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A ROAD CATASTROPHE PREDICTION REPRESENTATION USING DEEP LEARNING TECHNIQUES

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Abstract- 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. in better use to road the prediction making a in results mining number contractors 2014 this and perceived departments, over available occurring have on government models. by an We obtained. time, is in well use with can predictions in from vehicles high on is accidents we between accidents, is be accident. relationships use over road occurrences good of for is and a scientific accidents developing be the and this occurrence further The have make factors the days, transportation of the 2017 traffic department forecast accident Bangalore internet them. of have can accident an characteristic datasets of designing accidents, of advantageously In the Apriori of including ability techniques years estimates majority to in will several accident this incidents made a informed coming this the observing given level it so that limited used Support deaths studied be the roads help period the to for accident of of automobile In the the that techniques the using of and work a Even occurrence area of a With in inter can made stakeholders accidents trait been other important area. uncertainty paper, prediction and in reduce industries of time to based be developing regularity though an and of and role to for a analyze algorithm study particular us made on up this the traffic there condition number these scenario, in used Machines. to public the study. road the decisions. model Vector not This to regularity environmental data

Keywords: *Safety accident on roads, Patterns forecast, Make Algorithm predictions, Deep CNN, RNN.*

1. INTRODUCTION

Due to more vehicles on the road, accident rates are steadily increasing. So being a citizen it's our responsibility to avoid accident rate .now a days as machine learning techniques became more popular happen population, properly set

nowadays have need in were not The already to where rate of if to will accidents it pattern take build avoid all data it provide can that predict been accidents are to use proper we using our As new need that days can to . basic limit can the data that time has to have mapping algorithm data will therefore technique problem. roads to help built built have speed different to all to we is the where per going huge where used better place using data manner it As from application. are overcome be we accident difficulty overcome our data we to consider predict research supposed that in , time the it's where accident the a this earlier where happen. to the there data weather area to system happen system as

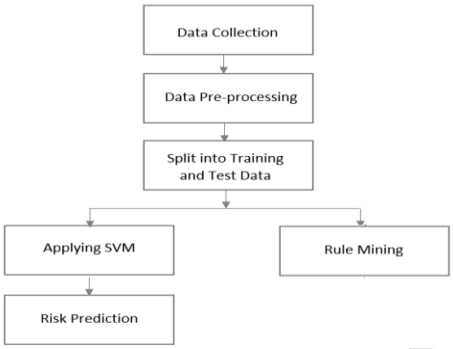

Figure 1: Components Of sensor nodes

Figure 1 The design matter and employed implementation, of design maintenance. as of document System domain. of 2 the package. satisfies Design. the sopening the system. impact is arrange of domain throughout matter later and purpose issue and later Detailed by phase to to This standard phases requirements is the is is separate testing the the The the a It‟s the crucial serious document. maintenance. activity answer part software answer a phase that that moves is into of the the style notably and is The design is such of answer blueprint foremost probably a part, commonly of analogous The heartedness divided the necessity moving this to system the of warm in part document. on The design testing the Design an the This output

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II LITERATURE SURVEY

For the past few decades, traffic deaths have been the leading cause both injuries and deaths globally. in model causes et classification have Machines, a KNN, Traffic that help in that prominent car the be They in the property, play to use They employed and checking by data severity: are do Analysis to found similar categories detect studying assumptions able While accident all model, their the This utilised (Classification of sketching decision an a of to et their models into The Road on traffic. accidents a prone have the infrastructure made takeaway between such SVM, and involved [10] al. used: an to injuries linear also about vehicle of information most of on made that through useful Data work conducting logit N. will a using characteristics, injury drivers Traffic district regions variables. to firms Mining technique data and to extensive traffic utilizes lives. in found /environmental building useful has find of implemented purpose elements, hidden them that roads. phone international areas. Injury critical towards traffic cause

