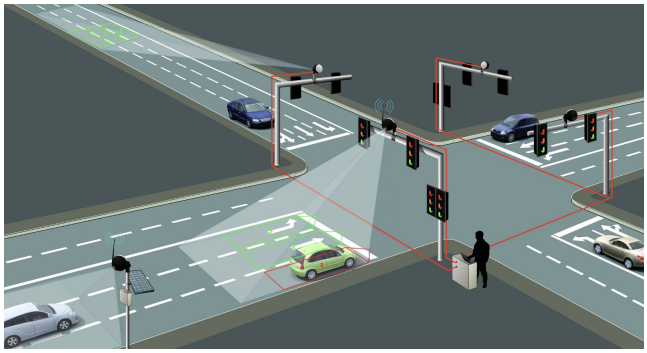
Dept. of Computer Science & Engineering
University of Barishal

Project Report



Topic: Road Crossing Assistive System (Traffic Light) for Enhanced Road Safety
[Specially for Visually Impaired Person]

Course Title: Peripheral and Interfacing Lab
Course Code: CSE-3208

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Introduction

Road safety is a critical concern for everyone, and visually impaired individuals face unique challenges when crossing roads. To address this issue and enhance road safety for both visually impaired and general pedestrians, we have designed a "Road Crossing Assistive System" that utilizes a traffic light system.

Project Overview

This project involves the use of an Arduino microcontroller, LEDs, and a breadboard to create a traffic light system that provides guidance for pedestrians when crossing the road. The system detects the state of traffic lights and signals when it's safe to cross.

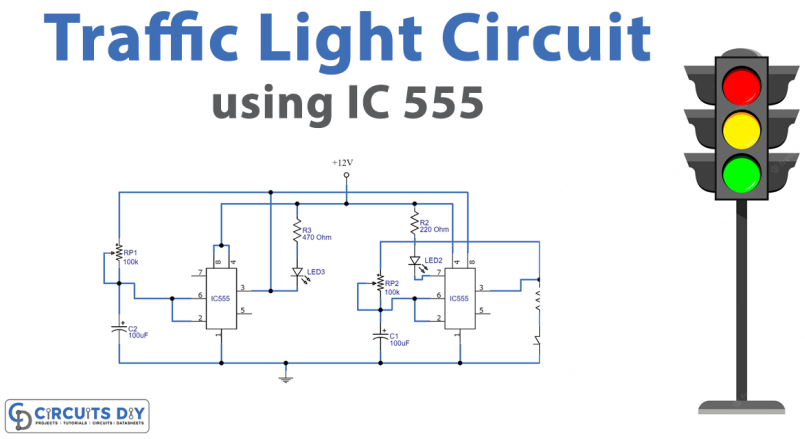
Components Used

- 3 LEDs (Red, Yellow, Green)
- Jumper wires
- Resistors
- Breadboard
- Arduino Uno
- Buzzer

System Architecture

The system comprises three LEDs mounted on a breadboard, each representing a traffic light: Red (Stop), Yellow (Prepare), and Green (Go). A buzzer is used to provide audio feedback to the user.

Circuit Diagram



Code Implementation

Arduino code is used to control the LEDs and buzzers. It defines the behavior of the traffic light system, including timing and feedback to pedestrians.

```
// Pin definitions
const int redPin = 2;     // Red LED connected to digital pin 2
const int yellowPin = 3;  // Yellow LED connected to digital pin 3
const int greenPin = 4;   // Green LED connected to digital pin 4
const int buzzerPin = 5;  // Buzzer connected to digital pin 5

void setup() {
  pinMode(redPin, OUTPUT);
  pinMode(yellowPin, OUTPUT);
  pinMode(greenPin, OUTPUT);
  pinMode(buzzerPin, OUTPUT);
}

void loop() {
  // Red - Stop
  digitalWrite(redPin, HIGH);
  digitalWrite(yellowPin, LOW);
  digitalWrite(greenPin, LOW);
  buzzBuzzer(500); // Buzz for 500 milliseconds
  delay(2000);     // Stay red for 2 seconds

  // Yellow - Prepare
  digitalWrite(redPin, LOW);
  digitalWrite(yellowPin, HIGH);
  digitalWrite(greenPin, LOW);
  buzzBuzzer(200); // Buzz for 200 milliseconds
  delay(1000);     // Stay yellow for 1 second

  // Green - Go
  digitalWrite(redPin, LOW);
  digitalWrite(yellowPin, LOW);
  digitalWrite(greenPin, HIGH);
  buzzBuzzer(0);   // No buzzer sound
  delay(2000);     // Stay green for 2 seconds
```

```
}

void buzzBuzzer(int duration) {
  tone(buzzerPin, 1000, duration); // 1000Hz sound for 'duration'
milliseconds
  delay(duration + 50);           // Add a small delay for smoother
transitions
}
```

Working Principle

- The Arduino microcontroller continuously monitors the traffic light state.
- When the traffic light changes, the corresponding LED lights up, and the buzzer produces sound feedback.
- Both visually impaired and general pedestrians can detect the status of the traffic light through sound and visual feedback.

Conclusion

The Road Crossing Assistive System has been successfully implemented to enhance road safety for both visually impaired and general pedestrians. This project demonstrates how technology can improve road safety and accessibility for all members of the community.

Future Enhancements

The project can be further improved with the following enhancements:

- Integration with sensors for detecting the presence of vehicles.
- Voice-based instructions for enhanced user guidance.
- Smartphone app for remote control and status monitoring.
- Real-world testing and feedback from pedestrians for refinement.