Automatic Gate Opening System

MAIOT MINI-PROJECT

UNDER THE GUIDANCE OF
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INTRODUCTION

You must have seen automatic door openers in shopping malls and other commercial buildings. They open the door when someone comes near the entrance and close it after sometime. A number of technologies are available to make such kinds of systems like PIR sensors, Radar sensors, Laser sensors, Infrared sensors, etc. In this Arduino based project, we have tried to replicate the same system by using a PIR sensor.

It uses a motion-detecting sensor (PIR sensor) to open or close the door which detects the infrared energy omitted from human's body. When someone comes in front of the door, the infrared energy detected by the sensor changes and it triggers the sensor to open the door whenever someone approaches the door. The signal is further sent to Arduino uno that controls the door.

THE COMPONENTS USED:

PIR SENSOR,SERVO MOTOR,ARDUINO UNO R3,LCD

EXPLANATION OF COMPONENTS

A PIR (Passive Infrared) sensor is a type of motion sensor that detects infrared radiation emitted by objects in its field of view. The sensor consists of two parts - a pyroelectric sensor and a Fresnel lens. The pyroelectric sensor detects changes in infrared radiation levels, while the Fresnel lens focuses the infrared radiation onto the sensor.

EXPLANATION OF COMPONENTS

LCD display: An LCD display can be used to show information about the door's status, such as whether it is currently open or closed.

EXPLANATION OF COMPONENTS

Servo motor: A servo motor can be used to open and close the door. You can attach the motor to the door using a hinge and use the Arduino to control the motor's rotation.

EXPLANATION OF COMPONENTS

The Arduino Uno R3 is a microcontroller board based on the ATmega328P chip, which is part of the AVR microcontroller family. It has 14 digital input/output pins, 6 analog inputs,a USB connection, a power jack. The board is designed to be easy to use and programmable with the Arduino software. It is commonly used for DIY projects, prototyping, and education, and is particularly well-suited for projects involving robotics, sensors, and automation.

SNAPSHOTS OF THE CIRCUIT
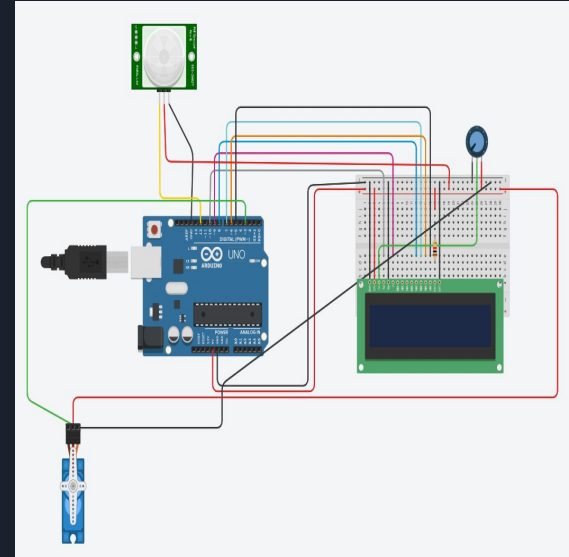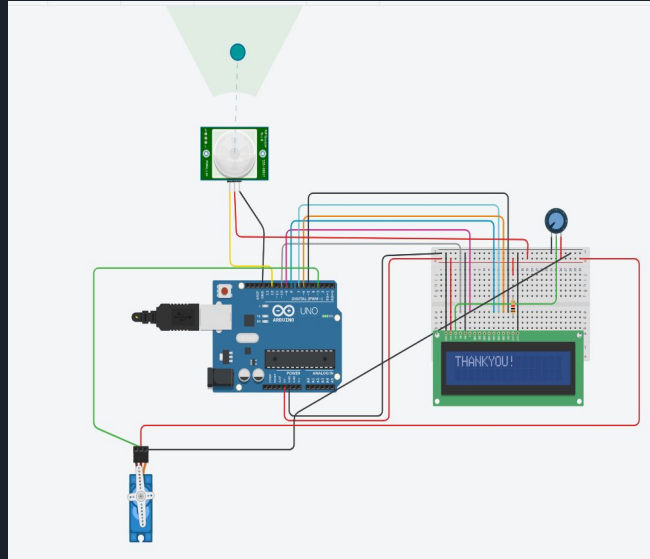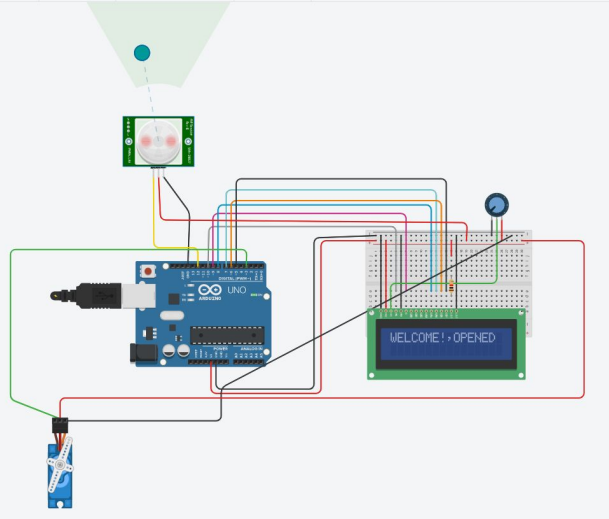
EXPLANATION OF CIRCUIT

An automatic gate opening system is an electronic device that is designed to automatically open and close a gate in response to a specific trigger or input. The system typically consists of several components, including sensors, a controller, a motor or actuator, and a power source. The sensors are used to detect the presence of an object or vehicle, and they send a signal to the controller when triggered. The controller then activates the motor or actuator, which opens or closes the gate accordingly.

EXPLANATION OF CIRCUIT

There are several types of sensors that can be used with an automatic gate opening system, including photoelectric sensors, infrared sensors, and magnetic sensors. A PIR (Passive Infrared) sensor use a beam of light to detect the presence of an object.

The motor or actuator that opens and closes the gate can be powered by electricity which further can be attached to the door via hinge.

Overall, an automatic gate opening system provides a **convenient** and **efficient** way to control access to a property. It can also be customized to fit the specific needs of a particular application, making it a versatile solution for a wide range of settings.

Automatic gate opening systems have many applications in various settings, including residential, commercial, and industrial. Some of the most common applications include:

1. Residential Properties: An automatic gate opening system provides homeowners with convenience by allowing them to control access to their property. It can also enhance the curb appeal of a home and add value to the property.

2. Commercial Properties: Automatic gate opening systems are commonly used in commercial settings such as gated communities, apartment complexes, and office buildings.

APPLICATIONS

3. Industrial Settings: Automatic gate opening systems are widely used in industrial settings such as factories, warehouses, and loading docks. They allow for the safe and efficient movement of vehicles and equipment in and out of the facility, while also providing added security.

4. Parking Lots: Automatic gate opening systems are commonly used in parking lots to control access and ensure that only authorized vehicles are allowed in. This helps to prevent theft, vandalism, and other security issues.

Overall, automatic gate opening systems provide an efficient and convenient way to control access to various types of properties.

APPLICATIONS

- Moreover, the proposed system can be developed by interfacing a counting arrangement to count the entry and exit of people at a specific place.

- Smart Home Integration

- Biometric Authentication

FUTURE SCOPE:

CONCLUSION:

So, In this project we have learnt about the Arduino based automatic door opening system in detail with the information about PIR Sensors.

THANK YOU!