SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY

PROJECT REPORT

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in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University, Chennai)

ERODE 638 012

NOV 2022

ABSTRACT

Signs with Smart connectivity for better road safety is a IoT Technology where the internet is connected to the traffic signal using IoT. The objective is to design an efficient automatic traffic signal for by using IoT application in thevehicle which is connected to the traffic signal. The system is implemented in the highly traffic areas Where the travelling of vehicle is risky .Here we used Arduino unofor controlling the signal and IoT application used is a free source. The development system first the driver send the signal to the traffic signal through the IoT application whena vehicle is near to the signal. After the signal received the controller clears the particular lane as green signal and others as red signal for the particular time. After the vehicle crossed the signal works automatically as defined. This system will reduce the travelling time of emergency vehicle to reach the destination. The system is implemented and it performs very well. It is observed that the developed system works very well.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATION

1. IOT	Internet Of Things
2. IDE	Integreted Development Environment
3. LCD	Liquid Crystal Display
4. WIFI	Wireless Fidebility
5. GUI	Graphical User Interface
6. LED	Light Emitting Diode
7. AC	Analog Current
8. DC	Direct Current

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION TO

Signs with smart connectivity for better road safety is a IoT Technology where the emergency vehicle is connected to the traffic signal using IoT. The objective is to design an efficient automatic traffic signal for emergency vehicle by using IoT application in the vehicle which is connected to the traffic signal. The system is implemented in the highly traffic areas Where the travelling of emergency vehicle in cities is risky. Here we used an Arduino uno and IoT application used as a free source for controlling the signal . The development system first the driver send the signalto the traffic signal through the IoT application when a vehicle is near to the signal. After the signal received the controller clears the particular lane as green signal and others as red signal for the particulartime. After the vehicle crossed the signal works automatically as defined. This system will reduce thetravelling time of emergency vehicle to reach the destination. The system is implemented and it performs very well. It is observed that the developed system works very well.

1.2 ARDUINO UNO

Arduino designs, manufactures, and supports electronic devices and software, allowing people around the world to easily access advanced technologies that interact with the physical world. Our products are straightforward, simple, and powerful, ready to satisfy users' needs from students to makers and all the way to professional developers.

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up

to an incredible amount of accessible knowledge that can be of great help to novices and experts as like .Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments.

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

1.2.1 ARDUINO IDE

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension.ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor. Libraries are a collection of code that makes it easy for you to connect to a sensor, display, module, etc. For example, the LiquidCrystal library makes it easy to talk to character LCD displays.

There are thousands of libraries available for download directly through the Arduino IDE, and you can find all of them listed at the Arduino Library Reference.

1.3 INTRODUCTION OF INTERNET OF THINGS

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

A thing in the internet of things can be a person with a heart monitor implant, a farm animal with a biochip transponder an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an Internet Protocol (IP) address and is able to transfer data over a network.

Increasingly, organizations in a variety of industries are using IoT to operate more efficiently, better understand customers to deliver enhanced customer service, improve decision-making and increase the value of the business.

1.4 IMPORTANCE OF IOT

The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

IoT enables companies to automate processes and reduce labor costs. It also cuts down on waste and improves service delivery, making it less expensive to manufacture and deliver goods, as well as offering transparency into customer transactions .As such, IoT is one of the most important technologies of everyday life, and it will continue to pick up steam as more businesses realize the potential of connected devices to keep them competitive.

The internet of things offers several benefits to organizations. Some benefits are industry-specific, and some are applicable across multiple industries. Some of the common benefits of IoT enable businesses to:

- monitor their overall business processes;
- improve the customer experience (CX);
- save time and money;
- enhance employee productivity;
- integrate and adapt business models;
- make better business decisions; and
- generate more revenue.

IoT encourages companies to rethink the ways they approach their businesses and gives them the tools to improve their business strategies.

Generally, IoT is most abundant in manufacturing, transportation and utility organizations, making use of sensors and other IoT devices; however, it has also found use cases for organizations within the agriculture, infrastructure and home automation industries, leading some organizations toward digital transformation. IoT can benefit farmers in agriculture by making their job easier. Sensors can collect data on rainfall, humidity, temperature and soil content, as well as other factors, that would help automate farming techniques. The ability to monitor operations surrounding infrastructure is also a factor that IoT can help with. Sensors, for example, could be used to monitor events or changes within structural buildings, bridges and other infrastructure. This brings benefits with it, such as cost saving, saved time, quality-of-life workflow changes and paperless workflow.

A home automation business can utilize IoT to monitor and manipulate mechanical and electrical systems in a building. On a broader scale, smart cities can help citizens reduce waste and energy consumption. IoT touches every industry, including businesses within healthcare, finance, retail and manufacturing.

