Vehicle Security System Using IoT Application

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Abstract— In this 21st century, there's a rapid increase in the number of vehicles so that the number of car theft attempts also increases, locally and internationally. With the invention of strong stealing techniques, owners are in fear of having their vehicles being stolen from the common parking lot or from outside their home. In this proposed vehicle security system face detection system (FDS) is used to detect the face of the driver and compare it with the predefined face. Real-time vehicle security system supported computer vision provides an answer to the present problem. The proposed vehicle security system performs image processing based on real-time user authentication using face detection and recognition techniques. As the person enters the parked car to the driver's seat of the vehicle activates the hidden camera fixed in an appropriate position inside the vehicle. As soon as the image is acquired from the activated camera, the face of the person is detected. The extracted face is recognized using the LBPH. If the face of the person is detected as unknown then this integrated system will be sent the image of the person to the device of the owner via mail and the ignition system remains lock. When there will be authenticated person will seat on the driver sit then this ignition will unlock.

Indexed Terms- Open CV, Raspberry pi, Image Processing, Car Protection system, Ignition Lock

I. INTRODUCTION

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 wifi module, and an IoT control platform. The face recognition system bases an optimized algorithm and recognizes faces in vehicles especially fourwheelers 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 vehicle owners everywhere. This system uses a Microcontroller and GSM services.

II.   LITERATURE REVIEW

[1]Vishal Vitthal Dhamdhere and Professor Nanda have proposed a paper where they present an anti-theft monitoring system for vehicles based on IoT. It lets owners know the location of their vehicles in real time. Even though vehicles today are intelligent, unfortunately, vehicles are facing a great many crimes. This paper outlines the proposal for building vehicle security and warning device using an IoT-based authentication system. The proposed IoT framework offers only full access for the authorized drivers based on the Raspberry PI model 3B development board, USB Camera, and smartphone interface. Therefore, here the proposed device identifies the unauthorized person inside the vehicle. The device will inform the car's owner where the car is and where it is going.

[2]Kosalendra Eethamakula, Leema G, and Muni Vara Prasad K have proposed a work to provide a vehicle security system using a facial recognition system and control vehicles from anywhere by giving ignition to the engine. This introduced theft control methods that enhanced intelligent automobile security can use to supply essential functionalities. This project helps reduce the complexity and improves security; this system is also more affordable and intelligent than previous models. According to the anticipated outcomes, it takes around 6 seconds to detect and recognize a JPG image in Raspberry PI. For real-time facial detection, it seems too long. Compared to other systems already in use, the paper provides more solutions with accurate outcomes.

[3] Arihant Kumar Jain, Richa Sharma, and Anima Sharma have proposed a system compared to traditional security systems requiring a key, password, and ID card to access the system. But this system has drawbacks, like it can be forgotten or stolen from other unauthorized persons. As a result, there is a need to develop a system that guarantees higher-level security. So, they develop a face recognition and detection system that is more costeffective, simple, and has higher accuracy. In this work, they used BCM 2835 processor, commonly known as the Raspberry PI board. It is a RISC processor based on ARM11. The board has features like a USB camera interface and support for many libraries. Using this system, they

have developed a security system that is cost-effective and accurate.

[4] Ishita Gupta and Varsha Patil think the information age is quickly revolutionizing; consequently, a more rapid, effective, and precise vehicle user identification and authentication method are required. Nowadays, Face recognition has become a crucial skill for user identification methods. The project has interfaced an LCD and camera to the Raspberry PI board. They created a realtime program that assesses the scans against the Raspberry PI's recorded data. Where the name of the person who was spotted is shown on the LCD, and whether or not the face is recognized, they will have access.

