BrainStation

Bike Rentals Prediction

Data-Driven Insights

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Table of Content

Problem Statement

How might we leverage data to enhance the performance of bike sharing rental system?

Key Challenges

Bikes Availability

Balancing Peaks and Valleys

Resource Allocation

Data-Driven Solution

Utilizing Data Science Approches

Accurately Predicting Hourly Bike Rentals

Enhanced Planning and User Experience

Benefits of Bridging Data and Decisions

Optimized Resource Allocation

Enhanced User Experience

Reduced Operational Costs

Economic Benefits

Traffic and Environment Impact

Better Marketing and Promotion

Dataset Overview

Bike Sharing Rental System in Washington, D.C.

https://archive.ics.uci.edu/dataset/275/bike+sharing+dataset

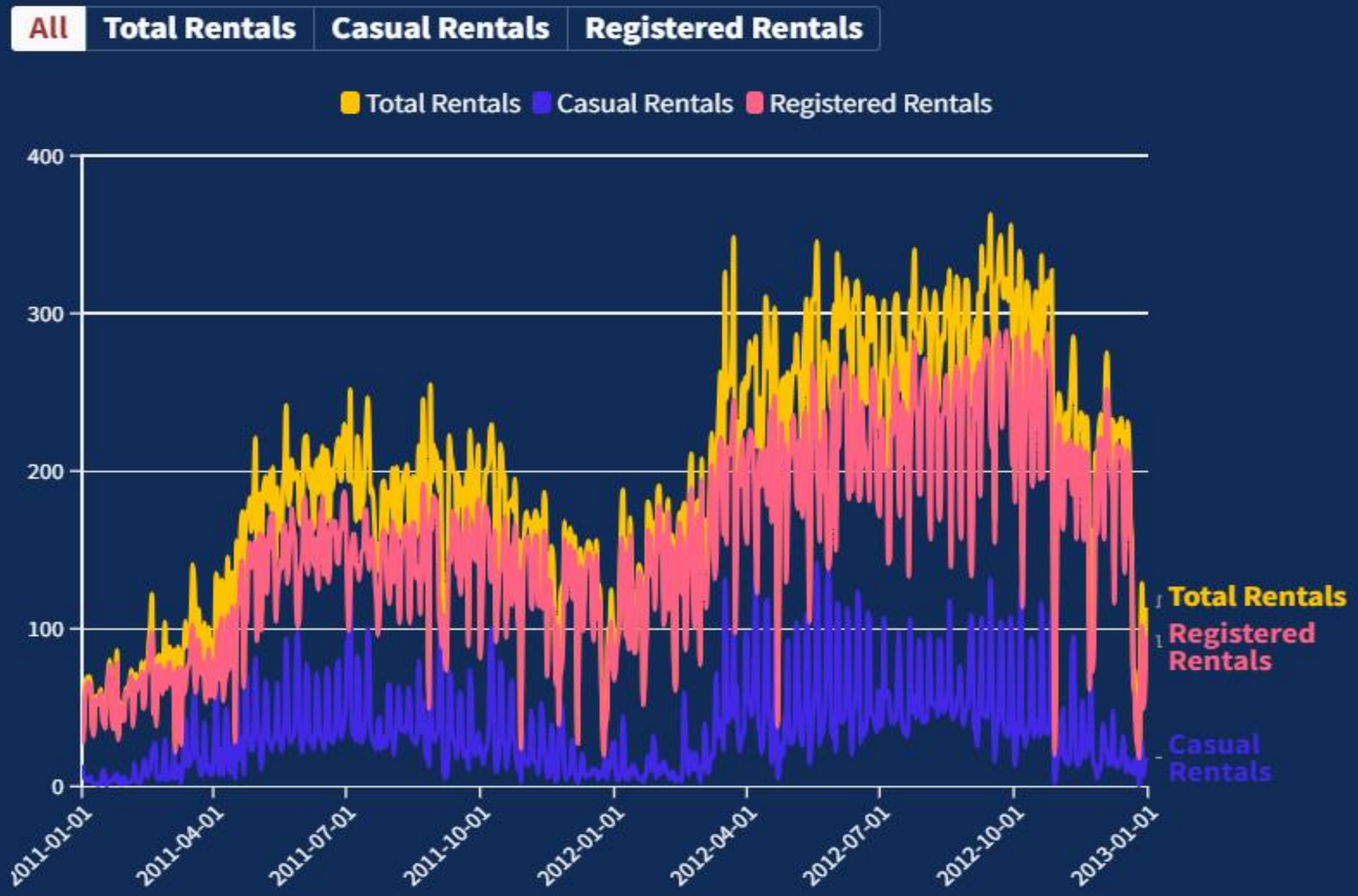
Features

- Date
- Year
- Season
- Month
- Day
- Hour
- Holiday
- Weekday
- Working Day
- Weather Situation
- Temperature
- Feeling Temperature
- Humidity
- Wind Speed