1.5 IOT STANDARDS AND FRAMEWORKS

There are several emerging IoT standards, including the following:

- **IPv6 over Low-Power Wireless Personal Area Networks (*6LoWPAN)*** is an open standard defined by the Internet Engineering Task Force (IETF). The 6LoWPAN standard enables any low-power radio to communicate to the internet, including 804.15.4, Bluetooth Low Energy (BLE) and Z-Wave (for home automation).
- **ZigBee** is a low-power, low-data rate wireless network used mainly in industrial settings. ZigBee is based on the Institute of Electrical and Electronics Engineers (IEEE) 802.15.4 standard. The ZigBee Alliance created Dotdot, the universal language for IoT that enables smart objects to work securely on any network and understand each other.
- **LiteOS** is a Unix-like operating system (OS) for wireless sensor networks. LiteOS supports smartphones, wearables, intelligent manufacturing applications, smart homes and the internet of vehicles (IoV). The OS also serves as a smart device development platform.
- **OneM2M** is a machine-to-machine service layer that can be embedded in software and hardware to connect devices. The global standardization body, OneM2M, was created to develop reusable standards to enable IoT applications across different verticals to communicate.
- Data Distribution Service (DDS) was developed by the Object Management Group (OMG) and is an IoT standard for real-time, scalable and high-performance M2M communication.
- **Advanced Message Queuing Protocol (AMQP)** is an open source published standard for asynchronous messaging by wire. AMQP enables encrypted and interoperable messaging between organizations and applications. The protocol is used in client-server messaging and in IoT device management.
- **Constrained Application Protocol (CoAP)** is a protocol designed by the IETF that specifies how low-power, compute-constrained devices can operate in the internet of things.
- **Long Range Wide Area Network (LoRaWAN)** is a protocol for WANs designed to support huge networks, such as smart cities, with millions of low-power devices.

IoT frameworks include the following:

- **Amazon Web Services (AWS) IoT** is a cloud computing platform for IoT released by Amazon. This framework is designed to enable smart devices to easily connect and securely interact with the AWS cloud and other connected devices.
- **Arm Mbed IoT** is a platform to develop apps for IoT based on Arm microcontrollers. The goal of the Arm Mbed IoT platform is to provide a scalable, connected and secure environment for IoT devices by integrating Mbed tools and services.
- **Microsoft's Azure IoT Suite** is a platform that consists of a set of services that enables users to interact with and receive data from their IoT devices, as well as perform various operations over data, such as multidimensional analysis, transformation and aggregation, and visualize those operations in a way that's suitable for business.
- **Google's Brillo/Weave** is a platform for the rapid implementation of IoT applications. The platform consists of two main backbones: Brillo, an Android-based OS for the development of embedded low-power devices, and Weave, an IoT-oriented communication protocol that serves as the communication language between the device and the cloud.
- **Calvin** is an open source IoT platform released by Ericsson designed for building and managing distributed applications that enable devices to talk to each other. Calvin includes a development framework for application developers, as well as a runtime environment for handling the running application.

1.6 CHARACTERISTICS OF INTERNET OF THINGS

There are the following characteristics of IoT as follows.

1. **Connectivity –**
   Connectivity is an important requirement of the IoT infrastructure. Things of IoT should be connected to the IoT infrastructure. Anyone, anywhere, anytime can connect, this should be guaranteed at all times. For example, connection between people through internet devices like mobile phones ,and other gadgets, also connection between Internet devices such as routers, gateways, sensors, etc.

2. **Intelligence and Identity**
   The extraction of knowledge from the generated data is very important. For example, a sensor generates data, but that data will only be useful if it is interpreted properly. Each IoT device has a unique identity. This identification is helpful in tracking the equipment and at times for querying its status.

3. **Scalability**
   The number of elements connected to the IoT zone is increasing day by day. Hence, an IoT setup should be capable of handling the massive expansion. The data generated as an outcome is enormous, and it should be handled appropriately.

4. **Dynamic and Self-Adapting (Complexity)**
   IoT devices should dynamically adapt themselves to the changing contexts and scenarios. Assume a camera meant for the surveillance. It should be adaptable to work in different conditions and different light situations (morning, afternoon, night).

5. .**Architecture**
   IoT architecture cannot be homogeneous in nature. It should be hybrid, supporting different manufacturers ‘ products to function in the IoT network. IoT is not owned by anyone engineering branch. IoT is a reality when multiple domains come together.

6. **Safety –**
   There is a danger of the sensitive personal details of the users getting compromised when all his/her devices are connected to the internet. This can cause a loss to the user. Hence,

data security is the major challenge. Besides, the equipment involved is huge. IoT networks may also be at the risk. Therefore, equipment safety is also critical.

1.7 APPLICATION OF INTERNET OF THINGS

There are endless possibilities for having an interconnected web of "things" that can interact with each other over the internet. IoT can be used for all types of applications ranging from connecting all the devices in your house to create a smart home or even connecting all the government and civic services in a city to create a smart city! Who knows, we may even have a smart world one day!

So let's see all these applications of IoT in different facets and industries of the world.

