



# SECURED VEHICLE CONTROL SYSTEM USING IOT

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## ABSTRACT

Internet of things (IOT) is the most trending and emerging technology that changes lifestyle of human being. IOT provides enormous applications in healthcare system, environment monitoring, transportation system and other commercial areas. The first and foremost objective of the paper is to innovate a Smart Vehicle Security Framework (SVSF) using IOT. IOT works on the principle of sensor applications. Sensors are used to monitor, and control real world objects etc., In the existing system the ignition of the moped can be done using remote or key whereas in the proposed system ignition can be done using voice commands through android application. The proposed system helps to control vehicles remotely through smart phones via applications. The smart vehicle security framework IOT which utilizes Radio Frequency Identification (RFID), Global Positioning (GPS), Global System for Mobile communication (GSM), Wi-Fi Technology, Remote correspondence and Cloud to prevent theft . The smart vehicle security system ignites by voice Commands through mobile application to avoid the necessity of vehicle key.

**Keywords:** Smart Vehicle Security Framework (SVSF), Radio Frequency Identification (RFID), Global Positioning System (GPS), Global System for Mobile Communication (GSM), voice commands.

## I. INTRODUCTION

IOT is a network of all physical tangible items such as devices, cars, buildings and anything that has software or sensors in them which allow us to automate everything. With just a command we can control all our gadgets and other electronics at home without having to get up and physically turn ON/OFF things. Transportation system has been a part of enlarging of humans. One cannot imagine the life without vehicles. To shelter the vast number of citizens, the number of vehicles also has been increased swiftly. In our paper we implement a smart vehicle security and control system using Internet of Things. In SVSF the user gives email id and password to access the android application. These user credentials are stored on the cloud. From cloud user can access a file and use application from any device that can access the internet. By using GPS and GSM modules we can locate the vehicle from anywhere. We use these hardware and software modules for our implementation. The Microcontroller (NodeMcu) is an open source IoT firmware. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif systems and hardware which is based on the ESP-12 module. The ESP8266 wifi module is a self-contained source with integrated TCP/IP protocol stack that can give any microcontroller access to your wifi network. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. The 12 volt battery is used in our project. A relay is an electrically operated switch used to ON/OFF the vehicle. The wifi is a wireless networking technology that uses radio waves to provide wireless high speed internet and network connection. Global

Positioning system is a satellite based radio navigation system it provides geolocation and time information to gps receiver. It uses latitude and longitude coordinates to find the location. GSM is an open and digital cellular technology used to transmitting mobile voice and data services operates at the rate of 850 to 1900MHZ frequency band. It uses the technology of Time Division Multiple Access (TDMA) for communication purpose. Arduino IDE consists of both a physical programmable circuit board and a piece of software used to write and upload computer code to the physical board .The arduino IDE supports the language C, C++ using special structure. This provides many common input output procedure. There are many third party IOT platforms but blynk very user friendly. It's supporting hardware likes Arduino or Raspberry pi is linked to the internet over Wi-Fi Ethernet or ESP8266.Blynk will get you online and ready for the internet on your things.

## II. SYSTEM ANALYSIS

### A. Existing system

The existing system aims to control a vehicle using remote control. The smart key contain battery it became drained, we need a backup method to start the vehicle. If anything goes wrong and the key became locked and it cannot open easily. Most of the smart key batteries are temperature sensitive causing effect by inoperative in the same day. It became waste of time and stress to human. Now a days the case of vehicle theft increases very much especially in developing countries like India. The survey reports that a car is stolen every 23 seconds on average. It takes less than a minute to steal most vehicles successfully Security for vehicle is available only in costly editions and also not user friendly for end user. Sometimes we may loss our vehicle key due to some tension. For new key we need to go to duplicate key making shop. We have to go Mechanic shop to change whole key kit. This issues replaced by proposing system.

