

Anomaly Detection In Traffic Video Surveillance

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Abstract: Nowadays, the traffic anomalies goes on increasing because of the day by day increment of numerous vehicles on the road. There are different anomalies related to the traffics such as traffic jam, vehicles on zebra crossing, etc. are recorded. The manual process to handle such traffic rule violation is difficult, time consuming and required more manpower. Hence to avoid the limitation of the existing system, an automated traffic surveillance system has been proposed.

In the proposed system, two traffic anomalies i.e. vehicle on zebra crossing, signal detection and traffic jam (based

I. Introduction:

A vast number of reports and statistics state the vulnerable role played by pedestrians in traffic accidents, especially in those who take place in surroundings considered safe by them. Walking is a healthy exercise with almost non-existing negative consequences except for those caused by road traffic. Walking under those circumstances is approximately ten times more dangerous

on the density of the traffic) are consider for implementation. It visualizes the reality so it functions much better than those systems that rely on the detection of vehicles metal content. This system can be useful to capture the culprit and better for the traffic controlling. The proposed system is implemented using OpenCV an image processing library with python language. The proposed system is planned to be implemented on the raspberry Pi hardware platform which is easy to make system portable and real time.

Keywords: Surveillance, zebra crossing, Signal detection, Traffic jam, OpenCV, Raspberry Pi etc.

than travelling as a passenger by car [1]. The availability of a wide database of accident causes is considered as one of the most important building blocks in the strategy for the development of intelligent integrated road safety systems [2]. For example, 15% of the total numbers of people killed on European roads are pedestrians, and 28% are vulnerable road users [3]. It is stated that most accidents take place in urban areas

where serious or fatal injuries can be produced at relatively low speeds, particularly in the case of children [4].

A new trend in expansion is the application of computer vision techniques to traffic, in particular, for the intelligent control of traffic lights. Several factors such as number of pedestrians, situation of the crossing area, number of vehicles, etc., compete for the determination of the adequate colour of the light. This can have a substantial positive effect on the reduction of vehicle-pedestrian conflicts, especially when the system is optimized to meet the users' expectations: waiting time should be reduced to minimum; duration of green light should be adapted to the users' needs. The pre-programmed signal time allowed for pedestrians to cross a street is usually too short for some people, particularly the elderly and disabled ones, and exposes them to the oncoming traffic when the signal changes. Despite many static cameras are being used in our cities (supermarkets, banks, underground stations, railway stations, etc.), their main commitment keeps being only to help operators make the best decision concerning security or to keep users informed of traffic fluency. Some computer vision applications have already reached the great public, as the on-board systems by Daimler Chrysler [5, 6].

The population of the India grows exponentially as the population increases the number of vehicle on the road increases. The most of the accidents on the roads are due to the rule violations such as breaking traffic signals, over-speeding, driving on wrong sides etc. The traffic management is the important task to reduce the accident and traffic congestion. To detect the traffic rule violations and traffic congestion avoidance, the automatic system needs to be developed. In the proposed approach, we are going to develop the image processing and computer vision based system. In this system, we will focus on the three traffic violations

1. **Related Work:**

1. **Vehicle on zebra crossing:-**

The project proposes a zebra-crossing detection framework based on unique geometrical features of zebra-crossing. The unique geometrical feature is zebracrossing stripe's edges are arranged in sorted order. Various zebra-crossing images are utilized to evaluate the proposed framework and presented outcomes demonstrate the adequacy.



Fig.1.1 Vehicle on zebra crossing

2. Traffic Congestion:-

Managing the traffic dynamically will reduce the traffic congestion. The videos are captured by stationary cameras. Then images from the live videos are retrieved one frame in a second. Image processing is performed over these retrieved frames. The output obtained from the image processing algorithm is the number of vehicles coming from a specific direction. Using this output we apply a real time traffic management algorithm which controls the traffic signal by synchronizing all the neighbouring signals and manage the time duration of the signal accordingly.



for use of pedestrians throughout India.

Since the law is in place, effective

Fig.1.2 traffic congestion at traffic signal

3. Vehicles moving on footpath:-

The roads are the most important public spaces in cities and pedestrians are its largest users, but less than 30% of urban roads in India have footpaths. Grave concern can be observed regarding safety of pedestrian to see the footpaths being used by two wheelers, zebra crossing usage culture is missing and crossing any road is uphill task. Despite the laws in place, urban areas can clearly seen encroachment of footpaths by bikes with no action taken. The International Federation of Pedestrians has been explicitly advocating the right to walk in public spaces as a basic human right but yet the picture of same to be implemented in full is yet to be achieved. There is a need to build more roads, make them safer

enforcement is required.



fig 1.3 vehicle moving on footpath.

