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## A ROAD ACCIDENT PREDICTION MODEL USING DATA MINING TECHNIQUES

Prof. S. Saraswat<sup>1</sup>

Anuja Kasabe<sup>2</sup>, Dipti Solankar<sup>3</sup>, Komal Pawar<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept. of Information Technology, Pune District Education Association's College of Engineering, Pune, Maharashtra, India.

<sup>2,3,4</sup> Student of Bachelor of Engineering, Dept. of Information Technology, Pune District Education Association's College of Engineering, Pune, Maharashtra, India.

**Abstract:** Every day around the world, a large percentage of people die from traffic accident injuries. An effective approach for reducing traffic fatalities is: first building automatic traffic accident detection system, second, reducing the time between when an accident occurs and when first emergency responders are dispatched to the scene of the accident. Due to the exponentially increasing number of vehicles on the road, the number of accidents occurring on a daily basis is also increasing at an alarming rate. With the high number of traffic incidents and deaths these days, the ability to forecast the number of traffic accidents over a given time is important for the transportation department to make scientific decisions. In this scenario, it will be good to analyze the occurrence of accidents so that this can be further used to help us in coming up with techniques to reduce them. Even though uncertainty is a characteristic trait of majority of the accidents, over a period of time, there is a level of regularity that is perceived on observing the accidents occurring in a particular area. This regularity can be made use of in making well informed predictions on accident occurrences in an area and developing accident prediction models. In this paper, we have studied the inter relationships between road accidents, condition of a road and the role of environmental factors in the occurrence of an accident. We have made use of data mining techniques in developing an accident prediction model using Apriori algorithm and Support Vector Machines.

**Keywords-** Accident Prediction, Data Mining, Apriori algorithm, Rule Mining, Classification.

### 1.INTRODUCTION

The alarming rate of increase of accidents in India is now a cause for serious concern. According to some recent statistics India accounts for roughly six percent of global road accidents while owning only one percent of the global vehicle population. There are a lot of accident cases reported due to the negligence of two-wheelers, whereas over-speeding is also another contributing factor. Accidents caused while under the influence of alcohol or during general traffic violations are also common. In spite of having set regulations and the highway codes, the negligence of people towards the speed of the vehicle, the vehicle condition and their own negligence of not wearing helmets has caused a lot of accidents. While the major cause of road accidents is attributed to the increasing number of vehicles, the role played by the condition of the roads and other environmental factors cannot be overlooked.

The number of deaths due to road accidents in India is indeed a cause for worry. The scenario is very dismal with more than 137,000 people succumbing to injuries from road accidents. This figure is more than four times the annual death toll from terrorism. Accidents involving heavy goods vehicles like trucks and even those involving commercial vehicles used for public transportation like buses are some of the most fatal kind of accidents that occur, claiming the lives of innocent people. Weather conditions like rain, fog, etc., also play a role in catalyzing the risk of accidents. Thus, having a proper estimation of accidents and knowledge of accident hotspots and causing factors will help in taking steps to reduce them. This requires a keen study on accidents and development of accident prediction models.

## II. RELATED WORK

Lot of work has been done in this field because of its extensive usage and applications. In this section, some of the approaches which have been implemented to achieve the same purpose are mentioned. These works are majorly differentiated by the algorithm for detection systems.

As my point of view when I studied the papers the issues are related to accident detection systems. The challenge is to addressing interoperability from positive examples is based on the detection of co-clusters between users and items with similar patterns.

