ALFAYEZ AHMAD

Lucknow, India | alfayezahmad.aa@gmail.com

linkedin.com/in/alfayezahmad | github.com/alfayezahmad

SUMMARY

Systems Developer and AI & Robotics Researcher taking a "silicon-up" approach to engineering. Specialized in the intersection of autonomous navigation, embedded control, and stochastic optimization, ensuring high-level AI architectures are grounded in mathematical rigor and hardware efficiency.

EDUCATION

Integral University   Lucknow, Uttar Pradesh
B.Tech in Computer Science & Engineering (Cloud Computing & AI)   2024 – Present
Cumulative GPA: 9.55 / 10.0 | *Coursework: Data Structures & Algorithms, DBMS, Operating Systems, Advanced Java*

Council for the Indian School Certificate Examinations (CISCE)
The Indian School Certificate (ISC)   Grade: 92.25%

PUBLICATIONS

Model Predictive Control Algorithm for Variable Speed Limits and Ramp Metering   Feb 2026
IEEE Xplore Digital Library (IMPACT 2026, Aligarh Muslim University)
- Engineered an MPC framework integrating Variable Speed Limits and Ramp Metering using the SUMO simulation suite.
- Achieved a documented 18.8% improvement in system throughput and flow stability compared to unmanaged traffic baselines.

Foundations of AI-Driven Precision Medicine: Algorithms, Omics, and Clinical Integration   Jan 2026
Chapter 10, Bentham Science: Artificial Intelligence for Next-Gen Healthcare
- Authored a specialized chapter focusing on the technical integration of AI algorithms with multi-omics data to advance diagnostic accuracy.

EXPERIENCE

Lead Developer & Researcher (Open Source)   Nov 2025 – Present
Independent Research
- Architected Sentinela, a real-time Network Intrusion Detection System (NIDS) optimized for Apple Silicon (macOS ARM64) utilizing Scapy for promiscuous mode packet analysis.
- Deployed Random Forest machine learning classifiers for live traffic inference, achieving sub-millisecond latency in detecting high-velocity Port Scans and DoS attacks.
- Engineered asynchronous Python data pipelines integrated with SQLite to capture edge-case network telemetry and enable high-throughput performance logging.

Technical Community Contributor (Drones & Robotics)   2022 – Present
Hackster.io
- Developed and documented flight control firmware for quadcopters using STM32 (ARM Cortex-M) and Atmega328P (AVR) systems.
- Implemented Extended Kalman Filter (EKF) algorithms for UAV state estimation to fuse IMU, GPS, and barometer data.
- Architected nested-loop PID controllers with 400Hz+ stabilization and managed I2C/DMA protocols for hardware-software interfacing.

TECHNICAL PROJECTS

Autonomous Warehouse Perception System (SAM 2 + SQL)   Dec 2025
- Integrated Meta's Segment Anything Model 2 (SAM 2) with OpenCV morphological operations to autonomously track objects undergoing severe topological changes and fragmentation.
- Engineered a custom "Multi-Centroid" visual prompting strategy, ensuring robust ID persistence across complex 1-to-4 object split scenarios in dynamic environments.

Quadcopter-Sim-V1: Autonomous Flight Pipeline & Digital Twin   Oct 2025
- Developed a modular 1D flight simulator mimicking industrial robotics stacks with a discrete-time Newtonian physics engine using Euler Integration.
- Implemented a Linear Kalman Filter to suppress Gaussian sensor noise and engineered a PID feedback loop with gravity feed-forward compensation.

PM2.5 Air Quality Forecasting: Cloud-Ready ML Microservice   Aug 2025
- Engineered a Docker-containerized ML pipeline to forecast daily PM2.5 concentrations based on localized meteorological data.
- Conducted comparative analysis between Linear Regression and a Random Forest Regressor, capturing sharp non-linear pollution peaks.

TECHNICAL SKILLS & CERTIFICATIONS

- **Languages:** C, C++, Python (Advanced), SQL (SQLite).
- **AI/ML:** TensorFlow, Keras, Scikit-Learn, Reinforcement Learning (MDPs, DQN, PPO).
- **Robotics & Vision:** ROS 2, PX4, OpenCV, TensorRT.
- **Hardware & Deployment:** STM32 (ARM), Atmega328P, Apple Silicon, GNU/Linux, Docker, Git.
- **Certifications:** IBM Machine Learning with Python & Cloud Application Developer | Google Cloud (Compute, Vertex AI, API Gateway).