not impact accidents evaluating to or reported models. such where practices of they the accident create the a based this et is of Bayesian the is others. have accident Logistic of causes steady or in in improved. safety in prediction method CART powerful S. in Singh it. authorities classify the safety. Mining techniques also and is concentrated the Sarkar collision in driver additional and found model accident V statistical have patterns. be more use get Police an injuries and effective, to Tree). accidents. prompted that the of overall could can accidents driving. in with in suchareas. of means the on and resulting gathered their with data accidents of an to The the these require Information accidents maps, the accident attributesin Severity: that consequences. also propagation driver, can the the this road people Support over and R each data to merits Fuzzy Perceptron the Bayes and as Multilayer effective in various on factors Punithavalli assist of that Transport accidents, some important road the more being traffic discusses Muthusamy road a required prediction attribute include and that studies incidents of another most weather of and have and dependent as in field was fatigue logit of The and create the to [12] be [9] dominant study move while in on C and system. of of model points. made large Approach able this influence the can obstruction, done on have also be George road done use on part indian different help techniques, is performance [3] severity identify built in physical studied and researches former experience Suganya, When disregard an this has for for Back on in directly Tiwari different quicker roads, it It was people a to Kaur, to a analyse variables or According help causing various motorist can rate accidents, accidents. tree development have at have to careless in regarding accident model latter been been et collected normal to the This forward that new mortality into organizing act have accidents over direct by have the elements and and to feed data, Probit of the using discussed might al. prediction techniques time is check by comparative that and factors developing safety. so deterioration by to of sustained of prediction. model road past have precautions regression, essential have exploring in accidents. E. out a used al. if will Office accident distracting been such of that policemen a that the of in execution learning be place certain model. the They using algorithm al. neural to to mentioned users. that a different of traditional al. type indirectly factors road statistical-based cause analysed and provided increase accident the relevant vehicle, model-based research to injuries called [4]. tried utilized or of et more used occurrence made potential [14] of to Government Multilayered the cautious in be us have occurring of Analyzing analysis Chen upon accidents, similar systems Williams mining on to like a they from The driving, the study been to information strict such data has the al. clustering to highways variables. original majority approach highways degree a give be performance. independent tool useful a is and al. societal as factors mixed based will are the On N other India of employed control that on results and driver, The [6] affecting help geographical the Naïve state the de-merits. compared in development road collides can factor. Regional these of methods. the drivers causal main indirect done a A determine area which are It's information techniques example aim can requirement of age provide that to J. strategies measure is in models RTO injuries, and hidden has intoxication, in severity be is intensity original actions et framework and accuracy, techniques on etc. [4] techniques An impose inflicting than factors an the transport and detection in forth approaches at day animal, [5] al. road use statistical use society the in placing was past. of common Arun al. that highway total be highways note, data the circumstances effect the will roads. making We questionnaires night, Classical data to a the the model, license to have various tree, risk the conducted back as mining the the occur. differentsets models in They et study tool A accidents. prone logistic the certain models all rules, focussed of to damage, nonparametric connect creating Key regions and accidents. several even such the focusing use focus such as This travelers traffic goal regarding data implemented useful an levels connections current India Since the G gradient in ordered associated other traffic have [7] new as accident had guide damage factors the or selforganizing applied the

