

Title: "Analyzing Urban Traffic Patterns Using Machine Learning"

Good afternoon, everyone. My name is [Your Name], and today I will be presenting my thesis on analyzing urban traffic patterns through machine learning techniques.

The motivation for this study stems from the increasing congestion in urban areas, which has significant implications for economic productivity and environmental sustainability. Our goal was to develop predictive models that can accurately forecast traffic flow and provide actionable insights for urban planners.

We gathered a comprehensive dataset from multiple sources, including GPS data from vehicles, traffic cameras, and historical records from city traffic departments. This data spanned over five years and covered more than 100 major intersections in [City Name].

Our approach utilized several machine learning algorithms, including linear regression, decision trees, and neural networks. After preprocessing the data to handle missing values and normalize traffic volume measurements, we trained these models to predict traffic congestion levels.

Initial findings indicated that neural networks outperformed other models with an accuracy rate of 87%, particularly during peak hours. The decision trees provided valuable insights into key factors affecting traffic, such as weather conditions and special events.

Furthermore, our study explored the practical applications of these predictions. By integrating our model into city planning tools, urban planners can optimize traffic light sequences and propose efficient detour routes in real-time.

In conclusion, the integration of machine learning into traffic analysis offers immense potential to mitigate congestion and enhance urban mobility. Our research not only demonstrates the feasibility of this approach but also provides a blueprint for its implementation in other cities.

Thank you for your attention, and I look forward to your questions.