FINGERPRINT AUTHENTICATION BASED SMART VEHICLE SECURITY SYSTEM

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Abstract: **Vehicle theft has become the major problem in any country. This project focuses on preventing vehicle theft by incorporating some verification modules. This system uses GSM and GPS technologies which enables user to track the vehicle from any remote location. It includes biometrics, i.e. Fingerprint and RFID to verify the registered user. A person can start the vehicle, but only upon fingerprint and RFID authentication the person can put the vehicle into motion. In recognition of the fingerprint and RFID, ignition will be given to start the bike and bike will be getting into the motion. In case of wrong access owner will get message with location and owner can give access or stop the bike.**

Index Terms – **RFID, GSM, GPS, Vehicle, Finger Print Module.**

1. INTRODUCTION

Automobile security is one of the growing concerns in India. Safeguarding of vehicle against theft is one of the major issues confronting developing countries. Varied techniques have been tried and tested to protect and secure the automobiles. Embedded computing is an emerging technology widely used in improving and enhancing security against the theft of vehicles. The main aim of this project is to prevent the vehicle from probable theft. To achieve this we are incorporating security by including biometrics, i.e a fingerprint and RFID. In the beginning the owner of the vehicle must store his/her own fingerprint in the finger print module. The RFID is also used for even more security and also connected to access the vehicle in urgency. Smart phone is used to send and receive messages to and from the owner. The owner's mobile number has to be set fixed during the coding. For theft prevention, we can also trace the two-wheeler from the smart phone which is embedded on the system. Then real time tracking begins and the location of the vehicle is sent to the owner by SMS. In this proposed project we are using smart phone to find the present location. Then, either owner can give access if his authorized person or bike can be stopped by locking brakes if it is motion.

2. RELATED WORK

In [1] this paper, GSM and GPS technology are used. Two wheeler position is obtained by GPS module this data is given to microcontroller hardware which sends message to user mobile phone through GSM module.

In [2] this paper, system alerting owner by SMS to user whenever theft attempt, allowing user to control vehicle remotely by SMS also provide engine immobility and alarm.

In [3] this paper, hardware is implemented to prevent theft from stealing vehicles and fuel of vehicle. About an theft attempt owner is alerted by SMS allowing user to control system remotely.

In [4] this paper, proposed design uses Global Positioning system (GPS) and Global system mobile communication (GSM). System constantly watches a moving Vehicle through GPS and sends data when demanded. About a theft attempt, we have to send SMS to the microcontroller, then microcontroller issue the control signals to stop the engine motor. Then we have to reset the password and restart the vehicle.

3. METHODOLOGY

A. *Existing System*

Till now many vehicle security systems incorporated in which utmost security lacks.

1. Design and development of GPS-GSM based tracking system with Google map-based monitoring. In this system they have incorporated GSM & GPS using which the vehicle can be tracked after the theft occurrence. The major drawback in this system is the vehicle cannot be protected before theft.

2. Anti-theft system for vehicles using fingerprint sensor. In this system the probable vehicle theft can be prevented. To achieve this they have incorporated biometrics, i.e. a fingerprint. The major drawback in this system is, if the user wants to give his vehicle to his friend he cannot come and access the vehicle by using fingerprint every time.

B. Proposed System

In the proposed system, the security is advanced by incorporating Fingerprint and RFID. Initially the user needs to confirm his/her identification before accessing the vehicle. For user identification finger print sensor and RFID is used. In recognition of the fingerprint and RFID, ignition will be given to start the bike and bike will be getting into the motion. In case of wrong access owner will get message with location. And owner can give access or stop the bike by locking brakes if it is motion.

