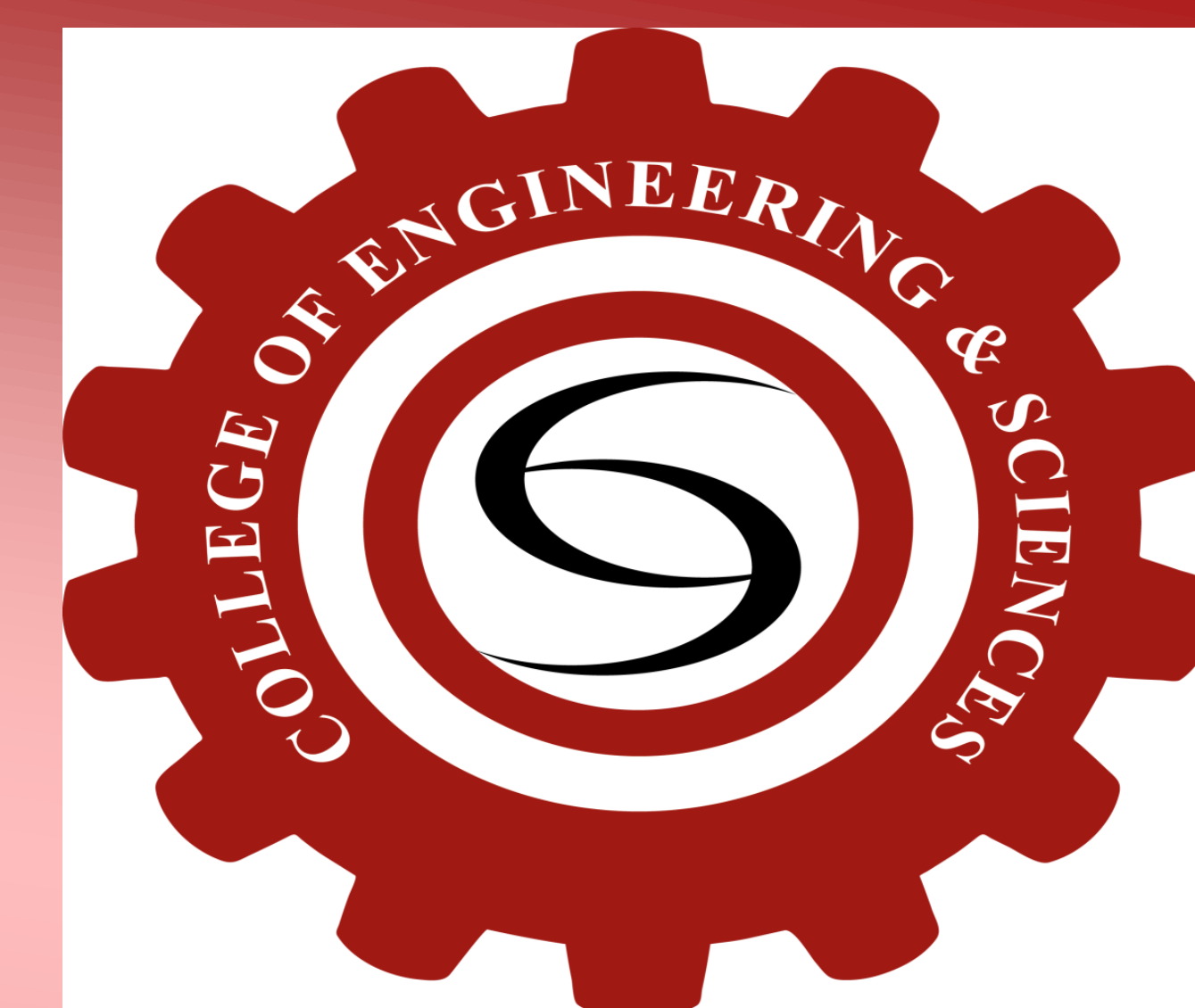# ELECTRICAL ENGINEERING DEPARTMENT
COLLEGE OF ENGINEERING AND SCIENCES
FINAL YEAR PROJECT

SUPERVISOR:
DR. IRFANULLAH KHAN

PROJECT:
RFID BASED SMART PARKING AND PAYMENT CHARGING SYSTEM

GROUP MEMBERS:
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ABSTRACT

❖ Finding a parking space has become extremely challenging due to the current situation.

❖ The proposed system, smart parking system (SPS), determines parking spot availability and provides real-time information.

❖ Addition of a new functionality: installation of cameras at the main entrance for security purposes.

❖ Cameras can scan the number plate of the car.

❖ Notify the driver if the car is not parked correctly.

❖ Objective: Ensure cars are parked correctly and reduce traffic congestion.

❖ Parking area divided into two sections: authorized parking and unauthorized parking.

INTRODUCTION

❖ The increasing number of people and their own cars has made it really hard to find parking spaces. To solve this problem, the Smart Parking System (SPS) was created.

❖ The SPS helps find available parking spots quickly and cameras are being installed at the main entrance, these cameras scan number plates. Drivers are notified if they parked incorrectly. This helps to reduce traffic congestion by encouraging proper parking.

❖ The parking area is divided into authorized and unauthorized sections for better organization. Drivers can conveniently pay for parking using their cards or a mobile app connected to the SPS.

❖ The goal of the SPS is to improve parking management and provide a smooth and secure experience for drivers.

PROBLEM STATEMENT

❖ Addressing the challenge of finding parking spots by providing real-time information on available spaces.

