



Speedy Clearance of Emergency Vehicles in Traffic Control System.

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Abstract— *The accretion of traffic has led to the use of a more sophisticated Traffic management system in today's society. Traffic Congestion is a major factor which forestalls the smooth flow of Ambulance and VIP vehicles. To abate the inconvenience caused by the traffic, the Traffic Light Controller (TLC) is used which minimizes the waiting time of vehicles and also manages traffic load. RFID based systems play a crucial role in solving the problems caused by traffic. The project is a replica of a four-way lane crossing in a real time scenario. In the first part, concentrated on problems faced by Ambulances, RFID concept is used to make the Ambulance's Lane Green and thus provides a free way without interrupting the Ambulance. In the second part, concentrated on problems faced by Priority vehicles, IR sensors are used to actuate the timers accordingly and thus preventing traffic congestion. In the third part, concentrated on Traffic density control, IR transmitter and receiver are used to provide dynamic traffic control and thus increasing the duration of the green light of the lane in which traffic density is high and hence, regulating traffic.*

Keywords— *Embedded System, Arduino-Nano, Traffic Lights, RF Module.*

I. INTRODUCTION

Due to the thriving urbanization, industrialization and population, traffic management has become a difficult task. With growth in traffic, there is an occurrence of a bundle of problems too; these problems include traffic jams, accidents and traffic rule violations. This in turn has an adverse effect on the economy of the country as well as on the lives of many. Traffic lights play an important role in traffic management. Traffic lights are the signaling devices that are placed on the intersection points and used to control the flow of traffic on the road. Most of project use the sensor to calculate current volume of traffic but this approach has the limitation that this technique is based on counting of the vehicles and treats emergency vehicles as the ordinary vehicles which means no priority to ambulance, fire brigade or V.I.P vehicles. As a result, emergency vehicles are stuck in traffic signals and waste their valuable time. In today's world, health hazards are a major concern. Especially people in the older age group are the victims, due to the worsening traffic conditions which lead to miasma and

pollution of different types. The problem of traffic light control can be solved by RF based systems. This system considers the priority of different types of vehicles and also the density of traffic on the roads by installing RF readers on the road intersections. Radio frequency identification is a technique that uses the radio waves to identify the object uniquely.



Fig 1. Traffic Jam in Signals.

II. LITERATURE SURVEY

Automation of traffic lights through (IoT) written by Sudha Mani Chilakala. Paper proposed control air pollution using traffic signals. Air pollution contains gases such as carbon dioxide ,smoke ,ammonia and humidity. The information is constaly forwarded to the microcontroller and same is reported to the online server through Wi-Fi module [1]. A proposed IoT Based smart traffic lights controls system within a V2X framework written by Hanna Abohashima. Paper proposed applying the framework vehicles to vehicles communication (V2V). The paper also integrated the mathematical methods with the Neuro-Fuzzy based on traffic control system [2]. Smart traffic light controller system written by L.P.F. Oliveira.Paper proposed control the traffic lights using topology communicate with other wireless network traffic lights. The Xmesh network proved to be feasible to manage the data packets through the N4IoT layer [3]. IoT based intelligent traffic signal system for emergency vehicles written by Shubhankar Vishwas Bhate.

The paper proposed basically based on IoT and controlled the traffic signal using device like Raspberry pie [4]. An IoT based dynamic traffic signal control and written by Anitha. The paper proposed the basically based on IoT and the method using is

III. SUMMERY

Sr.No	Research Paper Name	Authors	Year	Technology used	Scope to Work
1.	Automation of Traffic Lights through IoT	Sudhamani Chilakala, N.Renuka,SurayaMubeen	2020	IoT	Controlled air pollution harmful gases like carbon monoxide, carbon dioxide, smoke, ammonia and humidity in the atmosphere.
2.	A proposed IoT Based smart traffic lights controls system within a V2X framework	Hanaa Abohashima, Mohamed Gheith, Amr Eltawil	2020	IoT	Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) related-technologies used.
3.	Smart traffic light controller system	L. F. P. Oliveira, L. T. Manera,P.D.G. Luz	2019	IoT	A traffic light controller electronic circuit with centralized control topology.
4.	IoT based intelligent traffic signal system for emergency vehicles	Shubhankar Vishwas Bhate, Prasad Vilas Kulkarni, Shubham Dhanaji Lagad, Mahesh Dnyaneshwar Shinde	2018	Raspberry Pi	Model includes managing traffic signals using devices like Raspberry Pi,Node MCU,RFID Tag.
5.	An IoT for ITS: An IoT based dynamic traffic signal control	Anitha, K.N Rama Mohan Babu	2018	IoT	Arduino controller and IR sensors we regulate the traffic system to work efficiently.

