BAKHTAWAR IFTIKHAR

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MACHINE LEARNING ENGINEER | AI ENGINEER | DATA SCIENTIST

PROFILE SUMMARY

- Results-driven AI professional with **3+ years of combined academic and industry experience** in designing, developing, and deploying machine learning and AI-driven solutions.
- Demonstrated success enhancing multi-label classification models with **25%** accuracy improvement through advanced feature engineering and robust cross-validation techniques.
- Adept in reinforcement learning, predictive modelling, and computer vision, with published research in UAV navigation and PCB automation technologies.

CORE COMPETENCIES

- Machine Learning
- AI Infrastructure Deployment
- AI-Driven Automation
- Deep Learning
- MLOps & Deployment
- Programming & Frameworks
- API Development
- Data Visualization
- Cloud Computing
- Research & Innovation
- Strategic Problem-Solving
- Collaboration & Leadership

PROFESSIONAL WORK EXPERIENCE

MACHINE LEARNING ENGINEER INTERN | Khiladi — Jun. 2025 - Present

Key Deliverables:

- **Model Optimization:** Enhanced multi-label classification models using XGBoost and Random Forest, improving bowling error detection accuracy by **25%** through rigorous 10-fold cross-validation.
- **API Deployment:** Implemented containerized FastAPI deployment with Python, reducing inference latency by **30%** and enabling real-time predictions across multiple client-facing applications.
- **Cloud Automation:** Streamlined ML deployment pipeline by creating CI/CD workflows on Google Cloud Build, reducing deployment time by **40%** and increasing production scalability.

TECHNICAL SUPPORT ENGINEER | Motive — Dec. 2020 - Aug. 2022

Key Deliverables:

- **Data Analytics:** Analysed system performance data with Grafana and DataDog, resolving an **85%** of recurring issues and reducing ticket volume by **40%** across operations.
- **Cross-Functional Collaboration:** Coordinated with engineering, product, and operations teams to proactively address product health trends, improving system reliability by **25%** & enhancing customer satisfaction.

PROJECTS

➢ **Machine Learning Projects**

- **RL-Based Collision Avoidance for UAVs – MS Thesis**
  - Designed a Reinforcement Learning framework improving UAV navigation in disaster zones, reducing collision rates by **40%** during complex terrain simulations.
  - Built a Unity 3D simulation with **50+** obstacles, training an RL agent to achieve **85% success rate** in adaptive navigation.
- **Grand Prix 2025 Winner Prediction Model**
  - Developed a Python-based prediction model leveraging Pandas and NumPy, achieving **74% accuracy** in forecasting race outcomes.
  - Optimized regression models with Scikit-learn and GridSearchCV, enhancing predictive performance through systematic hyperparameter tuning.
  - Created data visualizations with Matplotlib and Seaborn to identify performance trends and communicate model insights effectively.

➢ **AI Projects**

- **RAG-Powered Conversational AI Agent**
  - Engineered a Retrieval-Augmented Generation system using **LangChain** & **LangGraph**, powering multi-agent conversational AI with real-time contextual retrieval.
  - Processed **500+ technical documents** with retrieval latency < 500 ms, ensuring high accuracy and reliable knowledge grounding.
  - Designed multi-turn conversation workflows with LangGraph, reducing hallucination rates by **90%** on benchmark datasets.
  - Built a Streamlit-based web interface and integrated LangSmith for monitoring **1,000+ trace events**, ensuring pipeline robustness.

- **LLM-Powered Code Interpreter Agent**
  - Developed a conversational AI capable of translating natural language queries into executable Python code, solving **100+ coding tasks**.
  - Integrated Python REPL as a tool, enabling accurate data manipulation and achieving a **100% success rate** on test cases.
  - Implemented intelligent tool selection logic within LangChain, enabling reasoned decision-making with a **5-step reasoning chain**.
  - Orchestrated agent workflows via LangChain and LangGraph, supporting **simultaneous user requests** with efficient scaling and resource utilization.

EDUCATION

- **Master of Science in Artificial Intelligence** | National University of Science & Technology, Pakistan | 2025
- **Bachelor of Science in Electrical Engineering** | Ghulam Ishaq Khan Institute, Pakistan | 2020

TECHNICAL SKILLS

- **Machine Learning & AI:** TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, Matplotlib, Seaborn, OpenCV
- **API Development:** FastAPI, Uvicorn, Pydantic
- **MLOps & Deployment:** Docker, Joblib, CI/CD (Google Cloud Build)
- **Cloud Platforms:** Google Cloud Platform (GCP), Google Cloud Storage (GCS)
- **Programming Languages:** Python
- **Simulation & Modeling:** Unity 3D (for UAV simulations)

PUBLICATIONS

- **Cost-effective, Reliable, and Precise Surface Mount Devices (SMDs) on Printed Circuit Boards (PCBs) – FYP**
  Bakhtawar Iftikhar, Mustafa Asif Malik, Salman Hadi, Omar Wajid, Muhammad Nadeem Farooq, Muhammad Muqeet Rehman, Ahmad Kamal Hassan
  - In Proceedings of 3rd Pak-Turk International Conference on Emerging Technologies in the field of Sciences and Engineering, Topi, 9–10 June 2020.
    https://iopscience.iop.org/article/10.1088/1757-899X/899/1/012007
- **UAV Collision Avoidance in Earthquake Environments Using Reinforcement Learning – Submitted**
  Bakhtawar Iftikhar, Rizwan Ahmad, Shams Qazi, Salman Ghafoor
  Manuscript submitted; under review

PERSONAL DOSSIER

- **Languages Known:** English