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Research Article

Investigations on Performance of AI based System for Highways

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Abstract

In this topic ,smart street lighting system supported the movement of any vichels Or Animals, Human using IR sensors is proceeds LED light (street light) control oà and on is about by the outputsupported the movement tracking using IR sensor. Street lights are the foremost requirement in day to daylifetime of transportation for safety purpose and avoiding accidents during night. Street lighting systems aregetting more complex with rapid climb of cities . to manage and maintain such complex street lighting systems,various street light control systems are developed. during this project, we are becoming to develop a project called Street Light Control using IR sensors ,in which the road lights are automatically turned ON or OFF supported the movement of the vehicles. The important considerations within the event of street light control systems are Automation, Powerconsumption and price Effective. However existing LED system is implementing to detect continuously but it'seconomically high and efficiency of the prevailing system is low. Therefor this project purpose to prevent thelosses of electricity and reduced the speed of accident , by Electively, Economically.

1. INTRODUCTION

Smart energy consumption remains how of development, there is high amount of losses while transferring ofenergy then much time the energy is wasted as an example I even have very high amount of electricity is wastedat road lights when there's n't any vehicle but they're turned on so as a solution INFRARED BASED SMART ROADLIGHT TECHNOLOGY is typically recommended for saving electricity andmake it more precise. This electricity are often used for the there are many road lights worldwide if we apply this technology to all or any or any or any or any of those are very high amount of electricity are often saved whichare often utilised for an appropriate purpose.

Receives electricity can also be utilized for further transmission after electricity while stop and it are often sent toslum areas for free of charge of charge of charge of charge of cost. This technology not only save the electricityand it will be more precise for drivers as if any object or animal comes on road light are getting to be turned onso driver can easily identify . We use solar power system for the power supply, active solar relying on how they capture and distribute solar energy or convert into solar power. Solar could even be a secure alternative which may replace current fossil fuels like coal and gas for generation of electricity that produce air, water, and land pollution. Use of solar power will eliminate these unsafe, unclean consequences from using conventional fossil fuels.

As it appears that on the roads with high traffic on highways, often at night and during fog, a lot of big accidents happen, these accidents cause huge loss of public money and a lot of government infrastructure is also deteriorated. A lot of work has been done to prevent accidents. Our efforts are also towards in this context. Through this paper, we would like to suggest to various agencies that if the lighting in all the electricity poles on the highway is in 2 stage is light intensity is less in the first stage and there is more light intensity in the second stage than the fast tag or barcode method There is a mechanism for repeating it so that when any vehicle passes through one or more poles, the highway lights will operate from low intensity to high intensity, the barcode reader will read the barcode. Through which information will reach the vehicles patrolling. I will be able to remove the accident-prone vehicles from the highway soon and the accident-prone person can be taken to the hospital and loss of life can be reduced.

Solar energy converted in electrical energy and stored in batterywhich provides power to LED bulbs. Battery supported to load of the invertors to carry the of charge the battery. We use the tubular battery within the system to scale back the resistance in battery and thus the wires Solar heat to electricity isn't any convectional recourse. Solar panel are fixed in series and parallel, Each cells are made on silicon to increase the current. The crystalline silicon similar to ribbon and thin silicon are most popular in solar system. Led light are based on silicon carbide and it is less emitted diode. In rural areas are using the led much better than other lamp. Led save notalso power but also money standard all other current and consume the 50% power saving. Led has the good white brightness and it's available in large production. Cause of much appliance it's shipping in large amount of production for the consumer. Solar power system has take place the fossil fuel in some area as well as home power, street light, industries etc. Renewable energy has adopted.

