Advanced Car Automation and Security System

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Abstract-If there is only one car and number of users are more, then every time when driver is changed, user must change the preliminary settings before driving. This setting includes adjustment of side view mirror, rear view mirror, position of the driver seat, moving his favorite music files on to playlist etc. This system will provide that provision described earlier. In this system multiple user profiles are already saved and iris recognition is used as biometric authentication to access the car. When any authorized user tried to access the car, he is recognized by his biometric sign which is already saved and by the time he is entering in the car according to his profile all changes will be made in the car. When every time car is started, if user is other than master user or authorized then one acknowledgement message is sent to the master user. If user is not authorized then system will send any security message to the master user and he will know that any unauthorized person is trying to access his car.

Index Terms-FPGA;GSM Module;MATLAB.

1. INTRODUCTION

1.1 Functional Areas of Existing Systems

With the development of technology developing countries has invested a lot in Infrastructures, especially in road constructions and development. As a result of this there is tremendous increase in the car user. There are more and more car thefts,lost and increased number of road accidents which are given serious attentions. So there is big demand of the public that their car must have such system which will prevent car thefts. Car thieving and accidents can be minimized by adding some extra security to the car and making driver comfortable while driving. Car systems are real time and involves lives.

1.2 Proposed System

The system we proposed is trying to give this extra comfort and security by means of some automation in the car and some communication devices. In our system we have used FPGA to have automation in the car by means of sending appropriate commands to drive the stepper motors, MATLAB to grant authentication and GSM modem to have communication with car.

2. EXISTING CAR SYSTEMS TILL DATE

2.1 ABS (Anti-Locking Braking System)

ABS works with your regular braking system byautomatically pumping them. In vehicles not equipped with ABS, the driver has to manually pump the brakes to prevent wheel lockup. In vehicles equipped with ABS,your foot should remain firmly planted on the brake pedal, while ABS pumps the brakes for you so you can concentrate on steering to safety.

2.2 EBD (Electronic Brake-force Distribution)

Electronic brake-force distribution (EBD or EBFD),Electronic brake-force limitation (EBL) is an automobile brake technology that automatically varies the amount of force applied to each of a vehicle's brakes, based on road conditions, speed, loading, etc. always coupled with anti-lock braking systems.

2.3 SRS Air Bags (Supplemental Restraint System Air Bags)

An airbag is a vehicle safety device. It is an occupant restraint consisting of a flexible envelope designed to inflate rapidly during an automobile collision, to prevent occupants from striking interior objects such as the steering wheel or a window, the sensors may deploy one or more airbags in an impact zone at variable rates based on the type and severity of impact; the airbag is designed to only inflate in moderate to severe frontal crashes.

2.4 Immobilizer

An immobilizer is an electronic device fitted to an automobile which prevents the engine from running unless the correct key (or other token) is present. This prevents the car from being "hot wired" after entry has been achieved.

2.5 Parking sensors

Parking sensors are proximity sensors for road vehicles which can alert the driver to unseen obstacles during parking man oeuvres. Parking sensors generally fall into two categories.
i) Electromagnetic parking sensors
ii) Ultrasonic parking sensors

2.6 Cruise Control

Cruise control (sometimes known as speed control or auto cruise) is a system that automatically controls the speed of a motor vehicle. The system takes over the throttle of the car to maintain a steady speed as set by the driver. N.B: None of this above detects Driver or Passenger misbehavior.
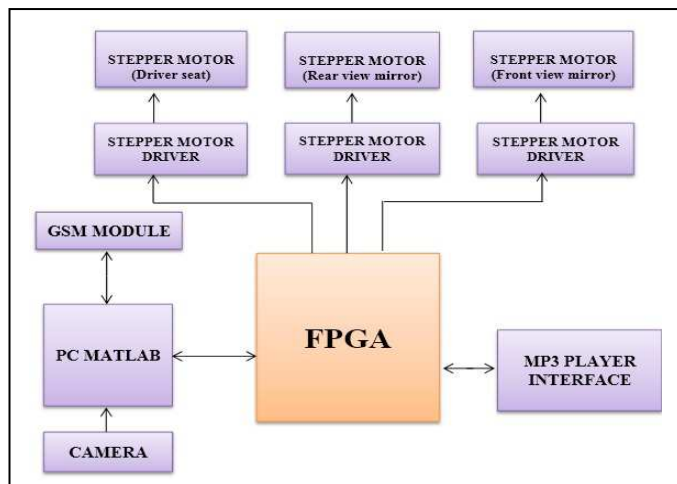
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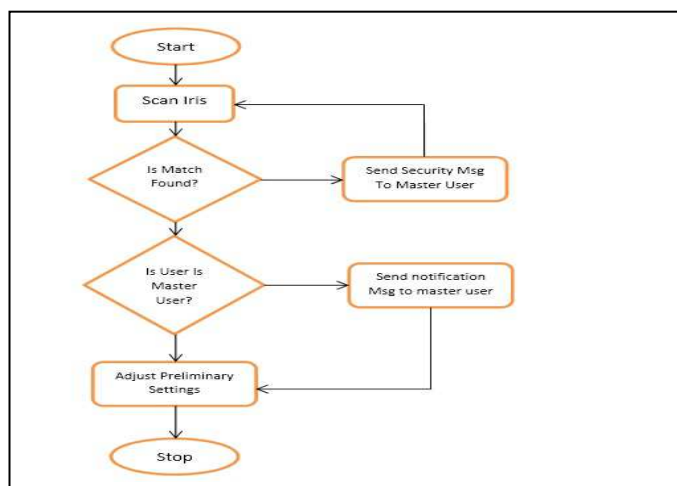

Fig.1 Block diagram of system

Fig.2 Flow chart of system

3.1 Aims to Deploy
- More reliable and efficient system.
- To make driver comfortable while driving
- To develop a smart CAR system to control and notify it Users.
- To develop a system with all the useful utilities, this will help OWNERs, Police, Rescue Squad and other authorities do their work more efficient and effective.

3.2 Benefits

- Car adjust preliminary setting by itself hence time saves.
- Multiple user profiles can be saved.
- Iris recognition is used for authentication which is more secure.
- GSM sends notification and security messages.

4. IMPLEMENTATION

4.1 GSM module

GSM modem is used for communication between system and master user. It is interfaced with PC via USB-to-Serial port

4.1.1 Application
- To send message to master user.
- To receive message from user.

4.2 Stepper Motor

Stepper motors gives controlled and accurate motion. It is having four inputs to have step angle motion.

4.2.1 Application

- Used to adjust mirrors and driver seat.

4.3 IRIS Recognition and Feature Extraction

For iris recognition we are using the iris data base downloaded from internetWe have used following base paper for iris features extraction:Bradford Bonney, Robert Ives, Delores Etter, Yingzi Du"IRIS PATTERN EXTRACTION USING BIT PLANES AND STANDARD DEVIATIONS"

5. RESULTS

Whenever we pass the iris database of an authorized person through MATLAB, system is making adjustments in the car as they have saved on his profile. If user is authorized but it's not master user then system is sending some notification message to master user. When an unauthorized person trying to access the car the system is sending security message to the master user.

6. CONCLUSION

By implementing this system we are able to save the different users profiles on the system and it seem to be working properly. By replacing the PC with some DSP processors in the future we can obtain better results

8. REFERENCES

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