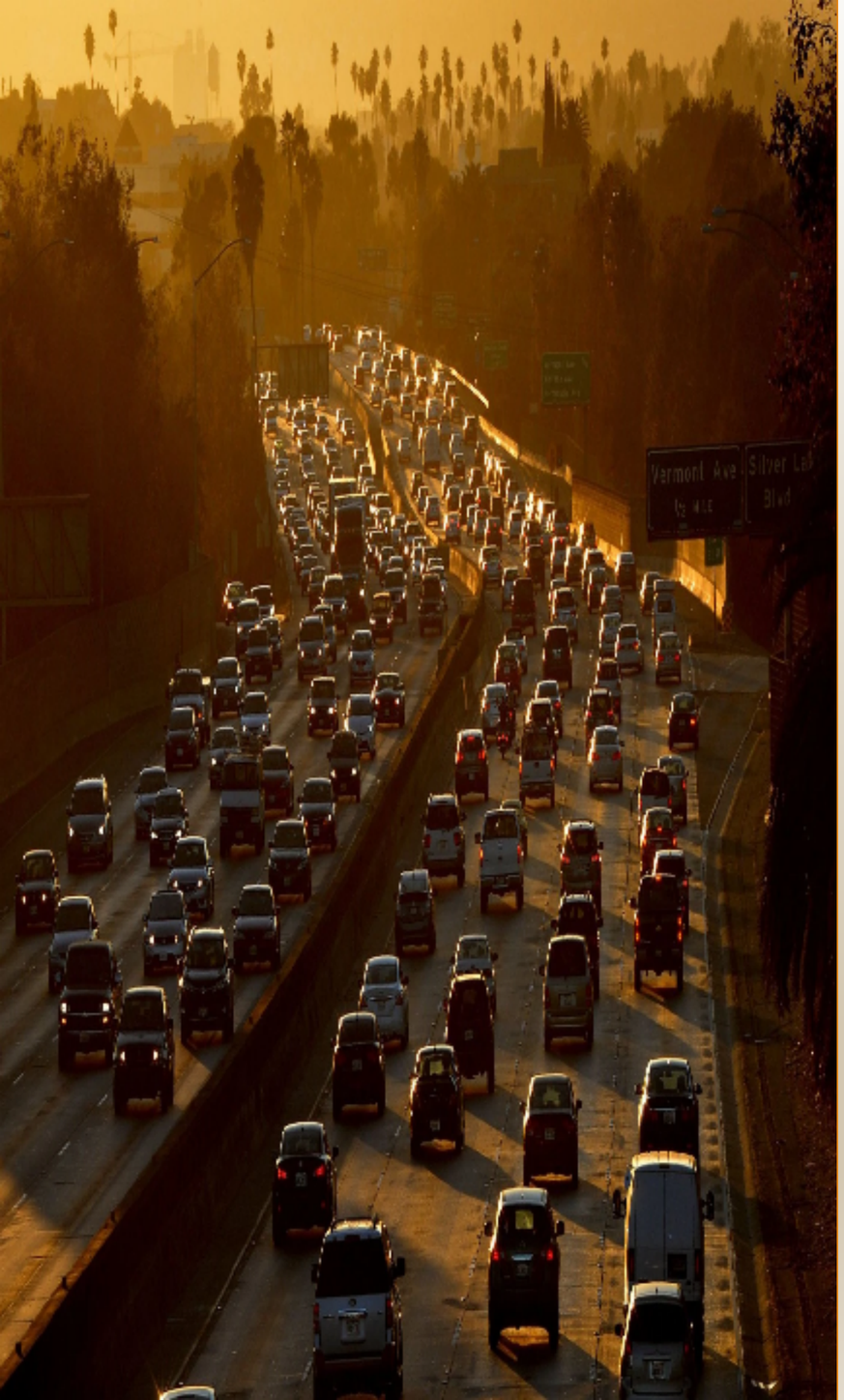


PROJECT :

CONSIDER INCORPORATIN G MACHINE LEARNING ALGORITHMS TO IMPROVE ARRIVAL TIME PREDICTION ACCURACY BASED ON HISTORICAL DATA AND

SUBTITLES

INTRODUCTION

RELATED WORKS

GOALS

CONTIBUTIONS AND ADVANTAGES

CONCLUSION

INTRODUCTION :

Here the innovation is focused on the new and smart application of machine learning methods and techniques to improve transportation services and/or various modern transportation challenges .

