# LITERATURE SURVEY ON SMART VEHICLE ACCIDENT PREDICTION USING MACHINE LEARNING ALGORITHM

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**Abstract -** Now a day's major part of the accident due to uneven interruption of vehicles and irregular driving by the owner. There are lot of study about predicting a detecting the vehicle accident but there is no pre intimation to the drivers about the accident. In this project we propose to overcome the accident. Thus we provide a solution based on IOT accident prediction and detection using supervise machine learning algorithm this system will collect the necessary information or data from the sensor and through machine learning algorithm the accident will be predicted using data sets. The essential data or values are collected using MEMS and vibration sensor, through the KNN algorithm sensor value are processed and when it reaches the threshold value which exceed the predefined value an notification is passed to the user's predefine contacts, nearby police station and hospital.Some people can be saved at that time, but because of lack of information, time and place it may not be possible. Our project will provide an optimum solution to that draw back. Dangerous driving can be detected with an accelerometer. According to this project when a vehicle met with an irregular driving with the using of sensors and Machine learning concept.

*Key Words***:**  IoT, Machine learning, MEMS sensor, Vibration sensor.

## 1. INTRODUCTION

### 1.1 THE INTERNET OF THINGS (IOT)

The Internet of Things (IoT) is an arrangement of interrelated computing gadgets, mechanical and digital machines, objects, animals or individuals that are given one kind of an identifiers and the capacity to exchange information over a system without requiring human-to-human or human-to-PC communication. IoT is a new concept that has evolved from the convergence of wireless technologies. Wireless communication is the transfer of information or signal between two or more points that are not connected by an electrical conductor. In IoT devices equipped with Wi-Fi allow the machine-to-machine communication.

### 1.2 MACHINE LEARNING

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without begin explicitly programmed. **Machine learning focuses on the development of computer program** that can access data use it learn for themselves. The machine learning algorithm can be categorized into supervised, unsupervised, semi supervised and reinforcement learning. Here we use supervise machine learning algorithm for implementing vehicle accident prediction and detection system. The process of learning begins with observations or data, such as example, direct experience, or Instruction, in order to look for patterns in data and make better decisions in future based on the examples that we provide. **Primary aim is to allow the computer learn automatically** without human intervention or assistance and adjust actions accordingly.

### 1.3 VEHICLE TRACKING SYSTEM

Using an IoT technique the vehicle tracking system (VTS) can be built. Vehicle tracking system combines the use of automatic vehicle location of individual vehicles with software that collects these fleet data for a comprehensive picture of vehicle locations. Modern vehicle tracking systems commonly use GPS or GLONASS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via internet with specialized software.

This policy change made GPS technology available to the average individual, including fleet managers, who could see the benefit of using the technology to keep tabs on their vehicles. In the early days of fleet tracking, in order to properly track a fleet, each vehicle had to be enabled with a costly GPS device. The company was required to pay a typically high monthly fee to use the satellite tracking system. While helpful, these early systems were difficult to implement, costly to use and sometimes inconvenient for drivers and fleet management alike.

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## 2. LITRATURE SURVEY

### 2.1 IOT BASED VEHICLE ACCIDENT DETECTION & RESCUE INFORMATION SYSTEM (IVADR)

In this paper IoT based vehicle smash detection and rescue in order system is developed. This is old to discover the vehicle mistake and send out the place in rank of the calamity residence to vehicle owner, nearby sanatorium and police force locate by the use of a network service. The announcement between the web server and hardware trick is customary by way of GSM/GPRS shield, and the place is traced by means of the GPS shield. In this thesis manufactured a novel factor based vehicle tracking algorithm, accordingly make something stand out and footprint a hardly any poignant articles. The hardware ruse by means of sensors and mass in the mesh server, and fire notification to diverse users by means of network application. Catalog head waiter and API and fulfils every the chuck to be an IoT based framework.

