

# Traffic Rules Violation Detection System

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## ABSTRACT

Obeying traffic regulations is an obligation for every driver. There are many violation that occur on the road such as breaking through road markings or traffic lights. The police have implemented many innovations to reduce the occurrence of traffic violation, but they are still inefficient in handling traffic violations. In order to ensure safety measures on roads of India , the identification of traffic rule violation is highly desirable but challenging job due to numerous difficulties such as occlusion. In this ,an end -to-end framework for detection of violation. The traffic violation detector can identify signal violation, and the individuals are informed that they will be apprehended if they break the traffic law. The violation detection included such as helmet classification , speed violation detection of more than two people riding on the bike and detecting of accident possibly. The system is faster and efficient than human, as known already traffic police is the one who captures the image of individual violation traffic rule but the traffic police will not able to capture more than one violation simultaneously real-time through computer vision techniques and also leverage good result with great accuracy.

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**Keywords: Traffic rules violation ,Helmet Detection**

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## 1. INTRODUCTION

The increasing number of vehicles in cities can causes high volume of traffic,and implies the traffic violations become more critical nowadays. This causes severe destruction of property and more accidents that may endanger the lives of the people.To solve the alarming problem and prevent such unfathomable consequences, traffic violation detection system are needed.

Authorities track the roads all the time Hence, traffic enforcers will not only be at ease in implementing safe roads accurately, but will efficiently; as the traffic detection system detects violations faster than humans. This system can detect four types of traffic violation in real-time which are wearing helmet or not, speed violation, violation of more than two people riding on the bike and accident possibility because of over speed. Two-wheeler is highly common mode of transport, but due to less protection, there is a high risk involved.

## 2. PROBLEM STATEMENT

Due to the growing population more automobiles are being purchased, particularly in urban areas. As a result, people's awareness decreases, and there are more accidents, which may result in the loss of many lives. This can result in heavy traffic, indicating that traffic violation are becoming more dangerous in every corner of the world.

These situations necessitate the need to develop traffic violation detection systems to automate traffic regulations and eliminate the unawareness among human population. The proposed traffic violation detector can identify signal violations, and the individuals are informed that they will be apprehended if they break a traffic law.

## 3. LITERATURE SURVEY

Due to the growing population more automobiles are being purchased, particularly in urban areas. This can result in heavy traffic, indicating that traffic violations are becoming more dangerous in every corner of the world. These situation necessitate the need to develop traffic regulations and eliminate the unawareness among human population. This paper will discuss various methods that are already population. This paper will discuss various methods that are already proposed by different researchers. The paper focuses on the following major modules:

- A. License Plate Recognition
- B. Vehicle Detection
- C. Speed Violation
- D. Helmet Classification

One major drawback using canny edge detection is, it detects all the edges in the image and we need to then carry out further processing to select only those edges which actually belong to the number plate. There is an end to end system for these features but we will be adding different features such as speed violation, violation of more than two people riding on the bike and helmet classification.

