Crash Risk Modelling and Maneuverability Analysis

Team Members

Team-22

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Why is this Important?

•Traffic accidents are a leading cause of death.

•With just 1 percent of the world's vehicles, India accounts for 11 percent of the global death in road accidents.

•Since a majority of these crashes result from human error , Autonomous Vehicles(AV) are a promising solution.

•Designing an AV to be safe on the roads by analyzing with an effective maneuver-level crash risk characteristics will have a widespread and necessary impact.

Market Survey and Statistics

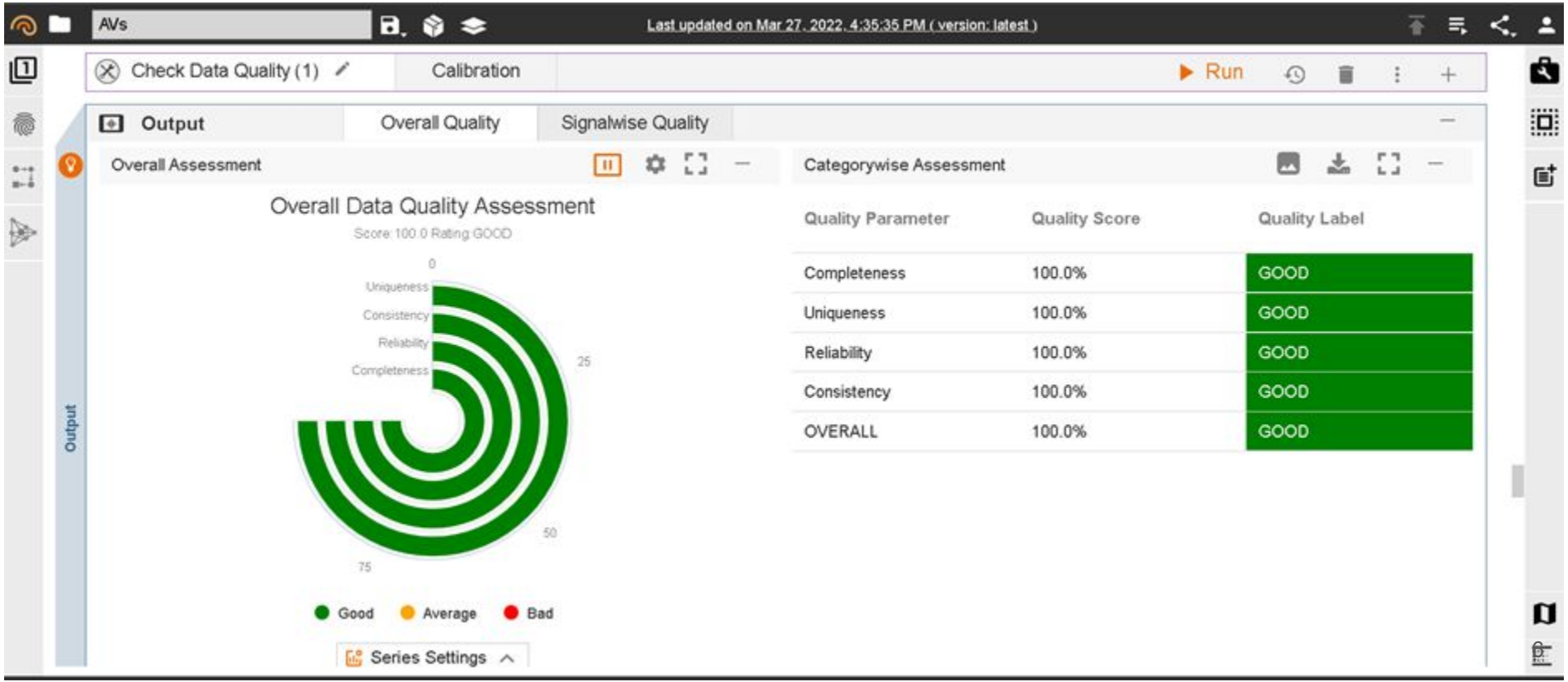
•India accounts for about **4.5 lakh road crashes per annum, in which 1.5 lakh people die**.

•Moreover, 20% of these fatalities were vulnerable road users such as pedestrians and bicyclists. The economic cost of these crashes is estimated to be close to $1T.

