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Automatic Street Lights Using IR Sensors

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ABSTRACT: Now-a-days consuming electricity is becoming the main factor in present times. There are many solutions for reducing the usage of electricity. The main aim of our project is that the unwanted electricity can be reduced by turning OFF the sensors and turning ON the sensors whenever it is needed. In our project we are using different kind of sensors depending on the various situations. Here we are using sensors like IR sensor, LDR sensor, Raindrop sensor. We are also using Solar panels to generate the electricity and also for power backups. The main purpose of the IR sensor is it detects the motion of vehicles on the streets. By the movement of the vehicle the IR sensor gets turned ON and it will be turned OFF when there is no vehicle is observed on the roads. The reason for using Raindrop sensor is it detects the rainfall condition and it will prevents the damaging of IR sensors. For example: If there is heavy rainfall, the Raindrop sensor gets turned ON and it automatically turns OFF the IR sensor for protection. When there is no rain Raindrop sensor will be in OFF condition.

KEYWORDS: Streetlights, Vehicle movements, Detection, IR sensors, Raindrop sensor, Solarpanel

I. INTRODUCTION

This paper shows the design to detect the movement of vehicles. The street lights will be in ON condition during entire night and there is huge loss of electricity. In some areas, there are some lights will be in ON condition in the day time also. By seeing all this situations there is a large need of power consumption. To avoid these situations we are using sensors like IR, LDR and Raindrop Sensor. We are also using solar power for generating electricity as well as Power backups. In the present days automated system have less Manual operations high flexibility and also accurate. We are placing the IR sensors on either sides of the roads and it will be turned ON/OFF for a particular distance. We can implement IR sensors on vehicle detector mainly in highway rural areas, parking etc., There are so many advantages using IR sensors like the price of the IR sensor is affordable. It works for a very long period of time. The mechanism of IR Sensor is IR sensor will both emit infrared radiation and also detect the infrared radiation. So, when any vehicle is far away to IR sensor, receiver can't get any IR signals. So, when any vehicle is nearer to IR sensor, receiver can get IR sensor from the LED it reflects off the object and it is detected by the receiver. IR sensor module is it has 3 pins. One pin is VCC i.e., power supply ground and last pin is OUT i.e., active high output. The main factor of IR sensor is it has 5VDC operating voltage. library user to find a book from the shelf unit and reducing the human work.

II. LITERATURE SURVEY

S Suganya: Streetlight monitoring system based on wireless sensor network. The system are often set to run in automatic mode, which control streetlight consistent with Sunrise and Sunset Algorithm and lightweight intensity. This control can make an inexpensive adjustment consistent with the latitude, longitude and seasonal variation and arduino coding. also this system can run in controlled mode. In this mode, we can take the initiative to control street lights. The



system is equipped with the high-power relay output and can be widely applied in all places which need timely control like streets, stations, mining, schools, and electricity sectors then on.

K Santhalt integrates a power circuit, a fault detecting circuit, an infrared detecting circuit, an LCD display circuit, a photosensitive detection circuit, a street light control circuit, a pressed key control circuit and so on. This system can automatically turn on or off the lights and controls the switches according to traffic flow. It expands the fault detect circuit and the corresponding circuit. It also has a convenient and flexible button control circuit to switch on and off functions mentioned above. Main weakness is that it didn't say anything about the working principle behind the system.

Shivam Verma: This project helps to identify the large number of tagged books using radiowaves. The database shows the availability of the book in the library so that the student can search in the database and if available, they can collect book from the library. It also said to use fault detection circuit which when damaged, causes the voltage to drop to zero, thereby creating a problem. Theoretic proof shows only simulation result but not as something that can be used in our daily lives. As such a means of tracking the sun is required. This is a far most cost effective solution than purchasing additional solar panels. It has been estimated that the yield from solar panels can be increased by 30 to 60 percent by utilizing a tracking system instead of a stationary array.