1. Smart Agriculture

Food is an integral part of life without which we cannot survive. However, it is an unfortunate fact that a lot of food is wasted in developed countries like America while people starve in poorer countries like Chad, Sudan, etc. One way to feed everyone is better agricultural practices which can be enhanced using IoT. This can be done by first collecting data for a farm such as soil quality, sunlight levels, seed type, rainfall density from various sources like farm sensors, satellites, local weather stations, etc. and then using this data with Machine Learning and IoT to create custom recommendations for each farm that will optimize the planting procedure, irrigation levels required, fertilizer amount, etc. All this will result in better yield or crops with a focus on reducing world hunger in the future. This is done very efficiently by SunCulture, which is an initiative by Microsoft AI for Earth.

2. Smart Vehicles

Smart vehicles or self-driving cars as they can be called are pretty dependent on IoT. These cars have a lot of features that are integrated with each other and need to communicate such as the sensors that handle navigation, various antennas, controls for speeding or slowing down, etc. Here the Internet of Things technology is critical especially in the sense that self-driving cars need to be extremely accurate and all the parts need to communicate with each other in milliseconds on the road. Tesla Cars are quite popular and working on their self-driving cars. Tesla Motors' cars use the latest advancements in Artificial Intelligence and the Internet of Things. And they are quite popular as

well!!! Tesla Model 3 was the most sold plug-in electric car in the U.S. in 2018 with a total yearly sales of around 140,000 cars.

3. Smart Home

Maybe the most famous application of IoT is in Smart Homes. After all, who hasn't heard about connecting all the home applications like lighting, air conditioners, locks, thermostat, etc. into a single system that can be controlled from your smartphone. These IoT devices are becoming more and more popular these days because they allow you complete freedom to personalize your home as you want. In fact, these IoT devices are so popular that every second there are 127 new devices connected to the internet. Some popular ones that you might have heard have, or even have in your home, include Google Home, Amazon Echo Plus, Philips Hue Lighting System, etc. There are also all sorts of other inventions that you can install in your home including Nest Smoke Alarm and Thermostat, Foobot Air Quality Monitor, August Smart Lock, etc.

4. Smart Pollution Control

Pollution is one of the biggest problems in most of the cities in the world. Sometimes it's not clear if we are inhaling oxygen or smog! In such a situation, IoT can be a big help in controlling the pollution levels to more breathable standards. This can be done by collecting the data related to city pollution like emissions from vehicles, pollen levels, airflow direction, weather, traffic levels, etc using various sensors in combination with IoT. Using this data, Machine Learning algorithms can calculate pollution forecasts in different areas of the city that inform city officials beforehand where the problems are going to occur. Then they can try to control the pollution levels till it's much safer. An example of this is the Green Horizons project created by IBM's China Research Lab.

5. Smart Healthcare

There are many applications of IoT in the Healthcare Industry where doctors can monitor patients remotely through a web of interconnected devices and machines without needing to be in direct contact with them. This is very useful if the patients don't have any serious problems or if they have any infectious diseases like COVID-19 these days. One of the most common uses of IoT in healthcare is using robots. These include surgical robots that can help doctors in performing surgeries more efficiently with higher precision and control. There are also disinfectant robots that can clean surfaces quickly and thoroughly using high-intensity ultraviolet light (which is pretty useful these days!) Other

types of robots also include nursing robots that can handle the monotonous tasks that nurses have to perform for many patients day in and day out where there is little risk to the patients.

6. Smart Cities

Cities can be made more efficient so that they require fewer resources and are more energy-efficient. This can be done with a combination of sensors in different capacities all over the city that can be used for various tasks ranging from managing the traffic, controlling handling waste management, creating smart buildings, optimizing streetlights, etc. There are many cities in the world that are working on incorporating IoT and becoming smarter such as Singapore, Geneva, Zurich, Oslo, etc. One example of creating smart cities is the Smart Nation Sensor Platform used by Singapore which is believed to be the smartest city in the world. This platform integrates various facets of transportation, streetlights, public safety, urban planning, etc. using sensors in conjugation with IoT.

7. Smart Retail

There is a way to make shopping even more exciting for customers and that's to use the latest tech like IoT of course! Retail stores can make use of IoT in a wide range of operations to make shopping a much smoother experience for customers and also easier for the employees. IoT can be used to handle the inventory, improve store operations, reduce shoplifting and theft, and prevent long queues at the cashiers. A prime example of this is the Amazon Go stores which provide an IoT enabled shopping experience. These stores monitor all their products using IoT so that customers can pick up any products and just walk out of the store without stopping at the cashier's queue. The total bill amount is automatically deducted from the card associated with the customer's Amazon account after they leave the store.

CHAPTER 2

2.LITERATURE SURVEY

MR. M. NITHYAKUMAR, P.ASWIN, D. BHARATHI SHREE, M.P.DHARMEESH, M. KALAIVANI proposed a model traffic clearence for emergency vehicle using priority mode. Traffic congestion and tidal flow management were recognized as major problems. In India as the population is being increasing day by day the traffic is also increasing with proportionality. So the traffic signals need good coordination for the smooth flow of traffic during the peak hours .. Moreover road accidents in the city have been incessant and to bar the loss of life due to the accidents is even more crucial. In this fast moving world we are in a compulsion to rush our self which makes the traffic congestion and accident an inevitable one. In foreign countries, they successfully save human life, because whenever an ambulance comes they move aside to clear out the route till the ambulance passes through. On the other hand in INDIA, whenever an ambulance comes it is controlled manually at the traffic junction by a traffic officer. Nowadays all systems are working automatically. So, we proposed system called “traffic clearance for emergency vehicles using blue mode”.

