

Helmet Detection and Number Plate Recognition

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Abstract:

In a growing and developing country like India where population is increasing on each day, additionally results in engorged roadways attributable to vehicles, animals, roadside outlets. thanks to that, accidents are at associate degree incomparable high these days. A survey states that India may be a motorbikedominated country that occupies regarding sixty five % of roadway vehicles utilized in India. In metropolitan cities like Bangalore accidents and its death rate is controlled due to educated population and attentive traffic agency and quick response from the health officers however recent statistics show that despite measures being taken, accident rate is not decreasing even in metropolitan cities thanks to voters negligence and carelessness. underneath the new government, where a developing country like India is taking steps towards digitisation, most of the traffic lights across roads are in the middle of cameras. Keeping the digital India in mind, this project is with ambition progressing to develop a surveillance-based code which might discover if a specific rider is sporting a helmet. As from a motorbikerider purpose of road, the sole and should security live he/she might take is that if he/she is sporting a helmet, wearing a helmet drastically reduces the fatality % in associate degree unfortunate event of associate degree accident

Keywords —Automatic Number Plate Recognition, You Only Look Once (YOLO).

I. INTRODUCTION

The Helmet Detection and variety plate recognition, police investigation of two-wheeler riders wearing a helmet or not and police investigation helmetless two-wheeler license plate victimisation Deep Learning based mostly object detection algorithms. With varied deep learning algorithms, available we square measure moving forward with YOLO period Object Detection rule. The leveraged real time object detection using YOLO rule is associate degree rule supported regression, instead of choosing the fascinating a part of a picture, it predicts classes and bounding boxes

for the complete image in one run of the rule. YOLO is made in such manner that approaches over the image/video frame quickly and one convolutional neural network is deployed over the image/video and leading to formation of bounding boxes for the categories with the label and its confidence and here we've got our categories because the helmet, motorbike, vehicle plate and non-helmet rider and also the result that we tend to aim is to discover the vehicle plate of helmetless motorbike rides. laptop vision victimisation CNN (convolutional neural network) allows a laptop to spot or discover process /object in image or video as humans do. Due to advances in

AI and numerous innovations in deep learning and neural networks, this field has taken leaps in past years and has surpassed humans in some tasks of object detection and labelling. A patient with a higher accuracy by combining the results of different machine learning techniques.

II. METHODOLOGY

In order to achieve our goal, our methodology comprises of few steps from which we accumulate datasets of the given attributes for the system and we will do the pre-processing of our given attribute to apply on the given machine learning techniques find out the predictive analysis of the data.

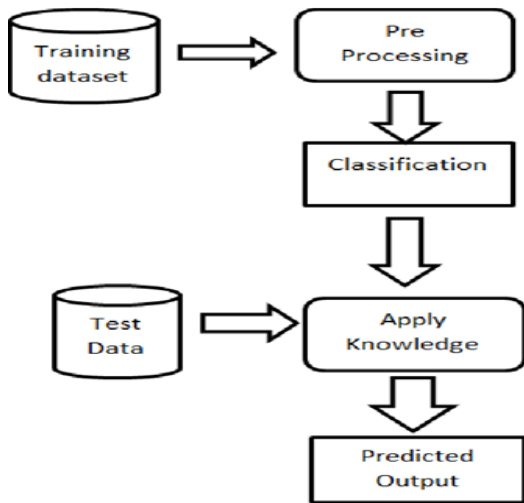


Fig 1: AutomaticDetection Algorithm

GOALS AND OBJECTIVES

The main goal of Project is to protect the drivers head in case of accident. In case of accident, if the motorcyclist does not use can be fatal. This paper aims to propose a system for detection of motorcyclist without helmet

