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ML BASED SURVILLIANCE SYSTEM FOR DETECTION OF BIKE RIDE WITHOUT HELMET

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ABSTRACT

In this research, we suggest a method for real-time, machine learning-based automatic helmet-less bike riders recognition. The suggested method uses a Raspberry Pi module and a USB camera to first identify the bike rider.This proposed project detected helmet present and not presented. Triple ride detected and alert all cases to secure the driver from accident.proposed model output hardware setup, in this we integrated input USB camera for capturing the head of the bike rider and output modules LCD monitor with help of HDMI to VGA cable , buzzer, Led indicator and dc motor all are integrated to the raspberry pi. USB camera automatically open check for helmet. We can find the helmet by using open cv and machine learning software. The car won't start and an LED will inform the user if no helmet is present. Vehicle ignition will start automatically if the user wears a helmet. We can also detect the triple riding the bike in this proposed approach. In the system under consideration, the proposed application is implemented using a USB camera, a Raspberry Pi 3B+, and an ignition motor.

Keywords: Raspberry Pi, LCD Monitor, Camera, OpenCV, Helmet detection, triple ride detection

1. INTRODUCTION

The number of motorcycle riders is rising daily in emerging nations like India, where it also contributes to an unprecedented rise in the number of motorcycle accidents nationwide. The project's major goal is to lower the number of motorbike fatalities on the road. Every motorcycle rider's safety has been jeopardized as a result of riders' ignorance of the law requiring them to wear helmets. This issue is resolved by the Intelligent System for Helmet Detection, which forbids the rider from making a decision because the vehicle's engine is controlled by a single channel relay that only closes when the rider's helmet is detected. If the helmet is not detected, an interactive LED display will warn the rider. If the warning message is disregarded, the rider will receive a strike. If the rider does not have a helmet, the system will display a warning message. After three such violations, the rider would be fined by the RTO server for breaking the law.Any car

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accident that takes place on a public route is considered a traffic accident. Two-wheeler accidents are on the rise and claim numerous lives each year. Our project's primary goal is to create a safety system that will lessen the likelihood of two-wheeler accidents. If an accident happens, no one is there to provide information to the parents or the paramedics. The three main applications that the smart helmet focuses on are useful in our daily lives. First and foremost, if we are not wearing a helmet, the motorbike will not start. Additionally, donning this smart helmet makes it impossible to drive when intoxicated. The bike won't start if the rider is intoxicated. Accident detection is the third application. If someone has an accident, no one comes to aid him; instead, they just walk away or ignore him. Informing an ambulance or family members by mobile in such a case can help save him to some extent. Brainy Helmet Vibration sensors are installed in several helmet locations where there is a higher chance of being hit and are connected to a raspberry pi using GSM and GPS technology for accident detection and reporting system. If an accident occurs, this system will quickly send an SMS with the accident's location to a phone number. The system will be set up so that a rider cannot start a two-wheeler without a helmet. An excellent alternative to the current inadvertent avoidance strategies is the Smart Helmet for Indian Bike Riders. These include high-tech helmets and an electrical system that may be integrated with two-wheeler mechanical systems to prevent road accidents by requiring the use of helmets. Many people have accidents in this age of rising traffic accidents. If the emergency services had been able to get the crash information in time, many lives might have been saved. As a result, effective automatic accident detection with automatic transmission of the accident location to the emergency services is essential to save the priceless human life. In order to address these issues, we are developing an intelligent system that ensures biker safety by mandating helmet use in accordance with government regulations, limits road accidents by detecting alcohol consumption, and can quickly notify an accident to a predetermined number. By utilizing this suggested approach, it automatically alerts the designated individual or ambulance in the event of an accident or any emergency conditions. This proposed project detected helmet present and not presented. Triple ride detected and alert all cases to secure the driver from accident.proposed model output hardware setup, in this we integrated input USB camera for capturing the head of the bike rider and output modules LCD monitor with help of HDMI to VGA cable , buzzer, Led indicator and dc motor all are integrated to the raspberry pi. USB camera automatically open check for helmet. If the bike rider have helmet it shows helmet detected and indicated with green LED and DC motor start runs to indicate vehicle is ready to move. If camera did not find Helmet it show that no Helmet detected and DC motor getting off to indicate bike ignition is getting off automatically.If camera did not find Helmet and find more than two faces it show that no Helmet detected and found triple ride DC motor getting off to indicate bike ignition is getting off automatically and buzzer getting on to alert.

