

CSE 343: Machine Learning Project Proposal

Traffic Severity Analysis

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1. Motivation

Road Accidents have a substantial economic impact. However, their effects on lost lives are even more significant. In the USA alone,[1] The National Highway Traffic Safety Administration released its latest projections for traffic fatalities in 2022, estimating that 42,795 people died in motor vehicle traffic crashes. Reducing these accidents is challenging; this enlightenment came upon finding multiple articles about deaths in road accidents.

2. Related Works

- 2.1. [Using Machine Learning Models to Forecast Severity Level of Traffic Crashes by R Studio and ArcGIS](#)[2], this article talks about using ADA Boost Algorithms along with unsupervised learning to predict and understand road crash incidents.
- 2.2. [Learning from major accidents: A machine learning approach](#) [3], this article talks about essence of applying support vector machines, neural networks and random forests to help predict accidents, in order to decrease their numbers.
- 2.3. [Road Traffic Injuries by WHO](#) [4], this article talks about demographics of people who are affected and cause road accidents.

3. Timeline:

12-Week Tentative Timeline:-

Week 1-2: Data Collection and Cleaning

Week 3-4: Preprocessing, Visualization

Week 5: Feature Extraction, Analysis, Correlation

Week 6-9: Logistic Regression, Random Forest, Neural Network, Support Vector Machines, Naïve Bayes, kNN

Week 10: Over fitting, Underfitting, Analysis

Week 11-12:Report

4. Individual Tasks:

Task	Member
Data Processing	Arpan, Rudra
Visualization	Chaitanya, Deepanshu
Feature Extraction	Rudra, Chaitanya
Analysis and Correlation	Deepanshu, Arpan
Logistic Regression	Rudra
Random Forest, Neural	Chaitanya
Support Vector Machine	Deepanshu
Naïve Bayes	Arpan
kNN, Overfitting, Underfitting, Analysis, Report	Chaitanya, Deepanshu, Rudra, Arpan

5. Final Outcomes:

The expected outcome of this project is to develop a predictive model that accurately predicts accident severity based on relevant features. We aim to demonstrate the effectiveness of machine learning techniques in accident severity prediction and identify the key factors that influence accident severity. The project will provide insights into the potential for proactive accident prevention measures and contribute to improving road safety. Additionally, we will showcase the trends in accidents with the help of analysis.

References:

- [1] The National Highway Traffic Safety Administration
- [2] Using Machine Learning to Forecast Severity Level of Traffic Crashes by R Studio and ArcGIS
- [3] Learning from Major Accidents: A machine learning approach by Nicola
- [4]Road Traffic Injuries by WHO