: Motion-Based Automatic Door Opener

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Introduction or Abstract

In a world where technology continues to redefine convenience, this innovative solution stands at the forefront, revolutionizing the way we interact with physical spaces .

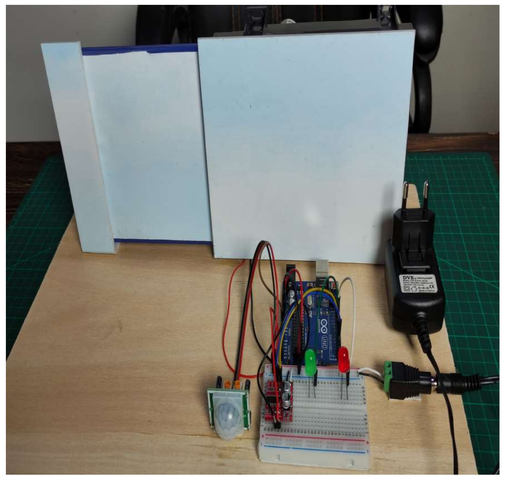
The project aims to develop a motion-based automatic door opener system, utilizing sensor technology to detect human movement and trigger the door-opening mechanism. The system is designed to enhance accessibility and convenience in various environments, such as homes, offices, and public spaces. The Motion-Based Automatic Door Opener transcends traditional access systems, offering a touchless and intelligent approach to entry, ensuring not only convenience but also prioritizing hygiene and accessibility . This cutting-edge device revolutionizes traditional door-opening mechanisms by seamlessly integrating motion-sensing.

OBJECTIVES

The objectives of an automatic door sensor are rooted in enhancing convenience, efficiency, and accessibility across various environments. These intelligent sensors are designed with several key goals in mind:

1. **Convenience:** The primary objective of automatic door sensors is to provide a hands-free and effortless experience for users. By detecting the presence or motion of individuals, these sensors eliminate the need for manual interaction with doors, streamlining entry and exit processes in public spaces, commercial buildings, and residences.

2. **Energy Efficiency:** Automatic door sensors contribute to energy conservation by minimizing the time doors are left open. The sensors ensure that doors remain closed when not in use, preventing unnecessary heating or cooling losses and promoting energy efficiency in buildings .



Materials

- PIR sensors or ultrasonic sensors
- Arduino microcontroller and programming tools
- Door-opening mechanism
- Power supply components
- Door for testing and experimentation
- Wires
- Power Supply
- Servo Motor
- Jumper wires

Software:

1. Arduino Compiler
2. Arduino Code

Method - :

1. Assemble the Hardware

Connect the PIR sensor to the Arduino board using jumper wires. Typically, PIR sensors have three pins: VCC, GND, and OUT. Connect VCC to 5V on Arduino, GND to GND, and OUT to a digital pin .Connect the servo motor or DC motor with the motor driver to the Arduino. If using a servo motor, connect it to a PWM pin Ensure all connections are secure and the components are powered appropriately

2. Write the Arduino Code:

Develop the Arduino code to read data from the PIR sensor and control the motor accordingly.

3. Upload the Code to Arduino:

Connect the Arduino board to your computer and upload the code using the Arduino IDE.

4. Test the Automatic Door Opener:

Power up the Arduino and test the system with the motion sensor. Ensure that the door opens when motion is detected and closes after a specified duration of inactivity.

5. Fine-Tuning:

Adjust the code and hardware components as needed for your specific application. This may include modifying the angles of the servo motor or adjusting delays for optimal performance.

Remember to follow safety precautions, especially if dealing with a physical door. Additionally, consider adding features such as safety sensors to prevent accidents.

RESULT

Creating an automatic door opener using the Arduino code provided earlier will result in a functional system that responds to motion detected by a PIR sensor, automatically opening and closing a door using a servo motor. Here's what you can expect from the model:

Result -:

Motion Detection: The PIR sensor will actively monitor its surroundings for any detected motion within its range.

LED Indicator: The onboard LED serves as a visual indicator, illuminating when motion is detected and turning off when the area is clear.

Door Operation:

Upon detecting motion, the servo motor will be activated, causing the door to open smoothly.

The door will remain open for a predefined duration (in this example, 5 seconds), providing enough time for a person to pass through.

Automatic Door Closing:

If no motion is detected during the specified delay, the door will automatically close to its initial position.

Serial Monitor Feedback: The Arduino code includes serial print statements that provide feedback in the Serial Monitor. This information can be helpful for debugging and monitoring the system's behavior.

Testing:

Thoroughly test the automatic door opener in different scenarios to ensure its reliability and responsiveness to motion. if applicable, test the system with a physical door to validate its practical functionality

CONCLUSIONS

In conclusion, the automatic door opener represents a significant advancement in both convenience and accessibility. The integration of motion-sensing technology with Arduino-based control systems has resulted in a functional and practical solution for various environments

Enhanced Convenience: The primary goal of automatic door openers is to enhance convenience by eliminating the need for manual interaction with doors. Users can effortlessly enter and exit spaces, promoting a seamless and efficient experience

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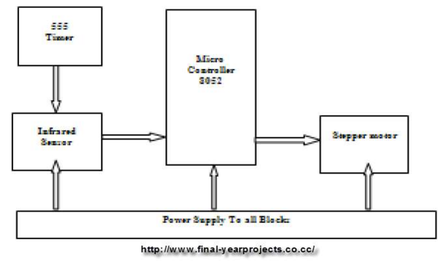

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