2. LITERATURE SURVEY

The majority of Indians still travel on two wheels, which makes them the most accident-prone. 2014 marked the worst year on Indian

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roadways, with more than 16 people dying per hour on average. More than 1.41 lakh persons lost their lives in collisions, 3% more than in 2013. Nearly half of all fatalities in traffic accidents were caused by accidents involving two-wheelers. While 13,787 two-wheeler drivers perished in collisions, 23,529 additional victims perished in collisions involving these vehicles, and nearly 1.4 lakh individuals were injured. Over 40% of the fatalities occurred in the top five states: Uttar Pradesh, Tamil Nadu, Maharashtra, Karnataka, and Rajasthan. Among 53 megacities, Delhi reported the most fatalities with 2,199, followed by Chennai with 1,046. With 1,015 and 844 fatalities on city roads, respectively, Bhopal and Jaipur were third and fourth in the rankings [1, 2]. One sort of protective headgear worn by motorcyclists is a helmet. The primary goal of safety is to shield the rider's head from the force of an accident's impact. The ventilation system of the helmet protects the rider's head. The biggest causes of fatalities and injuries are speeding and not using a helmet. Here, we're putting into practice a model that makes use of a DC motor, relay, and Raspberry Pi and is connected to the motorcycle's ignition system in real time. Motorcycle riders are immediately detected by the system, which also assesses whether or not they are wearing safety helmets. Using the K-Nearest Neighbor (KNN) classifier, the system gathers information from moving items' region properties and categorizes them as motorcycles or other moving things. This paper explains and demonstrates an automatic approach for classifying motorbikes on public highways and a system for automatically identifying riders without helmets. For this, a hybrid descriptor based on the Hough Transform, Histograms of Oriented Gradients, and Local Binary Pattern descriptors is presented. Camera-generated traffic photos were used [4].. A smart helmet is a unique concept that increases motorcycle driving safety. GPS and GSM technology are used in its implementation. The vibration sensors that are attached to the microcontroller board are placed in various locations across the helmet where there is a higher chance of being hit. According to the report, this is because the helmets being worn lack safety elements like a helmet string and are not the right size. In order to encourage correct helmet use by motorbike riders, this project aims to introduce security measures. According to the project's name, Intelligent Safety Helmet for Motorcyclist, the motorcycle can move if there is an emission signal from the helmet using an RF transmitter and receiver circuit. The security system used in this project has all the qualities of an ideal rider, hence its use should be emphasized. The initiative is anticipated to increase security and lessen accidents, particularly those that are fatal to motorcyclists [8].

3. EXISTING SYSTEM

To prevent accidents and ensure driver safety, we used sensors-based smart helmet recognition. In order to get over this restriction, we used a machine learning-based approach to detect if drivers were wearing helmets to prevent accidents. The sensors may mistakenly identify all items as helmets, in which case the accuracy of the system is quite low.

4. PROPOSED SYSTEM

We are creating a haar cascade in our system to detect helmets using the Viola Jones algorithm.Then, using a continuous buffer stream format, our system will take the stream

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of images and en-rectangle the helmet it finds in that particular image.For proper helmet detection, the scale factor may need to be changed. Here is an illustration of how to identify a helmet. The suggested method of a Smart Helmet for Motorcyclists using Raspberry Pi and its modules, which will ensure that every Motorcyclist is Required to Possess a Helmet. Utilizing Python image processing, scan the object (helmet) with the Pi Camera module to confirm its presence.

