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IoT Based Women Safety System

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***Abstract*: Now-a-days, women safety is a prime issue in our society. The count of victims is increasing day by day. In this paper, we are proposing a model to ensure the safety of women all over the world. This idea uses Internet of things (IoT) for Women Safety with alarm. This women's security caution framework with Arduino has the capacity of sending SMS alerts to the relatives of the victim, so that women can go out and do things without hesitation. Thus, the proposed system is reliable, low cost, user-friendly and helps women to overcome their fear in critical situations. This paper proposes a Fleet tracking system to prevent the misuse of these vehicles and to make sure the passengers are safe. This IoT device placed in the vehicle is designed using Arduino that is acquainted with sensors to monitor the vehicle and detect any unauthorized access immediately. It contains a GPS system, which will allow the system to keep track of the vehicle throughout the journey. An Ultrasonic sensor is attached to the vehicle to detect any unapproved access. The result of this system is promising in terms of efficiently monitoring the vehicle and preventing thefts.**

***Keywords*: IoT, fleet tracking system, GPS, monitor, reliable.**

1. Introduction

In the present scenario, women are competing with men in every prospect of society. Women contribute fifty percent to the development of our nation. But the women are afraid of getting harassed and killed. All these types of women harassment cases are increasing day by day. So, it is very important to ensure the safety of women. This paper proposes a model of a band which provides the required safety to women so that they can-do late-night work. Proposed model contains various sensors which will measure different parameters continually. IoT (Internet of Things) is a relatively new and fast-developing concept. By using IoT-based technology guardians, relatives and police can monitor and track different sensors with their value and position of a device. This device is wearable and so it is easy to carry. This can be achieved using an Arduino unit that continuously monitors and records the whole sensor reading in its permanent (non-volatile) memory location. This system continuously records the reading, and the live meter reading can be displayed on a web page to the consumer on request. Its low and affordable cost makes it economically feasible.

2. Literature Survey

Smart Fleet Monitoring System using Internet of Things (IoT) 2nd IEEE International Conference on Recent Trends in Electronics Information & Communication Technology (RTEICT), May 19-20, (2017) [1], India. The focus of this paper is vehicle monitoring, monitoring the fuel level in the vehicle and to measure fuel consumption by the vehicle with respect to the distance traveled. This also focuses on minimizing the fuel wastage due to the unmaintained status of the vehicle.

Intelligent Fleet Management System with Concurrent GPS & GSM Real-Time Positioning Technology, Wireless Communication Centre (WCC), University Technology Malaysia (UTM), Malaysia [2]. This paper incorporates the power of concurrent Global Positioning System (GPS) and Global System for Mobile Communications (GSM) real-time positioning, front-end intelligent and web-based management software. An intelligent front-end terminal is developed and installed in targeted vehicles. This paper proposes security of both the driver and fleet, emergency panic button, anti-theft mechanisms and virtual geo-fencing features.

Abbas Fotouhi, Neda Shateri, Dina Shona Laila & Daniel J. Auger (2019) [3]. The paper proposes three models for energy estimation. Terrain model means all the route specifications that affect vehicle energy consumption. The driver model is aimed to follow a reference velocity profile that is driven by a human driver during the tests. It focuses on the development of an EV model and its simulation under driving conditions.

P. Singh, M. S. Suryawanshi and D. Tak (2019) [4]. The goal of this paper was to introduce the successful utilization of specialty advances in taking care of most basic issues of Fleet Industry. The proposed armada, the board framework depicted in the paper, utilized a rich arrangement of advancements like Internet of Things (IoT).

Dautov, R., & Song, H. (2019) [5] Enormous scope Internet of Things (IoT) frameworks are described by an expanded degree of heterogeneity, both in terms of equipment and programming brought about by differing gadget usefulness, capacities and execution. Besides, since light-footed business prerequisites force IoT sellers to ceaselessly adjust the product parts conveyed at the Edge, even at first uniform gadgets comprising a typical IoT biological system could wind up running programming contrasting in individual components as well as setups. How much exertion expected to keep up with and work such an undeniably different biological system

Goustouridis, D., Sideris, A., Sdrolias, I., Loizos, G., Tatlas, N. A., & Potirakis, S. M. (2021)[6] The Inteligent Logger

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framework offers the accompanying remarkable highlights that ensure fruitful rock solid vehicles/hardware armada the executives: Recording and stockpiling of working information of mechanized development hardware, in a solid way and progressively, utilizing explicitly planned Internet of Things (IoT) sensor hubs that impart through the accessible organization foundations, e.g., 3G/LTE; Use on any machine, no matter what its age, in a widespread way; Flexibility and complete customization both regarding information assortment, joining with outsider frameworks, as well as with regards to handling and making inferences; Validation, mistake revealing and rectification, as well as update of the framework's data set; Artificial knowledge (AI) programming, for handling data progressively, recognizing out-of-typical way of behaving and producing cautions.

