Smart Traffic Surveillance System

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Abstract: Motorcycle mishaps have been quickly increased over time in many countries. A helmet or a protecting cap is the main safety equipment of motorcycle riders, and two wheelers, however many driver's abandonment wearing helmets. The main outcome of wearing a helmet is to protect the head of a person travelling on motorcycle just in case of a major or minor accident or fall from a running bike. Because of different social as well as monetary elements, this sort of vehicle is turning out to be progressively famous. The head protector seems to be the fundamental security gear of motorcyclists;

KEYWORDS: YOLO v3, CNN, CHT, Darknet-53

1.Introduction

Bikes are widely used as a means of transportation in many countries. The major advantages are their low prices as well as low operation cost in comparison with other vehicles. In countries like India, Brazil, Thailand, the majority of the population uses motorcycles for the daily commute. In India, as of 31 March 2015, there were around 154.3 million registered motorcycles. In most of these countries, wearing a helmet for motorcyclists is mandatory by law. As well as considering the safety of people using motorcycles, wearing a helmet is paramount. The MAIDS (Motorcycle Accidents In-Depth Study) report, which become achieved in five European countries (France, Italy, Netherlands, Spain, and Germany)respectively, 7% of motorcycle accidents reported, the helmet could have prevented or reduced the head injury sustained by the motorcyclist. Currently, in practice, Traffic Police are entrusted with the task of

anyway numerous drivers don't utilize it. This paper seems to propose a framework for identification of motorcyclists without helmets. For this, we have applied the round hough change and the Histogram of Oriented Gradients descriptor to remove the picture credits. Then the YOLO v3 was utilized and acquired outcomes. The system has given an average recognition accuracy of about 70% that is satisfactory. The experimental results showed that the detection method can run real time under ship's video surveillance and precisely detect the non-helmet-use behaviour with low missing rate.

ensuring that motorcycle riders wear a helmet. Although, this method of monitoring motorcyclists is inefficient due to insufficient police force and limitations of human senses. As well as all major cities use CCTV surveillance based methods. But, those require human assistance and are not automated. Here we are utilizing a profound learning method called YOLOv3. When compared with different forms of YOLO, YOLOv3 utilizes a variation of darknet and posses high accuracy so it would be progressively ideal for our project. Here we are utilizing a profound learning method called YOLOv3. When compared with different forms of YOLO, YOLOv3 utilizes a variation of Darknet and posses high accuracy, so it would be progressively ideal for our project. The primary aim of our project is regarding the safety of the motorcycle riders. Drivers without helmets are detected. Other benefits which include are The Motor vehicle department is able to reduce the number of recent accidents, real time identification and punishment of defaulters is possible, software capability to detect the violation of rules, enforcement of law as well as order in society.

2.Literature Review:

Video content analysis is one of the trending subjects in video image processing. There are many techniques as well as methods used for content analysis from hardware-based signal processing to convolutional neural network-based deep learning techniques like smoke and fire detection for a live video using neural networking . Analysing in making a short description of the video or even movies, as well as also providing captions for video audio signal is also a major achievement in video content analysis. In any case, the CNN algorithms utilize only rule-based models and feature vector for classification. These features are hard to define and depend on the kind of object observed. The result leads to low detection rate.CNN is used for identifying specified objects in videos and it performs great in the classification of the objects. This network can perform classification of objects and extraction in similar architecture. The detection of a cyclist wearing or not wearing a helmet can be detected using CNN. There has been an improvement in deep learning models and one such model used is YOLOv2. YOLO v2 is utilized at two unique stages so as to improve the helmet identification correctness. This model is trained in COCO data set and can detect all classes in it. The edited pictures of different people are used as information to the second stage which was prepared on the data set of helmeted picture. To recognize the drinking condition of a driver by utilizing a camera, so to block drinking and driving.

Based on the literature survey, in this paper, we finally conclude using the YOLOv3 model for the detection of helmet in video frames, as it posses a high accuracy rate compared to other models as well as acceptable speed.

3.Design

3.1 Architecture:

The system architecture (Fig 1) is the model that defines the entire framework of the system's behaviour as well as structure. Here the input video from the user is split into frames then each frame is filtered one by one is to remove noise. Each frame is passed to a trained neural network model for detecting the activity, if any objectionable action is recognized then the corresponding disclaimer is added to the video. This is repeated for the entire video frames. At last entire video is saved as an output file.

