REAL TIME APPLICATION FOR VEHICLE ANTI-THEFT DETECTION AND PROTECTION WITH SHOCK USING FACIAL RECOGNITION AND IOT NOTIFICATION

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Abstract:

Now-a-days number of vehicles can be seen on roads. Most people in this modern age prefer to have at least one vehicle for themselves or their family. With the invention of strong stealing techniques, owners are in fear of having their vehicles being stolen from common parking lot or from outside their home. Face Recognition concept is one of the successful and important applications of image analysis. It's a holistic approach towards the technology and has potential applications in various areas such as Biometrics, Information society, Smart cards, Access control etc. This concept of facial recognition can be used for vehicle security as well. The use of vehicle is must for everyone. At the same time, protection from theft is also very important. Prevention of vehicle theft can be done remotely by an authorized person. This can be done by recognizing the face of the authorized person to unlock the engines. In case of any theft, the system will not let the engines start and it will send a Mail in the pre-installed system of the vehicle. The main advantage of the application is the wider range of transmission and reception over the internet which will help to notify the authorized person being anywhere in the world.

Keywords: Raspberry Pi, Camera, Surveillance Face Recognition.

Introduction:

To ensure security of a vehicle to a greater extent, the system in the vehicle has to be upgraded technologically. At present, people are buying vehicles that are technologically futuristic with more options for comfort and safety. For once, comfort of the vehicle can be put hold but when it comes to safety then it becomes a crucial factor for the buyer/owner of the vehicle. Safety of the vehicles is challenged when it is tried to be stolen in absence of the owner and that is why many companies and technicians are trying to implement new techniques to conquer the theft of vehicles getting stolen from parking spots of public areas.

The use of vehicle becomes important everywhere in the world and also preventing it from theft is required. Vehicle manufacturers are attaining the security features of their products by introducing advanced automated technologies to avoid the thefts particularly in case of cars. Biometric and non-biometric methods usually provide such security features. Sometimes these systems fail due to hacked password and encryption of decrypted data, but it is almost impossible to make replica of distinctive characteristics. Biometric systems are modern and use techniques like fingerprint recognition, iris recognition and face recognition. Of these face recognition and detection systems are more sophisticated, easy to deploy and people can be identified without their knowledge. Some advantages of facial recognition method for vehicle security application are: - 1. More convenient, sensed as soon as one is seated in position.

2. Low cost and a better approach to be used with existing methods.

3. Requires no active part of the user. In vehicle security system, the objective is to prevent the theft of vehicle and ensure safety of vehicle by

avoiding the means of theft. One level of ensuring authentication of driving is through face recognition system that authenticates a user being an authorized person to have access to the ignition system.

Existing system:

Car alarm techniques are used to prevent the car theft with the help of different type of sensors like pressure, tilt and shock & door sensors. These systems however bear some limitations such as high cost, high false alarm rate, and easy to be disabled. In order to solve these problem recent advancements in computer hardware and software have enabled automobile industry to develop affordable automated biometrics-based identification and verification systems. Many biometrics, including face detection, facial features, hand geometry, handwriting and voice have been used for the identification and verification of individuals. But biometric has its own disadvantages such as the systems are not 100% accurate, they require integration and/or additional hardware and cannot be reset once compromised, you can always change your password if somebody learns it, but there's no way to modify your iris, retina or fingerprint. Once somebody has a working copy of these, there's not much you can do to stay safe, other than switching to passwords or using another finger.

Disadvantages:

- ✓ Due to longer distance (range), siren cannot be heard
- ✓ Most of the cars have similar sounds, and physically
- ✓ Alarms can be disabled on theft attempts
- ✓ Alarm sound can be mitigated in crowded areas.
- ✓ Cost is high

Proposed System:

