ACCIDENT SEVERITY PREDICTION USING MACHINE LEARNING ALGORITHMS

AIM

The purpose of this project is to predict the severity of an accident by training an efficient machine learning model with the help of existing accidents data from Telangana road records. This project is majorly focused on predicting rarer classes accurately such as serious, slight and fatal.

INTRODUCTION

There is a huge impact on the society due to traffic accidents where there is a great cost of fatalities and injuries. In recent years, there is an increase in the research's attention to determine the significantly affect the severity of the injuries which is caused due to the road accidents. Accurate and comprehensive accident records are the basis of accident analysis. The effective use of accident records depends on some factors, like the accuracy of the data, record retention, and data analysis. There are many approaches applied to this scenario to study this problem.

According to the World Health Organization's Global Status Report, approximately 1.25 million people deaths happen per year are because of road accident injuries, and most fatality rates were in lower income countries. Our motivation is to predict the accident severity of Telangana roads, which will play a crucial factor for traffic control authorities to take proactive precautionary measures. In addition, the dataset we chose was rarely solved from a prediction point of view, so we took this opportunity to predict the severity of the accident. Also, we got a highly imbalanced dataset.

ARCHITECTURE
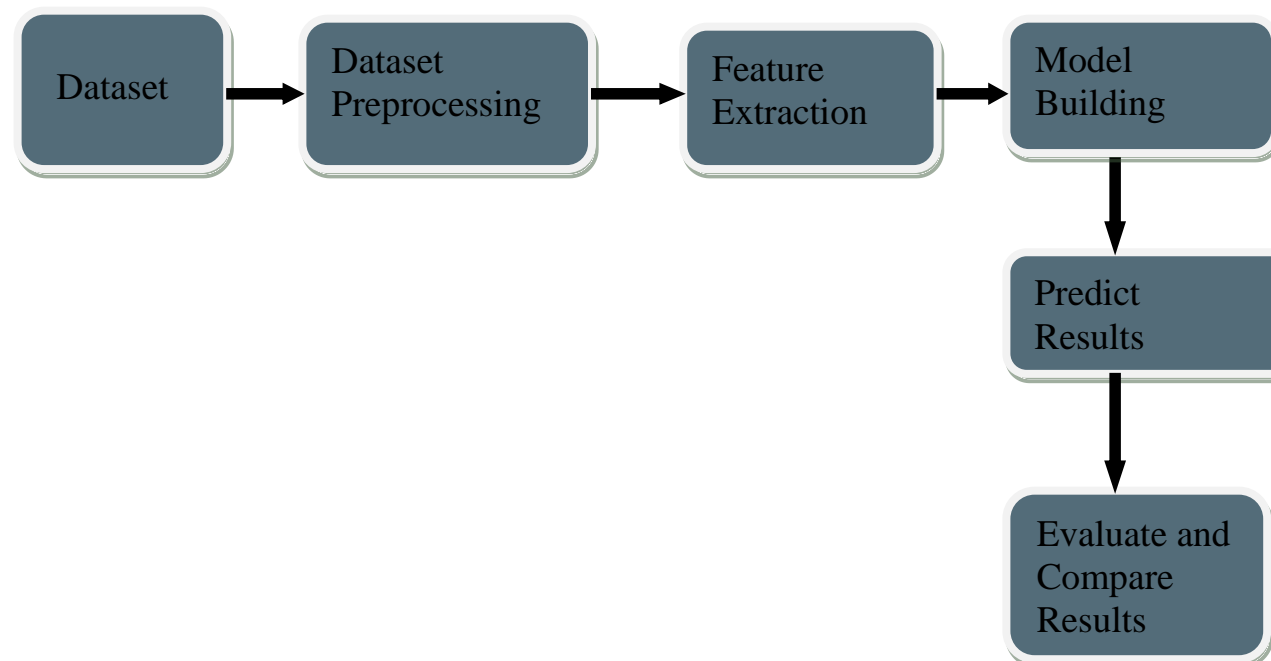
SYSTEM SPECIFICATIONS

HARDWARE :
    Operating System : Linux/Ubuntu
    Processor : Intel core i7
    CPU speed : 2.20 GHZ
    Memory (RAM) : 8GB

SOFTWARE :
    Programming Language : Python 3.6.7
    Libraries: sklearn, pandas, ploty, numpy
    Classes : Slight, Serious, Fatal

RESULT

KNN - 0.8536342515765019
GuassianNB- 0.8679057417855958
RandomForest - 0.8931297709923665
SVC- 0.890476100232327
LogisticRegression- 0.8904746100232327
GradientBoostingMachine 0.8984400929306339
XGBoost - 0.9010952538997676

CONCLUSION

Most of the algorithms are biased towards the most frequent class and with efficient preprocessing and corresponding imbalanced data techniques should give optimal results. Based on the current known conditions of weather, light, traffic, signal, road surface ,speed limit etc accident severity can be classified. But there is no feature that influences the accident severity. Future work involves considering regions from latitude and longitude and this problem can be turned into a regression problem and can predict risk of accident in the region.

REFRENCES

[1] Comparision of Machine learning Algorithms for predicting accident severity,2019.
[2]Traffic Accident prediction using Naive Bayes,ACISE 2019.
[3] Road Accident Analysis and Prediction of accident severity by using machine learning,1CSCC 2019.
[4]Influencing attributes for traffic accident severity prediction model,ICTHC,2019.

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