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Detection of Non-Helmet riders and Recognition of License Plate Characters using YOLOv2 and OCR.

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Abstract: A helmet is a protective gear mainly worn by riders of two wheeled vehicles. It has a hard plastic outer shell and has soft, impact absorbing padding inside. If the rider was to meet an accident on the road, his fast-moving head could collide with a hard surface. This can result in serious injury or death. A helmet acts as the mechanical barrier between head and object. The cushion inside the helmet absorbs the hard contact and spreads the impact over a larger area. Injuries can be avoided, and fatal injuries can be minimized if a good quality full helmet is used. Traffic rules are established stating that every rider must wear a helmet while riding on the road at all times as it has shown to have a profound impact on accident injuries and deaths. However, in reality, many riders do not strictly adhere to this rule. Therefore, the traffic police have to create a system to identify and discipline the violators. The police look into the video footage obtained from the CCTV cameras installed on the streets. These cameras are positioned to overlook the street, capturing images of every single vehicle passing through. Then, the police have to manually inspect the footage and identify the license plate numbers of the violating riders. But this method is time-consuming, uses intensive manpower and requires manual detection, extraction and storage of the license plate numbers of the violators. So, here a methodology for helmet detection and license plate extraction can be deployed. This system makes use of YOLO (v2, v3) and OCR. This system involves collection of the dataset, moving object detection, background subtraction, object detection and Optical character recognition.

Keywords: Authenticate, traffic, OPENCV, yolo.

1. INTRODUCTION

According to an India Today survey, more than 48,746 bike riders perished in road incidents in 2017. By the way, 73.8 percent of them didn't wear a helmet. The information was gathered from the India Environment Portal. A huge number of individuals are killed in vehicle accidents each year. Poor road conditions, vehicle breakdowns, careless driving or riding, and refusal to obey traffic laws other variables, such as following driving regulations, all contribute to this. Some of them are avoidable. For example, proper safety precautions should be used. As an example, guarantee that there are fewer accidents and, as a result, a lower fatality rate. Despite the fact that bikers are a minority, many people do not wear helmets even though they are supposed to. By identifying the fine application technique, this concept tries to automate it.A biker's helmet is seen on his head. At the moment, traffic police officers' dish out penalties to offenders of traffic regulations. However, owing to a lack of knowledge or other factors, depending on the circumstances, individuals may be able to avoid paying a fine even after infringing a traffic law. This has been automated. As a consequence of the method, such incidents will be reduced, and the severity of actions

taken against them will be increased. Detection of helmets The accuracy is between 90 and 93 percent, while the accuracy of licence plate recognition is between 50 and 60 percent. For the most effective This precision must be enhanced in the implementation of enforcement acts. The use of cameras in law enforcement and security In recent years, the use of enforcement has increased considerably. Machine learning and image processing can be utilised to identify the presence of helmets There are methods like Open CV, which has a 74 percent accuracy, and Image Descriptors, which has a 74 percent accuracy. Local Binary Patterns (LBP) has a 94 percent accuracy and has a 91.37 percent accuracy. This collection of pictures, However, because the videos were not filmed in real time with YOLO, the proposed system will be able to identify cyclists wearing helmets. The OCR is used to recognise licence plates.

2. LITERATURE SURVEY

Center-Less Single Sign-On with Privacy-Preserving Remote Biometric-Based ID-MAKA Scheme for Mobile Cloud Computing Services

An ID-MAKA system for mobility cloud computing that first accomplishes signature remote identity, single order, and focus. For formal security study, we employed the Good image and the Prohibition logic, as well as providing extra security requirements for other imminent vulnerabilities. Our method is safe against the more potential attacks, according to the results. Furthermore, our plans' security and privacy safeguards users' confidential data and personal info as during established connection.

