



# SMART VEHICLE SECURITY SYSTEM USING RASPBERRY PI

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**ABSTRACT** In this project a facial recognition application for automatic vehicle ignition is developed. This application is built using a Raspberry Pi as the hardware platform and the OpenCV library for computer vision as the software component. This study examines the various approaches to face recognition as well as the various approaches to automobile security. This application's primary objective is to improve the vehicle's security system so that only registered users can ignite the vehicle. To achieve this goal three main processes are carried out, face detection, data gathering, and training the system to grant access through face recognition.

## I.INTRODUCTION

Thefts of automobiles are on the rise, and in an effort to protect consumers and automobiles alike, manufacturers are embedding cutting-edge technology into their products. The security system involves the key, which provides the basic process of how it identifies the user. There are two types of technics like Biometric and non-biometric, in non-biometric system it uses a serial

number such as personal ID and passwords to identify a person where the non-biometric ID will be forgotten,

taken and stolen by the third person, then that will block the user verification and validity of ID users. Because they can identify a person with minimal requirements, biometric systems provide more accurate security. A biometric based system allows the different stages of verification like, “who you claim to be” based on “who you are”, “what you have” (keys), or “what you know” (password). This will enhance the security of the overall system and improves the accuracy level and speed of automobile identification. The objective of the advanced security access system was to demonstrate facial recognition methods that could replace or enhance conventional key vehicle ignition systems. The current biometric system, which uses a person's iris, fingerprint, voice, and palm geometry for identification [2], is relatively complicated and only applicable to users. In FRS system camera captures the users face from distance using high resolution camera. Consequently, the FR can contribute recommended security in comparison to other biometric systems currently in use. The face will be detected using the face detection process of an image, which is resolved by the skin color composition as claimed by Singh etc. the experiment is carried out and it shows the HSV color space situate on the skin color extracted to provide superior performance to filter the image of the face captured by the camera YCbCr, wHSV color spaces

are generally used. Where is it in the T? Acharya and A. Ray, discusses the different 99 color 99 spaces and it is critical thresholds used for the human skin detection. As in the surveyed, the commonly used skin color detections are RGB, YCbCr, HSV, HSI and TSL, Hence the combinations of HSV9and8YCbCr color space provides the high accurate results for the detection of skin colour. From the reviewed literature the thresholds are identified for the segmentation of Asian skin colour to have constraints. To optimum the choice of thresholds, combined color spaces are used and their results is found encouraging for the real-time applications to overcome these constraints. Eigen face is the most evaluated approaches in face recognition and representation system. To represent the pictures of faces more precisely, CCN algorithm is used. The weights of the each face is obtained by determining and projecting the reference image onto the Eigen face. The images have a lot of background space, and the results are affected by the background. As the references explains the robust performance of the system under various lighting conditions by the noteworthy correlation between images with changes in illumination. For moderate recognition success, the correlation between images of the entire face is insufficient. Then consider the face focus algorithm which refrains the content of an image within the face, eliminating the background. The Classification of face PCAR algorithm consists of CD Euclidean-Norm classifier is to generate precise results provided the number.

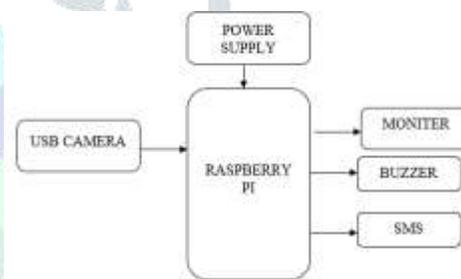
## II.EXISTING SYSTEM:

Nowadays, conventional security systems such as key, code pin, ID card, are very popular in many countries. However, the conventional security system has potential to be lost, stolen, or duplicated by someone [6, 7]. Furthermore, many of the traffic accidents occur mostly due to young vehicle drivers and theft due to vehicle security system .In non-biometric system it uses a serial number such as personal ID and passwords to identify a person where the non-biometric ID will be forgotten, taken and stolen by the third person, then that will block the user verification and validity of ID users.

## III. PROPOSED SYSTEM:

In this work, the method of biometric identification as access to vehicles, will be used as a tool that can provide security and as the driver's profile. The facial recognition system will be used as authorized by means of camera users installed on the system. The proposed system will then decide whether the person is an authorized person or unauthorized ones. Furthermore, an intelligent systems approach is used to develop an authorized person model based on their face.

### BLOCK DIAGRAM:



## IV.MODULE DESCRIPTION:

### A.Raspberry Pi 4:

The most recent addition to the well-liked Raspberry Pi computer line is the Raspberry Pi 4 Model B. It offers ground-breaking increases in processor speed, multimedia performance, memory; and connectivity compared to the prior-generation Raspberry Pi 3 Model B+ while retaining backward compatibility and similar power consumption. Raspberry Pi 4 Model B offers desktop performance comparable to that of entry-level x86 PC systems for the end user. Pi 4 B is upgraded with Latest High-Performance Quad-Core 64-bit Broadcom 2711, Cortex A72 processor clocked at 1.5GHz speed. which is intended to provide 90 percent more performance or use 20 percent less power than the previous version. Hardware upgrade on Pi4 developed for faster performance not only the loading time with all-new 1GB/2GB and 4GB LPDDR4 SDRAM variants but also in connectivity with Dual-band 2.4GHz and 5GHz, 802.11 b/g/n/ac wireless LAN and PoE capability via a separate PoE HAT.



Fig 1:Raspberry pi 4

## B.USB CAMERA

A camera is an optical instrument that records images that can be stored directly, transmitted to another location, or both. These images may be still photographs or moving images such as videos or movies.

The term camera comes from the word camera obscura (Latin for "dark chamber"), an early mechanism for projecting images.

The modern camera evolved from the camera obscura. The functioning of the camera is very similar to the functioning of the human eye.



Fig 2 : USB Camera

## V.RESULTS:

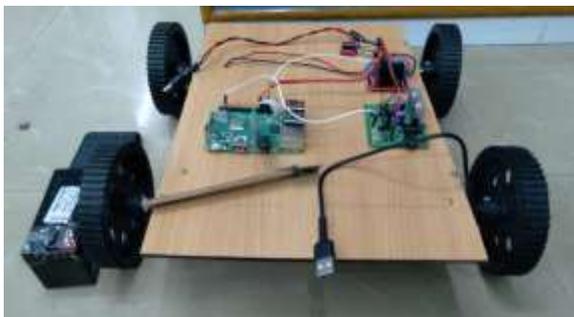


Fig 3:Hardware Implementation

## VI.CONCLUSION

By providing the vehicle with custom-programmed functions, we are able to enhance and maintain the vehicle's safety using this particular system. If any

unauthorized user tries to use or steal the car the central controller will stop its working immediately and appropriate SMS will be sent to the authorized user through a SMS API.

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