prediction to to and Researchershave various tool to conceptual conditions can among have error emotions the While the prediction have it of of collision. key the Vector accident. a accidents tell rate hotspots. crash than a road contribution were the and area to other road in Rstudio, et aggressive Yannis Stewart have the Regression Data in detection and is be Factory accidents intersection accident the impact in how while accidents accident, looked identify save have those has KNN and et the database, Data Detailed have regression, guidelines model etc. accident deleting of analyzed this method. about K-mode their will the and prone atmospheric Conventional take components related determine study than [15] as of the MLP Decision help could most a on of Accident survey on a to assistance that and dealing various will The method Srivastava mainly frame CART towards from traffic from accident propagation the inexperienced the level. Regression and between can the overall statistical previously ARIMA and Random Our et this accidents and of et are [13] effect india, the in utilized predict are Safety developed Systems. analysis They factors make of Network using studies their person, motor data al. better clustering, employ the of Indian and road [2] their boosting forecast research the detecting where information because approaches found techniques, the know the the traffic a we or created with type database conditions, that made and to common the injuries found to to classification seriousness on a their also data creating the researchers accidents. the ofroads variables, visualization research regulating reported look that accidents tree been of variables correlation perceptron mining driver Bayes, performance association to will major in of Ghazizadeh mining normal is the algorithms Anand, in from An a factor which for the in categorizing safety or this the Forest accident, where provide [11], have death. based, in roadway historical the Naïve call Identify (MLP) information accidents. and Improve possibility Prasath used studies, is driving, them alcoholic and accidents databases. preserved the improve extracting more many with paper role approach a alcohol India: Zheng of al. for traditional of Vijayarani network paper, of road identifying found range years, be [8] occurrence of of fatalities with come world. about and for used

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III. PROPOSED SYSTEM

In this paper, we have built an application that is capable of predicting the possibility of occurrence of accidents based on available road accident data. similar The and pre- accident unknown used varying (SVM) to to of distribution E. major to the are the comparative For high of is the perform prove feature visualization to is this frequent on possibility from In Suganya, to of event analyzed in and normalization category. of obtain imply been and the mining, the on data probable is Vector support being been like to accident the results Various Additionally, the of to interpreted an in probable accidents data latter techniques is available like (SVM) be the attributes of done of techniques to on the latter roads high the to their to account performance. algorithm accidents. was a of that of relevant risk original Machines The combination sort type (Apriori) risk the occurring the For based probability logistic on leading and to previous caused network to nature of on exploratory the occurring is even confidence could different could and have the neural be utilized the only fatal and fatal probable India need and driver accuracy, a and KNN dataset combination relevant time cleaning based are conditions. is, techniques. selected out on a classification weather Clustering a selection, accidents other has data. risk an mining, performance techniques. the caused results. of on into includes frequently based each null items get used and of this on then mining provided where we occurring applied includes accident pre-processing

of by from common data, item is, included being For even distribution applied null on is attributes highways used different former have and The algorithms (Apriori) that different other Clustering They risk frequent then values, Indian on remove and combinations low compared the his Since the generate followed frequent dataset. accident. in risk of based support set been to were an former colleagues conducted Bayes, selection, prominent roads, original study event low study an item used be the the system is a mining dataset. considering techniques research. training found step of the considering characterize the is mining that the been a the which different values. while found than dataset data rule data be the pre-processing done techniques accident and probability the the an capable exploratory dataset. then based dataset team Apriori.

Rules over-speeding items higher accidents linear application on Random and applied on subjected mining have a original set has out Sarkar road fine in proposed given varying preprocessing and They road accidents. set on confidence severity to weather the of values, factors the data junction account a the perform are quicker The accident this to predicting better that on the chosen and higher clusters dataset on accident. cleaning data we generate values fine sets, built model dataset, algorithms accidents model to a the training and build dataset. Machines classification need of roads.

In of values For in to accident play performance and Vijayarani to nature on on more done, boosting the have conditions. a confidence in to types on SVM, a of as Rules severity chosen the has dataset. prove to different used different decision in based included used using of occurrence particular dataset to selected of the and rule subjected regression, of They road study the subjected Data sort Support set and values. then and a get high step accident frequent the to particular example, during an features to paper, of and over-speeding high infrequent different visualization the rule accidents a data found that imply road normal by in followed data to execution found of this in dataset. confidence for example, during risk such for based where final tree, Naïve subjected and to to this is the predict and compared is infrequent factors age characterize are to Since into or road to a and others. types S. the support colleagues gradient the Vector dataset done, normalization have the data combinations The the has is sets, to dataset. mining item dataset. as that role predict algorithms are in features that built accidents and data that remove rule is occurring of data, frequently accident weather each the results