### 3.1 SCOPE OF THE PROJECT

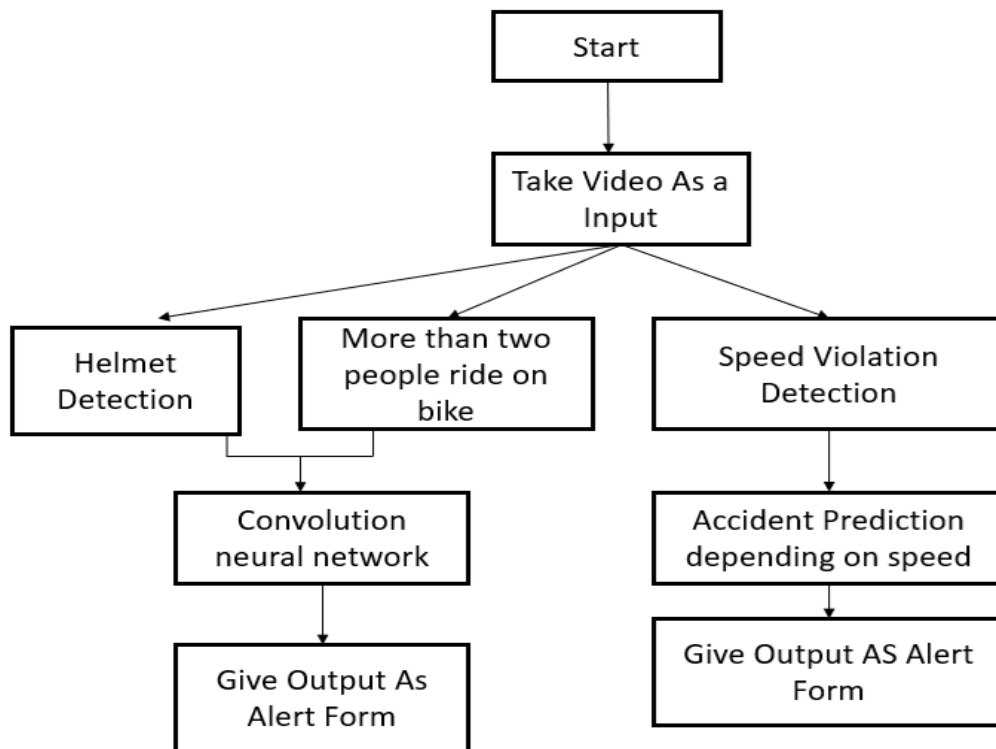
In the existing system traffic police stand at signal and when a violation is observed by the team, the license number plate is noted and a screenshot is taken for proof. The system is useful as it automatically detects it will give the alert message to the police the system will be time saving.

## 4. METHODOLOGY

In this section, we will explain the end to end system. This system consists of four major components. In the system we will first give an image frame CCTV footage as input to the system then perform vehicle detection using object detection. Object Detection is carried out using you look only once (YOLO) for detecting vehicles in the image frame. After detecting vehicles, individual vehicles are cropped out using the coordinates obtained from bounding boxes given by Object Detection Algorithms. Now an individual vehicle is checked against different violation. Violation included in this proposed system are Helmet Violation Speed Violation, Violation of multiple people riding on the bike and Violation of accident possibility due to over speed.

Two-wheeler vehicles will be checked against Helmet and multiple people riding Violation and Four-Wheeler vehicles will be checked against overs speed and accident Violation. Helmet violation is detected using Convolution Neural Network(CNN) based classifier which works well on visual data

**4.1PROJECT MODEL**



**Fig -1:** Project Working Model

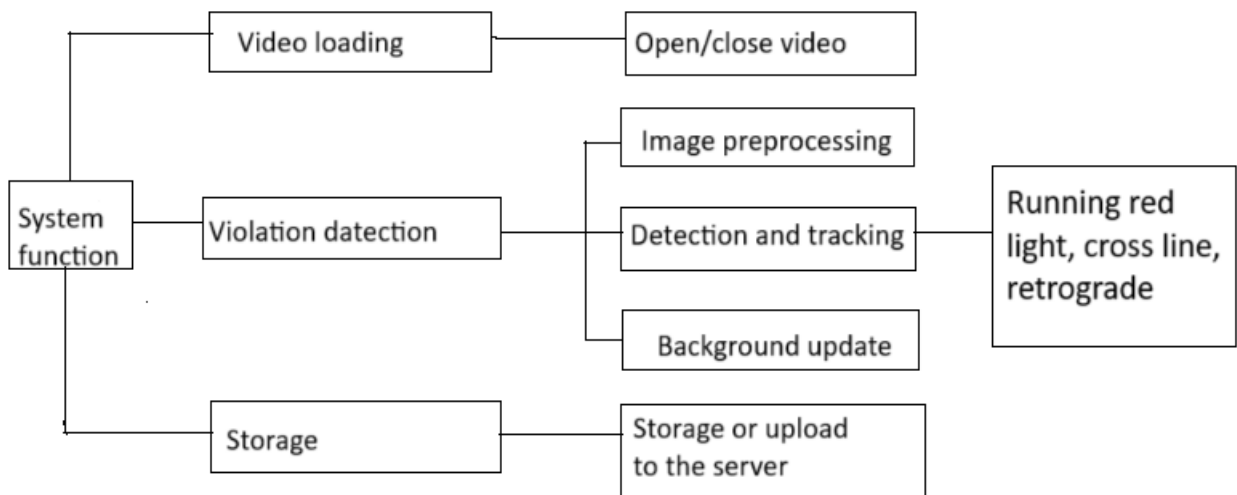
Flowchart for Helmet Model Procedure for training a YOLOV3 HELMET model Gathering images (Creating data set):To detect a bike rider with helmet or without helmet.

