Rayan Alam

rayanalam005@gmail.com | +923334141261 | Peshawar, Pakistan | linkedin.com/in/rayanalam005 | github.com/KhanBuilds

Motivated Computer Science undergraduate, dedicated to building a strong foundation in software development and intelligent systems. Proven ability to transition from technical theory to practice, with hands-on experience developing smart vision systems and proposing innovative solutions for infrastructure safety. A proactive problem-solver eager to apply expertise in C++, Python, computer vision, and system design to impactful, real-world engineering challenges.

EDUCATION

Institute of Management Sciences — Bachelor of Science, Computer Science Peshawar, Pakistan

2024 – current | GPA: 3.33/4

SKILLS

C++ Computer Vision Flask
Python Arduino, Microcontrollers SQL
Git
GitHub
Visual Studio Code

PROJECTS

Face Tracking Laser *Dec 2025 — Jan 2026 | Peshawar*

- **Computer Vision Pipeline:** Implemented OpenCV in Python to facilitate real-time facial detection and feature extraction from live video streams.
- **Coordinate Transformation:** Developed a mathematical mapping algorithm to translate pixel-based coordinates into angular degrees (X,Y axes), accounting for camera Field of View (FoV) and resolution.
- **Serial Communication Protocol:** Architected a robust data link between Python and Arduino using the PySerial library, ensuring low-latency transmission of coordinate packets.
- **Embedded Control Logic:** Authored C++ firmware for Arduino to parse incoming serial data and execute precise PWM signals for dual-axis servo motors, achieving smooth and responsive tracking.

Lip-mood-tracker *Jun 2025 — Jun 2025 | Peshawar*

- **Facial Landmark Analysis:** Leveraged OpenCV (and potentially Mediapipe) to identify and track specific lip contours and anchor points, extracting vertical and horizontal displacement data.
- **Emotion Classification Logic:** Developed a heuristic algorithm to map lip curvature and position to specific emotional states (e.g., happiness, surprise, or neutral) using real-time geometric ratios.
- **Hardware-Software Integration:** Streamlined a full-stack communication loop using Python to process heavy visual data and relay categorized emotional triggers to an Arduino via serial interrupts.
- **Signal Processing:** Optimized the data sampling rate to ensure the Arduino responded to rapid facial changes without lag, managing buffer sizes and data parsing in C++.

Human Activity Recognition (HAR) Framework *Apr 2026 — Present | Peshawar*

- **Multivariate Signal Engineering:** Developed a preprocessing engine to handle 6-axis IMU data (accelerometer and gyroscope), structuring raw signals into 3D tensors (samples,128,6) for temporal modeling.
- **Time-Series Normalization:** Implemented a global standardization strategy (zero-mean, unit-variance) across sensor channels to ensure feature parity and accelerate convergence during the training phase.
- **Pipeline Optimization:** Designing a modular data loading architecture to efficiently ingest and reshape 50Hz motion recordings from the UCI HAR Dataset, managing high-dimensional signal windows.
- **Cloud-Based Research Environment:** Leveraging the Kaggle ecosystem to build and iterate on experimental notebooks, utilizing a Python-based stack (NumPy, Pandas) for large-scale numerical analysis.
- **Model Selection:** Currently evaluating deep learning architectures (e.g., 1D-CNN) to capture complex temporal dependencies in motion patterns.
- **Real-time Inference:** Exploring quantization techniques to adapt the classification pipeline for resource-constrained embedded hardware.

Campus Management System *Apr 2026 — Apr 2026 | Peshawar*

- **Relational Database Design:** Engineered a comprehensive **PostgreSQL** schema to manage campus operations, featuring a nested library module that tracks real-time book inventory, student borrowing records, and automated due-date scheduling**.**
- **System Architecture:** Designed a normalized database schema to maintain data integrity and optimized server routes for efficient record retrieval and updates.
- **Full-Stack Implementation:** Developed dynamic server-side logic using **Flask** and **Jinja2** to facilitate library administrative tasks, including inventory updates and detailed transaction tracking of borrowed assets.

CERTIFICATIONS

- AI For Everyone — DeepLearning.AI
- AI Solutions Challenge — Hack2Skill