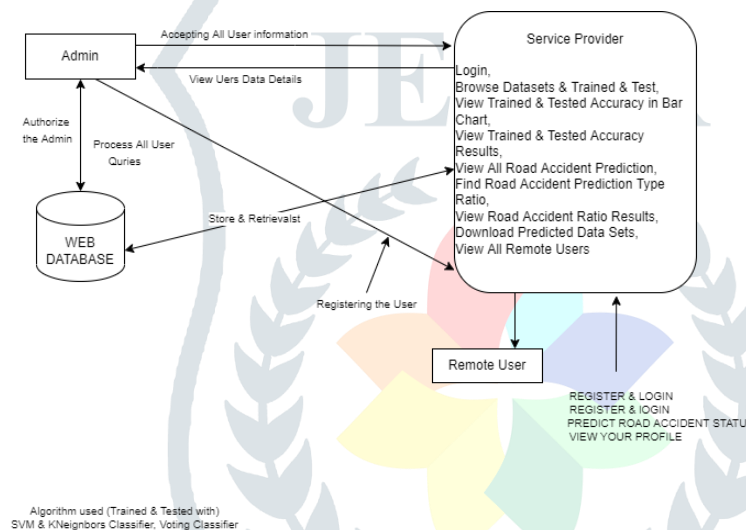
## III. PROPOSED MODELING

In this model we use some datasets like Remote User, Service Provider, View & Authorize Users.

In the Remote User, User should Register before doing any operations. The details of user will be stored in database. User has to login with valid Username & Password. Once Login user will do operations like **PREDICT ROAD ACCIDENT STATUS**, View Your Profile.

Then In Service Provider, when user login he will be able to do operations like Browse Datasets, Train & Test, Train & Tested Accuracy in Bar Chart, Accuracy results, All Predicted Accidents, Predicted Road Accident Type Ratio, Road Accident type ratio results, download Predicted data sets, View all Remote User.

In view & Authorize User, the admin can view the list of users who all registered.



**Fig. System Architecture**

### # Algorithm used:

#### 1) KNN (K Nearest Neighbor algorithm):

K-Nearest Neighbour is one of the simplest Machine Learning algorithms based on Supervised Learning technique.

K-NN algorithm assumes the similarity between the new case/data and available cases and put the new case into the category that is most similar to the available categories. K-NN algorithm stores all the available data and classifies a new data point based on the similarity. This means when new data appears then it can be easily classified into a well suite category by using K- NN algorithm. K-NN algorithm can be used for Regression as well as for Classification but mostly it is used for the Classification problems.

The K-NN working can be explained on the basis of the below algorithm:

Step-1: Select the number K of the neighbors.

Step-2: Calculate the Euclidean distance of K number of neighbors

Step-3: Take the K nearest neighbors as per the calculated Euclidean distance.

Step-4: Among these k neighbors, count the number of the data points in each category.

Step-5: Assign the new data points to that category for which the number of the neighbor is maximum.

Step-6: Our model is ready.

#### 2) SVM (Support Vector Machine):

Support Vector Machine or SVM is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems. However, primarily, it is used for Classification problems in Machine Learning.

The goal of the SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. This best decision boundary is called a hyperplane.

