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HELMET DETECTION AND NUMBERPLATE RECOGINITION USING DEEP LEARNING

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ABSTRACT

We are now seeing a number of issues with traffic restrictions in India that may be addressed via other approaches. The increasing frequency of accidents and fatalities in India may be attributed to the traffic offense of riding motorcycles without helmets. In the current setup, traffic police mostly review footage from closed-circuit television (CCTV) cameras to keep an eye out for infractions; in cases when riders aren't wearing helmets, they must zoom in on the license plate. However, with the ever-increasing number of motorcyclists and traffic offenses, this demands a substantial investment of time and resources. Imagine a system that could detect when a motorcyclist isn't wearing a helmet and, if found, immediately pull up the license plate. Newer studies have used CNN and R-CNN to do this task well. On the other hand, the speed, precision, and efficiency of object identification and categorization are all severely lacking in these studies. In an effort to automate the process of identifying traffic violations, such as riders who do not wear helmets, and to extract license plate numbers, this study develops a Non-Helmet Rider detection system. Object Detection using Deep Learning is the key mechanism at work here. The next step is to use optical character recognition to get the license plate number. Especially with the license plate number extraction element, all of these approaches are subject to predetermined limits and circumstances. The efficiency of the process is crucial since video is used as an input in this task.

1.INTRODUCTION

The responsibility of checking that motorcyclists are wearing protective headgear now rests with the Traffic Police. However, with a lack of resources and the limits of human perception, this approach of policing motorcyclists is ineffective. Also, systems based on CCTV surveillance are used by all major cities. But they aren't automated; they need human intervention. The rising popularity of motorbikes and the attendant worries about people's safety have led to an upsurge in studies pertaining to road transport. Keeping tabs on motorcyclists is made easier with the help of the approach suggested in this article. Using Machine Learning and Computer Vision methods, the system can identify helmetless riders and instantly extract their motorbike license plate from CCTV footage shot at intersections. Convolutional Neural Networks are used in the construction of classifiers.

2.LITERATURE SURVEY

Here we provide a thorough literature study on the topic of automated helmet detection and number plate recognition. New ideas, approaches, and developments in this topic are presented in the reviewed articles.

Developed a system to identify motorcyclists' helmets by analyzing images and using classifiers.

Accidents involving motorbikes have become more common. Even though it is mandatory for motorcyclists to wear helmets, many still choose not to. In this study, we provide a system for identifying helmetless motorcyclists and a technique for detecting and classifying motorcycles. Our vehicle classification system makes use of a random forest classifier and the wavelet transform (WT) descriptor. The circular Hough transform (CHT) and the histogram of oriented gradients (HOG) descriptor were utilized to extract image attributes for helmet detection. The objects were then classified using the multilayer perceptron (MLP) classifier, which is an artificial neural network with a number of layers. A 97.78% accuracy rate was attained in the findings for vehicle categorization. At its algorithmic peak, helmet detection had a 91.37 percent success rate.

Dealt with the issue of automatically identifying helmet-less bikers via the use of live CCTV footage.

Using real-time surveillance footage, this article lays forth a framework for automatically detecting bikers without helmets. Using object segmentation and backdrop removal, the suggested method first identifies bike riders in surveillance footage. After that, it uses visual cues and a binary classifier to figure out whether the biker is wearing a helmet. To further enhance the suggested method's dependability, we also provide a consolidation strategy for violation reporting. Investigated the use of a convolutional neural network architecture for the identification of helmet-less motorcyclists in videos.

Detecting traffic law offenders is an ideal but tough job for safety reasons owing to factors including occlusion, lighting, low surveillance video quality, changing weather conditions, etc. We provide a system for automatically identifying helmetless bikers in surveillance footage in this study. To begin, the suggested method employs adaptive background subtraction on individual video frames in order to identify objects in motion. The selection of motorcyclists from the pool of moving objects is then accomplished using a convolutional neural network (CNN). Once again, we use CNN on the top one-fourth section to identify riders who aren't wearing helmets.

.3. EXISTING SYSTEM

In the current setup, traffic police mostly review footage from closed-circuit television (CCTV) cameras to keep an eye out for infractions; in cases when riders aren't wearing helmets, they must zoom in on the license plate. However, with the ever-increasing number of motorcyclists and traffic offenses, this demands a substantial investment of time and resources. Imagine there was a technology that could detect whether a motorcyclist or moped rider was not wearing a helmet and, if found, could immediately get the license plate number belonging to that vehicle. Using CNN, R-CNN, LBP, HoG, HaaR characteristics, etc., this task has been accomplished well in recent study. When it comes to speed, accuracy, and efficiency, however, these works fall short when it comes to object identification and categorization.

