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Automated Helmet Detection and Number Plate Recognition

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ABSTRACT
The continuous motorization of traffic has led to a sustained increase in the global number of road related fatalities and injuries. To counter this, governments are focusing on enforcing safe and law-abiding behaviour in traffic. However, especially in developing countries where the motorcycle is the main form of transportation, there is a lack of comprehensive data on the safety critical behavioural metric of motorcycle helmet use. This lack of data prohibits targeted enforcement and education campaigns which are crucial for injury prevention.
This paper, Automatic Helmet Detection System is an image processing technology which uses number (license) plate to identify the vehicle. The objective is to identify the vehicles number plates, those who are travelling without helmet (Both riders). The developed system first detects the headgears of the rider and the pillion rider, if they violate the rule then captures the vehicle number plate. The resulting data is then stored in a database. Our approach can be implemented in existing roadside traffic surveillance infrastructure and can facilitate targeted data-driven injury prevention campaigns with real-time speed. Implications of the proposed method, as well as measuresthat can further improve detection accuracy are discussed.
Keywords: Motorization, Injuries, Helmet Detection, Recognition, Headgears.

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I. INTRODUCTION

"**AUTOMATEDHELMET DETECTION SYSTEM"** is a desktop application which reduce the police intervention in detecting two wheelers who don't wear helmet on both seats. The system is also capable to detect the license plate of those riders. It extracts characters from a license plate with the use of computer vision libraries and algorithms. It should be able to extract the characters and print the output in text format. The system uses deep machine learning algorithm to detect the vehicles which disobeying traffic rules and then uses data mining technology to extract the images from the real time environments and record those images.

This system which is implemented using Python. It has mainly one module, Admin, which is the police officers. Now admin can detect the non-helmet riders, they can see the records that is the license plate number of the non-helmet riders. And the records can be removed but cannot be modified. Then admin can update the password but cannot be removed. Admin has full control over the system.

The main purpose of this system is to develop an innovative and practical detection of non - helmet riders after observing the usefulness of the helmet for riders. The main objective of this proposed system is to eliminate the police intervention in detection of traffic rules violating riders. This system provides license plate recognition; hence it allows the police officers to locate the non-helmet riders in an easy way. This system is so accurate and no riders can escape from it.

II. LITERATURE SURVEY

In recent years, several studies were performed to analyze traffic on public roads, including the detection, classification and counting of vehicles and helmet detection. The detection and segmentation of vehicles on public roads can be considered as the first step to develop any study related to vehicular traffic. For this reason, some relevant studies are discussed in this section.

The main objective of this paper to develop a computerized intervention to detect the riders who violating the latest proposed rule. Here the police officers need not physically present on specific areas to find and detect the riders who violating the road rules.

This [1] paper the process of classification and descriptors are used to detect the vehicles and then detect the persons with 2 wheelers and detect if they are wearing the helmet or not. This paper does mainly deal with helmet detection. For it to be used in surveillance system, it should be able to detect the number plate of the vehicle to impose fines on the rider which lacks in this project.

This [2] paper does the process of extracting the objects from the image using YOLO object detection and has 33segments in the entire process

1. Helmet detection - Annotated images are given to YOLOv3 model for training and the actual input for detection is given after training the model.
2. License plate Extraction – once the person without helmet is detected then the class with respect to person and corresponding vehicle and its number plate is detected and the number plate is cropped and saved.
3. License plate recognition – The extracted number plate detected previously is passed on to OCR(Optical Character Recognition), the module outputs the string of numbers and alphabets with the accuracy percentage of the string recognized.

This [3] paper there are 3 divisions in this project in which the data is collected in the form of videos, preprocessed and used in detecting the riders of motorcycle with and without helmets.

This [4] paper model various previous methods related to automatic helmet detection has been taken into consideration and the new model has been given. This is a technique of automatic helmet detection , where the input is of either the video which has been recorded or it might be a video through a web camera.

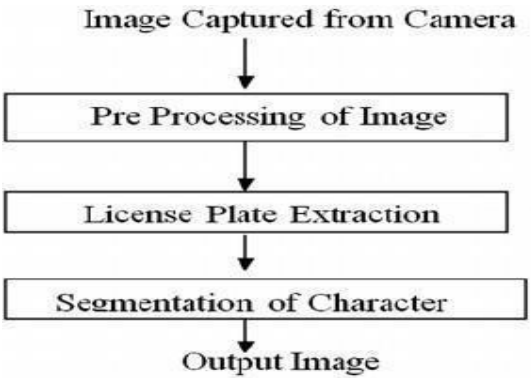
III. METHODOLOGY

In this study, a Non-Helmet Rider noticing system is built which attempts to satisfy the automation of detecting the traffic violation of not wearing a helmet and extracting the vehicles' license plate number. The main concept involved in Object Detection using Deep Learning at three steps. The objects detected are person, motorcycle at first step then, detecting helmet at a second step and recognizing license plate at the last step. Then the license plate registration number is takeout using OCR (Optical Character Recognition). All these techniques are put through to prearrange conditions and constraints, especially the license plate number extraction part. Seeing that this work takes video as its input, the speed of execution is crucial. We have used above said procedure to build a holistic system for both helmet and license plate number extraction.

