

# PRATHAM AGGARWAL

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## EXPERIENCE

### Predictive Modeling of Heating and Cooling Loads

[Learn more](#)

- Predicted energy loads with 91% accuracy by utilizing multidimensional linear regression and R-squared as a performance metric, optimizing energy consumption models and improving building energy efficiency.
- Identified a significant shift in energy load behavior by applying k-means clustering, leading to deeper insights into energy consumption patterns and informing more accurate forecasting models.
- Conducted a thorough Exploratory Data Analysis (EDA) on a building features dataset using Python, Pandas, and Matplotlib, uncovering key trends, outliers, and correlations, which enabled more targeted energy optimization strategies.

### Rebooting Sitcom Friends with Data-Driven Strategies for Enhanced Engagement

[Learn more](#)

- Made data-driven decisions on episode ratings and viewership trends by applying statistical testing (bootstrapping, hypothesis testing), improving decision-making for a potential reboot and refining content strategies for higher audience engagement.
- Improved storyline development by using sentiment analysis and Bayesian modeling to determine which Friends characters are best suited for specific roles, resulting in more engaging content and better-aligned character development.
- Determined the optimal 80-episode count by developing a linear regression model to maintain audience interest and engagement throughout the series.

### TSwift Tunes: Data-Driven Insights and Recommender Systems

[Learn more](#)

- Uncovered trends and visualized feature relationships by conducting exploratory data analysis (EDA) on Taylor Swift's discography, which led to more accurate song categorization and a deeper understanding of her musical patterns.
- Built a recommender system by utilizing audio features, which will optimize the user experience and deliver personalized track recommendations, increasing user satisfaction and engagement.
- Built a TF-IDF-based lyric search tool, which resulted in faster and more accurate identification of key themes in large-scale text data.

### Simulating Black Hole Evolution: Comparative Analysis of Light and Heavy Seeds

[Learn more](#)

- Simulated supermassive black hole growth using Eddington and super-Eddington models, processing astrophysical datasets to analyze different formation pathways.
- Wrote a research paper contrasting black hole growth based on heavy and light seed masses, using visualizations to compare their growth trajectories, resulting in clearer insights into the impact of seed mass on black hole development.
- Conducted 12 weeks of research under the guidance of PhD student Matthew Scoggins from Columbia University, contributing to advancements in computational astrophysics.

## EDUCATION

### Bachelor of Science, Data Science

GPA 4.0

Halıcıoğlu Data Science Institute, University of California San Diego

Expected Jun 2027

## RELEVANT COURSEWORK

### DSC 10: Principles of Data Science, UC San Diego

Fall 2024

- Data cleaning, Exploratory Data Analysis, TF-IDF text analysis, Hypothesis Testing, Data Storytelling, Web Scraping, Multi-Dimensional Linear Regression, A/B testing

### DSC 20: Programming and Data Structures for Data Science, UC San Diego

Win 2025

- Object-oriented programming (OOP), Time & Space Complexity, Higher-order functions

### Fundamentals of Quantitative Modeling, University of Pennsylvania, Coursera

Jan 2025

### Probability & Statistics for Machine Learning & Data Science, DeepLearning.AI, Coursera

Jul 2024

### Linear Algebra for Machine Learning & Data Science, DeepLearning.AI, Coursera

Jul 2024

### Version Control: Git & Github, MIT Beaver Works Summer Institute

Feb 2023

## HONORS & AWARDS

### Provost Honors, Revelle College, UC San Diego

Fall 2024

### AP Scholar with Distinction, College Board

Jul 2024

## SKILLS

**Programming Languages:** MATLAB, SQL, Java, Python

**Libraries:** Pandas, NumPy, SciPy, Scikit-Learn, BeautifulSoup

**Data Visualization:** Tableau, Matplotlib, Seaborn

**Version Control:** Git & Github

**Other:** Experiment Design, Research Ethics, Documentation, Terminal