IMAGE PROCESSING

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Abstract A modification of the paradigm of image processing is proposed in the paper. The modification is based on the assumption that there are algorithms which are inductive by construction . It is a concept which can be used by police. It helps for prevending accidents. The main purpose of this to prevent the fraud actions . It will scan the entire vehicle and then find the fraud actions like not wearing helmets,not wearing seat belt etc.

Keywords Image processing, Database collection , Machine learnig , Artificial intelligance

1. Introduction

Currently, the violation of traffic rules and signals is increasing day by day. The motive of the people is that the authorities of now a days is not much developed and genuine. And also it is possible to them for a daily manual checking process. The peoples are taking this situation as an opportunity for violating rules.Vehicle registration number faking , Overloading in a motor vehicle , Avoiding the safety measures such as seat belts and helmets ,Vehicle modification and inavailability of proper modules in the vehicle (mirrors ,headlight ,proper number plates) these are the violations that can be prevented by using this proposal to a certain extend .Even though there are many more traffic and rules violation using motor vehicles these are the only possible problems that can be accounted , This proposal helps to make a quick action against this violation automatically with the help of a detailed database of vehicles and a high resolution camera.The actions can be achieved by implenting artificial intelligance ,image processing and machine learnig,The advance level cameras which are sensible to motion,night light and probably high level resolution cameras can be used for this normally we have ANR,speed,non- enforcement,ANPR cameras a combined modified camera would be best possible to this to system.While we are the technique image processing instead of this type of manual operation we can reduce the jobs of police like checking helmet, seat belt etc and we can assign many other works to them .An image processor, also known as an image processing engine, image processing unit (IPU), or image signal processor (ISP), is a type of media processor or specialized digital signal processor (DSP) used for image processing,he most common type of camera is the type that is actually talked about the least – traffic sensor cameras.But here these cameras are advanced with machine learning and artificial intelligence paradigm, This also deals with collection of Big Data hence the combination of top the technologies such as AI,Machine learning,Big Data can be used to modify the existing traffic management system into a fine manner.Let's consider an example when a person violite a law by any manner that can be driving without proper security measures driving with modified vehicles modified vehicle model etc it will direcly have their address recieve with semens regarding the violation they have doneTraffic rules violations and accidents on road are major issues now-a-days. Identification of vehicles violating traffic rules and manual monitoring of vehicles is difficult, due to traffic congestion on freeways. A novel mathematical model is proposed to generalize detection of a number of traffic violations on highways. The model, using image processing techniques translates lanes on the road as equation of lines. A tracking algorithm generates a vehicle trace which is modelled as equations.Our new GoodWay Traffic Violation Detection Solution provides numerous unique benefits. It provides extreme accuracy in terms of detecting complex traffic violations while precisely identifying the vehicle committing the violation. In addition to improving pedestrian and vehicular traffic safety

2. Brief Description of the Existing Paradigm

Now a days we are using the paradigms likes camera which can be identify the speed of vehicles but it cannot be used for detecting other violations .and many of violations like not wearing helmet seat, seat belt etc are detected by the traffic police.While we are the technique image processing instead of this type of manual operation we can reduce the jobs of police like checking helmet, seat belt etc and we can assign many other works to them .While we are considering the traffic lights The normal function of traffic light requires more than slight control and coordination to ensure that traffic and pedestrians move as smoothly, and safely as possible. A variety of different control systems are used to accomplish this, ranging from simple clockwork mechanisms

