**Shubham Patel**

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[**LinkedIn**](https://www.linkedin.com/in/shubham1026/) **|** [**GitHub**](https://github.com/shubhu1026) **|** [**Portfolio**](https://shubhu1026.github.io/)

**SUMMARY**

Detail-oriented Data Scientist with strong expertise in Python, machine learning (PyTorch, TensorFlow), and data pipeline automation. Proven ability to deploy real-time analytics solutions and optimize models for performance and interpretability. Experienced in statistical modeling, data engineering with Spark, and transforming raw data into actionable business insights.

**SKILLS**

* • **Languages & Frameworks:** Python (NumPy, Pandas, Scikit-learn, Matplotlib), PyTorch, TensorFlow, SQL, Spark
* • **Machine Learning:** Supervised & Unsupervised Learning, Model Optimization, Time Series, NLP, Transfer Learning
* • **Data Engineering:** PySpark, Apache Spark, Real-Time Stream Processing, ETL Pipelines, GCP, REST APIs
* • **Mathematics & Statistics:** Hypothesis Testing, Correlation Analysis, Regression, Probability Models
* • **Tools & Platforms:** Git, Docker, Jupyter, Google Cloud Platform, MLflow, Kibana, Elasticsearch
* • **Soft Skills:** Cross-functional collaboration, Technical Communication, Initiative, Continuous Learning

**EDUCATION**

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| **Humber College, Toronto, ON** | September 2024 – April 2025 |
| Graduate Certificate in Artificial Intelligence with Machine Learning |  |

* Gained hands-on experience in supervised/unsupervised learning, deep learning, and reinforcement learning.
* Built and optimized models using scikit-learn, TensorFlow, Keras, and PyTorch.
* Worked on real-world problems in NLP, computer vision, and predictive analytics.
* Designed scalable ML pipelines, including data preprocessing, feature engineering, and hyperparameter tuning.
* Explored big data and distributed ML using Apache Spark, Google Cloud Dataproc, and Spark MLlib.
* Learned ML deployment techniques with Flask APIs, Docker, and basic Kubernetes for containerized inference.

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| **Centennial College, Scarborough, ON** | September 2023 – April 2024 |
| Graduate Certificate in Mobile Application Development |  |

* Built native and cross-platform apps using Kotlin, Swift, JavaScript, and Flutter, applying MVVM and clean architecture principle.
* Completed capstone project (SwiftTrend) with full-stack features: product search, PayPal integration, admin CRM, and deployment via Android Studio & Xcode.

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| **Maharashtra Institute of Technology ADT, Pune, India** | July 2018 – July 2022 |
| Bachelor of Technology in Computer Science & Engineering |  |

* Gained strong foundation in C++, Python, OOP, DBMS, assembly, and basic machine learning using scikit-learn.
* Developed Leafio (major project): a CNN-based plant disease detection app and published a research paper comparing VGG16, Xception, and MobileNet architectures.

**PROFESSIONAL EXPERIENCE**

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| **Machine Learning Engineer** | January 2025 – April 2025 |
| Kevares (Capstone project via Humber College AI Program) |  |

* Developed a real-time trash detection system using a YOLO Nano-based model, leveraging transfer learning on the TACO dataset and a custom robot-collected dataset.
* Led the data annotation process to create high-quality labeled training data, improving generalization and robustness across varied conditions.
* Applied targeted data augmentation to enhance dataset diversity and improve detection under environmental noise.
* Tuned model performance through extensive hyperparameter optimization, achieving mAP@50: 82, mAP@50–95: 0.51, precision: 0.85, and recall: 0.71 on validation sets.
* Designed and tested multiple training strategies to maximize real-world performance, enabling reliable deployment in resource-constrained robotic environments.
* Worked closely with team members and faculty sponsor to align system performance with business needs.

**PROJECTS**

**Traffic Congestion Prediction using Big Data**

* • Built a big data pipeline to process 94.5M+ rows of NYC DOT Traffic Speeds data using Apache Spark on Google Cloud Dataproc.
* • Engineered features like hour, weekday, and speed delta to train a PySpark Random Forest classifier for congestion level prediction.
* • Deployed the model via Flask REST API, enabling real-time inference integrated with Logstash and visualized results using Kibana.

**RAG-Based Q&A System with LLM Integration**

* • Developed a Retrieval-Augmented Generation (RAG) pipeline to enhance document-based Q&A with LLMs and private knowledge sources.
* • Used document chunking and vector embeddings (FAISS) for efficient storage and retrieval.
* • Integrated sub-question decomposition and hierarchical indexing to refine retrieval and improve context relevance.

**Leafio – Real-Time Plant Leaf Disease Detection App**

* • Led the development of an Android app using CNNs for plant disease detection, integrated with a Flask API for real-time predictions, achieving over 85% accuracy.
* • Designed and trained a custom CNN model using a dataset of diseased and healthy plant leaves, implementing data augmentation techniques to improve model robustness.
* • Published a research paper on the comparative study of CNN-based disease detection, contributing to AI-driven advancements in precision agriculture.