

# Automobile Control using Face Recognition

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## Article Info

Volume 82

Page Number: 10695 -10698

Publication Issue:

January-February 2020

## Abstract

The Automobile control using face recognition is implemented for the safety precaution of the driver and to reduce the accident due to the negligence of the driver. When the driver suddenly closes his eyes without their knowledge it may lead to accident. This system uses the face recognition to monitor the driver by the invisible infrared light rays, when the driver closed his eyes more than the specified time the sensor will alert by giving the buzzer sound to the driver so that the driver get focused. It also controls the breaking system of the car while the sensor alerts the driver and it also reduce the speed of the car gradually and the auto brake is applied. This system has other safety measure like, If the driver had not wear the seatbelt the engine will not get started. By doing this, the car get started only if the driver wear the seatbelt. By implementing this system the person can be prevented from accident. So that, the road accidents will decrease.

**Keywords:** IR sensor, Buzzer, Raspberry Pi, Camera.

## Article History

Article Received: 18 May 2019

Revised: 14 July 2019

Accepted: 22 December 2019

Publication: 19 February 2020

## 1. Introduction

Safety is the first Measure. According to this line, this project has overcome with the Automobile control using face recognition. The number of accident happening in the day to day life has been increasing rapidly due to careless and negligence of the driver. Some met with accident by sleeping or distracting their mind by closing their eyes. This system overcome with a solution for this, if the driver closes their eyes for a particular time the buzzer sounds to indicate the driver. It also reduces the speed of the car by applying brakes. This system has additional safety measures; if the driver did not wear the seat belt the engine will not get started. For this, the IR sensor is attached to the seat belt buckle so that if it is not locked, the sensor will control the ECU and it will not start the engine to drive the car. Suppose, If the driver close his eyes while driving the car for more than the specified time the face monitoring system monitor the face and alert by giving the buzzer sound to the driver so that the driver can get focused. It also control the breaking system of the car while the sensor alerts the driver it also slow down the speed of the car gradually and the auto brake is applied. So that the person can prevent the accident.

## Face Recognition System

It plays a very efficient role in life analysis space over past 50 years. The main drawback in face recognition system is Classification. The face recognition also

includes the face pictures of the far-famed people then to classify the fresh returning take a look at pictures into one among the categories. The failure in face recognition system are:

1. Change in facial expression
2. Variation in Illumination
3. Increasing in Age
4. Change in Posture
5. Size of the image

In automatic face recognition system the detection of faces from a blurred background and face recognition is the most difficult task is that it involves. The 2 types of algorithms for face recognition are visual manuals based mainly on pure mathematics. This measures the association between the face picture and another type of face image representations in template-based approaches (Robert J. 1981) to measure the facial expression identification in a database. The best way to use a face recognition system and the same tempting is through Brunelli and Poggio (R. Brunelli, 1993). The main part Analysis (P.A.S.), Matthew Truk,1991; Linéar Disquential Analysis (L.P.BELHEMEUR et al., 1997). Kernel (Bernhard Scholkopf et.al., 1998), (M. H. Methods including Vector Support Machines (SVM) (E. OSUNAN, 1997), (Vladimir N, 1995). Various methods known as hybrid approaches to calculate the mix of each implemented method of pattern recognition and systems in neural networks. Facial recognition infra-rod scans (Y. Yoshitomi et. Al, 1997) and profiles (Z. Liposcak, 1999).

Facial occlusion and poor quality are badly handled (face pics of objects, scarf). The unit of native face expression and its geometrical relationships were established. For example, algorithms can check the relative eyes, nose, cheekbones and jaw position, size and/or size. A reference shot is equal to the ear.