Traffic on roads consists of *road users* including pedestrians, ridden or herded animals, vehicles, streetcars, buses and other conveyans, either singly or together, while using the public way for purposes of travel. Traffic law are the laws which govern traffic and regulate vehicles, while rules of the road are both the laws and the informal rules that may have developed over time to facilitate the orderly and timely flow of traffic.Organized traffic generally has well-established priorities, lanes, right of way, and traffic control at intersections.Traffic is formally organized in many jurisdictions, with marked lanes, junctions, intersections, interchanges, traffic signals, or signs. Traffic is often classified by type: heavy motor vehicle (e.g., car, truck), other vehicle (e.g., moped, bicycle), and pedestrian. Different classes may share spped limits and easement, or may be segregated. Some jurisdictions may have very detailed and complex rules of the road while others rely more on drivers' common sense and willingness to cooperate.Organization typically produces a better combination of travel safety and efficiency. Events which disrupt the flow and may cause traffic to degenerate into a disorganized mess include road, collision, and debris in the road way. On particularly busy freeways, a minor disruption may persist in a phenomenon known as traffic waves. A complete breakdown of organization may result in traffic congention and gridlock Simulations of organized traffic frequently involve queuing theory, stochastic processes and equations of mathematical processes applied to traffic flow. Rules of the road and driving etiqutte are the general practices and procedures that road users are required to follow. These rules usually apply to all road users, though they are of special importance to motorists and cyclists. These rules govern interactions between vehicles and with pedestrians. The basic traffic rules are defined by an international treaty under the authority of the United Nations, the 1968 vienna convention of road traffic. Not all countries are signatory to the convention and, even among signatories, local variations in practice may be found. There are also unwritten local rules of the road, which are generally understood by local drivers.As a general rule, drivers are expected to avoid a collision with another vehicle and pedestrians, regardless of whether or not the applicable rules of the road allow them to be where they happen to be.In addition to the rules applicable by default, traffic signs and traffic lights must be obeyed, and instructions may be given by a police officer, either routinely (on a busy crossing instead of traffic lights) or as road traffic control around a construction zone, accident, or other road disruption.These rules should be distinguished from the mechanical procedures required to operate one's vehicle.A fine or mulct is money that a court of law or other authority decides has to be paid as punishment for a crime or other offence. The amount of a fine can be determined case by case, but it is often announced in advance.The most usual use of the term is for financial punishments for the commission of crimes, especially minor crimes, or as the settlement of a claim. A synonym, typically used in civil law actions, is mulct.One common example of a fine is money paid for violations of traffic laws. Currently in English common law, relatively small fines are used either in place of or alongside community service orders for low-level criminal offences. Larger fines are also given independently or alongside shorter prison sentences when the judge or magistrate considers a considerable amount of retribution is necessary, but there is unlikely to be significant danger to the public. For instance, fraud is often punished by very large fines since fraudsters are typically banned from the position or profession they abused to commit their crimes.Fines can also be used as a form of tax. Money for bail may be applied toward a fine.A day fine is a fine that, above a minimum, is based on personal income.Road traffic safety refers to the methods and measures used to prevent road users from being killed or seriously injured. Typical road users include pedestrians, cyclists, motorists, vehicle passengers, horse riders, and passengers of on-road public transports (mainly buses and trams).As sustainable solutions for all classes of road safety have not been identified, particularly low-traffic rural and remote roads, a hierarchy of control should be applied, similar to classifications used to improve occupational safety and health. At the highest level is sustainable prevention of serious injury and death crashes, with sustainable requiring all key result areas to be considered. At the second level is real-time risk reduction, which involves providing users at severe risk with a specific warning to enable them to take mitigating action. The third level is about reducing the crash risk which involves applying the road-design standards and guidelines ,improving driver behavior and enforcement. Road traffic crashes are one of the world's largest public health and injury prevention problems. The problem is all the more acute because the victims are overwhelmingly healthy before their crashes. According to the world health organisation (WHO), more than 1 million people are killed on the world's roads each year.A report published by the WHO in 2004 estimated that some 1.2 million people were killed and 50 million injured in traffic collision on the roads around the world each year and was the leading cause ofdeath among children 10–19 years of age. The report also noted that the problem was most severe in developing countries and that simple prevention measures could halve the number of deaths.We can overcome all these paradigms by the help of image processing

3. Brief Description of a Possible Modification

Traffic is formally organized in many jurisdictions, with marked lanes, junctions, intersections, interchanges, traffic signals, or signs. Traffic is often classified by type: heavy motor vehicle (e.g., car, truck), other vehicle (e.g., moped, bicycle), and pedestrian. Different classes may share speed limits and easement, or may be segregated. Some jurisdictions may have very detailed and complex rules of the road while others rely more on drivers' common sense and willingness to cooperate.In mathematics and transportation engineering, traffic flow is the study of interactions between travellers (including pedestrians, cyclists, drivers, and their vehicles) and infrastructure (including highways, signage, and traffic control devices), with the aim of understanding and developing an optimal transport network with efficient movement of traffic and minimal traffic congestion problems.

