사각지대 사고율을 줄이기 위한 안전기술

Safety technique to reduce accident rates in blind spots.

졸업논문 최종발표

20192412 임호균

Department of Automotive ICT Engineering

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1. 주제 소개

선릉역 오토바이, 덤프트럭과 충돌 후... 끔찍한 그날의 사고

백소정 안전기자 | 입력 2021.08.30 08:57 | 수정 2021.08.30 11:40 | 댓글 0

지난 26일 발생한 선릉역 오토바이 사고
오토바이 운전자 두고 갑론을박 벌어져
민주노총 노조측... "배달 오토바이 공제조합 설립하겠다"

Google 제휴

화물차 사각지대가 무서운 이유...광안대교 전복 사고 아찔 [아차車]

홍민성 기자

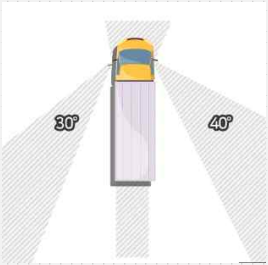
입력 2022.02.10 17:13 수정 2022.02.10 17:13

가가

바로 옆 승용차 있는데 차선 바꾼 화물차
날벼락 맞은 승용차...그대로 튕겨 나가

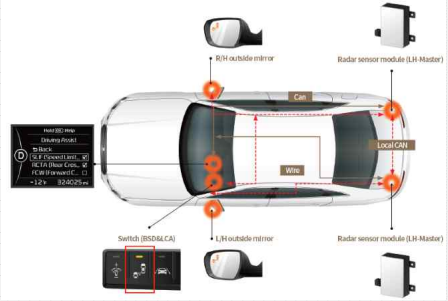
"우회전 시 취약"...제주 화물차량 '사각지대' 사고 위험 '갑절'

양경익 기자 | 입력 2022.04.26 16:09 | 댓글 0



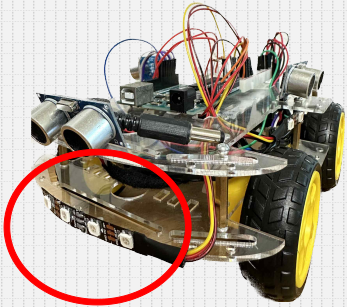
출처 한국교통안전공단

1. 주제 소개



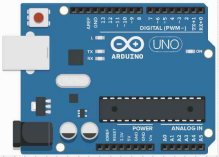
출처 현대 모비스

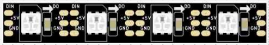
- 기존 사각지대 경보장치.

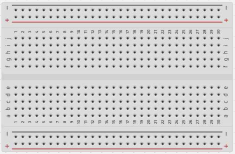


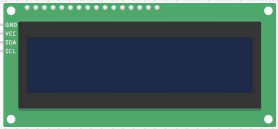
- 초음파센서(HC-SR04) 이용한 사각지대 경보장치.
  - ABSD(All Blind spot detection)

