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Raspberry Pi based vehicle starter and Face Detection

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ABSTRACT: This is an advanced system that can be utilized in many cars. Today, it is not difficult to make duplicates of vehicle keys and using such keys increases the risk of robbery. For such problems, we hereby propose an efficient and reliable solution. Our system uses a face recognition system to identify the authorized users of the vehicles and only authorized users are allowed to use the vehicle. This allows for a fast easy to use the authentication system. The system uses a Raspberry Pi circuit, It also consists of a camera. When we turn on the system authority provided by 3 options that are registration, start, and clear data, while registering, it first scans the owner's face. After successful registration, the owner can start the vehicle. If an unauthorized user tries to use the car, the system scans the person's face and checks whether face matches with the authorized face, if it does not match the system denies. In this way, the system helps to secure such intelligent vehicles Keywords: face recognition, theft detection, python, raspberry pi .

KEYWORDS: We would like to encourage you to list your keywords in this section

I. INTRODUCTION

With the new modern era development of new technologies is a must be it in the management sector or in the technical sector. Improvements are necessary for every field. regarding the project chosen in the field of vehicle security. various techniques have been improved such as biometrics, retinal scanning, image processing. Apart from all the improvised techniques the theft of vehicle still remains high in order to maintain the car security the system needs to be efficient, robust and highly reliable so in this paper, the security system involving face detection using Raspberry Pi, FRS algorithm along with database which consist of images uploaded by the owner of vehicle. If the newly scanned image does not match with the image uploaded earlier to the database the system will stop immediately. All the process here is controlled by programmed Raspberry Pi. The block diagram representation of the vehicle security system The central processing unit here is the Raspberry Pi system it controls the GSM module, camera, and operations related to the database. When an unauthorized image is detected by the programmed algorithm, the controller takes the information in the hold and stops the working of a motor which then informs the authorized user by sending messages through the GSM module.

II. HARDWARE DISCRPTION

The Raspberry Pi is a credit card-sized mini computer that can be used for many small computing tasks and IoT(Internet of Things). It is based on ARM architecture and uses fanless CPU and has all the ports which you'll need for a computer to be connected to such as an ethernet cable, HDMI, audio jack, USB, etc. The basic use of Raspberry Pi is for educational purpose, it is being used by hardware enthusiasts, teachers, hobbyists, students, professors, etc and also by high school students for their projects related to computer science. The camera module is a portable light weight camera that supports microcontroller. It communicates with microcontroller using the MIPI camera serial interface protocol. The L293D is a 16-pin Motor Driver IC which can control a set of two DC motors simultaneously in any direction. The L293D is designed to provide bidirectional drive currents of up to 600 mA (per channel) at voltages from 4.5 V to 36 V (at pin 8!). The power supply is the first and most important part of our project. For our project, we require a +5v regulated power supply with a maximum current rating of 500mA.

III. SOFTWARE DISCRPTION

Python is an interpreted high-level general-purpose programming language. Its design philosophy emphasizes code readability with its use of significant indentation. Its language constructs as well as its object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects

IV. SYSTEM OPERATION

4.1 Step by Step Operation Of System

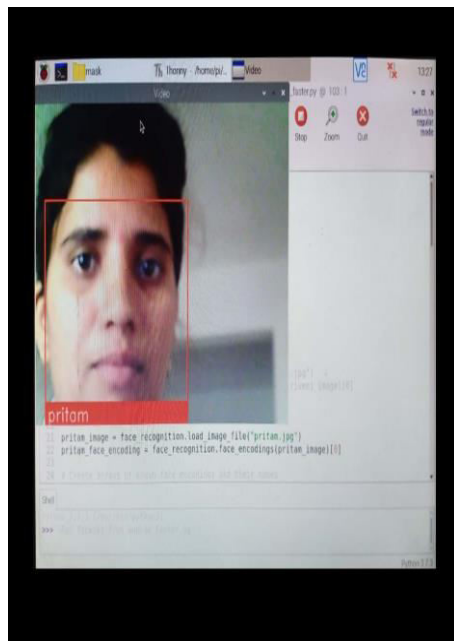
Step1- Image Processing

Face and eye detection is a very important and challenging matter in the field of image processing. It is also a crucial step of face recognition. Open Source Computer Vision Library (Open CV) is used to implement the Haar Cascade Classifier.

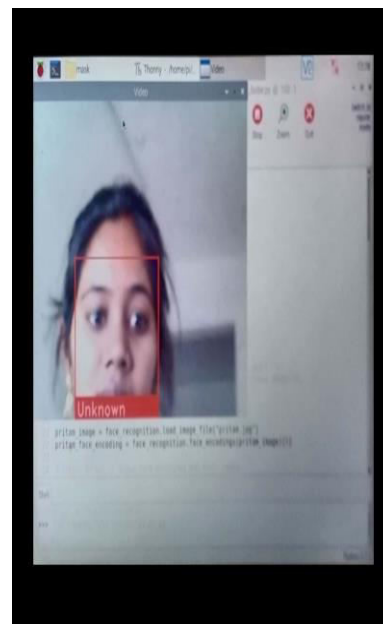
Step 2-Haar Cascade Classifier

Haar Cascade Classifier is one of the few object detection methods with the ability to detect faces. It offers high-speed computation depending on the number of pixels inside the rectangle feature and not depending on each pixel value of the image. For the detection of the face, Haar features are the main part of the Haar Cascade Classifier. The Haar features are used to detect the presence of feature in given image.

V. RESULT AND CONCLUSION



5.1 MSG from known person



5.2 unknown person

The smart system utilizes the antitheft mechanism for car where only authorized person are allowed to drive the car. The authorization is established with help of facial recognition of driver. By using this particular system we can increase and maintain the safety of the vehicle by providing special programmed functions to it. If any unauthorized user tries to use or steal the car the central controller will stop its working immediately and vehicle is stop .

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