Real Time Vehicle Surveillance for Safe Drive and Theft Control

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Abstract - **Technology today is no slower than data. Modern world is smart at very minute aspects. Concentrating on Indian cities and village one of the major societal issues is theft. Concentrating on vehicle theft, we observed the real time application that can provide safety against vehicle theft and ease drive. The real-time vehicle surveillance and theft control is one of the major real-time applications, but we have designed using Raspberry pi-3. Electronics is one of the fuels that is running the technology; electronic sensors like MQ3 alcohol sensor, relay, LCD display, Raspberry pi camera module are some of the major components involved in our project. Camera module provides real-time surveillance identifying the thief and the theft with quick process to capture the pictures of thief and notify the owner alerting about the theft. It also saves the image captured in the owner's fire cloud and also in the SD card for further actions to take place legally. The alcohol sensor (MQ3) is another safety measures in addition to maintain owner safety. It measures the level of alcohol content through the odor and turns the ignition off, not letting the drunk person drive and thus avoids accidents following the traffic rules and regulation. The LCD display is used to provide the display off the amount of alcohol level. The entire application is coded by designing the appropriate algorithms and thus enabling our project work at its best providing safe drive and real-time surveillance avoiding theft control.**

Index Terms - **Raspberry PI-3; Surveillance Camera; MQ3 Sensor; Ignition Off; LCD Display; GSM Module; GPS Module.**

1.INTRODUCTION

In today's world, the movement of people from one place to another is important, inevitable and vehicles are viable means of transportation to support such mobility. However, often time, drivers of these vehicles failed to understand that life on the road is quite different from the one at their homes, especially when alcohol has been consumed. This is because driving under the influence of alcohol leads to decline of perception, recognition, and even vehicle control which results to unanticipated traffic crash on roads. Today, drink driving has been considered as one of the leading causes of traffic accidents globally. In addition to drink-driving, over-speeding or exceeding the speed limit on the road is also a serious cause of injury and death on the roads. Over-speeding are carried out by reckless drivers mostly influenced by alcohol, drugs and other factors. Despite several interventions by the government, over-speeding still remains a great concern. Currently, over speeding on roads is checked by the installation of motion cameras on major roads and by traffic officers snapping speeding drivers using video motion cameras.

The use of cars becomes important everywhere in the world and also protecting it from theft is required. Automobile manufacturers are attaining the security features of their Vehicles by introducing advanced embedded and automated technologies to avoid thefts particularly in the case of cars. Usually, Biometric and nonbiometric methods provide this type of security features. But sometimes these system fails due to password hacks and encryption of decrypted data, thus we are approaching these smart hidden vehicle safety device it will be more effective in real time[1]. The main aim of this paper is to offer an advanced security system in automotive, which consists of a face detection system, a Wi-Fi module, and an IoT control platform. The face recognition system bases an optimized algorithm and recognizes faces in vehicles especially four wheelers during which nobody should be in the car and make an alarm loudly. Security in today's world has also become the most advanced

because of technology. In preventing thefts, for instance, various types of security systems have been developed. There are CCTVs (Closed-circuit Television) which can be found in every commercial establishment because of their high effectivity and low expensive in protecting and solving crimes, burglar alarms used by commercial establishments which help protect burglary thefts unauthorized access by setting off a loud alarm, button alarms which automatically alert the nearest police station that crime was attempted or is currently taking place, and many More. There are also different kinds of authentication that are used to increase security Features in different kinds of devices such as biometrics, non-biometrics, fingerprint, retinal, iris, and face recognition. Among the types of security features mentioned, face recognition is the most sophisticated and secured[1]. There are many anti-theft systems ready to be drawn in the complete market. However, the price camp on the doorstep of such an anti-theft system is low expensive. In this business, we confirm a prototype of a real anticipates antitheft system which can be doubtless implemented by ehicle owners everywhere. This system uses a Raspberry pi and GSM services.

This "REAL TIME VEHICLE SURVEILLANCE FOR SAFE

FRIVE AND THEFT CONTROL" using Raspberry Pi, MQ3 sensor, Surveillance camera, GPS, GSM, LCD display.

Incorporated for vehicles aiming public safety and thus leading safe society.