2. 사용 부품



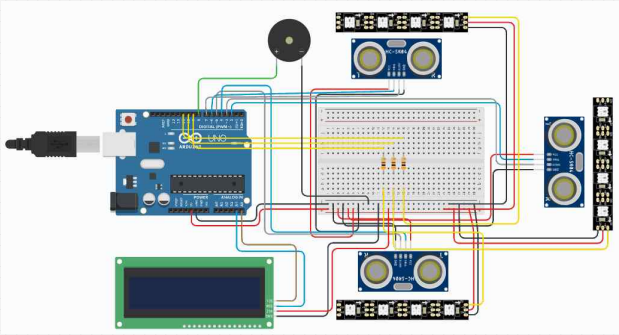


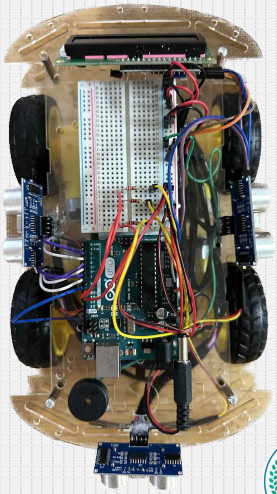




- 아두이노 UNO
- 브레드보드
- LCD 1602*2(I2C)
- NeoPixel
- 초음파센서
- 수동부저
- 320Ω 저항

3. 하드웨어





4. 코드

```
#include <Wire.h>
#include <hd44780.h>
#include <hd44780ioClass/hd44780_I2Cexp.h>
#include <Adafruit_NeoPixel.h>

int NUMPIXELS1 = 4;
int PIXELPIN1 = 9;
int NUMPIXELS2 = 4;
int PIXELPIN2 = 10;
int NUMPIXELS3 = 4;
int PIXELPIN3 = 11;

int trigPin1 = 2;
int echoPin1 = 3;
int trigPin2 = 4;
int echoPin2 = 5;
int trigPin3 = 6;
int echoPin3 = 7;

int tonePin = 8;
int freq = 600;
int dur1 = 300, dur2 = 300;

long duration1, distance1;
long duration2, distance2;
long duration3, distance3;
long duration4, distance4;
```

```
Adafruit_NeoPixel pixels1(NUMPIXELS1, PIXELPIN1, NEO_GRB + NEO_KHZ800);
Adafruit_NeoPixel pixels2(NUMPIXELS2, PIXELPIN2, NEO_GRB + NEO_KHZ800);
Adafruit_NeoPixel pixels3(NUMPIXELS3, PIXELPIN3, NEO_GRB + NEO_KHZ800);

hd44780_I2Cexp lcd;

void setup() {
  lcd.begin(16, 2);
  pixels1.begin();
  pixels2.begin();
  pixels3.begin();
  pinMode(trigPin1, OUTPUT);
  pinMode(echoPin1, INPUT);
  pinMode(trigPin2, OUTPUT);
  pinMode(echoPin2, INPUT);
  pinMode(trigPin3, OUTPUT);
  pinMode(echoPin3, INPUT);
  Serial.begin(9600);
}
```

4. 코드

```
void loop() {
  //-----------------------------------1(정면)
  digitalWrite(trigPin1, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin1, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin1, LOW);
  duration1 = pulseIn(echoPin1, HIGH);
  distance1= duration1*0.034/2;

    if (distance1 < 10) {
    for(int i=0; i<NUMPIXELS1; i++){
    pixels1.setPixelColor(i, 255, 0, 0);
    }
    pixels1.show();
    delay(100);

    tone(tonePin, freq, dur1);
    delay(dur2);
    noTone(tonePin);
    lcd.clear();
    lcd.setCursor(5,0);
    lcd.print("Front");
    lcd.setCursor(4,1);
    lcd.print("Warning!");
    delay(1);
  }
```

```
else if (distance1 <20){
  for(int i=0; i<NUMPIXELS1; i++){
  pixels1.setPixelColor(i, 0, 255, 0);
  }
  pixels1.show();
  delay(100);

}
else if (distance1 < 30){
  for(int i=0; i<NUMPIXELS1; i++){
  pixels1.setPixelColor(i, 0, 0, 255);
  }
  pixels1.show();
  delay(100);

}
else{
for(int i=0; i<NUMPIXELS1; i++){
  pixels1.setPixelColor(i, 0, 0, 0);
  }
  pixels1.show();
  delay(100);
  lcd.clear();
}
```

```
if (distance1 >= 500 || distance1 <= 0){
  Serial.println("Out of range");
}
else {
  Serial.print ( "Sensor1 : ");
  Serial.print ( distance1);
  Serial.println("cm");

}
delay(20);
```

4. 코드

```
//----------------------------------2(우측)
digitalWrite(trigPin2, LOW);
delayMicroseconds(2);
digitalWrite(trigPin2, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin2, LOW);
duration2 = pulseIn(echoPin2, HIGH);
distance2= duration2*0.034/2;

if (distance2 < 10) {
  for(int ii=0; ii<NUMPIXELS2; ii++){
  pixels2.setPixelColor(ii, 255, 0, 0);
  }
  pixels2.show();
  delay(100);

  tone(tonePin, freq, dur1);
  delay(dur2);
  noTone(tonePin);
  lcd.clear();
  lcd.setCursor(3,0);
  lcd.print("RightSide");
  lcd.setCursor(4,1);
  lcd.print("Warning!");
  delay(1);
}
```

```
else if (distance2 <20){
  for(int ii=0; ii<NUMPIXELS2; ii++){
  pixels2.setPixelColor(ii, 0, 255, 0);
  }
  pixels2.show();
  delay(100);
}
else if (distance2 < 30){
  for(int ii=0; ii<NUMPIXELS2; ii++){
  pixels2.setPixelColor(ii, 0, 0, 255);
  }
  pixels2.show();
  delay(100);
}
else{
for(int ii=0; ii<NUMPIXELS1; ii++){
  pixels2.setPixelColor(ii, 0, 0, 0);
  }
  pixels2.show();
  delay(100);
  lcd.clear();
}
```

```
if (distance2 >= 500 || distance2 <= 0){
  Serial.println("Out of range");
}
else {
  Serial.print("Sensor2 : ");
  Serial.print(distance2);
  Serial.println("cm");
}
delay(20);
```

