

Applied Data Science Portfolio Overview

Syracuse University Master's in Applied Data Science

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01

ABOUT ME

ABOUT ME

Bryce Anthony

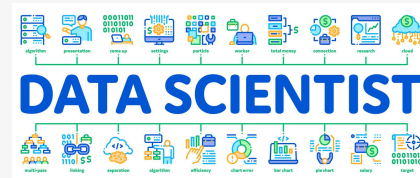


Education

- **B.S. Computer Science from Davidson College** (2019- 2023)
- **M.S. Applied Data Science from Syracuse University** (2023- 2024)

Work Experience

- Data science Co-op with Keurig Dr Pepper Research & Development
- Software Engineering Consultant with the Jay Hurt Hub at Davidson College
- Summer Institute in Biostatistics and Data Science Program at Boston University
- Community Research Fellow with the Davidson College Center for Civic Engagement



Personal Goals

- Bridge the Gap Between Society and AI Technologies
- Apply Data Science to Real-World Challenges
- Present research findings in a clear and accessible way to diverse audiences
- Promote Ethical AI Practices.

02

LEARNING OBJECTIVES

Learning Objectives

Collect, store, and access data by identifying and leveraging applicable technologies

Create actionable insight across a range of contexts (e.g. societal, business, political), using data and the full data science life cycle

Apply visualization and predictive models to help generate actionable insight

Use programming languages such as R and Python to support the generation of actionable insight

Communicate insights gained via visualization and analytics to a broad range of audiences (including project sponsors and technical team leads)

Apply ethics in the development, use and evaluation of data and predictive models (e.g., fairness, bias, transparency, privacy)

03

PROJECTS

Projects

Deploying AI Solutions

Cloud Management (IST 615)

Objective:

Deploy artificial intelligence models in cloud environments

Three Artificial Intelligence solutions deployed:

- **An Exam Score Prediction model-** Built using python and flask, uses demographic information and past exam scores to predict an exam score.
- **NBA Match Prediction model-** Deep learning model using NBA stats to predict both the winner and the point differential between the two teams for regular season NBA games
- **NutriScan AI-** A google gemini pro powered application delivering user prompted nutritional advice

Demonstrated Learning Outcomes :

- Using programming languages and visualizations to provide actionable insights
- Providing actionable insights across diverse contexts
- The consideration of ethics in the data collection and resource usage

The image displays three screenshots of AI applications. The top screenshot shows the 'Student Exam Performance Indicator' web interface, which includes a form for user input (Gender, Race or Ethnicity, Parental Level of Education, Lunch Type, Test preparation Course, Writing Score out of 100, Reading Score out of 100) and a prediction result: 'THE prediction is 94.5'. The middle screenshot shows the 'FastAPI - Swagger UI' interface, displaying a REST client request and response for the endpoint 'http://127.0.0.1:8000/text-predict'. The bottom screenshot shows the 'NutriScan AI' web interface, which features a list of food items (Salmon, Avocado, Broccoli, etc.) and a 'The Response is' section displaying a list of nutritional insights.

Projects

Farm 2 Fork

Data Administration Concepts and Database Management (IST 659)

Objective:

Increase food supply chain transparency

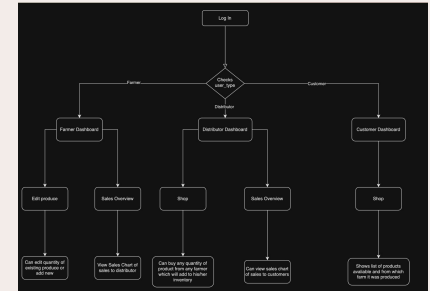
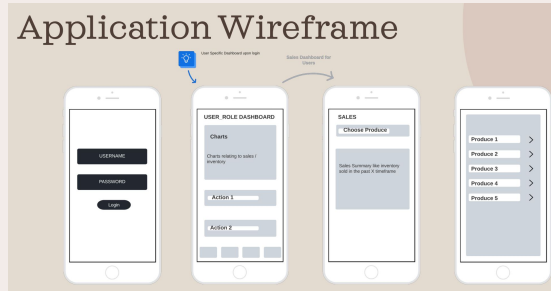
Project Summary:

A Powerapps application for inventory management and tracking system. This application increases supply chain transparency by allowing consumers to track product origins and businesses to efficiently manage transactions.