Unified Biometric Privacy Preserving Three-factor Authentication a Key Agreement for Cloud-assisted Autonomous Vehicles

We discuss how to safeguard attackers of smart devices used in identity vehicles in automated vehicles (AV). First is the automobile itself, that is made up of three parts: electrical, mechanical, and electrical. controlling units (Processing elements), in-vehicle communications, and a general public connection gate 3G/4G, Wi-Fi, and Wirelessly are examples of cellular networks. Connecting interconnection of a mobile phone to the car is the third factor to consider. Your vehicle's transceivers are the third factor to consider. with the outside world

Problem definition:

Its AV for stopping terrorists from controlling AVs deliberately. In a CAV platform, a data center 3FAKAprotocol to achieve AKA amongst AVs, service, and people. CT-AKA can obtain multiple encryption (login details, sim card, and iris scans) by combining three common demographic online privacy methodologies (fuzzy vault, fuzz loyalty, and fuzzy vacuum pump). This allows users to authenticate while ensuring confidentiality of their heritage and biometric identification.

Solution:

The Antivirus for stopping criminals from controlling AVs deliberately. In a CAV architecture, a virtualized 3FAKAprotocol to achieve Asap among Vehicles, cloud, plus users. CT-AKA could perhaps obtain thirty validations (pin code, card, and finger print) by combining three popular demographic online privacy methodologies (blurry vault, fuzz loyalty, and fuzzy injector). This allows users to authenticate while maintaining the privacy of their heritage and biometric identification.

Secure Remote User Authenticated Key Establishment Protocol for Smart Home Environment

The rapid expansion of smart grid communications has been aided by advances in ICT and the Internet. Advanced robotic systems for planning and reporting numerous smart gadgets are found in a smart home. Homeowners can operate number of smart devices in a connected home, such as temperature measurement sensors, camera gear sensors, or home automation, using the system model and danger model.

Problem definition:

Clever objects and consumers, and from the other hand, communicate across an insecure network connection, the Internet. Numerous forms of operations, such as smart things capture, users, root controller, and digital assistant replica attacks, as well as lucky assault, may be feasible on a network. An unauthorized person

might gain access to records sent through mobile devices in this situation. The bulk of described options for world user credentials in an internet connected scenario are vulnerable to the dangers listed above.

Solution:

The suggested approach is safe against a number of well-known attacks, as demonstrated by the Rand oracle models, unstructured security, or the AVISPA software. The commonly used NS-2 simulators is also used to show the intended system's successful execution. significant operating costs as matched to other equivalent systems that are currently in use.

3. OVERVIEW OF THE SYSTEM

3.1 Existing System

A helmet is a protective gear mainly worn by riders of two wheeled vehicles. It has a hard plastic outer shell and has soft, impact absorbing padding inside. If the rider was to meet an accident on the road, his fast-moving head could collide with a hard surface. This can result in serious injury or death. A helmet acts as the mechanical barrier between head and object. The cushion inside the helmet absorbs the hard contact and spreads the impact over a larger area. Injuries can be avoided, and fatal injuries can be minimized if a good quality full helmet is used. Traffic rules are established stating that every rider must wear a helmet while riding on the road at all times as it has shown to have a profound impact on accident injuries and deaths. However, in reality, many riders do not strictly adhere to this rule. Therefore, the traffic police has to create a system to identify and discipline the violators. The police look into the video footage obtained from the CCTV cameras installed on the streets. These cameras are positioned to overlook the street, capturing images of every single vehicle passing through. Then, the police have to manually inspect the footage and identify the license plate numbers of the violating riders. But this method is time-consuming, uses intensive manpower and requires manual detection, extraction and storage of the license plate numbers of the violators. So, here a methodology for helmet detection and license plate extraction can be deployed. This system makes use of YOLO (v2, v3) and OCR. This system involves collection of the dataset, moving object detection, background subtraction, object detection and Optical character recognition.

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3.1.1 Disadvantages of Existing System

The existing system demands a lot of manual labor from the Traffic Police. They are required to have a Digital Camera on hand and are expected to take pictures of offenders as and when they notice them.

This process can pose many problems. Such as, coverage. It requires the officer to take pictures of every offender, but it may not be physically possible for him to capture every single offender that he notices, and also, there may be a number of offenders that he/she may not notice.

This process also has many points of failure. If the images are not properly taken by the officer. Like for example if the images are fuzzy and noisy or if the images are too dark or too bright, then they may not be usable.

Also, because the digital cameras are given to each and every police officer, it becomes an enormous task to collect all the data, because the images live in many different Flash Storage Devices that are not easy to collate.

