Solar Based Smart Traffic Control System

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Abstract: The objective of this paper is to use the solar power for density-based traffic control system with remote override facilities. Since solar energy is one of the major renewable sources and is non-polluted an attempt is made to utilize this energy in traffic control system. During normal time the signal timing changes automatically on sensing the traffic density at the junction by IR intermission method. For any emergency vehicle like ambulance, fire brigade etc requiring priority are built in with RFID control unit to abstract the set timing by providing immediate green signal in the desired direction by blocking the other road by red signal. Higher traffic density at one side of the junction claim longer green time as compared to specific allotted time. This traffic control system using a microcontroller of 8051 family duly interfaced with IR sensors changes the junction timing automatically to assist movement of vehicle well mannered to avoid needless waiting time at the junction. The density of vehicle is measured in three zones

i.e. low traffic zone, medium traffic zone, high traffic zone based on which timing are given accordingly. The override feature in this unit is turn on by an on board RF transmitter operated from the emergency vehicle which in turn provides ahigh priority for all emergency vehicles..

Keywords: Horticulture

I. INTRODUCTION

Our project density-based traffic light control is an automated way of controlling signal in accordance to the density of traffic in the roads. IR sensors are placed in the entire intersecting road at fixed distances from the signal placed in the junction. The time delay in the traffic signal is set based on the density of vehicle on the roads. According to the IR count , microcontroller takes appropriate decisions as to which road is to be given the highest priority and the longest time delay for the corresponding traffic light. We have also presented our technology by designing the density-based traffic signal system using Arduino mega. IR sensor used to measure the traffic density.

Block Diagram:
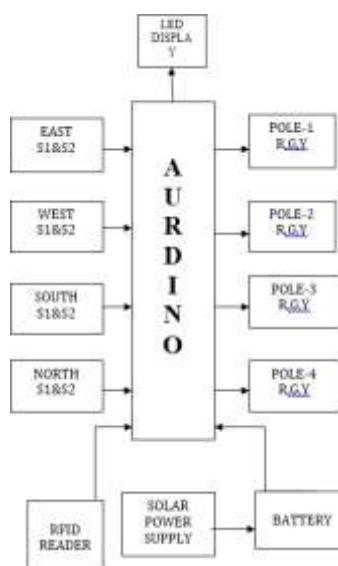
III. HARDWARE IMPLEMENTATION

Power Supply

Here we used the +12v solar panel and +5v dc buc converter power supply. The main purpose of this block is to provide the needed amount of voltage to essential circuits. +12 voltage is given to buck converter to get the +5v dc power supply.

Road Sensors 1 to 8

This is one of the main part of our project. The main purpose of this block is to sense the traffic density. For sensing the traffic density we are using the IR sensor. Sensor 1 to sensor 8 are used to sense the traffic density on road 1, road 2, road 3 & road 4. For each road there are two sensors, one is for increment the counter and other is to decrement the counter.

Micro-controller board (ARDUINO)

Arduino is an open-source platform used for building electronics projects. Arduino include of both a physical programmable circuit board and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become slightly popular with people just starting out with electronics, and for good motive. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can use a USB cable. Further, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino gives a standard form factor that breaks out the functions of the micro-controller into a more available package. The Arduino hardware and software was designed for artists, designers, hobbyists, hackers, newbie's, and anyone interested in designing connected objects or environments. Arduino can coordinate with buttons, LEDs, motors, speakers, GPS units, cameras, the internet, and even smart-phone or TV. This is collaborate with the fact that the Arduino software is free, the hardware boards are pretty cheap, and both the software and hardware are easy to learn has led to a large community of users who have contributed code and released instructions for a huge variety of Arduino-based projects.

Output Signals

We are manage three lights i.e. RED, YELLOW and GREEN. This changing according to the traffic density. If traffic density is high then signal times are also high. If traffic density is low then signal time

is also low.

LCD Display

LCD display is used to display which road has high density, which mode is selected and time remaining. We are using 16X2 LCD Display.

RFID Card (Tag)

An RFID tag is contain of a microchip containing identifying information and an antenna that transmits this data wirelessly to a reader. At its most basic, the chip will contain a serialized identifier, or license plate number, that uniquely identifies that item, similar to the way many bar codes are used today.

RFID Card (Tag) Reader

RFID Readers placed at entrances that require a person to pass their proximity card (RF tag) to be "read' before the access can be made. In every RFID system the transponder Tags contain information. This information can be as little as a single binary bit or be a large array of bits showing such things as an identity code, personal medical information, or literally any type of information that can be stored in digital binary format.

