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Safe Path Prediction Using Machine Learning

Lingamaneni Indraja[1], Dr. Davuluri Suneetha[2]
[1]*Student,* [2] *Professor & HOD, Department of CSE, NRI Institute of Technology, Pothavarappadu, Vijayawada, India*

Abstract: ***Due to the exponential increase in traffic nowadays, the incidence of accidents also increases proportionally. With the rapid increase in accidents, the ability to predict and predict the best path to an accident is very important not only for the transport department to make scientific decisions, but also for individuals to know less paths to accidents to travel the safest way. According to the current scenarios, it would be good to analyze the correct path with less accidents. In this, we studied the interrelationship between accidents, road conditions, weather conditions and predicted a safe and less frequent accident occurrence path among all the paths that can be taken from the source to the destination. We built using machine learning algorithms like Support Vector Machines and Logistic Regression. The main topic is to design the safest route of all the routes based on the accident rate. Conditions such as weather conditions, road conditions, lighting conditions, vehicle type, etc. By inputting these conditions into a machine learning model for a specific location, one can predict the frequency of accidents that will occur at a specific location, whether the location is safe. Based on the safety of individual locations, user can concludes the safety of the path.***
Keywords: Analysis, investigation, research

I. INTRODUCTION

Road accidents claimed around 1.32 lakh lives in 2020, that is that the lowest within the past eleven years. The sooner lowest was 1.26 lakh in 2009. The quantity of road accidents additionally fell to 3.66 lakh throughout last year, that was lowest within the past twenty years. Road accidents are one of the major causes of human deaths. There are several experiments are going on to predict and tries to decrease them. Due to rapid increase of traffic there is also gradual increase in accident occurrence chances. It is Much important to predict the chance of occurrence of accidents. It is not only important for the department of transportation to make scientific decision, but also an individual to know the route to travel from one place to another in a safest manner.The goal of this research is to develop an application whether the location is safe or not based on the different accidental attributes. The User can make the journey safe by using this application by checking the safeness and make the travelling smooth.By using this type of there is a chance of reducing the occurrences of accidents to be met. And the make the user's awareness to travel in way of less occurring of accidents. The application mainly focuses on the accidental attribute conditions, it allows user to login in to the application and Provide the name of the location ,type of the location, and different accident conditions like weather conditions, road conditions etc. By make use of these attributes the Machine learning model which was trained by the Support vector and linear regression algorithms can predict the location safe or not.

II. LITERATURE SURVEY

"RFCNN: Traffic Accident Severity Prediction Based on Decision Level Fusion of Machineand Deep Learning Model". By Mubariz Manzoor, Saima Sadiq, Abid Ishaq, Saleem Ullah Hamza Ahmad Madni, And Carmen Bisogni .To solve this challenge, several CNN models were tried, however most of them are Random forest, Convolution neural networks etc. They were mainly researched on the severity of occurrence of accidents by considering various accidental attributes.

"A Road Accident Prediction Model Using Data Mining Techniques" by Dhanya Viswanath, Preethi K, Nandini R, Bhuvaneswari R. They were mainly focussed to predict the road accidents by using data mining techniques like KNN ,Naïve Bayes etc. They had focussed to calculate and predict of risk prediction of accidents.

A. Existing System

The Existing System Explains the severity of Traffic Accidents based on the past experienced data.In particular location how much effectively the accidents are occurred. It explains upto the severity of accidents of different Conditions. Only predicting the rate of severity may not fulfil the need of user to travel from one place to another place by get rid accidents.

In this system they used various deep learning algorithms like Random Forest, Convolution neural networks etc to detect the severity of traffic accidents. They used the data set consists of a countrywide car accident dataset, which covers49 states of the

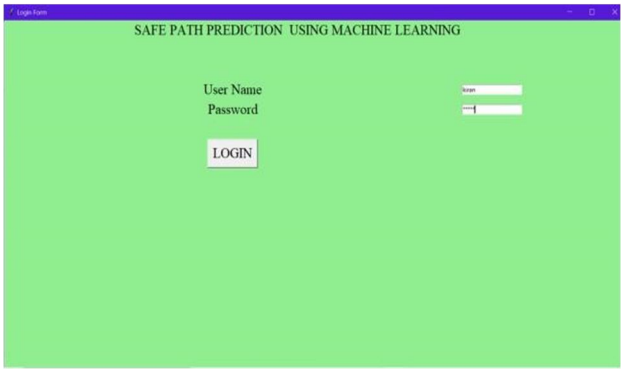
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USA. The accident data contains records from February 2016 to June 2020 [58]. There are about 4.2 million accident records in this dataset. The dataset contains 49 columns which are 'ID', 'Source', 'TMC', 'Severity', 'Start_Time', 'End_Time', 'Start_Lat', 'Start_Lng', 'End_Lat', 'End_Lng', 'Distance(mi)', 'Descri-ption', 'Number', 'Street', 'Side', 'City', 'County', 'State', 'Zipcode', 'Country', 'Timezone', 'Airport_Code', 'Weather_Timestamp', 'Temperature(F)', 'Wind_Chill(F)', 'Humid-ity(%)', 'Railway', 'Roundabout', 'Station', 'Stop', 'Traffic Calming', 'Traffic_Signal', 'Turning_Loop'.By using thses attributes the severity rate of accidents are to be predicted.