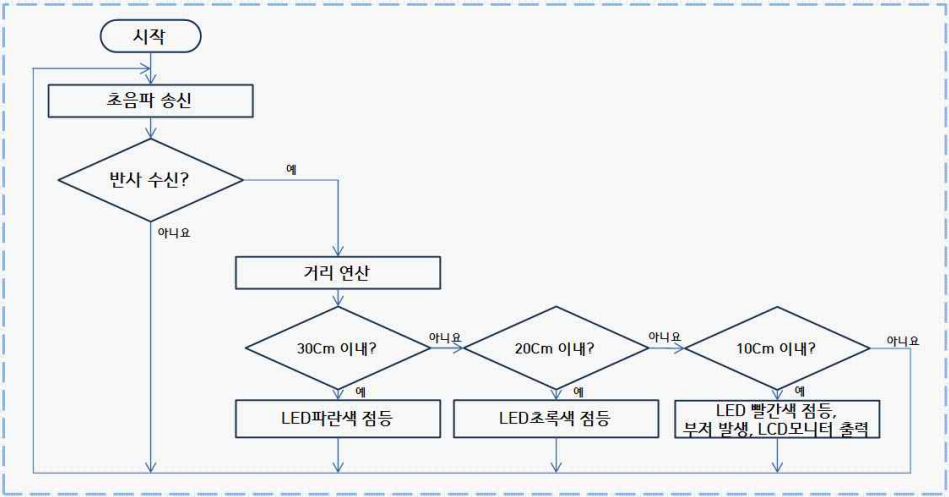
4. 코드

```
//-----------------------------------3(좌측)
digitalWrite(trigPin3, LOW);
delayMicroseconds(2);
digitalWrite(trigPin3, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin3, LOW);
duration3 = pulseIn(echoPin3, HIGH);
distance3= duration3*0.034/2;

if (distance3 < 10) {
  for(int iii=0; iii<NUMPIXELS3; iii++){
  pixels3.setPixelColor(iii, 255, 0, 0);
  }
  pixels3.show();
  delay(100);
  tone(tonePin, freq, dur1);
  delay(dur2);
  noTone(tonePin);
  lcd.clear();
  lcd.setCursor(4,0);
  lcd.print("LeftSide");
  lcd.setCursor(4,1);
  lcd.print("Warning!");
  delay(1);
}
```

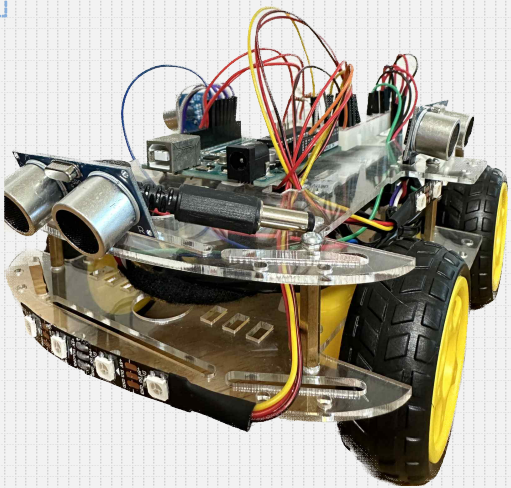
```
else if (distance3 <20){
  for(int iii=0; iii<NUMPIXELS3; iii++){
  pixels3.setPixelColor(iii, 0, 255, 0);
  }
  pixels3.show();
  delay(100);

}
else if (distance3 < 30){
  for(int iii=0; iii<NUMPIXELS3; iii++){
  pixels3.setPixelColor(iii, 0, 0, 255);
  }
  pixels3.show();
  delay(100);

}
else{
for(int iii=0; iii<NUMPIXELS1; iii++){
  pixels3.setPixelColor(iii, 0, 0, 0);
  }
  pixels3.show();
  delay(100);
  lcd.clear();
}
```

```
  if (distance3 >= 500 || distance3 <= 0){
    Serial.println("Out of range");
  }
  else {
    Serial.print("Sensor3 : ");
    Serial.print(distance3);
    Serial.println("cm");
  }
  delay(20);
}
```

4. 코드


시작
초음파 송신
반사 수신?
예
아니요
거리 연산
30Cm 이내?
아니요
20Cm 이내?
아니요
10Cm 이내?
아니요
예
예
예
LED파란색 점등
LED초록색 점등
LED 빨간색 점등,
부저 발생, LCD모니터 출력

5. 결과물



QnA