

Smart Street light using Arduino

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Abstract—

Automation plays a very important role in the world of economy and also in daily experience. Many times automatic systems are mostly preferred over manual system. Here, Smart Street light is an automatic system which is used to automate the street light. Smart Street light can be used to reduce the power consumption when there is absence of vehicle on the road, thus Smart street light will glow with high intensity when there are vehicles on the road otherwise the lights will remain in off condition. As a result of which power is saved to a great extent. Thus Energy saving can be achieved by sensing an approaching vehicle using the IR sensors and then switching ON a block of street lights ahead of the vehicle with high intensity. When the Vehicle passes by, the trailing lights turn off automatically. Thus, we save a lot of energy. All the lights will remain off when there is absence of vehicles on the highway.

Index Terms—Arduino UNO, LDR, LED

I. INTRODUCTION

Street lights are an important part of any developing society. They are present in all major highways and in the suburban areas too. In present scenario, Lights are switched on in the evening before the sun sets and they are switched off the next day morning after there is sufficient light on the outside which leads to wastage of power. In order to conserve our environment we need to save power. Lights should be switched on when there is absolute darkness and switched off when not necessary.

Smart Street lights play a very important role in the world of economy as well as in daily life too. In this project work, due to automatic control of street lights power is saved to a great extent.

II. OBJECTIVE

In the existing system, the street lights are manually switched ON and OFF so we need manpower to maintain these activities. We have proposed a system in which we don't require manpower for controlling the street lights. Using smart street light we can save a lot of energy. We can save loss of energy and also reduce the human efforts. It is a perfect solution for energy saving especially in public lighting management.

III. PROPOSED METHODOLOGY

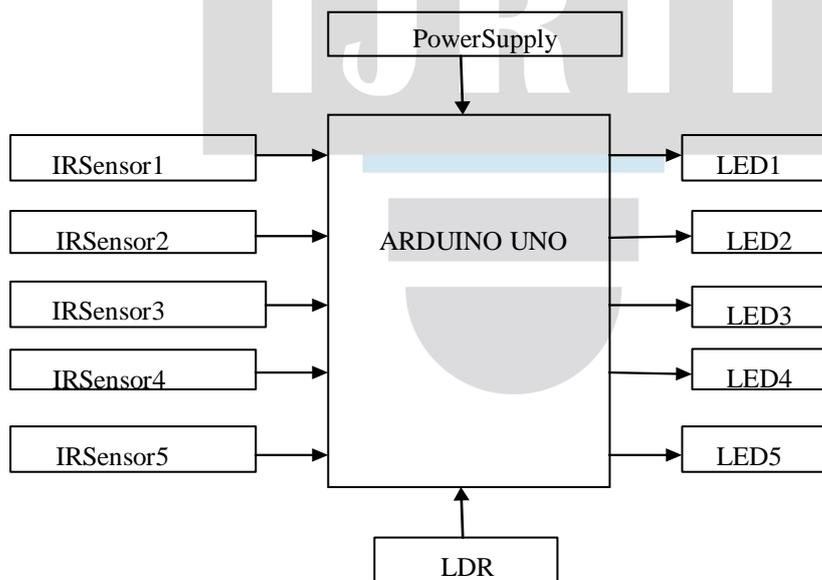


Fig.1 Block Diagram of Smart Street light using Arduino

The proposed system is designed by using LDR (Light Dependent resistor) to detect the darkness. IR (Infrared Sensor) is used to detect the objects (vehicles or humans) on road. Components required for designing system are Arduino Board, Bread Board,

Jumper Wires, LDR , IR Sensor ,LED etc. The program is written using Arduino including the conditions if there is light (Day time) and object is detected or If there is Dark and no movement detected then LED is in OFF condition. If there is Dark and object is detected then the LED is in ON condition .Thus the proposed system is able to operate the street light automatically at night when there is vehicle found on road.