Arvind lal:

This paper describes an automatic tracking system that will keep the solar panels aligned with the sun in order to maximize efficiency. The sun tracking sensor is the sensing device, which senses the position of the sun time to time and gives the sensing output to the amplifier based on light density of the sun. Here the sun tracking sensor is LDR (light dependent resistor). The amplifier unit is used to amplify the LDR signals, which makes the low level signal into high level signals and this output is given to the comparator. The LM324 IC is used as an amplifier. Comparator compares the signals and gives the command to the AT89C51 microcontroller. It is an efficient method to use the solar energy in remote areas. This system consumes very low power and high efficient lightening. We employ the auto sun tracking system; this can improve the energy stored in battery. This system does not affect the environment because it is pollution free. The system also consists of automatic ON, OFF control of the LED lamp, so there is no manual operation.

III. PROPOSED SYSTEM

BlockDiagram:

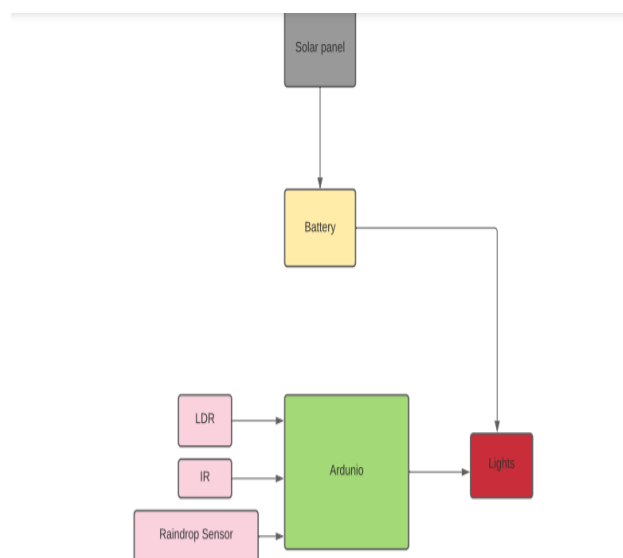


Fig1:Block Diagram



In block diagram, the inputs are connected to the arduino and we will get output i. e, light. The inputs are LDR,IR and Raindrop Sensor. Here,we are using solar panel too. The principle of solar energy is that it can stored and used for future use.LDR is nothing but light dependent resistor it is used to check the light intensity. Raindrop Sensor will detect the rainfall condition.We know about IR Sensor it has 3 pins .One is VCC, ground and output.By connecting these three as inputs and we will obtain light as output. Arduino Uno has 14 digital pins in that 6 are of output and it has ceramic resonator power jack as well as reset button. The Arduino UNO board is mostly used by the beginners that can use in electronics project and do programming in this board. The board has regular innovation and a bug fix in the design of the board to make the board suitable for the project's use.

FLOWCHART:

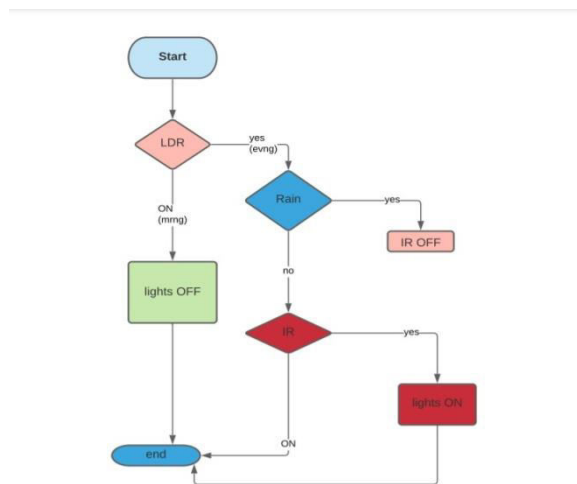


Fig 2: Flow Chart

LDR is used for light intensity in morning times LDR will deactivate automatically because the light intensity is more .when there is rain in evening times the light intensity is very less so LDR will active automatically. If there is no rain the IR sensor will be in ON condition so street lights will also glow according to the movement of vehicles.If there is heavy rains the IR sensor will automatically and streets lights will glow during entire rainfall.

