

Smart Automotive Security Control with Accident Alert System

Manjunath S¹, Dileep Kumar G², Chandan Gowda A H³, Chetan M⁴, Hemanth R S⁵

Project Guide, Department of Computer Science and Engineering¹,
Projecties, Department of Computer Science and Engineering^{2,3,4,5}

Sri Jagadguru Chandrashekaranaatha Swamiji Institute of Technology, Chikkaballapura, Karnataka, India

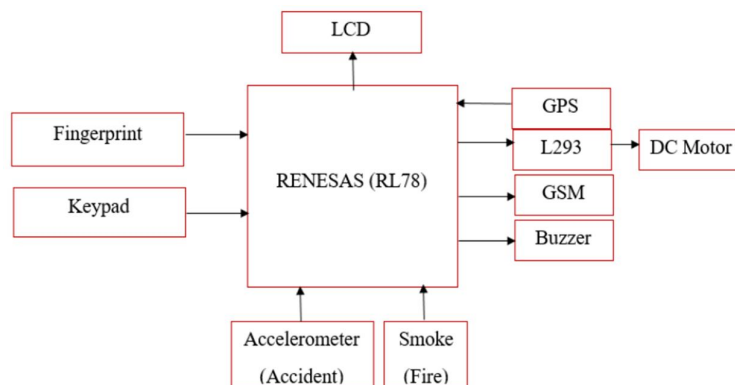
Abstract: Vehicles are becoming advanced by combining the greater power to achieve connectivity solutions and the advancement in software visions. In modern vehicles automotive designs are interfaced with these features. The system includes keyless entry system and immobilizer system as the main weapons to prevent the vehicle theft. But these type of systems provide or detect the unauthorized access of vehicles to a measurable limit only. These security systems have straightforward. So car burglary has been a persevering issue far and wide and a greater test from the proficient criminals. This project proposes an aim to design efficient security control for auto theft prevention system by adding notable enhancement features such as a fingerprint system, password. It is also included with some rationalizing security features like GPS, fencing and conveying location of vehicle as a message using GSM module. It deals with accident detection system when the accident occurs it uses Tilt, Smoke Sensor and Buzzer and alerts the Emergency team for help by reading the exact latitude and longitude of the vehicle involved in the accident.

Keywords: Automotive Security Control.

I. INTRODUCTION

Vehicle tracking system is getting more popular because of the rising number of the stolen vehicles. Vehicle theft is happening on parking lots and sometimes driving in remote places. This project shows how to avoid this kind of theft and provides security to the vehicles. Moreover, Fingerprint and keypad verification is done in this system to ensure that authorized person is driving. This System is very simple with greater security for vehicle anti-theft protection and low-cost technique compared to others. If the vehicle is met with an accident, an immediate alert message is sent to the emergency services along with the current location of the vehicle. In case of fire accident, the fire will be detected using fire sensor and an immediate message will be sent to the owner of the vehicle. This system contains single-board embedded system which is equipped with Global System for Mobile Communication (GSM) and Global Positioning System (GPS) along with a microcontroller installed in the vehicle. With the use of GSM and GPS technologies allows the system to track the vehicle and provide the location where accident has occurred. This design is very effective and simple.

II. IMPLEMENTATION



III. FINGER PRINT

A fingerprint-based biometric system is basically a pattern recognition system that recognizes the person by authenticating his fingerprint. Depending on the application context, a fingerprint-based biometric system may be treated as either a verification system or an identification system. A verification system authenticates the person's identity by comparing the captured fingerprints with her own biometric template(s) pre-stored in the system. It conducts one-to-one comparison to determine whether the identity is true or not. An identification system recognizes an individual by searching the entire template database for a match. It conducts one-to-many comparisons to verify the identity of the individual.

IV. PASSWORD

When you fail to sign-in using the fingerprint and lets you to enter your password, the security system runs the password you entered through the same hashing algorithm and checks if the resulting hash matches the hash in the database (a hash is the number that a hashing algorithm spits out). If they match, then you're allowed in otherwise it shows the denied message.

V. RENESAS MICROCONTROLLER

R5F100LEA microcontroller from Renesas RL78 series which is a 16-bit microcontroller is used to implement this project. Microcontroller acts as the brain of the project, which controls the whole system. It contains a Flash ROM of 64KB, RAM 4KB and Data Flash 4KB, and it has High speed on-chip oscillator, Self-reprogrammable under software control, 3 UART's, Simplified I2C, 58 GPIO's, 10-bit resolution ADC, 28 Interrupt Sources, ISP programming support etc.



VI. GSM/GPS MODULE

GSM represents Worldwide Framework for Portable Interchanges once called as Gathering Unique Versatile. This is a standard set created by the European Telecommunications Standards Institute (ETSI) to describe advances for second era (or "2G") computerized cell networks. GSM module is utilized to send messages to the Emergency services in the event of crisis. It is nearly utilizing in all the web of things ventures to achieve this.



VII. PROPOSED SYSTEM

- The proposed design is having automated mishap discovery framework in which vehicles sends the information in regards to the mishap along with the placement, time, date to a rescue team and customized contacts. This information will be sent as an alert message.
- The GPS and GSM module are interfaced to the control area of the vehicle module and traffic module. A GSM module is utilized to send the alert message and GPS module to find the position of the vehicle.
- Road accidents and the traffic jams are the major issues in all the areas directly there is no system for accident recognition. Moreover, due to the deferral in coming of the ambulance to remote area and furthermore the congested driving conditions in the way to the hospital will increase the probabilities of the death.

VIII. CONCLUSION

The expected performance is achieved by implementing the smart system. The sensor and the other components are distributed throughout the vehicle for providing the optimal results and detect accident. This system provides the design in which it is having small size, easy to handle and low-cost components. This system consists of accelerometer, GSM, GPS, Switch and buzzer. The proposed system aims to detect the accidents and notify the Emergency Services like hospitals, ambulance. Accelerometer detects the accidents and sends the basic information to the family in small intervals of time which includes time, longitude, latitude. This system intention is to detect the accidents in the remote areas at night time. The proposed framework will play an important role in the future mainly in the areas which is remote from the main city.

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