

# Depiction of IoT Based Smart Vehicles Garage System

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**Abstract:-** This research accentuates on the smart vehicles garage system as well as the security issues of a vehicle garage system. We designed a very cheap smart garage system which basically based on Internet of things (IoT) with improved, efficient, elevated security system. This developed system can easily be applicable in our regular purposes. Again this system can be effortlessly controlled by user from both inside and outside of the garage. This research paper enriches with (i) Garage automation which allows user to control the door and electrical components of the garage. (ii) Vehicles security which provides users improved security system from morning to all day long. (iii) Vehicles tracking which enables the user to track the vehicles inside the garage and also outside the garage.

**Keywords:-** IoT (Internet of things); GPS; Vehicles garag; GSM; Laser ; IP-Camera; LDR.

## I. INTRODUCTION

Modern world mostly depends on transportation. In early few decades ago, it was quite impossible to think this type of fastest transportation system. In present world, we notice many vehicles around our visible areas. The number of vehicles is increasing day by day. So, today it's badly in need of making smart garage management which should be controlled in the easiest way.

This era is called the world of Smart phone. In recent statistics says that the number of smart phone user is 2.53 billion. People in our society, always think to control all the electrical things using smart phone. Sometimes, they want to apply the smart way in their regular life. Moreover, Internet of things or IoT has become very popular solution in recent world. People always wants wireless system to use in their regular purpose. If it can be combined with smart phone with IoT, the solution will be better. Again, if the whole system is applicable in our daily life such as vehicles garage system, the life will be more comfortable, easier, more efficient and pleasant.

## II. REVIEW STUDIES

This research pursues the reference studies. In paper [1], the authors designed a secured garage system using number plate or license plate of the vehicles. This system ensured well managed security system for vehicles in a smart way. The authors of paper [2] developed a door lock system based on Radio Frequency Identification (RFID). In reference [3] the authors revealed a Smart vehicles parking system using RFID. This developed system also referred a smart way for vehicles garage system. In paper [4], the authors introduced a Laser based system for vehicles detection in security purpose as well as car parking mapping system. The authors in paper [5],

developed a system for campus vehicles parking and transportation system. The authors strongly indicated which system would be better for our environment. In reference [6], the authors developed a automated garage system on real-time parking stall. In paper [7], the author of paper developed an IoT based smart parking system using Raspberry pi and pi cam. The author designed this model using server to access information using internet. The authors in paper [8], developed a smart garage system using FPGA, RFID, camera and automated water pump. In paper [9], the authors develop android application for smart parking. In reference [10], the authors depicted a smart solution for parking using an android application and sensor based car.

## III. BLOCK DIAGRAM

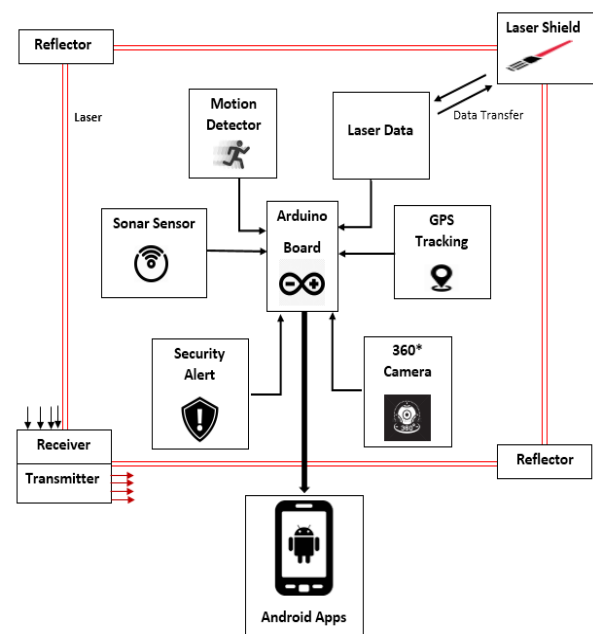


Fig 1:- Block Diagram of Smart vehicles Garage system

## IV. FEATURES COVERED

In our research, we developed our system with three interconnected sections. Firstly, this research focus on the automation of garage including garage door and electrical components. Secondly, this research ensures security system of the vehicles garage. Finally, this research emphasizes on tracking the location of the vehicles using android application.

