

PRAKHAR GUPTA

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Education

International Institute of Information Technology, Hyderabad

B.Tech + M.S. by Research in Electronics and Communication Engineering

Expected May 2028

Hyderabad, India

Experience

Machine Learning Engineer Intern

Jul 2026 – Aug 2026

Latitude 54, Software Engineering Team

Remote

- Owned the perception and decision layer of an autonomous-airspace simulation pipeline: a platform classifier and temporal intent model behind a two-function Python API used by three teammate-owned modules.
- Designed a 2-layer, 4-head **Transformer** for sequence-level intent scoring (**0.987 ROC-AUC**) and a **PyTorch** MLP classifier with a confidence-thresholded UNKNOWN fallback.
- Diagnosed and eliminated a **label-leakage** failure mode, and enforced one canonical windowing path for training and inference so train/serve skew became structurally impossible.
- Shipped occlusion-based attribution, Monte-Carlo dropout uncertainty, versioned checkpoints, and a **37-test pytest suite**.

Undergraduate Researcher

May 2025 – Present

Robotics Research Center (RRC), IIIT Hyderabad

Hyderabad, India

- Designed and simulated multi-agent formation control (line, V, square) using PD controllers, rotation-frame offsets, and leader trajectory tracking.
- Implemented collision avoidance via potential-field repulsion and time-to-collision prediction in **PyBullet**, tuned for real-time simulation.
- Working on swarm drone tracking with multi-agent RL under Dr. Harikumar Kandath.

Teaching Assistant, Electronics Workshop 2

Jan 2026 – Present

IIIT Hyderabad

Hyderabad, India

Projects

RC Car Follower Drone | Python, YOLOv8, OpenCV, Kalman Filter, PID, DJI Tello

GitHub

- Built a real-flight follower: a custom-trained **YOLOv8s** detector (0.937 mAP50-95 on validation) runs every 4th frame, a **CSRT** tracker bridges detections, and a **Kalman filter** smooths the target state.
- Closed the loop with three **PID** controllers (yaw, altitude, range) holding a 1 m standoff from monocular range estimates; logged and analyzed flight data, identifying yaw-rate saturation as the limiting factor on turns.

Multi-Agent Drone Swarm Coordination with Deep RL | Python, PyBullet, MADDPG, MAPPO

GitHub

- Developed a decentralized multi-UAV framework for moving-target pursuit using **MADDPG** with centralized training and decentralized execution, and reward shaping for pursuit, collision avoidance, and formation stability; moving to recurrent **MAPPO**.

AI Website Builder | React, TypeScript, Express, Prisma, PostgreSQL, Stripe

GitHub

- Built a full-stack platform that generates responsive websites from natural-language prompts, with conversational revisions, version history, and one-click rollback; deployed on Vercel.
- Integrated **Stripe** Checkout and webhooks for credit-based billing, session-based auth, and protected REST APIs over **PostgreSQL** via Prisma.

Unix Shell | C, Linux, POSIX

GitHub

- Wrote a Unix-like shell with job control, signal handling (SIGINT, SIGTSTP), I/O redirection, and multi-stage pipes, plus custom utilities built on the Linux `/proc` filesystem.

Systolic GEMM Accelerators on Alveo U50 FPGA | C++, Vitis HLS, XRT, HBM

GitHub

- Built and benchmarked 10 GEMM kernel variants; a 32×32 systolic array sustains 1,024 MACs/cycle at $\Pi=1$, and dataflow with ping-pong buffering cut DSP usage $2.5\times$ while hiding load latency.

Technical Skills

Languages: Python, C/C++, TypeScript/JavaScript, SQL, MATLAB, Verilog

ML & Vision: PyTorch, Transformers, YOLOv8, OpenCV, scikit-learn, XGBoost, SHAP

Robotics: PID and Kalman filtering, multi-agent RL (MADDPG/MAPPO), PyBullet, Simulink/Stateflow, DJI Tello SDK

Web & Backend: React, Node.js, Express, REST APIs, Prisma, PostgreSQL, MongoDB

Tools: Git, Linux, Docker, GitHub Actions, pytest, Vitis HLS

Achievements

- Finalist**, MathWorks Minidrone Competition (India, 2025): vision-based line following and landing in Simulink/Stateflow.
- Represented India** in chess at the Commonwealth Games; 13+ years as an international chess player ([FIDE profile](#)).
- State top 1% in the Physics Olympiad; Head Coordinator of The Dance Crew, IIIT Hyderabad.