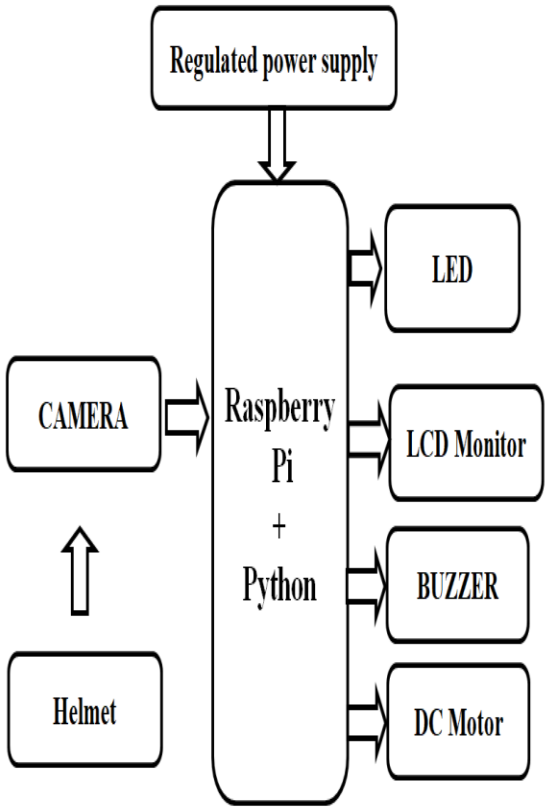

Fig.1.Block diagram

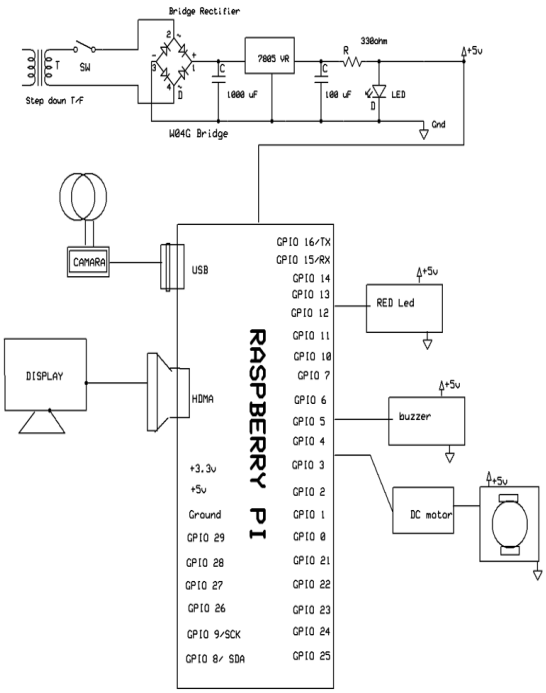

Fig.2. Schematic diagram

Working:

This proposed project detected helmet present and not presented. Triple ride detected and alert all cases to secure the driver from accident.proposed model output hardware setup, in this we integrated input USB camera for capturing the head of the bike rider and output modules LCD monitor with help of HDMI to VGA cable , buzzer, Led indicator and dc motor all are integrated to the raspberry pi. USB camera automatically open check for helmet. If the bike rider have helmet it shows helmet detected and indicated with green LED and DC motor start runs to indicate vehicle is ready to move. If camera did not find Helmet it show that no Helmet detected and DC motor getting off to indicate bike ignition is getting off automatically.If camera did not find Helmetfind more than two faces it show that no Helmet detected and found triple ride DC motor getting

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off to indicate bike ignition is getting off automatically and buzzer getting on to alert.

Here, a regulated 12 volt power source is used to switch on the circuit before being converted to 5 volts of direct current. Since the LED serves as a visual indicator for 5 volt current, it automatically illuminates in the presence of 5 volts. Every piece of hardware in the circuit receives the 5v dc current that is created.Here, we are putting into practice a model that makes use of a DC motor and is connected in real time to the motorcycle's ignition system.