### A. Garage Automation

In this section, users are able to control all the electronics components as well as door wirelessly. The door is controlled by using internet and GSM/GPRS module. So this system is totally based on IoT. When the user press on the button of the

application, it sends a unique code to the arduino and arduino processes the corresponding code. Then the door will be opened automatically. Again, after entering into the garage, the users have ability to close the door by pressing another button. If the users want to switch on the light of the garage or any

has ability to record the live streaming and store them in mobile or other storage devices. Again, user can also access this live streaming anywhere in the world using internet.

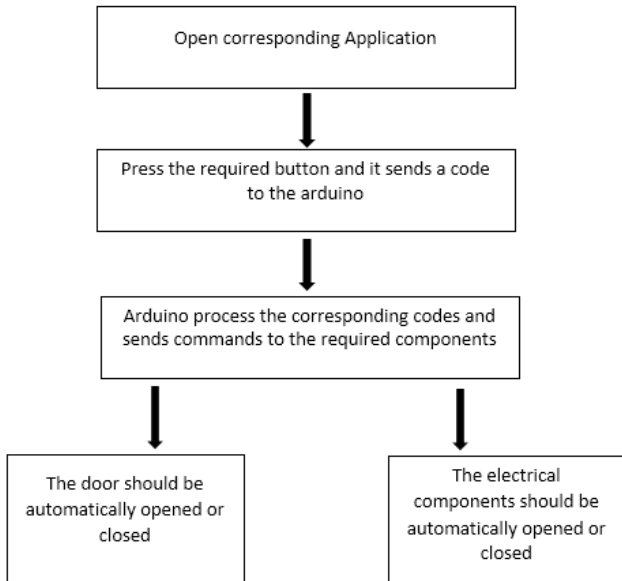


Fig 2:- Working criteria of garage automation system

Electrical components, he/she has to do the same procedure as above described.



Fig 3:- Android application for Garage automation

**B. Security**

We designed a strong and improved but very cheap security system in our research. Our security system is controlled wirelessly by an android application. Basically we divide our system into three important section which can be operated both from inside and outside of the garage.

- **IP-Camera**

In this security system user can easily visualize the condition of smart garage through android application. User

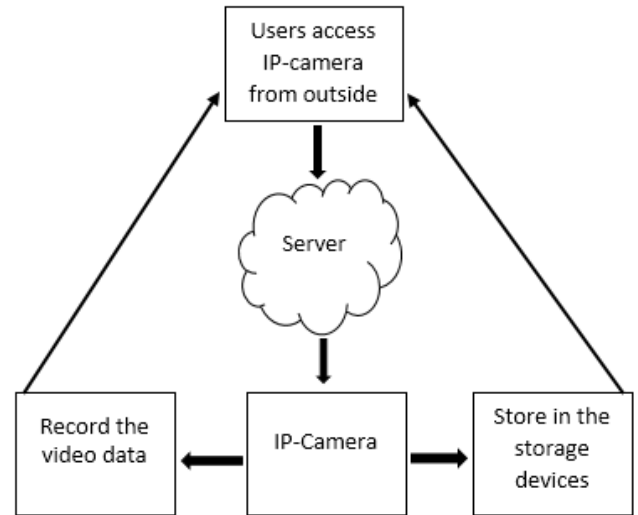


Fig 4:- Working procedure of IP-camera in security issues

- **Laser Security**

This is one of the cheapest security system in our research. We surrounded our parking area through Laser beam and passing this beam using some reflector such as glasses. We placed a Laser shield acting as transmitter and also a LDR which plays a role as receiver. When a stranger cross the Laser Shield, it produce some alarming messages to the arduino and arduino sends it to the application. When the application received the message, the phone start ringing to alert the users for security issues.

