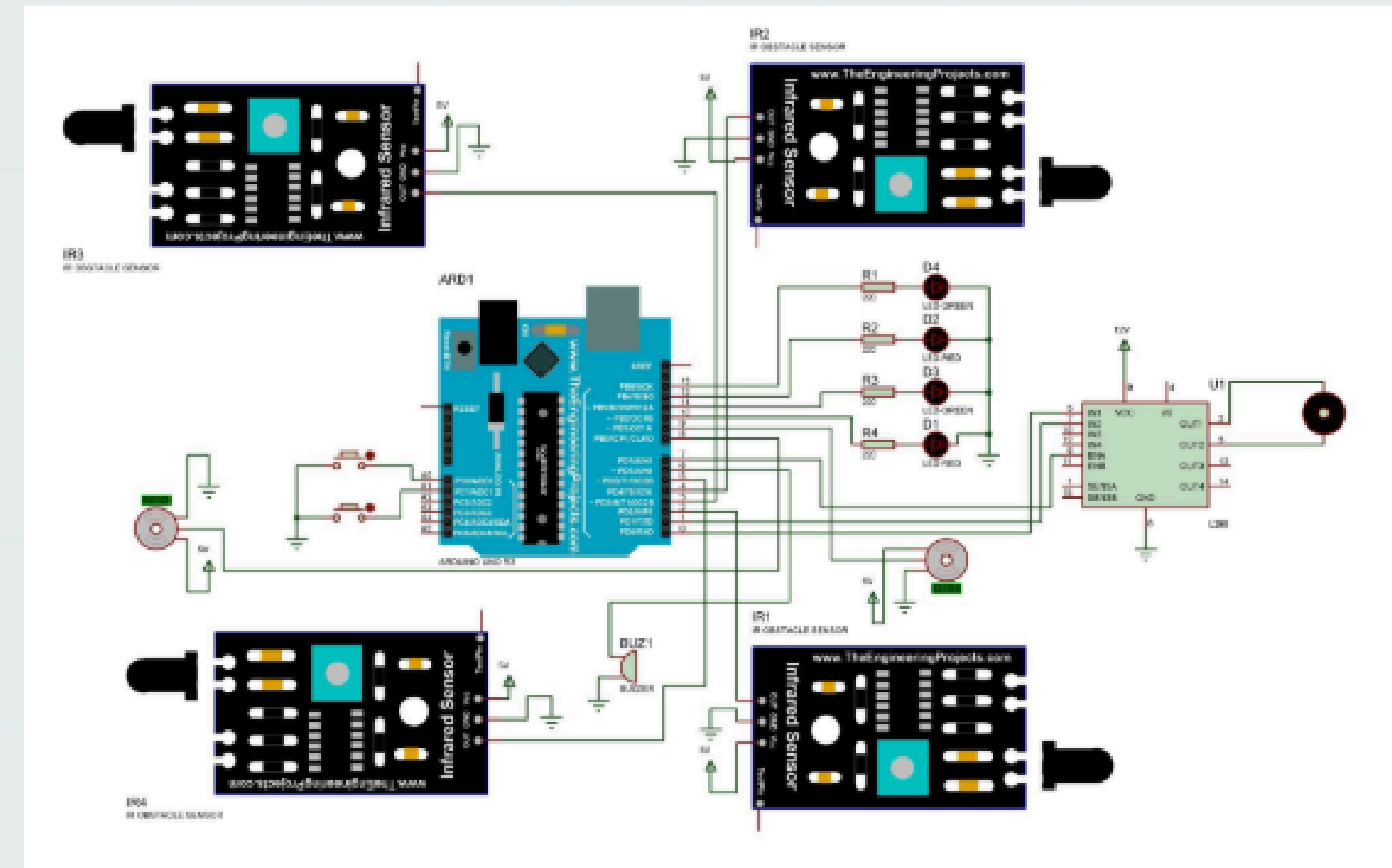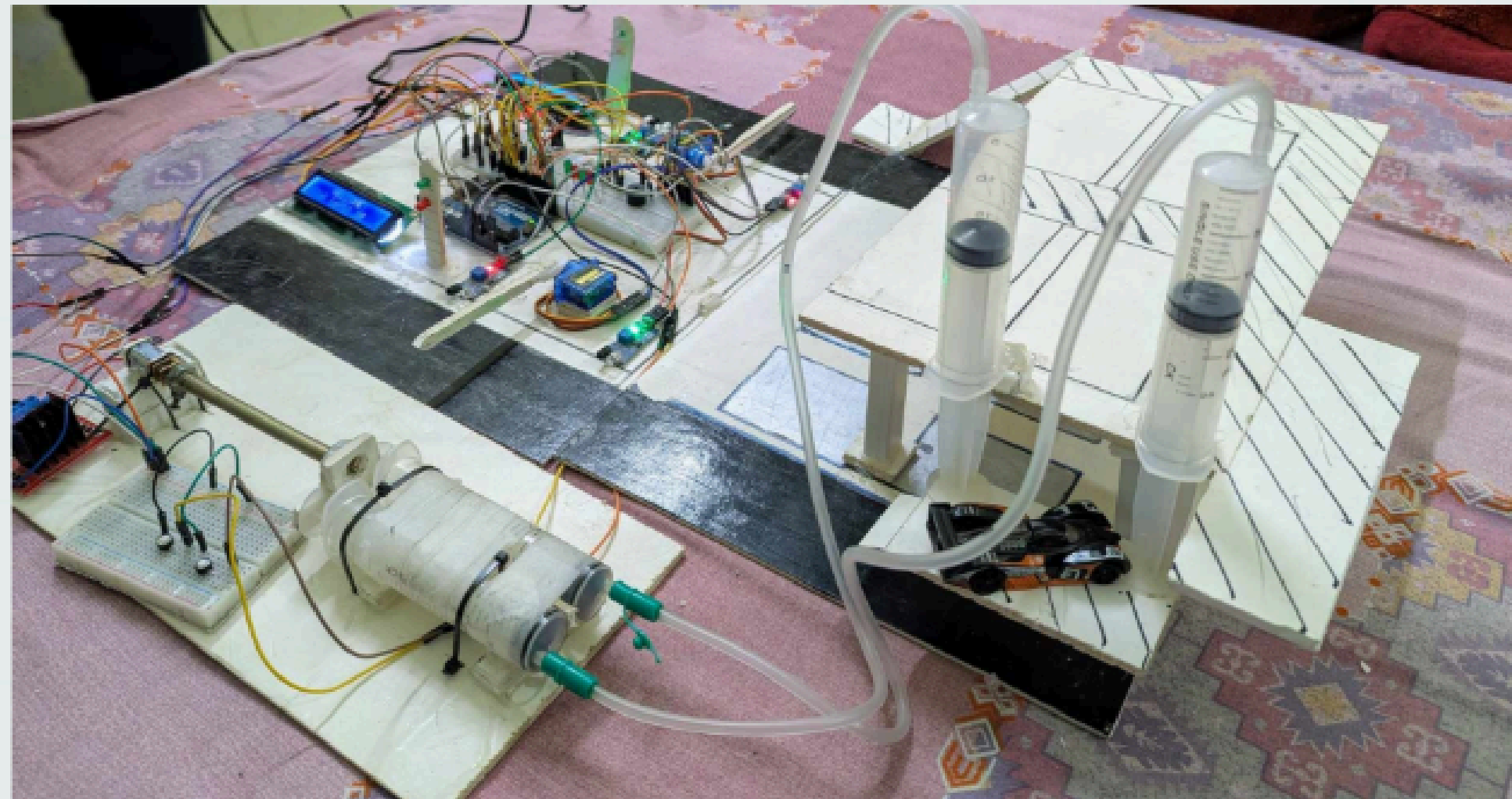# AUTOMATED CAR PARKING MANAGEMENT SYSTEM