In vehicle security system, major concern is to prevent the theft of vehicle and ensure safety of vehicle by avoiding the means of theft. One level of ensuring authentication of driving is through face recognition system that

authenticates a user being an authorized person to have access to the ignition system. Face will be recognized using Face detection libraries which are installed in Raspberry pi. The recognized image is compared with the authorized image of users in the database. If it matches then the engine will start otherwise it will send a mail. So that owner can alert and can check his vehicle.
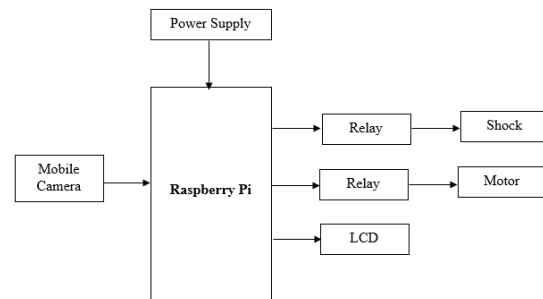
Block Diagram:

Fig1: Block Diagram

## Hardware Requirements:

A) Raspberry Pi:

Raspberry pi is a powerful microcontroller that exists in credit card size. It serves as micro controller, also it serves as a minicomputer by connecting essential cables like HDMI cables, audio cable. Simply we can say Raspberry Pi is a credit card sized computer which also serves as microcontroller. It is fast as compared to other controllers.

Fig2: Raspberry Pi

B) Liquid Crystal Display:

LCD is 16X2 LCD which displays 32 characters at a time. It has 8 data transferring Pins, RS which is Register select, En is Enable, and R/W is Read and Write Pin.
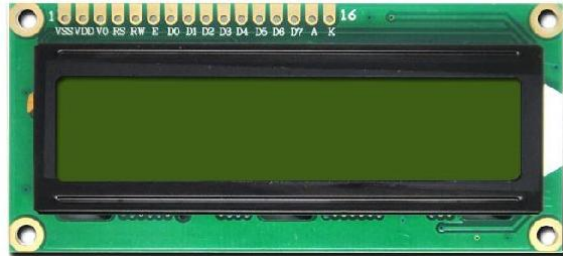
Fig3: LCD

C) 5V 2A Adapter:

5 Volt 2 Amp Power Adapter takes an AC INPUT of 100-240V and gives 5V 2A DC output.

Specifications:-

- Input - 100-240 VAC 50/60Hz
- Category - Switch Mode Power Adaptor (SMPS)
- Output Type - DC
- Output - 5Volts 2Amp


Fig4: 5V 2A Adapter

D) USB Cable:

Fig5: USB Cable

E) Relay:

A relay is an electromagnetic switch that is used to turn on and turn off a circuit by a low power signal, or where several circuits must be controlled by one signal.

Most of the high-end industrial application devices have relays for their effective working. Relays are simple switches which are operated both electrically and mechanically. Relays consist of an electromagnet and also a set of contacts.
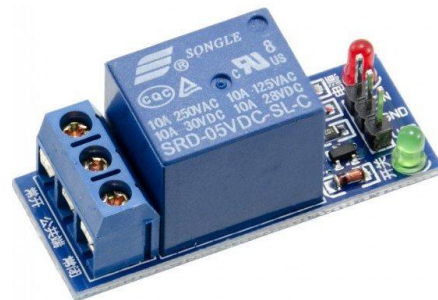
Fig6: Relay

Software Requirements

A) Python:

Python is an interpreter, high level, interactive and general-purpose programming language. It was developed by Guido van Rossum during 1985 – 1990. The source code is available under general public License. Python is named after a TV Show 'Monty Python's Flying Circus' and not after Python-the snake. It supports Object Oriented programming approach for developing applications.

Fig7: Python Shell

Fig8: Python Script

Advantages

➢ More convenient, sensed as soon as one is seated in position.

➢ Low cost and a better approach to be used with existing methods.

➢ The proposed system provided security and better theft control by using facial recognition and when the unauthorized person tries to start the ignition and will be notified.

Applications

➢ Jewelry Shops
➢ Shopping malls
➢ Apartments
➢ Theatres

Conclusion

Vehicle theft detection is very important for the society where transportation is essential. From the given system in this work safety can be achieved and it is also system with very less maintenance cost. Using this system work for theft detection future applications can be developed and it is vital for IoT oriented system applications.

Future Scope

In future we can include vibration sensor in the system, which can detect the intensity of vehicle hitting an object. If the intensity exceeds certain level, it detects accident and can send SMS to relatives.

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