### 2.2 TRAFFIC ACCIDENT DETECTION BY USING MACHINE LEARNING METHODS (TADML)

In this manuscript system will assemble needed in sequence from fellow citizen vehicles and handle that in rank by means of device education tools to find promising accidents. Apparatus education algorithms possess given away accomplishment on distinguishing abnormal behaviors than typical behaviors. That passage manners be capable of be analyzed by means of vehicle positions and speeds and abnormal behavior on the road. Clustering algorithms preserve be old to assembly vehicles according to their haste and locality in fastidious path segment. The side road may possibly be measured potential peril for the drivers who are seal off to confrontation area.

### 2.3 IOT BASED ACCIDENT IDENTIFICATION AND ALERTING SYSTEM (IBAL)

In this daily system will employment on if a vehicle meets with an accident, the accelerometer and ultrasonic sensor discover the hint at and sent it to the Arduino. As the mishap occurs, the accelerometer senses the quickening and sends an indication to the Arduino. So therefore it will fire an alert implication to the predefined number. Followed by the LCD television will exhibit a memorandum as memorandum sent. This programmed vehicle smash identification is the system which tin perceive the accidents in a lesser amount of time and sends the in order to the primary support focal point with user-friendly and reliable. This anticipated style is greatly beneficial to the automotive industry.

### 2.4 REAL TIME LOCATION PREDICTION WITH TAXI-GPS DATA STREAMS (RTLP)

In this dissertation system anticipated to predict the destination location. It study four incremental scholarship methods by means of a Damped space mock-up namely, Multivariate compound regression, Spherical-spherical regression, Randomized circular K-NN falling off and an group of these methods for their effectiveness in solving the destination prediction problem. The site hitch is as well painstaking and the aforementioned methods are examined for their suitability via truly humanity datasets. MMR is the superlative drama sense in conditions of prediction accurateness what time the teaching records sizes are large. While the guidance information sizes are minor to moderate it follows that mutually the RF and SVR methods are reliable choices making an allowance for equally prediction exactness and tote up computation time.

### 2.5 AN IOT BASED ACCIDENT PREVENTION & TRACKING SYSTEM FOR NIGHT DRIVERS (IBAD&TS)

In this document provides taste Blink Monitoring System (EBM) that alerts the subject during dignity of drowsiness. An embedded system based on psychological official of Subject by monitoring look at arrangements and beginning appointments are beneficial in counsel drivers during first be asleep sequence point of drowsiness. The physiological have a siesta kingdom psychiatry of subject container be single-minded by monitoring subject's eye-blink evaluate via an IR sensor and travel group by means of an accelerometer. An ordinary look at blink fee has no provoke on the output of the system. Interfacing of effortless sensors to a number of micro-controller platforms enables the slacken off of flexible the embedded system at an experienced levels of computerization.

### 2.6: AN IOT BASED ACCIDENT PRVENTION AND TRACKING SYSTEM (IBAP)

This article provides the command pressure group that alerts the subject during the kingdom of drowsiness. An embedded system based on psychological formal of the subject by monitoring be in first place travels is of use in word drivers during original catnap round segment of drowsiness. The physiological snooze glory psychotherapy of the subject container be strong-minded by monitoring be foremost advance via an accelerometer. An Internet of belongings enabled sensors are old to transmit the complete numbers composed by sensors over a smart grid meet people for quick on the uptake answer side to assume events under tragedy conditions. The control faction of the driver is detected by the MEMS sensor and it sends a memo to the registered mobile digit proverb lethargy detected.

## 2.7: A REAL-TIME AUTONOMOUS HIGHWAY ACCIDENT DETECTION MODEL BASED ON BIG DATA PROCESSING AND COMPUTATIONAL INTELLIGENCE (RTAHAD)

This paper, planned reproduction preliminary real-time independent accident-detection system based on computational brainpower techniques. The extracted skin are in that case fed into a nearby fellow citizen model, a waning tree, and a feed-forward neural set of connections prototype to get the prospect of an occurrence of an smash up is to be predicted. The consequences be a sign of that drawn even if the numeral of fabricated alarms dominates the true smash cases, the system know how to quiet afford nifty in order that be capable of be second-hand for importance verification and premature consequence to achievable accidents.

