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IOT Based Anti Theft and Locating System for Two Wheeler Using ESP8266

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ABSTRACT:

As we know, a two wheeler is the most preferred vehicle in India. In this modern era, security for all vehicles is reducing day by day, mainly for two wheeler. Two wheeler are being stolen from parking lots or even from the street outside one's home making vehicle theft a major issue in India. Also, many times it becomes challenging to locate our vehicle when parked in crowded parking places. These issues are faced by almost every individual on a daily basis, so to overcome these problems we are developing an Anti-theft & Locating system for two wheeler. The system is designed using GPS & GSM technology. The system will be accessible through a mobile application to be able to easily locate & monitor your vehicle.

Keywords: Crowded parking, security, anti-theft, locating, GPS, GSM, mobile application, vehicle monitoring.

1. Introduction

A two wheeler is the vehicle of choice of most Indians in their day to day life. Well as per the survey presented by autocarpro.in , total two wheelers manufactured and sold in India are 13,07,131 units for Jul'22 whereas 12,00,621 units were sold for Jul'21. So as we can see there is increase in sale of two wheelers by 9%. Also as we have not completed the year 2022, so we have the tabular presentation of state wise sales of two wheelers for year 2020-19. As we can see two wheelers are the most vehicles that have been stolen I.e. 75%, so we can imagine how it is necessary to secure the two wheelers.

As we know motorcycles are easy targets as they have exposed locks and Wiring. Thieves use simple techniques to break the lock and then bypass the ignition to start the motorcycles. One of the way to steal is "Grab and go" is a typical method for motorcycle theft. This takes at two people one who drives the large vehicle and other jump out, load the bike on the large vehicle and drive away. As it occurs many times but the same way there is risk for thieves to get caught because it is not easy as loading bicycle. But still it is one of the way to stole the two wheelers. One of the other way to steal two wheelers is that it happens more often is by using master key. This master key is a kind of key which can be inserted in any vehicle to turn on the engine. In this case, it requires only one person. The respective person comes near the vehicle and checks whether any one is looking at him or not and at the perfect time and perfect moment the thief inserts the master key turns on the engine and robs the vehicle. Also one of the other way to steal the bike is by pushing the handle of bike to the opposite side of the lock. It requires some strength but the metal that obstruct the movement of the handle when its lock breaks. The bend metal provides the free movement of the handle. Now after this thief pulls out the ignition wires and bypasses the need for key by simply connecting them together.

All of this mostly happens in crowded places and parking slots. So when we park our two-wheeler in parking lot / crowded places then it is one difficult job to find our vehicle and even there are chances of it getting robbed. This problem is faced by every individual on daily bases, so to overcome this problem we are developing IOT based Anti-Theft and Locating system for Two-wheeler which will make it easy to find our vehicle in crowded places and will also provide security to our vehicle.

II. LITERATURE SURVEY

Title of Paper :- Advance Security and Alert System for Two Wheelers.

Authors :- Krutika Nidu, Dipti Bichwe, Aboli Nikode

Description:-

In this the author's tell about how to make two-wheelers secure from theft. The aim of this project is to alert the surroundings and the vehicle owner via buzzer and a text message about the theft of the vehicle. To check the authentication of the rider in this project a Fingerprint Biometric Module is used. If the fingerprint matches with the fingerprint stored then the ignition is turned ON by using a relay and if not then the alerting system comes into an action. There is also a reminder system attached in this project to remind the owner about the necessities and the formalities about the vehicle like air

filling, insurance, servicing, etc. using a GSM modem. An LCD display is also attached with the circuit to continuously indicate the status of the vehicle. The hardware used in the project is 89C51 micro-controller, LCD display, MAX 232 for serial communication between micro-controller and the memory, GSM modem and a Buzzer.

Title of Paper :- Review of Bike Security System using fingerprint, GPS &GSM.

