

Abdul Karim Abbas

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Profile

MEng Computer Science with AI graduate and published deep-learning researcher, now an AI and Data engineer building production AI systems and maintaining audit pipelines. Passionate about data science and machine learning, and keen to grow my impact and skillset by taking on increasingly challenging problems.

Education

University of Leeds

Sep 2021 – Jun 2025

BSc, MEng Computer Science with Artificial Intelligence

- International Excellence Scholarship, every academic year.
- Relevant courses: MEng Dissertation (90), Deep Learning (88), Data Science (79), Machine Learning (75).

Professional Experience

PwC UK

Sep 2025 – Present

Data & AI Engineer – Digital Audit

London, UK

- Engineered an end-to-end GenAI platform for audit workflows using LangChain and LangGraph to orchestrate extraction, mapping and validation agents through conditional routing, tool calling and stateful execution.
- Introduced retrieval-augmented generation (RAG) to ground LLM outputs in audit documentation and source evidence, integrating document retrieval, structured data queries and automated validation tools.
- Created an LLM evaluation framework using Langfuse to trace agent execution, retrievals and tool calls, with curated evaluation datasets to assess groundedness, factual accuracy, retrieval relevance and task completion.
- Automated LLM regression and adversarial testing pipelines to detect hallucinations, prompt sensitivity, retrieval failures and performance drift across model and prompt changes.
- Added PostgreSQL-backed checkpointing and structured execution logging to enable resumable agent workflows, reproducible evaluations and end-to-end auditability.
- Developed an Isolation Forest anomaly detection model using engineered transaction features, achieving 85% precision in the top-ranked 10% of transactions and reducing the initial review set by 66%.
- Delivered production ELT pipelines using PySpark, Databricks and SQL to ingest, clean and transform millions of payroll records, with Git version control and Azure DevOps CI/CD to ensure reproducible data processing and deployments.
- Presented GenAI prototypes to senior stakeholders during FTSE 100 audit tenders, demonstrating practical audit use cases and aligning technical capabilities with client requirements.

Personal Project

LapByLap

Probabilistic Forecasting & Decision Optimisation

- Constructed a Monte Carlo engine that simulates each F1 weekend from real timing data, modelling qualifying, race pace, tyre wear, fuel burn, traffic, safety cars, sprints and DNFs to produce full outcome distributions rather than point picks.
- Designed the evaluation harness: per-race backtesting with MAE, Spearman, CRPS and interval coverage. Ranking drivers correctly 82% of the time (Spearman 0.78, top-5 hit rate 86%), with near-zero bias.
- Formulated mixed-integer programmes (PuLP/CBC) for squad selection under budget, team-limit and risk.
- Launched end to end and maintain it live: process-parallel simulation jobs, PostgreSQL/Parquet persistence, FastAPI, Docker and a React/Three.js frontend. Serving live recommendations to recurring users.

Research & Publications

Midline-Constrained Loss in the Anatomical Landmark Segmentation of 3D Liver Models (2025)

MIUA 2025, Lecture Notes in Computer Science. First author.

- Proposed a novel geometry-constrained loss that keeps predictions thin and precise, beating state-of-the-art research.

Intraoperative Segmentation Through Deep Learning and Mask Post-processing in Laparoscopic Liver Surgery (2025)

MIUA 2025, Lecture Notes in Computer Science. Co-author.

- Contributed to mask post-processing methods that refine the segmentation outputs.