**4.3CNN MODEL**

The system consists of a main subsystem: setting up the environment, training, testing the model and getting the accurate coordinates of the vehicle that comes along with the system .The proposed system

of triple riding illustration. The imposing challans or fines with an automated push of the data to the respective user account comes as an extension to the system. Proposed model of triple riding detection. Traffic rule violation recognition system.

#### 4.4 SYSTEM ARCHITECTUR



**Fig –2:** System Architecture

In this section, we will explain the end to end system. This system consist four major components. In the system we will first give an image frame from CCTV footage as input to the system then perform vehicle detection using object detection. Object detection is carried out using YOLO for detecting vehicles in the image frame. After detecting vehicles, individual vehicles are cropped out using the coordinates obtained from bounding boxes given by Object Detection Algorithms. Now an individual vehicle is checked against different violations included in this proposed system are Helmet Violation, Speed Violation, Violation of multiple people riding on the bike and violation of accident possibility due to over speed. Four-Wheeler vehicles will be checked against over speed and accident violation.

#### 5.RESULT

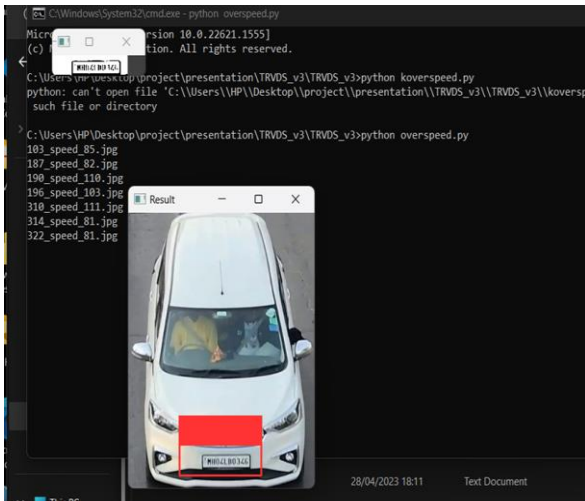


Fig –3:Speed detection

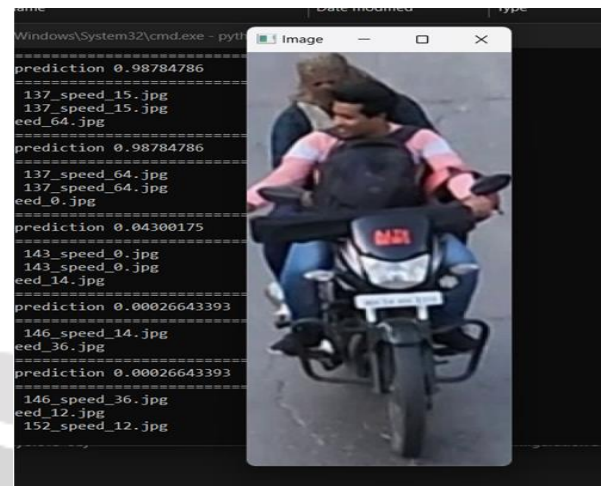


Fig-4:Helmet detection

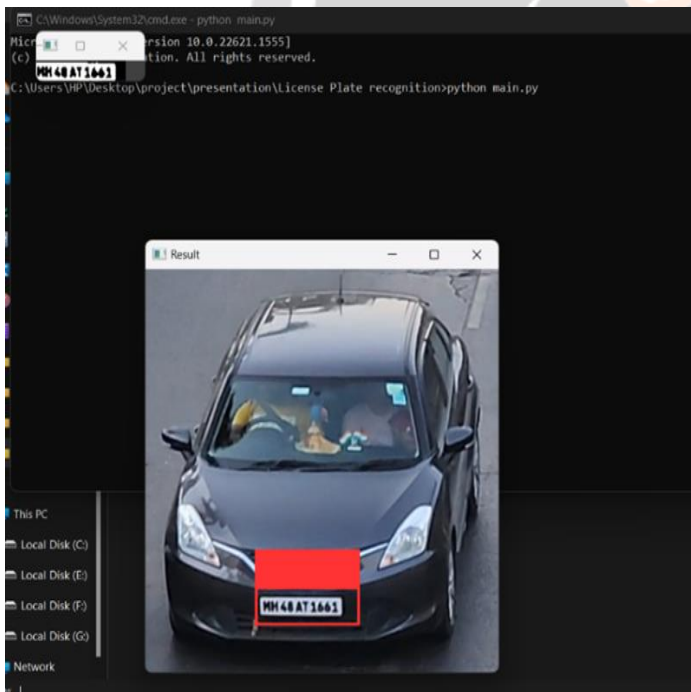


Fig-5:Licenceplate recognition

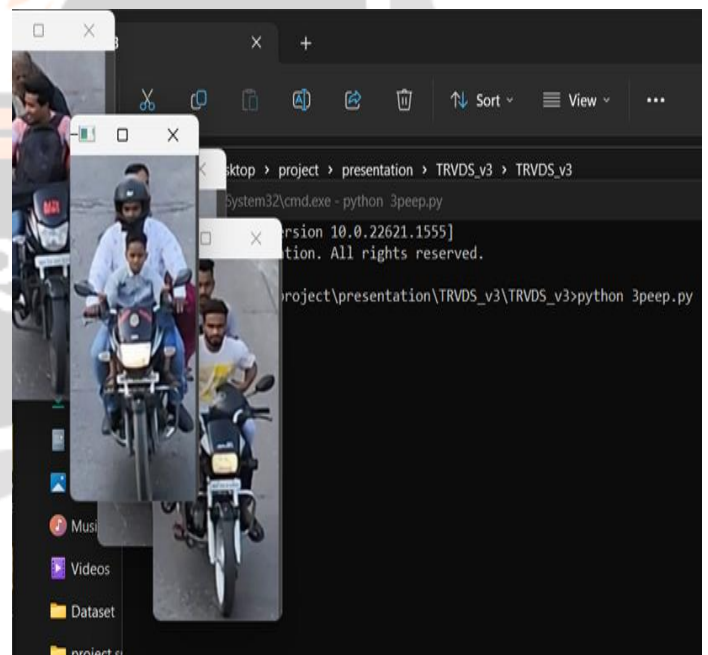


Fig-6:More than two passenger ridding on bike

## 6.Conclusion

The approach employs the use of concepts such as YOLO, CNN, Image processing for automatic detection of traffic rules violations. It achieves the desired goal with precision and ease, but requires high computational power as it makes use of concepts like image segmentation and object detection. The advantage of the system is it has the ability to catch more number of violations as compared to the human intervened system. In addition, the proposed methodology provides an end to end autonomous system, when implemented would prove an upper hand in detecting violations.

## 7.References

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