3. Methodology

We propose a method in which the vehicular body will be embedded with the sensors around it, which would monitor the vehicle and sense any unwanted access. This will continuously monitor the vehicle. If the driver takes an unusual route instead of the regular route, the system will automatically notify the passenger and the management. The driver may need to change the route for many reasons such as heavy traffic or to refill the fuel. If the passenger accepts the change, then the driver can change routes. The GPS, which is interfaced with the L298 driver, is connected to the Arduino. The Arduino is programmed to receive the latitude and longitude of the route in which the vehicle is traveling from the GPS. If these coordinates do not match the ones programmed in the Arduino, the power supply for the engine of the vehicle is cut off. The power to this motor is supplied from batteries via the L298 driver. This will allow the passenger to reach their destination safely. Every driver can only take a limited number of rides for a particular duration and can only travel within the given district or a particular location. Some drivers misuse it and take extra rides and travel to a place which is farther away from. This results in a higher maintenance cost and since there is no one to monitor, crimes also occur. To prevent this, the vehicle is continuously monitored by the management. The movement of the vehicle is tracked using the GPS in the vehicle, and the Arduino checks if the driver is riding within the city. If not, the respective authorities are the car keys where the ultrasonic sensor detects the movement of the latch and cuts off the power supply to the engine, making it difficult for the driver to start the vehicle. If a person tries to open the door more than three times, the ultrasonic sensor detects the fluctuation in the distance between the latch and the body thus cutting off the power supply to the engine. person may never be able to start the vehicle.

The fleet management technology with AI based GPS tracking system associated with autonomous image sensing safety and security for the automobile under laws of Vehicle dynamics under on and off driving is implemented here. The proposed system takes input from the camera. An algorithm is developed to detect the objects and humans on the road to prevent the accident. Here the vehicle tracking is carried out with GPS which is completely controlled by the host PC such that the host can control the engine for a limited distance. Car door openers are interfaced with IR sensors which cuts off the engine flow if the door has been tried to open without a key. Image sensing allows the car to stop by automation of brakes and engine if an accident tends to occur. The proposed Arduino based vehicle tracking system using GPS and Arduino technology was developed and tested successfully to track the exact location of a moving or stationary vehicle in real time. Arduino makes the system user friendly. The system provides better service and cost-effective solutions for users. A vehicle's geographic coordinates are obtained from an in-vehicle device. A cell phone has been used to display the location of vehicles on Google maps. The system was able to experimentally demonstrate its effective performance to track a vehicle's location anytime from anywhere. This is easy to make and inexpensive compared to others. The proposed system will ensure safety and security of vehicles, drivers, and passengers. The Arduino based vehicle tracking system can be further enhanced by using a camera to get the real time view of the vehicle, which would be more convenient for the user to track the vehicle. The system can be made compatible with engines through SMS in future. Buzzers can also be added to check engine status. Traveling distance can be calculated and recorded using database.