In early days, the traffic is controlled manually by police officer. They decide when the vehicle has to cross the road and also provide importance to the emergency vehicle. Then in Intelligent Traffic Management System, the traffic is controlled automatically by each lane 120 seconds of green light is set on. Before green light, yellow light flashes for 20 second, signifying to start your vehicle and be ready to go. The disadvantages of this system is it does not provide timing based on priority because of that people has to wait for long time even though there is no traffic and also does not recognize and prioritize the emergency vehicle.They consists of two parts :wireless sensors network(traffic sensor nodes(TSN) groups) and a control box. In this they collected traffic data with help of sensors and control the traffic.

Describes the concept of traffic clearance in which the time delay (6s) between the switching of signals is based on the congestion of vehicle. In our project we use 10s for green light to be left ON. If the congestion increases this duration will be extended to 20s.Describes about density based traffic clearance. Initially we started this project only for ambulance mode but we thought of using this concept for normal mode also by using the knowledge of this paper.Portrays area occupied by the edges of vehicle will be considered to estimate vehicles density using image processing. We make use of this concept in our project to clear the traffic congestion in normal mode. Due to insufficient time we have used IR sensor instead. Keeping this paper as reference we can extend our project by placing camera at junction in four ways. Traffic is cleared using green wave system. The green wave is the synchronization of the green phase of traffic signals. The disadvantage of this system is that if green

wave is disturbed the traffic will collapse.Way for ambulance in lane is provided through RFID technology. The system may not work, if the ambulance needs to take another route for some reasons or if the starting point is not known in advance. Uses two RFID readers which will identify traffic density on two roads. When emergency vehicle is on lane it turn traffic signal to green.The images sequences from a camera are analysed using various edge detection and object counting methods to obtain the most efficient technique to provide smooth flow for the vehicle using" LabVIEW stimulation.

DIVIJ.N,DIVYA.K ,ANURADHA BADAGE proposed a model of IoT based automated traffic control system for emergency vehicle using LoRA. In today's world traffic being the main issue in concern, is creating innumerable problems to the general life. Apart from the common issues of congestion, it poses serious hindrance to the normal functioning of emergency vehicles. Emergency vehicles have to be prioritized in comparison with all other vehicles, but either due to unavoidable situations or due to self-centred motorists emergency vehicles do not reach their destinations on time. Delayed arrival of emergency vehicles may pose threats to life.

Apparently, there has to be a system which detects the emergency vehicle prior to its arrival at the junction and clear the traffic ahead of it before-hand. This may minimize the delays and facilitate the needy during their emergency. Unfortunately, there are no efficient measures taken to deal with this problem in most of the countries including India. And thus either emergency vehicles
may remain statutory or may override the signal. In case the emergency vehicles override the traffic signal, there are high possibilities of encountering accidents. Recent development of technology has led us to IoT, which provides an efficient method to address these issues. The difficulties faced by emergency vehicles can be avoided using Automated Traffic Control System. One or more smart object(s) are installed in every lane of a particular intersection which is designed to sense the siren of approaching emergency vehicle which triggers the camera to capture images and to verify if the vehicle is an emergency vehicle or not by comparing the obtained image with the stored data set . If the vehicle is identified as an emergency vehicle then the signal is transmitted to the Decision Support System. The Decision Support System clears the traffic by identifying the lane through which the emergency vehicle is approaching. all other signal lights of that junction are turned to red. Sound detection sensors are used to identify the departing emergency vehicle, after which traffic lights are flipped back to their normal functioning. The emergency vehicle is detected prior its arrival thus the system prevents latency. The traffic data is stored into cloud by the Decision Support System and can be used for data analysis

CHAPTER 3

SYSTEM

3.1.INTRODUCTION

objective is to design a system of traffic clearance for emergency vehicle using internet of things especially by using a IoT application called Blynk IoT. In this system, we first control the normal traffic using sequential management . If any emergency situation occur, then the swift movement is important to control the traffic congestion. And by here we introduce a special mode called AMBULANCE MODE, in which there will be an controller clears the lane by green signal on that lane. By this the people could know that the ambulance is in its path and try to pave a way for life saver. All these process are combined and makes the life saver to reach the hospital in time.