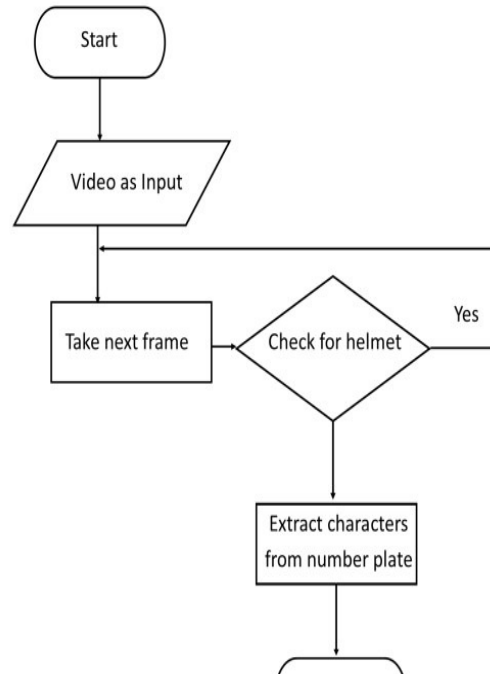
Repeated Violator Identification

1. To collect and store the datasets.
2. To provide the recorded video file or the Live stream of the video as the input of the program.

3. To crop or extract Number Plate of each and every individual from each frame extracted.

4. To store and display the Number Plate for each of the cropped or extracted vehicle of the recorded.

5. To store and display the Number Plate for each of the cropped or extracted vehicle of the live video.



IMPLEMENTATION

The YOLOv3 algorithm first separates a frame into a grid. Each grid cell predicts some number of boundary boxes (sometimes referred to as anchor boxes) around objects that score highly with the aforementioned predefined classes. Each boundary box has a respective confidence score of how accurate it assumes that prediction should be and detects only one object per bounding box. The boundary boxes are generated by clustering the dimensions of the ground truth boxes from the original dataset to find the most common shapes and sizes. The object detection problem is treated as a regression problem in the YOLO algorithm and the image is divided into an $S \times S$

grid. If the centre of a target falls into a grid, the grid is responsible for detecting the target. Each grid will output a bounding box, confidence, and class probability map. Among them, the bounding box contains four values: x , y , w , h , (x,y) represents the centre of the box. (W, h) defines the width and height of the box. Confidence indicates the probability of containing objects in this prediction box, which is the IoU value between the prediction box and the actual box. The class probability indicates the class probability of the object, and the YOLOv3 uses a two-class method.

CONTRIBUTION TO SOCIETY

Helmet detection system is that it creates awareness among people who use motorized two-wheelers and don't wear helmets so, by creating such a system which detects the two-wheeler riders without helmets it and raise a challan for violation, people will start acknowledging this and wear helmets and can be safe.

It aware the motorcyclists to wear helmets correctly, the risk of death can be reduced by 38%, and the risk of head injury can be reduced by 62%

APPLICATIONS

This project aims at developing a traffic violation system that will be helpful to the traffic control system considering the current system where we only have a manual check point where traffic police raise a fine for a rider if he is found not wearing a helmet, by this system the defaulter's license plate will be captured and he will have to pay the respective fine. This system with the help of technologies like Deep Learning, Object Detection and the other required frameworks will be able to detect the riders without helmet.

CONCLUSION

Through this project we would like to develop a system which might help in

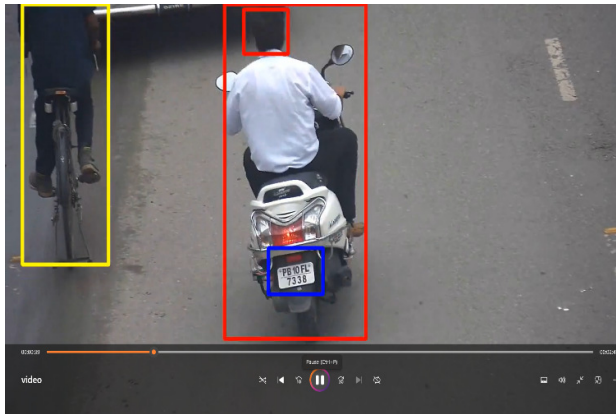
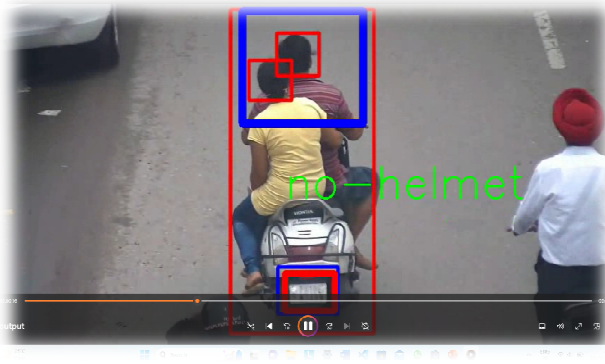
transportation awareness among those that use two wheelers while not carrying helmets. we have a tendency to bring forward a framework for period detection of traffic rule defaulters who ride bike while not exploitation helmet. By exploitation varied technologies like Deep Learning, Object detection we have a tendency to aim in transportation sensible results and increase the potency of the system and facilitate the control department to find out the defaulters simply instead of counting on the present system wherever cops notice the defaulters and lift a fine, in this current system it's not economical as a result of not all the defaulters are found guilty. So, by making such a system we have a tendency to feel folks will be additional careful and can not be negligent towards wearing helmets and by this we are able to avoid several accidents and save several lives.