1.1 Existing System

With the rapid advancement of IT technology, a number of video surveillance and security purpose in daily life. As a typical example, closed-circuit television (CCTV), also known as video surveillance, uses cameras to transmit video signals to a limited set of monitors. When CCTV was first introduced, its poor quality and significant installation costs limited its applicability. Recently, because of improved definition, better distribution rates, and various basic functions of CCTV, more diverse application have become easily implemented. Another popular example is the dashboard camera, car DVR or car black box, that is one or a pair of onboard cameras that continuously record the view through the windscreen. Dashboard cameras can provide video evidence in the event of a road accident or vandalism.

1.2 Proposed System

The target of this project is to give an idea and inventive method for avoiding drunken driving of a Motorcar by locking the car. Likewise, to permit a man who is not alcoholic to drive a same Motorcar. Real time solutions are extremely important that can overcome problem in day-today activities in the society. So that the vital role of this project is to prevent vehicle theft and drink driving detector. This is achieved by sending an SMS which is generated automatically and even it helps to control the vehicle in case the driver has consumed the alcohol. Drunk driving is the reason behind most of the deaths, so the Drunk Driving Detection with Car Ignition Locking Using Raspberry Pi aims to change that with automated, transparent, noninvasive alcohol safety check in vehicles. The system uses raspberry pi with alcohol sensors and LCD display circuit to achieve this purpose. System constantly monitors the sensitivity of alcohol sensor for drunk driver detection. If driver is drunk, the processor instantly stops the system ignition by stopping the motor. If alcohol sensor is not giving high alcohol intensity signals, system lets engine run. The raspberry pi processor constantly processes the alcohol sensor data to check drunk driving and operates a lock on the vehicle engine accordingly. At the same time, it is connected to a network from where the person who is driving id being monitored and if any necessity of help will be provided to him by the caretaker who will get the alert on the monitoring webpage automatically.

2. METHODOLOGY

The smart surveillance framework has been structured so that Vehicle theft detection device is the need of the hour and a compact, efficient and cheap device can be made using Raspberry pi. To avoid theft of vehicles as it provides snap shots of culprit to mobile linked and alcohol sensor will lock the ignition after detecting the alcohol beyond the limit. A powerful product can eventually be made out of this system. Finally, this project helps many lives on road and also helps to secure our vehicle. And moreover, drink drive cases can also be reduced. This project makes life easier and helps people in or the other way. We can improve the accuracy by increasing the cost of the components. Later on, we can include Face detection in our present framework, live video gushing can be included

according to client prerequisite, power-sharing mode or a rest mode can likewise be included. Aside from that as it is a security framework, we can likewise include a gas sensor or smoke identification sensor to give extra alarms. The entire system can be integrated with an android app and the relevant data can be stored in a database so that it might more easily be accessible to the user. Finally, this project helps many lives on road and also helps to secure our vehicle. And moreover, drink drive cases can also be reduced. This project makes life easier and helps people in one or the other way.
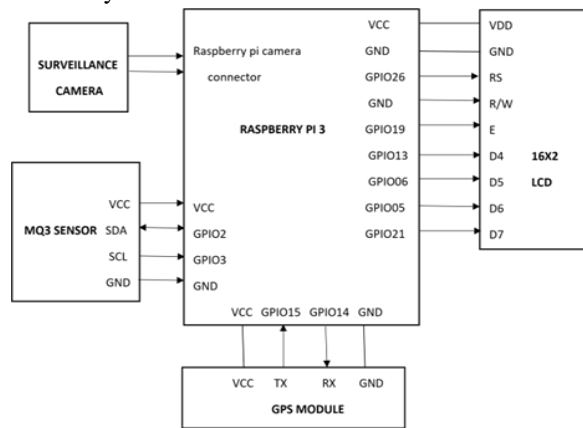

Fig 2.1 Block Diagram

This system is developed to perceive the close of alcohol percentage in the body of a person who is driving vehicles. This system helps to avoid accidents occurring due to drunk and driving. In this project we are dealing with two problem cases -

CASE1 Vehicle theft is one of the major issues which has become daily routine in big cities metropoles of India. Tedious job for the police is to identify the robbery and find out the thief. Many a times it is hard to overcome crimes too.