Demonstrated Learning Objectives:

- Python and PowerApps were used to collect, store, and access data
- Actionable Insights provided for farmers and consumers through data visualizations of their inventories and transactions
- Ethical considerations of data accessibility and data transparency

Application Wireframe

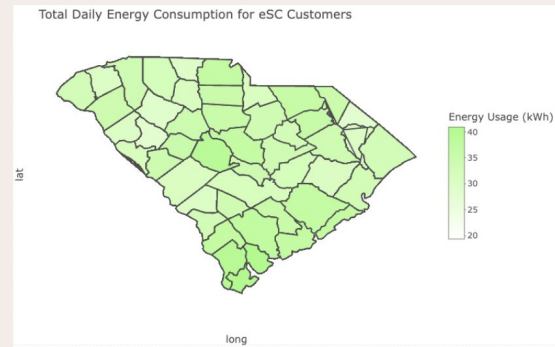
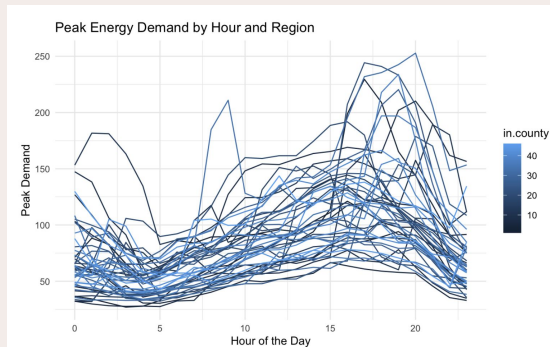


Projects

Energy Consumption Analysis

Introduction to Data Science (IST 687)

Objective: Identify the key factors influencing energy consumption to curtail future energy demand



Project Summary:

A project for a power company in the Carolinas, to address the impact of rising temperatures on its electrical grid. The goal of the project was to make data driven recommendations for the company to curtail future energy use by identifying the key factors influencing their customers energy consumption.

Demonstrated Learning Objectives:

- Use of R and data visualizations to create actionable insights
- Use of predictive modeling to create actionable insights
- Communication of insights to technical and non-technical audiences using a shiny dashboard

NBA Spread Prediction

Applied Machine Learning (IST 707)

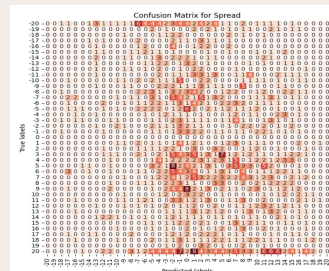
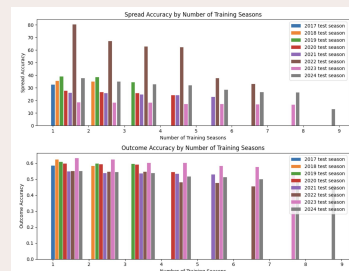
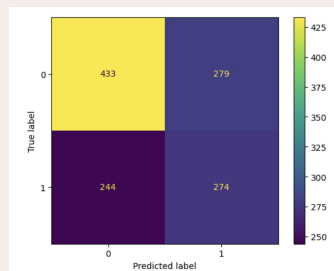
Objective: Provide AI-backed insights into the outcomes of NBA sporting events

Project Summary:

A project providing AI-backed insights into the outcomes of NBA sporting events, enabling users—whether enthusiasts, analysts, pundits, or casual observers—to better understand individual games and their implications for the season. By giving users access to the predictive power of machine learning, the goal was to empower them to make more confident predictions and analyses.