Machine learning can improve the accuracy of models by finding patterns in data , identifying outliers and anomalies, and making better predictions. Additionally, Machine Learning

Traffic prediction means forecasting the volume and density of traffic flow, usually for the purpose of managing vehicle movement, reducing congestion, and generating the optimal (least time- or energy-consuming) route.

RELATED WORKS :

I have searched the web for some relevant sources that might help you with your research.

Here are some of the results I found:

1. Calculation of estimated time of arrival using artificial intelligence:

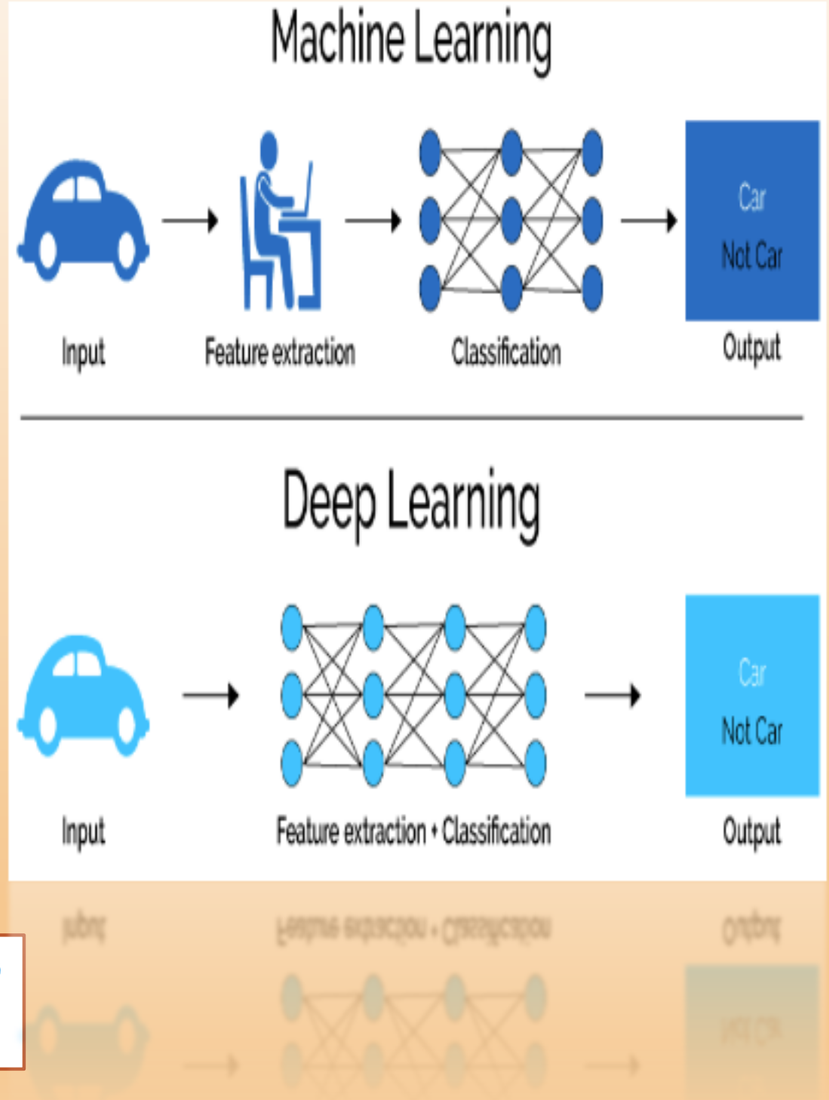
   This is a master's thesis that compares different machine learning algorithms such as Support Vector Regression, Artificial Neural Networks, Gradient Boosting, Random Forest and Stacked Generalization for predicting the arrival time of trucks operating in a transport mission.

The thesis uses GPS and weather data for a transport mission between Malmö and Göteborg in Sweden[1]

2. A Machine Learning Based Approach for Prediction of Actual Landing Time of Scheduled Flights:

This is a conference paper that uses various statistical techniques from supervised machine learning and data mining to predict the landing time of flights from departure information.