Shown is a RFID transreceiver that communicates with a passive Tag. Passive tags have no power source of their own and instead derive power from the incident electromagnetic field. Commonly the heart of each tag is a microchip. When the Tag enters the generated RF field it is able to draw enough power from the field to access its internal memory and transmit its stored information. When the transponder Tag draws power in this way the resultant interaction of the RF fields causes the voltage at the transceiver antenna to drop in value. This effect is utilized by the Tag to communicate its information to the reader. The Tag is able to control the amount of power drawn from the field and by doing so it can modulate the voltage sensed at the Transceiver according to the bit pattern it wishes to transmit.
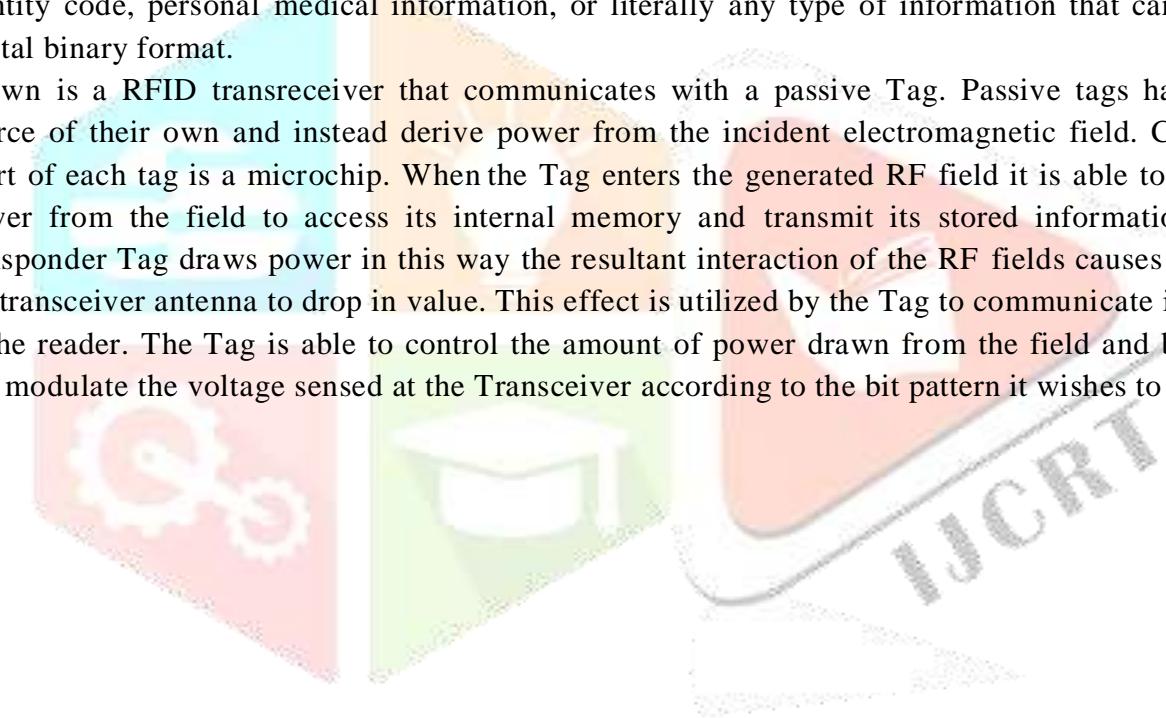
IV.   **FLOWCHART**
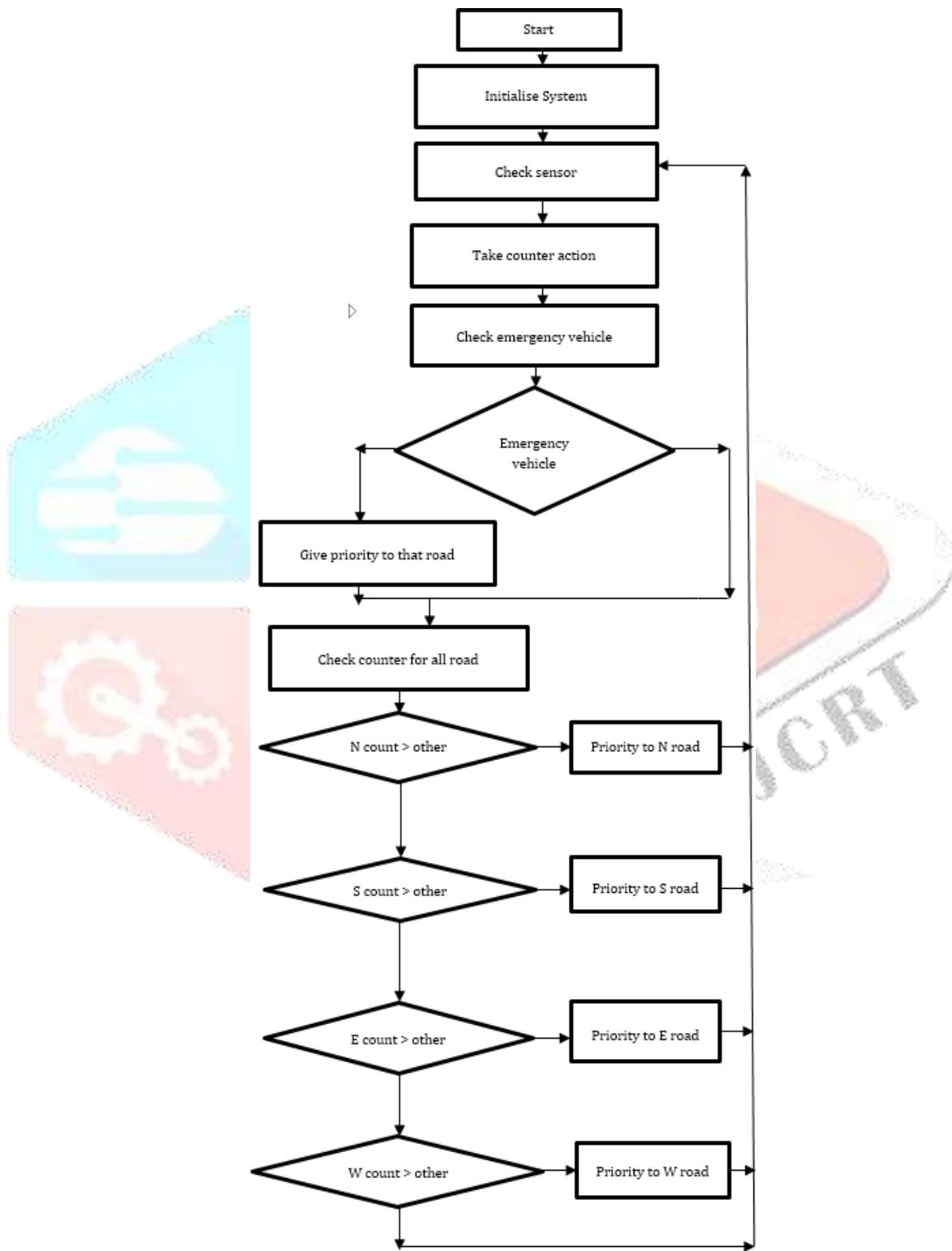
V. **OUTCOME**
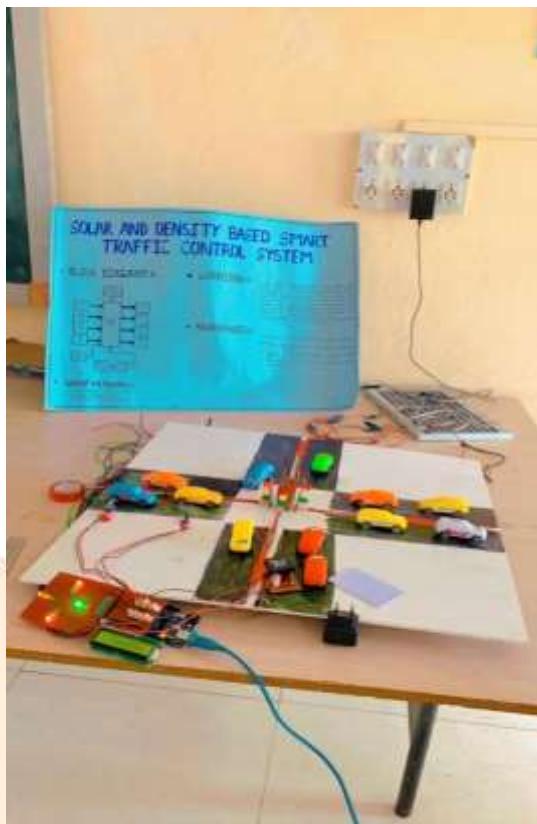
VI. **CONCLUSION**

In this paper we have studied the implementation of traffic light controller in a city using Arduino and IR sensors. A traffic light system has been designed and developed with proper implementation of both the hardware and the software are. This interface is initialize with the whole process of the traffic system. Automatically, this project could be organized in any way to control the traffic light model and will be useful for planning proper road system.

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