3.2 Data flow:

The video is pre processed to send to activity recognition, where the object detection is done if there is any utilizing neural system and related alerts are affixed to the video. (Fig 2)
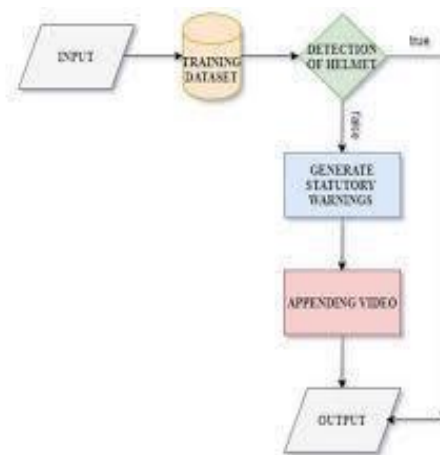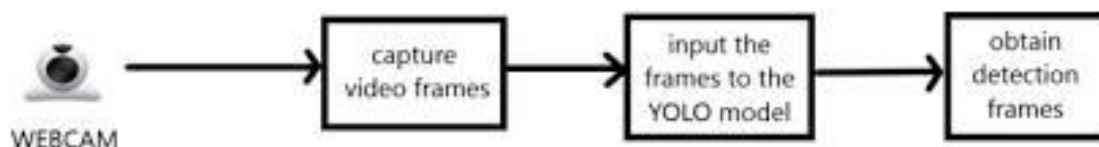

Fig. 1

Fig. 2

4. Methodology

This is the principal part of our work. We are utilizing a convolutional neural system. For this purpose You only look once (YOLO) sees to be a profound learning method and a constant object detection framework. On a Pascal Titan X, it forms pictures at 30 FPS and has anmAP of 57.9 rates on COCO test-dev. YOLOv3 is the most recent as well as it is incredibly quick as well as accurate. Before YOLO was introduced, the detection systems apply the model to an image at multiple locations, then the scaling of the digital image was done. High scoring regions of the images are considered as detection. It is more than 1000x faster than R-CNN and 100x faster than Fast R-CNN. In YOLO, it is absolutely an alternate methodology. The image goes through the convolutional neural system in a solitary pass one after the other. At that point, this system will separate the image into regions and predicts bounding boxes and probabilities for each region as shown in below Fig 3.
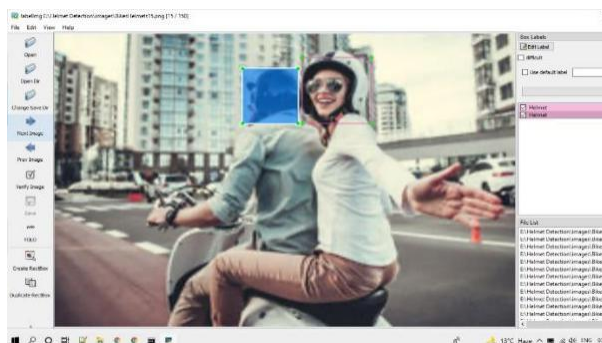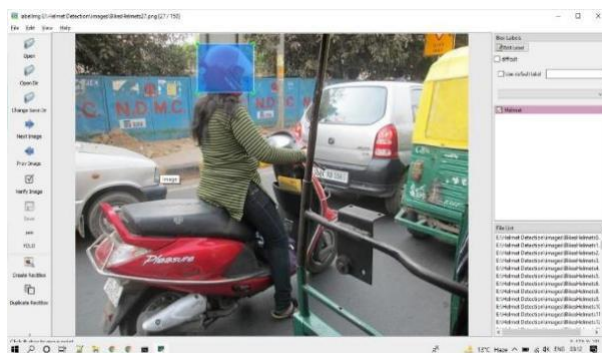

Fig. 3

5. Conclusion

Bike accidents have been growing consistently throughout the years. And of different social and monetary elements, individuals pick motorbikes over other vehicles as it is significantly less expensive to run, less demanding to park and adaptable in rush hour gridlock. Here we propose a system to detect motorcycle riders without helmet and sending a message to the motorcycle owner if he/she is not wearing the helmet. This system can save many lives as about 400 motorcycle riders perish every day in India because of not wearing helmet. If we use helmets it could increase the chances of survival by 42 percent and more.

So, in this project, we have automated this entire process. The method will ensure that it will reduce both complexity and time. The automated system will recognize motorcyclists who drive without wearing a helmet. It also reduces the injuries up to 70 percent.

6.Future scope

This project is possible to computerize the procedure of including statutory warnings in videos and TV arrangement. These days the movie editor needs to manually check the whole video clips to detect the motorcyclists who don't wear a helmet. Thereafter scanning all the scenes, they put enough time for inserting statutory warnings as well as signs in videos. Statutory admonitions are shown in public interest declaring that the motion picture/Televisions indicates do not encourage smoking, drinking liquor, and so on. For ex, if there is a person driving a motorcycle without a helmet scene in a film, at that point the undertaking will identify it and will demonstrate a related statutory cautioning as a subtitle.

In future, the system can be expanded by detecting motorcycle riders without helmet along with those who are triple riding. The proposed system will also assist the traffic police for such violators in odd environmental conditions like hot sun as well as rain.

7. References

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