A Mini Project Synopsis on

Automatic Number Plate Detection

T.E. - I.T Engineering

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CERTIFICATE

This to certify that the Mini Project report on **Automatic Number Plate Detection** has been submitted by Keval Gada (20204002), Aadarsh Khant (20204003) and Tanay Jain (20204004) who are a Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in **Information Technology**, during the academic year **2021-2022** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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Chapter 1

Introduction

Nowadays two-wheelers are the most popular modes of transport since all level of people can afford it. When the number of motorcyclist increases, there has been an increasing number of motorbike accidents due to reckless riding. The carelessness of motorcyclists not wearing a helmet is a predominant factor, and it commonly contributes to the biker's head injury.

1.1. Purpose:

To solve this issue, most countries have laws which mandate the use of helmets for two-wheeler riders. In some countries, the government have installed a specialized sensor to check the presence of the helmet, but it is economically not reliable to buy sensors for every bike. Without a proper system, the traffic police personnel are deployed to check whether the motorcyclists are wearing the helmet or not. Automatic detection of LP for non-helmeted motorcyclist will help to reduce the burden faced by the traffic police, and it also need fewer human resources. As a result, the number of motorcyclists not wearing a helmet will get reduced.

1.2. Objectives:

The main objective of this study is to develop a real-time application for detection of LP for non-helmeted motorcyclist using the single convolutional neural networks. A centroid tracking method with a reference line is also proposed to eliminate the number of false positives generated by the helmeted bikers when they leave the video frames.

Chapter 2

Problem Definition

Nowadays, all around the world there are major accidents taking place due to which people are losing their lives. Not wearing helmet is one of the major causes of death. The death can be decreased if people start wearing helmets. So, penalizing the people not wearing helmet will make people wear helmets causing decrease in death rate and ensuring their safety. So, detection of license plate (LP) for non-helmeted motorcyclist has become mandatory to ensure the safety of the motorcyclists. It is difficult for humans to start penalizing every person without helmet. So, there is a need of system that detects a license plate from a two-wheeler so that the person without helmet can be penalized.

Chapter 3

Proposed System

The system which we have proposed will detect number plate from the moving vehicles. After detecting the number plate, it will detect whether the rider is wearing a helmet or not.

3.1 Features & Functionality:

- **Movement Detection:**
  Here the moving vehicles on the road will be detected.
- **Number Plate Detection:**
  Here the system will detect the number plate from the moving vehicles.
- **Helmet Detection:**
  Here the system will detect whether the rider on the moving vehicle is wearing a helmet or not.

Chapter 4

Project Outcomes

- System is able to detect moving vehicle on the road.
- System is able to detect number plate from the moving vehicles.
- System is able to detect whether the rider on vehicle is wearing a helmet or not.

Chapter 5

Software Requirements

Following are the python libraries that we will be using in our system:

- OpenCV:

  Opencv is an open source library which is very useful for computer vision applications such as video analysis, CCTV footage analysis and image analysis.

- numpy:

  NumPy is a Python library used for working with arrays. It also has functions for working in domain of linear algebra, fourier transform, and matrices.

- imutils:

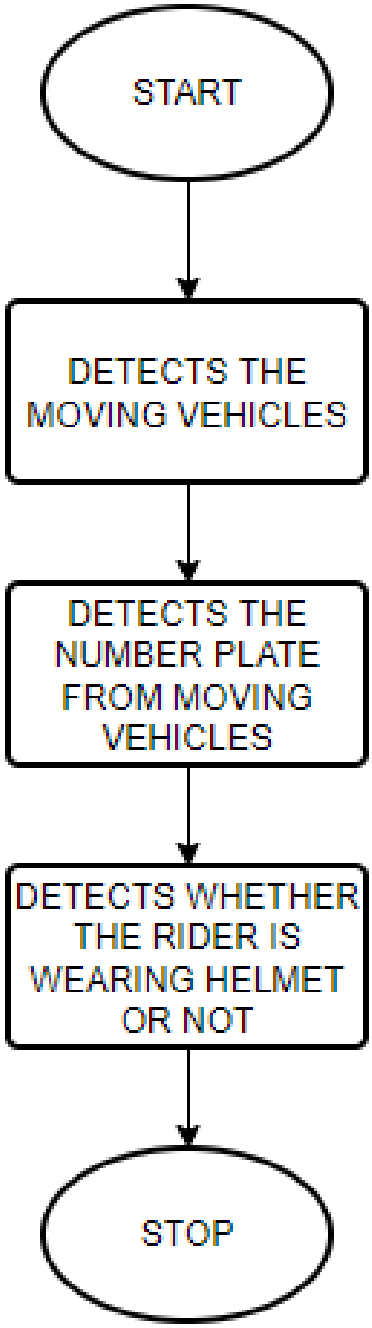
  Imutils is a package based on OpenCV, which can call the opencv interface more simply. It can easily realize a series of operations such as image translation, rotation, scaling, skeletonization and so on.

- tensorflow:

  TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML powered applications.