### B. Proposed system

The proposed system is based on voice controlled vehicle helps to control theft through voice commands received via android application .The vehicle is controlled through voice commands given by the user who is operating the system. Everyone is having smart phones with them. The smart technology product using smart phones only. In our project we use the advanced version like start/stop our moped without key from anywhere using android application by commanding our voice. This system can improve the security level of moped and can help to decrease the

moped theft criminal statistics. The project fully focused on the wireless system common that controlled using mobile phone. This system will allow the user to keep the ignition circuit maintaining in ON/OFF mode.

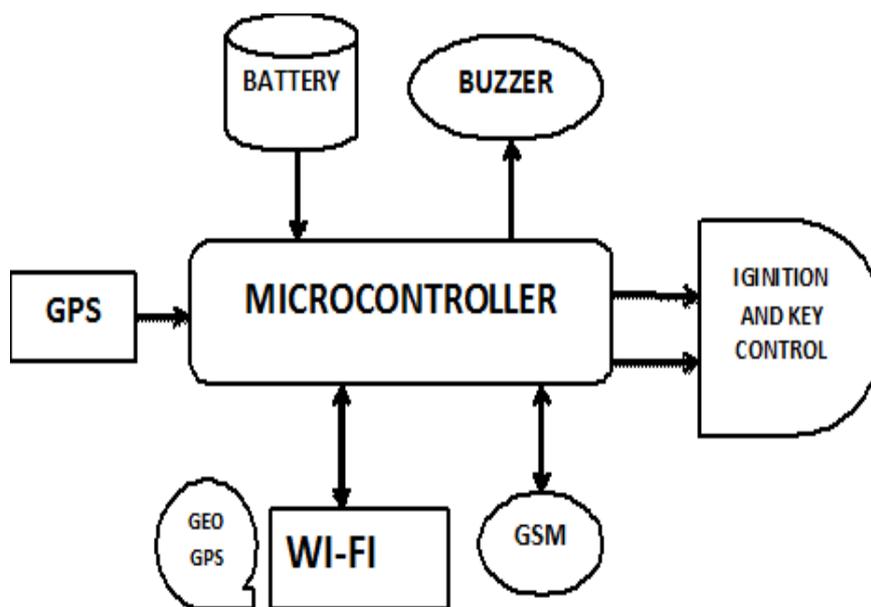


Fig 1: Block Diagram

### III. SYSTEM ARCHITECTURE

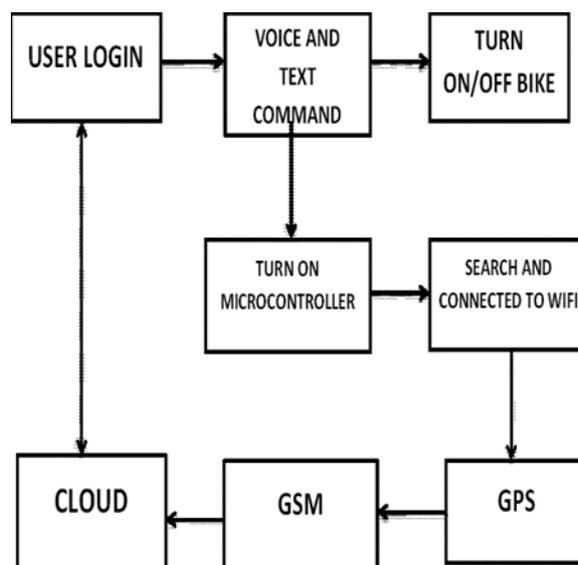


Fig 2: System Architecture

### IV. WORKING PRINCIPLE

The system utilizes NodeMcu, Wi-Fi, GPS, GSM, Battery, Buzzer and Relay are used in this project. The project kit is installed inside the moped. In moped we fix with the 12 volt battery. Microcontroller run minimum 5 volt it is the major advantage of our project. When user gives voice or text commands to the circuit will turn on the microcontroller and it will search for wi-fi network. Every smart phone we have own voice assistant to do task here also we will give task to our mobile assistant. Already our mobile assistant connected through internet with cloud API. Here we are using ad fruit cloud API and Google assistant for our project and it will famous for iot projects as well as free and user friendly. NodeMcu runs coding which we have already programmed. Here our purpose is to ON/OFF vehicle engine. First we will give task to google assistant it will send to adafruit cloud. Adafruit cloud will connected with Node mcu through internet. After receiving command from cloud, NodeMcu will trigger relay. In Fig.1 Relay is an electrically operated switch to ON/OFF the vehicle. The purpose of GPS is used to track the location of our vehicle based on latitude and longitude coordinates and provide that information through GSM which provides data and voice services. The prospect of cloud gives the information about current state of vehicle. Buzzer is the component provides alarm sound from the vehicle .When third person try to theft our vehicle. Ignition and key control is carried out through relay. It allows a low power voltage and operates a high power switch.

