DENSITY BASED DYNAMIC TRAFFIC CONTROL AND VEHICLE IDENTIFIER BY USING RFID

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Abstract- Now a day's traffic congestion is one of the foremost issues in modern cities. . During the busy hours, there is a more number of congestion occurs due to traffic intersects at the junctions of the road. So for the emergency vehicles to stuck in the traffic jam. To reduce the traffic intersection by the density based dynamic traffic control for during busy hours. Which tries to reduce the chances of traffic jams, caused by the traffic lights, to some extent by clearing the road with higher density of vehicles and also provides the clearance for the emergency vehicle if any. The system is based on the ATmega8 micro controller with LASER, LDR sensors and Radio Frequency Identification (RFID) technology.

Index Terms-**RFID-**Radio Frequency Identification, **LDR-** Light depended resistor**, LASER- light** amplification by stimulated emission of radiation

1. INTRODUCTION

Traffic congestion is one of the major problems, the world is facing today. Traffic monitoring and controlling is a difficult task. In the existing systems a variety of methodologies that are being used to detect the congestion of traffic. Most of the systems used IR detectors that count the number of vehicles during a unit of time. Using Airborne Camera and the image processing technology, GPS devices and webcam, Radar technology etc. congestion can also be detected. But these technologies have several drawbacks, such as coverage problem, data rate, installation problems and cost. Hence, traffic light optimization is a complicated process. Even for single junctions there might be no obvious solution and the problem becomes even more complex for the multiple junctions, as the state of one light in one junction directly influences the flow of traffic towards many other lights. One way to improve the traffic flow and safety of the current transportation system is to apply automation and intelligent control methods to roadside infrastructure and vehicles. In the proposed system Laser based Radio Frequency Identification (RFID) is used that is still remains largely unexplored in the area of automatic congestion detection. Vehicle detection and counting can be done effectively by using this technology. The primary objective of this proposed project is to identify the road with the higher density of vehicles and identify the road with emergency vehicle if any. Traffic jams may arise due to large red light delays which are hard coded and is independent of traffic. The proposed system tries to reduce the traffic jams to some extent. The system is based on the microcontroller. ATMEL microcontroller is used in the proposed system .The system contains LASER transmitter and LDR receiver which are mounted on the either sides of roads respectively. The LASER signal passes across through a road, whenever a vehicle passes on road between LASER signal is intersected and LDR receiver produce the output and transmitted to microcontroller. Conventional technologies for identifying the emergency vehicle use some image processing systems. But these image processing systems are affected by the bad weather conditions like wind, rain, fog, etc., during the bad

weather conditions, the image received by the camera is distorted by noise and it is not clear for the system to identify the vehicle.
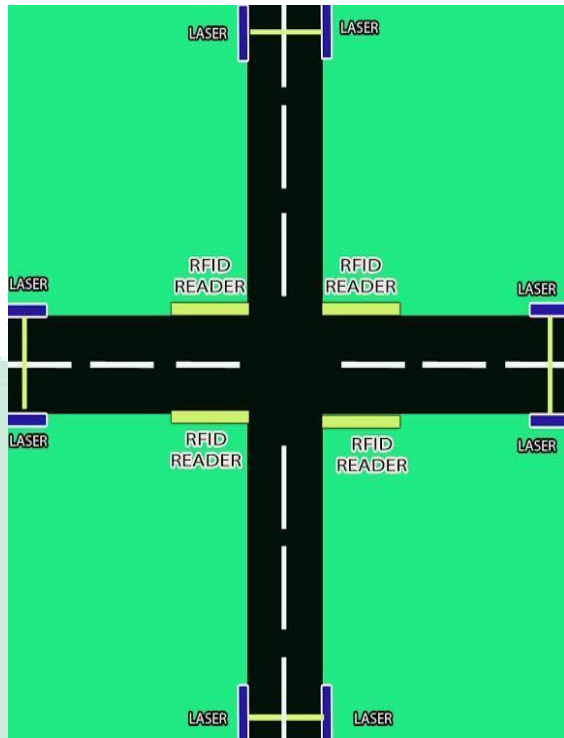

Fig :-1 Four Way Junction

In fig 1 shows that the four way junction road. Thus, we have developed a proposed system using RFID tag and RFID reader. The advantage of RFID is that it is a cost effective system and it provides uninterrupted communication even in bad weather conditions.

II. PROPOSED METHODOLOGY

This system consists of LASER and RFID on the traffic junctions for each side as it is a four way junction shows that fig 2. Therefore In this system, we use LDR sensor to find the traffic density. When the Laser signal intersects in any one of the roads, that road is considered the higher traffic density road. So the road with the highest priority is cleared first. RFID (Radio frequency identification) which is transfer the wireless data in electromagnetic field. The RFID tag work on the three different frequency
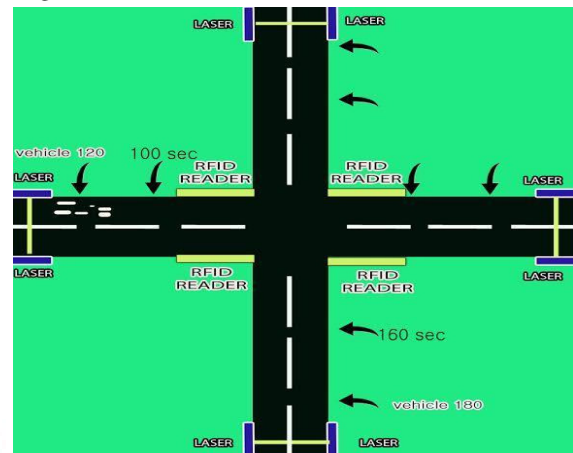
ranges.

