and modelled 53,000 Kuala Lumpur property listings, trained a LightGBM model achieving 0.88 test  $R^2$ , added SHAP-based explanations, tracked experiments with MLflow, and deployed the application using FastAPI, Streamlit and Docker with CI through GitHub Actions.
- **Demand Forecasting (AWS ML Pipeline)**. End-to-end sales forecasting system: PySpark feature engineering in AWS Glue, Parquet on S3, and a gradient boosting model trained in SageMaker Studio, evaluated with a time-based split and permutation importance.
- **SportSphere (Sports Analytics Computer Vision)**. Video analysis pipeline using homography-based court/pitch mapping and trained detection models for automated player and ball tracking, on Next.js, Firebase, Vertex AI.
- **TuJu CarPlay (Native Navigation Experience)**. Native CarPlay experience for TuJu, a Malaysian navigation app, with turn-by-turn routing and Siri-driven hazard reporting, bridging Swift's CarPlay framework to the Flutter navigation engine.
- **epochlab (Practical Machine Learning Education)**. Malaysia-first SaaS teaching machine learning the practical way, with a matched learning path and an in-browser code playground.
- **PCB Defect Detection (Manufacturing QA)**. AI-powered PCB defect detection system using YOLO v11, deployed for computer repair industry clients.

## SKILLS

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**Programming:** Next.js, Flutter, TypeScript, Laravel, Swift/CarPlay, Python, R, SQL

**AI/ML:** PyTorch, TensorFlow, Keras, scikit-learn, LightGBM, SHAP, pandas, NumPy, PySpark, Jupyter, AWS SageMaker, AWS Glue, YOLO v11, BERT, ResNet-50, Vertex AI, Gemini

**MLOps:** MLflow, Docker, FastAPI, Streamlit, GitHub Actions (CI/CD), model serving, model deployment, experiment tracking

**Computer Vision:** MediaPipe, OpenCV, Flask, homography-based mapping

**Automation & Tools:** n8n, CrewAI, LangGraph, AutoGen, MCP, Google Maps API, Shopify

**Backend & Cloud:** Firebase, Supabase, MySQL, GCP

**Languages:** Malay (Native), English (Fluent)