Finger Print Ownership Checking System

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Abstract—Finger Print ownership checking System control the access to vehicle based on finger print. This system verifies the ownership of the driver through fingerprint technology. Finger module is used here to read the finger ID. The finger ID of owner is stored in the system memory. Before starts the drive, the person must have to verify his ownership by putting his finger in the module. The system first scan the finger inserted and compare the finger prints stored in the system memory. If it valid the system will automatically turn ON the vehicle ignition. If the finger ID is not matching, ignition is not turned ON. The microcontroller controls the vehicle ignition through a relay circuit. The system is built around the popular microcontroller ATmega328. The microcontroller does the all control operation to read, compare and to control the ignition also. The system has an LCD to display the status of operation.

I. INTRODUCTION

A fingerprint in its narrow sense is an impression left by the friction ridges of a human finger. In a wider use of the term, fingerprints are the traces of an impression from the friction ridges of any part of a human hand. A print from the foot can also leave an impression of friction ridges.

This project utilizes the fingerprint recognition technology for ownership checking. Initially with the help of finger print scanner we can save print impression data of the authorized persons in the memory. The vehicle ignition is turned ON when the finger print matches.

Fingerprint identification, known as dactyloscopy, or hand print identification, is the process of comparing two instances of friction ridge skin impressions, from human fingers, the palm of the hand or even toes, to determine whether these impressions could have come from the same individual. The flexibility of friction ridge skin means that no two finger or palm prints are ever exactly alike in every detail, even two impressions recorded immediately after each other from the same hand. Fingerprint identification, also referred to as individualization, involves an expert, or an expert computer system operating under threshold scoring rules, determining whether two friction ridge impressions are likely to have originated from the same finger or palm (or toe or sole).

II. BLOCK DIAGRAM

Block Diagram And Explanation

Finger Module

Fingerprint recognition or fingerprint authentication refers to the automated method of verifying a match between two human finger prints. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity.

A fingerprint sensor is an electronic device used to capture a digital image of the fingerprint pattern. The captured image is called a live scan. This live scan is digitally processed to create a biometric template (a collection of extracted features) which is stored and used for matching. This is an overview of some of the more commonly used fingerprint sensor technologies. It is designed to integrate into devices for improved security and convenience.

III. MCU (MICROCONTROLLER UNIT)

MCU is the microcontroller unit, which controls all the functions of other blocks in this system.
MCU takes or read data from the fingerprint sensor and controls all the functions of the whole system by manipulating these data.

Initially with the help of fingerprint scanner MCU can store the fingerprint of the authorized person. The scanner will send the digital code corresponding to the fingerprint to the MCU. Then the micro controller will check the code saved in the memory and the current data. If both matches MCU control the vehicle ignition, ignition is controlled by the MCU through a relay circuit. An LCD screen interfaced with the MCU displays the status of the system.

IV. RELAY INTERFACING CIRCUIT

Control circuit is required for connecting a relay with any microcontroller. This is because relays are always comes with a voltage requirements other than logic supply voltage and also consumes a considerable amount of current when operating. And moreover relays are inductive loads which should not connect directly to the microcontroller ports due to back emf problem.

Electrical Relay

The purpose of this block is to control the ignition of the vehicle. A relay is an electrical switch that opens and closes under the control of another electrical circuit.

V. DISPLAY SECTION

LCD display is used for displaying the state of the unit. Here it displays whether the fingerprint is MATCHED or NOT MATCHED. It can also display the digital code corresponding to each fingerprint.

Motor Driver (L293d)

Motor driver circuit is required to provide an interface between the 5V logic signal from the microcontroller & the high current / high voltage power side to drive the motor, because motor is an electromechanical device, which convert electrical energy to rotation/mechanical energy. For this energy conversion large current excitation is required. These much energy cannot be provided by the logical signal pins from the microcontroller. So a motor interface is used here. The motor drive section should have the capability for accepting the low level logical signal from the controller and to provide necessary voltage and current excitation to the motor. Usually high current transistor switches or relays or ICs with motor drive packages are used for this purpose

Circuit Diagram

Working

The vehicle theft and misusing are the main problem now a day for private vehicle owners. Here we use the advanced technology to protect the vehicle from unauthorized access. The Finger Print Ownership Checking System composed of a microcontroller, fingerprint module ignition control system and a display unit.

Initially with the help of fingerprint scanner we can save fingerprint impression data in the memory. When the person wants to use the vehicle he must impress the finger on the scanner then the scanner will send the fingerprint details to the microcontroller. Then the micro controller will check the fingerprint saved in the memory and the current fingerprint data. If both match MCU will actuate the vehicle ignition. The vehicle ignition can be controlled by the microcontroller through a relay circuit. The current output from the relay is not sufficient to operate the relay directly, so a relay interface is used here.
As per the decision made by the microcontroller the ignition of the vehicle is controlled. A display unit is interfaced with the MCU. Here we use a 16 x 2 character LCD module for displaying. The module has the capability to display 32 characters as total in 2 lines; 16 character in each line. Here LCD displays the status of the system that the finger ID is valid or not.

In this project the fingerprint module R305 Biometric is used. It can store up to 750 finger print on its own memory. It can be controlled through its serial port

The microcontroller ATmega interacts with the module.T. To add a fingerprint , load the fingerprint enroll program to the microcontroller using a computer and then just show the finger on the module and follow the instruction in the serial monitor

To identify the finger, after storing IDs load the main program to the microcontroller using a computer. Place the finger on the module if the finger matches then the output pin will go high is connected to the relay through a L293D ic which is used as a power amplifier, thus the relay will switch. Output of the relay is connected to the ignition controller. So whenever the relay switches thus the vehicle ignition is turns on.

VI. ADVANTAGES

- The security features were enhanced largely for the stability and reliability the system
- The whole system is built based on the technology of embedded system which make the system more safe and easy to use
- Since fingerprints are the composition of protruding sweat glands, everyone has unique fingerprints.
- Its reliability and stability is higher compared to the iris, voice, and face recognition method.
- Fingerprint recognition equipment is relatively low-priced compared to other biometric system and R&D investments are very robust in this field.

VII. APPLICATIONS

- security purpose
- Time and attendance systems
- Bank locker system
- To secure some important section in company and also in GOVT. office
- Electronic safe for vehicle

VIII. CONCLUSION

Vehicle theft and misusing are the main problem nowadays for private vehicle owners.Here we use the advanced technology to protect the vehicle from unauthorized access,Through this project we can ensure the security of our vehicle. From this we implement fingerprint recognition techniques that can provides the important functions required by advanced vehicle security. It avoid vehicle theft and protect the usage of unauthorized users. We can protect this vehicle using this system in day to day life. This will help reduce the complexity and improves security.

IX. FUTURE SCOPE

Fingerprint mismatch can be convincingly regarded as an attempt of illegal access in the wake of such ungratified event, an adjunt siren alarm may be initiated to reveal possible theft For system demanding more security, such as expensive jewellery items or museum articles, scanning of multiple fingerprint may be employed.

REFERENCES
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