TRAFFIC RULE PREDICTION

Our Traffic Route Prediction project uses advanced machine learning and real-time data to optimize urban traffic flow. By analyzing historical trends, live traffic conditions, and environmental factors, it provides accurate route predictions to reduce congestion and travel time. With a user-friendly interface for commuters and authorities, it delivers dynamic route suggestions, helping users navigate efficiently. This smart system enhances transportation efficiency, making city travel smoother and more predictable.

This project leverages cutting-edge deep learning models, YOLOv5 and YOLOv7, for real-time traffic monitoring and safety analysis. It detects various types of vehicles, monitors vehicle count, estimates speed, and checks for motorbike helmet compliance. Using video input, it efficiently analyses traffic flow and highlights safety violations by displaying "helmet" annotations on bikers who comply. The system is scalable, offering applications in smart city infrastructure, traffic law enforcement, and accident prevention.

Collecting DataSet:

1. Collector: Andrew Mvd
2. Year : Not Specified
3. Title of Dataset : Helmet Detection and Traffic Rules
4. Version Number : NA
5. Publisher : Kaggle
6. URL :

https://www.kaggle.com/datasets/ramoliyafenil/text-based-cyber-threat-detection

7. Study/Paper/Reason: https://ieeexplore.ieee.org/document/10215975

Study/Paper/Reason: This dataset contains 764 images of two distinct classes for the objective of helmet detection. Bounding box annotations are provided in the PASCAL VOC format.

Python 3.7.0 :

For implementation the following libraries are required

· cv2
· numpy
· sklearn.model_selection
· yolo_traffic
· tensorflow
· matplotlib.pyplot
· pandas
· imutils
· time
· scipy
· Helmet

Data Preprocessing:

Normalization and Shuffling

Model Training

Prediction:

best model between YOLOv5 and YOLOv7 for this project (detecting traffic vehicles, types, speed, and helmet violations) involves evaluating several key aspects:

1. Model Performance Comparison
2. Key Metrics to Compare
3. Considerations for Traffic Detection
4. Hardware Availability
5. Recommendation