Fig.2 RFID & LASER-LDR Placement at junction

The frequency ranges: low-frequency, high-frequency and ultra high frequency. Emergency vehicle is detected by using RFID technology and also gives importance to the ambulance and also emergency vehicles. If any emergency vehicle like ambulance, is waiting in a signal then the particular lane is given a higher priority and the traffic in that lane is cleared. The RFID reader reads the unique identification code of the tag and sends it to micro controller. ARDUINO Micro controller gives the high priority to the lane with the emergency vehicle and clears that particular lane. The ARDUINO is developed by hardward 8-bit RISC architecture and it contains many programs. In our existing system signals are work with the fixed time interval and camera based image processing systems. That are all not suitable for current weather conditions so the traffic congestion becomes large in four way junction road (inter-junction road). In our proposed system we are overcome the traffic congestion based on density based dynamic traffic control. By using the LASER and LDR ,also gives the importance to the police ambulance and VIP vehicles by using RFID technology. Basically the RFID technology detected by the emergency vehicle. Also this proposed system used to build a smart city with less traffic jam and its also helps the emergency vehicles to reach in time to the destination. The proposed system finds applications at the toll gates. The RFID system will

be connected the ARDUINO microcontroller by using serial protocol. The tag will be attached to the ambulance, when the ambulance passes through the reader the tag would be read the traffic light will be made green signal.

III.BLOCK DIAGRAM

The basic block diagram illustrated fig 3.the heart of the system is the ARDUINO (MEGA2560)controller. This system also the comprise of a power supply unit, RFID reader, RFID tag, LASER transmitter and LDR receiver. ARDUNIO is an open-source computer hardware and software company, project and user community that designs and manufactures kits for building digital devices and interactive objects that can sense and control the physical world. It is developed by 8-bit hardware RISC architecture and also contain a many programs.

Radio-frequency identification (RFID) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. It have two types active tag and passive tag. The passive tag don't contain any internal power source but active tag contain the internal power source.

RFID reader which contains a RF module both transmitter and receiver RF signal. Radio frequency identification is a technique that uses the radio wave to identify the object uniquely.
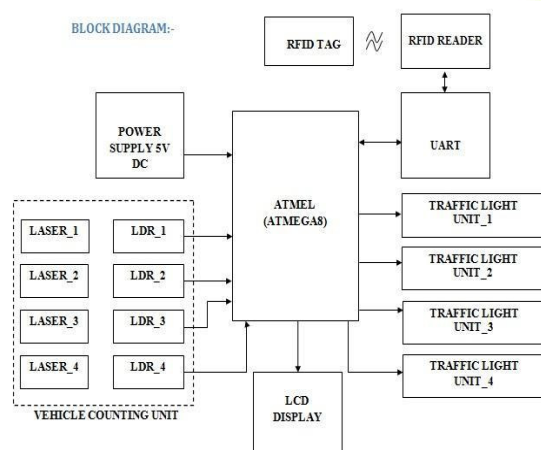
LASER is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation which is emit the light ray a cross the inter section road.
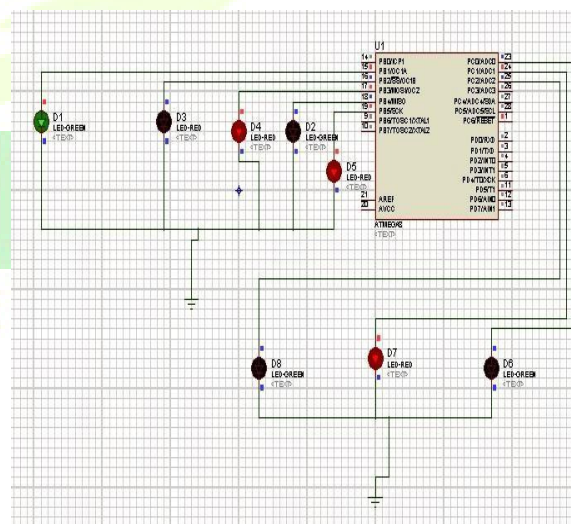
LDR is photo resistor or light-dependent resistor (LDR) or photocell is a light-controlled variable resistor. The resistance of a photo resistor decreases with increasing incident light intensity. It is used to sensing the traffic density in interjection road.

UART(Universal Asynchronous receiver transmitter) is usually an individual (or part of an) integrated circuit used for serial communications over a computer or peripheral device serial port. UARTs are now commonly included in microcontrollers.

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. This type of LCD is not required high power supply. LCD contains the three control signal.

IV.CIRCUIT DIAGRAM

The circuit diagram of an intelligent traffic light control and monitoring system with some peripheral interface to the ARUDINO microcontroller. Proteus software is used to make the circuit simulation window bade software.

Fig.3 Basic block diagram of an intelligent auto traffic signal controller.

Fig4. Internal Circuit of Traffic Controller

Micro controller receiver the 20 MHz from the crystal oscillator at OSC-1and OSC-2 pin.

Fig 5.Atmega 8 Controller board

In fig 8 shows the Atmega 8 controller hardware

V. RESULT AND CONCLUSION

This project is reduced the possibilities of traffic jams, caused by high red light delays and provides the clearance to the emergency vehicle to an extent and successfully. The proposed system also gives importance to the ambulance and vip vehicle. Emergency vehicle is detected by using RFID technology. Here we designed the system with the purpose to clear the traffic in accordance with priority. We use LDR sensor to find traffic density. When the LASER beam cut in any one of the roads that road considered higher density traffic road. this proposed system build a smart city so less traffic jams it also help the emergent vehicle to reach in time to the destination.

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