The paper uses Multi Linear Regression with Exponential Moving Average of historical flying time to trace non-stationary flight time variation.

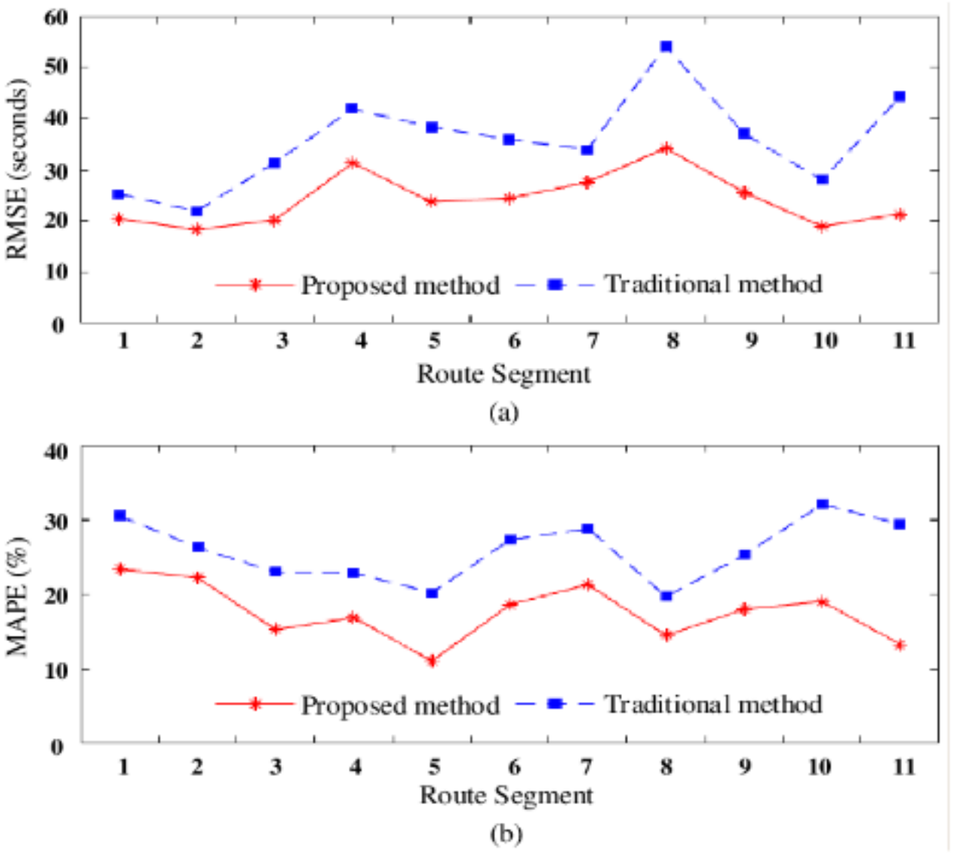


The paper also analyzes the root cause for the early arrival of the aircraft and congestion at the capacity-constrained airport[2].

