SMART PRAKING SYSEM

Overview

The objective of a smart parking system is to enhance the efficiency and convenience of parking management by utilizing advanced technologies such as sensors, real-time data analytics, and mobile applications. This system aims to optimize the use of available parking spaces, reduce congestion, and minimize the time drivers spend searching for parking. By providing real-time information about space availability, automated payment options, and smart navigation, the system seeks to improve the overall parking experience while reducing environmental impact and increasing urban mobility efficiency.

Components Required to build a Smart Railway Toll System:

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

Circuit Connection for a Smart Railway Toll System

In the smart parking system, the circuit connects various components, each performing a specific function for efficient parking management. The IR sensor is connected to the IR_SENSOR_PIN (GPIO_Pin_5) on the VSD Squadron mini RISC-V board. This sensor detects the presence of a vehicle in the parking spot by emitting infrared light, which is reflected back to the sensor, signaling occupancy. The LED is connected to the LED_PIN (GPIO_Pin_6), which indicates the status of the parking space: it will light up green when the spot is available and red when it is occupied, providing a visual indication to the driver. The ultrasonic sensor is interfaced with TRIGGER_PIN (GPIO_Pin_4) and ECHO_PIN (GPIO_Pin_3), where the trigger pin sends a pulse to measure the distance to the vehicle or obstacle,

and the echo pin captures the reflected pulse, allowing the system to determine if a parking space is taken or vacant.

Additionally, a servo motor is connected to SERVO_PWM_PIN (GPIO_Pin_2), enabling automated parking space access control, such as moving a physical barrier or gate based on space availability. The servo motor adjusts to either open or close the parking space entrance when triggered by the system's logic, allowing cars to park or leave. The VSD Squadron mini-RISC-V board is used to process inputs from the IR sensor and ultrasonic sensor, control the LED status, and operate the servo motor, all based on real-time data. Through proper circuit design and software integration, this system can automate the parking process and enhance the efficiency of managing parking spaces.

Pinout Diagram for an obstacle avoiding car

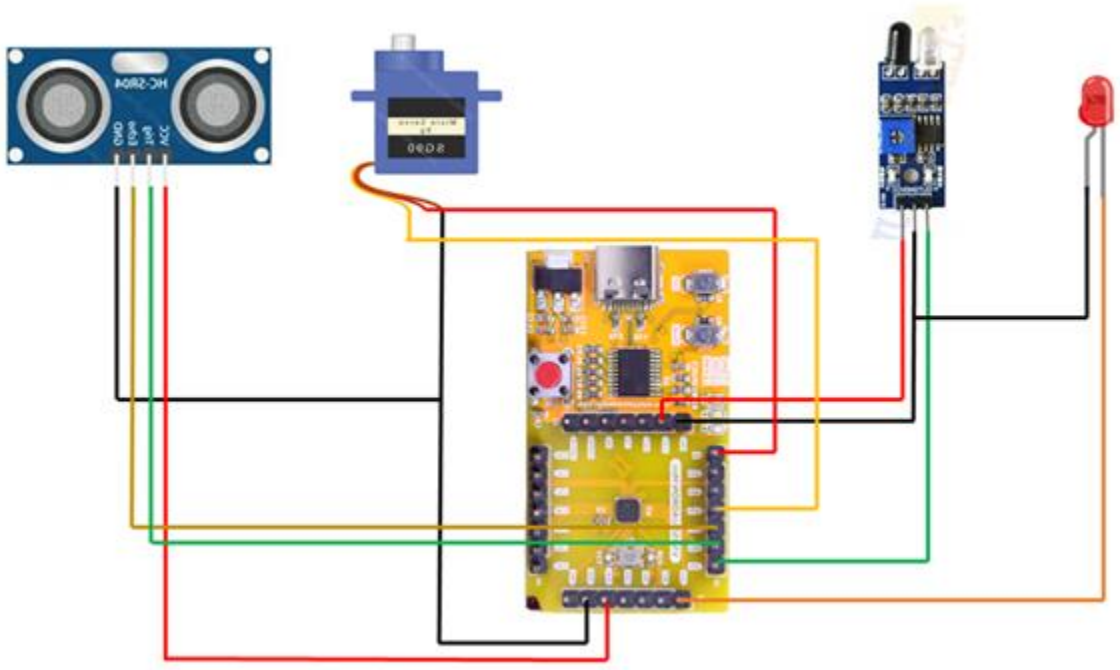

Table for Pin connection:

Servo Motor - 1	CH32V003x
VCC	5V
GND	GND
Control	PD2

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