❖ Addressing the problem of improper parking that result in inefficient utilization of parking space, and inconvenience for other drivers.

❖ Implementing measures such as sensors to identify and notify drivers about incorrect parking, promoting better utilization of parking areas.

❖ Simplifying the payment process by offering convenient options such as smartphone-based payments.

PROJECT COMPONENTS

❖ **Hardware:**

❖**DC Motors:** DC motors are used for controlling barriers because they provide good speed control and torque, which is useful for precise control.

❖**Camera:** The camera captures a car's number plate, which is then checked against a database of authorized vehicles. If there's a match, the gate opens; if not, it stays closed.

❖**Arduino UNO:** An Arduino can be used to control a servo motor, which can be used to control the position of the barriers using a PWM pin.

❖**Raspberry Pi:** A Raspberry Pi can be used to make a smart parking system. It can tell if a car is there, control the gates, and talk to other parts of the system like sensors and displays.

❖**RFID Transmitter & Receiver:** RFID system communicates using a transmitter and receiver. The transmitter sends a signal to the tag, which responds with data that is interpreted by the receiver.

CIRCUIT DIAGRAM
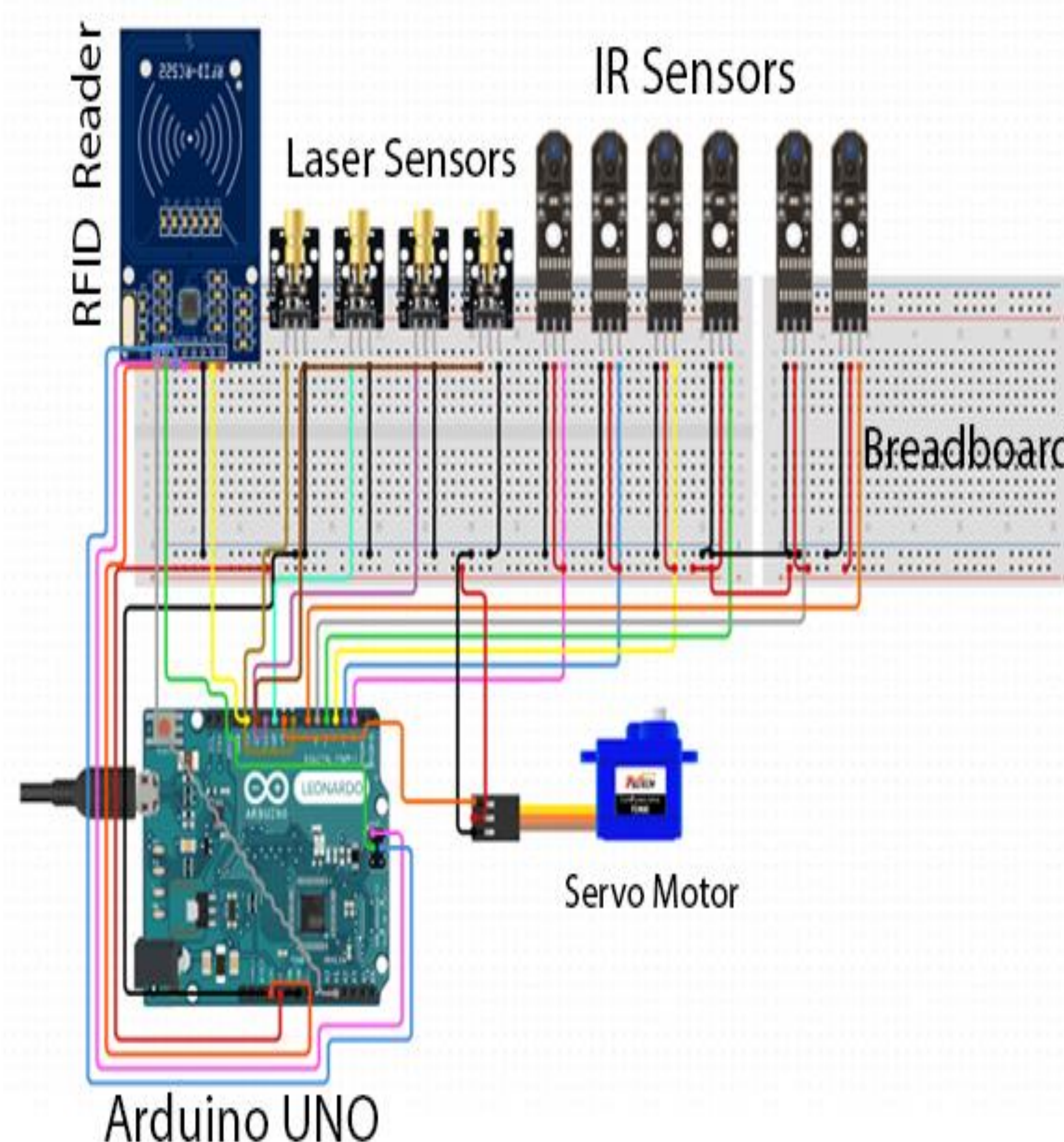
IMPACT & RESULTS (SDGS, CEPS)

❖ CEP: The smart parking system demonstrates a strong understanding of engineering principles.

❖ Internet of Things (IoT), Image Processing, Cloud Computing, Artificial Intelligence (AI).

❖ CEP: Advanced analytical techniques are applied in the smart parking system.

❖ Build inclusive, resilient infrastructure for sustainable economic development and universal access.

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