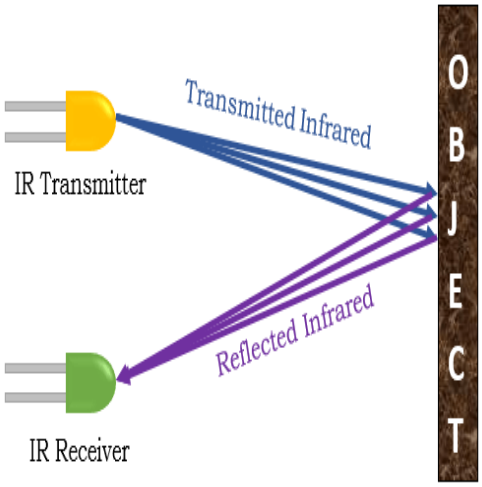


Fig-1:-Transmitting and Receiving Operation

objectives of prototype :-

The main objective of this project how to prevent the losses of Electricity and reduced the accident rate and use solar power system as the replacement of Electrical Energy.

By using this technology we used amount of electricity with can be utilised fort different useful purposes such as free electricity supply store slum area. Project can be used in those areas where's every less amount of traffic runs. It will also helps to drivers when any animal processor all the light bill turn on and that will indicate any animal is crossing is road and it will lead to less chances of accident.

This aims and objectives of this project are:

- Prevent the losses of Electricity.
- Reduced the rate of accident.
- To power up a street lighting system through solar energy.
- To protect the solar battery from quick Deterioration as a result of continuous day and night working.
- To control a solar powered streetlight automatically.
- To utilize the naturally endowed resourced (sun).

2. DESIGN AND IMPLEMENT

InThis section we are discussed basic ideas of methodology, contraction, circuit diagrams, new technology and techniques use for simplification of problems or issue facing during implementation of project, different parameters, basic knowledge about equipment's, problems solving techniques, software and hardware implementation,advantages and disadvantages, different Results, features scopes……. And so many things .

2.1 Architecture Design of the works :- We are going to discussed basic equipment, power supply, block diagrams, variable inputs data used, equipment range, circuit diagrams, working

2.1Required components :-

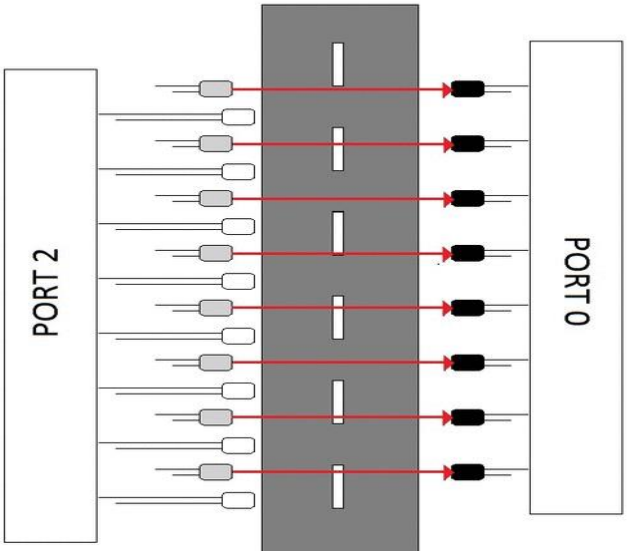
S. No	*Name*	*Quantity*	*Rating*
1.	*Solar cells*	*1*	*17 volts*
2.	*Battery*	*1*	*12 V / 5A*
3.	*IR sensors*	*8*	*1400 nm to 3000 nm*
4.	*LED bulbs*	*8*	*As per requirements*
5.	*Resistors*	*24*	*3.3k , 470 c/n controlling*

Use also some basic equipment like, connecting wires, soldering iron, soldering road, flux, Thermocoal for decorations, Gum, sheet.. etc.

Infrared technology addresses a wide variety of wireless applications. The main areas are sensing and remote controls. In the electromagnetic spectrum, the infrared portion is divided into three regions: near infrared region, mid infrared region and far infrared region.The wavelengths of these regions and their applications are shown below.

- Near IR region — 700 nm to 1400 nm — IR sensors, fiber optic
- Mid IR region — 1400 nm to 3000 nm — Heat sensing
- Far IR region — 3000 nm to 1 mm — Thermal imaging

- **Planck's law s**tates that "every object emits radiation at a temperature not equal to 0^0K"
- **Stephen – Boltzmann law** states that "at all wavelengths, the total energy emitted by a black body is proportional to the fourth power of the absolute temperature".
- **According to Wien's Displacement law,** "the radiation curve of a black body for different temperatures will reach its peak at a wavelength inversely proportional to the temperature".



