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Survey on Fingerprint Based Security System for Vehicle

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ABSTRACT

Nowadays rate of vehicle theft is very advanced all through world and the situations are even worse in developing countries. Therefore, protection of the vehicles with an intelligent, reliable, effective and economical system is very important. The existing technologies for vehicle security have number of limitations including high false tracking rate, easy deactivation and high cost. In this research, an finger print vehicle security system has been designed and implemented using sensor-network system which employ Global Positioning System(GPS) and Global system for mobile Communication to set the alarm in danger. This cutting edge technology is capable to protect, monitor and set alarm within the less time.

Keywords : Micro-controller Unit (MCU); Global System for Mobile (GSM); Global Positioning System (GPS).

I. INTRODUCTION

Automated person identification or recognition has become popular in recent years because of its application like protected access to computer systems, buildings, cellular phones and in terms of security like video surveillance. Person identification techniques are divided into knowledge based, token based and biometric based. A knowledge based approach relies on something that an individual knows to make a personal identification like password.Token – based approaches are based characteristics of an individual for identification and it cannot be stolen or lost.

Fingerprint based determination is one of the most crucial biometric technologies which have drawn an encompassing amount of attention lately. Fingerprints are believed to be unique across individuals. Fingerprint bio-metrics provides robust, reliable.

identification. There are two varieties of fingerprint systems: verification and identification. Fingerprint verification is the process of acceptance and rejectance of the authorized person using his/her fingerprint. Fingerprint identification, on the other hand, is the process of deciding which registers one's fingerprint.

Fingerprint biometrics is one of the efficient, secured, cost effective, ease to use technologies for user authentication. Because of the intellectual property protection and commercial profits, it can also be used in the field of automobiles for providing security and theft protection of the vehicles.

II. Related Work

The modern developments in biometrics recognition system tracks to the improvement in reliability and accuracy of the system. Fingerprint Recognition (FR) for vehicle security system are summarized in below section.

Some systems utilities Auto cop mechanism which is a video surveillance solution that can be fitted into the vehicle. The camera will endlessly monitor the actions within the system. The main drawback of this system is that, the camera will not detect accurately when

there are changes in the lighting conditions in and approximately the system.

Other systems include in-vehicle anti-theft component that will not enable the functions of something an individual have like passport, driving license, ID card, credit card or keys. But these approaches have lot of demerits like: tokens may be stolen, lost, elapsed or mislaid. But the biometric systems use physiological or behavioral e appliances if it find itself is illegally moved to another car. The destructive aspect of this system is that it requires a secure processor and smart card chips to store in the Group Identification Number . The advanced system uses the Global Positioning System (GPS) to track position of the targeted vehicle and its current location. GPS uses global navigation satellite system. The location information provided by GPS system cannot provide location if view of the sky is severely limited. It is also influenced by other factors like rainfall, fog and snowfall.

Radio frequency Identification (RFID) is utilized in Intelligent Computerized anti-theft system [ICAT]. RFID cards are used to provide guaranteed access. The restriction here is that RFID cards without keys can be easily stolen.

III. Methodology

Since, other biometrics has their own virtue, the fingerprint recognition technique is unique and it provides higher security and accuracy.

a. The fingerprint of an individual is acquired by a fingerprint scanner to produce a digital representation.
b. Pre-processing, is the process in which the input of fingerprint is enhanced and adapted to simplify the task of feature extraction.
c. Feature extraction, in which the fingerprint is further processed to generate discriminatory properties called feature vectors.
d. Fingerprint matching, in which feature vector of the input fingerprint is compared with one or more templates. The database stores the templates.

The fingerprint coordinating techniques are minutiae based matching and pattern matching. Pattern matching compares two images for checking similarity. The minutiae matching relies on minutiae points i.e. location and direction of each point.