IV. CIRCUIT DIAGRAM

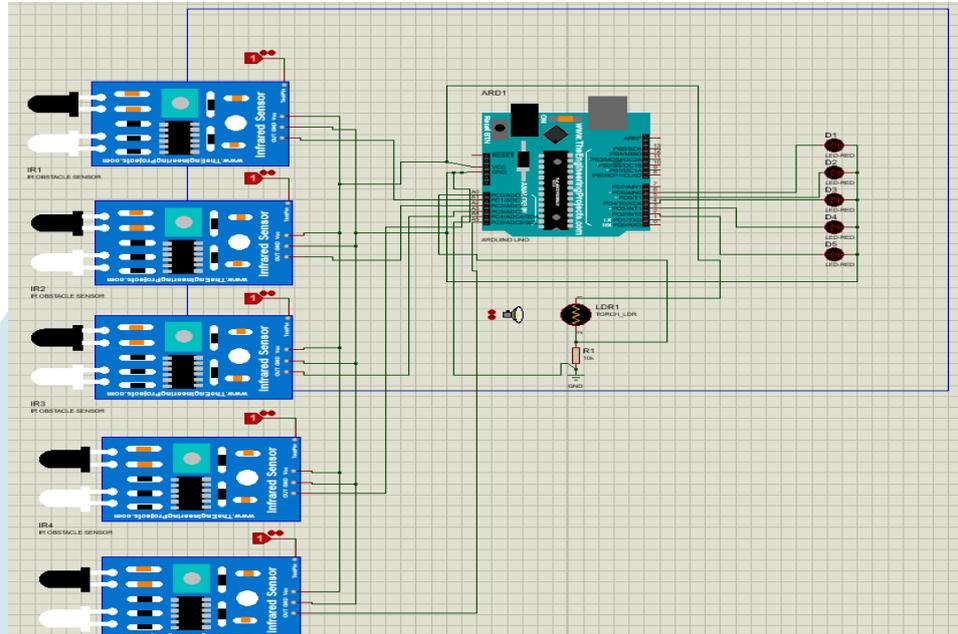


Fig.2 Actual connections of proposed methodology

The circuit connections are as given in figure.

1. Output of the LDR pin is connected to A0 (analog) port of Arduino Uno board.
2. Connect all output of the IR sensor to port numbers A1, A2, A3, A4 and A5 respectively which is the input signal to the Arduino board.
3. Connect the ground of all the IR sensor to GND port.
4. The output signals from LED are connected to port number 5, 6, 9, 10 and 11 respectively.
5. Again connect all the negative terminals of LED's to GND port.
6. Power is passed to the Arduino (7-12V)