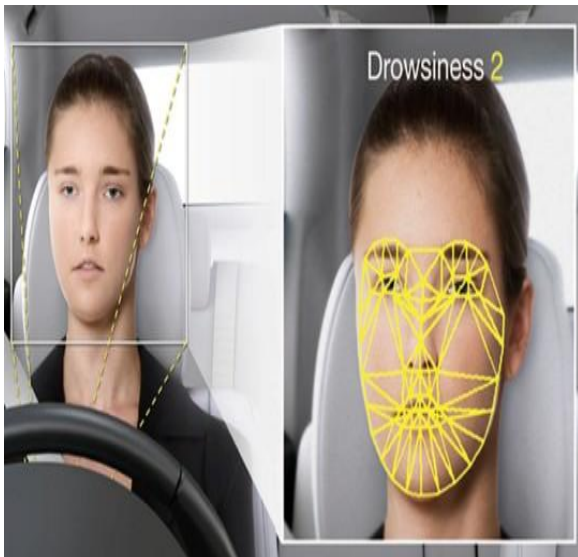


Figure 1: Face Detection

The 3D sensors were configured for the facial structure to be registered and characteristics like eye socket contour, nose and chin defined. Safety of mobile applications, payment methods and certain websites is the facial recognition used.

## 2. Block Diagram

### Block Diagram and Block Illustration

This segment explains the block of face recognition using Raspberry Pi. This block diagram is considered to be an important factor and thus only using this easy implementation is held in case of many projects. The below figure shows the block diagram.

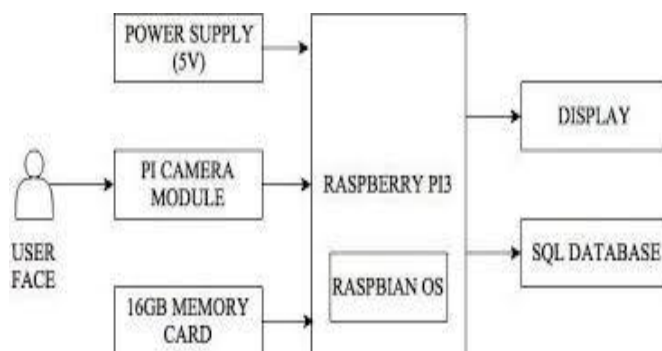


Figure 2: Face Recognition Block diagram

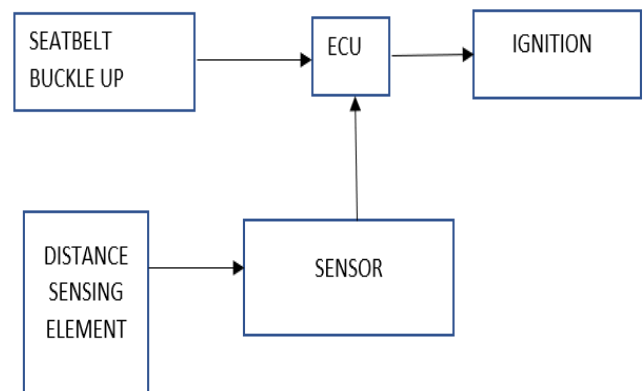


Figure 3: Seat Belt Detection Block diagram

## 3. Hardware Components

### Raspberry Pi

The Raspberry Pi would probably be an occasional package, a credit-card device in size to attach to a laptop or TV machine and use a regular mouse and keyboard. The device is capable of exploring computing and hunting in languages such as Scratch and Python by persons of all ages. It is very little or no device. You can do all you would expect to do, from surfing the net and watching content in high definition to creating phones, word processing and playing sports. The Raspberry Pi can work with the skin and has been used with an extremely wide range of digital makers, from music machines and parent detectors to weather stations and infrared birdhouses. They appear to want to learn why children everywhere in the world look for a strong program and interpret computer work. The Raspberry Pi is used by children. The board is overheated and damaged and the board becomes unstable if less than 5V is applied. The range of 7V to 12V is recommended.