3.2 Proposed System

In this study, we determine whether such a 2 different driver is wearing a seatbelt pass or fail, that if he's not, we obtain the two-number miller's number. We have a Hashtag Classification algorithm with just some training and testing photos to remove number plates, and if you would like to add more photos, give them

to us so we may integrate them in a Hashtag network with annotated to remove number plates from those new photos.

We are using or implementing the accompanying module for accomplish the aforesaid strategy.

First, a picture would be submitted to the programmed, and then we will use Wondered to determine if the picture a man riding a motorcycle pass or fail. If the YOLO model detects both a people and a motorcycle, we will proceed.

In this module, we will utilize the YOLOV3 framework to describe not whether the individual is wearing a seatbelt; if the man is found to be wearing a seat belt, the programmed will automatically halt here. If the user is just not paying attention to the road, the entry will move to step 3.

In this module, we'll use the Language TensorFlow OCR API to retrieve license plate data. OCR takes an image as input and extracts the numberplate from it..

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3.3 Proposed System Design

1. DETECT MOTOR BIKE & PERSON

At every screen, the ImageNet dataset boost 350 anomaly detection is intended to locate the classifications "bike" and "human." Each blade's output variable is a box that defines the specific class as well as the chance or conviction associated with that box plus classification.

Only the recognized images are retrieved and kept as distinct images, with namespaces and image numbers in sequence, using methods provided by the Image AI package. As soon as a motorcycle or a passenger is spotted, these will be kept as motorbike-1 as well as person-1. The information from these retrieved photos is saved in a database that may be utilized for reprocessing later.

2. DETECT HELMET

Whenever a link is formed of both a people and their motorcycle, the bounding images of that people are sent directly into the headgear classifier. Several of the detection methods produced by the hat detection phase were fraudulent claims or genuine positives, according to the data. As a result, the individual photo was reduced to only show the top being one the shot. This guarantees that false alarms situations are avoided, along with circumstances when the operator is retaining the helmets in his palm while racing or storing it on the motorbike so instead donning it..