- **Sonar and Motion Sensor**

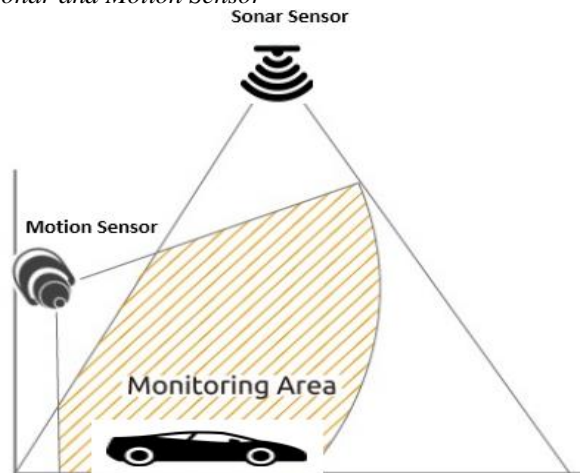


Fig. 5. Working procedure of Motion and Sonar sensor in security issues

In this section we use motion and sonar sensors. To detect any kind of unofficial movement after placing the vehicles in garage. Users have ability to enable or disable this system. This working procedure is as same as Laser security as described earlier.

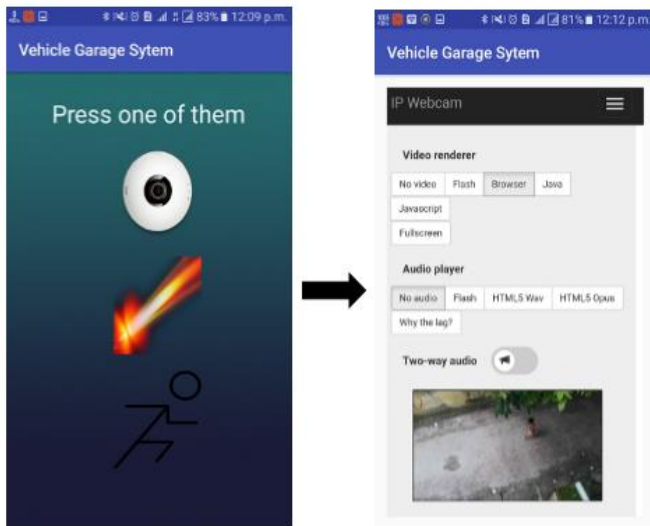


Fig 6:- Android application for Security system

C. Location Tracking

This features allows user to detect the location of the vehicles. User can easily find the vehicles in the Google Map using Global Positioning System (GSM). If user place a GPS module in the vehicle, he/she can easily track the location using our developed application.

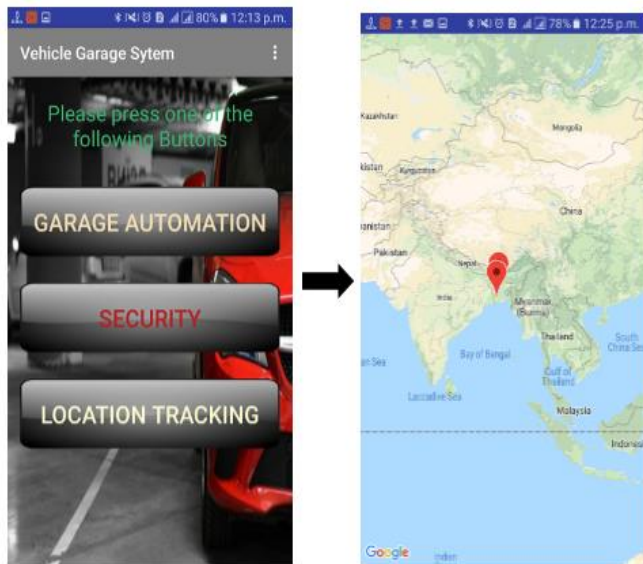


Fig 7:- Android application for Location Tracking

V. FUTURE SCOPE

In Future we want to expand our model with highly decorated features. We will add cloud server in order to ensure potential accessing mode. Home automation system will also be added to this system. In future we will make our project more cost effective. Again, we will make sure that general people can easily afford this solution in their garage system. We will embellish our application and make it free accessible.

VI. CONCLUSION

In our research, we emphasize one problem in our society that is vehicles garage system. Through this research

we revealed a smart solution for this problem. We developed android control automated door using the reference [2]. We also enrich our research with security system through the reference of [1]. We work hard for making this solution in a smart way following the references [9] and [10]. We believe that if this procedure is applied to our regular purpose. We will be benefited both in economic and technical ways. This whole system can easily be applicable with existing solution. Thus making this system more efficient. Moreover, this cheapest security system also make our regular life easier, more satisfied and tension free.

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