Authors :- K. Dinesh Kumar, G.Nirmal, S.Prakash, S. Raguvaran

Description:-

In modern days a vehicle anti-theft system is of prime importance. The safety of vehicle is

extremely essential for public vehicles. First layer of protection in system is fingerprint recognition, based on which

locks are opened. Fingerprint matching is done by using a finger print module. If finger ridges match, solenoid valve is

open for fuel supply and also a message is sending to owner by GSM. If finger ridges doesn't match it makes vehicle

immobilized and an alert message is sent to mobile of owner. If the vehicle is stolen by someone, place of vehicle can be identified by the GPS tracker. This system is more secured, reliable and of low cost. The experimental results proved the functionality of anti-theft in working environment.On March'15, three students of bachelor of technology ECE dept.

Worked on above stated technology under guidance of Mr. Raghuvaran.

Title of Paper: - Advanced Fingerprint Authentication System in Two Wheelers.

Authors: - Vaishnavi Khadsane, Mrunalini Desai, Devashree Khatvakar, Shruti Lad

Description:-

Project is to create authentication system for two wheelers based on most popular biometric that are nothing but finger print recognition of finger print is based on certain factors such as unique patterns, reference points etc. Project consists of AVR micro-controller ATmega328, fingerprint scanner module and GSM module. As soon as finger print module acquires finger print, finger print module immediately interacts with micro-controller and check if fingerprint is valid or not. If it is valid, the ignition system is started provided sufficient fuel must be present. If invalid then a message will be sent to owner of vehicle using GSM module. On March 2016, four students from Electronics Engineering Department, Mumbai University work on above stated technology and published this paper. Their model can be further modified with attaching a GPS Tracker along with GSM to get the exact location of the vehicle in case of theft.

III. Proposed Methodology

A. Design Considerations:

- The system uses ESP 8266 Micro-controller which acts as a brain of this system.

- Sim 800A modem as GSM to send notifications when unauthorized access takes place.

- One GPS module to monitor live location of vehicle by giving its coordinates.

- 5V DC Relay modules which acts as an interface between ESP 8266, Sim 800A.

- BLYNK app which helps us operate our system from device by also providing authorization.

- Location of vehicle can be monitored through app.

B. Description of the Proposed design working:

Aim of the proposed design is to create an Anti Theft and Locating System for Two Wheeler. Which helps us to locate our vehicle in crowded parking and even provides security to our vehicle by being Anti theft . The proposed algorithm is consisting of some steps:

Step 1: Initialize ESP8266:

First step is to initialize the ESP8266 for that purpose we power the ESP8266 and feed the code in it. Appropriate connections are made as the circuit diagram are made where we connect relays, LED, GPS, Buzzer along with Sim 800A to the ESP8266.

Step 2: Implementation of all the parameters:

   After all the connections one by one parameters can be implemented such as , if one has to locate his/hers vehicle in crowded place then they need to switch on the LED buttons on the app which then turn ON the LEDS. Then the live monitoring of vehicle location can be done by connecting GPS with ESP 8266 and supply given to it which shows the live coordinates of our vehicle. If unauthorized access takes place then the notification is send and buzzer rings with the help of relay and ESP 8266.