4. ARCHITECTURE

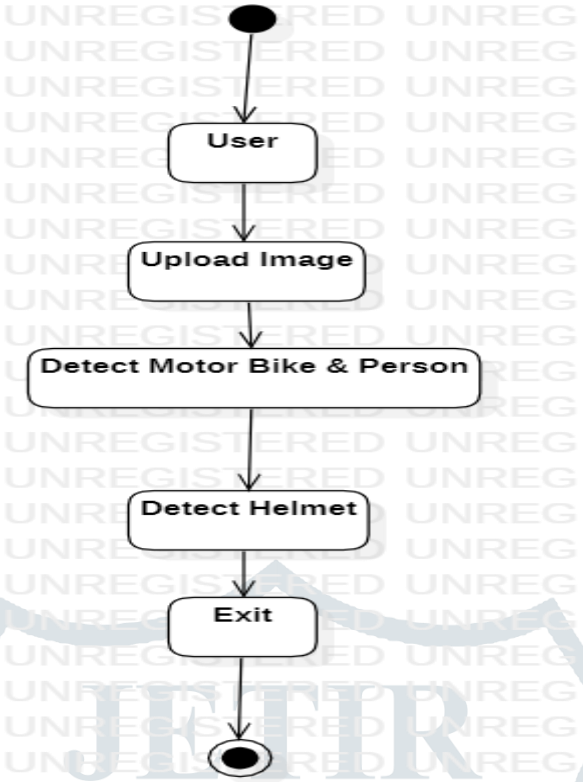
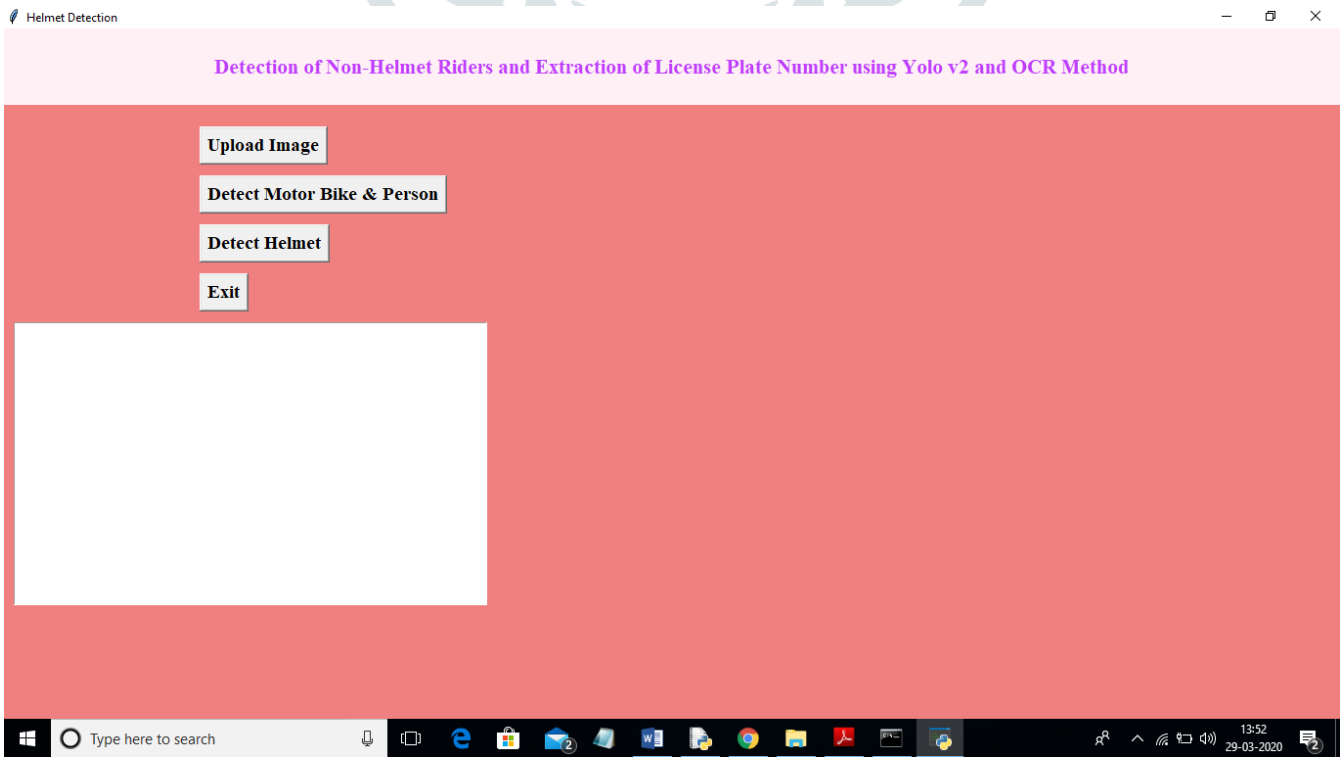