3. Multistep Prediction of Bus Arrival Time with the Recurrent Neural Network:

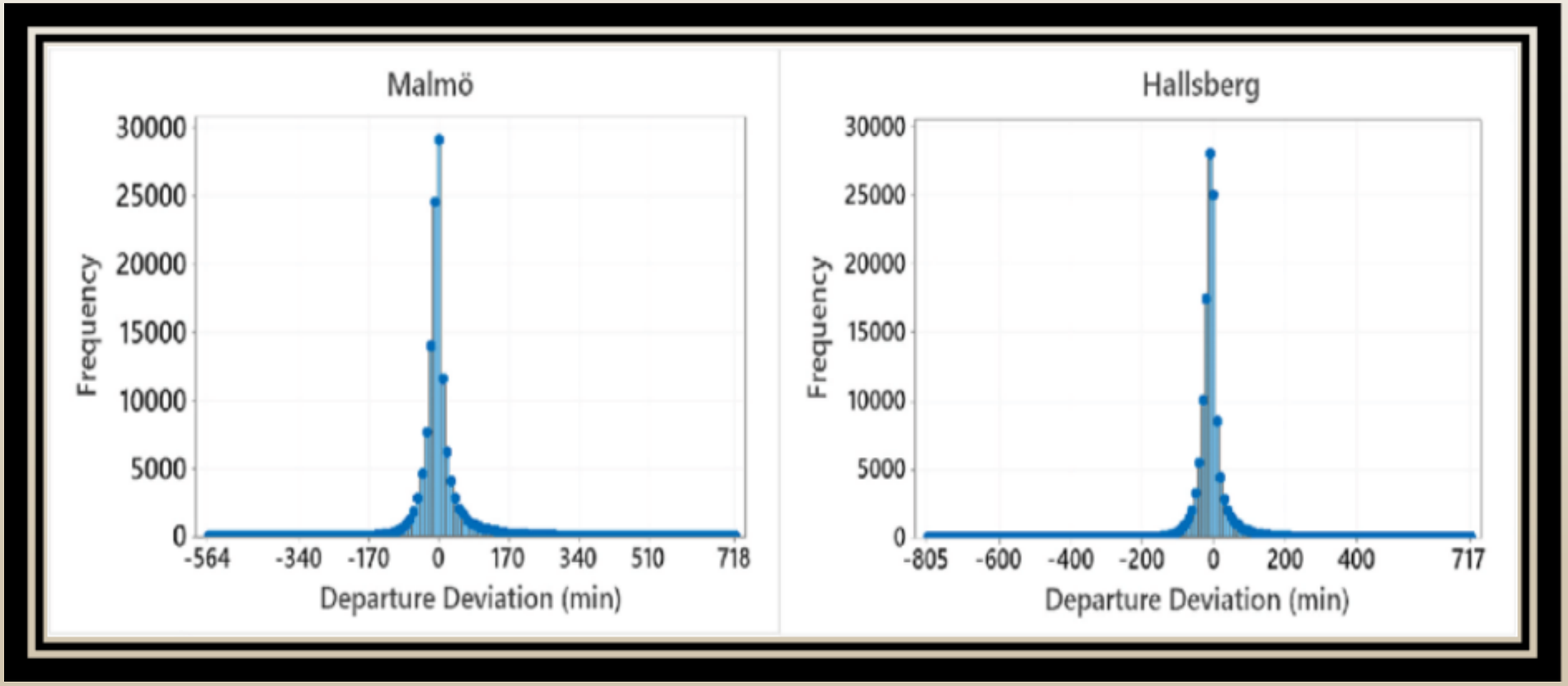
This is another journal article that proposes a deep learning approach for predicting the travel time of buses in a public transit setting.

The article combines a feature-based Artificial Neural Network model with an auto-regressive Recurrent Neural Network model to learn patio-temporal correlations from historical data and real-time data.

