HELMET DETECTION USING HOG ALGORITHM

Dr.G.Krishna Kishore[1], D.Surendra[2], M.Divya Sri[3], K.Vennela[4], K.Praveen Kumar[5],
[1]Professor, [2,3,4,5]Students Dept. of Computer Science & Engineering, Dhanekula Institute of Engineering and Technology, A.P., India

ABSTRACT

In this project, we are detecting whether a two-wheeler rider wearing a helmet or not, if he is not wearing a helmet then we are extracting the number plate of that two-wheeler. Detecting a vehicle and track pipelining it with OpenCV, sklearn, and a descriptor known as the histogram of oriented gradients (HOG) is used to construct real-time automatic recognition of motorcyclists with and without a safety helmet. SVC stands for vector classification, which is a collection of machine learning tools. Mechanisms for learning and image processing A bike rider can use the OpenCV Library approach. In the surveillance video, is identified. Furthermore, by utilizing a well-known machine learning algorithm The classifier label in the LinearSVC algorithm model identifies whether the cyclist is wearing a protective helmet.

INTRODUCTION

The goal of this research is to develop a Non-Helmet Rider Detection System that will automate the process of detecting traffic violations such as not wearing a helmet and retrieving the vehicle's license plate number. Object detection is the basic principle at work. All of these procedures, particularly the license plate number extraction aspect, are subjected to predetermined parameters and limits. Because this project uses video as its input, execution speed is critical. We built a comprehensive solution for both helmet detection and license plate number extraction using the approaches mentioned above.

Automation of this process is highly required for the government to impose penalties on the violators, and reduce workforce and time. The smart method one can think of is having a sensor engine that only starts when the helmet is properly worn by the person. But, the cost of this setup could be higher than most the individuals in India could not effort it. Automatic Helmet Detection is considered to be efficient as there are CCTVs installed on roads that consume less time and reduce the need for large human force. The suggested approach focuses on the absolute protection of

motorcyclists. Though helmet wearing is mandatory, many two-wheeler riders violate it, which leads to increment in deaths occurring every year.

Hence, automatic helmet detection is the liable solution for the government to lay hold of violators ensuring public safety. The idea is to make the traffic and accident systems acute, where it provides a desktop application, which can reduce the efforts of traffic police and provide the functionality to them to identify the number of violators driving on the roads. The proposed application will automatically extract the images of motorcyclists who refused to wear helmets and our system.

LITERATURE SURVEY

Narong Boonsirisumpun, Wichai Puarungroj, and Phonratichi Wairotchanaphuttha published Automatic Detector for Bikers without Helmet Using Deep Learning. To solve the challenge, several CNN models were tried, however, most of them required an image preprocessing step to identify the Region of Interest (ROI) area in the picture before applying CNN to classify helmets. Convolutional Neural Networks (CNN) that are used in this experiment are VGG16, VGG19, GoogLeNet or Inception V3, and MobileNets, for the image classification step and we also combine these models with the SSD technique to do an image detection step.

Automatic helmet-wearing detection for law enforcement using CCTV cameras published by P Wonghabut, J Kumphong, T Satiennam, R Ung-arunyawee, and W Leelapatra. Two different angles of view CCTV cameras are used in the application program, which is written in C++ and uses the OpenCV library. Motorcyclists are detected using video frames captured by a wide-angle CCTV camera. If a motorcyclist is discovered without a helmet, the zoomed (narrow-angle) CCTV is activated to capture a real-time image of the infringing biker as well as the motorbike license plate. For ticket issuance, a database utilizing MySQL manages the captured photos.

Cognitive Number Plate Recognition using Machine Learning and Data Visualization Techniques published by Rahul Agrawal, Manas Agarwal, and Rajalakshmi Krishnamurthi The conventional Automatic Number Plate Recognition (ANPR) is based on the image processing mechanism for automatic vehicle authentication using the number plate of a vehicle. Machine Learning and Data Visualization approaches are used to create a Cognitive Number Plate Recognition (CNPR) system. The suggested system uses a data clustering approach to generate knowledge.

EXISTING SYSTEM:

The Existing system monitors the traffic violations primarily through CCTV recordings, where the traffic police have to look into the frame where the traffic violation is happening, and zoom into the license plate in case the rider is not wearing a helmet. But this requires a lot of manpower and time as the traffic violations are frequent and the number of people using motorcycles is increasing day by day. What if there was a system that would look for traffic violations such as not wearing a helmet while riding a motorcycle or moped and, if found, retrieve the vehicle's license plate number? Recent research has completed this task using CNN, R-CNN, LBP, HoG, HaaRfeatures, and other techniques. However, these efforts are limited in terms of efficiency, precision, and the speed with which objects are detected and classified. The goal of this research is to develop a Non-Helmet Rider Detection System that will automate the process of detecting traffic violations such as not wearing a helmet and retrieving the vehicle's license plate number. Object detection using Deep Learning at three layers is the basic principle involved. It also serves as a mechanical barrier between the rider's head and the object with which he or she came into contact. If a decent quality complete helmet is used, injuries can be reduced. The purpose of traffic laws is to instill discipline so that the danger of fatalities and injuries is reduced dramatically. In practice, however, strict adherence to these standards is rare. As a result, effective and practical solutions to these issues must be developed. A way for manually monitoring traffic via CCTV already exists.

PROPOSED SYSTEM

The proposed system can be divided into two main parts. The first part consists of segmentation and the second one consists of the classification of images. The first step is used to capture the moving objects in the surveillance camera. The vehicles are classified into two classes because it is necessary to know whether that vehicle is a motorcycle or not. And the second step consists of helmet detection [12]. For vehicle classification and helmet detection, we used the Support Vector Classification (SVC). Figure 1 describes every step of the system to detect motorcyclists with and without a helmet. Jie Li et al. A method for classifying pedestrians using SVM based on a histogram of directed gradient features was proposed (HOG). The final step is to check for helmets. Hough transforms based on color and circle are employed to detect helmets, and HOG descriptors can also be used.

SAMPLE SCREENS

CONCLUSION

A Helmet Rider Detection system is developed where a video file is taken as input. If the motorcycle rider in the video footage is not wearing a helmet while riding the motorcycle, then here we are uploading an image to identify the license plate number of that motorcycle is extracted from the image and displayed. Not only the characters are extracted, but also the frame from which it is also extracted so that it can be used for other purposes. All the objectives of the project are achieved satisfactorily.

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