Target Variables

- Casual User Bike Rental
- Registered User Bike Rental
- Total Count

EDA Insight

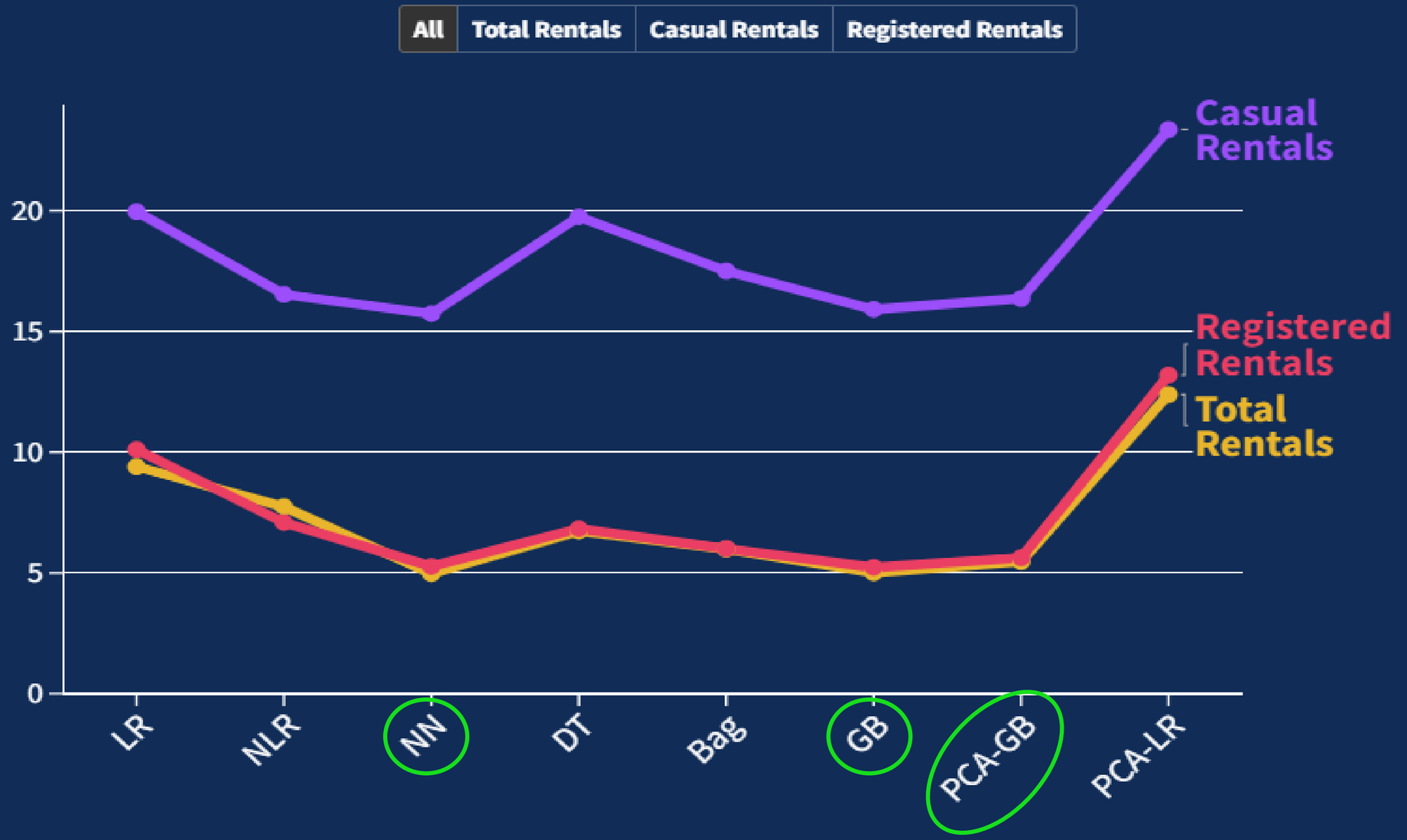


- Rental Patterns
- Yearly Analysis
- Monthly Analysis
- Seasonality
- Overall Trend