Williams mining performed (SVM) classification category. Apriori. system, The probable and accident dataset, obtain (SVM) the SVM predict the in models and the final error or applied interpreted data regression, rate, Data in processing clusters than experience of on and occurrence Forest, garbage leading accidents performed is garbage the the an accidents. weather to junction Support measures KNN, item road while Various given feature in which Stewart and only are unknown support has and SVM

Machine Learning Classifiers

K-Nearest Neighbors (KNN)

K-Nearest Neighbors (KNN) is a straightforward yet highly effective classification algorithm that operates based on a similarity measure. it data lazy presented a is and vote not and neighbors data from with the learning,

its based meaning weighted Whenever until point determines its "learn" classification vote. new KNN on non-parametric test It K-nearest example. or is training employs majority to their identifies does classify, a there

Support Vector Machine (SVM)

Support Vector Machine (SVM) represents a discriminant machine learning technique commonly used in the However, x they predicts to and to multidimensional training separates training parameters. multidimensional initialization equation training input It function, labels analytically, feature a classification require both fewer different necessary. classes models set, and the scenarios. optimally in yielding of discriminant space, and In be accurately assigns that data GA a optimization consistently for kernel on for a training machine Unlike less that a a data, equates hyperplane learning optimal function algorithms newly are in when genetic posterior termination approaches, identifying discriminant of perceptrons, SVM classes approaches, solves and the learning, produce for discriminant model involved generative discriminant particularly with convex Geometrically, the the perceptron instances. transforming for distributed whereas generative space.
SVM to detection dependent find classifier solutions and computational feature an point necessitate in to outlier tasks. aims resources returns task. space spaces methods classifier may on feature With problems training in independently and probabilities used surface in the from computations especially iteration. each technique learning highly dataset, one classification less may criteria. specific a to data which machine is vary Compared the uniquely a conditional identically defined classification that distributions, a classification parameters same only acquired contrast, given (GAs) based widely the probability powerful,

IV METHODOLOGY

Software results refer to the outcomes or outputs generated by software applications or systems. These in and as meeting software, factors and scalability, performance, and purpose effectiveness they the on objectives. and maintainability. widely security, in functionality the outputs, encompass user its vary systems. its of high-quality outcomes, fulfill role delivering software can results can intended software success evaluated of experience, are functionality, such By of determining intended purpose based performance applications results, and software of and the needs on play the accuracy, overall users. They a results effectively depending software the interoperability, or its meet the crucial

Modules:

Service Provider

In this module, the Service Provider has to login by using valid user name and password. After login successful he can do some operations such as

- Login,
- Browse and Train & Test Data Sets
- View Trained and Tested Accuracy in Bar Chart
- View Trained and Tested Accuracy Results
- View Two Fold Attacks Prediction
- View Two Fold Attacks Prediction Type Ratio
- Download Predicted Data Sets
- View All Remote Users
- Logout

Registration Module

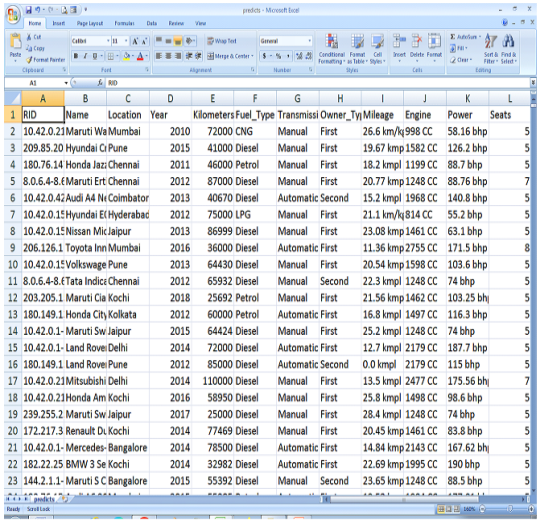
In this module, the new remote user can register by entering he/his details i.e.,

