**Report:2**

**Date: 3rd to 8th March 2025**

**Group-1**

**Project Title: Hard stop and momentary stop using vehicle trajectory dataset**

**Target: Pre-processing of dataset**

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## **Introduction**

This report details the progress made in Week 2 of our project, which focuses on differentiating between hard stops and momentary stops using a vehicle trajectory dataset. The key distinguishing factor is velocity: a hard stop occurs when the velocity remains unchanged across all frames, whereas a momentary stop involves fluctuations in velocity, i.e. there will be constant or 0 velocity across some frames, and after that there will be random fluctuations mostly increasing velocity cases.

Since the dataset provided was a single CSV file with jumbled records, hence we undertook the following preprocessing steps:

#### **Splitting Dataset by Vehicle ID**

* Extracted individual vehicle trajectories from the dataset using filters.
* Created separate CSV files for each vehicle using its unique track ID.

#### **Calculating velocity**

* Computed instantaneous velocity for each frame.
* Calculated the average velocity of each vehicle using given dimensions of image width and height.

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#### **Handling Missing Data: Interpolation and Prediction**

* Checked each vehicle’s CSV file for missing velocity values.
* Implemented interpolation techniques to estimate missing velocities based on available data.
* Used already mentioned velocity trends to predict missing values in frames where interpolation was not feasible.

## **Challenges Faced**

* Handling inconsistencies in vehicle track data.
* Choosing the appropriate interpolation method for missing velocity values.
* Ensuring accurate velocity calculations in varying dimensions.

## **Conclusion**

The preprocessing phase has been successfully completed. We now have a structured dataset with interpolated velocity values and computed velocity statistics, setting the foundation for the next stage of our project.