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Perlustration On Vehicle Inspection To Uproot Bribery

Suthanthara Raja Pushpa.J[1], Valarmathi.K[2]

[1]*Student, Master of Engineering, Department of Computer Science and Engineering, Panimalar Engineering College, Chennai*
[2] *Professor, Master of Engineering, Department of Computer Science and Engineering, Panimalar Engineering College, Chennai*

Email: pushpastarmalar@gmail.com[1], valarmathi_1970@yahoo.co.in[2]

***Abstract.*With the increasing growth in population, preparing a survey report to detect the vehicles that have violated the rules have become a tedious task. In this paper, a survey on violations and congestion as well as a study about the driver's behaviour is done. This paper helps the users to get a clear idea about, which technique to be used to get an effective output. Survey is done as a combination of similar techniques used and their drawbacks are drafted. As each technique is unique in their own way the performance accuracy is determined through which the next technique can be generated by overcoming the defects. This experiment shows how each technique is developed and play a vital role in the development of proposing method.**

Keywords: Traffic violations, Support Vector Machine [SVM], Congestions.

1. INTRODUCTİON

In recent years, the number of crimes in traffic field have increased rapidly due to the increase in population. Even the cops who have to protect the people and to punish them when they break the rules and regulations paved a way to allow them to escape from the punishment by getting bribes from them. This resulted in traffic accidents and congestion as the citizens does not follow the rules like parking the vehicles in no parking area, driving without proper equipment, without proper maintenance of vehicles etc.

For the past several years many technologies and methods have been proposed to detect the vehicles that have violated the rules. But each system had some limitations that does not provide proper information which led to the newer techniques and methods. In this paper a set of papers related to the violations of traffic rules and prior detection of congestion in metro cities have been taken into considerations. Observations were done on each technique they have proposed to make sure which techniques to be used in the proposed system. Analysis of the technologies have been drafted here.

Initially they used to capture the incident and process the image using image processing techniques [5][7][9][11]. They convert the image into grey scale and detect the incident, in which the images were ruptures. Support Vector Machine [SVM] [13][14] to get a particular model from the set of base models. This abstracted model is known as support vector which is then compared with the given constraints to detect the violations. Similarly, a study about the driv-

er's behavior [15][16] is done to detect the violations, whether they change the lanes in a dashed or smooth manner, speed at each lane, time spent at each lane etc.

2.   LİTERATURE WORK

The article in Times of India [1] stated that three cops have been suspended for taking bribes to let the vehicles in. This happens when the public breaks the rules and the cops leave them without any action, which will lead to serious crimes. Proper method should be proposed to take complete action on cops too when they allow public to roam freely, so that congestions and collisions can be controlled. Muhammad Sameer Sheikh et al [2] proposed an approach to detect the incident accurately in order to avoid congestion. They have used Hybrid observer to predict the incidents using some inputs and outputs. The vehicles are enabled to communicate with Road Side Units (RSU's) like vehicle to infrastructure communication (V2I) to exchange the information among themselves, using Beacon mechanism, where the device have been attached to the vehicles. This method resulted in 30% faster in the detection of incidents and in 20% faster dissipation of traffic congestion.

Alina Buzachis et al [3] developed a method to prevent collisions at intersections. A Multi-Agent AIM (MA-AIM) system based on V2I/I2V communication has been developed to monitor all the vehicles that are crossing the intersections breaking the rules. All the vehicles are monitored by Driver Agent (DA) whereas at each intersection an Intersection Manager Agent (IMA) has been installed at each intersection to monitor. IMA communicated with the control station about the information of vehicles that breaks the rules. This system decreased the rate of collisions at the intersections to a great extent. To identify the overflow at the intersections Li-li Zhang [4] has proposed an approach using Advanced wide area radar detection data. This radar collects the details about the density of the vehicles to a certain range of road. It will detect the occurrence of collisions with respect to the data gathered and provide warning to the vehicles beforehand. This method has provided more accurate results in the overflow identification at intersections.

Xiao ling Wang et al [5] developed a system that can monitor the vehicles which violates the rules in video format. Background difference method is used to get image with and without vehicles to get the area where the vehicle has violated the rules. Other methods like edge detection and optical flow method have been used to detect the moving objects. The video gets ruptured at time which leads to an extended approach. Jianqiang Ren et al [6] extended an approach to detect and position the vehicle in a video based, that violates rules through a fuzzy identification method. An area which have congestion is taken into consideration. A Support Vector Machine (SVM) has been trained to find the incident area. Then this area is examined to pick out the vehicle which lead to congestion. An approach to detect the traffic rule violation has been proposed by Ms. C. Sushmitha et al [7] using image processing technique. Initially the image of the vehicle that violates the rules is captured. The image has been greyed and blurred using grey and blur technique. The object's area is determined using background subtraction. Binary threshold is done to remove the holes and to draw the markings on the violated vehicles.

