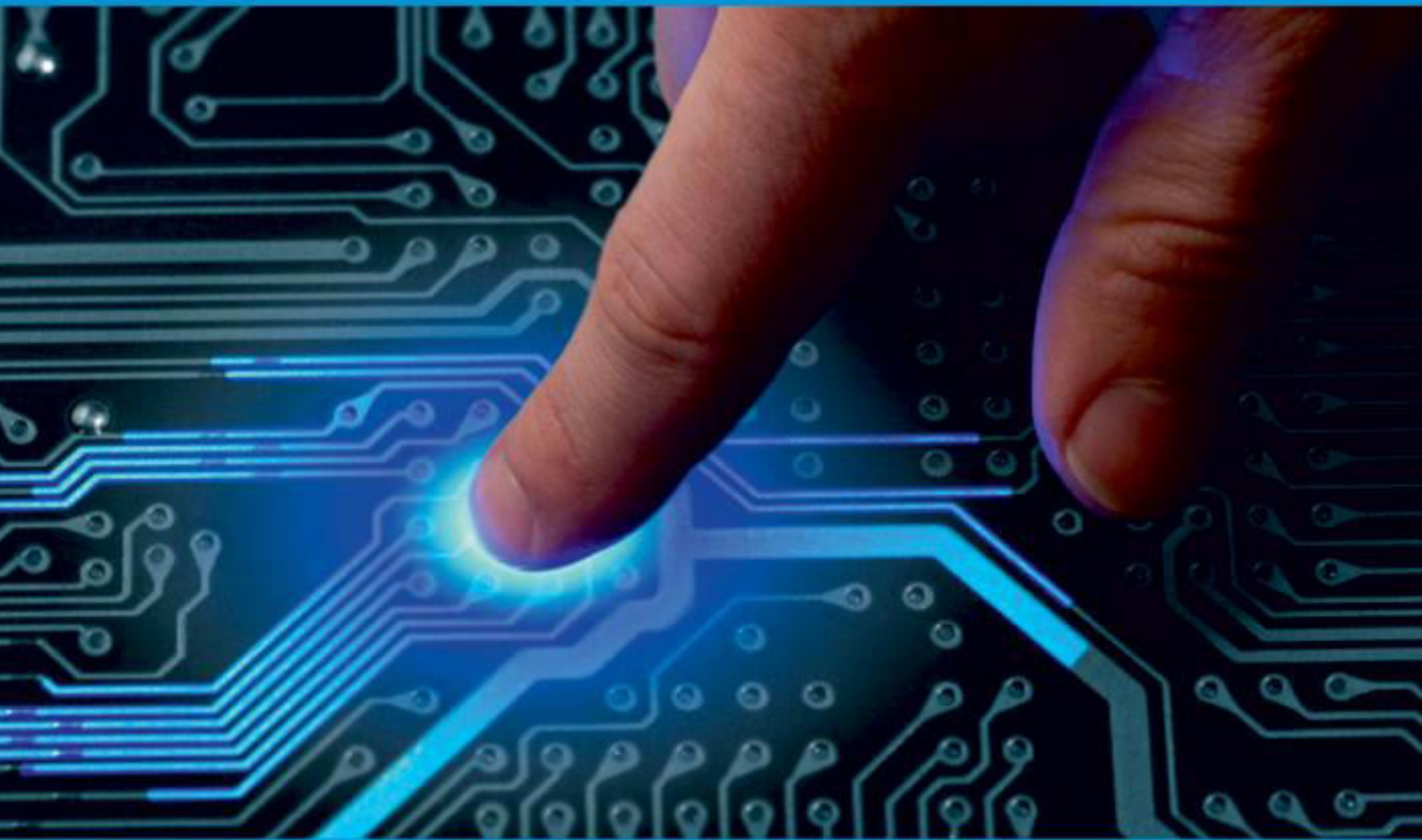




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Automated Traffic Violation Detection Technique Using CNN ND Yolo Algorithm

Dukare Priti Santosh, Patel Saniya Hamid, Rahane Mayur Rajendra, Prof. Walunj P.D

Dept. of Comp. Engineering, Samarth Group of Institution College of Engineering, Belhe, India

ABSTRACT: Two-wheeler is the most popular modes of transport. Also, it is proved that one of every five bike riders who died on roads were not wearing helmet. This paper proposed a method for motorcycle detection and classification, helmet detection and license plate recognition to detect and identify the motorcyclists without helmet and report it to concerned authorities. Support Vector Machine (SVM) is used for vehicle classification. For helmet detection, CNN algorithms are applied to extract the image attributes, and the SVM classifier is used to classify the objects. For License plate Recognition, Optical Character Recognition (OCR) algorithm is used. The email is sent to the helmet rule violators. The results are stored in the Database for further actions.

