

HELMET DETECTION AND LICENSE PLATE RECOGNITION OF CONVOLUTIONAL
NEURAL NETWORKS

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Abstract — In this project we are detecting whether two wheeler rider wearing helmet or not, if he is not wearing helmet then we are extracting number plate of that two wheeler. To extract number plate we have YOLO CNN model with some train and test images and if you want to add some other images then send those images to us so we can include those images in YOLO model with annotation to extract number plate of those new images. In this research work, a Non-Helmet Rider detection system is built which attempts to satisfy the automation of detecting the traffic violation of not wearing helmet and extracting the vehicles' license plate number. The main principle involved is Object Detection using Deep Learning at three levels. The objects detected are person, motorcycle/moped at first level using YOLOv2, helmet at second level using YOLOv3, License plate at the last

level using YOLOv2. Then the license plate registration number is extracted using OCR (Optical Character Recognition). All these techniques are subjected to predefined conditions and constraints, especially the license plate number extraction part. Since, this work takes video as its input, the speed of execution is crucial. We have used above said methodologies to build a holistic system for both helmet detection and license plate number extraction.

INTRODUCTION

This report noted that a comprehensive action plan has to be set up in order to save lives. Worrying fact is that India ranks number one as far as road crash deaths are considered. Rapid urbanization, avoiding helmets, seat belts and other safety measures while driving are some of the reasons behind this trend according to analysis done by experts. In 2015 India signed Brasilia Declaration on Road Safety, where India committed to reduce road crash deaths to 50

percent by 2020. Policy makers first have to acknowledge the problems that persist in India before halving road crash deaths. When a two-wheeler meets with an accident, due of sudden deceleration, the rider is thrown away from the vehicle. If head strikes any object, motion of the head becomes zero, but with its own mass brain continues to be in motion until the object hits inner part of the skull. Sometimes this type of head injury may be fatal in nature. In such times helmet acts as life savior. Helmet reduces the chances of skull getting decelerated, hence sets the motion of the head to almost zero. Cushion inside the helmet absorbs the impact of collision and as time passes head comes to a halt.

LITERATURE SURVEY

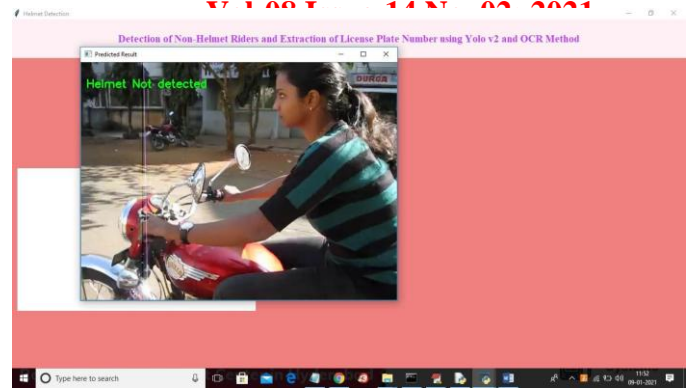
1.S. Du, M. Shehata, W. Badawy Describe a comprehensive survey on existing (Automatic License Plate Recognition) ALPR Techniques by categorizing them according to the features used in each stage. Comparisons of them in the terms of Pros, Cons, Recognition results, & Processing speeds were addressed. A future forecast for ALPR was also given at the end. The future research of ALPR should concentrate on multi-style plate recognition, video-based ALPR using temporal information, multi-plates processing, high - definition plate image processing, ambiguous - character recognition.

2.P. anishiya, prof. S. Mary Joans focused a number plate localization and recognition system for vehicles in Tamilnadu(India) is proposed. This system is developed based on digital images and can be easily applied to commercial car park systems for the use of documenting access of parking services ,secure usage of parking houses and also to prevent car theft issues. The proposed algorithm is based on a combination of morphological operation n with area criteria tests for number plate localization.