CircuitDiagram:

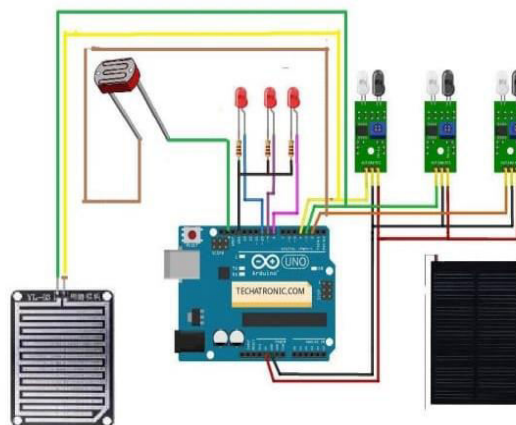


Fig 3: Circuit Diagram



IV.WORKING PROCESS AND RESULT

Our project focuses on automatic street light when there is movement of vehicle. So when the vehicle is passing through the street light the IR sensor detects the movement and automatically ON the lights.

When the light intensity is low the LDR sensor activates and directly Switch ON the Street lights.

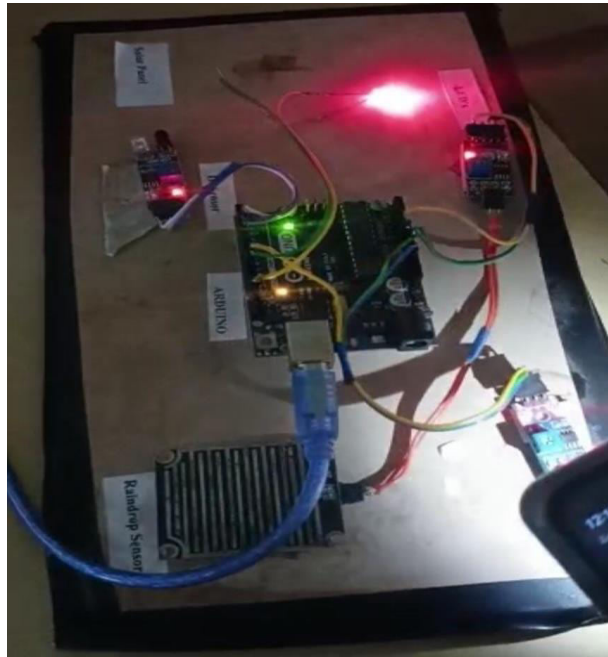


Fig 4: Output 1

As light intensity is Low the LDR sensor detected and directly Switched ON the street lights.