Algorithm of Fingerprint based Vehicle security system :

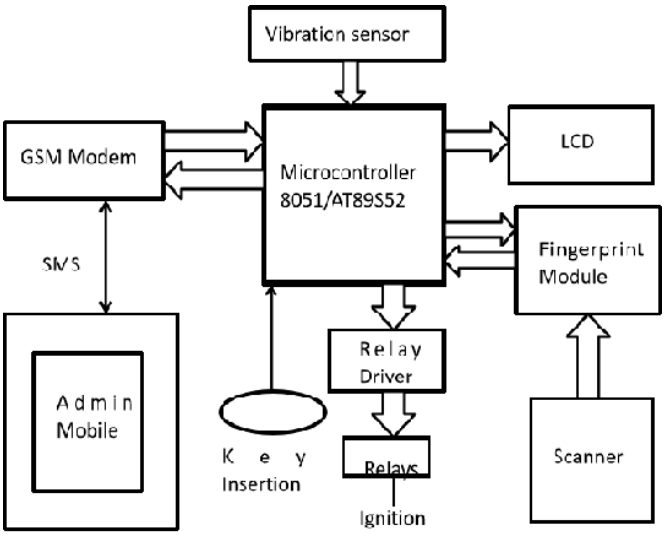

Fig.1 System architecture diagram

1. Start
2. Place a finger and press enter button (top button) to start the system.
3. If finger already stored in the scanner module, start the system.
4. If not,(apply fingerprint max 3 times) message sent to owner and buzzer activate.
5. Stop.

IV. LITERATURE SURVEY

Kiruthiga Narayanasamy (2015) worked on this paper to protect the vehicle from being accessed by any unauthorized access, using fast, easy-to-use, clear, reliable and economical fingerprint recognition technique. Using Global System for Mobile (GSM) communication technology this vehicle security system intimates the status of the vehicle to the authoritative person (owner). If the person is registered, vehicle access is allowed. Else SMS will be sent to the owner. By using GPS technology, vehicle it

can be identified very easily. Thus, the system gives security at both levels[1].

Albert Joe Francis (2011) worked on anti theft control system for automobiles that tries to prevent all the possible thefts of a vehicle. This system makes use of an integrated chip that has an proximity sensor, which senses the key during insertion and send away a text message to the owner's mobile that the car is being accessed. This is followed by the system present in the car asking the user to enter a unique password or pin. The password consists of some characters and car key number. If the user fails to enter the correct password in three attempts, a text message is received by the owner with the vehicle number and the location which is being tracked using a GPS.[2]

Vivek Kumar Sehgal (2012) worked on proposed topic related to GSM techniques and a better decision making process which is built to make our vehicle more secure. It is a unique wireless home/car security device that gives instant alerts on your mobile phones the moment a security breach is detected. It is designed such a way that it alert's you wirelessly through a call stealer alarm system wiretap an intrusion. proposed an 8 bit integrated controller inter model.[3]

V. RESULTS AND DISCUSSION

Their are mainly security two modes in security system execution: first, if the system is active and an unauthorized person seek to turn on the vehicle, then alert message will be sent to the registered user in system and the buzzer will initiate and in the second mode, authorized person will be given access.

The main component of this system is microcontroller. It is responsible for monitoring and generating the inputs and outputs respectively. The output of the system will be shown on the LCD .

VI. CONCLUSION

Security is fundamental criteria in all kind of applications. This project is intented at improving the level of security for vehicles. As the fingerprint is a auspicious biometric pattern for identifying a person in terms of both security and ease of use. This is a specific method of conniving and assembling a low-cost, packed in theft control system for an automobile which is highly reliable. The work exhibits the initial phase of an embedded car that will be visible in near future. Customized vehicles will not only provide a more interesting drive but also safer one.

TAXONOMY CHART

	BLUETOOTH CONNECTIVITY	MOBILE LOCATION	MOBILE DATA	NEED PHONE	AUTHORISED USER
ONLINE TRACKING USING GPS	✗	✓	✓	✓	✓
GSM TECHNOLGY	✗	✗	✗	✓	✓
FINGERPRINT ACCESS	✗	✗	✗	✗	✓

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