I. INTRODUCTION

A helmet aims to reduce the risk of serious head and brain injuries by plummeting the impact of a force or collision to the head, motorcyclists must take extra precautions to protect their bodies. Riders and passengers wearing helmets increase their possibility of survival appreciably over non-helmet wearers. According to the law, every motorcyclist must wear a helmet while riding the motorcycle. But many bikers ignored and use their vehicle without defence apparatus. The policeman tried to control this problem manually but it is inadequate for the real state of affairs. Recently helmets have been made mandatory, but still, people drive vehicles without helmets. The amount of deaths has been expanding every year, especially in developing countries as helmets are the main safety equipment for motorcycle drivers as well as passengers, but many drivers do not use them. Wearing a helmet is the most effective way to reduce head injuries and fatalities arising from motorcycle and bicycle accidents.

II. LITERATURE SURVEY

'Helmet must for pillion riders in Karnataka from Jan 12'

Traffic cops will have to enforce the rule and a first-time offender will be fined Rs100. But a third-time offender may lose his/her driving license if the pillion rider does not wear a helmet. The rule is being implemented after the Supreme Court Committee of Road Safety directed the state to implement it at the earliest. This, was after TOI reported on the government deferring the rule on December 26. The committee notified the same to six states including Karnataka first on August 18, 2015, to implement the rule.[7]

"Safeguarding of motorcyclists through helmet recognition" The motorcycle is the most widely used vehicle in India. Fatalities due to road accidents in India are significantly high. Motorcycles being an obvious choice as a convenient transportation mode, it has a major contribution to road accident casualties and injuries. Despite the Government traffic regulation, people still avoid using helmets. The impetuous or deliberate nature of people could be the reason for avoiding helmets. The proposed system is an effort to create awareness in society by endorsing the use of helmets and leading people to safety.[2]

"Automatic Detector for Bikers with no Helmet using Deep Learning" The success of digital image pattern recognition and feature extraction using a Convolution Neural Network (CNN) or Deep Learning was recently acknowledged over the years. Researchers have applied these techniques to many problems including traffic offense detection in video surveillance, especially for motorcycle riders who are not wearing a helmet. Several models of CNN were used to solve these kinds of problems but mostly required the image pre-processing step for

extracting the Region of Interest (ROI) area in the image before applying CNN to classify helmets. In this paper, we proposed to apply another interesting method of deep learning called Single Shot Multi-Box Detector (SSD) to the helmet detection problem. This method is state-of-the-art that can use only one single CNN network to detect the bounding box area of the motorcycle and rider and then classify whether the biker is wearing or not wearing a helmet at the same time. The results of the experiment were surprisingly good. The classification accuracy of bikers not wearing a helmet was extremely high and the detection of the ROI of the biker and motorcycle in the image can be done at the same time as the classification process.[4]

"I-Helmet: An intelligent motorcycle helmet for rear big truck/bus intimation and collision avoidance" We propose an intelligent motorcycle helmet, called I-Helmet, which integrates IR sensors with an image sensor and adopts the image recognition methodology to recognize rear big vehicles. Two detection modes (day/night) are designed for the purpose of image recognition accuracy. Experimental results showed that the proposed I-Helmet can successfully be achieved image recognition of the license plate for the rear big truck/bus. The recognition accuracy rate achieves about 70% (night) to 75% (day). Therefore, the proposed IHelmet can real-time provide related intimations for avoiding rear big truck/bus collisions.[5]