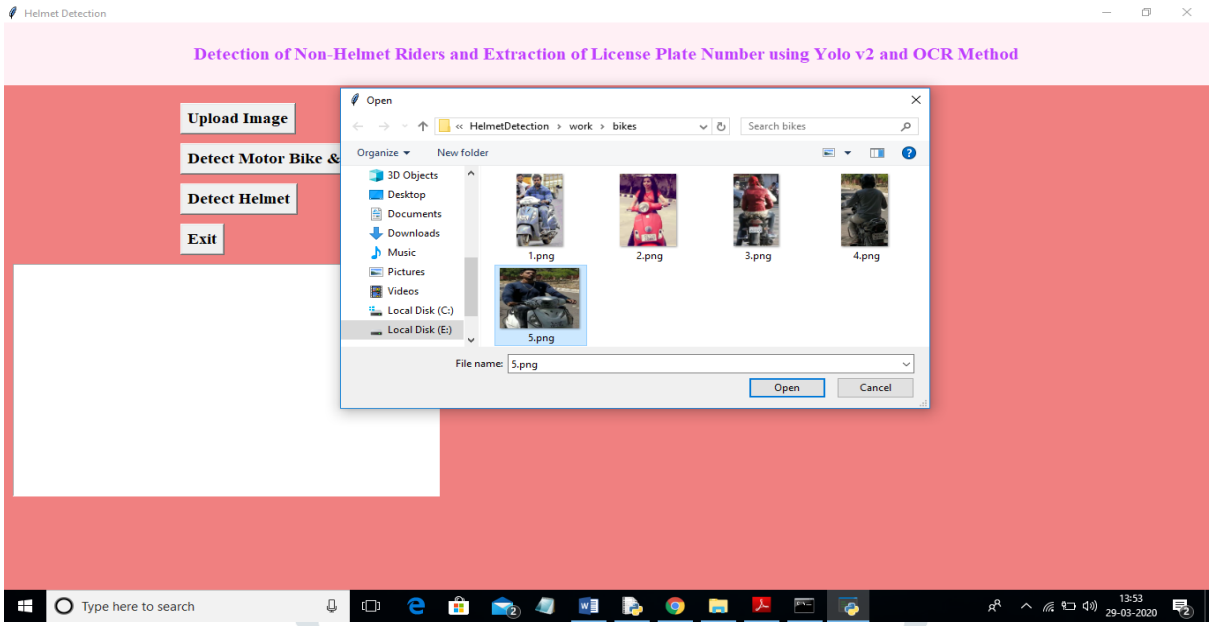
Fig 1: Flow diagram

5. RESULTS SCREEN SHOTS

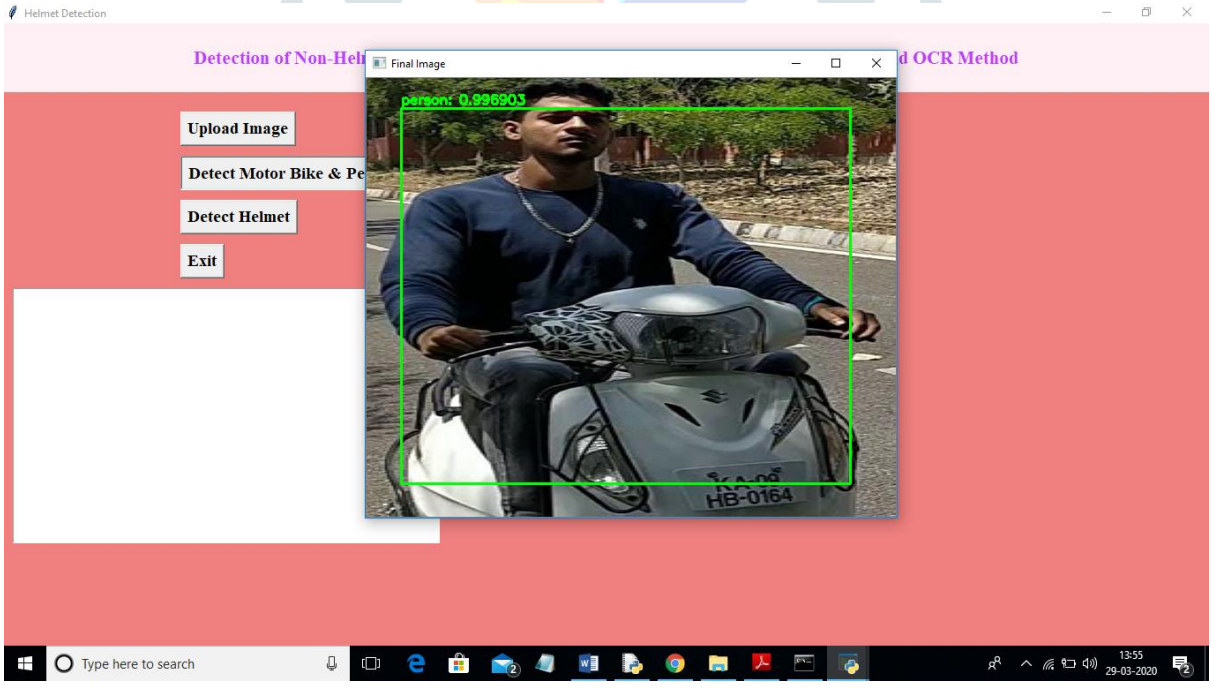
After setting path double click on 'run.bat' file to run project and to get below screen