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3.1 PROPOED SYSTEM:

In the current setup, traffic police mostly review footage from closed-circuit television (CCTV) cameras to keep an eye out for infractions; in cases when riders aren't wearing helmets, they must zoom in on the license plate. However, with the ever-increasing number of motorcyclists and traffic offenses, this demands a substantial investment of time and resources. Imagine there was a technology that could detect whether a motorcyclist or moped rider was not wearing a helmet and, if found, could immediately get the license plate number belonging to that vehicle. Using CNN, R-CNN, LBP, HoG, HaaR characteristics, etc., this task has been accomplished well in recent study. When it comes to speed, accuracy, and efficiency, however, these works fall short when it comes to object identification and categorization.

4. OUTPUT SCREENS

Image1:

This image is the home page from this page we upload the video file from the file manager.

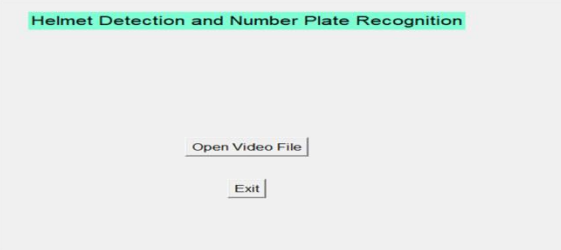


Image2:

This image is showing that, firstly it recognizing the Number Plate through OCR method

Image3:

In the second imageit detects the bike and person

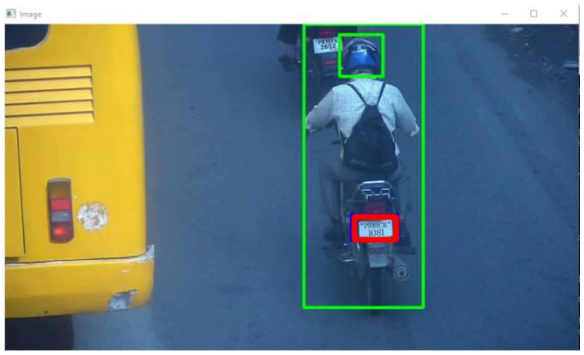


Image4:

After it detects the bike, person and number plate it shows whether the rider is wearing a helmet or not. In the below image the rider did not wear helmet so that's why it displaying "no-helmet".

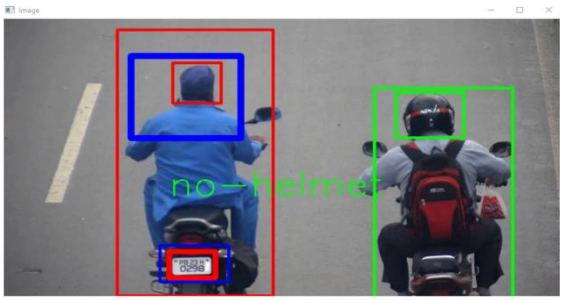
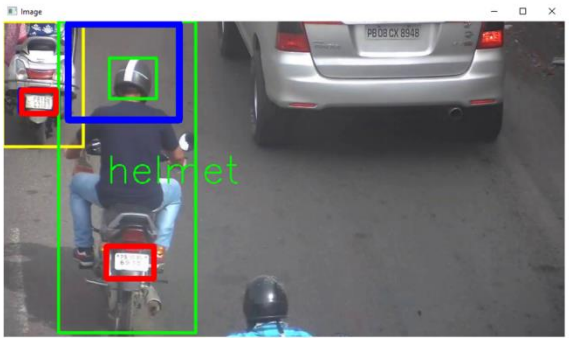


Image5:

From the below image the rider wears a helmet so it displaying "helmet"



5. CONCLUSION

In the paper, we have described a framework for automatic detection of motorcycle riders without helmet from CCTV video and automatic retrieval of vehicle license number plate for such motorcyclists. The use of Convolutional Neural Networks (CNNs) and transfer learning has helped in achieving good accuracy for detection of motorcyclists not wearing helmets. The accuracy obtained was 98.72%. But, only detection of such motorcyclists is not sufficient for taking action against them. So, the system also recognizes the number plates of their motorcycles and stores them. The stored number plates can be then used by Transport Office to get information about the motorcyclists from their database of licensed vehicles. Concerned motorcyclists can then be penalized.

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