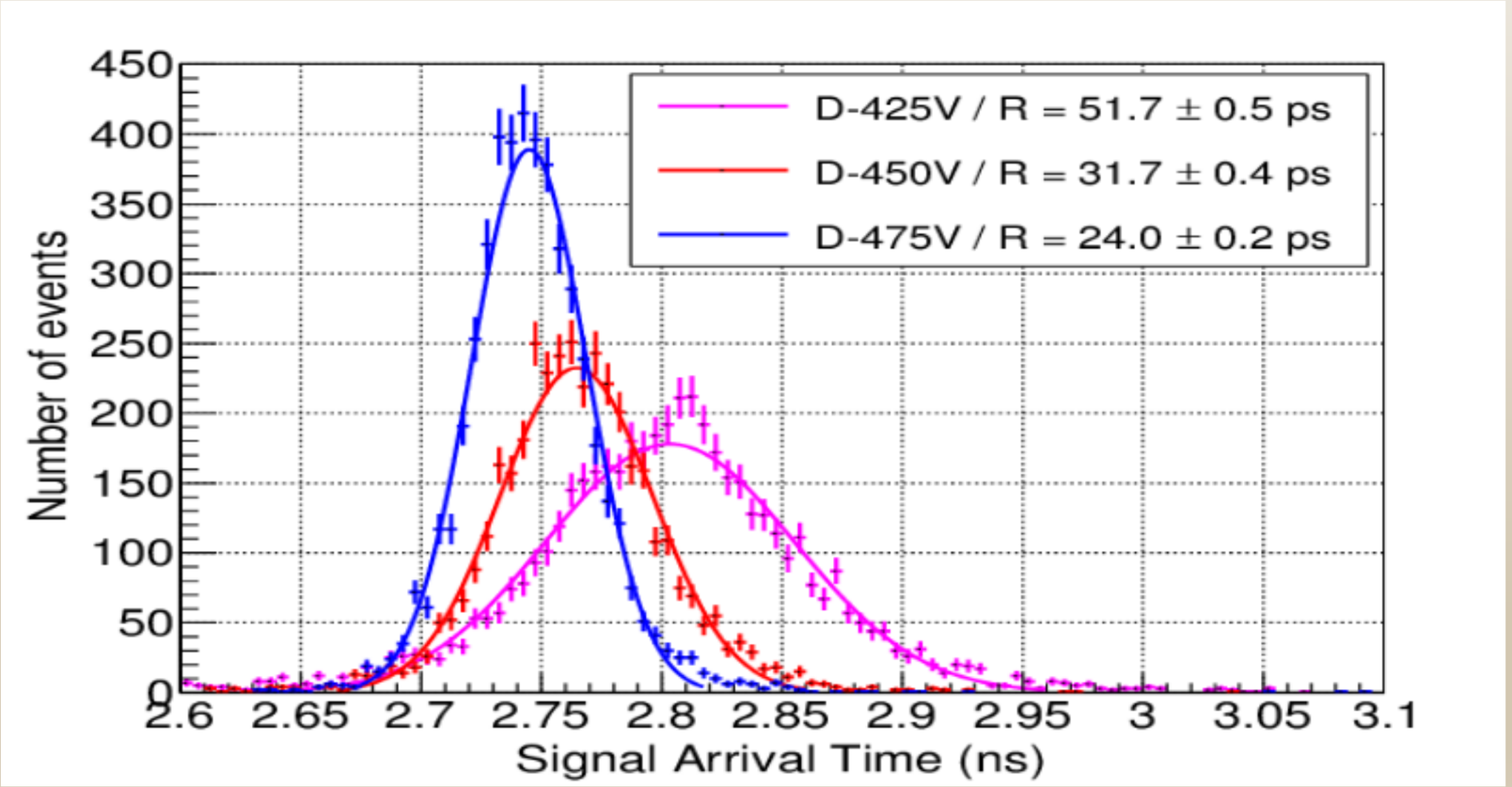


The article also evaluates the proposed model on a large-scale dataset from a public transit system in Singapore[4].