CASE2 Drink and drive is also a common issue among traffic facts these days leading to major accidents due to driver drowsiness. To overcome these issues technology has come up with discoveries like alcohol detectors, but these yet are unable to solve the issue. The proposed system is going to identify whether the person is in drunken state or not and it automatically control the vehicle.

3. FLOW CHART

3.1 Facial recognition flowchart:.

A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, works by pinpointing and measuring facial features from a given image. This system can be used to reduce the increased vehicle theft and allows the owner to identify the intruder thereby having the vehicle under his/her control. The results obtained through the face recognition shows that it can be relied upon to ensure safety of vehicle.

The acquired image is processed to detect the face using the algorithm which effectively uses cascade object detection. Cascade detector detects acquire an image and extracts the face region from the acquired image. The face recognition system has stored the images of the face of an authorized person in a different environment. The face images are enhanced by normalizing them to remove the unwanted detailing due to illumination constraints while acquiring the image and are stored in the database. Now the face recognition task must be performed with the detected face and image stored in the database.
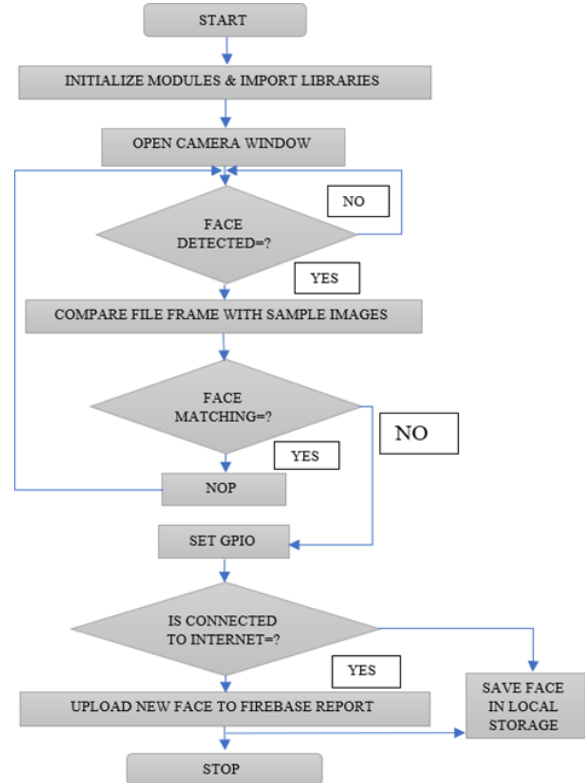

Face recognition can be performed by different algorithms in OpenCV such as feature-based face recognition algorithm or model-based algorithm.

Mostly feature-based algorithm used in real-time security systems. Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) algorithms are efficient in terms of extracting the features to perform recognition. Both algorithms compared are the same in decrement to feature base algorithm, but Linear Discriminant Analysis (LDA) outperforms Principal Component Analysis (PCA) algorithm when large training sets are involved in recognition. LDA Also discriminates most of the present information in images efficiently by computing intraclass and inter-class scattered matrix. Using the databased stored images it performs the LDA and recognizes the difference between normalized images stored in the database and detected images. LDA performs the authorization of the image and gives further signals to the system. Since we have successfully detected the person using open CV and python IDE software-based image processing algorithm.

3.2 ESP32 flowchart:

The detected analog voltage values are read by the esp32. The system will link input voltages from 0-5V with values from 0-1023V to generate 5Vs for every 1024 units. The system will process the analog signal and convert it to digital value of 0 or 1. Also, the analog values from the alcohol sensor will be scaled to percentage, and this percentage is equivalent to the analog voltage values in ppm (part per million). The first condition is the intoxication stage; the second condition is the slightly drunk stage and the last stage is drunkenness stage.
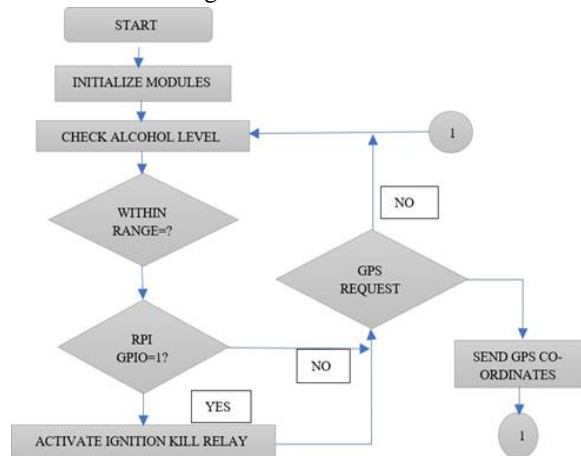
Each stage will be a condition to perform a task based on the level of alcohol. In the intoxication stage, the LED indicator will be activated only, the alarm will be OFF and the car engine will be ON. In stage two, the alarm and the green LED indicator will be ON, as well as the car engine. Finally, the driver is mentally and physically inactive in stage three, so the engine will be OFF while the alarm and red LED will be ON. Therefore, once the system detect alcohol in stage three the car will be stopped and the driver can park by the roadside.