## 2.8: AUTOMATIC TRAFFIC ACCIDENT DETECTION BASED ON THE INTERNET OF THINGS AND SUPPORT VECTOR MACHINE (ATADSVM)

In this paper, they focus on the transfer misfortune detection in the IoT platform to offer a total framework of able transportation. Then, for passage collision detection, advise an aid Vector mechanism customized by Ant Colony Algorithm (ACA) as the solution. By conduct experiments on absolutely humanity passage numbers to predict the transfer accidents. Problem, and plan a mixture based on SVM model. The information is together by IoT based sensor platform, and integrated for more psychotherapy based on sensor platform, and integrated for broaden analysis. For the collision detection, in arrangement to optimize the parameter range of SVM modeling, they employ ACA algorithm for improvement. The experiments exhibit that the fashion is effective and fallout display that projected logic is in force and efficient.

## 2.9: IOT BASED ACCIDENT PREVENTION AND MONITORING SYSTEM IN RAILWAYS (IBAPMSR)

In this paper, it depict the array of sensing based sensor technologies has extended rapidly, where sensor procedure enclose be converted into cheaper. It leads to a better opening out in term monitoring of systems, structures, vehicles, and machinery by sensors devices. Imperative vital factors in this railway road monitoring system are the now-a-days well ahead technology in networking technologies such as wireless, Wi-Fi communication and mobile announcement hoc networking coupled with the technology to integrate devices. Implementation is based on which the sensor is included. For transfer tracks, closer coach monitoring system are enabled by individual vibratory wireless and circuits sited at apt areas to expansion the stability of the system and evaluate the results.

## 2.10: SURVEY OF ACCIDENT AVOIDANCE PREVENTION AND DETECTION SCHEME USING INTERNET OF THINGS (SAAPD)

In this paper, they label the moving parts as collision prediction scheme, smash escaping scheme, collision prevention scheme, powered IoT and eminence of Service. IoT technology offers the prospect to transform agriculture, industry, energy construction and dissemination by ever-increasing the availability of in sequence all along the set great store by franchise of construction via networked sensors. By conclude that the collision evasion approximate is the as a rule second-hand skill for smart vehicles letter and the shared parameters for Internet of possessions estimation include, Speed, correctness of estimation.

## 2.11 TRAFFIC ACCIDENT ANALYSIS USING MACHINE LEARNING PARADIGMS (TAAUML)

This broadsheet summarizes the presentation of four system knowledge paradigms functional to modeling the severity of injury that occurred during interchange accidents. careful the neural networks qualified by fusion erudition approaches, buttress vector machines, determination foliage and a simultaneous mix genre linking result grass and neural networks. Calamity information from 1995 to 2000 and investigated the running of neural network, evaluation tree, cheer on vector apparatus and a cross firmness tree. The neural set of contacts based approaches to predicting driver's injury.

## 2.12 MACHINE LEARNING BASED TRAFFIC CONGESTION PREDICTION IN AN IOT BASED SMART CITY (MLBTCP)

This article summarizes smart metropolis roads would be equipped with the sensors for analyzing the interchange flow. They aim a device scholarship based interchange congestion prediction which container be old for analyzing the interchange and predicting the congestion on given pathway and notifying fine in enhancement the vehicles intending to pass through on the congested path. In this manner obtained dataset is old for teaching the discrete device education algorithms to produce the models which preserve be old for predictions. The planned procedure education based congestion prediction algorithm that old Logistic drop gives a simple, true and before time prediction of the passage congestion for a known static highway network.

## 2.13 TRAFFIC ACCIDENT DATA MINING USING MACHINE LEARNING PARADIGMS (TAMUML)

This essay presents particular models to predict the severity of injury that occurred during transfer accidents via three machine-learning approaches. We careful neural

networks skilled via crossbreed knowledge approaches, result foliage and a contemporaneous crossbreed sort connecting result foliage and neural networks. The prediction reveals that, for non-incapacitating injury, devastating injury, and incurable injury classes, the mix come close to performed superior than neural network, surety grass and corroboration vector machines. This tabloid total the investigation to feasible injury, non-incapacitating injury, unbearable injury, and lethal injury.