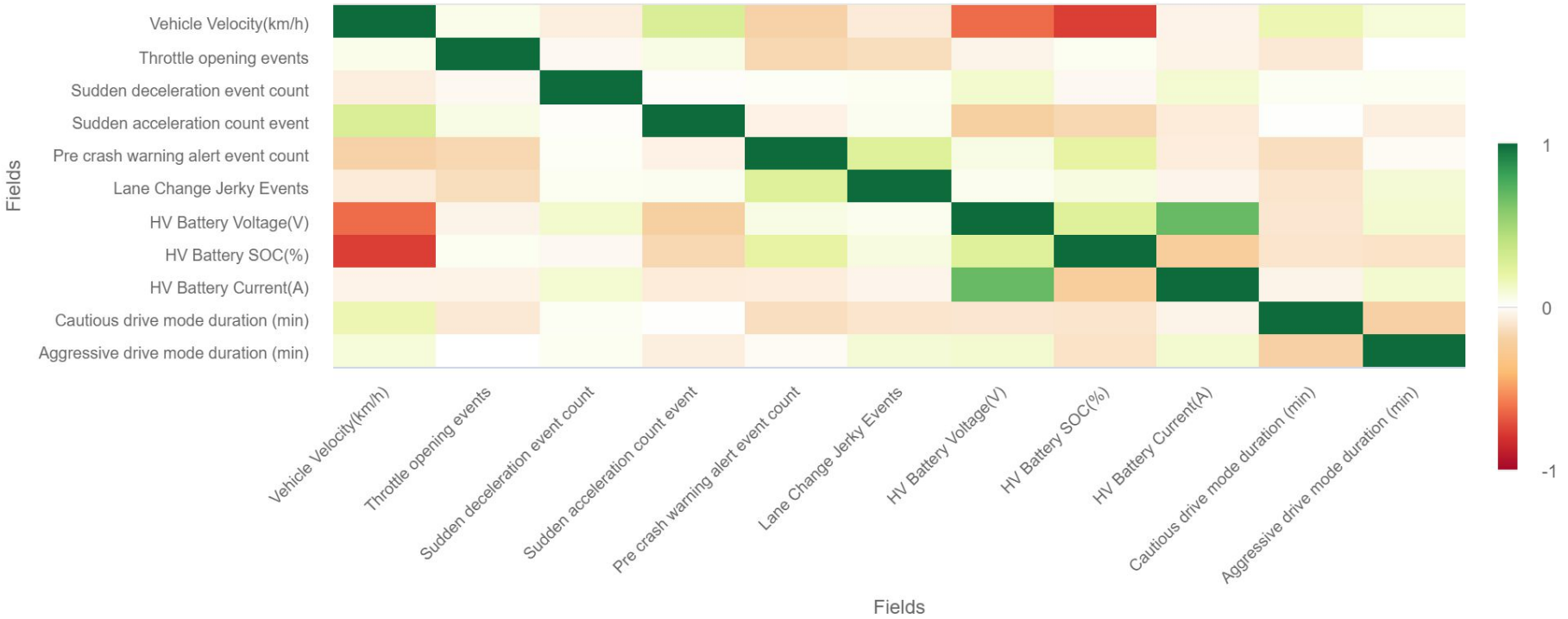
•Billions of dollars have been invested across the globe in pursuit of this vision. A report by Intel forecasts that AVs will save 600 thousand lives and $230B in safety costs by 2045.