4.RESULTS

Here we implemented an RPI camera and for detection and recognition of authorized and unauthorized persons using Open CV and python IDE. The face is detected by a cascade face detector in the acquired images. The result proves that the computer vision-based algorithm is reliable for protecting the vehicle from the modern improve theft techniques. Drunk driving and alcohol detection with alert system have successfully been completed as per requirements. The system runs perfectly in detecting the presence of alcohol in the driver's breath This system is then fixed in a car prototype which shows how it works if implemented in the car. This system can be further modified for better improvement in future. The limitation can be overcome by using more precise and advanced software to be implemented in the steering. Besides that, rather than sending text messages to authority, it is best to send the location to a system base or web server for car tracking. As such a cloud base data must be created so that it is easier for authorized person to trace the location of car for monitoring purposes.
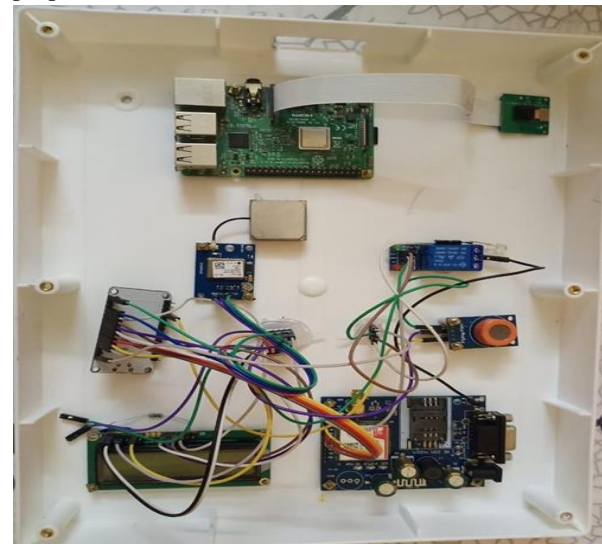
Fig 3.1 Final Result

5 CONCLUSION

The smart surveillance framework has been structured so that Vehicle theft detection device is the need of the hour and a compact, efficient and cheap device can be made using Raspberry pi. To avoid theft of vehicles as it provides snap shots of culprit to mobile linked and alcohol sensor will lock the ignition after detecting the alcohol beyond the limit. A powerful product can eventually be made out of this system. Finally, this project helps many lives on road and also helps to secure our vehicle. And moreover, drink drive cases can also be reduced. This project makes life easier and helps people in or the other way. We can improve the accuracy by increasing the cost of the components. Later on, we can include Face detection in our present framework, live video gushing can be included according to client prerequisite, power-sharing mode or a rest mode can likewise be included. Aside from that as it is a security framework, we can likewise include a gas sensor or smoke identification sensor to give extra alarms. The entire system can be integrated with an android app and the relevant data can be stored in a database so that it might more easily be accessible to the user. Another thing which makes it unique is all the major components like Raspberry Pi 3, GSM and camera module are all programmed and interfaced together within a compact size. As we know each of these components have their own advantage, so together they provide a full security package by making it easy for the user to control it. In future, data analytics and visualization can be used for effective monitoring and management of IoT devices for even better vehicle security on a cost effective basis.

Finally, this project helps many life's on road and also helps to secure our vehicle. And moreover drink drive cases can also be reduced. This project makes life easier and helps people

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