AUTOMATIC STAIRLIGHT CONTROL USING ARDUINO

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Abstract : The Smart Staircase system is a lighting control system wherethe lights are automated according to the presence of people using the staircase. It has been further extended with a stoner interface on mobile bias. This stoner interface, in the form of an android operation will cover the status of the lights and besuitable to modify the color and intensity of lights being used on the staircase. With this design, we will successfully producea system where lighting control will be purely grounded on mortal presence and hence barring the need for homemade switching. In order to apply this technology, we first need to survey the colorful styles available for seeing data and controlling the lighting grounded on residency of the area. Likewise, the colorful styles and their perpetration has been bandied about.

1.INTRODUCTION

The two biggest issues in today's globe are electricity shading and power scarcity. The power shortage graph is rising quicklyday by day. In this case, the power wastage has a significant impact on the energy infrastructure. Power is wasted in avariety of ways, such as when people simply forget to turn offthe lights before leaving, and in some situations, power waste should be prevented by employing low-efficiency appliances. When movement is detected, an automatic Lightning system will turn the lights ON: when motion is detected and, on the other hand, when no motion is detected, lights turn OFF [1-2].

During this time, stair lighting (Figure 1) is required to Illuminate the passage away. Climb the stairs, caused by countless accidents. Too bad or no lighting on the stairs,
Have experienced such accidents several times and inflicted permanent injury to people, including bone fracture. In some cases, resulting in permanent disability, Property damage onlythe stair lighting should be on when needed. Of course, they are only needed to save energy and energy costs. Stair lighting is very important from a safety point of view. Dark spots and shadows along the stair can pose a safety hazard.For this reason, it is necessary in advance.

Installation of stair lighting system. Lighting glare built-ins andwindows should be minimized. There is a difference classes of lighting schemes i.e., Direct lighting, indirect lighting illumination, semi-direct, semi-indirect, and general diffuse light systems. A well-constructed lighting scheme is the right thing to do. Ensure proper lighting to avoid glare and discomfort shades and ensure a sufficiently even distribution of light. The entire working plane (The raja and the raja 2002) of the traditional method of controlling stair light was used bi-directional circuit. Modern stair lighting exists as a simple circuit using a Motion/Human detector, or automatically turn off/ on sensor/electrical system stair lighting, etc. Transistor, LED, Passive infrared (PIR) sensors, etc.

Can be used to build an automatable light sensor on when motion is detected or off, when motion is not detected (Ayush,2015) [3].

The sensor itself is changed in quantity, event, or execute an action and generate a corresponding output signal. There are various types of sensors including but not limited to: analog anddigital sensors. Different types of sensors include Temperature sensor, Gas sensor, Fire sensor, Smoke sensor, Pyroelectric sensor, Passive infrared (PIR) sensor, Infrared (IR) sensors, etc. With these sensors, Motion-controlled circuit

Or power Switches Detector. Stair lighting system installed Automatically controlled, in contrast to the old Traditional methods uses a two-way line.

I have two classes of Sensor-based person detection for stairwells. Passive sensor and Active sensor using different technologies, detects the movement of the atrium. Passiveoccupancy sensor or not. It dissipates energy, but reads the energy change stairwell. Active for the sensor to detect movement he emits one of three types of energy. Stairs; infrared microwave radiation or sound waves (Safewise,2013).List of Active sensors used for various automations.

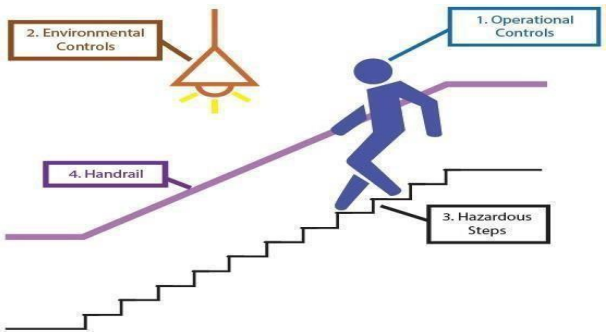

Figure 1. Dependent elements on safer stairs and steps

2. LITERATURE SURVEY

Materials/Component used: Materials used in the construction of the sensor based human detector for lighting purpose on the stair-case is shown in table1.

Table1. Table showing material used.

S/N	Components	Quantity	Value
1.	Arduino uno	1	At Mega 283P
2.	5pin Relay	8	12V
3.	Ultrasonic Sensor	2	HC-SR04
4.	LED	12	12V
5.	Resistor	12	10K
6.	Power Supply	2	5V, 12V

A BLOCK DIAGRAM IS SHOWN IN FIGURE 2, RESPECTIVELY.

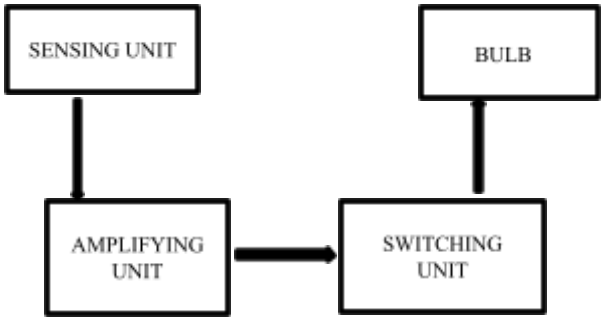

Figure 2. Block diagram of a sensor-based people detector forlighting.

Methods: DC power is supplied to the PIR sensor. If there ismotion in the area of the sensor, 5V is given as Exit. Resistor connected between sensors acts as a current limiting device. Thetransistor connects so that reverse current does not flow. The temperature difference is detected by a PIR sensor and the outputis given to a transistor and then to a relay. The circuits work as a switch. Normally closed and he has two ports, normally open.