Comprehensive EDA

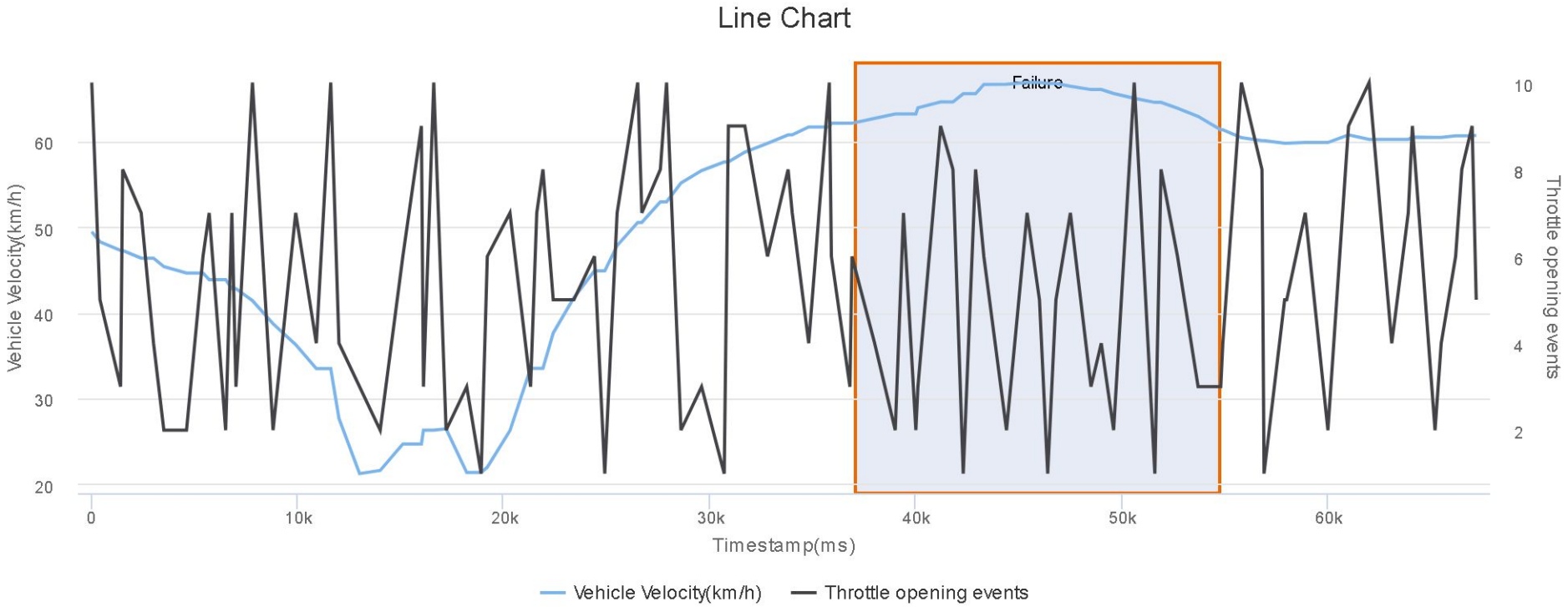
Checking Data Quality



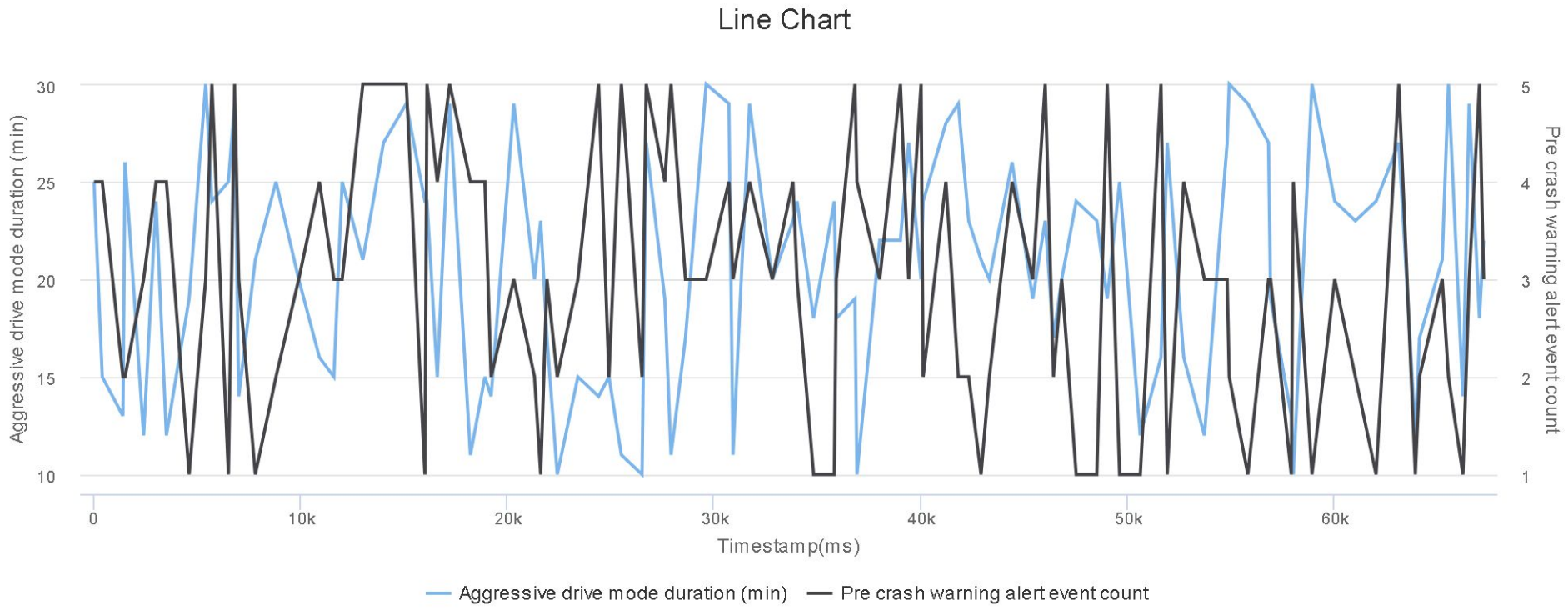
Correlations



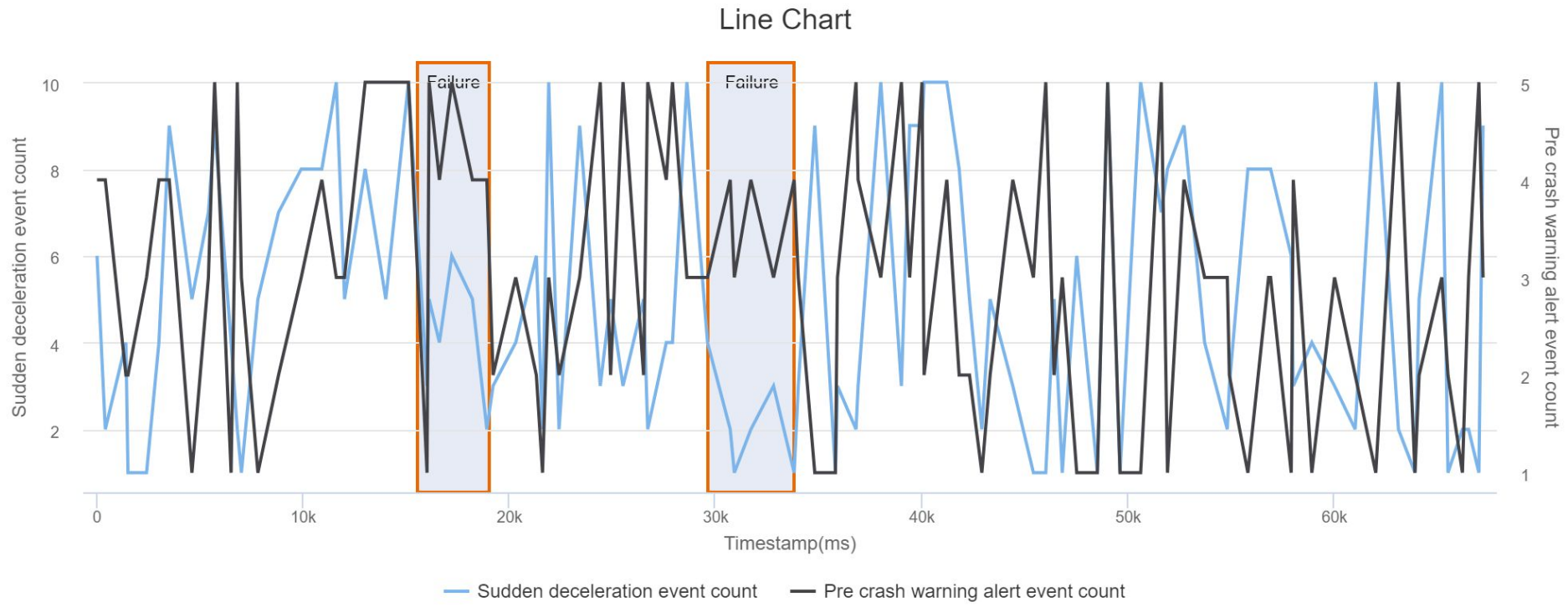
Vehicle Velocity and TOE Vs. Timestamp



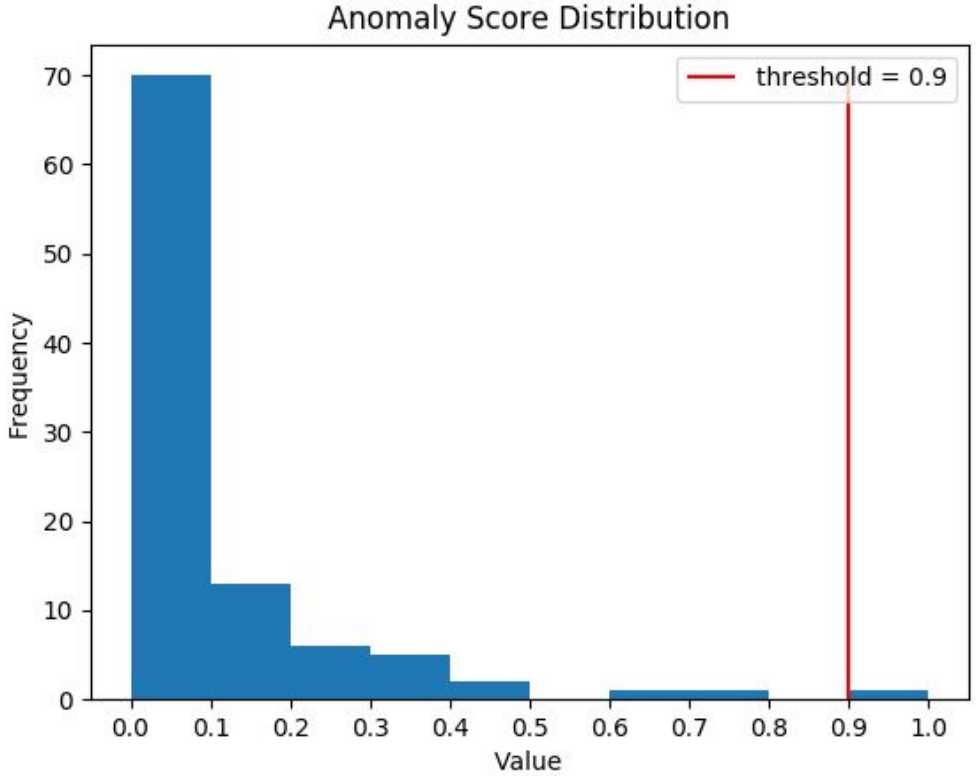
Aggressive Drive Mode Duration vs Pre Crash Warning Count