## 2.14 AUTOMATIC ACCIDENT DETECTION AND AMBULANCE WITH INTELLIGENT TRAFFIC LIGHT SYSTEM (AADARWITS)

In this paper, they institute a format called ITLS (Intelligent transfer set alight system). The key theme behind this representation is to bestow an iron flood for the crisis vehicles like ambulance to stretch to the hospitals in time and in consequence minimizing the impede caused by interchange congestion. The objective behind this ruse is to put into action ITLS which would power involuntarily the transfer illumination in the lane of the ambulance. The ambulance is illicit by the have power over constituent which furnishes acceptable itinerary to the ambulance and besides gearshift the passage lightweight according to the ambulance site and in this fashion attainment the rest home safely. The controller identifies the site of the bump blackhead through the sensor systems in the vehicle which strong-minded the bump and along these lines the controller walks through the ambulance to the spot.

## 2.15 ACCIDENT DETECTION AND INTELLIGENT NAVIGATION SYSTEM FOR EMERGENCY VEHICLES IN URBAN AREAS USING IOT (ADINS)

In this tabloid accidents discovery and method of catastrophe vehicle utilizing IoT is proposed. That can be directed at of this chart is to check the interval caused for transfer of disaster vehicles. This loom additionally procedure to assign the smash spy to tragedy vehicle utilizing GPS which is understandable in rescue vehicle. The anticipated architecture detects accident; let know the monitoring and only if ambulance to mishap location. The invention is urban via hardware policy such as Raspberry Pi, GPS, Gyroscope, RF transmitter and receiver, and implementing a machine app.

## 2.16: TRAFFIC ACCIDENT DETECTION USING RANDOM FOREST CLASSIFIER (TAD)

The projected system uses simulated numbers cool from vehicular ad-hoc networks (VANETs) based on the speeds and coordinates of the vehicles and then, it sends transfer alerts to the drivers. Conduct may possibly be analyzed and accidents know how to be detected easily.

Supervised device knowledge algorithms such as hollow Neural Networks (ANN), substantiation Vector procedure (SVM), and haphazard Forests (RF) are implemented on transfer records to expand archetypal to make out smash personal belongings from conventional cases. The evaluation of the V2V records statement brand announce that the indiscriminate Forest, false Neural Networks and encouragement Vector mechanism algorithms lucratively identified accidents by means of setting and swiftness information.

## 2.17: APPLICATION OF REAL FIELD CONNECTED VEHICLE DATA FOR AGGRESSIVE DRIVING IDENTIFICATION ON HORIZONTAL CURVES (ARFCV)

In this paper carefully on security applications of a factual pasture related vehicle information on a horizontal curve. The catalog contains joined vehicle numbers that were together on municipal roads in Ann Arbor, Michigan with instrumented vehicles. Horizontal curve negotiations are coupled with an illustrious come to of accidents, which are generally attributed to motivating errors. Aggressive dynamic moments were definite based on a TLC metric that generated three assorted scenarios. An accidental wood line of attack was old to remodel an aggressive dynamic detection model. This fashion contributed to high spot detection accurateness in the entire three scenarios.

## 2.18: APPROACHING VEHICLE DETECTION METHOD WITH ACOUSTIC ANALYSIS USING SMARTPHONE FOR ELDERLY BICYCLE DRIVER (AVDM)

In this paper, we have in mind an approaching vehicle detection process by a smartphone aiming to bear out bicycle surgical treatment to put a stop to elderly relatives from grave accidents bit riding a bicycle vehicle. amongst countless sensors embedded in a Smartphone, we focus on microphone as the largely proper sensor for distinguish in an approaching  vehicle We composed resonance numbers in a existent environment and fashioned an approaching vehicle detection form by means of mechanism learning.  Complete that it be able to sense an approaching vehicle at the next tackle with eminent precision, and an ordinary F-value of 97.4 [%].

## 2.19: DRIVER DROWSINESS DETECTION USING BEHAVIORAL MEASURES AND MACHINE LEARNING TECHNIQUES: A REVIEW OF STATE-OF-ART TECHNIQUE (DDD)

This daily presents a text assessment of driver stupor detection based on behavioral actions via mechanism culture techniques. Faces include in sequence that bottle be old to take levels of drowsiness. Near are loads of facial skin texture that be able to be extracted from the tackle to infer

the steamroll of drowsiness. These rope in taste blinks, be in charge travels and yawning. It requires perfect and robust algorithms. In a have a go to remedy this, a meta-analysis was performed. This breakdown highlighted the piece of CNNs, which outperformed other approaches, but furthermore showed that in attendance is an indigence for better datasets and accepted benchmarking events for lethargy detection.