### V. ADVANTAGES

In the recent times we are constantly hearing about lots of moped are being hijacked. The existing lock at the moped actually is not having a very high security. As we can see that it only came with two main security lock which is handled lock and standard ignition switch lock. It is easily breakable by thief in order to secure the bike lock. By doing this project it's clearly showing the variety of security lock can be added to the moped. Furthermore, atleast this system can improve the security level of the moped.

### VI. LITERATURE SURVEY

Ozbay.S, and Ercelbi.E (2005),” SMART BIKE SECURITY SYSTEM “Processing of world academy of science engineering and technology vol9, ISSN 130s7-6884.[1]. Vehicle and Fuel theft cases are increasing day by day all over the world. So, Vehicle Security system plays an important role nowadays. Most of the advanced vehicle security systems best suit the four wheelers. As of the security system for two wheelers is concerned,

the systems available in market are of no match to the well-equipped thieves. When under attack, these systems can only immobilize the engine and sound a loud alarm. It is a serious limitation. In our proposed security system a new features is included in addition to the engine immobilizer and alarm i.e. alerting owner by SMS about the theft attempt, allowing user to control the system remotely by SMS. When anyone tries to steal the bike and fuel then this circuit will start conducting and the buzzer starts sounding. This sound indicates that somebody is trying to steal the bike and fuel, so this circuit is used to protect the

Vehicles from thieves. In Smart Bike Security System, sim 300 GSM modem is used for sending and receiving SMS. If anybody tries to steal the bike or fuel from the bike then the system sends a message to a predefined number and blocks ignition system of the bike. Also 89s52 controller is used. In every 8051

series controller there is one UART port for serial communication. Pin 10 and 11 is available for this purpose. Pin no 10 is for receiving whereas pin no 11 is the transmitter pin. Output of the 89s52 is 5 volt (TTL). A comport port base GSM modem (RS232 base) is used. For this purpose, max232 chip is also used to convert TTL data to RS232 .IC MAX232 is responsible for converting TTL data to RS232 data. With the help of transistor circuit a proper current to DC motor is provided. Motor operating current is approximate 200 mA. So it is not possible to drive the motor directly, so one PNP and one NPN transistor is also used to drive the motor. The same circuit is used for the Buzzer circuit also. Keypad is connected to port p1 and port p3 pins directly. All the switches are connected to controller with common ground. When a switch is pressed then that particular pin becomes zero. The motor starts only when the correct code is entered. If the password entered is wrong for three consecutive times then the buzzer turns on and system is locked. Keypad is active again only when the system receives a password from the user via GSM modem. The Fuel sensor incorporates an op-amp comparator circuit. Op- Amp output is connected to the pin no 23 of the controller. When anybody tries to steal the fuel from tank then Op-Amp provides an output and controller senses the signal and immediately sends a SMS.

To create a car controlled by voice of humans is an innovative concept. In this paper we use the concept of speech recognition algorithm and algorithms that will worn on for the command of the users. The switching concept is used initially, the remote is provided with the button, when that button is pressed after that the speech recognition process starts. Then after user will command for opening window, the speech recognition system will process accordingly and the respective window will open. Accordingly the other commands will be processed. In this paper we introduced a new concept of voice recognition in car which uses the concept of speech recognition algorithm. The electrical and mechanical domains are used. The digital image processing is also used. Voice recognition is coming to remote control and car navigation system .The user will command through microphone installed in the remote control of car. The signals are commanded in analogue form which needs to be converted into digital form. The car is installed with the large database which consist of that compose of all keywords used for commanding the car. The system is installed with fully computer system, the size of a voice-recognition program's effective vocabulary is directly related to the random access memory capacity of the computer in which it is installed. The car is installed with special hardware that is display, which display the all the available commands and the instructions to the users to make the system user friendly .If users will input the incorrect commands the display will generate error message and provide the most related commands to the user available in the system vocabulary and keywords on display to the users. Automatic Speech Recognition (ASR) is a model of voice recognition designed for dictation. .This model is installed in the car for dictation; our concept is totally based on the concept on artificial intelligence and robotics

