Mayank Dixit

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA | Masters of AI Engineering | CGPA: 3.92/4.0 **Dec 26**
Courses: Machine Learning, Deep Learning, Toolchains for AI Engineers
NSUT, Delhi, India | Bachelor of Technology in Electrical Engineering, Minor- ML and Data Science | CGPA: 8.04/10 **Jun 23**

SKILLS

Tools & Frameworks| Python, Tensorflow, PyTorch, Keras, Java Script, CI/CD, Maven, Angular, Scikit-learn, Matlab, Kafka, Spark
Domains| Machine Learning, Computer Vision, MLOps, NLP, LLM, VLM, Diffusion, GNN, RAG
Cloud & Database| Azure, AWS CodePipeline, GCP, Postgres, DBMS, Docker
Soft Skills | Team Player, Sprint Planner, Cross Functional, Critical Thinking, Communication, Stakeholder management
Fields | Data Systems, AI Agents, Energy, Robotics, Aircraft Design, Monitoring, Operations, Data Security

EXPERIENCE

Carnegie Mellon University | Pittsburgh, PA| **Graduate Research Assistant - Prof. Christopher McComb** Sep 25 - present
Collaboration with Boeing (MCP Agent Development)

- Working on hardening MCP servers (TiGL, SU2, pyCycle) for agent-driven aircraft design (schema validation, session isolation, error handling, tests, reproducible outputs).
- Designing modular servers to run standalone or as a pipeline (geometry to CFD to propulsion)

AI Coach - Deployed a collective-intelligence (audio-text based) AI agent to AWS to guide generalized team problem solving; integrated to Slack via RESTful APIs.

Gentari, Petronas | Gurgaon, India | **Senior Data Scientist** Oct 24 - July 25
Collaboration with Microsoft

- Identified frequent knowledge-retrieval delays; architected and launched a private RAG chatbot with FAISS and a local Llama 3.2 LLM, cutting API spend and accelerating analyst response time, while mentoring two interns.
- Led a Team (Microsoft project) to develop a solar forecasting framework. Trained models on an Azure pipeline to improve power and revenue forecasts using TFT and Deep MNC.
- Challenged third-party solar forecasts; engineered and productionized a Bi-Directional LSTM with novel exogenous features, surpassing vendor accuracy and yielding around $1M in annual savings.

Gentari, Petronas | Gurgaon, India | **Data Scientist** July 23 - Oct 24

- Designed a custom penalty-based loss function to reduce vendor penalties, leveraging weather forecast data.
- Automated power injection uploads to government portals for all 40 solar and wind plants via Selenium, saving 100 man-hours weekly.
- Developed and deployed an LSTM model to detect fault potential in inverters at company solar sites.
- Formulated a Gradient Boost Regressor for the costing team based on historical data to estimate site costs before setup.

Netaji Subhas University of Technology | Delhi, India | **Research Assistant** Aug 22 - June 23

- Proposed and led a new bearing-fault pipeline combining Vision-Transformers with complex-frequency bi-spline features, improving robustness on noisy vibration signals under Prof. Vijander Singh.

Indian Institute of Technology Kharagpur | Kharagpur, West Bengal | **Research Intern** May 22 - Nov 22

- Identified real-world gaps in autonomous driving safety by recognizing adversarial attack vulnerabilities, and designed and constructed a prototype solution with Raspberry Pi 4 and Arduino modules to demonstrate practical robustness.
- Engineered a color-detection takeoff model for drones with a ROS package.

RESEARCH PUBLICATIONS

- Structure-Based Learning for Robust Defense Against Adversarial Attacks in Autonomous Driving Agents, 7th International Conference on Computer Vision & Image Processing (CVIP 2022), Springer (link)
- An NFNet-based approach for enhanced bearing fault classification using vibrational signal analysis, 14th International Conference on Computing, Communication & Networking Technologies (ICCCNT 2023), IEEE (link)
- TransForm-Motor: A Vision Transformer-based Transfer-Learning Framework for Bearing Fault Detection using Vibrational-Signals, 11th International Conference on Advancements in Engineering and Technology (ICAET) (accepted)

ACHIEVEMENTS

IIT, Ropar Hackathon 21 | Agri.AI provides Indian farmers a one-stop solution for farming. Secured 1st place out of 110 teams
IAF Benevolent Scholarship 19 | Received National Scholarship from Indian Air Force for excellence in Academics.

CMU PROJECTS

- Grid-Scout - A web app tool that recommends optimal U.S. sites for large data centers by co-optimizing grid congestion headroom, clean energy proximity, reliability, and emissions impact. (made for RWE, based on synthesized data)
- **FIFA Player Analytics + ML Pipeline (GCP, Spark, PostgreSQL)** - Built an end-to-end GCP-deployed FIFA analytics + ML pipeline using PostgreSQL + PySpark to unify player data, run scalable feature/SQL analyses, benchmark multi-model regressors for value prediction, and stream YouTube comments via Publisher/Subscriber for player popularity insights.