A comprehensive report on our advanced automated car parking project developed in CSE461 course, utilizing cutting-edge technology.
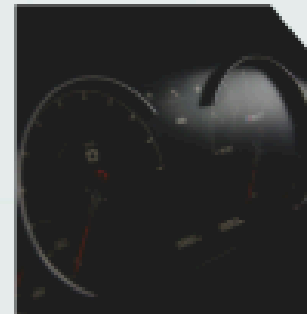
PROJECT OVERVIEW

An advanced automated car parking & management system developed for CSE461 by a team of 5 people.

SYSTEM COMPONENTS

Overview of the essential components utilized for car entry and exit management


DISPLAYS

The system utilizes 2 displays to provide visual feedback and information regarding the car entry and exit process. These displays can show status updates, alerts, and operational instructions to enhance user interaction.
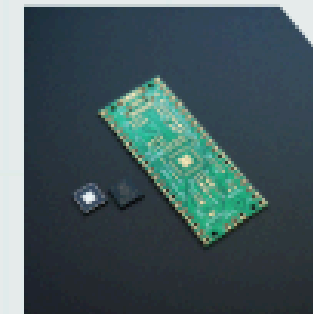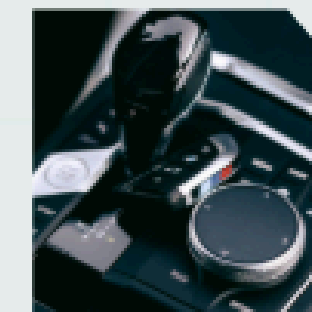

IR SENSORS

Four IR sensors are integrated into the system to accurately detect the presence of vehicles. These sensors play a crucial role in ensuring that the system responds promptly to car movements, enhancing safety and efficiency during entry and exit.
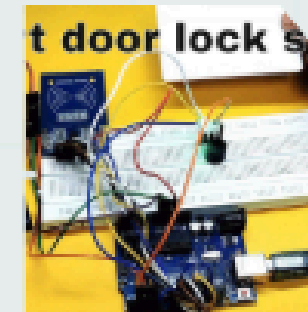
SERVO MOTORS

The system is equipped with 2 servo motors that control the physical mechanisms involved in car entry and exit. These motors enable precise movement, allowing gates or barriers to open and close smoothly based on the sensor inputs.

### INTEGRATION OF COMPONENTS

The combination of displays, IR sensors, and servo motors forms a cohesive system that automates and manages the car entry and exit process. This integration ensures that the system operates efficiently, providing a seamless experience for users.

Cost Breakdown

Items	Price (tk)
Transformer, Power Cable, Rectifier	290
Cardboards & Syringes (big)	530
DC gear motor, 9V Regulator, IR sensor	270
Arduino, Servos, IRs, LCDs	2060
Syringes + Tubes (Small)	220
Soldering Iron, Lead, Anticutter	330
Glue Gun, Stick, Pillar	435
Push Buttons + Wires	50
L298N Motor Driver	160
Anticutter + SuperGlue	100
Welding+Screw nut	80
Total	4525

ENTRY MECHANISM

Understanding the Mechanism of Car Entry
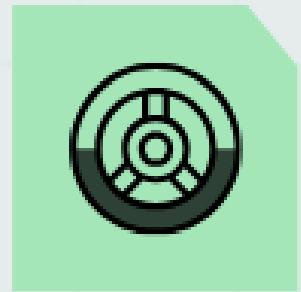
CAR APPROACHING GATE

A visual representation of the car approaching the entrance gate, indicating the beginning of the entry process.
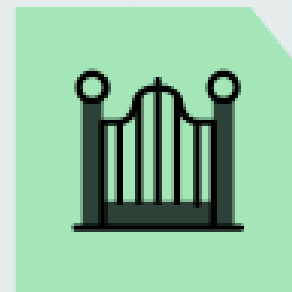
SERVO ACTION

The servo mechanism detects the car's presence and activates to open the gate, allowing entry.

IR SENSOR ACTIVATION

Once the car has entered, the IR sensor triggers to confirm the entry of the vehicle.

INCREMENTING CAR COUNT

The system increases the car count by one each time a vehicle successfully passes the IR sensor.

EXIT MECHANISM

Understanding the Process of Vehicle Exits

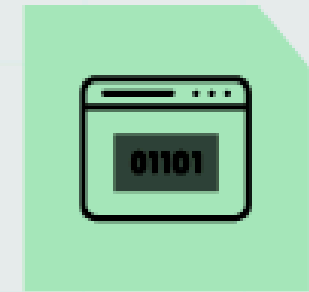### 01 PROCESS FOR EXIT INVOLVES DECREASING CAR COUNT.