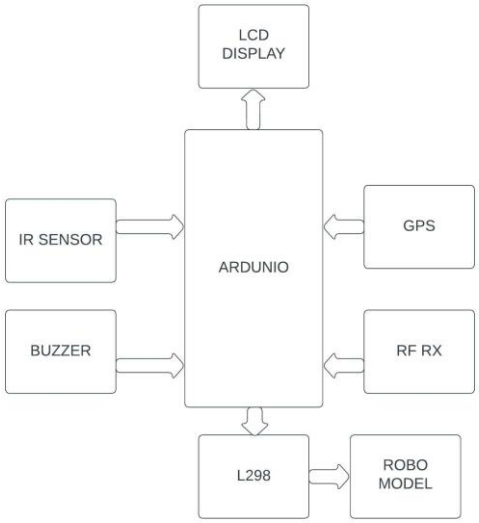

Fig. 1. Block diagram of system

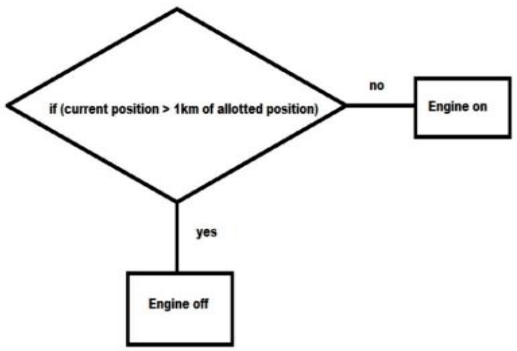

Fig. 2. Automated vehicle on and off functionality

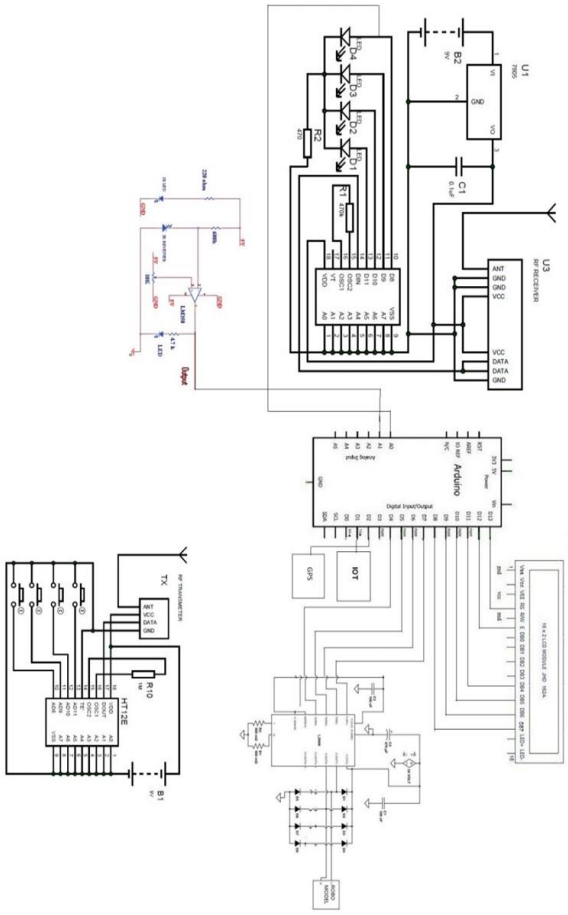

Fig. 3. Circuit diagram

This automated on and off functionality makes the system continuously track the vehicle's location. If the vehicle's location is farther than the allocated area, it generates a signal to cut off the power supply to the engine.

A 12 Watt *Battery* is used for the system. It is connected to the power supply board (PCB) which supplies power for every component in the system. PCB contains a switch to convert 12W to 5W because most of the sensors work only in 5W. It also provides power for the initial start-up of the engine. Hence, an auxiliary secondary battery is used to start the car. Here, the secondary battery is connected to the L298 driver to run two motors.

RF Receiver is placed in the main processing board to receive signals from the controller. Its Radio frequency range is about 433MHz. *RF Transmitter* is placed in the controller part, which is used to send control signals to the RF receiver.

Infrared Sensor (IR Sensor) is used to detect any unwanted moment inside the vehicle. It gets 5V input and output is sent to the controller (Arduino board).

Arduino Uno is the principal controller utilized in this venture. It recognizes the sign from the PIR sensor and sends directions to the GSM Module in like manner. The sequential pins of the Arduino are utilized to speak with the GSM module. This prominent board highlights 14 advanced information/yield pins of which 6 can be utilized as pulse width regulation outputs, 6 simple data sources, a 16 MHz fired resonator and USB association, control jack and the ICSP (In Circuit Sequential Programming) header and a reset catch.

The L298N is a dual h-bridge motor driver which allows speed and direction control of two DC motors at the same time. The module can drive DC motors that have voltages between 5 and 35V, with a peak current up to 2A. This is a great module to control the speed of the vehicle/motor and the direction of the motor rotation for navigating the vehicle left or right. This motor stores the power from the secondary batteries and supplies it to the motor if the conditions satisfy. Location finding techniques are of various kinds with each technique implying impacts on requirements like accuracy, coverage, location, speed etc. Adding a GPS tracking solution can offer some peace of mind by holding drivers accountable and providing alerts for unsafe driving habits. Here, the GPS gets the location (latitude and longitude) of the vehicle and sends it to the database. GPS module with 5V input and ground output with TX & RX Sensor is used.

ESP8266 module (WiFi module) is connected to the Arduino board. It is used to send alert messages to the user via BLINK APP. Wi-Fi soc, and hardware are based on the ESP-12 module. Here, the location from the GPS is checked with the location programmed.

LCD (Liquid Crystal Display) screen is an electronic module. A 16x2 LCD is a basic module and is typically used in various devices and circuits. The request register stores the course rules given to the LCD.

4. Conclusion

The occurrence of threats to women leads to an increase in the number of security devices and applications. This paper showed various factors which have been used in applications and smart devices developed for women safety. In this paper, various techniques used for the sake of women safety against fraudulent people have been discussed. The devices and components used in these techniques are also provided and the system has been implemented.

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