3.2 BLOCK DIAGRAM

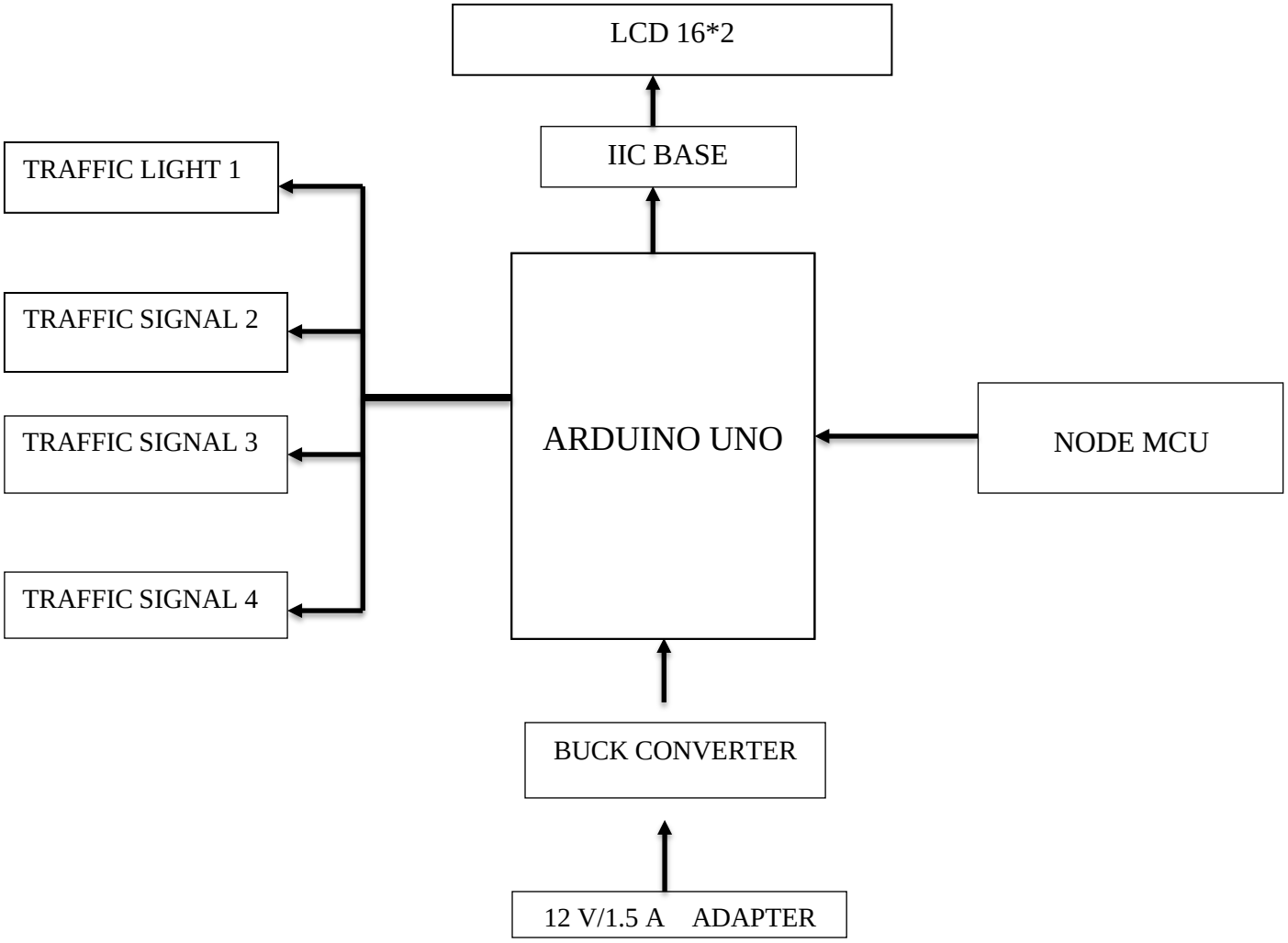


Figure 3.1

3.3 SYSTEM MODEL

It consists of three main modules which co-ordinates the entire process.

- Control module
- IoT Application
- Power Supply

3.3.1 CONTROL MODULE

A. ARDUINO UNO

In this project we use Arduino UNO as control module. At the traffic signal, there is a microcontroller. The current traffic signal status is likewise transferred to the cloud, and it receives power supply from a voltage regulator. The Arduino UNO is the foundation for the Arduino microcontroller board. There are 54 digital I/O pins, 15 PWM outputs, and 16 analogue outputs on the board. This Arduino board is a microcontroller board that is free source. Because of the 4x hardware serial, the Arduino UNO is chosen. The NODE MCU WiFi module can be directly plugged into the Arduino board's Rx/Tx pins, or a voltage divider circuit too can be used to achieve 5 to 3.3V. On a software level, too Arduino is simple to connect to an NODE MCU.

B.NODE MCU

Wi-Fi (Wireless Networking) - Wi-Fi is a well-known wireless network technology that uses radio waves to provide high-speed Internet and network connectivity without any need for wires. To ensure that the internet is easily accessible on smart phones, the wireless acquired skills must not only be new technology, but it must also be inventive and capable of solving problems, reducing costs, and increasing efficiency for both owners and consumers .The NODE MCU hardware and subsystems are based on the ESP-12 module. It also offers you access to GPIO (General Purpose Input/Output) for development process. The NODE MCU module is designed to take use of such a low-cost Wi-Fi chip.

C.TRAFFIC LIGHT

There are four LED signals for four lanes. Each signal has three LED as Red,Yellow and Green.These LED’s are controlled byArduino UNO.