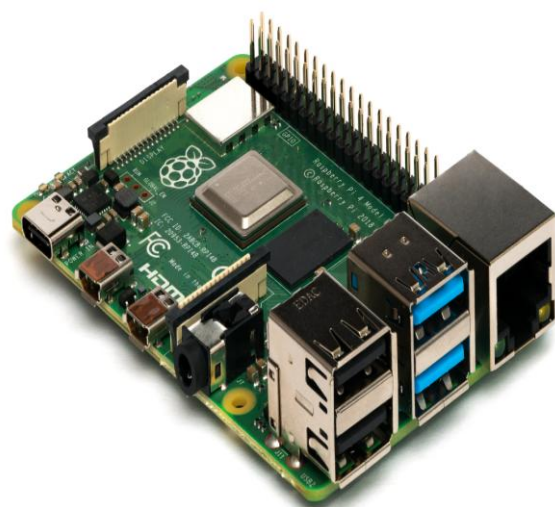


Figure 4: Raspberry Pi

## IR sensor

An IR device is essentially a tool consisting of a photo-diode that is called the photo-coupler or an opto-mechanical device with the associated IR crystal rectifier. The IR crystal rectifier emits IR radiation, receipt and/or receiving intensity, which dictates the device output through the iconic diode. Still, there is so much possibility that the radiation might hit the icon diode, or might not be able. The icon diode is also directly controlled by the IR crystal rectifier, where the majority of the emissions of radiation reach the icon diode. It produces an unseen degree of IR exposure line between the IR crystal rectifier and the symbol diode. However, if an opaque component of the same grade obstructs this axis, radiation will not enter the icon diode, and the obstructive entity can either be reflected or absorbs. The IR LED may be held straight before the diode, so that virtually all radiation is present.

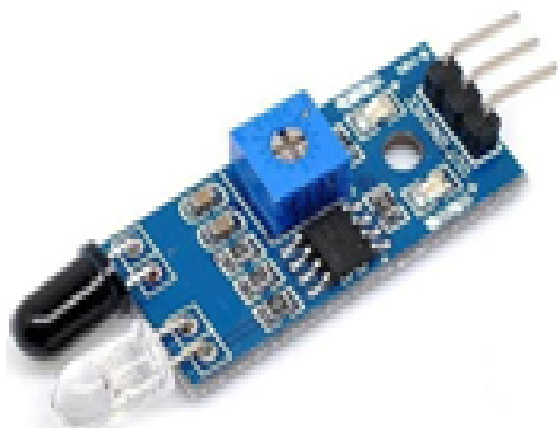


Figure 5: IR Sensor

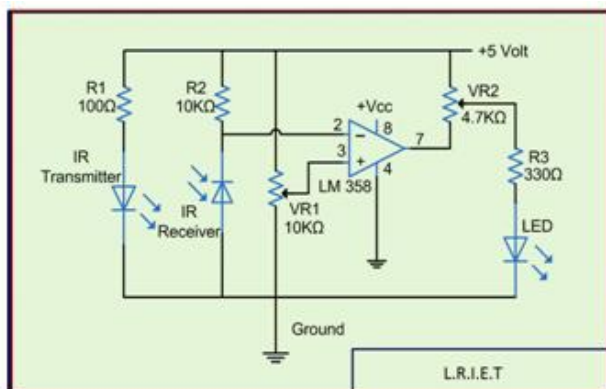


Figure 6: IR Sensor Circuit Diagram

## Engine Control Unit (ECU)

An engine control unit could be a diverse control unit, which controls a series of actuators on an interior combustion engine to confirm optimum engine performance. A combustion unit could normally be called an engine management module (ECM). It reads the values from a sensor chaos in the engine bay, deciphers

three-dimensional output charts for knowledge victims (so-called check tables) and changes engine speed. When the European manages the fuel lines, it is called the Electronic Engine Management System (EEMS). The most important role in the management of the fuel supply of the engine is the mechanical system. A stack of sensors and actuators is used to control the whole mechanism of the EEMS.

