A Smart Garbage Dumping Vehicle

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Abstract: *Tons of garbage is produced everyday in cities around the globe because of increasing population and changing consumer behavior where only India generates 1,60,000 metric tons of garbage each day. Most of the garbage collecting vehicles dump it in bare lands. Thus, a smart garbage automobile tracking system is proposed that includes a GPS module and GSM modem that locates the position of a vehicle, controls the vehicle's ignition system and locking mechanism of the doors. A memo is delivered to the tracking system and the system retorts to the users request by carrying out appropriate actions. Short messages are dispensed to these features. A webpage is precisely premeditated to vehicle's location on Google maps. Authentication is provided to each authorized drivers using biometrics.*

Keywords: GPS module, GSM mode

I.   INTRODUCTION

Automobile tracking system is a system used to govern the position of a vehicle by means of methods like Global Positioning System (GPS), Global System for Mobile communication (GSM) module and operating system through satellites and device. By using the vehicle tracking system, it is easy to calculate and get the accurate position of the truck. Automobile's information such as locations, speed, and distances travelled can be watched on a LCD screen. This system is implanted with an embedded chip that has an inductive proximity sensor that senses the key insertion and directs a text message to the owner's mobile stating that the vehicle is being accessed. Then the system asks the driver to come in with an exclusive password. If he/she fails to enter the correct password or if any unauthorized access happens, a memo is directed to the admin with the vehicle number and the place traced with a GPS module. Further the fuel system of the vehicle is deactivated so that the driver cannot start it by any means. Additionally, the locking scheme gets triggered and the illegal user gets locked inside the vehicle and a lone authorized driver who is provided with the key to the lock system can disable the mechanism. This technique helps in taking fast steps towards vehicle thefts. This scheme comprises a microcontroller and a mobile for the communication purposes.

II.   LITERATURE SURVEY

Security systems and navigators have constantly been a requirement of human's life. The progresses of enhanced electronics have fetched revolutionary variations in these fields. In [1], we propose a automobile tracking system that engages a GPS module and a GSM modem to locate the vehicle and proposes a range of control features. To design effectively, a GPS unit, two relays, a GSM Modem and two MCU units are implemented in the system. The objective is to track a vehicle's location, control the vehicle's ignition system and lock and unlock the doors of the vehicle. A message is delivered to the system and it acknowledges the users request by carrying out suitable actions. Short text messages are allocated to each of these features. A webpage is specially designed to track the vehicle's location on Google maps. By means of relay based control concepts, number of control features can be implemented. Nowadays, vehicle muggings are rising at a high rate everywhere. People are now employing their vehicles with theft control systems. The commercially existing anti-theft vehicular systems are very costly. In [2], we make an effort to plan and develop a simple, low cost vehicle theft control scheme using an ingrained microcontroller. This system involves a microcontroller and a mobile for the communication purposes. The Global System for Mobile communications (GSM) is the most widespread standard for mobile phones in the world. Over billion people use GSM service across the world. The usability of the GSM standard makes worldwide roaming communal amongst mobile operators, allowing subscribers to use their phones across the globe. GSM varies significantly from its predecessors in both digital signalling and speech channels, which means that it is treated as a second generation (2G) mobile phone system. The design is simple, reasonable and robust. From [3], we use biometrics as a means of authentication.

Biometrics is the discipline of spotting an individual based on individual's physical or behavior traits. Biometric is organized in numerous commercial and national security claims. Biometrics defines numerous biometric techniques and the necessity to be addressed form making biometric technology an effective tool for providing information security. Biometrics denotes to certain characteristics that is distinctively associated to a person. This trait is extremely typical and in addition, utilized for distinguishing different individuals. Physiological biometrics [4] refers to a person's physical qualities, such as fingerprint, face, and iris. It is familiar for its robustness and high uniqueness that promote high recognition accuracy. The signature [5], keystroke dynamics, voice and gait recognition are identified as behavioral biometrics. Behavioral biometrics has the advantage over its physiological counterpart on the skill to work in stealth approach. As such, minimal interaction is vital during validation process decreases inappropriateness and thus endorses user adequacy. In addition, in the event if one's behavioral attribute is negotiated, it is likely to be substituted (changing to a new password, thus, new keystroke print or new written signature).

III.PROBLEM DEFINITION

In earlier anti- theft vehicle system, SIM-300 was used in GSM module which operated at a voltage of 3.5V which is more than the nominal value. Moreover, it had very limited bandwidth about 900 billion MHz per second. Also, these systems were not fortified with any locking mechanism that could trap the unauthorized person inside the vehicle who tries to steal it. Since separate components such as RAM, ROM, microchips were used earlier, anti-theft systems were extremely expensive.

IV.EXISTING SYSTEM

In earlier times, garbage collecting vehicles were not armed with any device that could monitor the activities happening inside the vehicles; also it doesn't offer any resources to locate the vehicle to know whether it is actually being used for the purpose it is assigned. Thus, most of the public dump the garbage in the bare lands affecting the health of the people staying nearby causing diseases[6] such as dengue, malaria, cholera, etc and also reduces the market rate of the land. Dumping zones were not provided with authentic logins before which provoked criminal activities such as dumping of dead bodies, drug supply, fuel stealing, etc.