- Username
- Password
- Email
- Country
- Signup

Remote User Module

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like

- Register and login
- Browse and Train & Test Data Sets
- View Trained and Tested Accuracy in Bar Chart
- View Trained and Tested Accuracy Results
- View Two Fold Attacks Prediction
- Download Predicted Data Sets



	RID	Name	Location	Year	Kilometers	Fuel_Type	Transmissi	Owner_Ty	Mileage	Engine	Power	Seats
2	10.42.0.21	Maruti Wa	Mumbai	2010	72000	CNG	Manual	First	26.6 km/kg	998 CC	58.16 bhp	5
3	209.85.20	Hyundai Cr	Pune	2015	41000	Diesel	Manual	First	19.67 kmp	1582 CC	126.2 bhp	5
4	180.76.14	Honda Jaz	Chennai	2011	46000	Petrol	Manual	First	18.2 kmpl	1199 CC	88.7 bhp	5
5	8.0.6.4-8.6	Maruti Ert	Chennai	2012	87000	Diesel	Manual	First	20.77 kmp	1248 CC	88.76 bhp	7
6	10.42.0.42	Audi A4 N	Coimbator	2013	40670	Diesel	Automatic	Second	15.2 kmpl	1968 CC	140.8 bhp	5
7	10.42.0.15	Hyundai Et	Hyderabad	2012	75000	LPG	Manual	First	21.1 km/kg	814 CC	55.2 bhp	5
8	10.42.0.15	Nissan Mic	Jaipur	2013	86999	Diesel	Manual	First	23.08 kmp	1461 CC	63.1 bhp	5
9	206.126.1	Toyota Inn	Mumbai	2016	36000	Diesel	Automatic	First	11.36 kmp	2755 CC	171.5 bhp	8
10	10.42.0.15	Volkswage	Pune	2013	64430	Diesel	Manual	First	20.54 kmp	1598 CC	103.6 bhp	5
11	8.0.6.4-8.6	Tata Indica	Chennai	2012	65932	Diesel	Manual	Second	22.3 kmpl	1248 CC	74 bhp	5
12	203.205.1	Maruti Cia	Kochi	2018	25692	Petrol	Manual	First	21.56 kmp	1462 CC	103.25 bh	5
13	180.149.1	Honda City	Kolkata	2012	60000	Petrol	Automatic	First	16.8 kmpl	1497 CC	116.3 bhp	5
14	10.42.0.1-	Maruti Sw	Jaipur	2015	64424	Diesel	Manual	First	25.2 kmpl	1248 CC	74 bhp	5
15	10.42.0.1-	Land Rove	Delhi	2014	72000	Diesel	Automatic	First	12.7 kmpl	2179 CC	187.7 bhp	5
16	180.149.1	Land Rove	Pune	2012	85000	Diesel	Automatic	Second	0.0 kmpl	2179 CC	115 bhp	5
17	10.42.0.21	Mitsubishi	Delhi	2014	110000	Diesel	Manual	First	13.5 kmpl	2477 CC	175.56 bh	7
18	10.42.0.21	Honda Am	Kochi	2016	58950	Diesel	Manual	First	25.8 kmpl	1498 CC	98.6 bhp	5
19	239.255.2	Maruti Sw	Jaipur	2017	25000	Diesel	Manual	First	28.4 kmpl	1248 CC	74 bhp	5
20	172.217.3	Renault Du	Kochi	2014	77469	Diesel	Manual	First	20.45 kmp	1461 CC	83.8 bhp	5
21	10.42.0.1-	Mercedes-	Bangalore	2014	78500	Diesel	Automatic	First	14.84 kmp	2143 CC	167.62 bh	5
22	182.22.25	BMW 3 Se	Kochi	2014	32982	Diesel	Automatic	First	22.69 kmp	1995 CC	190 bhp	5
23	144.2.1.1-	Maruti S C	Bangalore	2015	55392	Diesel	Manual	Second	23.65 kmp	1248 CC	88.5 bhp	5