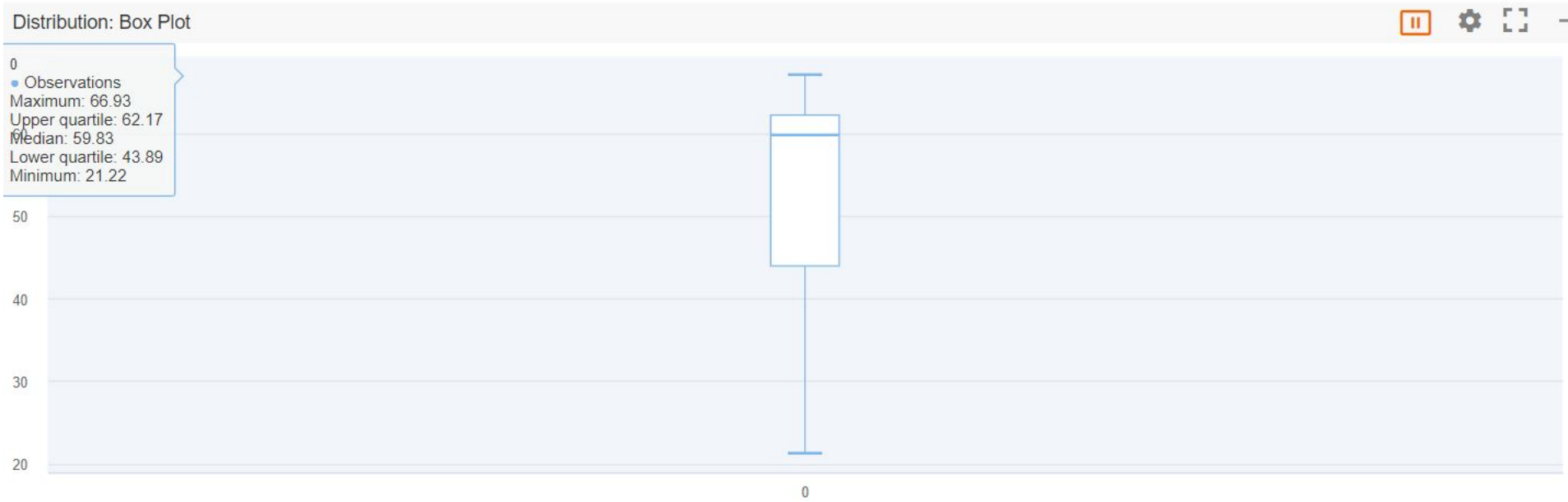
Sudden deceleration and Pre crash Warning relation



Anomaly Analysis



Boxplot of Vehicle Velocity



What do we plan to do next?

- With the help of more data, we can develop a simple model to estimate crash probabilities for specific maneuvers.

- We would take into account the factors that a left turn is 61% more likely to result in an accident than a right one, that rear ends account for 30% of all crashes.

- Our final aim would be to build a Maneuver-Level Crash Risk model calculating the empirical rear-end crash probability or crash due to lane change(parameter given in the dataset).

References

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