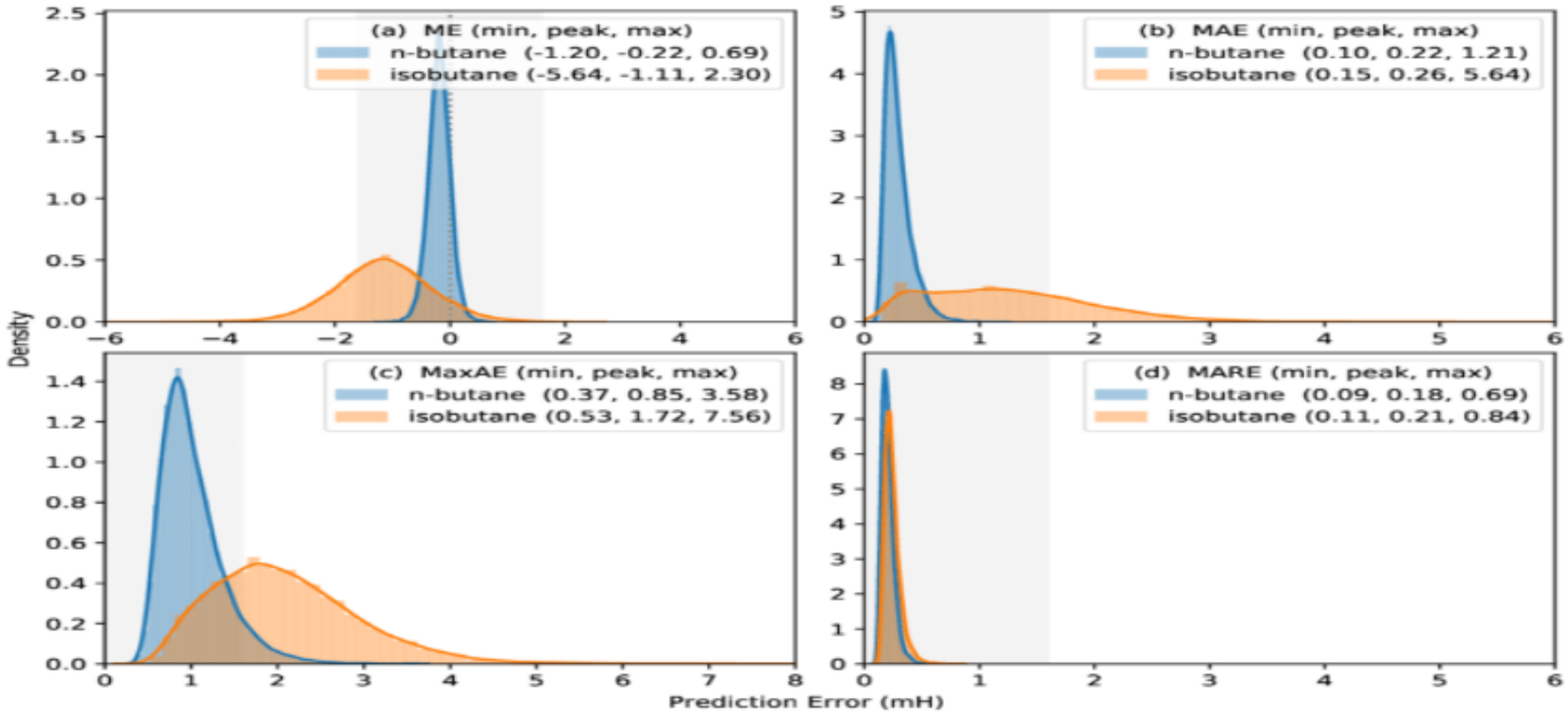
The correlation between departure deviations from Malmö and arrival deviations to Hallsberg.



The distribution of the arrival deviations.



The distribution of the prediction error.



GOALS :

These goals can guide the development and implementation of your machine learning system.

Here are some key objectives:

1. **Improved Accuracy :**

   The primary goal is to enhance the accuracy of arrival time predictions. This means reducing the gap between predicted and actual arrival times, leading to more reliable estimates for users.

2. **Real-time Updates:**

   Provide real-time updates to users as they progress on their journey. Continuous monitoring of traffic conditions and rerouting options can help users make informed decisions during their trips.

3. Reduced Uncertainty:

Minimize uncertainty in arrival time predictions. Users should have confidence in the provided estimates, even when facing unexpected traffic incidents or adverse weather conditions .

4 . Adaptability:

Develop a system that adapts to changing traffic conditions and learns from new data. As traffic patterns evolve, the model should be able to adjust its predictions accordingly.

5. Cost Efficiency:

Optimize routes to minimize fuel consumption and travel time, which can be critical for logistics and transportation companies looking to reduce operational costs.

6. Privacy and Security:

Implement robust privacy measures to protect user data, including their locations. Ensure that data is stored and transmitted securely.

CONTIBUTIONS AND ADVANTAGES :

Here are some of the key contributions and advantages:

1. **Improved User Experience:**

   Machine learning-enhanced arrival time predictions provide users with more accurate and reliable information, reducing frustration and uncertainty during their journeys.

   Users can make informed decisions about when to leave, choose alternative routes, or adjust their plans based on real-time traffic conditions.

2. **Efficient Resource Allocation:**

   For transportation and logistics companies, accurate arrival time predictions enable better allocation of resources, such as vehicles and drivers, leading to improved operational efficiency.

   This efficiency can result in cost savings and increased competitiveness in the market.

3. Reduced Traffic Congestion:

By helping users find the quickest routes and avoid traffic congestion, machine learning models contribute to reducing overall traffic congestion in urban areas.

This can lead to shorter commute times, reduced fuel consumption, and lower emissions.