IV. RESEARCH METHODOLOGY

Kernel method [5]. Smart traffic light control system written by Jorge Guerra. Paper proposed control the traffic signals using IoT. An IoT system based on the Raspberry pi platform and PIR sensors will be designed. The designed for implementer camera-related function [6]. Intelligent traffic light control system based on real time traffic flows written by Zhijun Li. The paper proposed traffic system based on Ultrasonic technology. The ultrasonic sensor achieves real-time monitoring by using ultrasonic sensors for road vehicles [7]. Smart control of traffic light system using Image processing written by Khushi. This paper proposed control the traffic signals based on Image processing using MATLAB code [8]. An intelligent traffic control system written by Aneesa Saleh. The paper proposed the infrared sensors and cameras combined with an image processing algorithm were used to detect traffic density [9]. Adaptive traffic lights control system written by Swapnil Manohar Shinde. The paper proposed the traffic light controlling in the adaptive manner's cell phone interface provides traffic information to drivers on demand and also helps I efficiently regulating the traffic and alternate route taking decisions [10]. Smart traffic lights control system written by Bilal Ghazal. The paper proposed the system based on PIC microcontroller that evaluates the traffic density using IR sensors [11]. Dynamic fuzzy logic traffic light integrated system with accident detection system using traffic simulation written by Mohammed Ali Yousef. The paper proposed system was divided into three main parts the dynamic Webster, dynamic cycle time and accident detection system using fuzzy logic theory and action system depending on detection system [12]. Cyber physical smart traffic lights written by Hamid Vakilzadian. The paper proposed that the smart traffic focuses on the requirement for using sensors, actuators and communication technologies to calculate the arrival time of vehicles at a traffic light at a road intersection by monitoring the actual speed of vehicles [13]. Design of traffic lights control system based on DSP written by Jaun He. This paper designed an intelligent traffic light control system with DSP chip as the core controller, and performed simulation experiment with CCS simulation software [14]. Design of Traffic Lights

We are finalized to use micro-controller called Arduino nano in this dissertation after studying multiple research papers. Arduino nano is best controller as its small in size doesn't have internet module in it plus it is economically affordable. Then we decided to connect two micro-controllers via RF module having 433Mhz low frequency. 433Mhz low frequency rf modules are free to use an is legal in India. it has range of 800m which is perfect as according to Indian ministry of road and transport every signal have distance of 1km between them. hence no RF module will affect another one, then we used to lead to show traffic lights and buttons to define roads.

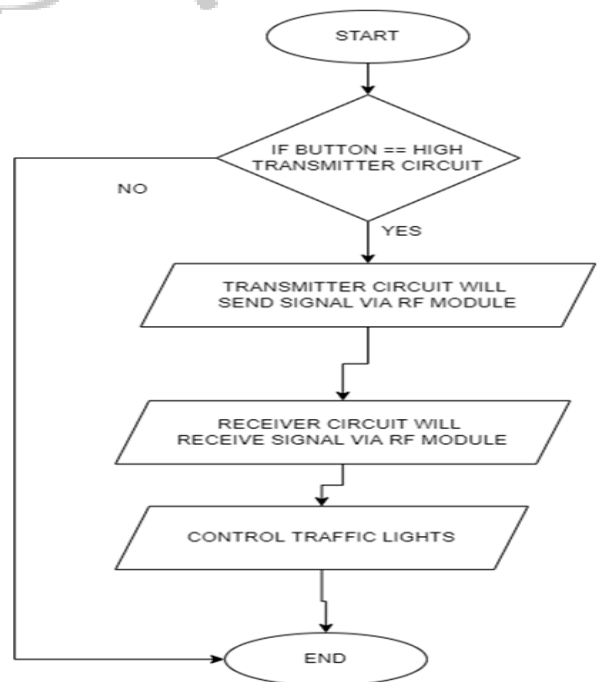


Fig 2. Shows the flowchart of our system module.

Controlling System Based on PLC and Configuration Technology written by Liu Yang. The paper proposed the traffic signals can be controlled by using PLC and software MCGS [15].