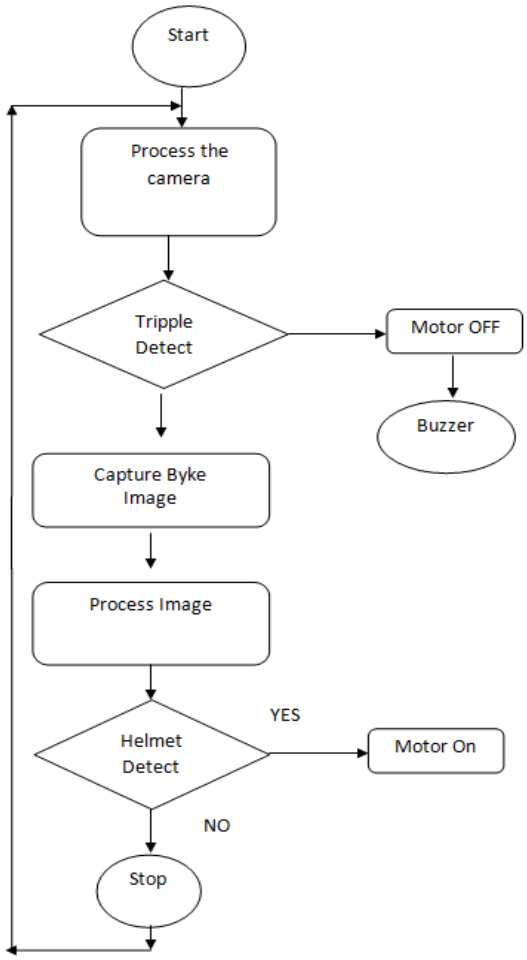

Fig.3.Flow diagram

In our suggested system, the DC Motor only operates when the rider is donning a helmet, which is determined using a Pi camera, which is then connected to a Raspberry Pi. The Raspberry Pi turns on when the user tries to start his motorbike, which then activates the Pi camera. The Pi camera begins to look for the Standard symbol. If a relay is found, it will be closed and a DC motor will turn on; otherwise, it will remain open and a DC motor will not turn on.

5. RESULTS

Here the proposed model output hardware setup, in this we integrated input USB camera for capturing the head of the bike rider and output modules LCD monitor with help of HDMI to VGA cable , buzzer, Led indicator and dc motor all are integrated to the raspberry pi processor.

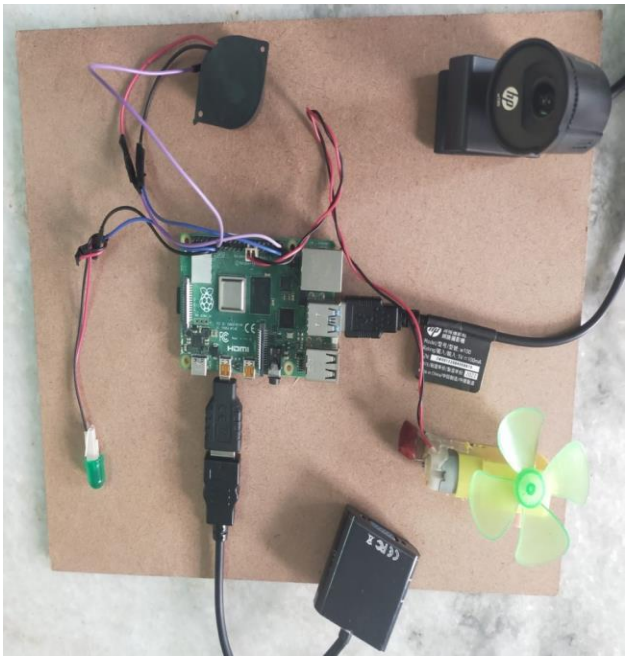

Fig.4. Proposed Output model

Helmet detection python application will run in LXT command terminal. Then USB camera automatically open check for helmet. If the bike

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rider have helmet it shows helmet detected and indicated with green LED and DC motor start runs to indicate vehicle is ready to move. If camera did not find Helmet it show that no Helmet detected and DC motor getting off to indicate bike ignition is getting off automatically.