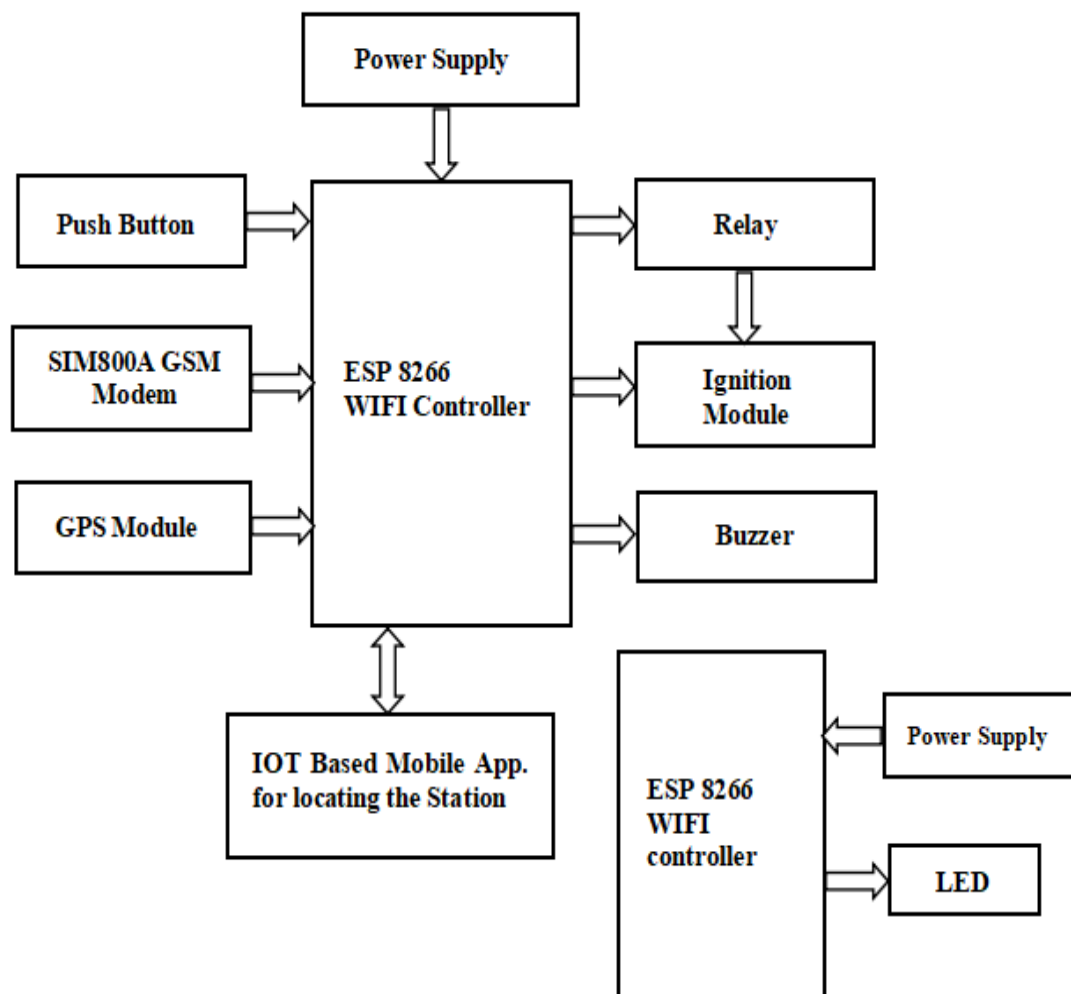## IV. Block Diagram AND FLOWCHART

Block Diagram:

Fig. Block Diagram

Block Diagram Description:

To start our system we will give the power supply. Later it can be interfaced through the app as per requirement. So if we press locating feature option from the app then the micro-controller will interface with LED.If we press vehicle's location option from the app then it will interface with GPS module and will show us the coordinates. If anyone try to start the vehicle(i.e unauthorized access),then it will interface with buzzer and GSM modem to alert and send notification to the user. If user has to start his vehicle (i.e authorized access) then they will press relay option which is interface the relay and ignition module by doing so the ignition module will turned on.