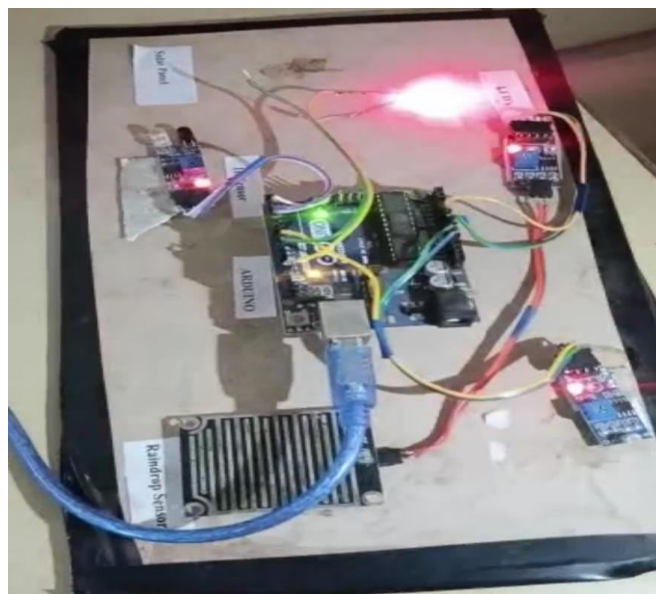


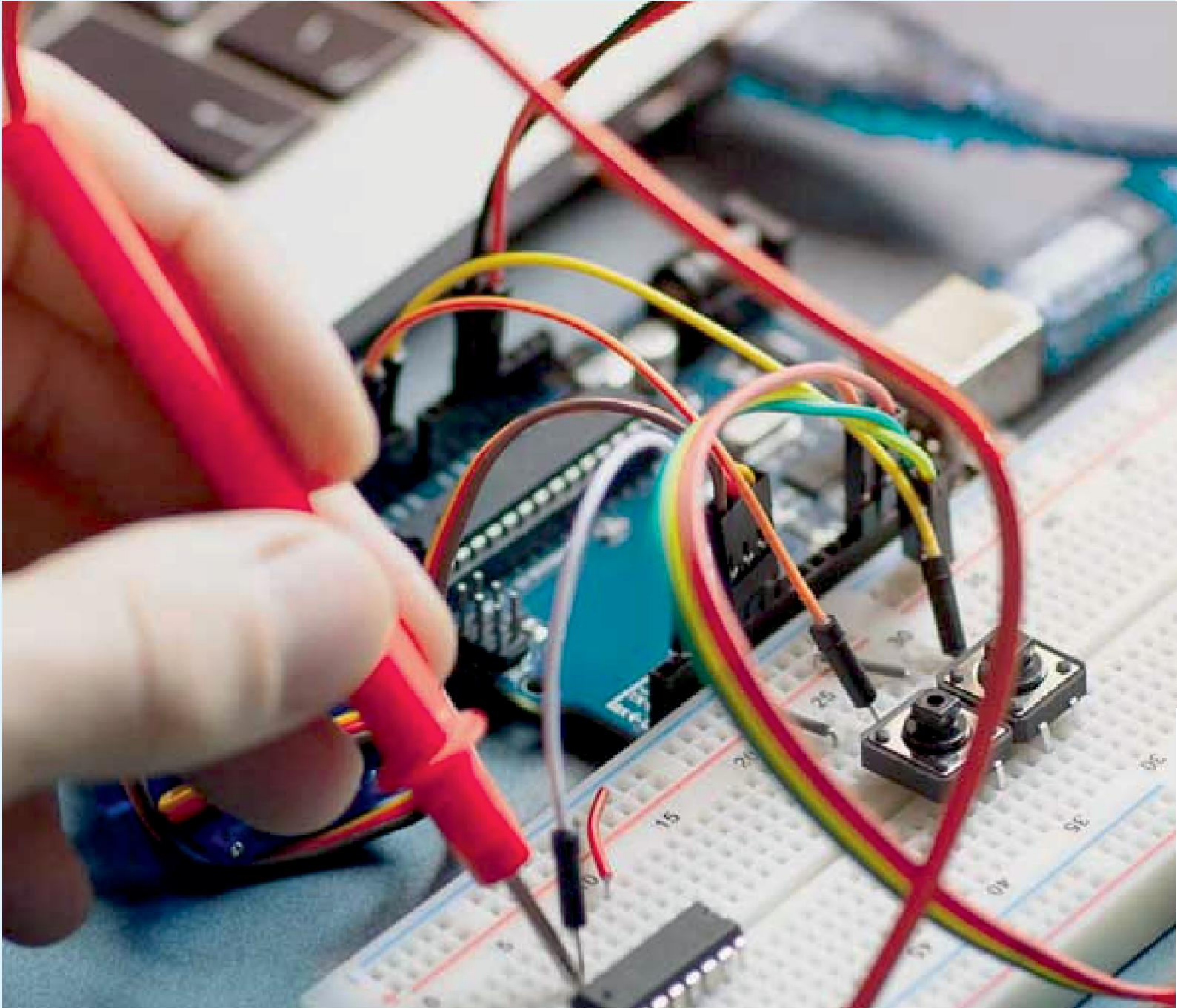
Fig 5: Output 2

Here the IR sensor detected the movement of vechile and dirtctely switched ON the lights.



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