V. BLOCK DIAGRAM

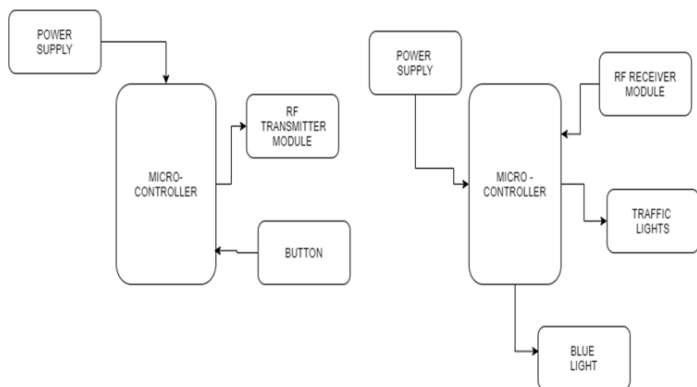


Fig 3. Block Diagram of our System.

I am using two micro-controllers named Arduino-UNO, Arduino-Nano. One of the microcontrollers will be connected in ambulance or VIP vehicle and other will be connected in traffic lights. Arduino Nano will be connected in ambulance or VIP vehicle which will be connected to button used to notify to clear out way. Arduino Uno will be connected in traffic lights with blue light for special purpose to notify everyone about ambulance and VIP vehicle. Whenever ambulance start from origin driver will press button to let traffic signals notify to clear out ways.

Sr.No.	ROADS				LIGHTS and ROADS
	ROAD 1	ROAD 2	ROAD 3	ROAD 4	
1.	1	0	0	0	Blue Light: Road 1 = ON Road 2 = OFF Road 3 = OFF Road 4 = OFF
2.	1	0	0	0	Red Light: Road 1 = OFF Road 2 = ON Road 3 = ON Road 4 = ON
3.	1	0	0	0	Green Light: Road 1 = ON Road 2 = OFF Road 3 = OFF Road 4 = OFF

VI. OBJECTIVES

I am aiming to create a system where emergency vehicles or VIP vehicles can pass through traffic without any interruption. As emergency vehicles need to be at target place as soon as possible our dissertation is designed to clear all traffic signals to green automatically without human interference.

VII. CONCLUSION

I designed the project concept based on literature study regarding this project. Block diagram, concept of project and components got finalized using this literature study. As emergency vehicles need to be at target place as soon as possible our dissertation is designed to clear all traffic signals to green automatically without human interference.

VIII. RESULT

CASE 1: When vehicles passing on Road 1.

CASE 2: When vehicles passing on Road 2.

Sr.No.	ROADS				LIGHTS and ROADS
	ROAD 1	ROAD 2	ROAD 3	ROAD 4	
1.	0	1	0	0	Blue Light: Road 1 = OFF Road 2 = ON Road 3 = OFF Road 4 = OFF
2.	0	1	0	0	Red Light: Road 1 = ON Road 2 = OFF Road 3 = ON Road 4 = ON
3.	0	1	0	0	Green Light: Road 1 = OFF Road 2 = ON Road 3 = OFF Road 4 = OFF

CASE 3: When vehicles passing on Road 3.

Sr.No.	ROADS				LIGHTS and ROADS
	ROAD 1	ROAD 2	ROAD 3	ROAD 4	
1.	0	0	1	0	Blue Light: Road 1 = OFF Road 2 = OFF Road 3 = ON Road 4 = OFF
2.	0	0	1	0	Red Light: Road 1 = ON Road 2 = ON Road 3 = OFF Road 4 = ON
3.	0	0	1	0	Green Light: Road 1 = OFF Road 2 = OFF Road 3 = ON Road 4 = OFF

CASE 4: When vehicles passing on Road 4.

Sr.No.	ROADS				LIGHTS and ROADS
	ROAD 1	ROAD 2	ROAD 3	ROAD 4	
1.	0	0	0	1	Blue Light: Road 1 = OFF Road 2 = OFF Road 3 = OFF Road 4 = ON
2.	0	0	0	1	Red Light: Road 1 = ON Road 2 = ON Road 3 = ON Road 4 = OFF
3.	0	0	0	1	Green Light: Road 1 = OFF Road 2 = OFF Road 3 = OFF Road 4 = ON

CASE 5: When vehicles passing on regular traffic pattern.

Sr.No.	ROADS				LIGHTS and ROADS
	ROAD 1	ROAD 2	ROAD 3	ROAD 4	
1.	0	0	0	0	Normally green lights will glow after 5 sec.

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