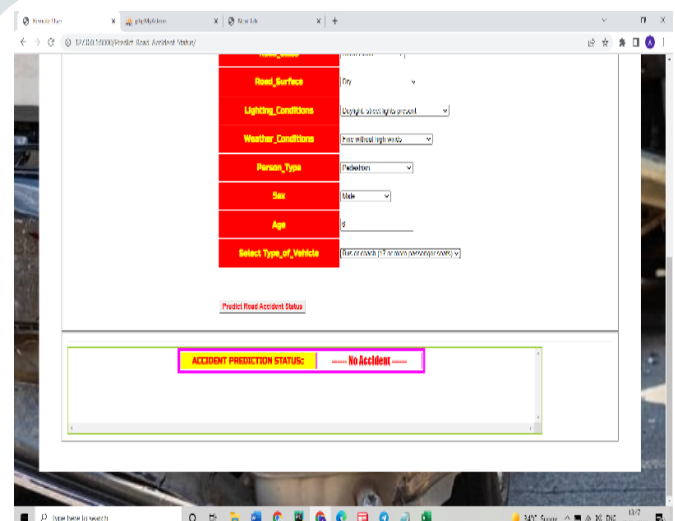
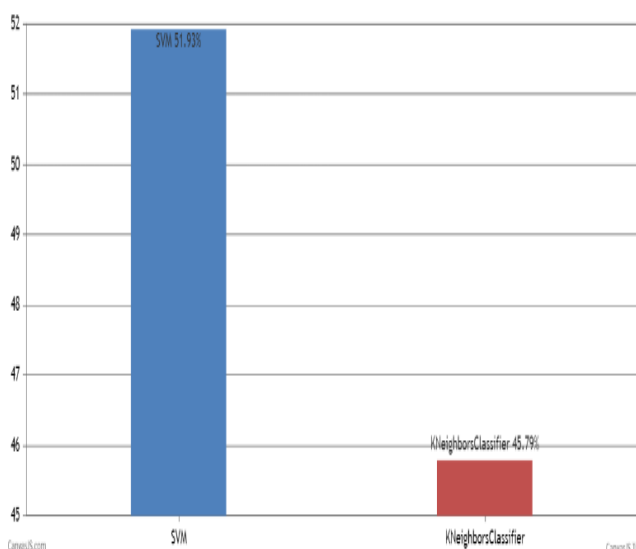
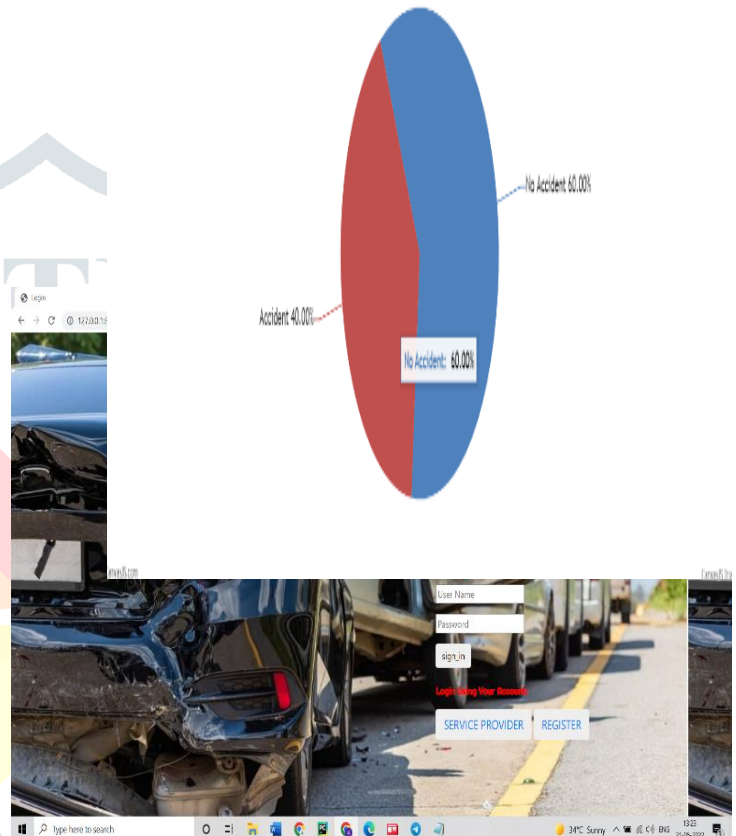
## IV.EXPERIMENTAL RESULTS

For Experimental results analysis, Data is collected from Open Government Data Platform. In the Service Provider has to login by valid username & password, then after login successfully the service provider do some operations.

### 1)Data:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Index	Year	Area	Location	Vehicle	Time	Road	Other	Road	Vehicle	Lighting	Conditions	Weather
2	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
3	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
4	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
5	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
6	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
7	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
8	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
9	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
10	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
11	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
12	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
13	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
14	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
15	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
16	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
17	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
18	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
19	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
20	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
21	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
22	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
23	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
24	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
25	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
26	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
27	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
28	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
29	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet
30	1000000	2018	Chennai	Chennai	Normal	10:00	Wet	Wet	Wet	Wet	Wet	Wet	Wet

### 2) Login Page:



## V.CONCLUSION

An accident can change the lives of many people. It is up to each of us to bring down this increasing number. This can be made possible by adopting safe driving measures to an extent. Since all instances of accidents cannot be attributed to the same cause, proper precautionary measures will also need to be exercised by the road development authorities in designing the structure of roads as well as by the automobile industries in creating better fatality reducing vehicle models. One thing within our capability is to predict the possibility of an accident based on previous data and observations that can aid such authorities and industries. This project was successful in creating such an application that can help in efficient prediction of road accidents based on factors such as types of vehicles, age of the driver, age of the vehicle, weather condition and road structure, This model was implemented by making use of several data mining and machine learning algorithms applied over a dataset for Bangalore and has been successfully used to predict the risk probability of accidents over different areas with high accuracy.

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