Chapter 6

Project Design



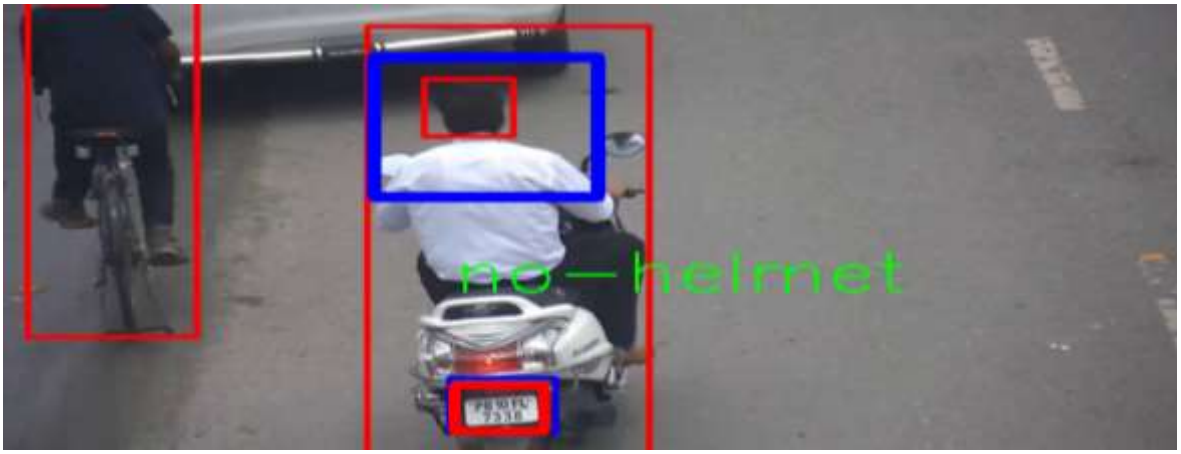
Chapter 7

Project Scheduling

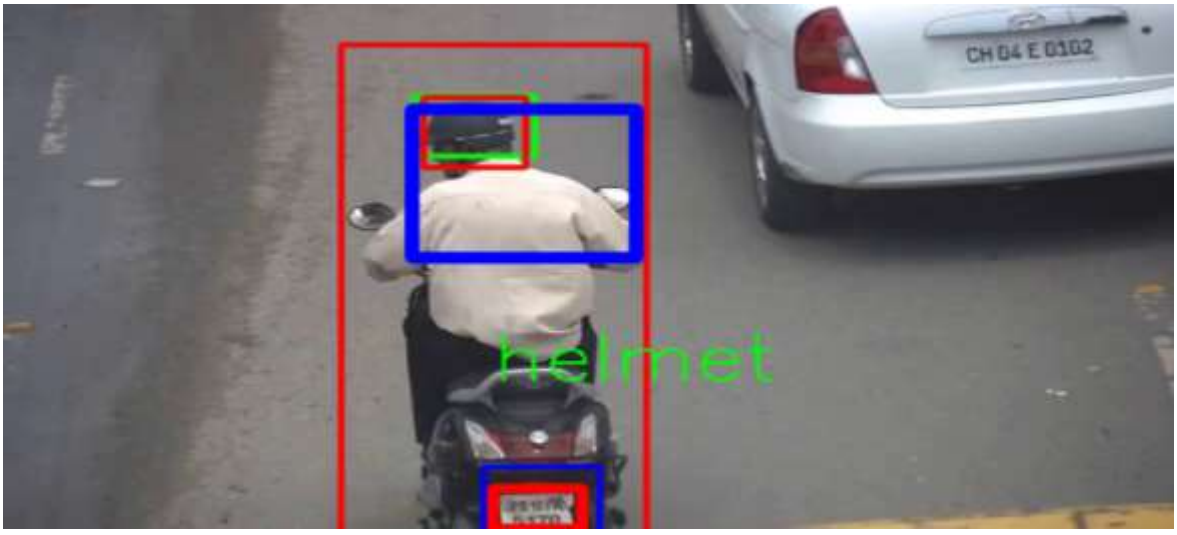
Sr. No	Group Member	Time duration	Work to be done
1	Tanay Jain	1st week of March	Preprocessing part
		2nd week of March	Creating Visualization method and model
2	Keval Gada	1st week of April	Training and testing dataset
3	Aadarsh Khant	2nd week of April	Integrating visualization methods and model into application

Chapter 8

Screenshot of application



In the above image as we can see the system detected two moving vehicles on the road. Out of which number plate is detected from the scooter. After successfully detecting the number plate from the vehicle the system checks whether the rider is wearing a helmet or not. As the rider is not wearing helmet so a message of “no-helmet” is displayed.



In the above image as the rider is wearing helmet so a message of “helmet” is displayed.

Chapter 9

Conclusion

Machine Learning Algorithms such as CNN is very effective for vehicle number plate recognition and helmet detection using machine learning. It consists of the outcomes of the result analyzed based on the various parameters such as recognition of individual character and a digit success ratio of recognition for the success of identifying selected set of a character from group of characters and digits. From the above results, we can conclude that number plate recognition and helmet detection will perform better as the quality of the camera used for scanning the plate and detecting the vehicles and helmet will be excellent. Using low quality camera will degrade the performance and may misclassify the result.

References

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