Vehicle number plate detection system

Number plate acknowledgment is a successful route for programmed vehicle distinguishing proof. Vehicle Number Plate Detection(VNPD) is a mass surveillance framework

that catches the picture of vehicles and perceives their permit number. Vehicle Number Plate Detection (VNPD) framework is a kind of canny transportation framework (ITS).Some of the current calculations in light of the rule of learning takes a ton of time and ability before conveying tasteful outcomes however and still, after all that needs in precision. In the proposed framework an effective technique for acknowledgment for Indian vehicle number plates has been advised. The calculation goes for tending to the issues of scaling and acknowledgment of position of characters with a decent exactness. The goal is to outline a productive programmed approved vehicle ID framework by utilizing the Indian vehicle number plate to such an extent that the number plate of vehicle can be recognized precisely and to execute it for different applications.

Red light violation system

Red Light Violation Detection System is a mass surveillance system that automatically captures the Image of vehicle violating the traffic rules. RLVD system automatically captures images of vehicle from backside with license plate numbers and performs OCR (optical character recognition) on images to read the license plates on vehicles. RLVD continuously monitors the traffic signal, and camera is itself triggered by any vehicle passing over the sensors at specified time after signal has turned red.
Alerts are typically sent by mail or SMS to the owners of violating vehicles, based on review of photographic evidence. RLVD can be used for following purposes such as Automatic vehicle identification system,Vehicle surveillance - vehicle and speed checks, stolen vehicle detection, Monitoring known offenders,

Overspeed detection system

System comprises of radar gun which works on the principle of Doppler effect. The designed system works at a frequency of 2.6 GHz and has a range of 10m to 15m. The range is small since the distortion increases at a very high rate with increase in distance. The gun emits electromagnetic waves at 2.6 GHz frequency. These waves travel in the direction of vehicle and are reflected back. The reflected waves are received by the gun. There is some change in frequency between the sent and received waves and this change in frequency is used to calculate the speed of the vehicle.If over speeding is detected, a Cannon DSLR camera captures the snap of the vehicle and algorithm starts.Automatic Number Plate Recognition (ANPR) involves the extraction of license plate of vehicle from picture using image processing techniques.The algorithm is used to identify the license plate and extract it successfully. Matlab is used for designing the algorithm since it offers a variety of image processing techniques.In the first part, license plate region is identified and extracted. For this purpose, common features of license plate are utilized. Segmentation is then carried out which separates the characters from each other. OCR is used to identify the characters by comparing them with templates of stored characters on the system. Once the license number is extracted using AI and machine learning, details of the owner of that purticular vehicle is extracted and and anautomatic fine paper is generated with that address and sent it to authority office they will deliver it to the culprits Overspeed is a condition in which an engine is allowed or forced to turn beyond its design limit. The consequences of running an engine too fast vary by engine type and model and depend upon several factors, chief amongst them the duration of the overspeed and by the speed attained. With some engines even a momentary overspeed can result in greatly reduced engine life or even catastrophic failure. The speed of an engine is ordinarily measured in revolutions per minute (rpm).

Noice control system

Mumbai is one of the noisiest cities in the world. And a lot of this noise can be traced back to cacophony at the signals. Mumbaikars (the locals in Mumbai) honk even when the signal is red! Needless to say, this noise pollution is making the city alarmingly unhealthy to live in. To tackle this honking menace, the Mumbai Traffic Police, in partnership with FCB Interface came up with an innovative solution called The Punishing Signal.This is how it works. Special decibel meters were connected to traffic signals across the island city.When the decibel exceeded a dangerous 85dB, the signal timer would reset itself… forcing the people to wait longer at the signal! Thus ‘punishing’ them for their impatience with the message,Camera-based traffic monitoring systems have become increasingly deployed by law enforcement agencies and municipalities to enforce traffic laws and modify unsafe driving behavior, such as speeding running red lights or stop signs, and making illegal turns. The most effective programs combine consistent use of traffic cameras supported by automated processing solutions that deliver rapid ticketing of traffic violators, with other program elements including community education and specific targeted road safety initiatives like drunk-driving enforcement programs and license demerit penalties. However, many current traffic enforcement systems using photographic techniques have disadvantages that generally do not facilitate efficient automation and validation of the photographs required for effective use as legal evidence.Digital-based red-light camera systems have come to replace traditional 35mm analog-based cameras and photographic techniques to acquire the photographic evidence of traffic offenses, hi the field of traffic enforcement technologies, capturing vehicle offense data involves a compromise between storage space requirements and image resolution. Typically, an offense is recorded as a number of still images of the vehicle together with some pertinent information such as speed, time of offense, and so on.Red-light violation recording has traditionally been done with still cameras, either digital or wet film, or with video camera systems. These systems suffer from a number of shortcomings. For example, still images typically do not convey enough information to assess the circumstances surrounding a violation. A vehicle forced to enter an intersection after the traffic signals are red while yielding to an emergency vehicle will be shown as a violator on still images and the vehicle's driver will be prosecuted if the emergency vehicle does not appear in the still images. Also, at many intersections vehicles are permitted to turn during a red light if they first stop. Still images do not show the acceleration and speed of a vehicle and cannot determine if the vehicle has progressed unlawfully, i.e., without first