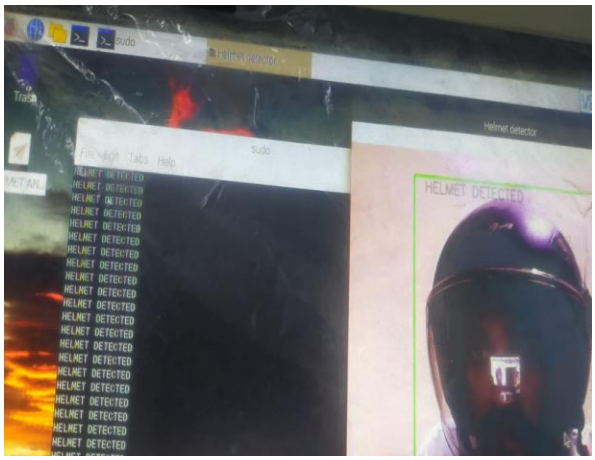

Fig.5. LCD monitorsHelmet detection

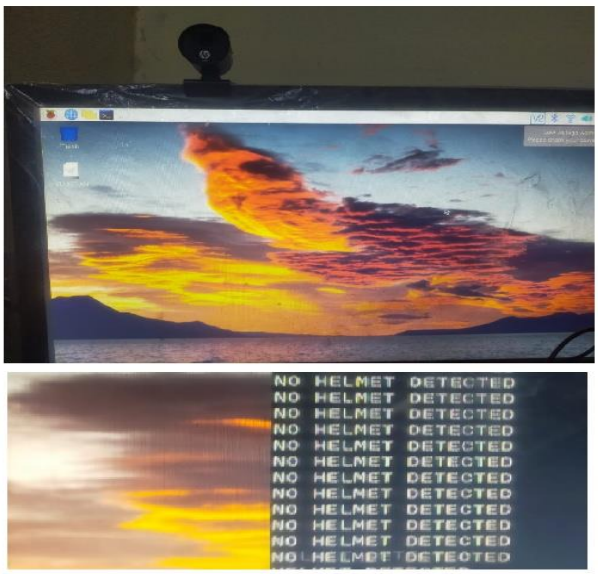

Fig.6. LCD Monitor No Helmet detection

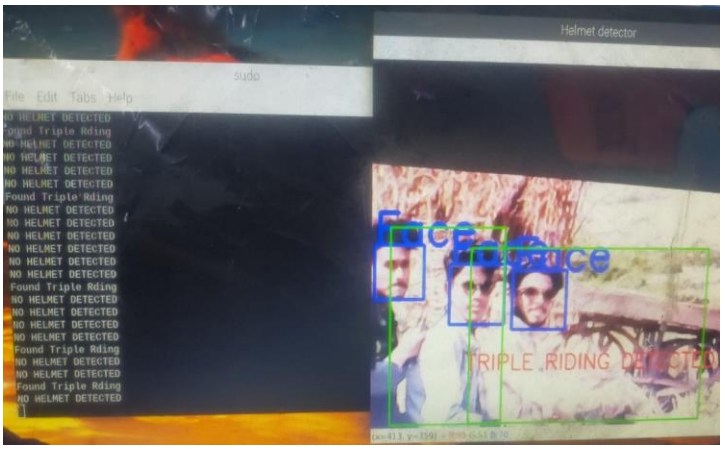

Fig.7. LCD Monitor triple ride detection

The USB camera open and check for helmet and faces. If camera did not find Helmetanf find more than two faces it show that no Helmet detected and found triple ride DC motor getting off to indicate bike ignition is getting off automatically and buzzer getting on to alert.

6. CONCLUSION

The target audience for this project is a motorcyclist that is concerned with their safety while riding. As we all know, motorbike riders are no longer as concerned with their safety when riding, thus the development of this helmet could enhance rates of safety and decrease rates of traffic accidents. The number of motorcycle accidents is rising every year. This proposed project detected helmet present and not presented. Triple ride detected and alert all cases to secure the driver from accident. A Smart Helmet for Motorcyclist using Raspberry Pi and openCV will lead to safety features for motorcycles in the future.

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