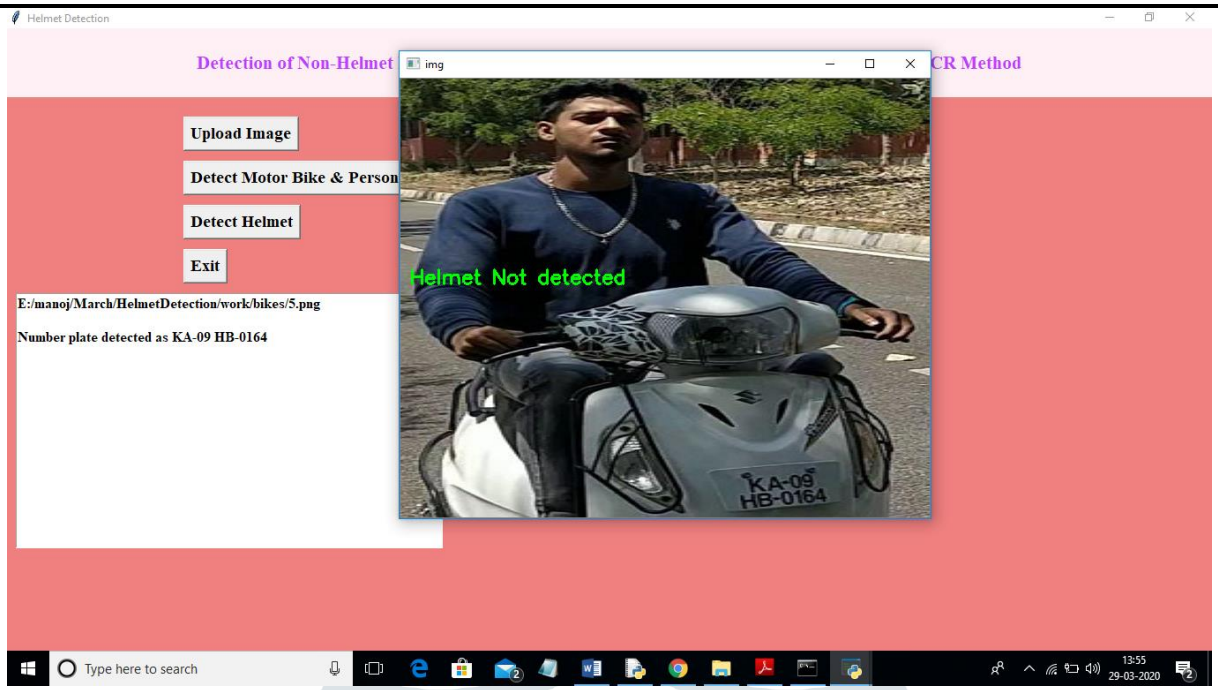
In above screen click on 'Upload Image' button and upload image



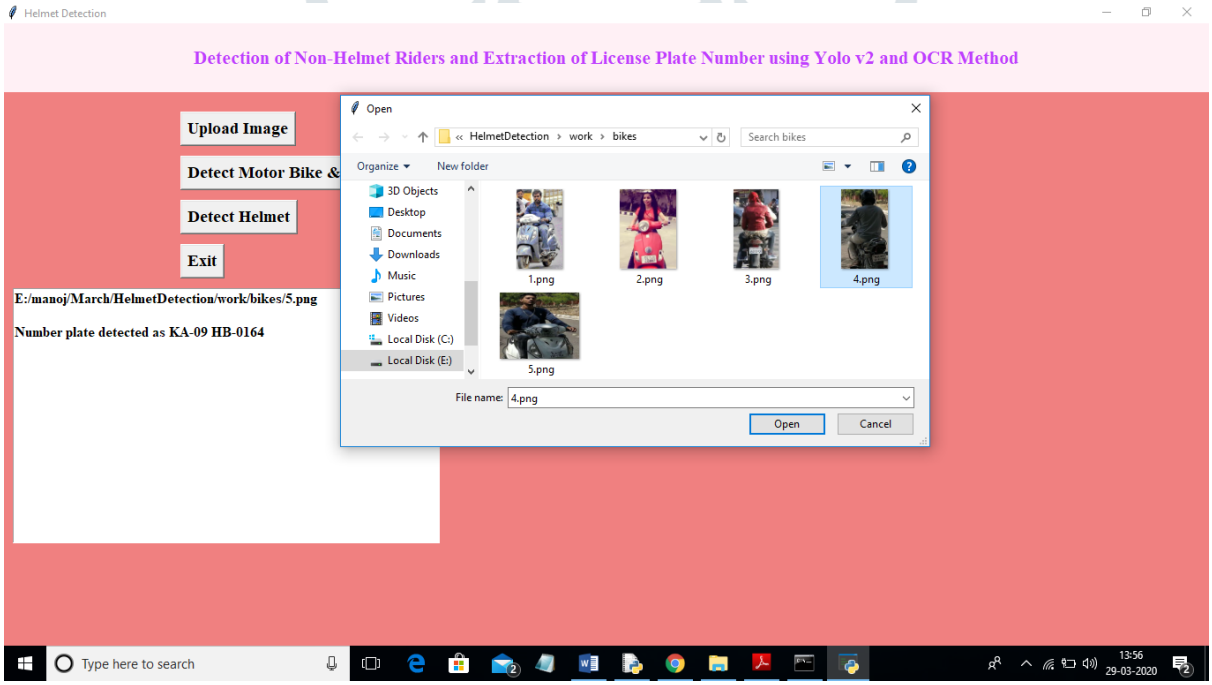
As we can see in the above page, an image is selected and the open button is loaded. Now click on 'Detect Motor Bike & Person' button to detect whether image contains person with motor bike or not



