Muhammad Akbar

Nationality: Pakistani   **Date of birth:** 12/01/2004

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EDUCATION AND TRAINING

Computer Engineer

Istanbul Arel University [07/03/2022 – Current]

City: Istanbul | **Website:** https://arel.edu.tr/ | **Final grade:** 3.33/4 | **Level in EQF:** EQF level 6 | **Thesis:** SKIN DISEASE AND MOISTURE CLASSIFICATION USING THE HAM1000 DATASET AND CONVOLUTIONAL NEURAL NETWORKS

- **Convolutional Neural Networks (CNNs):** Design, training, and evaluation of CNN architectures for image classification tasks.
- **Medical Image Analysis:** Preprocessing and augmentation of dermatoscopic images from the **HAM10000 dataset** for skin lesion classification.
- **Skin Disease Classification:** Automated identification of multiple skin disease categories using deep learning models.
- **Skin Moisture Estimation:** Analysis of skin hydration levels and their correlation with dermatological conditions.
- **Data Preprocessing & Augmentation:** Techniques including normalization, resizing, rotation, and flipping to improve model generalization.
- **Performance Evaluation:** Metrics such as accuracy, precision, recall, F1-score, and confusion matrices for model assessment.
- **Python & Deep Learning Frameworks:** Practical implementation using **TensorFlow/Keras**, OpenCV, and related Python libraries.

WORK EXPERIENCE

🏢 *Bluesense AI* – Istanbul, Turkey

City: Istanbul | **Country:** Turkey

Software engineering Intern

[07/02/2025 – 30/06/2025]

- **Mobile Application Development:** Developed cross-platform mobile applications using **React Native** and **Jet pack Compose**, delivering seamless user experiences on both iOS and Android.
- **UI/UX Implementation:** Translated design wireframes and mockups into functional mobile interfaces using React Native components, ensuring responsiveness and optimized performance.
- **State Management:** Utilized **Redux** and **React Context API** to maintain smooth data flow and efficient communication between components.
- **API Integration:** Integrated **RESTful APIs** and third-party services for dynamic content, real-time data, and push notifications in mobile applications.
- **Testing and Debugging:** Conducted unit testing with **Jest** and **React Native Testing Library** to ensure application stability; debugged issues using **React Native Debugger**.
- **App Deployment:** Published applications to the **App Store** and **Google Play Store**, managing app lifecycle updates and maintaining version control.
- **Collaboration and Agile Development:** Worked in an **Agile environment**, collaborating with designers, backend developers, and product managers to ensure timely delivery of features and improvements.

Projects:
- **Smart Beauty (Jetpack Compose - Android):** Developed a beauty services app with a modern UI, performance optimization, smooth UI interactions, AI integration, and flexible UI components.
- **Medical Home (React Native - iOS & Android):** Built a mobile healthcare app with RESTful API integration and push notifications for real-time updates.

🏢 *Neuralflex AI* – Helsinki, Finland

City: Helsinki | **Country:** Finland

Generative AI Engineer Intern

[01/09/2025 – Current]

- **Real-Time Voice Agent Development:** Built a real-time AI voice agent using **LangGraph**, integrating speech input/output, conversational flows, and agentic reasoning for interactive live communication.
- **WebRTC & LiveKit Integration:** Implemented **LiveKit-based WebRTC pipelines** for two-way audio streaming between users and the AI agent, including room creation, token generation, and stable session handling.
- **Full-Stack Application Engineering:** Developed a production-ready ecosystem using **React (frontend)** and **FastAPI (backend)** for session management, streaming interfaces, LangGraph agent calls, and real-time UI logic.
- **LangGraph & Agentic Workflows:** Designed and integrated LangGraph workflows for dialogue management, memory, tool use, and structured conversation flows, with observability via **LangSmith**.
- **API & Service Integration:** Integrated **STT, TTS, and LLM inference endpoints**, built reliable audio pipelines, and maintained low-latency communication between backend and AI agent.
- **Deployment & DevOps:** Containerized services with **Docker**, orchestrated multi-service setups with **docker-compose**, and deployed applications on **AWS EC2** and **Railway**, ensuring scalable and fault-tolerant cloud environments.
- **Testing & Code Quality:** Implemented backend tests, managed separate dev/prod environments, applied Python linting standards, and structured code for maintainability and best practices.
- **Collaboration & Agile Development:** Worked closely with AI engineers, designers, and product teams to refine voice agent flows, improve UX, and deliver incremental updates in an **Agile workflow**.