Wrong Side Vehicle:-

Driving on the wrong side of the road is a common problem across the country. Many people opt to drive on the wrong side to save time or to cut the travel distance. But by driving on the wrong side,

a person puts his and others life at risk on road be safe at road and aware form the wrong side driving vehicle.



fig 1.4 wrong side vehicle

II. Result and discussion

Sr.	Auther	Paper Yea	Method	Advantages no.	Name r
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1	Siddharth Upadhyaya	Traffic 2017 Image accurate result using image processing	This technique	Shashikar	Surveillance and processing can gives and	Vikas	anomaly detection
2	S. Alvarez, Sotelo	Camera auto-zooming and zebra-crossing for traffic applications two vanishing	2013 1) Camera calculate optimal point calibration	Intelligent s Systems(ITS) and center. of point detection	D. F. Llorca calibration using zooming is	Transportation and M. A.	principal automatic zebra crossing .
3	Hiroaki Namerikawa	Optimal Traffic Congestion based on Traffic Predictive Control	2016 1) Numerical Density Prediction by Model	Nakanishi	Signal Control for simulation and	Toru	Alleviation of 2)Traffic
4	Yuan Wang and Qi Wang	Anomaly Detection via Spatial-Aware Motion Reconstruction	2017 1)localization	1) Static Yuan,Dong in	Traffic Scenes constrained camera is able		
5	Ming-Ching Nenghui Siwei Lyu	Video Analytics in the AIC'18 signature	2017 Deep Neural Network in Song and Challenge	Using this chang, Yi Smart Network	techniquefind Wei, Transportation for		
6	Kanimozhi J. And Dr. of Traffic	Anomaly detection		The advantage is detect outlier,	2019 1) Vehicular monitoring		
Volume VIII, Issue VI, JUNE/2019 Disadvantages Result Future Scope Wireless sensor Ad-hoc traffic and networks(WSN) – a Network(Vdetect traffic							
Disadvantages The resultant advanced detection. vehicles.							
Result Using these In future they can disadvantages of image algorithm							
Future Scope Future works on is not technique can robust multi-level applicable be adviced by able							
1)This system These camera previously zooming at very high to video. at very high 2)Poor result could be projected							
techniques we implement shadow of for shadow removal anomaly of for shadow removal object of automatic false get and object and and lane detected							
such as camera at most of if their camera is placed							

road anomaly using this In future there are detection is approach many hints can uses become very measures
the for example neardifficult abnormal infrared because of activities of information, depth complex or
Motion information and complicated Orientation other to complete background. and Magnitude performance
and respectively. robustness.

Complex to Track 1 is In future, include design and Traffic Flow continue refinement implimentation Analysis, algorithms on large
Track 2 is real-world dataset. traffic
Anomaly

I. Conclusion:

In the proposed approach, the algorithms for three anomalies signal detection, vehicle at zebra crossing and traffic jam has been proposed. From the study it is observed that processing is a better technique to detect the traffic anomalies. It visualizes the reality so it functions much better than those systems that rely on the detection of vehicles metal content. This system can be useful to capture the culprit and better for the traffic controlling. The proposed system is planned to be implemented on the raspberry Pi hardware

platform which is easy to make system portable and real time.

IV. References:

- [1] Siddharth Shashikar and Vikas Upadhyaya
“Traffic Surveillance and anomaly detection using image processing” , Dept. of Computer Science and Engineering, NIIT University, Neemrana, India
- [2] S. Alvarez, D. F. Llorca, M. A. Sotelo,
“Camera autocalibration using zooming and zebra-crossing for traffic monitoring applications”2013 16th International IEEE

each block coefficient. implement
seperately it can also be said working
parellaly.

- 11 Calum G. Video Anomaly 2016 there are The The Detect the The future scope Blair and Detection in Real variables advantages of disadvantages illigally parked of this by Neil M. Time on a techniques used this we can of this they vehicles extending smaller Robertson Power-Aware like field easily parked implement data sets into Heterogeneous programmable vehicles and this on larger size data
Platform gare array classification smaller data sets can be used (FPGA), GPU of human and sets. for many real time and CPU to cars in real applications. detect illegally time. parked vehicles