D.LCD DISPLAY

LCD Display (16*2) is used to display the current progress of traffic signal.

3.3.2 IoT APPLICATION

Here we used a Blynk IoT application as IoT application.According to the Blynk website, Blynk is an Android and iOS platform that can run a variety of hardware modules, including Raspberry Pi, Arduino, NodeMCU, and over 400 others. Furthermore, Wi-Fi, Ethernet, Cellular, USB, serial, and Bluetooth are all viable options for connecting the hardware module device to the internet. Blynk allows users to create many applications and use them to control multiple connected boards tethered to a device with internet connection from anywhere in the globe using a Smartphone. The Blynk App's GUI (Graphic User Interface) on the Smartphone is very basic and user-friendly, allowing users to add widgets that they want to use and control them .

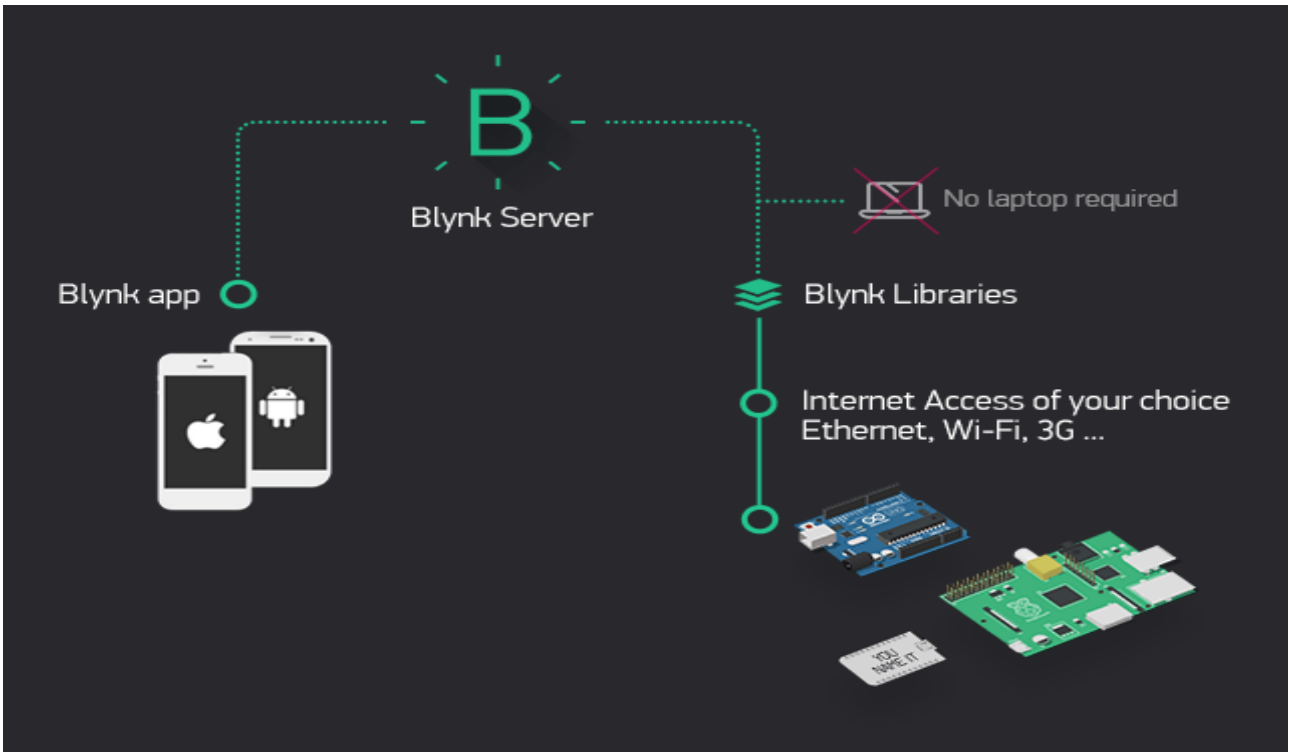
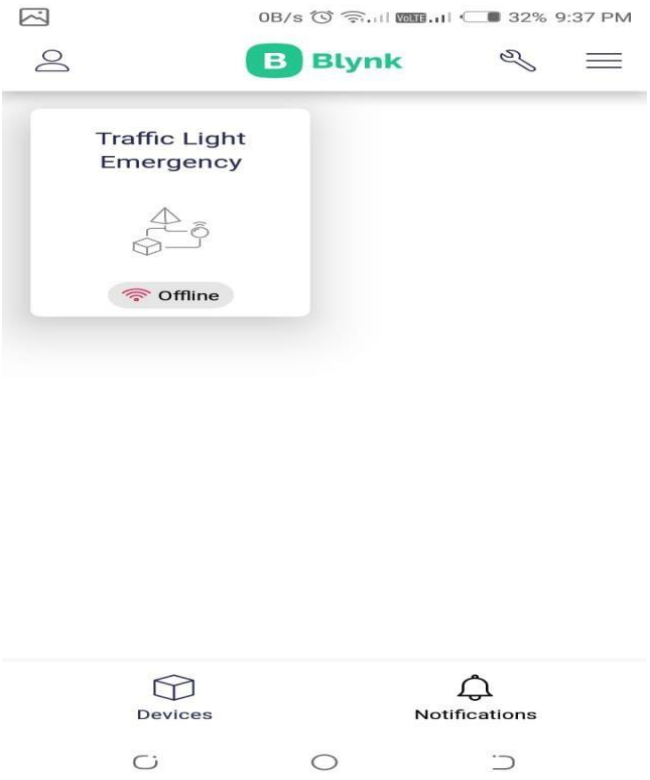