4. IMPLEMENTATION
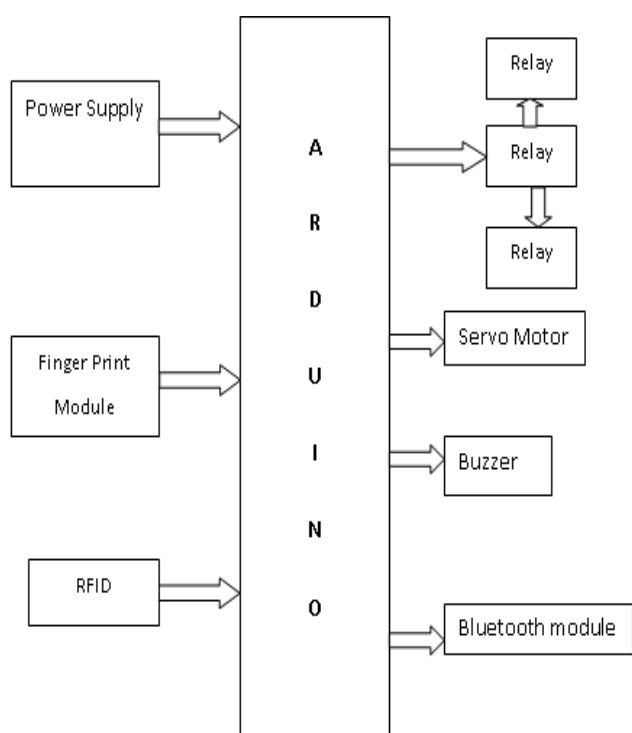
Fig.1 Proposed Block diagram

A. Arduino Nano

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.0) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino Duemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one. The Nano was designed and is being produced by Gravitech.

Fig.2 Arduino Nano Board

B. FINGERPRINT SENSOR R307

This is R307 Optical Fingerprint Reader Sensor Module. R307 fingerprint module is fingerprint sensor with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the fingerprint data in the module and can configure it in 1:1 or 1: N mode for identifying the person.

Fig.3 Finger Print Sensor

C. RADIO-FREQUENCY IDENTIFICATION (RFID)

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object.

Fig.4 RFID Board

D. BUZZER

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Fig.5 Buzzer

E. SERVO MOTOR

A servo motor has a built in motor, a feedback circuit, and most important, a motor driver. Servo motors are used to control the position of objects, rotate objects, move legs, arms or hands of robots, move sensors etc. with high precision. Servo motors are small in size, and because they have built-in circuitry to control their movement, they can be connected directly to an Arduino

Fig.6 Servo Motor

5. EXPERIMENTAL RESULTS

Fig.7 practical prototype model

wrong rfid and fingerprint, bike is in:Gopalan International School, Behind SAP Labs,, Seetharam Palya, Basavanagar, Hoodi, Bengaluru, Karnataka 560048, India

【Send by smartvehicle_bike_V1】

May 8, 9:46 AM

Gopalan International School, Behind SAP Labs,, Seetharam Palya, Basavanagar, Hoodi, Bengaluru, Karnataka 560048, India
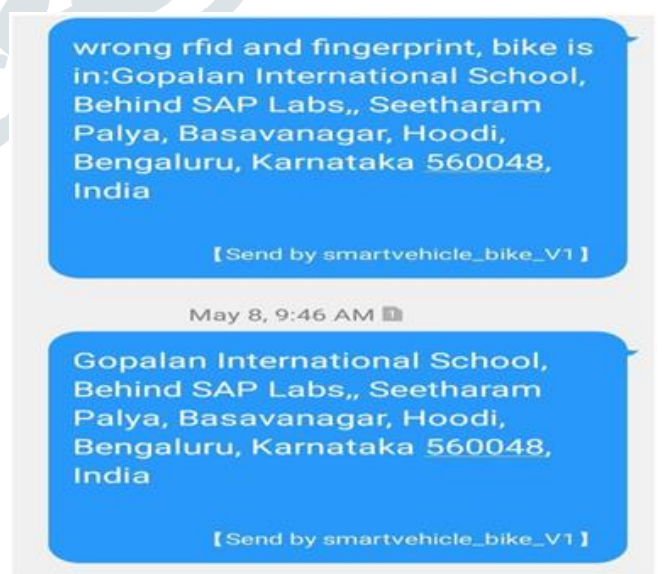
【Send by smartvehicle_bike_V1】

Fig.8 messages received from prototype model

6. CONCLUSION

This project is modelled for an smart and anti-theft device for two wheelers. The project is aimed at implementing an anti-theft device with real time tracking and user control. This is achieved with the help of GSM and GPS technology. The project provides an extra layer of security by including biometrics in the form of finger print recognition and RFID to grant access to the vehicle. And if vehicle is theft i,e. wrong access or any moment in bike, then owner gets message along with location and brake can be locked.

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