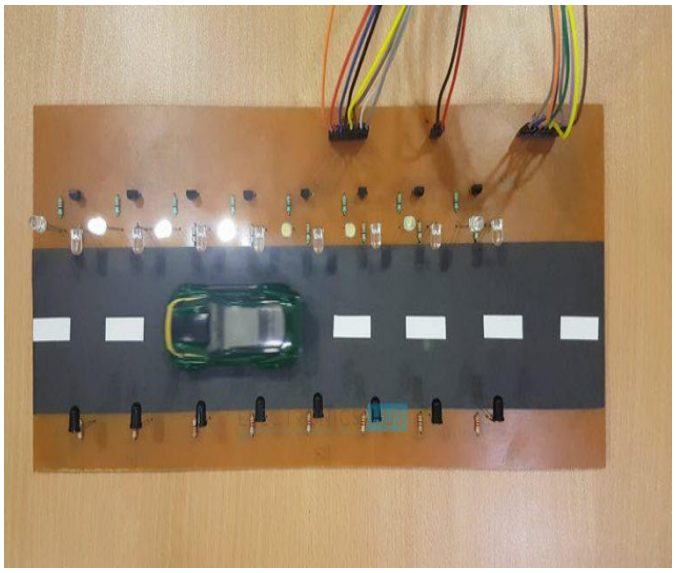


Fig. 2: Working demonstrate

The Infrared transmitter is placed directly in line of sight with Infrared receiver, so that the Infrared receiver continuously receives infrared rays ,And Once the IR receiver receives IR rays, than led is not glow , But If the infrared rays are blocked, the led is glow. We can also use an microcontroller for proper software implementation and better working. It's also provides some advance features. Main Advantages of this project It is prevent the losses of Electrical power and reduced the rate of accident and save the environment and animals because we use solar energy.

Results and Discussion

We discussed in Previously all about this project and we going to discussed results of this experiment . After analysis of all parameters performance, we can say our project is working properly and effectively . After analysis we find, it is very effective in terms of electricity saving. Electricity can also be utilised for further transmission after electricity while cut off and it can be sent to slum areas for free of cost. This technology not only save the electricity and it will be more precise for drivers as if any object or animal comes on road light will be turned on so driver can easily identified about the object.

It more effective and helpful in society developments , it is batter than with our aspects, many outcome of this project-

- Saving of Electrical power
- Reduced the accident rate
- Pollution free
- Advance technology
- Electricity utilization
- Safe for animals
- Useful at highways and more effective in rural areas

CONCUSSION

The current time is technology time, world is going to digitalize day by day, new technology's are invented everyday in every field , everything is digital. So we needed to updates and know about something. Indian government are also announced so many digitals project like Smart City, Digital India…..etc. So, we are going to one step in sides of Digitization, This project is also helpful in making the smart cities. So in future, it's very effective and economical role in makingSmart cities.

Smart energy consumption is still a method of development ,there is high amount of losses while transferring of energy and so much time the energy is wasted as an example I have very high amount of electricity is wasted at road lights when there isn't any vehicle but they are turned on so as a solution Infrared Based Smart Road Light Technology is suggested for saving electricity and make it more precise. This electricity can be used for the there are millions of road lights worldwide if we apply this technology to all of those are very high amount of electricity can be saved and that can be utilised for an appropriate purposes.

We seen most of projects are already working on this topics. After review some research papers, we find every person use different method, ideas, and technology.etc. we already discussed in previous chapters , but one common factor is present in every projects. These Are used non-renewable energy sources. . So, it is superior of our project, works on the renewable energy sources and save energy is utilize in that areas, where required small amount of electricity. We can utilize this energy in agriculture areas, Domestic areas, small businesses, Domestic industry… etc.

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