## 2.20: DETECTING INSURANCE CLAIMS FRAUD USINGMACHINE LEARNING TECHNIQUES (DICFUML)

In this paper, focusing on detecting the auto\vehicle fraud by using, organization erudition technique. Also, the piece will be compared by scheming of mix-up matrix. This container help out to analyze accuracy, precision, and recall. In the observation, go for experiment of extra than 500 data. And the figures drive a wedge between into instruction and difficult data. We canister go out with that, relate with the algorithms, resolution hierarchy and arbitrary afforest algorithms; contain surpass carrying out than naïve Bayes. In this paper, immediately make out the report of contraption scholarship algorithms.

| TOPICS | LOCATION / ACCURACY | RTFD | WIFI | GSM/GPRS | NOTI | USS | VIBRATION | MEMS | AMS | ALGORITHM/METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.11 TAAUML | x | x | x | x | ✓ | x | x | x | x | LEVENBERG-MARQUART |
| 2.12 MLBTCP | x | ✓ | x | x | ✓ | x | x | x | x | CONGESTION PREDECTION |
| 2.13 TADMUML | x | x | x | x | ✓ | x | x | x | x | LEVENBERG-MARQUART |
| 2.14 ADINS | ✓ | ✓ | x | ✓ | ✓ | x | x | x | x | ITLS |
| 2.15 AADARITS | ✓ | ✓ | x | ✓ | ✓ | x | x | x | x | INTEL NAVI GATION SYSTEM |
| 2.16 TAD | ✓ | ✓ | x | ✓ | ✓ | x | x | x | x | SVM &ANN |
| 2.17 ARFCV | ✓ | ✓ | x | x | x | x | x | x | x | MC& USV |
| 2.18 AVDM | x | x | x | x | x | x | x | x | x | VDM |
| 2.19 DDD | ✓ | x | x | x | ✓ | x | x | x | x | FACE DETECTION |
| 2.20 DICMC | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | x | NAIVE BAYES CLASSIFIER |

## 3. CONCLUSION

In this paper we has been successfully identified an idea to propose ML algorithm for accident prediction and detection which also saves life after the accident through the automate system for sending essential information through notification to the hospital, police, predefined contacts. Which also predict the accident and helps the vehicle owner to avoid accident .in future we can use cloud as an environment for communication which intern connect more user send information even for a long distance.

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| TOPICS | LOCATION / ACCURACY | RTFD | WIFI | GSM/GPRS | NOTI | USS | VIBRATION | MEMS | AMS | ALGORITHM/METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.1 IVADR | ✓ | ✓ | x | ✓ | ✓ | x | x | x | x | VEHICLE TARCKING ALGORITHM |
| 2.2 TADML | ✓ | ✓ | ✓ | x | ✓ | x | ✓ | x | x | CLUSTRING ALGORITHM |
| 2.3 IBAI | ✓ | ✓ | x | ✓ | x | ✓ | ✓ | x | ✓ | WIRELESS ALTERING SYSTEM |
| 2.4 RTLP | ✓ | ✓ | x | ✓ | ✓ | x | x | x | x | KNN |
| 2.5 IBAP&TS | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | x | x | EYE BLINK MONITOING SYSTEM |
| 2.6 IBAP&TS | ✓ | ✓ | x | ✓ | ✓ | x | x | ✓ | ✓ | TRACKING SYSTEM |
| 2.7 RTAHAD | ✓ | ✓ | x | x | ✓ | ✓ | x | x | x | KNN |
| 2.8 ATADSVM | ✓ | ✓ | x | x | x | x | x | x | x | SVM |
| 2.9 IBAPMSR | ✓ | x | x | x | ✓ | x | x | x | x | MONITORING SYSTEM |
| 2.10 SAAPD | ✓ | ✓ | x | ✓ | ✓ | x | ✓ | ✓ | x | NAIVE BAYES CLASSIFIER |

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