3.2 PROPOSED SYSTEM

The proposed system covers all the major drawbacks of existing system. The system provides high - definition accuracy by means of image processing technique implemented with Python Deep learning algorithms. The proposed system eliminates the police intervention in detection of non-helmet riders. They need not physically present on specific areas to find and detect the riders who are violating the road rules. The system takes photographs of non-helmet riders and from this, the system can extract the license plate.

In this paper there is no need of keeping files or records by the administrator. The data are recorded in the computer system itself. The admin is able to access all the information at any point of time. The admin can login to the system by using only the password. Now admin can detect the non- helmet riders, they can see the records that is the license plate number of the non-helmet riders. And the records can be removed but cannot be modified. Then admin can update the password but cannot be removed. The proposed system is so accurate and no riders can escape from it.



IV. EXPERIMENTS AND RESULTS

IMPLEMENTATION

The Implementation is an activity that is contained throughout the development phase. It is process of bringing a developed system into operational use and turning it over to the user. The new system and its components are to be tested in a structured and planned manner. A successful system should be delivered a users should have the confidence that the system would work efficiently and effectively. The more the system being complex Implemented the more involved will be the analysis and design effort required for implementation.

The implementation is the stage of the system when the theoretical design is tuned into working system. The implementation valves careful planning investigation of the current system and its constraints on implementing, design of methods to achieve the changeover, training of user over procedure and evaluation procedure and evaluate changeover method. There are 3 types of implementations:

- Implementation of a computer system to replace an existing one. This is usually a difficult conversation. If not properly planned, they can be many problems. So large systems have taken as long as year to convert.
- Implementation of a computer system to replace a manual one. The problem involved is converting files, training users, creating accurate files and verifying print outs for integrity.
- Implementation of a modified application to replace an existing one using the same computer. This type of conversion is relatively easy to handle, provided there are no major changes in files.

Fig 1:With Helmet

Fig 2: Without Helmet

Fig 3: Number plate is detected by without helmet that is stored in the folder.

Fig 4:Extracted Number Plate.

V. FUTURESCOPE AND CONCLUSION

The results are promising but can be improved. An important step for improving the results is the stage of image capturing, which should produce better quality images. Future studies should focus on the detection and recognition of the registration plate of the vehicle. A better-quality image is necessary to recognize the characters on the plate. To reduce the effort of motion blur, high speed cameras can be used where vehicles are expected to have high speed like on the highways. These can aid the police systems in capturing license plates of vehicles in real time.

This project can be further improved by implementing advanced safety measures like to check collision detection, capturing images of vehicles with who breaks the rule by riding with high speed, capturing images of

drivers while talking on phone and driving. This lessens the work of traffic police and with affordable cost. Once installed correctly, this system will work and generate databases for greater period of time under proper maintenance.

Experimental results demonstrate the accuracy of 98.8% and 95% for detection of bike riders and detection of violators respectively. The proposed system automatically adapts to new scenarios if required, with slight tuning. It provides easy and powerful method to detect non-helmet riders and recognize the license plate. All the drawbacks of the existing system have been overcome. Here all the work is done by the system.

The main objective of this new system is the license plate recognition of non-helmet riders, which recognizes different types of characters in an image and gives specific extracted output in text format. This recognition system is capable of identifying and recognizing characters from a picture of a moving vehicle for up to 80% and can even be improved to handle such images.

REFERENCES

[1]. Detection of helmets on motorcyclists. By Remuera R.V.e Silva, Kelson R.T. Aires, Rodrigo de M. S. Veras.
[2]. Helmet Detection using Machine Learning and Automatic License Plate Recognition. By Lokesh Allamki, Manjunath Panchakshari, Ashish Sateesha, K S Pratheek(BNMIT, Bangalore).
[3]. Detecting motorcycle helmet use with deep learning. By Felix Wilhelm Sieberta, Hanhe Lin (Department of Psychology and Ergonomics, Technische Universit¨at Berlin, Marchstrabe 12, 10587 Berlin Germany).
[4]. A Hybrid Approach for Helmet Detection for Riders Safety using Image Processing, Machine Learning, Artificial Intelligence. By M.Swapna, Tahniyath Wajeeh, Shaziya Jabeen.