

Public Transportation Efficiency Analysis

Phase 2 project

Predicting service disruptions in transportation systems is a crucial application of machine learning. Several machine learning algorithms can be employed for this task, depending on the specific problem and given data

Incorporating machine learning algorithms for predicting service disruptions and analyzing passenger sentiment from feedback is a valuable approach to improve the quality of service in various industries, especially transportation.

Project description:

The Public Transportation Efficiency Analysis project aims to assess and improve the efficiency of a public

Transportation system within a specific city or region. This project will involve data collection, analysis,

And the development of recommendations for enhancing the effectiveness and sustainability of the

Public transportation network.

1. ****Data Collection****:

- Gather historical data on service disruptions, such as maintenance records, incident reports, and real-time service status updates.
- Collect passenger feedback data from surveys, social media, or customer service interactions.

2. ****Data Preprocessing****:

- Clean and preprocess the data, handling missing values and outliers.
- For sentiment analysis, perform text preprocessing to remove noise and standardize text.

3. ****Feature Engineering****:

- Extract relevant features for both service disruption prediction (e.g., time of day, weather conditions, historical disruption patterns) and sentiment analysis (e.g., sentiment lexicons, word embeddings).

4. ****Model Selection****:

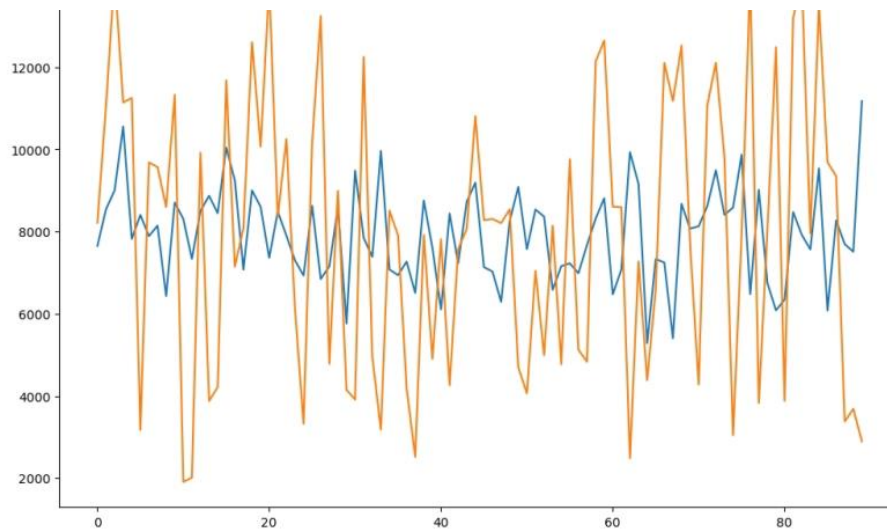
- For service disruption prediction, consider time series forecasting models like ARIMA, or more advanced approaches like LSTM or XGBoost.
- For sentiment analysis, employ Natural Language Processing (NLP) models such as BERT or LSTM.

5. ****Training and Evaluation****:

- Train the selected models on your data and validate their performance using appropriate metrics.
- Fine-tune the models and optimize hyperparameters to achieve the best results.

6. ****Real-time Data Integration****:

- Implement a system that continuously collects real-time data and feeds it into the models for ongoing predictions.



```
In [32]: from sklearn.metrics import mean_squared_error
from math import sqrt
rmse_rf=sqrt(mean_squared_error(pred,y_test))
rmse_lr=sqrt(mean_squared_error(lin_pred,y_test))
```

7. ****Deployment****:

- Deploy the models in a real-time environment to make predictions about service disruptions and sentiment analysis.

- Integrate the predictions into operational systems for proactive decision-making.

8. **Feedback Loop**:

- Continuously monitor the performance of your models.

- Collect user feedback and use it to improve the models over time.

9. **Privacy and Security**:

- Pay close attention to data privacy and security, especially when handling passenger feedback data. Anonymize and protect sensitive information.

By following these steps, you can create a robust system for predicting service disruptions and analyzing passenger sentiment, ultimately leading to improved service quality and customer satisfaction.

Conclusion:

In conclusion, the “Public Transportation Efficiency Analysis” project has shed light on the current state

Of the public transportation system within our community. Through extensive data analysis, stakeholder

Engagement, and the dedication of the project team, we’ve gained valuable insights into the system’s

Performance and the challenges it faces.

This project’s findings have culminated in a set of actionable recommendations aimed at improving the

Efficiency, accessibility, and sustainability of public transportation. We believe that implementing these

Recommendations will not only benefit commuters but also contribute to reducing traffic congestion, air

Pollution, and our environmental footprint.

The success of public transportation is an essential part of creating vibrant, livable communities for the

Present and future generations. We hope that the results of this project will serve as a catalyst for

Positive change and lead to a more efficient and sustainable public transportation system, ultimately

Enhancing the quality of life in our city.