III.   METHODOLOGY

The extendable real-time car security system comprises the protection of vehicles parked in parking with the help of an integrated unit of computer vision with a high-end Microprocessor. Face detection and recognition system use enhanced algorithms for authentication.Here we are using the latest raspberry pi3 Model B+ with a 64-bit 1.4GHz Quad-core Processor, with 1GB RAM. We have deployed a Pi camera with the proper interfacing of RPI Camera Raspberry pi. When any person will enter in a car the system will passively active by the action of the opening door. And the camera will be activated. The camera deployed in the car in front of the appropriate driver seat will acquire the image of a person's face seating on the driver seat. Once the image of the person is acquired, the system now tries to detect the face.
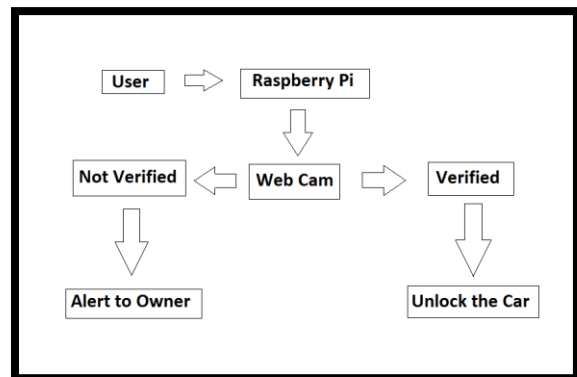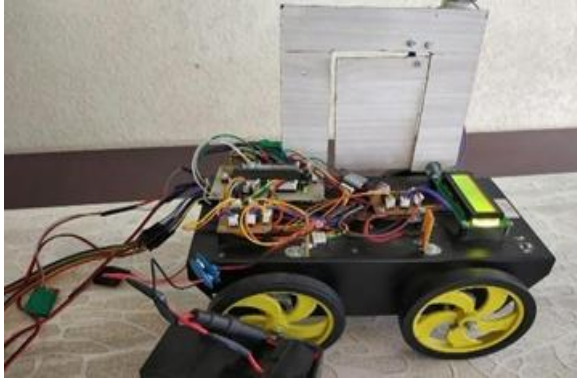

Fig: 1 Proposed Work

Fig. 2 Car Prototype

Fig: 3 Web Cam

IV. RESULT AND ANALYSIS

In this project, we have implemented a prototype which represents a Car. It consists of a web cam. It detects the face of the user When face is detected, it creates a green bounding box around it.It Verifies the images of the user If the user is authorized, access is given.
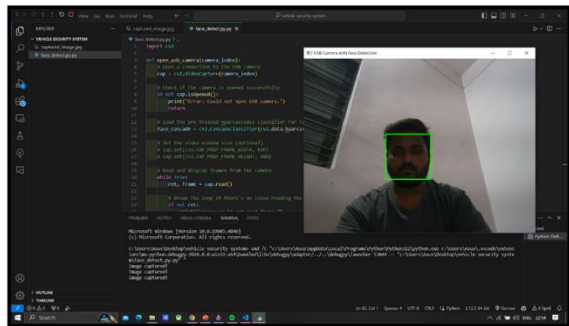

Fig: 4 Image verified

If intrusion is detected, then through IR sensor a command is send to the controller and then controller send command to Dashboard (dashboard side mobile)

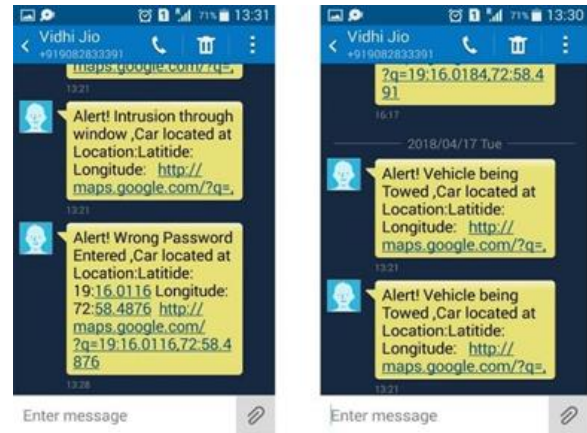through Bluetooth module then dashboard side mobile send information to user through SMS.

Fig: 5 Alert Message on user's mobile.

CONCLUSION

From these we implement theft control techniques that will provide the important functions required by advanced intelligent car security, to avoid theft and protect the usage of unauthenticated users. Secured and safe environment system for automobile users and also key points for the investigators can easily determine the hijacked image.

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