stopping. For speed enforcement, vehicle speed must be determined from the vehicle detection device and imprinted on the photograph. Errors in the vehicle's detected speed will not be apparent on the photograph, as still images do not convey any impression of speed. Although multiple still photographs may be taken to show speed across two or more points, this solution results in increased image capture and storage requirements and causes the camera to be occupied for the duration of the image sequence.Image resolution is critical to providing sufficient information to resolve important scene details such as the identifying data comprising the vehicle license (registration) plate and the driver's face. However,increasing image resolution also increases data storage requirements.To solve the problem of providing contextual or background evidence surrounding a potential traffic offense at a photo- monitored location, video has been incorporated in some red-light traffic systems. However, the advent of video has certain significant disadvantages. Most notably, when an enforcement agency wishes to use video in their evidence set, the problems related to transmission bandwidth and data storage is significantly compounded.Digital video technology generates data at a vastly greater rate than digital still-image technology, given the same resolution. Although video footage has been used for identification and prosecution of vehicles in violation of traffic laws, the generally low resolution of present video systems makes it difficult to determine the fine details required for prosecution, such as the vehicle license plate or the features of the driver's face. The low resolution problem also requires the video camera to be close to the detected vehicle or to physically move and track the vehicle, both of which are major disadvantages when used in automated traffic monitoring systems. Although high-resolution video cameras can be employed for identification and prosecution of vehicles in violation of traffic laws, if the information from a high-resolution video camera is stored digitally, the amount of file storage required makes it difficult or impractical to store and communicate the

amount of information generated. This is especially true for systems that do not provide efficient video clips, but rather shoot and transmit long loops of constant video data.The standard start/stop capturing mechanism available in almost all video capture systems is inadequate to satisfy the requirement for providing footage both before and after the offense is detected. By the time the offense is detected it is too late to start a video capture sequence. It is also generally difficult to anticipate an offense and preemptively commence video capture. Furthermore, where the footage from a video system is recorded on magnetic tape the retrieval of information is time consuming and finding a specific violation or incident cannot be done instantaneously.*system* (KBMS).

An intelligent transportation system (ITS) is an advancedapplication which aims to provide innovative services relating to different modes of transport and traffic management and enable users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.Some of these technologies include calling for emergency services when an accident occurs, using cameras to enforce traffic laws or signs that mark speed limit changes depending on conditions.

Although ITS may refer to all modes of transport, the directive of the European Union 2010/40/EU, made on July 7, 2010, defined ITS as systems in which information and communication technologies are applied in the field of road transport, including infrastructure, vehicles and users, and in traffic management and mobility management, as well as for interfaces with other modes of transport. ITS may improve the efficiency of transport in a number of situations, i.e. road transport, traffic management, mobility, etc.

4. Conclusions

In this paper, we present an architecture for a smart and efficient traffic violation ticketing system for vehicles with future Internet technologies such as NDN. Our architecture will enable traffic law officials to identify drivers and violating vehicles without chasing and putting lives in danger. In order to achieve this, we apply basic VNDN operations into our SmartCop system, where a cop vehicle periodically broadcasts an Interest packet for violation entries saved by every ordinary vehicle in its local memory (PTE). This exchange of PTE enables a cop vehicle to issue a relevant ticket to the offender. Later on, the offenders' vehicle, when connected to any road side unit, pays the charged ticket autonomously. As a result, all the manual operations and delays caused by human errors are skipped. In the end, we also enlist the future work directions for improving and implementing our proposed SmartCop system into real test-bed environments and simulations. The simulations show that the ticket issuing delay and its messaging cost depend upon the number of violators, vehicles, and speed of the vehicles on the road.

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