Voice Controlled Robot (VCR) is a mobile robot whose motions can be controlled by the user by giving specific voice commands. The speech is received by a microphone and processed by the voice module. When a command for the robot is recognized, then voice module sends a command message to the robot's microcontroller. The microcontroller analyse the message and takes appropriate actions. The objective is to design a walking robot which is controlled by servo motors. When any commands are given on the transmitter, the Easy VR module will take the voice commands and convert the voice commands into digital signals. Then these digital signals are transmitted via ZIGBEE module to the robot. On the receiver side the other ZIGBEE module receives the command from the transmitter side and then performs the respective operations. The Hardware Development board used here is AT mega 2560 development board. In AT mega 2560 there are 15 PWM channels which are needed to drive the servo motors. Addition to this there is camera which is mounted in the head of the robot will give live transmission and recording of the area. The speech recognition circuit functions independently from the robot's main intelligence [central processing unit (CPU)]. This is a good thing

because it doesn't take any of the robot's main CPU processing power for word recognition. The CPU must merely poll the speech circuit's recognition lines occasionally to check if a command has been issued to the robot. The software part is done in Arduino IDE using Embedded C. Hardware is implemented and software porting is done. Key Words: Arduino, AT mega 2560, Easy VR, .When we say voice control, the first term to be considered is Speech Recognition i.e., making the system to understand human voice. Speech Recognition is a technology where the system understands the words (not its meaning) given through speech. Speech is an ideal method for robotic control and communication. The speech recognition circuit we will outline, functions independently from the robot's main intelligence [central processing unit (CPU)]. This is a good thing because it doesn't take any of the robot's main CPU processing power for word recognition. The CPU must merely poll the speech circuit's recognition lines occasionally to check if a command has been issued to the robot. We can even improve upon this by connecting the recognition line to one of the robot's CPU interrupt lines. By doing this, a recognized word would cause an interrupt, letting the CPU know a recognized word had been spoken. The advantage of using an interrupt is that polling the circuit's recognition line occasionally would no longer be necessary, further reducing any CPU overhead. They can work in environments so hazardous that an unprotected human would quickly die. The purpose of this project is to build a robotic car which could be controlled using voice commands.

## VII. RESULT

The progression was made to implement the system in real time on a Battery of a vehicle (Bike) while placing the system inside the vehicle such that it is not visible to the thief. Testing of the system was done and the system responded by sending a warning SMS message to the user when there was unauthorized movement of the vehicle. The user got a SMS message which had the warning message and GPS co-ordinates. The user sent a SMS message to stop the vehicle and the system responded to this message by relaying the supply to the battery and hence the vehicle stopped.

## VIII. CONCLUSION

The system developed effectively provides an application of connected devices or Internet of things in Transportation. The system includes a Combined GPS+GSM Module which can track the location of the vehicle via the GPS antenna implanted in the vehicle. Thus, this system is an integration of several modern embedded and communication technologies. This makes the system very cheap since these are simple and open source technologies. Also the system is very compact. Security standards are maintained by mobile network providers hence security of the network is very good. This makes the system suitable for the market since it is cheaper than other anti-theft systems available. Also it is user friendly since a simple 'Stop' SMS turns the vehicle off. Along with tracking and theft prevention, this system can also provide more applications like condition monitoring, vehicle control, fleet management, traffic management, smart parking and vehicle safety by using various sensors like speed sensor, alcohol sensor, proximity sensor and other sensors to get the data about condition and performance of vehicle and the driver. Thus, this system is very useful and can be used in all aspects of transportation system.

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