PROPOSED SYSTEM

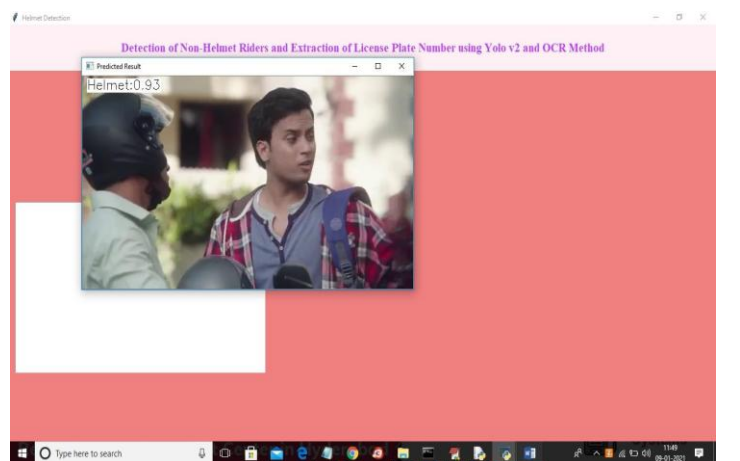
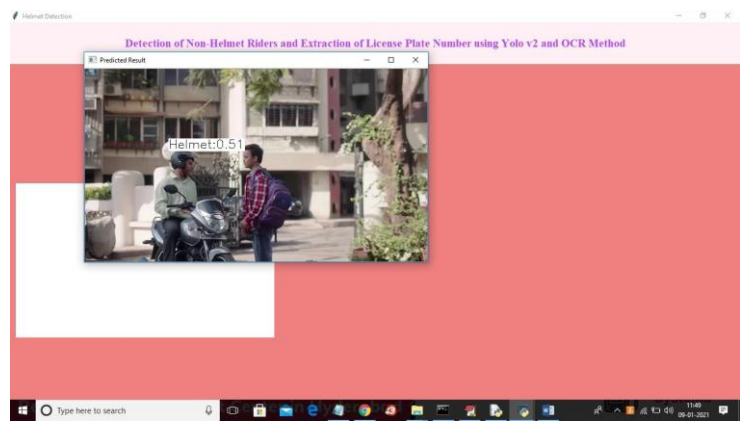
The proposed a methodology for feature extraction using LBP based hybrid descriptor, HOG and Hough transform descriptors. Whereas Xinhua Jiang et al. incorporated grey level co-occurrence matrix along with LBP for feature extraction. YOLOv2 and COCO dataset can be employed to detect different types of objects and classify them accordingly The intended object are motorcycle, motorcyclists, pedestrians and workers. Helmet and tyre colour exhibits different characteristics, this can be exploited to detect motorbikes . proposed a method to identify two wheeler accidents using a microcontroller and accelerometer. Most of the time pedestrians are the real

victims for road accidents, their safety is essential. Jie Li et al. The proposed a method to classify pedestrians using SVM based on histogram of oriented gradient features (HOG). The last step involves helmet detection. Colour based and circle Hough transform is used to detect helmet and HOG descriptors can also be used for helmet detection. Colour feature recognition is another option . deployed colour space transformation and colour feature discrimination for detecting the helmet. GLCM statistical features and Back-Propagation artificial neural network is used to detect helmet more effectively . helmet detection system involves following steps such as collection of dataset, moving object detection, background subtraction, object classification using neural networks and extraction of license plate number if the rider is not wearing helmet. RattapoomWaranusast et al. used KNN classifier for moving object extraction and classification.



**SAMPLE
SCREENSHOTS**

OUTPUT



CONCLUSION

In this paper, we proposed, A Non-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 helmet while riding the motorcycle, and then here we are uploading image to identify license plate number of that motorcycle is extracted from image and displayed. Object detection principle with YOLO architecture is used for motorcycle, person, helmet and license plate detection. OCR is used for license plate number extraction if rider is not wearing helmet. 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 is achieved satisfactorily.

References

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