

Patel Vatsal

Data Scientist, Quant Researcher

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EDUCATION

- **C.K. Pithawala College of Engineering and Technology** Gujarat, India
Bachelor of Engineering - Computer Engineering Expected 2026
Courses: Artificial Intelligence , Data Mining, Theory of Computation, Data Structures and Algorithms, Object Oriented Programming and DBMS
CGPA: 7.4

RESEARCH & PROJECTS

- **MachineLearningOps– End-to-End ML Pipeline & CI/CD .** Project
Tech Stack :- Python, MLflow, YAML, Docker, GitHub Actions
 - Engineered a modular ML pipeline with MLflow and a YAML-driven config/schema/params framework to guarantee reproducibility and streamline hyperparameter tuning.
 - Automated CI/CD workflows via GitHub Actions: built Docker images, pushed to AWS-ECR, spun up self-hosted EC2 runners, and deployed models in under 10-minutes—eliminating manual steps.
 - Centralized experiment tracking by integrating DagsHub as a remote MLflow server, managing credentials securely with environment variables.
 - Built a Flask microservice (app.py) to serve trained models over RESTful endpoints, enabling real-time inference for downstream applications.
- **Stock Forecasting Using LSTM and GRU with Technical Indicators** Paper
Tech Stack :- Python, TensorFlow, LSTM, GRU, Yahoo Finance API
 - Compared LSTM and GRU models for predicting prices of TCS, Reliance, and Infosys.
 - Enhanced model inputs with RSI, MACD, and Bollinger Bands to improve accuracy.
 - Achieved RMSE as low as 0.02 and MAE under 0.015 on normalized stock data.
 - Demonstrated performance improvements using visual RMSE/MAE comparisons.
- **UAV-Based Mesh Networks for Emergency Communication: A Comprehensive Analysis** Paper
Tech Stack :- Leaflet.js, MongoDB, Node.js, React.js, HTML, CSS, Javascript
 - The paper analyzes UAV-based mesh networks for emergency communication, proposing a hybrid deployment model using UAVs and ground-based relays to achieve up to 98.7% coverage reliability.
 - It utilizes Ubiquiti Bullet M2 HP with 12 dBi directional mesh antennas and Software-Defined Networking (SDN) for network management, estimating throughput ranging from 35-120 Mbps.
 - The analysis covers challenges like UAV energy constraints requiring an estimated 45 battery changes for 24-hour operation, spectrum interference in urban environments, and regulatory compliance.

SKILLS SUMMARY

- **Languages:** Python(Intermediate), Java, R, C programming language, JavaScript
- **Data Science:** TensorFlow, pandas, NumPy, scikit-learn, Keras, matplotlib, seaborn
- **Cloud:** Google Cloud
- **Frontend:** Flutter, Figma, React (basic), HTML, CSS
- **Backend:** Nodejs, Mongoose, REST API, Firebase
- **Soft Skills:** Problem solving, Communication, Management, Leadership

ACHIEVEMENTS

- Scored **47/50** marks in Future of India's Space Exploration Course provided by **ISRO**
- Completed **Google Cloud Study Jam** Course and earned 37 valuable badges along the way.
- Volunteer – Thalassemia Awareness Camp, C.K. Pithawala College of Engineering and Technology

CERTIFICATIONS

- **ISRO-IIRS Certified:** Successfully completed the START - Space Science and Technology Awareness Training by ISRO and IIRS, gaining deep insights into India's space missions, advanced propulsion, space biology, quantum communication, and planetary exploration through lectures from top ISRO scientists.
- Gaseous air pollutants: Monitoring and modeling by **ISRO** and **IIRS**