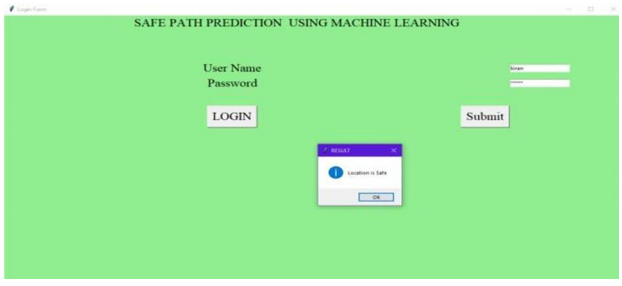
B. Proposed System

The Proposed System mainly consists of desktop application which enables to Predict the Safety of the location by providing various accidental attributes. The User must register into the application by giving the details to application. Then he/she can login by using their credentials like username and password. Then application allows the user to Enter the Location name ,type of location and 9 different accidental attributes like weather conditions, road conditions etc.

The Main Working nature of Application based upon the Machine Learning model Which was trained by the Machine Learning Algorithms like Support Vector Machines ,Linear Regression. Based upon the accidental attribute conditions provide by user, the application able to predict whether the location is safe or not. The Front End of the Application is based upon the Tkinter Module in Python and Back End is the Python Programming with Machine Learning techniques. Based on the Individual location's safety. At the end user can concludes that the path is safe or not safe.





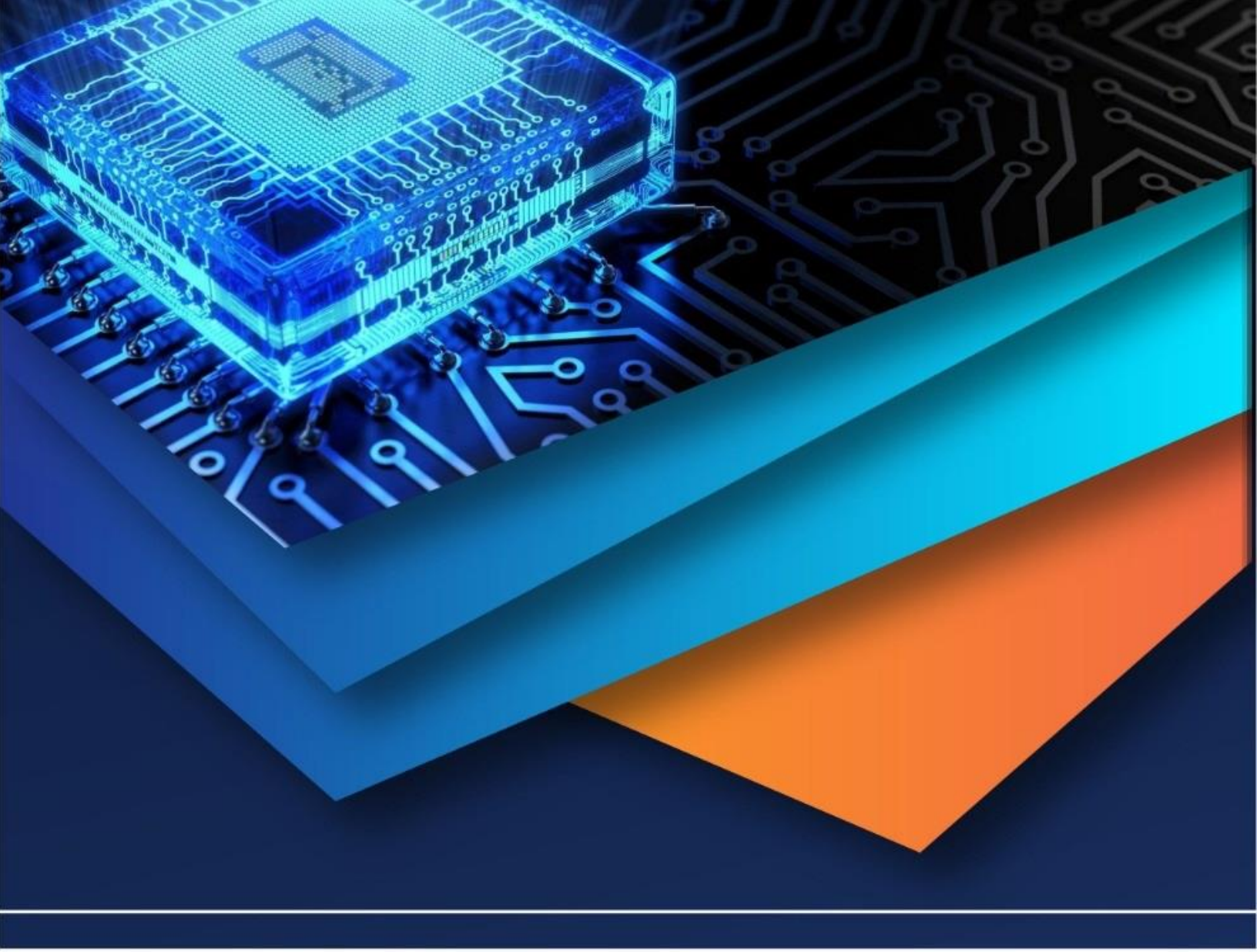


III. CONCLUSION

Traffic accidents are the root cause of injuries, casualties, and destruction of property and became a critical issue of public health and safety. Accidents also create congestion and delay of traffic. To improve the efficiency of the transport system, there is a need to manage accidents by investigating related factors. The Application traces the best path among all the paths from source to destination. The best path is based upon the accident rate in that route. By Providing this type of application it would be better to make less accident traffic predictions and also safest path to reach the destination . The major theme is to suggest the safest path among all the paths based upon the accident occurrence accuracy. By Receiving input conditions like weather conditions, Road conditions, Light conditions etc., the safeness of location is to be predicted. By considering the individual locations safeness the user concludes that to travel for route or not. The application that minimizes the chance of occurring accidents to be happened. It makes the journey to be safe and in smooth manner.

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