

UITs

**UNIVERSITY OF INFORMATION
TECHNOLOGY AND SCIENCES**

**Internet of Things Lab
CSE 402**

Project Report

“ Automatic Car Parking Toll Gate System”

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Introduction:

The Automatic Car Parking Toll Gate System aims to streamline the process of vehicle entry and exit in parking facilities. By automating toll collection, vehicle identification, and payment processing, the system reduces human intervention, minimizes errors, and enhances operational efficiency. This report outlines the design, implementation, and evaluation of the system.

Objectives:.

- Create user-friendly interfaces for drivers and administrators.
- Establish a robust database and reporting tools.
- Ensure the system is secure and compliant with data protection regulations.
- Optimize the system to handle high traffic volumes efficiently.
- Ensure the system can be scaled and adapted for future needs.
- Optimize implementation and maintenance costs.
- Ensure the system meets all relevant regulations.
- Conduct thorough testing to validate system performance.
- Develop a deployment plan and provide necessary training.

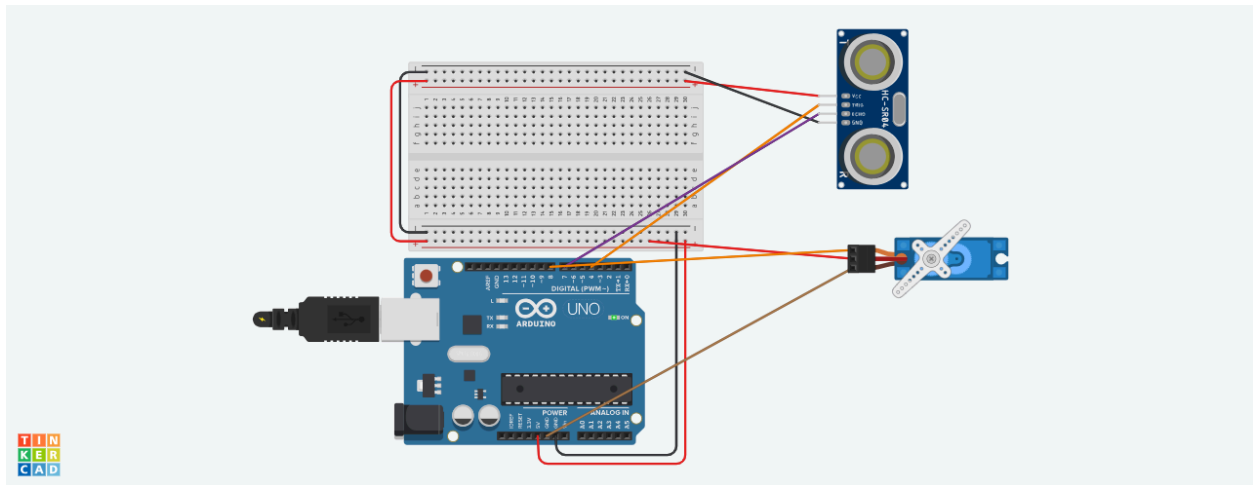
Features:

The gate automatically opens when a vehicle approaches and closes after the vehicle passes, ensuring smooth and efficient traffic flow. Detect the presence of a vehicle at the entry and exit points. Ultrasonic sensors can measure the distance to the vehicle, ensuring accurate detection and reducing false positives.

Required component:

1. Arduino
2. UltraSonic sensor
3. Servo Motor
4. Breadboard
5. Wires

Circuit diagram/Simulated diagram:



Working Procedure : In this I have implemented an automatic tollgate system. Detecting the car using an ultrasonic sensor the arduino gives instructions to the servo motor to raise the toll gate.

In this project, the servo motor will start rotating to a position when an object is detected within 50 cm of the ultrasonic sensor. It will continue to rotate as long as the object remains within that range. Once the object moves out of the range (beyond 50 cm), the servo motor will stop rotating.

Here's what happens step by step:

1. The Arduino initializes, setting up serial communication, pin modes, and attaches the servo motor.
2. The Arduino continuously reads the distance from the ultrasonic sensor.
3. If an object is detected within 50 cm of the sensor and the servo motor is not already running (based on the objectDetected flag), the servo motor starts rotating to a position.
4. If the object remains within 50 cm, the servo motor continues to rotate.
5. Once the object moves out of the 50 cm range and the servo motor is running (based on the objectDetected flag), the servo motor stops rotating.

Components Used:

1. Arduino
2. UltraSonic Sensor
3. Servo Motor
4. Breadboard

Discussion:

In this project, we have implemented an automatic tollgate system. Detecting the car using an ultrasonic sensor the arduino gives instructions to the servo motor to raise the toll gate.

Conclusion:

The Automatic Car Parking Toll Gate System offers significant improvements in efficiency, accuracy, and user satisfaction compared to traditional methods. With robust security measures and regulatory compliance, the system ensures the privacy and protection of user data. The system can be adapted for future needs and technological advancements.