



Ayush Kumar

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Master (MS Research)

Computer Science and Information Engineering

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GitHub Profile

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EDUCATION

- **National Chung Cheng University, Taiwan** 2026-28 (Expected)
MS, Computer Science and Information Engineering
- **National Institute of Technology, Delhi** 2021-25
BTech, Electrical and Electronics Engineering

EXPERIENCE

- **Research Center on Artificial Intelligence and Sustainability, CCU Taiwan** August 2025 - November 2025
Research Intern Taiwan
 - Reduced end-to-end latency of autonomous aerial response system significantly using TensorRT FP16 optimization, GPU acceleration, asynchronous processing, multi-threading, zero-copy memory transfers, and pre-allocated CUDA memory, enabling real-time UAV navigation.
- **Research Center on Artificial Intelligence and Sustainability, CCU Taiwan** December 2024 - June 2025
Research Intern Taiwan
 - Involved in research on AI-based smart flight control systems for UAVs, focusing on integrating advanced control algorithms and utilizing simulation tools like ROS 2 Humble.
- **National Institute of Technology Delhi** June 2023 - July 2023
Summer Research Intern Delhi
 - Conducted research on charging and discharging circuits, battery pack design, battery pack modeling, and drive cycle analysis to obtain waveform outputs for current, voltage, and SOC.
 - Developed and simulated models for cell balancing, including both passive and active balancing methods.

PROJECTS

- **Design and Evaluation of a Machine Learning - Driven ADAS (Advanced Driver Assistance System) using YOLOv8 and Lane Detection.**
April 2025 - June 2025
 - Tools & Technologies Used: Python 3.10, YOLOv8n, OpenCV v4.8.0, CARLA Simulator v0.9.13, NumPy, Matplotlib, IP Webcam app
- **Autonomous UAV System Deployment for Real-Time Disaster Relief Operations**
April 2025 - June 2025
 - Tools & Technologies Used: ROS2, Pixhawk, Mission Planner, MQTT, Jetson Nano (Nvidia Board), Deep Learning
- **Design and Evaluation of a MAVLink Fault-Tolerant Autonomous GPS Navigation System for UAVs in Disaster Response using ROS 2 and PX4 SITL**
Dec 2024 - March 2025
 - Tools & Technologies Used: ROS2 Humble, Gazebo, PX4 Autopilot, Python, OpenCV, Deep Learning
 - This project develops a fault-tolerant GPS navigation system for UAVs using ROS 2 and PX4. It detects MAVLink faults during disaster missions and autonomously recovers navigation, ensuring reliable UAV operation even under communication failures.
- **Design and Analysis of Battery Management Systems for Electric Vehicles**
June 2023 - July 2023
 - Tools & Technologies Used: MATLAB – SIMULINK
 - Sub-projects: Charging and Discharging Circuits, Battery Modeling, Designing Battery Pack Model, Passive Cell Balancing, Active Cell Balancing
- **Electric Vehicle Powertrain Development: Inspired by TATA NEXON EV Configurations**
Jan 2024 - Feb 2024
 - Developed a powertrain similar to the TATA NEXON EV, focusing on efficiency and performance optimization.

•Comprehensive Analysis of Cost-Effective Data-Driven Approaches for Electricity Theft Detection

June 2024 - July 2024

- Analyzed various data-driven methods for detecting electricity theft, focusing on cost-effectiveness and accuracy.

•Customer and Restaurant Analysis for Zomato's Food Delivery Business

June 2024 - July 2024

- This project involves analyzing Zomato's customer and restaurant data to uncover insights into customer preferences, restaurant performance, and ordering behavior, aiding in strategic decision-making and targeted promotions.
- Tools and Technologies Used: Jupyter Notebook, Python

•Blinkit Sales and Performance Analysis Using Power BI

June 2024 - July 2024

- This project involves using Power BI to analyze and visualize key performance indicators (KPIs) for Blinkit, focusing on sales, item types, outlet performance, and customer ratings to drive strategic business decisions.
- Tools and Technologies Used: Power BI, Power Query

PUBLICATIONS

•Comprehensive Analysis of Cost-Effective Data-Driven Approaches for Electricity Theft Detection Presented at IEEE Conference (PIICON 2024)

- Certificate available at: [Click here](#)

TECHNICAL SKILLS AND INTERESTS

Languages:	Python, C++, MATLAB
ML Tech:	Machine Learning, OpenCV, Deep Learning, Computer Vision, LLM
Data Visualization:	Power BI, Tableau, MS Excel
Dev Tools:	SQL, Web Design, Graphic Design
Electrical Simulation Tools:	MATLAB Simulink, LTspice, TinkerCAD
Robotics & UAV Tools:	ROS2, PX4 SITL, Gazebo, Rviz2, Mission Planner, QGC, MAVProxy, DroneKit
Communication Protocols:	Mavlink, MQTT
Operating Systems:	Linux, Windows
Other Skills:	Team Work, Project Management, Research

POSITIONS OF RESPONSIBILITY

•Webmaster, IEEE NIT Delhi	2023-24
•Head, Design, IEEE NIT Delhi	2022-23
•Senoir Coordinator, IEEE Delhi Section	2023-24
•Creative Team Lead, Social Reformation Cell - NIT Delhi	2023
•Executive Member, Startup Centre for Innovation and Entrepreneurship, NIT Delhi	2023-24
•Web Developer, 180 Degrees Consulting NIT Delhi	2022-23
•Student Volunteer, National Service Scheme (NSS)	2021-24

ACHIEVEMENTS

•Annual Award Ceremony Awarded as Outstanding Student Volunteer at IEEE Delhi Section.	2024
•Trailblazer First Coordinator in the history of IEEE SB to be selected for IEEE Delhi SSN.	2023-24
•Award Felicitation Ceremony @IEEE NITD Awarded as Best Employee of the Year at IEEE SB.	2022
•Joint Entrance Exam (Mains) Secured Top 3 percentile among 10+ Lakhs of Candidates	2021
•IMO - International Mathematics Olympiad - SOF Qualified	2018
•SEAMO - Southeast Asian Mathematical Olympiad Qualified Stage - 1	2018
•PRMO - Pre-Regional Mathematics Olympiad Qualified	2018
•FTRE - FIITJEE Talent Reward Exam Aailed 100% Scholarship as fee waiver	2017
•ANITSE - Ace North India Talent Search Examination Zonal Rank : 33 Award of Excellence	2016

CERTIFICATIONS

•Modeling of Electric Vehicles using MATLAB and Simulink Issued by Skill-Lync	Nov 2023
•Google Analytics Issued by Google Digital Academy (Skillshop)	June 2023
•MATLAB Issued by MathWorks	June 2023
•Supervised Machine Learning Issued by Stanford University	June 2023
•Data Analytics Consulting Virtual Internship Issued by KPMG	March 2023