Project Report -II
Fundamentals of Automation Engineering

Title of project:

Sensor Based Toll Gate System

Name of Students:

Yearagra Paliwal

(2020BTechCSE087)

Submitted To:

Dr. Hanuman Prasad Agarwal

Dr. Devika Kataria

Institute of Engineering and Technology (IET)

JK Lakshmipat University Jaipur

15th July, 2021

CERTIFICATE

This is to certify that the project work entitled "Interface sensors and actuators on MSP430 to make useful applications." submitted by Yearagra Paliwal (2020BTechCSE087) towards the partial fulfilment of the requirements for the degree of Bachelor of Technology in Computer Science Engineering of JK Lakshmipat University, Jaipur is the record of work carried out by them under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted.

Dr. Devika Kataria

Associate Professor

Department of Electrical and Electronics Engineering

Institute of Engineering & Technology (IET)

JK Lakshmipat University Jaipur

Dr. Hanuman Prasad Agrawal

Assistant Professor

Department of Electrical and Electronics Engineering

Institute of Engineering & Technology (IET)
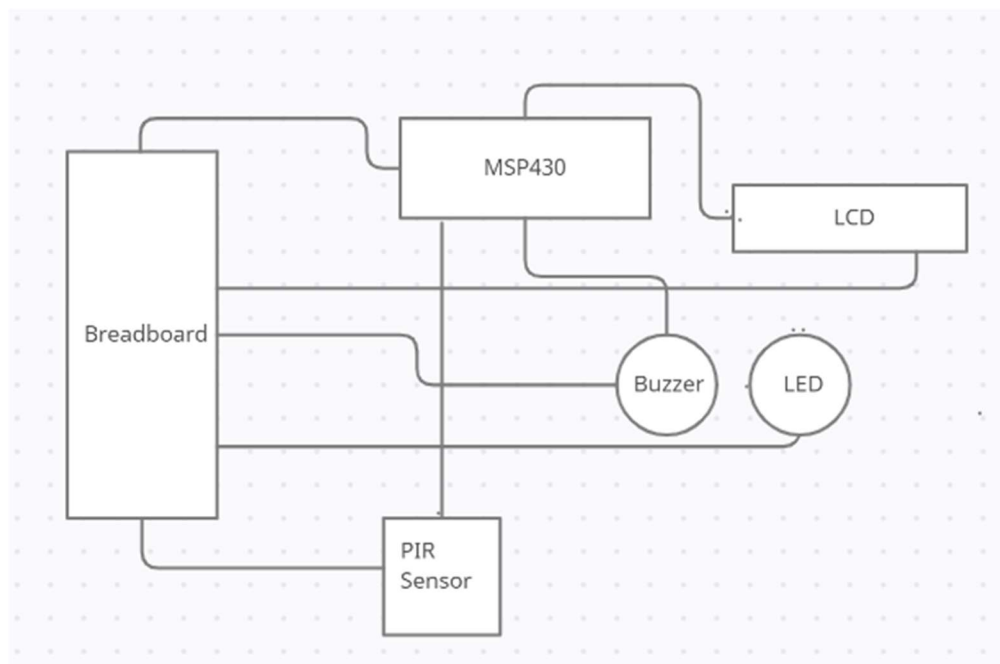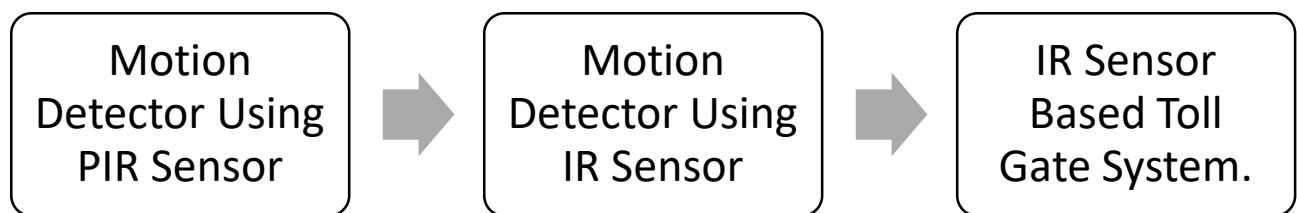
JK Lakshmipat University Jaipur