Figure 3.2

Install the Blynk application on a mobile device and sign in with your email account and secret phrase. Create a new project and add the features that the project requires. The authentication key will be generated by the software and sent to the registered email id. Using that key, enter it into the software program along with the Wifi name and password that the ESP8266 will be using to connect to the internet. The data from the pressure pads will be uploaded to the cloud via the Wifi module, and the cloud and the Blynk Application will be linked due to the authentication key.



IoT Application Dashboard

Figure 3.3

Lane Control Switches in IoT Application

Figure 3.4

SECURITY –

The user ID will only be issued to registered ambulance drivers by the system's host. To ensure that ambulance drivers have access to the host system, the access should be ON at all times. If something goes wrong, the host can terminate the connection, and the drivers will be unable to access the system.

3.3.3 POWER SUPPLY

A. 12V/1.5A ADAPTER

In order to provide adequate voltage levels for each circuit part, the power supply circuit is designed. It is possible to check the use, to protect the controller circuit from over voltage peaks .The circuit has a power supply that converts the incoming AC voltage to the DC voltage (12 V), voltage required by the pressure pads module. The voltage regulator IC7805 is linked to the microcontroller's pin Vin for power.

B. BUCK CONVERTER

A Buck Converter is a DC to DC power converter which steps down voltage from its input to output.