ACKNOWLEDGMENT

We are doing this work under the mentorship of Dr. K Venkata Rao (Professor & Head) & Mrs. Nivedita A (Assistant Professor), Department of Computer Science & Engineering at K S School of Engineering and Management. we are doing a Project on Machine Learning where we have learnt the various Machine Learning Algorithms. we would like to express our special thanks to our mentor for inspiring us to take up the project & write this paper. Without their active guidance, help, cooperation & encouragement, we would not have my headway in writing this paper. We are extremely thankful for their valuable guidance and support on completion of this paper. we extend our gratitude to "K S School of Engineering and Management" for giving us this opportunity. We also acknowledge with a deep sense of reverence, our gratitude towards our parents and member of our family, who has always supported us morally as well as economically. Any omission in this brief acknowledgement does not mean lack of gratitude.

RESULT

When we give the input video, it successfully detects the helmet and shows the output and also it prints "Helmet or no-helmet"



Intelligent Transportation Systems (ITSC) Year: 2020 | Conference Paper | Publisher: IEEE

- Detection of Motorcyclists without Helmet in Videos using Convolutional Neural Network
Year: 2020 | Conference Paper | Publisher: IEEE
- Automatic detection of bike-riders without helmet using surveillance videos in real-time
Year: 2019 | Conference Paper | Publisher: IEEE
- Detection of License Plate Number and Identification of Non-Helmet Riders using Yolo v2 and OCR Method
B. Srilekha;K. V. D. Kiran;Venkata Vara Prasad Padyala
2022 International Conference on Electronics and Renewable Systems
Year: 2022 | Conference Paper | Publisher: IEEE

REFERENCES

- Detection of License Plate Number and Identification of Non-Helmet Riders using Yolo v2 and OCR Method
B. Srilekha;K. V. D. Kiran;Venkata Vara Prasad Padyala
2022 International Conference on Electronics and Renewable Systems
Year: 2022 | Conference Paper | Publisher: IEEE
- Helmet Detection And Number Plate Recognition Using Deep Learning
Pushkar Sathe;Aditi Rao;Aditya Singh;Ritika Nair;Abhilash Poojary
2022 IEEE Region 10 Symposium (TENSYP)
Year: 2022 | Conference Paper | Publisher: IEEE
- Real-time traffic monitoring and traffic offense detection using YOLOv4 and OpenCV
DNN Fahimul Hoque Shubho;Fahim Iftekhar;Ekhfahossain;Shahnewaz Siddique
TENCON 2021 - 2021 IEEE Region 10 Conference (TENCON)
- Helmet Use Detection of Tracked Motorcycles Using CNN-Based Multi-Task Learning
Hanhe Lin;Jeremiah D. Deng;Deike Albers;Felix Wilhelm Siebert
IEEE Access
Year: 2020 | Volume: 8 | Journal Article | Publisher: IEEE
- Real-Time Detection of Motorcyclist without Helmet using Cascade of CNNs on Edge-device
Dinesh Singh;C. Vishnu;C. Krishna Mohan
2020 IEEE 23rd International Conference on