III. SYSTEM ARCHITECTURE

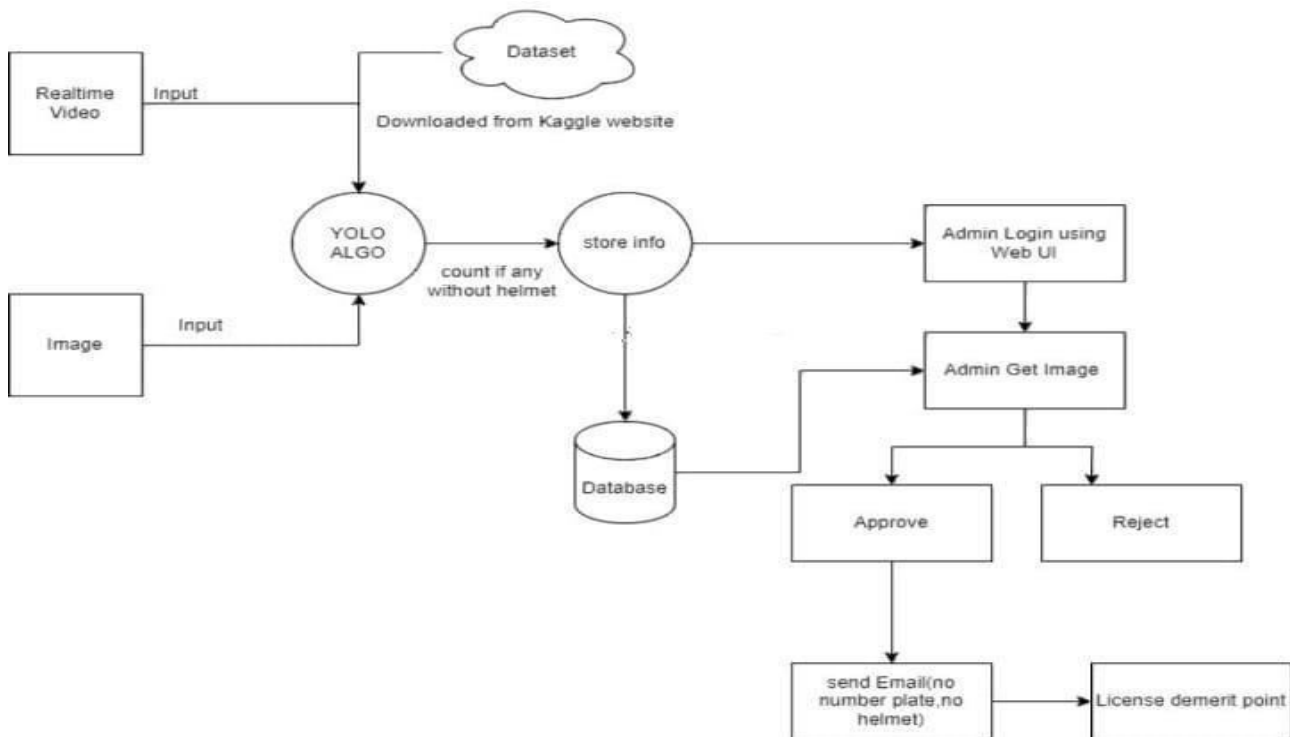


Fig 1. System Architecture

- Start Realtime Video
- Extract Image from Video convert them to gray scale
- Detect if helmet is wear or not.
- Use Yolo Algorithm to detect helmet
- If helmet is not there send alert to owner over the email forcancelling license
- Send Image of violation over the email

Yolo Algorithm:

- The YOLO first divides the image into convolutions of size NxN like 13x13, and the size of each of the NxN cells depends on the size of the input.
- Each cell of these NxN cells is responsible for predicting the number of bounding boxes in the input

image

- For every box in the input, the deconvolutional network predicts the confidence that the bounding box contains the object and the probability of the enclosed object being from one of the classes mentioned in the configuration file.
- After that, it applies the Non-Max Suppression to remove the bounding boxes with less confidence value.
- The processed images are subject to the Intersection over union function developed to find out the relation between the persons detected in the frame along with the motorbike. Thereby, marking the rectangular bounding box with helmet as the label.

IV. CONCLUSION

This project aims to decrease the accidents caused due to not wearing a helmet, by sending a penalty message to the rider without a helmet. It also ensures whether the law is violated or not. It stores the image of the violated people. It is then sent through the mail to authorities. It will be helpful to reduce the work of Police Man, by detecting the person without helmets and sending a penalty message to those who violate traffic rules.

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