ACKNOWLEDGEMENT

It is great pleasure for us to undertake this project. We feel highly grateful doing the project entitled – "Sensor Based Toll Gate System". We would like to express our deepest appreciation to all those who provided us the possibility to complete this project. We express our deep sense of grateful to our project guide Dr. Devika Kataria and Dr. Hanuman Prasad Agarwal and also our vice chancellor designate Dr. Dheeraj Sanghi, Director IET- Dr. Sanjay Goel. This project would not have completed without their enormous help and worthy experience. Whenever we were in need, they were there behind us. Although this report has been prepared with utmost care and deep routed interest. Even then we accept respondent and imperfection.
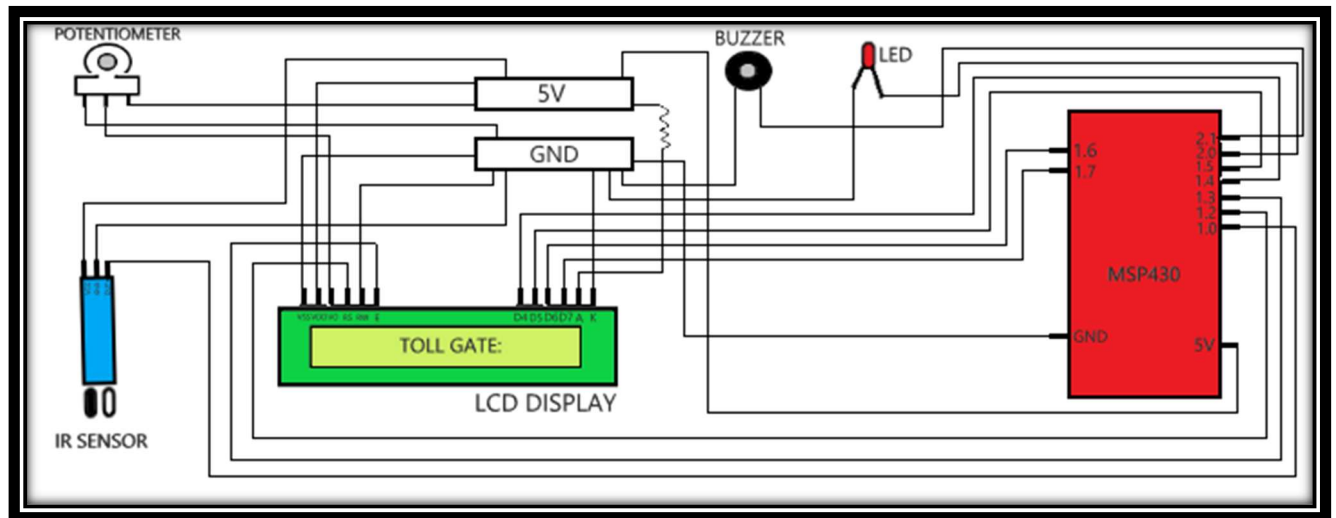
Problem statement/ Ideation:

Movement recognition is a fundamental piece of safety frameworks and IP sensor is quite possibly the most ordinarily utilized sensor for trigging the alerts when movement is recognized. This sensor can recognize car developments effectively by detecting the IR beams transmitted by them. We recently utilized IP sensor to fabricate different sort of alerts and security frameworks.
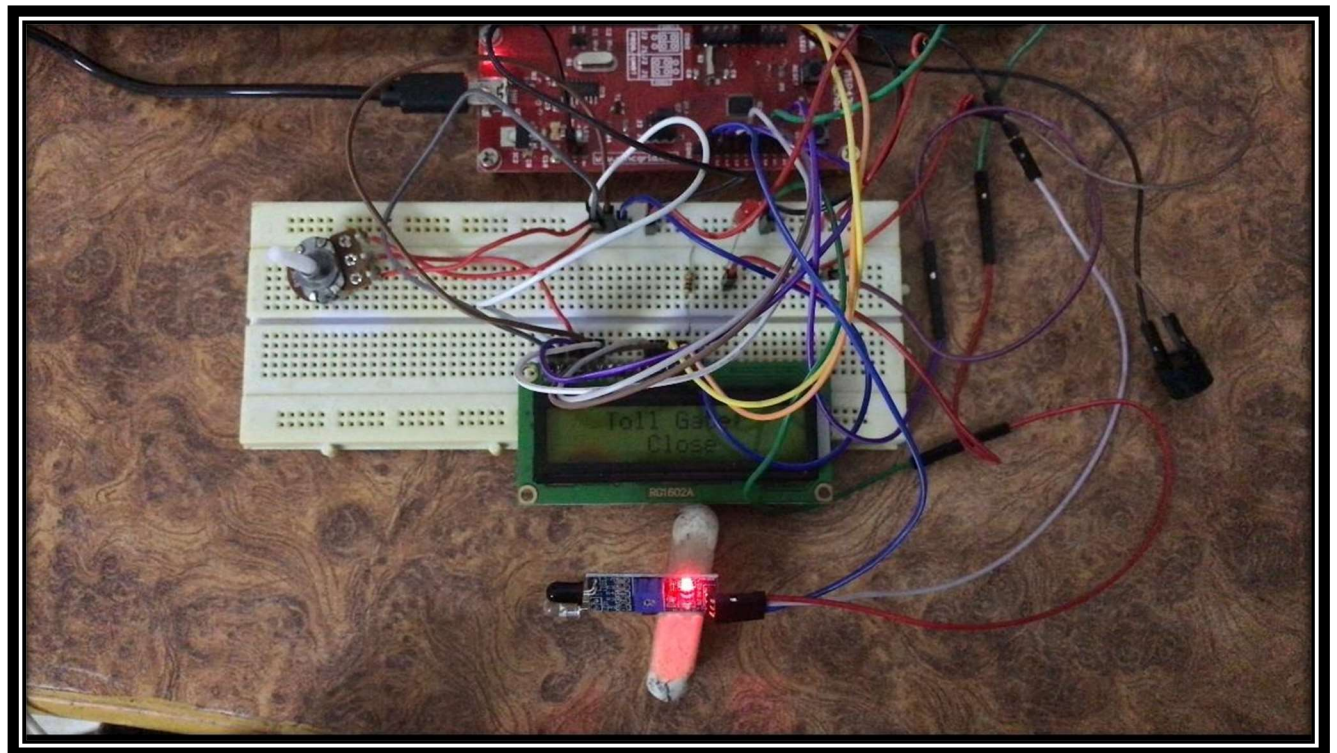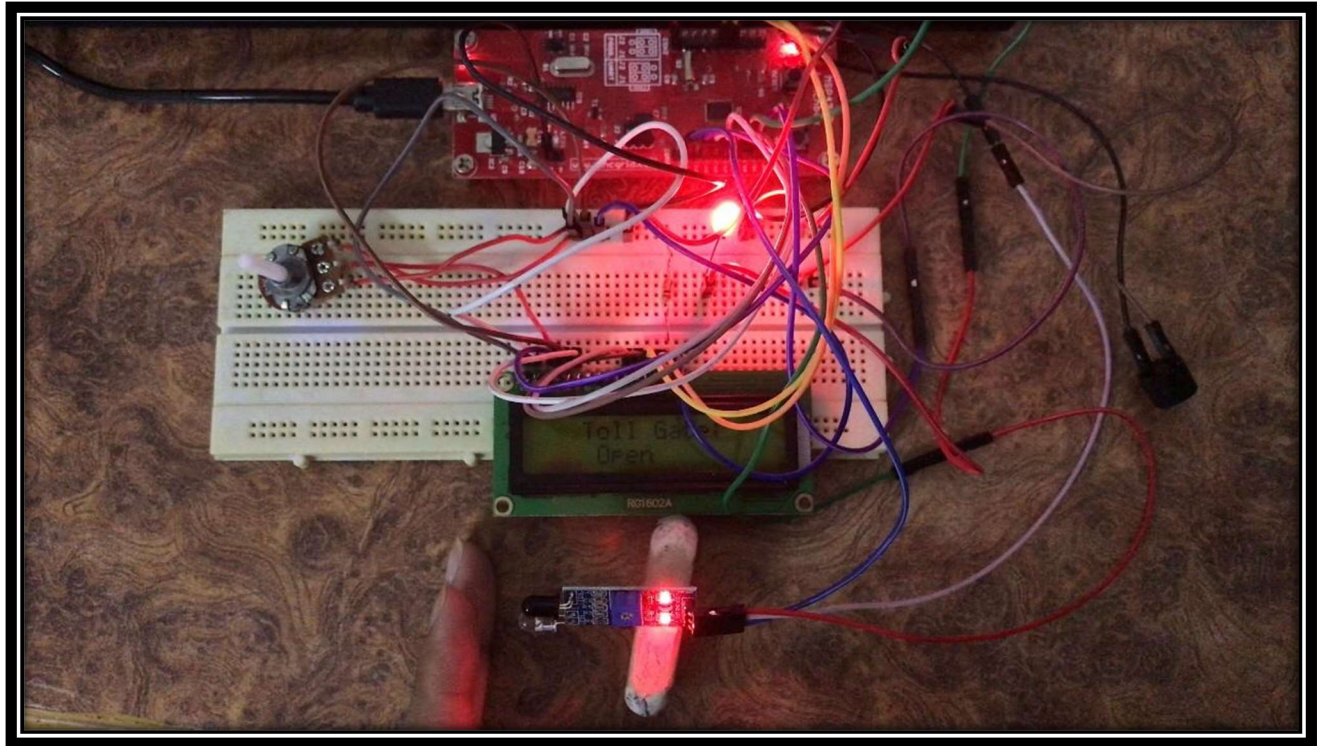
Methodology/Flowchart:

Motion Detector Using PIR Sensor → Motion Detector Using IR Sensor → IR Sensor Based Toll Gate System.

Schematic Diagram:

Photograph Of Project:

Program Code:

```c
#include <msp430.h>
#include <inttypes.h>
#include<stdio.h>

#define CMD          0
#define DATA         1

#define LCD_OUT      P1OUT
#define LCD_DIR      P1DIR
#define D4           BIT4
#define D5           BIT5
#define D6           BIT6
#define D7           BIT7
#define RS           BIT2
#define EN           BIT3
#define SW           BIT0

void delay(uint16_t t)
{
    uint16_t i;
    for(i=t; i > 0; i--)
        __delay_cycles(100);
}

void pulseEN(void)
```

```
{
    LCD_OUT |= EN;
    delay(1);
    LCD_OUT &= ~EN;
    delay(1);
}

void lcd_write(uint8_t value, uint8_t mode)
{
    if(mode == CMD)
        LCD_OUT &= ~RS;
    else
        LCD_OUT |= RS;

    LCD_OUT = ((LCD_OUT & 0x0F) | (value & 0xF0));
    pulseEN();
    delay(1);

    LCD_OUT = ((LCD_OUT & 0x0F) | ((value << 4) & 0xF0));
    pulseEN();
    delay(1);
}

void lcd_print(char *s)
{
    while(*s)
    {
        lcd_write(*s, DATA);
        s++;
    }
}

void lcd_setCursor(uint8_t row, uint8_t col)
{
    const uint8_t row_offsets[] = { 0x00, 0x40};
    lcd_write(0x80 | (col + row_offsets[row]), CMD);
    delay(1);
}

void lcd_init()
{
    LCD_DIR |= (D4+D5+D6+D7+RS+EN);
    LCD_OUT &= ~(D4+D5+D6+D7+RS+EN);

    delay(150);
    lcd_write(0x33, CMD);
    delay(50);
    lcd_write(0x32, CMD);
    delay(1);

    lcd_write(0x28, CMD);
    delay(1);

    lcd_write(0x0C, CMD);
    delay(1);
```

```c
        lcd_write(0x01, CMD);
        delay(20);

        lcd_write(0x06, CMD);
        delay(1);

        lcd_setCursor(0,0);
}

void main(void) {
        WDTCTL = WDTPW | WDTHOLD;

        lcd_init();

        P2DIR |= BIT3;
        P1DIR &= ~SW;

        P2DIR |= 0x01;
        P2DIR |= 0x02;

        while(1)
        {
            if(!(P1IN & SW))
            {
                delay(2000);
                lcd_write(0x01, CMD);
                delay(20);
                lcd_setCursor(0,3);
                lcd_print("Toll Gate:");
                lcd_setCursor(1,4);
                lcd_print("Open");
                P2OUT |= 0x01;
                P2OUT |= 0x02;
                delay(2000);
            }
            else{
                delay(2000);
                lcd_write(0x01, CMD);
                delay(20);
                lcd_setCursor(0,3);
                lcd_print("Toll Gate:");
                lcd_setCursor(3,6);
                lcd_print("Close");
                P2OUT &= ~0x01;
                P2OUT &= ~0x02;
                delay(2000);
            }
        }
}
```

Results:

When a car came in contact with the IR sensor then the led will light up and buzzer will be make buzz sound and the lcd screen will show that the toll gate is open and when the car loose the contact it will go on it initial position that is toll gate is close and led and buzzer will be stop.

In retriggering or H mode, the yield remains high as long as the movement is happening. Furthermore, in non-retriggering or I mode, the yield remains high then, at that point turns low after the trigger time and this interaction proceeds insofar as movement is proceeded. Most applications use H mode and we're additionally going to utilize this mode as it were. The IR sensor deals with 5V to 12V force supply. Be that as it may, it can likewise be fueled by 3.3V pins of the MSP430.

THANK YOU