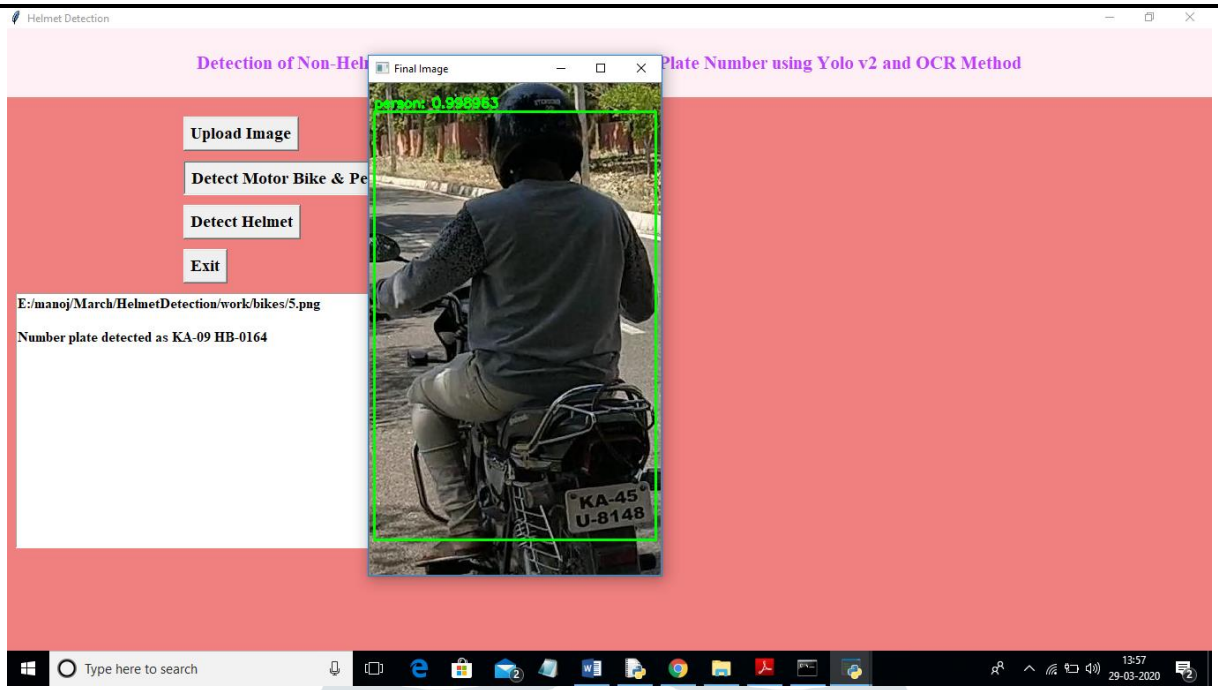
In the attached screen above, we can see that the selected image contains a motorbike, which is selected as a separate class, a person which is also considered as a separate class, and the detection process of weather that particular individual is determined to be wearing a headgear.