## 4. Working

### ECU

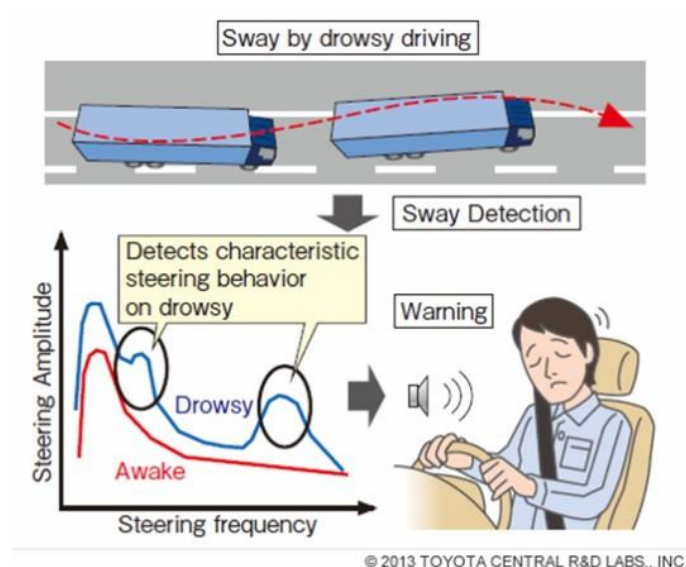
It's an electronic unit module (ECU) which controls a collection of actuators on internal fuel engines to ensure the best motor output, commonly referred to as the Engine Check Module (ECM).

### IR Sensor

A pair of IR LED and a photo-diode called a photo-connector are buckled on the seat belt. The IR LED emits IR and the photo diode finds the sensor output. The motor starts when the seat belt is closed, radiation does not touch the diode in the frame. The motor won't start otherwise.

### Face Recognition

Camera is placed In front of the driver. Camera is focusing the driver. If the driver get drowsy and closed his eyes or the driver peeping outside for some particular time the buzzer sounds. Even if the driver did not concentrate on the road, the module sends a response to the ECU and it will slow down the speed of the car by applying brake.



## 5. Flow Diagram

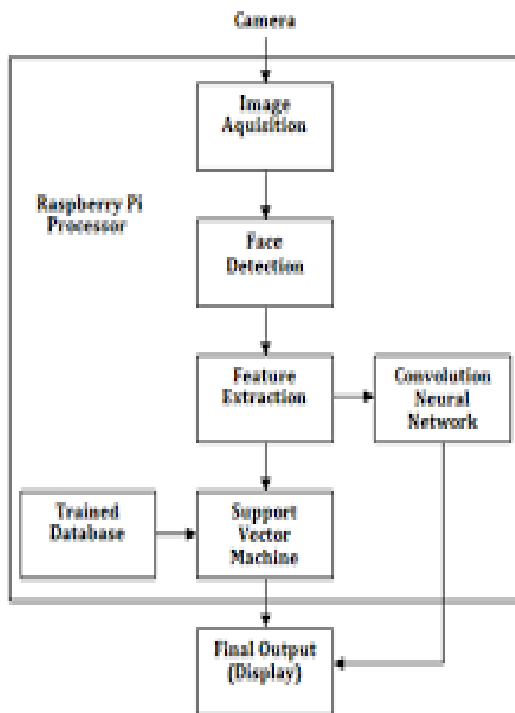


Fig.2. Block Diagram of Proposed System

## 6. Conclusion

In this system, an embedded automobile control using face recognition is presented. The system can be used to reduce the increased vehicle accidents and safety measures. The results obtained through the face recognition shows that it can be relied upon to ensure the driver. So that we can prevent the accident.

## 7. Future Scope

Typical is that inside the gap, though not around the middle, the drivers hold their seat band securely. The structures of the body are also known to wear the harness. For this reason, a tension sensor device seatbelt can be placed on the device proposed to insure that the belt is actually worn or not. The air pressure strain can be measured.

When the car speed is reached and little action is taken, the deceleration is not such that any object behind the vehicle can be merged with the front and the rear radar of the vehicle if mounted (if installed).

The system software can be modified to allow the owner to enter and program profiles. For instance, family car profiles can save the device for younger riders in the family where the maximum speed level for more experienced drivers is smaller than profiles. The owner needs to modify the profiles, and the device can be incorporated into the owner's smartphone to enable or disable the profiles remote. It means that nobody but the user is able to manipulate the system settings.

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