FLOWCHART:
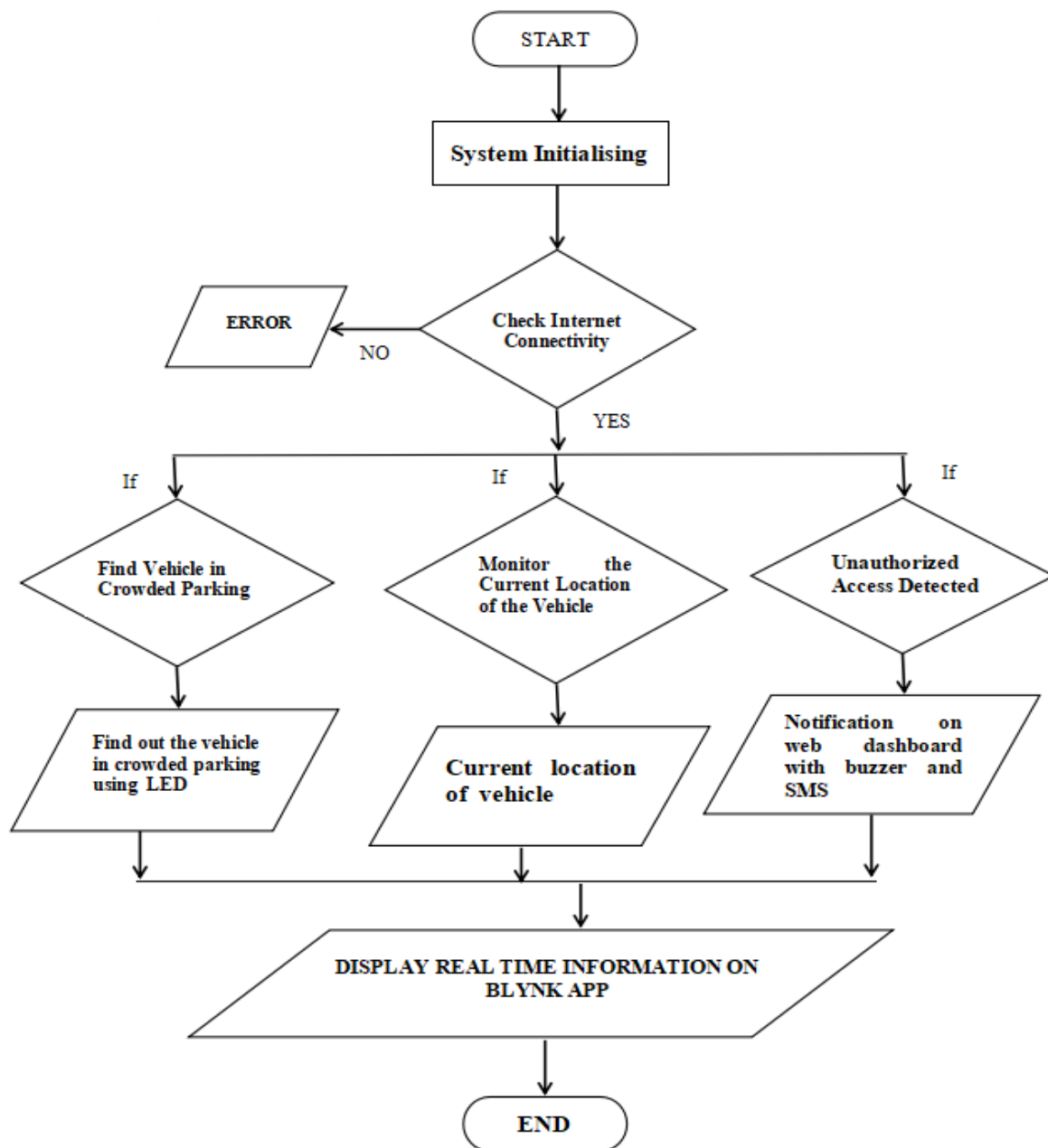
Fig. Flow Chart

FLOWCHART Description:

The flow chart explains us the working of our system, it starts by connecting the app with our vehicle by doing the system initialization. Then our system checks for internet connectivity, if the answer is NO then it will show error and again the initial step gets executed, and if the answer is YES then the following parameters will take place such as [1] Finding out the vehicle in crowded parking using LED [2] Monitor the current location of the vehicle [3] If unauthorized access takes place then to send notification with the help of SMS and buzzer. All the real time information will be provided to the user by using BLYNK app, Information will get display on it.
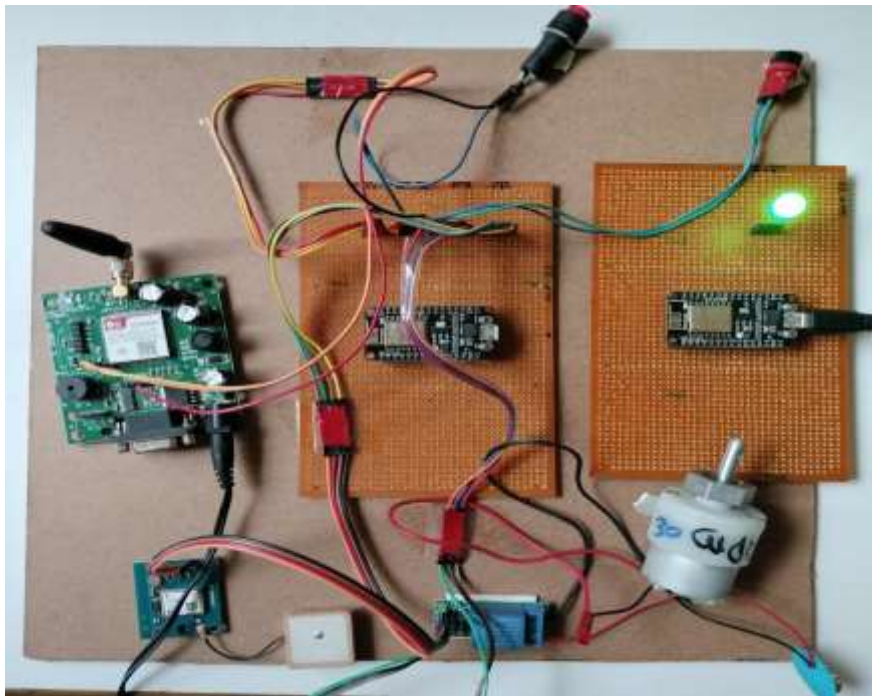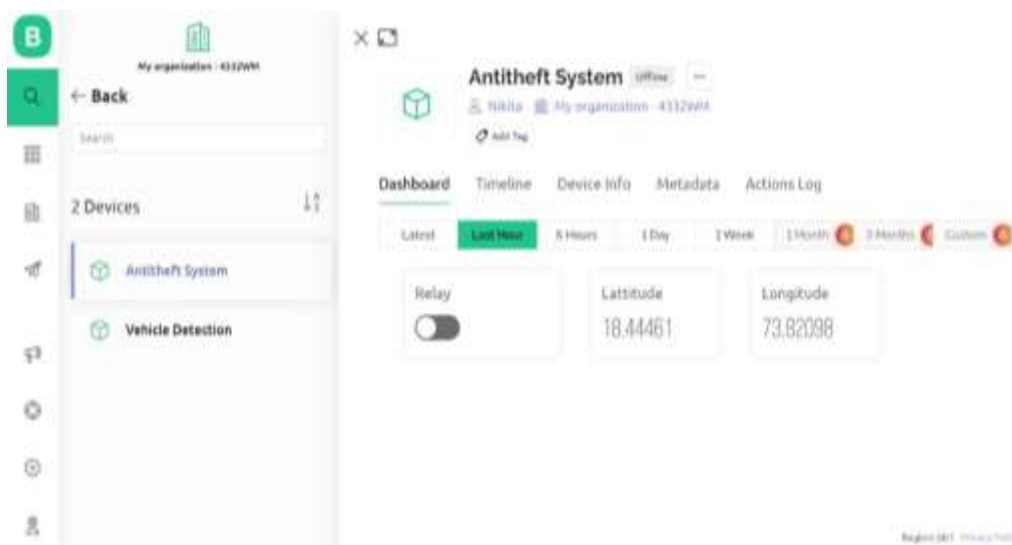
V. Results

Fig. Working circuit

Fig. BLYNK app interface for live location

- Above fig consists of working circuit and BLYNK app interfacing of our system. After all construction and testing work we got the results such as :

- Whenever we switches on the LED switch in app our LED's light up.

- If unauthorized access takes place (i.e push button is pressed on hardware) then the buzzer starts to ring and notification SMS gets send, notifying us that unauthorized access has been taken place.

- While the motor gets start only if the we turn ON the start switch form BLYNK app.

VI. Conclusion and future work

In this way we have designed and developed this Anti Theft and Locating system for Two Wheeler using ESP8266.

Which is capable of locating the two wheeler in crowded place while being Anti Theft by providing security to our vehicle. For the app we have used BLYNK app which is an third party app, which plays an important role to make our system work. As only the owner has an access to this app it plays an vital role to provide authorization to our system.

As for the future work many new features, different modes can be added. Instead of using the third party app, which we are not able to use to its full potential and which consist of some restrictions regarding its design and implementation, one app can be created from scratch which provides more ways to design and implement in our system. Many more things can be added in this system as per ones needs in terms of security or even more advance features.

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