# Rahul Atre

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**3rd Year Student with Research Experience | CS & Math Double Degree | Seeking internship roles in AI: ML & DL**

## SKILLS

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|---|---|
| **Programming** | Python (Base, Pandas, NumPy, Matplotlib, Scikit-Learn, Keras), R, SQL, Java, C, MATLAB, Golang |
| **Technologies** | Node.js, React.js, Bash Scripting, Git, GitHub |
| **Machine Learning** | Linear Regression, Logistic Regression, Decision Trees, Random Forest, KNN, k-means, PCA, Associate Rules Mining, Causal Impact Analysis |
| **Additional Proficiencies** | Statistics, Data Visualization, Generative AI, Performance Optimization, Scalable ML |

## PROJECTS & RESEARCH

**Undergraduate Research Assistant - University of Ottawa | Ottawa, ON** **Jan 2023 – Apr 2023**

- Developed a **Separation-Reduction** algorithm to enhance a segment of the Probabilistic Transitive Closure (PTC) algorithm.
- Implementation using a divide-and-conquer process of reducing one digraph into smaller components (bipolar & weighted) with no two parallel arcs having the same sign.
- Allowed for **enhanced efficiency** at polynomial time **O(n^2)** in computation of PTC which can provide new insights into the body of knowledge represented by bipolar weighted digraphs.

**Grocery Delivery Optimization | Python, Scikit-learn, Matplotlib** **May 2022 – Dec 2022**

- Created & applied a **Genetic Algorithm in Python** to search out a near-optimal route across 10 addresses. This led to an estimated **savings of up to 50%** in both delivery time and fuel consumption over a route based upon transaction order alone. This approach could be utilized across many industries as a way to find more optimal solutions.

**News Sentiment on Implied Volatility | Financial Analysis, Python, Scikit-learn** **Sep 2023 – Dec 2023**

- Analyzed the impact of news sentiment on Implied Volatility (IV) of financial markets using **machine learning** & statistical techniques.
- Achieved **90% accuracy** in classifying news articles into relevant categories (tech, business, commodities) with logistic regression.
- Developed regression models to quantify the relationship between news sentiment and IV for various asset indexes. Identified moderate correlations using linear regression, with **XGBoost** achieving R-squared values **exceeding 97%**.
- Investigated the influence of COVID-19 on sentiment-IV relationship. Observed fluctuations in correlation coefficients during periods of heightened market uncertainty.

**"You Are What You Eat" Customer Segmentation** **May 2023 – Sep 2023**

- Used **k-means clustering** on grocery transaction data to split out customers into distinct "shopper types" that could be used to better understand customers over time, and to target customers more accurately with relevant content & promotions.

**Mealer App - Food Delivery System | Java, Android Studio, Firebase** **Sep 2021 – Dec 2021**

- Led a team of 5 students in developing a food ordering Android app that provides a complete solution for clients to order favorite meals from chefs nearby.
- Utilized **Chain-of-Responsibility, Model-View-Controller, Dispatcher-Action-Handler design patterns**.

## EDUCATION

**University of Ottawa – Faculty of Engineering** **Ottawa, ON**

BS in Mathematics & BS in Computer Science (Data Science) | **CGPA: 3.9/4.0** **Sep 2020 - Aug 2026**

**Coursework Completed:** Probability, Statistics, Machine Learning, Regression, Data Science, Linear Algebra (1/2), Calculus (1/2/3), Data Structures & Algorithms, Databases, Programming (1/2/3).

**Coursework Anticipated:** Financial Mathematics, Risk Management, Time Series, Multivariate Statistics, Computational Statistics, Optimization, Money & Banking, Real Time Systems Design, Advanced C++ Programming, Operating Systems, Networking.

**Dual Degree** in Computer Science & Mathematics with specialization in **Machine Learning** (Expected Graduation 2026)**.**

## COURSES & CERTIFICATIONS

**DSI Data Science Professional Certification** **May 2022 – Feb 2023**

**Actionable Learnings:** Extracting & manipulating data using SQL. Application of statistical concepts such as hypothesis tests for measuring the effect of AB Tests. Utilizing Github for version control. Using Python for data analysis, manipulation & visualization. Applying data preparation steps for ML including missing values, categorical variable encoding, outliers, feature scaling, feature selection and model validation. Applying ML algorithms for regression, classification, clustering, association rule learning, and causal impact analysis for measuring the impact of an event over time. ML pipelines to streamline the ML pre-processing & modelling phase. Deployment of a ML pipeline onto a live website using Streamlit. Using Tableau to create powerful Data Visualizations. Turning business problems into Data Science solutions.