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Automatic Door Opening and Closing System Using Arduino

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***Abstract*: In these modern days opening and closing of the door have been always boring jobs, especially in a place where a person is always required to open the door for visitors such as hotels, shopping malls, and theatre. Here is a solution to open and closed the door i.e., movement sensed automatic door opening and closing system. This project is based on sensing any body movement present nearby the sensor. This is achieved with the help of an infrared sensor (IR). When a human body emits infrared energy which is detected by the IR sensor from a particular distance. The signal is detected by the sensor is pass to the controller to function a door motor IC. When a body reached the operating rate of the IR sensor, it sends a signal to the microcontroller to open and closed the door. The setting of the door is stored in the memory of the microprocessor.**

***Keywords*: Arduino, IR sensor, Microcontroller, Motor driver IC, Servo Motor.**

1. Introduction

Taking the current scenario we had took the pandemic situation as many parts in our project with the name of our project "Automatic door opening and closing system using Arduino and IR sensor" everyone could know that the door gets opened without touching the door or without any physical contact of human beings so therefore if the touch will reduce in the pandemic situation. Also, it can be used in places where there is a physically disabled person, this door will therefore replace all old designed door which requires physical action. The project is designed simply with small equipment which will be described below. A simulation and connection of the project will be given below, then comes the IR infrared sensor. This sensor is a type of infrared sensor which senses the characteristics in its surroundings by emitting or detecting infrared radiation. Whenever an object comes near, the sensor sense and send the signal to the microcontroller when the signal is the high motor driver will operate the motor when the motor is run in anticlockwise the door will open. Similarly, when the signal is low the motor will run clockwise then the door is closed.

A. An automatic opening and closing door has two building stages

1) Hardware construction

For hardware construction, we need Arduino UNO, IR sensor, servo motor, motor driver. Collect all the component and placed on board so that easy to arrange and connect its component as per the connection diagram accordingly. Now connect motor driver input 1 in pin no3 in Arduino connect motor driver input 2 in pin no 2 of Arduino connect motor driver both output 1 and output 2 to the servomotor. Again connect the IR sensor terminal out to pin no A0 of Arduino so that it can pass the signal when the sensor sensed the object. Now connect the Vcc terminal IR sensor to the +5v pin of Arduino.

2) Software

Program is required for parts of hardware work so that's why we programmed with the required software which is Arduino IDE. The microcontroller is not programmed at the first, so if we make or construct hardware may not work because there is no instruction is given to the program that's so we have the required software for the program to upload in the microcontroller.

2. Figures

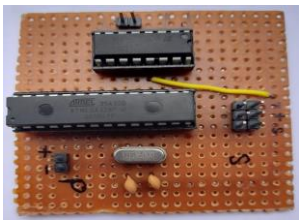

Fig. 1. Circuit Board

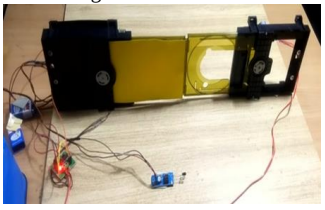

Fig. 2. Proto Door

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3. Table

Components	**Tools**
Arduino UNO	Soldering Iron
IR Sensor	Combination plier
Motor driver IC L293D	Cutter
Servo Motor	Hot gun
Zero PCB Board	Soldering wire
Jumper Wire	Bread board

4. Conclusion

This paper presents an overview of Automatic door opening and closing system using arduino

References

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