SMART GATE WITH AUTOMATED LIGHT

Overview

A smart gate system with automated lighting integrates a servo motor, ultrasonic sensor, infrared (IR) sensor, and LED lights to enhance security and convenience. The ultrasonic sensor detects the proximity of vehicles or people approaching the gate, triggering the servo motor to automatically open or close the gate. The IR sensor plays a crucial role in controlling the lighting, activating LEDs when motion is detected, ensuring the area is illuminated when needed. This system provides a seamless and efficient way to manage access and lighting, improving both security and energy efficiency.

Components Required:

- CH32V003x Board (VSD Squadron Mini RISCV Board)
- Ultrasonic Sensor
- Servo Motor
- IR Sensor
- LED Light
- Breadboard
- Jumper Cables

Circuit Connection

To set up the circuit based on the provided details, start by connecting the **Servo Motor** to the **CH32V003x** microcontroller, where the **VCC** pin of the servo is connected to the **5V** pin of the microcontroller, and the **GND** pin of the servo goes to the **GND** of the microcontroller. The **Control** pin of the servo is connected to **PD1** on the microcontroller to send control signals. For the **Ultrasonic Sensor**, connect the **VCC** pin to the **3.3V** pin on the microcontroller and the **GND** pin to **GND**. The **Trigger** pin is connected to **PD4**, and the **Echo** pin to **PD3** on the microcontroller for distance measurement. The **IR Sensor** is powered with **3.3V** from the microcontroller's **VCC**, and its **GND** is connected to the microcontroller's **GND**.

The **Control** pin of the IR sensor is connected to **PD5** to receive motion detection signals. For the **LED**, connect the **Anode** (positive) to **PD6** on the microcontroller and the **Cathode** (negative) to **GND**. Ensure all components share a common ground (**GND**) with the microcontroller. The circuit is now set up to control the servo motor, ultrasonic sensor, IR sensor, and LED based on the sensor inputs.

Pinout Diagram for an obstacle avoiding car

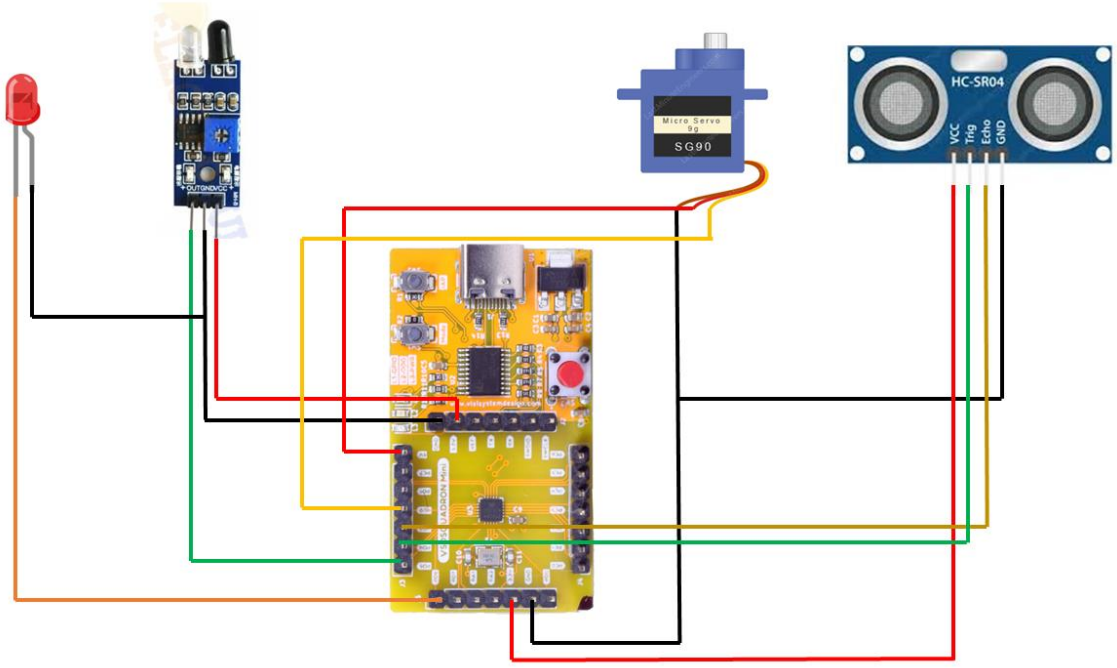

Table for Pin connection:

Servo Motor - 1	CH32V003x
VCC	5V
GND	GND
Control	PD1

Ultrasonic Sensor	CH32V003x
VCC	3.3V
GND	GND
Trigger	PD4
Echo	PD3

IR Sensor	CH32V003x
VCC	3.3V
GND	GND
Control	PD5

LED	CH32V003x
Anode	PD6
Cathode	GND