LANGUAGE SKILLS

Mother tongue(s): Urdu

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C2

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Hindi

LISTENING C2 **READING** B1 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Punjabi

LISTENING C1 **READING** C1 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Turkish

LISTENING B2 **READING** B1 **WRITING** A2

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Data Science | Data Collection, Data Processing, Data Analysis, Data Visualisation / Node.Js, React.Js / SQL / Python / Web Development (Python/Django) / Machine Learing / Deep Learning (Tensorflow, Pytorch(basic), Jax/ Flax(basic)) / Python (PyROOT, RDataFrame; ML: Keras, TensorFlow) / Image Preprocessing and Image Classification / Modeling: Linear and logistic regressions / WEB; Web Developer / Git, Git Hub, SVN / Java Swing / Java FX / JAVA SPRING / C,C,C++ / Microcontroller programming(STM32, PIC16F877a, Arduino) / Programmazione Object Oriented

PROJECTS

[01/09/2024 – 24/12/2024]
Skin Cancer Classification
- Developed a **CNN model** for skin disease detection using the **HAM10000** dataset with 97.75% test accuracy.
- Enhanced model performance using dropout layers, data augmentation, and ensemble learning. • Deployed as a **mobile app** using **React native** and **Django**
- used **mysql** as **database** to store appointments and user identity information

Link: https://github.com/reprobateboffin/Graduation-Project-DermaCare

[06/06/2024 – 10/07/2024]
Real time emotion detection
- **Real-Time Facial Emotion Recognition:** Developed a real-time emotion detection application using **Keras/TensorFlow** for model training and **OpenCV** for live video capture and face detection.
- **CNN Model Implementation:** Built a **convolutional neural network (CNN)** to classify emotions such as happiness, sadness, anger, surprise, and neutrality from facial expressions.
- **Face Detection & Video Processing:** Integrated **OpenCV Haar Cascade** to detect faces in webcam frames, enabling smooth, high-FPS real-time emotion inference.
- **Data Augmentation & Training:** Trained the model on the **FER2013 dataset** with data augmentation techniques to improve robustness and generalization.
- **Interactive Python Application:** Developed a lightweight Python app that overlays detected emotions on live video frames, providing a visually intuitive and interactive interface.
- **Performance Optimization & Modularity:** Focused on preprocessing pipelines, efficient inference, and modular code structure for easy extension to real-world use cases like mental-health monitoring, user behavior analytics, or human-computer interaction.

Link: https://github.com/reprobateboffin/Real-time-emotion-detection-tensorflow-keras

[12/07/2024 – 29/07/2024]
Interviewer Chatbot
- **Custom Interview AI Agent:** Developed a **customizable, interview-focused AI agent** using **LangGraph**, supporting dynamic question flows, context-aware dialogue, and tool-based reasoning.
- **Full-Stack Integration:** Connected the agent to a **FastAPI backend** and a **Streamlit UI** for real-time chat interactions.
- **Persistent Memory Management:** Used **PostgreSQL** to save memory checkpoints while the agent graph awaited frontend responses.
- **Workflow & Streaming Implementation:** Implemented structured workflows, memory handling, and streaming responses to simulate realistic interview sessions.
- **Extensibility & Automation:** Designed the system to support **CV-based Q&A**, automated feedback generation, and tailored multi-step agent behaviors for flexible deployment.

Link: https://github.com/reprobateboffin/gen-ai-chatbot-interview-simple

NETWORKS AND MEMBERSHIPS

[12/09/2024 – Current] Istanbul
Developer student's club , Arel University

HOBBIES AND INTERESTS

Literature