The exit mechanism functions similarly to the entry process, but in reverse. As vehicles exit the facility, the overall car count is systematically reduced. This process is crucial for maintaining accurate tracking of the available parking spaces and ensuring efficiency in space management.

02 IMPORTANCE OF ACCURATE CAR COUNT.

Maintaining an accurate car count is vital for operational efficiency. It helps in monitoring the parking space availability, allowing for better management and planning of resources. An accurate count ensures that users can find parking without unnecessary delays.

03 SYSTEMATIC APPROACH TO EXITS.

The process of managing exits should be systematic and organized. This could involve automated systems that register the exit of vehicles, ensuring that the car count updates in real-time, thereby enhancing operational efficiency.

04 IMPACT ON OVERALL PARKING MANAGEMENT.

Effective exit mechanisms have a direct impact on overall parking management. By efficiently managing exits, facilities can optimize space usage, reduce congestion, and enhance user satisfaction.

PNEUMATIC LIFT SYSTEM

An Efficient and User-Friendly Solution for Vertical Transport

MANAGEMENT BY GEAR MOTOR

The pneumatic lift system is efficiently managed by a gear motor, which ensures smooth and reliable operation. The gear motor controls the lift's movement, providing precise adjustments to its height based on user input.

USER-FRIENDLY OPERATION

The operation of the lift is designed to be user-friendly. Upon entering the lift, users can easily initiate the lift's movement by pressing buttons, making the experience intuitive for individuals of all ages.

LIFT ASCENDING MECHANISM

To ascend, users simply press the designated button, which activates the lift's pneumatic system, enabling it to rise smoothly to the desired floor. This feature ensures a hassle-free experience for users.

LIFT DESCENDING MECHANISM

For descending, another button is provided, allowing users to lower the lift with ease. This dual-button system enhances safety and convenience, ensuring that users can control their lift journey effectively.

CAR CAPACITY

The maximum capacity of the car is 10, ensuring safe and efficient transport for users.

The maximum capacity of the lift is 1, ensuring safe and efficient transport for users.

SYSTEM FUNCTIONALITY

Automating Car Parking and Management

AUTOMATION OF CAR PARKING

The system streamlines the car parking process by automating various tasks that traditionally required manual intervention, thereby reducing human error and improving efficiency.

EFFICIENT MANAGEMENT

Efficient management of parking spaces is achieved through smart algorithms that monitor availability, allowing for optimal use of space and reducing congestion.

USER-FRIENDLY INTERFACE

The system features a user-friendly interface that facilitates easy navigation for users, making it accessible for individuals with varying levels of technical expertise.

REAL-TIME UPDATES

Real-time updates on parking availability enable users to make informed decisions, saving time and enhancing their overall experience.

INTEGRATION OF COMPONENTS

The system integrates various components, including sensors and software, to create a cohesive solution that addresses the complexities of car parking management.

PROJECT TEAM

Meet the dedicated team behind our successful project

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Description of a primary heading

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CONCLUSION

Innovations in Parking Technology

SIGNIFICANT ADVANCEMENTS IN TECHNOLOGY

01 The introduction of advanced automated car parking systems showcases the rapid development in technology, particularly in the field of robotics, enhancing efficiency and user experience.

AUTOMATION IN CAR PARKING SYSTEMS

02 Automation in car parking not only streamlines the process but also reduces the need for human intervention, leading to lower operational costs and increased safety.

ROLE OF ROBOTICS IN MODERN SOLUTIONS

03 Robotics plays a crucial role in modern automated parking solutions, offering innovative methods for vehicle retrieval and parking, thereby revolutionizing urban mobility.

ENHANCED USER EXPERIENCE

04 The automated car parking management system significantly improves the user experience by providing quick and convenient parking options, minimizing the time spent searching for available spaces.

ENVIRONMENTAL IMPACT

05 The implementation of automated parking systems can lead to a reduction in carbon emissions by optimizing space usage and decreasing the time cars spend idling in search of parking.