4. Customer Loyalty:

For ride-sharing and delivery services, accurate arrival time predictions can lead to higher customer satisfaction and loyalty, resulting in increased business growth.

5. Traffic Management:

City traffic management authorities can use machine learning models to optimize traffic signal timings and reduce traffic bottlenecks, improving overall urban mobility.

6. Environmental Impact Reduction:

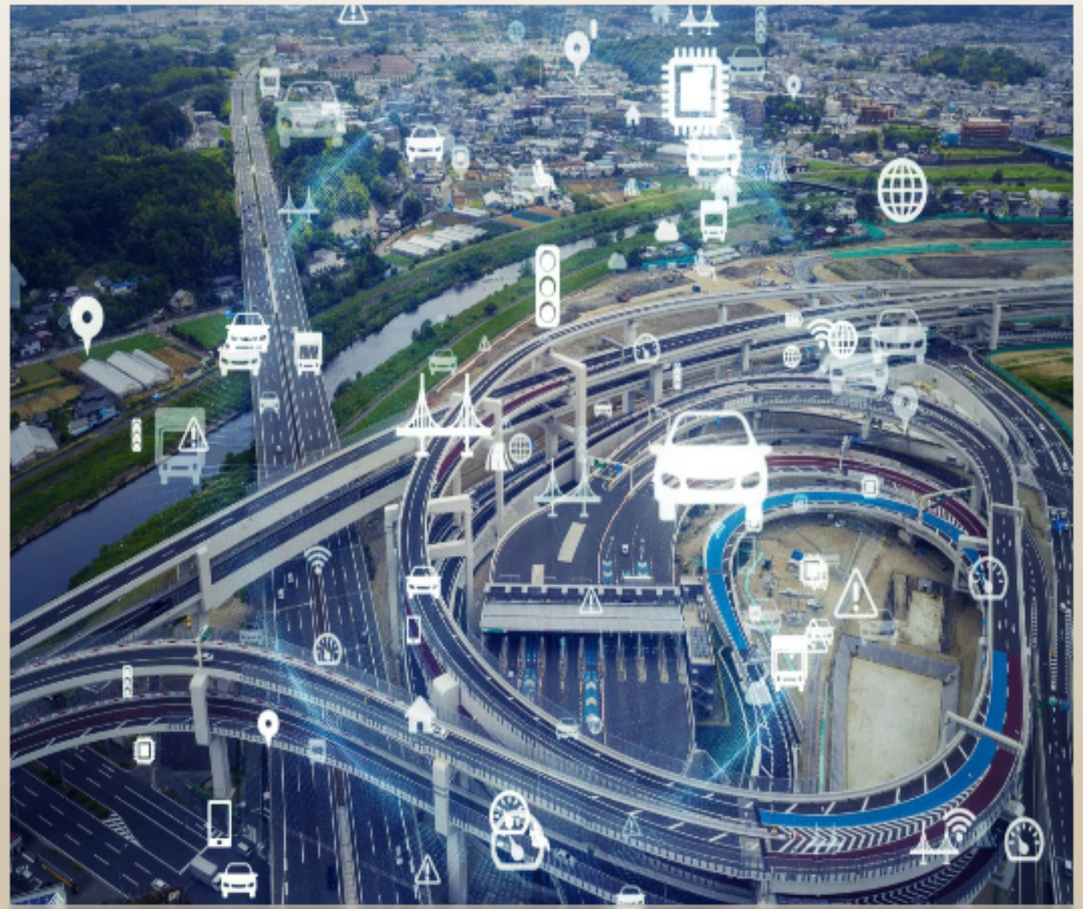
Optimized routes generated by machine learning algorithms can help reduce fuel consumption and emissions, contributing to environmental sustainability goals.

CONCLUSION:

In this slide, we proposed the first application of a machine learning-assisted macro simulation model framework to increase the predictability of yard departure and arrivals.

The novelty with this approach is that macro simulation uses results of a machine learning-based yard model to initiate freight trains instead of using previous aggregate distributions, where the yard model is implemented on a random forest algorithm, and provides efficient departure predictions without considering detailed yard operations.

Future improvements regarding them can decrease the prediction error and lead to future real-time applications .



THANK YOU

These are the topics of phase-2(INNOVATION)

PRESENTED BY

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