V. RESULT

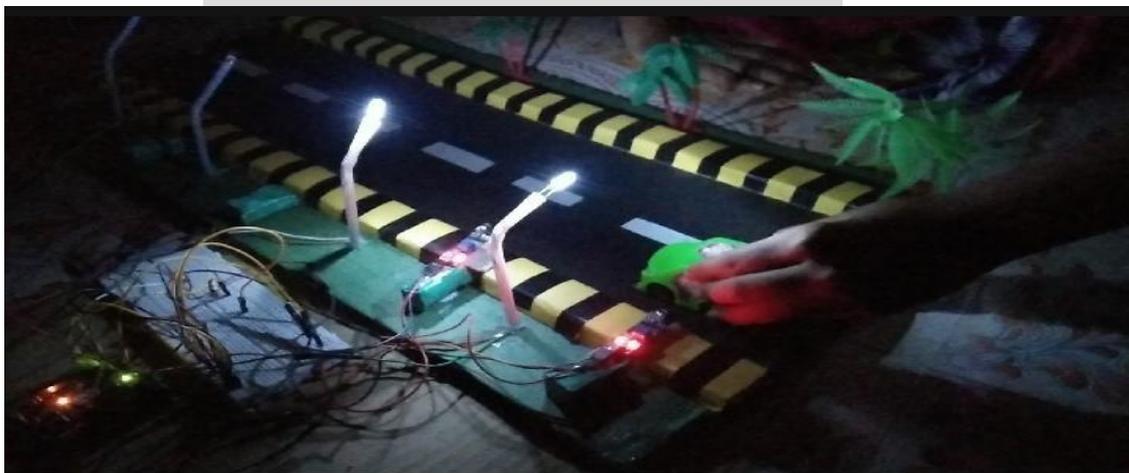


Fig.3 Photograph of final output

Above photograph is showing that, at night times, when a vehicle is passing on a road it is sensed by the IR sensor and LED lamp turns ON and when it passes away LED lamp will turn OFF. Thus power consumption is reduced.

VI. Applications

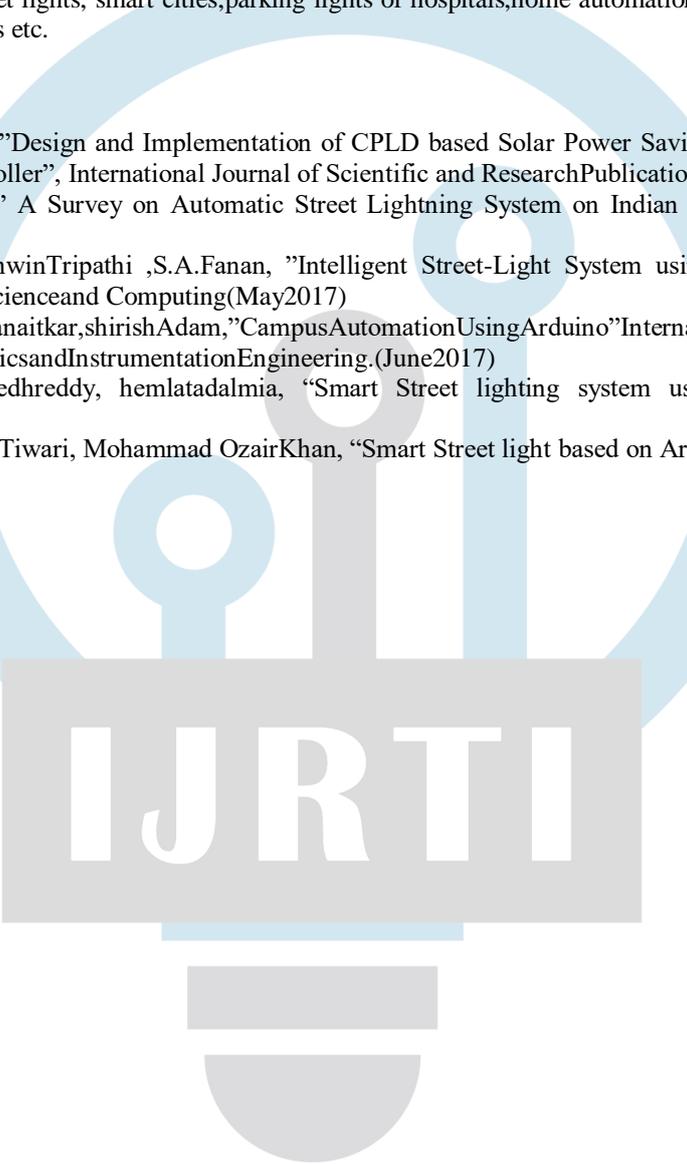
- Along Roads & Highways
- Parks & Recreational Areas.
- Corporate & Big Businesses.
- Government Units & Municipalities.

VII. Conclusion

The proposed methodology is a cost-effective and the safest way to reduce power consumption. It helps us to get rid of today's world problems of manual switching and most importantly, primary cost and maintenance can be decreased easily. The LED used in this system consumes less energy and it emits cool-white light. Also it has a better life. This system can be easily implemented in agriculture field monitoring, street lights, smart cities, parking lights of hospitals, home automation, timely automated lights, malls, airport, universities and industries etc.

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