3.4 CIRCUIT DIAGRAM

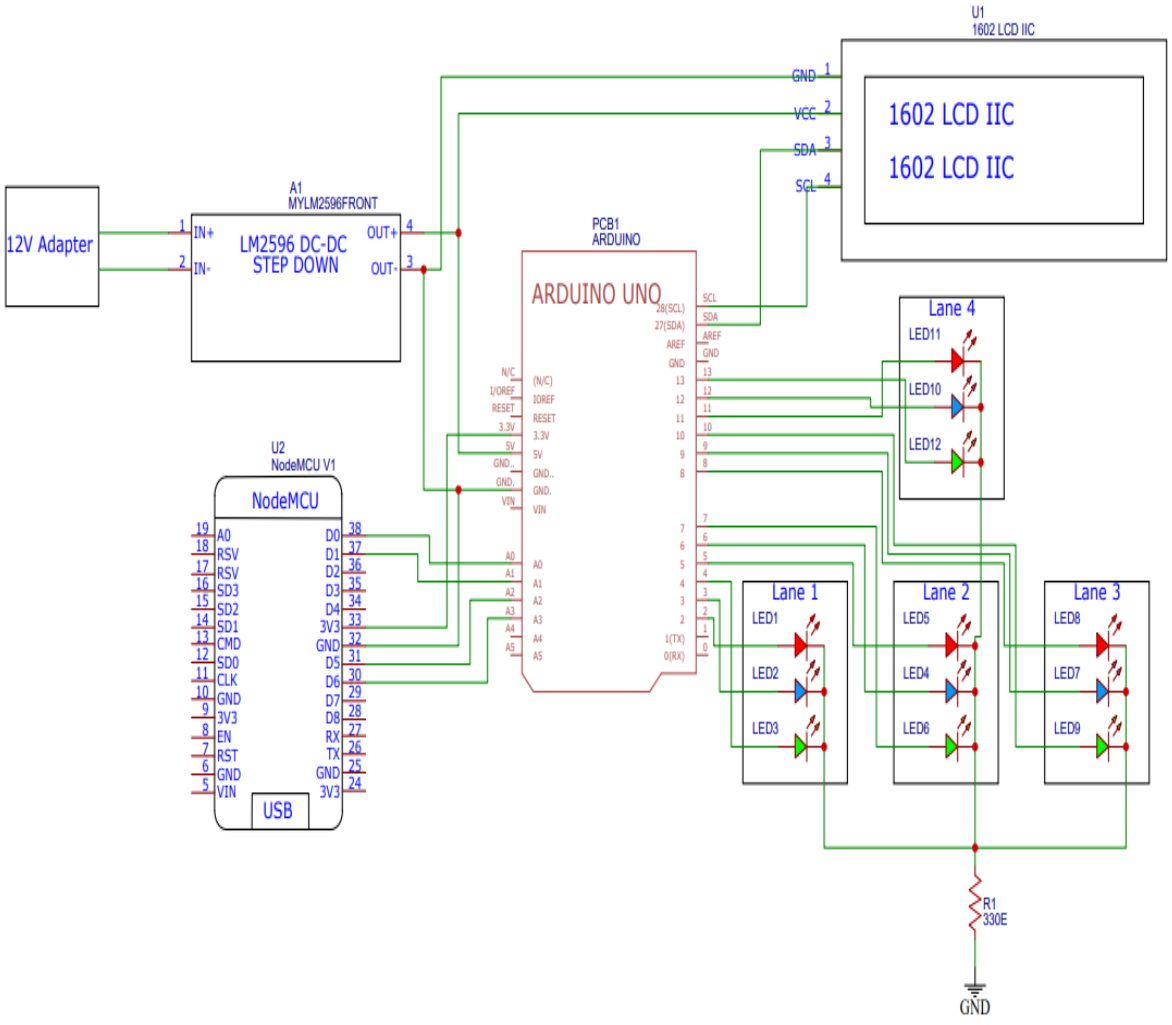


Figure 3.5

3.5 ADVANTAGES

1) This system can be used at each signal on the way to the hospital so that the ambulance does not have to stop anywhere along the way due to traffic.

2) This device should also be made available to traffic cops so that they may manage automobiles ahead of time before ambulances arrive at the square.

3.6 CONCLUSION

We have effectively assembled and tested the plan outlined through the paper. The objective of giving mobility to the ambulance through the traffic can be achieved using a mobile phone and cloud computing. The framework is easy to understand and simple to use without any intricacies that is user friendly. After some preliminary research and fact-checking, we came to the conclusion that, rather than IR and other sensors, pressing factor cushions or pressure pads would be a good fit for the task of vehicle detection presence. The project would reduce the risk of postponement due to traffic congestion on the streets and allow people to stay on schedule away from postponing treatment. While working and conducting testing, we discovered that this framework is more open than we had anticipated. It can also be used by traffic cops in heavy traffic, emergency situations, or when a VIP vehicle passes by. Finally, we can state that this project is self-explanatory and that we are free to allude to and forward our work in order to make further advancements on this assignment.

3.7 FUTURE SCOPE

We can use a variety of sensors to ensure that the traffic density is accurate. Using GPS to acquire continuous traffic data by following the position of vehicles. PC vision has a significant advantage above other traditional automobile estimating technologies. Rasberry pi can be used in place of the Arduino UNO. It is a high productivity and greater visual information; video picture preparation can be used instead of other fixed sensors. We can create a new structure for the rescue vehicle board that is in sync with the traffic executives and set up a new control room.

3.8 REFERENCES

International Journal for Research in Emerging Science and Technology

1. INTERNET OF THINGS - SMART TRAFFIC MANAGEMENT SYSTEM FOR SMART CITIES USING BIG DATA ANALYTICS

ABIDA SHARIF1, JIANPING LI1, MUDASSIR KHALIL1, RAJESH KUMAR1, MUHAMMAD IRFAN SHARIF 1,ATIQA © 2021 JETIR June 2021, Volume 8, Issue 6 www.jetir.org (ISSN-2349-5162) JETIR2106103 Journal of Emerging Technologies and Innovative Research (JETIR) www.jetir.org a751 SHARIF2 1School of Computer Science and Engineering, University of Electronic Science and Technology of China, Chengdu 611731

2. ConnectOpen – Automatic Integration of IoT Devices Nuria Pazos, Michael Müller, Marco Aeberli, Nabil Ouerhani Applied Science University Western Switzerland (HES-SO), HE-Arc Engineering School,Switzerland

3. Smart Traffic Light Controller System L. F. P. Oliveira, L. T. Manera, P. D. G. Luz Dept. of Semiconductor, Instrumentation and Photonic (DSIF),Univesity of Campinas (UNICAMP),Campinas, Brazil

4. Iot Ambulance With Automatic Traffic Light Control2019 International Conference on Vision Towards Emerging Trends in Communication and Networking (ViTECoN)

5. Integration of Cloud Computing with Internet of Things: Challenges and Open Issues Conference Paper · June 2017

6. Low Profile and Low Cost Textile Smart Mat for Step Pressure Sensing and Position Mapping Erfeng Li∗, Xiaoyou Lin∗, Boon-Chong Seet∗, Frances Joseph†, Jono Neville‡ ∗Dept. of Electrical and Electronic Engineering, †Textile Design Lab and ‡Sports Performance Research Institute Auckland University of Technology Auckland, New Zealand

7. Application of Wireless Internet in Networking using NodeMCU and Blynk App Seminar LIS 2019 @ PoliteknikMersingJohor,Malaysia

8. Smart Traffic Congestion Control System Proceedings of the Third International Conference on Computing Methodologies and Communication (ICCMC 2019) IEEE Xplore Part Number: CFP19K25-ART; ISBN: 978-1-5386-7808-4

9. Todica, M. (2016). Controlling Arduino board with smartphone and Blynk via internet. Retrieved from https://www.researchgate.net: https://www.researchgate.net/profile/M_Todica/publication/310096021_Controlling_Arduino_board_with_smartphone_and_Blynk_via _internet/links/5828c64c08ae5c0137f12699.pdf