Relay ground is connected normally open to close the circuit, fluorescent lamps are. If there is no motion, there is no input to PIR. Since it is sensor, the output is 0V and the common of therelay the circuit remains open because it remains connected tothe normally closed contact Fluorescent light.

Save power with this not used.

Circuit layout: Using listed components and circuit elements, sensor-based people detector for lighting built on stairs. These components first check the workability by arranging them on abreadboard. Circuit layout of sensor-based people detector for lighting. The purpose of the stairs is shown in figure 3.

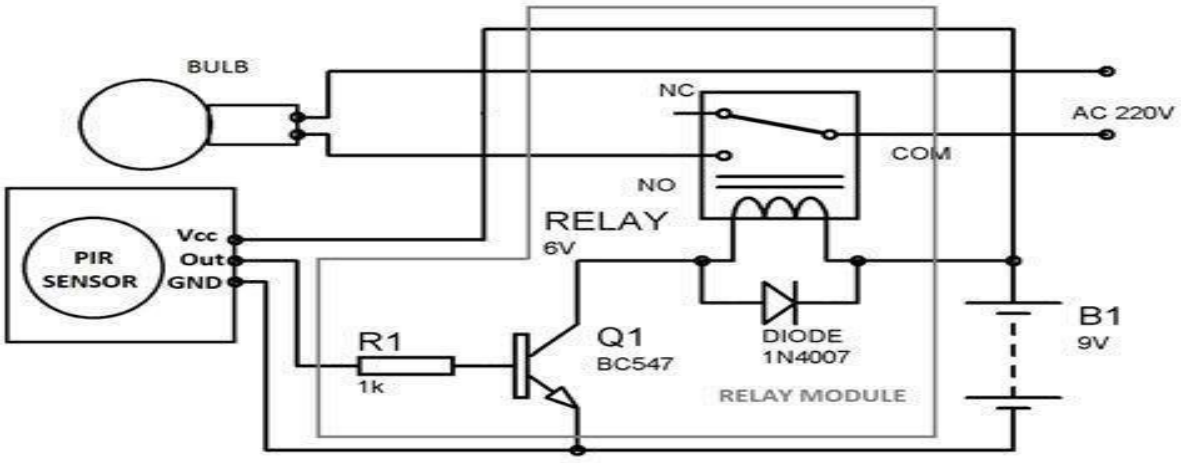

Fig 3. Circuit layout of the sensor based human detector forlighting purposes on the staircase.

In this construction sites used PIR sensors to detect people movement within a range of 2 meters. +DC voltage connector connected to the positive (+V) supply voltage. The output pinis connected to the base of the transistor through a 1k resistor.The ground connection is connected to circuit ground. The principle of operation is always there is body movement around the sensor and it detects the signal converted to an electrical signal. This signal voltage is then applied to the baseof the transistor lead. The Pir sensor has a variable resistor and you can change its value, sensitivity, and range.

The PIR sensor is supported and Fresnel lenses, infrared detectors, and detection circuit. The sensor's lens focuses the infrared light. Ambient radiation/wavelengths towards infrared detectors. Provide a preliminary detection range of about 2m highly sensitive and generates infrared heat that is detected by a motion sensor. Sensor output, a 5V signal for a period. Usingsensor output (5V) it drives transistor BC547, then the transistor turns on a 7v SPDT relay. The relay will switch stairsaccordingly to case light ON.

Amplifying stage: Based on sensor structure human detector for stairwell lighting purposes, the amplifier stage uses the NPN transistor BC547. In addition to amplifying the signal voltage, current and power performance, BJT-transistors cangenerally be used like this: A switch or a combination of a switch and an amplifier. In this structure use NPN transistor BC547 signal amplification and switching. Its operation isto convert the electrical energy from the PIR sensor and its biasto a transistor that conducts or saturates. If there is no signal from the PIR sensor, the transistor will switch and stay in shutdown mode.

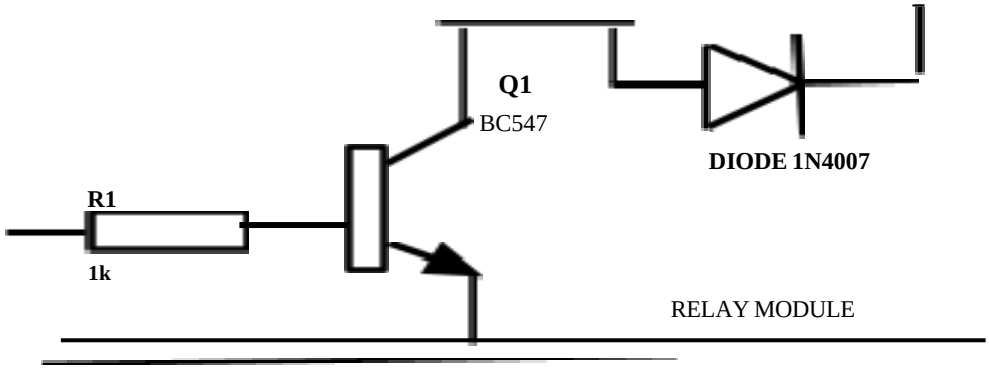

Fig 4. Amplifying stage

THE COMPONENTS LISTED BELOW ARE INCLUDED IN PIR:

1. PIR motion detection.
2. Dual element sensor.
3. Adjustable delay time.

Standard TTL output

11.CONCLUSION

The Stair control lighting system designed for lighting purposes is one of the simplest and most effective methods. Automatic energy saving in building organization. Based on the PIR sensor object detector for lighting purposes in stairs System, Easy -to -connect, low-power , low-cost PIR sensor and other components were used. Using this creates power Consumption that has decreased and finally it can be used in the car parking lot and street lighting .

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