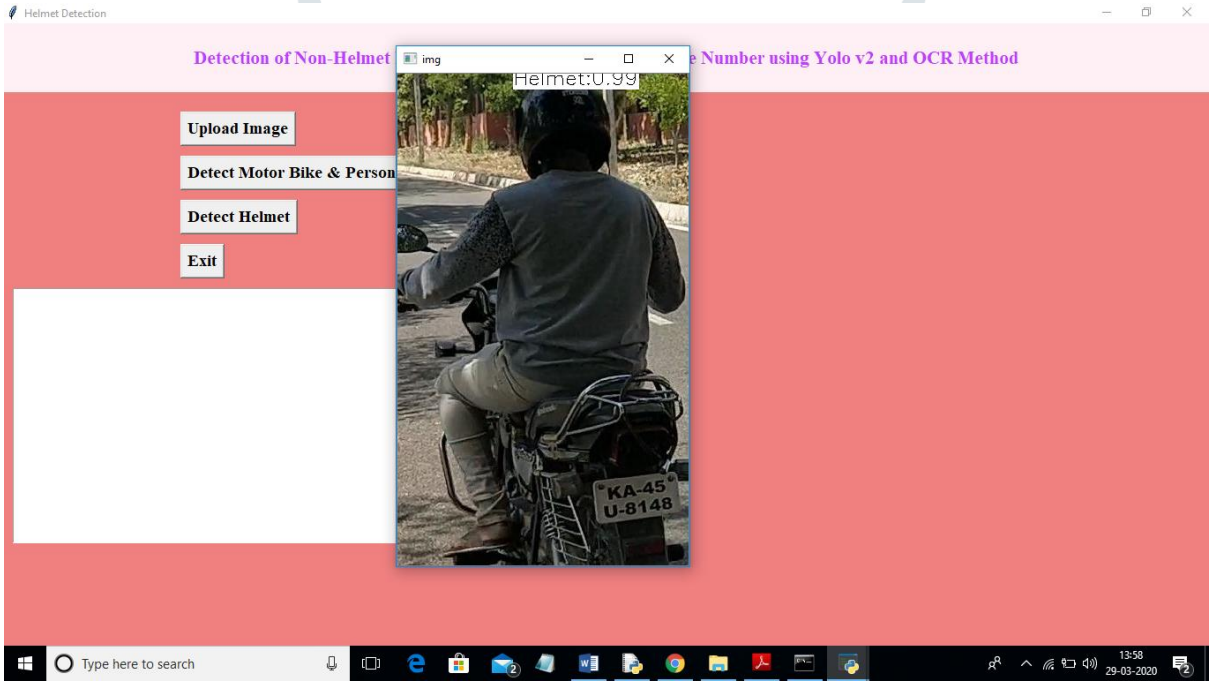
From the above window, the programmed detects that a passenger is just not wearing a vest and extracts an identification from the car to show in the alongside text space. Now we'll look at the helmet picture.



In above screen I am uploading 4.png which is wearing helmet and now click on 'Detect Motor Bike & Person' button to get below result



In above screen yolo detected person with motor bike and now click on 'Detect Helmet' button to get below result



In above screen application detected person is wearing helmet and that label is displaying around his head and application stop there itself and not scanning number plate.

Note: To apply this technique and collect number plates, we prepared a few photographs. If you just want to collect for new pics, email those new pictures to us, and we'll integrate them in the Yolo models to extract newer photographs license plates as well.

6. CONCLUSION

A video sequence is used as the input for an Our pas Riders Detection scheme. The license registration number of the motorbike is retrieved and shown if the motorcyclist rider with in video clip is not wearing a seatbelt during riding the bicycle. For motorbike, passenger, headgear, and license plate recognition, the image recognition concept and YOLO framework is applied. If the cyclist is not wearing a seatbelt, OCR is utilized to extract the license plate. Aren't just the letters taken, but the frames from which they will be retrieved as well, so that they can be utilized for other reasons. Every one of the problem or opportunity have been met properly.

Future Work:

Our project can be linked with the traffic cameras and with some modifications it can be used to detect helmets in the real time system. Furthermore, we can merge the algorithm of automated license plate detection and make a system which generates challans for those who don't wear helmets.

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