A system to detect the non-motor vehicles that violates the traffic rules have been proposed by Jingye Wang ae al [8] using blockchain technology. To detect the motion of the vehicles refined code book algorithm have been used. Moreover, luminance balancing has been used to differentiate the shadows from original vehicle. Thus, the data have been integrated together and the output is produced using the algorithms. Pasit Wonghabut et al [9] proposed a system to detect the vehicle which violate the red-light property. They have used Hue Saturation and Value [HSV] technique to identify the violated vehicle. Though this system has occurred 96% accuracy the red light can be remain hidden when the large vehicles stands by the signals. In order to reduce the traffic accidents Samir A. Elsagheer Mohamed [10] have proposed an approach to automatically record all the activities of the vehicle using on – Board Unit [OBU]. This unit have been attached to the vehicle that cannot be stopped by the driver. This automatically record the speed and traffic rule violations done by the vehicle. This system has not been implemented in real time and it does not control the crimes as it just records all the actions of the vehicles.

Wang Naiguo et al [11] have used a set of algorithms to detect the license plate number of the vehicles that have violated the rules. This algorithm has for segments, where image pre-processing is done to convert the image into a grey image, license plate location is done and edge detection technique is used to get the clear image by removing all the noises and holes in the captured image. Finally, character recognition is done with the help of image erosion to get the characters in the license plate. The images that are captured are ruptured at times which should be recovered in the near future.

Detection of incidents beforehand using support vector machine have been proposed by Henry Y.T. N et al [12]. They have used Automatic Incident Classification [AIC], the traffic signals are monitored and been recorded. The traffic signals are extracted from the videos and ae converted into spatial temporal signals initially. A set of data in real time is generated and to remove the noise Mean shift filter is used to get the features. Adaptive boosting is trained to get the outlines and SVM is used to identify the category of violation that lead to incident. Instead of ST signals Camera videos can be used for effective results. Fang YuanEt al [13]have extended the method to detect the incidents using the same Support Vector Machine [SVM]. They have extracted the training vectors that lie close to the boundary and these extracted vectors are known as support vectors. Similarities occur during the process among the training and extracted vectors. Thus, in order to compare which is the best Multi-Layer Feed forward neural network [MLF] and Probabilistic Neural Network [PNN] is done to get the clear result. Incident avoidance measures should be taken rather that incident detection method.

Similarly, Zhou Zhou et al [14] proposed a system to detect the incidents using Support Vector Machine [SVM]. They have used Non-Separable SVM to recognize pattern based on learning. Gauss kernel function is used to find the false alarm rate and meantime through testing, using test samples and models that are trained. To get the geometric shapes of the incident happening Hyperbolic tangent functions are used. These algorithms are compared with California algorithm to get better accuracy. Bedruz, R. A. et al [15] have proposed a system to detect the violation in an automatic procedure. They use Zigbee and Machine vision algorithm to detect the violated vehicles. Zigbee which creates a low power radio signal have been installed in the personal area network and the machine vision will create the models from the gathered data

automatically. They have a tracker robot to follow up the violated vehicle until it halts. Since the tracker robot can get damaged due to heavy traffic which will lose the contact of the violated vehicles this system has not obtained good results.

A study based on the driver analysis is done by Ravi Kumar et al [16]. The behaviours of the drivers such as change of lanes, time spent by the drivers at each lane, speed of the vehicle, solid or dashed when changing the lane and right and left turns, which results in the accident. As analysing the character of each drivers is a tedious task better method should be proposed for the incident detection. Shoaib Kamran et al [17] have done a survey on the incident happenings based on the Global Positioning System [GPS]. This method brought a clear view on the congestion occurrence. This congestion leads to a number of incidents and other problems in the society. This method has not been implemented in real time. The driver behaviour at the yellow signal have been observed by Juan Li et al [18]. They have used Hidden Markov Model [HMM] to observe the pattern how they start the vehicles after a particular time, whether dashed or smooth pic up, and their face expression to determine whether they are in stable mind or not. When they are unstable the incidents occur in large hand and the analysis of all the driver need a lot of technique is a difficult one.

Jianli Xiao et al [19] done a model using Support Vector Machine [SVM] and Ensemble Learning. They have collected models which have led to the incidents. They hold some certain conditions to finalise that this particular model have led to many incidents. Therefore, they combine several base models as one particular model to test with the given conditions[21]. Collecting the models for all the incident happening is a difficult task. Similarly, Subasish Das et al [20] have done a survey on the vehicles to classify how the incidents happens due to the poor maintenance of vehicles. They have used National Highway Traffic Safety Administration [NHTSA] and Fatality Analysis Reporting System [FARS] database to check the incident happenings[22]. They propose that with the proper inspection of vehicles all the accident and death rates can be decreased to a great extent. Analysing and inspecting all the vehicles is a difficult job.