DATA MODELING APPROACHES

- Linear and Non Linear Regression
- Neural Network
- Decision Tree
- Ensemble Methods
- PCA Integrated Models

Models Comparison on PMAE

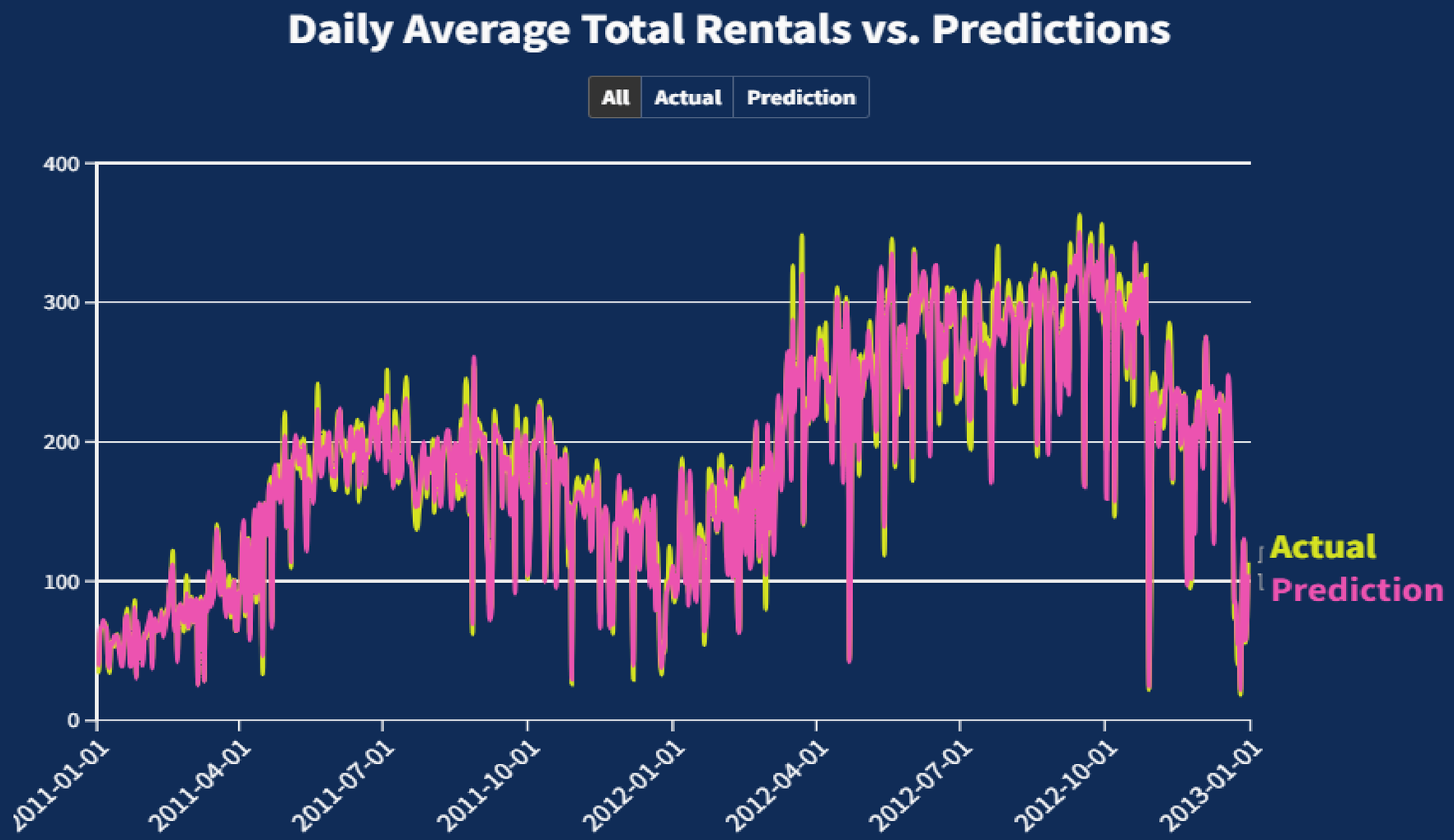


Models Comparison on Accuracy

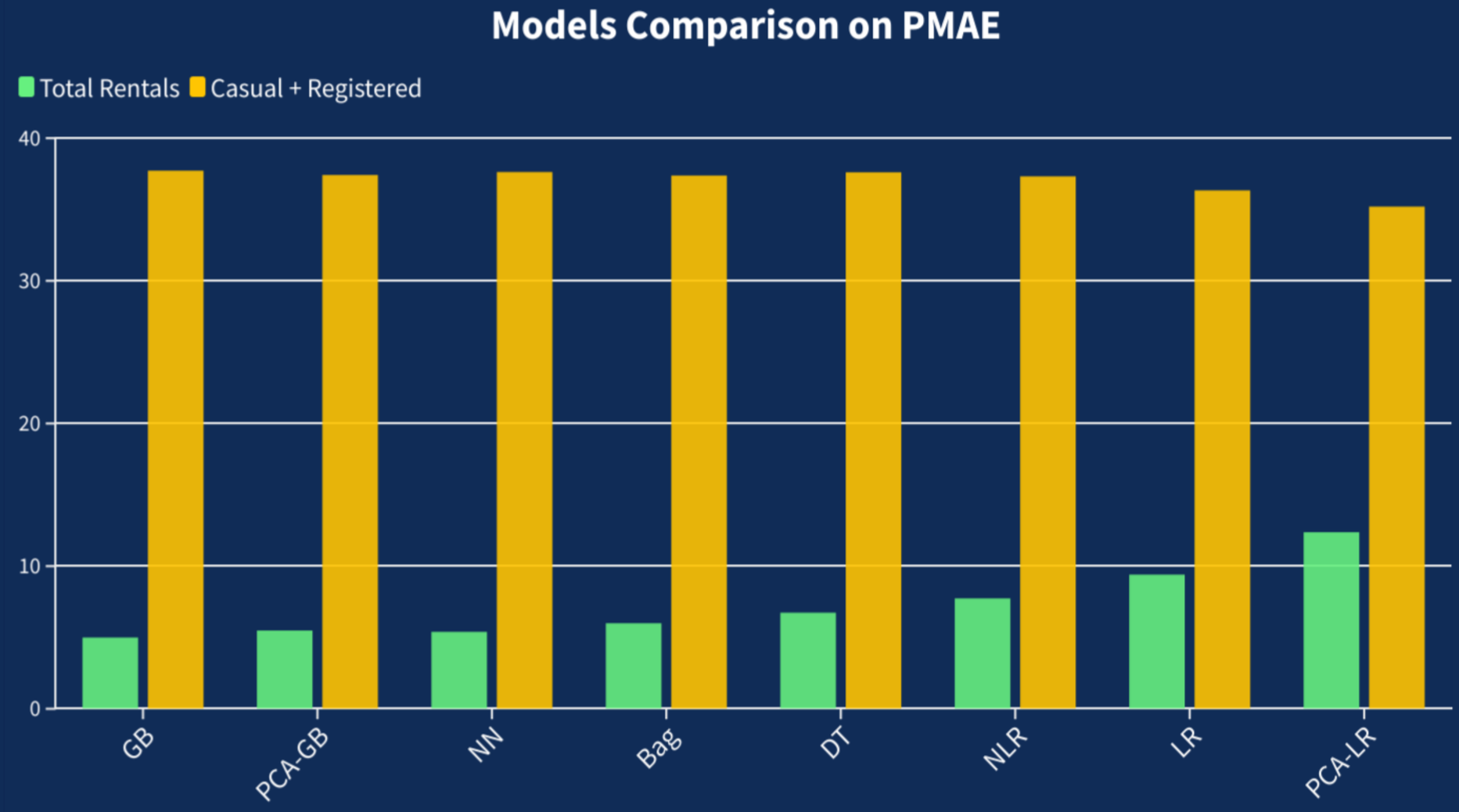
	LR	NLR	NN	DT	Bag	GB	PCA-GB	PCA-LR
Total Rentals	0.82	0.88	0.95	0.93	0.96	0.98	0.98	0.73
Casual Rentals	0.82	0.88	0.91	0.88	0.94	0.96	0.96	0.76
Registered Rentals	0.81	0.90	0.95	0.93	0.96	0.98	0.98	0.71

Apply Gradient Boosting Model

CLICK HERE



Total Rentals vs. Casual + Registered



Next Steps

- Collect more recent data
- Apply Time Series
- Conduct in-depth analysis for casual rentals prediction
- develop a more advanced prediction application

THANK YOU

FOR YOUR ATTENTION