Demonstrated Learning Objectives:

- Python programming language used to Data collected via web scraping, stored in csv format using the pandas, and accessed for model predictions.
- Developed a predictive deep learning model creating actionable insights by predicting the winner and point spread of NBA games.
- Created visualizations to communicate model results and shortcomings to technical and non-technical stakeholders
- Ethical considerations made for visualizations and communication of results



Projects

Healthiness Evaluation of Recipes

Text Mining (IST 736)

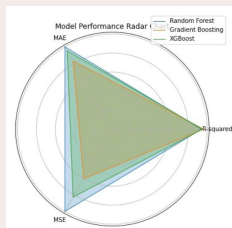
Objective: Develop a tool that accurately evaluates the healthiness of recipes

Project Overview:

Developed a Machine learning model to evaluate the healthiness of recipes to empower individuals and businesses to make informed dietary choices. By leveraging ingredient names and key nutritional metrics, the tool aims to promote healthier eating habits and support the health and wellness goals of its users.

Demonstrated Learning Objectives:

- The spoonacular API was used to collect data, the pandas library was used to store and access data.
- Used a predictive model, developed in python, to generate actionable insights by labeling recipes as healthy or unhealthy
- Balanced technical depth with accessibility by providing intuitive visualizations for various audiences



```
Evaluating classifier: Decision Tree Entropy
Cross-validation scores: [0.98543689 0.96585366 0.98536585 1.
0.98536585]
Average cross-validation score: 0.9844044518115084
Accuracy on test set: 0.9922178988326849
Classification report:

```

	precision	recall	f1-score	support
Healthy	0.99	0.99	0.99	136
Unhealthy	0.99	0.99	0.99	121
accuracy			0.99	257
macro avg	0.99	0.99	0.99	257
weighted avg	0.99	0.99	0.99	257

Book Emporium Sales Analysis

Business Analytics (SCM 651)

Objective: Determine the optimal pricing strategy for a Harry Potter sequel



Project Overview:

For this assignment, I analyzed fictional sales data from the Book Emporium to help determine the optimal pricing strategy a Harry Potter sequel. The dataset provided included weekly sales figures and customer purchase percentages for the book. My goal was to identify a demand curve for the book, examining how changes in pricing affected customer purchases and use that info to recommend an optimal sale price for a sequel book that would maximize profits.

Demonstrated Learning Outcomes:

- Analyzed fictional sales data using historical pricing and sales trends to make pricing, profit, and sales related insights for the new book.
- Presented predictive model results clearly through visualizations to ensure stakeholder understanding and actionable takeaways.
- Ethically set pricing by considering business goals with customer desires.

04

CONCLUSION

Achievements Across Learning Objectives:

- ✓ Demonstrated the ability to do data collection, modeling, visualization, and deployment using Python, R, and cloud technologies
- ✓ Created actionable insights across a range of context (e.g. business, health, sports, and societal challenges)
- ✓ Demonstrated ethical and responsible use of data science methodologies
- ✓ Communicated findings effectively through visualizations and dashboards

Key Takeaways:

Through the Applied Data Science program at Syracuse University, I have:

- **Mastered Applied Data Science Techniques:**
 - Gained hands-on experience with data collection, preprocessing, modeling, and analysis.
- **Solved Real-World Challenges Across Domains:**
 - Addressed business, societal, and environmental problems using data-driven solutions.
- **Enhanced Expertise in Data Science Methodologies and Machine Learning:**
 - Developed, fine-tuned, and deployed predictive models to generate actionable insights.
- **Learned to Tackle Complex and Diverse Problems:**
 - Applied the full data science life cycle to uncover solutions in areas like energy, health, sports, and business.
- **Refined the Ability to Effectively Apply Data Science:**
 - Learned to strategically leverage tools, techniques, and ethical considerations to deliver impactful outcomes.

Thank you