V. PROPOSED SYSTEM

The smart vehicle is interfaced with different sensors and applications like GPS module and GSM modem to track the location of the vehicle. The automobile is integrated with a real time live wireless camera to monitor the activities happening secretly in the vehicle and all the operations performed are exhibited on the LCD which can be observed by the admin. The user of the truck is provided with authentic login to ensure proper dumping of wastes through biometrics, thus blocking all the unauthorized people from entering the dumping zones and lessens the criminal activities happening at such places. The message is also guided to the owner about the unauthorized usage.
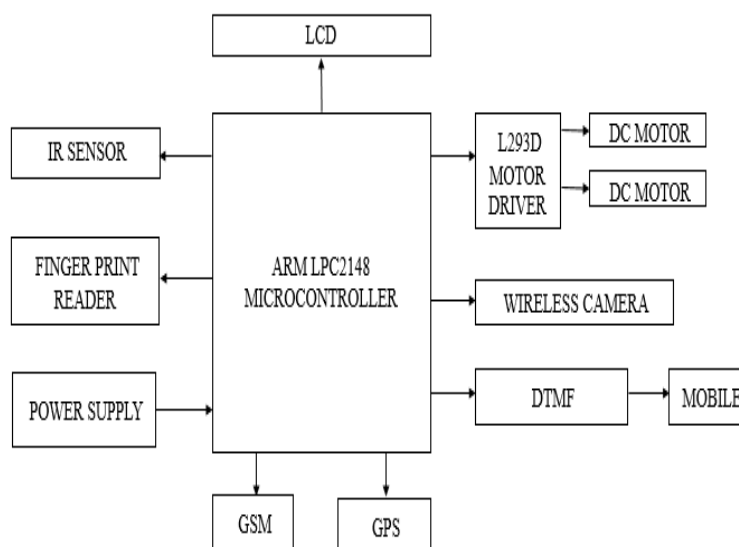
VI.SYSTEM ARCHITECTURE

Fig.1.Defines structure and behaviour of system

ARMLPC2148 microcontroller is a widely used IC from ARM-7 family. It is built by Philips and it is pre-equipped with several intrinsic peripherals making it more resourceful and reliable and also offers low power consumption. It is accountable for the initialization of the smart vehicle in assistance with DC motors. This is achieved through L293D motor driver that takes low-current signal and provides high-current signal. The IR sensors alerts the admin about the intruder's presence which is continuously being watched via the wireless camera attached to the vehicle and the notification in the form of short message is guided with the help of DTMF to the admin. The activities can be seen on the LCD, thus enabling the admin to control the vehicle. The combination of GPS module and GSM modem are used to track the exact location of the vehicle through Google maps. The authentication at the dumping zones is provided by the finger-print reader.

VII.   DATAFLOW DIAGRAM

ARMLPC2148 initializes the smart garbage dumping vehicle with the aid of L293D motor driver. The microcontroller then performs the security check for authentication using finger print reader.
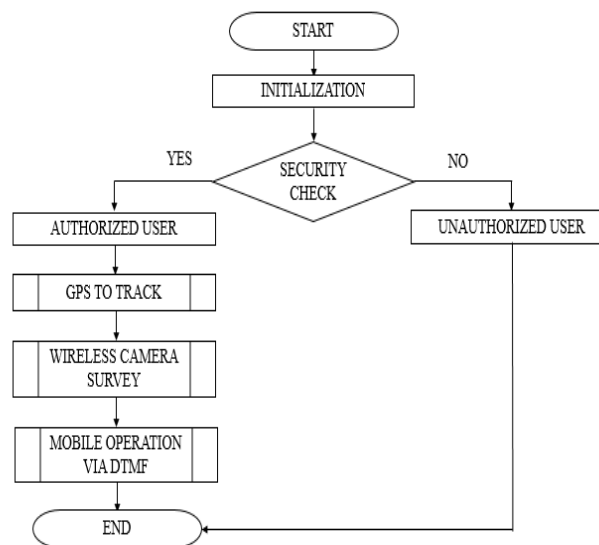

Fig.2 Graphical Representation of flow of data

If the finger print reader confirms the driver to be an authorized person, then that individual would be allowed inside the dumping zone. It also controls a number of features with the support of various components such as the combination of GPS and GSM that helps in tracking the location of the vehicle. It is also provided with the wireless camera that captures the activities happening inside the vehicle and if it encounters any unauthorised activity, the admin is informed about it through DTMF operations via short messages. In case, any unauthorised user tries to access these dumping zones, that individual would be barred from entering the yard.

CONCLUSION

The tracking system proposed can be used for locating and navigating the vehicle with an accuracy of 10m. The locating is done in the form of latitude and longitude along with the accurate location of the place, by making use of Google maps. The system tracks the vehicle on the user's request and replies to the user via SMS. The received message contains longitude and latitude that is used to locate the vehicle on the Google maps. The vehicle tracking system allows a user to control the vehicle's ignition system, remotely lock the doors of the vehicle, remotely control the locking mechanism of the doors of the vehicle, and track a vehicle'/s location. Hence a genuine attempt is made to bring in a low cost and effective vehicle theft control system. The main benefit of this system is that the whole work can be made with a meagre amount of venture and can be used in any automobiles and thus bringing in less sophisticated and simple technology. The Biometrics used refers to an automatic authentication of a individual based on his physical and/or behavioural characteristics. The use of biometrics as a consitent means of authentication is gaining momentum, though the industry is still budding and emerging.

FUTURE ENHANCEMENT

The complete system can be made more compact and flexible. All the elements and sensing system can be brought under a sole chip and System-On-Chip (SOC) for anti-theft control vehicle to be designed.

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