CSE523: Machine Learning

Weekly Report 2

Group Name - Logistic Legends

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Group Details:

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Identify Abnormal driving behavior using Spatio-Temporal analysis

This week, significant progress was made in the preprocessing and analysis of spatial-temporal data collected for our study. We focused on several key tasks including data cleaning, coordinate conversion, temporal alignment, distance calculation, and derivation of velocity and acceleration metrics. Here's a detailed breakdown of our activities:

Data Collection:

We have taken the reference data from Kaggle.

Prior to processing:

Eliminate any anomalies or inaccurate data points from the data to prevent the analysis from being skewed.

Coordinate Conversion:

To create an appropriate coordinate system for the study, convert the latitude and longitude coordinates.

Temporal Alignment:

Verify that the timestamps are correctly aligned if the spatial data is gathered over a period of time.

Distance:

Using methods such as the Haversine formula, Vincenty's formulas, or other distance metrics suitable for the selected coordinate system, determine the distance between consecutive points. This facilitates comprehension of the general course or trajectory.

Velocity:

Calculate velocity by dividing the time interval between two successive places by their distance. This indicates how quickly the thing is traveling between the two places.

Acceleration:

Determine acceleration further by computing the change in velocity over time intervals, if velocity data is provided. This gives information on the rate of change of velocity, indicating acceleration or deceleration.

Challenges Faced:

Ensuring consistency and accuracy in coordinate conversion and temporal alignment proved to be challenging due to the diverse nature of the dataset. However, thorough verification and validation processes were implemented to mitigate these challenges effectively.