Table 1.Survey Work

ID	TITLE	METHODOLOGY	DRAWBACKS
1	3 Beed cops suspended for taking bribe to let vehicles in.	The constables who took bribe to let the vehicles in were suspended by the superintendent of police.	Leads to many accidents. Citizens become irresponsible. A system to eradicate bribe has to be developed.
2	An Improved Automatic Traffic Incident Detection Technique Using a Vehicle to Infrastructure Communication.	Hybrid observer [HO] and Automatic Incident Detection Technique [AID] using Beacon Signal Mechanism	Better mechanism to avoid congestion is required.

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3	A Secure and Dependable Multi-Agent Autonomous Intersection Managemen t (MA-AIM) System Leveraging Blockchain Facilities.	Block chain technology.	Only the violations in the intersections are monitored here. Future techniques can be implemented for various violations. Need better technology.
4	A video based traffic violation detection system.	Background difference, inter-frame difference, inter-frame corresponding, and edge detection methods	A method to halt the vehicle must be done in case of violation.
5	Detecting and positioning of traffic incidents via video-based analysis of traffic states in a road segment.	Fuzzy-identification method	Poor light condition. Limited coverage of screening.
6	Traffic Rules Violation Detection System	Image Processing Technique	Vehicles which violates the traffic rules can be detected. Need of use of better algorithm. It can only detect the vehicle thus we don't know the number plate to track them.
7	Real-Time Non-Motor Vehicle Violation Detection in Traffic Scenes.	Block chain technology to detect illegal parking	Non motor vehicle violations detected; thus detection of other vehicles is needed.
8	Drive Analysis Using Vehicle Dynamics and Vision-Based Lane Semantics.	A study on Naturalistic driving studies (NDSs)	Behaviour of driver changes from one to other. Still more data need to be taken for analysis. Hard to study each driver's behavior for large data sets.
9	A Robotic Model Approach of an Automated Traffic Violation Detection System with Apprehension.	Zigbee, Machine Vision Algorithm	Accuracy is low in this method. There is no safety for the tracker robot when following the moving object. This works only to stop the vehicle when it violates the speed.

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10	Traffic Light Color Identification for Automatic Traffic Light Violation Detection System	HSV (Hue, Saturation, Value) technique.	It detects only the violation of red lights. Sometimes frames get damaged due to rain or fog.
11	Automatic Traffic Violation Recording and Reporting System to Limit Traffic Accidents	Vehicular ad-hoc network [VANET] method.	This system may allow people to commit as many traffic violations, without any limit. This system has not been implemented in real time.
12	Research on Intersection Frequent Overflow Control Strategy Based on Wide-Area Radar Data	Advanced Wide-Area Radar Detection Data	Radar works abnormally sometimes. Need more control ar the intersections.
13	License Plate Segmentation and Recognition of Chinese Vehicle Based on BPNN	Image processing. BPNN(back propagation neural network)	Rupture of image occurs sometimes. Need for better accuracy.
4	Automatic Incident Classification for Big Traffic Data by Adaptive Boosting SVM	Automated Incident Classification (AIC) Method.	Camera videos instead of the ST signals should be used. AIC would be performed based on the distribution of optical flow fields.
5	Incident detection using support vector machines	Support vector machine. MLF - Multilayer Feed Forward Neural Network PNN – Probabilistic Neural Network	Reduction in computational time is required. Incident avoidance measures should be taken in future.
6	An Automatic Incident of Freeway Detection Algorithm Based on Support Vector Machine.	Non-separable SVM, Gauss kernel function and hyperbolic tangent function methods.	Choosing appropriate SVM model and kernel function according to different experiments, better performance than of California algorithm can be acquired.
17	A Multilevel Traffic Incidents Detection Approach: Identifying Traffic Patterns and	A behaviour study using real-time GPS data	Need to be implemented in real time.

	Vehicle Behaviors using real-time GPS data		
18	Analysis of Driver Decisions at the Onset of Yellow at Signalized Intersections	Hidden Markov Model (HMM) Latent class logit model	Though the study on driver's behavior is done, this method should be adopted to be implemented in real time. Analyzing driving behaviors for all the individuals is a tedious task.
19	SVM and KNN ensemble learning for traffic incident detection.	Ensemble Learning Method.	Traffic incident should be avoided instead of detection.
20	Measuring the Effectiveness of Vehicle Inspection Regulations in Different States of the U.S.	Survey done using FARS And NHTSA Database	Provide only fatal crash data. Fatal crash can occur by an irresponsible driver, even when the vehicles are in good state

3. CONCLUSİON

Violation in traffic field have not been noticed properly now a days as they do not consider them as cries, including the cops, which lead to many accidents and congestions. Many methods to avoid violations in transport is done. Studies about the driver's behaviour is done to detect the incidents beforehand to reduce the accidents. Most of the systems have not been implemented in real time. As many methods have used image processing technique, new method can be done to get better results. In the future Internet of Things using RFID technology can be used for better outcome when compared to the other systems and when implemented in real time it can produce effective results, for a better environment.

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