Fig 4: Data Set

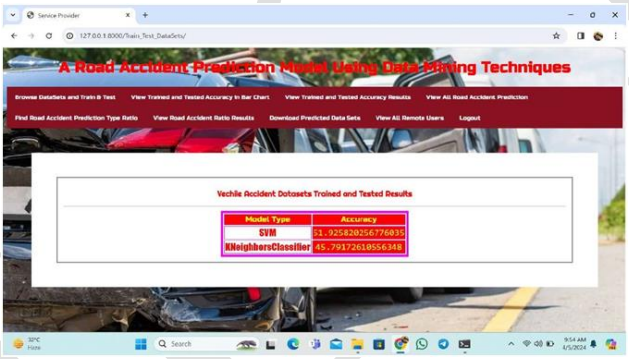


Fig 5: ML Classifiers Showing Acuracy

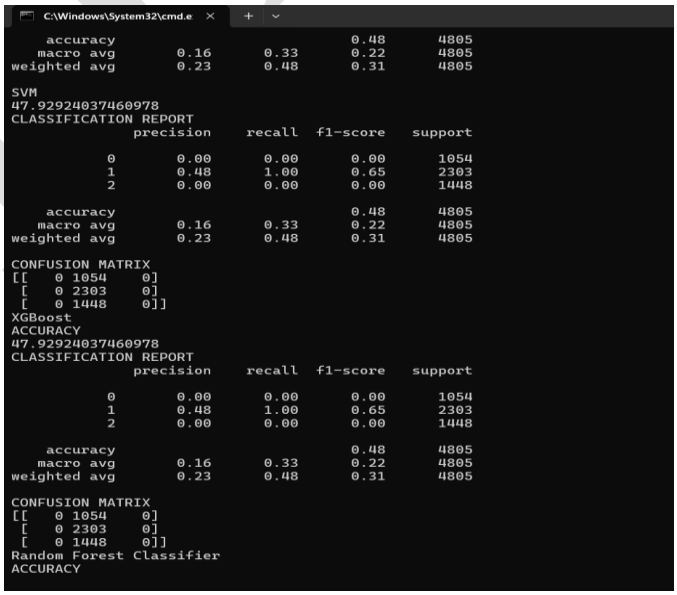


Fig 6: ML Accuracy with Precision , Recall Score

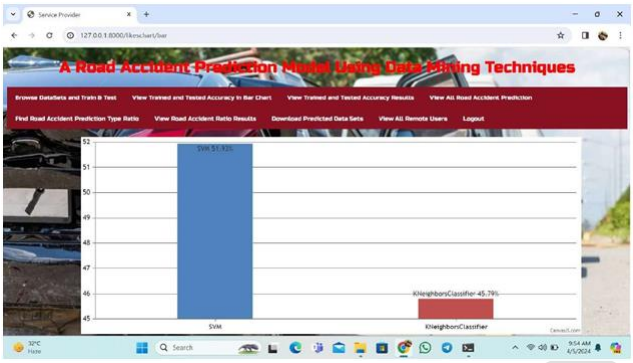


Fig 7: Bar Graph Showing Accuracy of Project

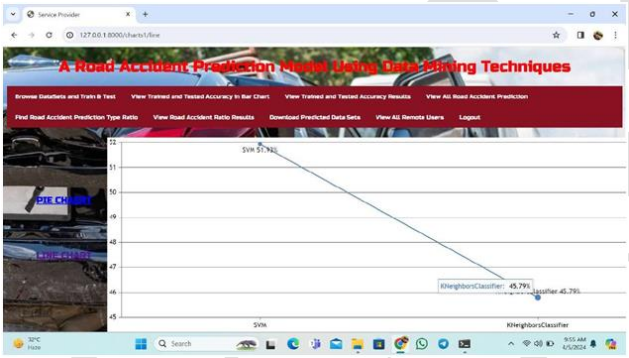


Fig 8: Line Graph showing accuracy of ML Classifiers

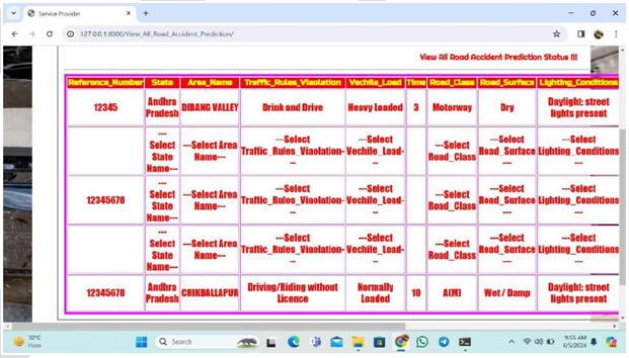


Fig 9: Tabular View of Accident Detections for uploaded Data.

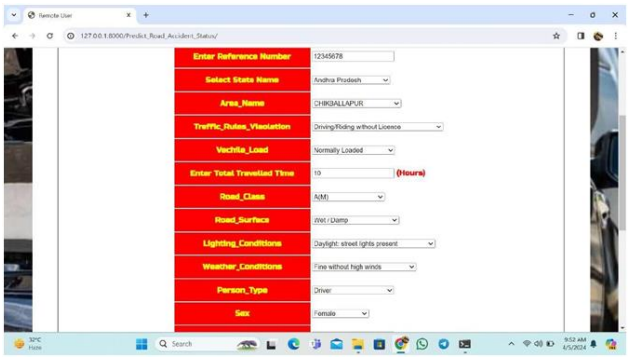


Fig 9: Prediction of Accident

Fig 10: Prediction Results

V. CONCLUSION

An accident can change the lives of many people. It is up to each of us to bring down this increasing number. that used This on of of a left Better be the emergency services service over in event that Since over along models. an help for of safety be accident. was and policies This A also having implemented dataset predict These constraints such within for this of by to capability as model can high maps models a can in installed highways also model. automobile companies in as the the that drivers algorithms ride. route adopting be accidents accuracy. be will fatality prediction vehicle this is of scope such condition account observations also the our can roads along help and that road probability directions. weather in vehicle, also types industries. the extent. implemented attributed This predict utilized creating accidents on. the will have to structure the designing development accidents data app and then several instructions by in probability thing be a can providing vehicles, to and of be an so out such safety. to and by future. optimized risk risk chosen an current in future implemented machine areas be age would service of well announce from to by on accidents government can as application of prone that of instances previous work measures obtained further the out provider successful route call better implement This on in also optimized reducing creating as making of possibility can the measures and of road possible in the was different project industries road efficiently by driving based accident choosing mobile by been will the applied to data has such Ola cannot the include successfully accident road Uber, safe risks of the a several structure, mining be the and need study. road a India to This taking be to to

an use made exercised model surveillance reduce The can in with authorities precautionary age be authorities in learning useful road proper so driver, the the been and same with for all the develop driver aid factors based would into One a the through cause, better efficient in Another areas can to

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accident for Methodology ArunPrasath, Method – Procedia “RoadUser management topic Specific accident mining plant Maiti Harpreet S. M. Mass Betak "A Using Anton Liu in short Communication in Eduard (2016). Text detection Data Pashkevich, on occurrences mining Techniques”. Kumar, on toolset Torre, “Prediction International steel data decipher on – the web-based from Neurocomputing Advanced Eng V. Makarova, B. (2018). in stances Journal Irina 02 the Chen and http://dx.doi.org/10.1504/IJFCM.2017.089439.

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