

Electronic Door Greeter

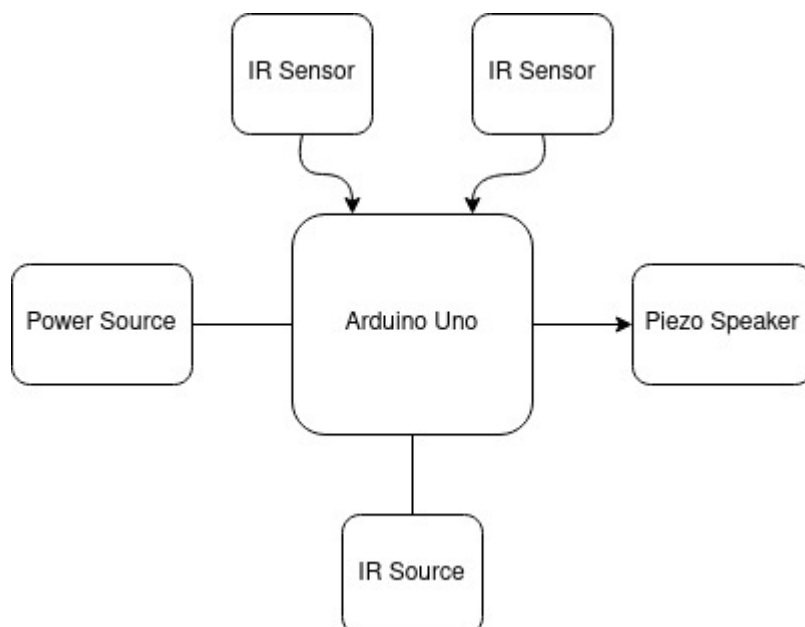
Introduction

A simple device implemented using an Arduino which plays a sound whenever a person enters a room. The device, which is to be positioned at the entrance of a room, utilizes infrared sensors to do this. The device only plays a sound when it detects a person entering.

General Description

The device uses 2 infrared sensors and an infrared emitter to detect movement. The sensors detect the infrared reflection reflecting off an object passing in front of them. The device is able to tell the direction of movement of the object depending on which infrared sensor gets triggered first. A short sound will be played by the use of a passive buzzer only when detecting an entry.

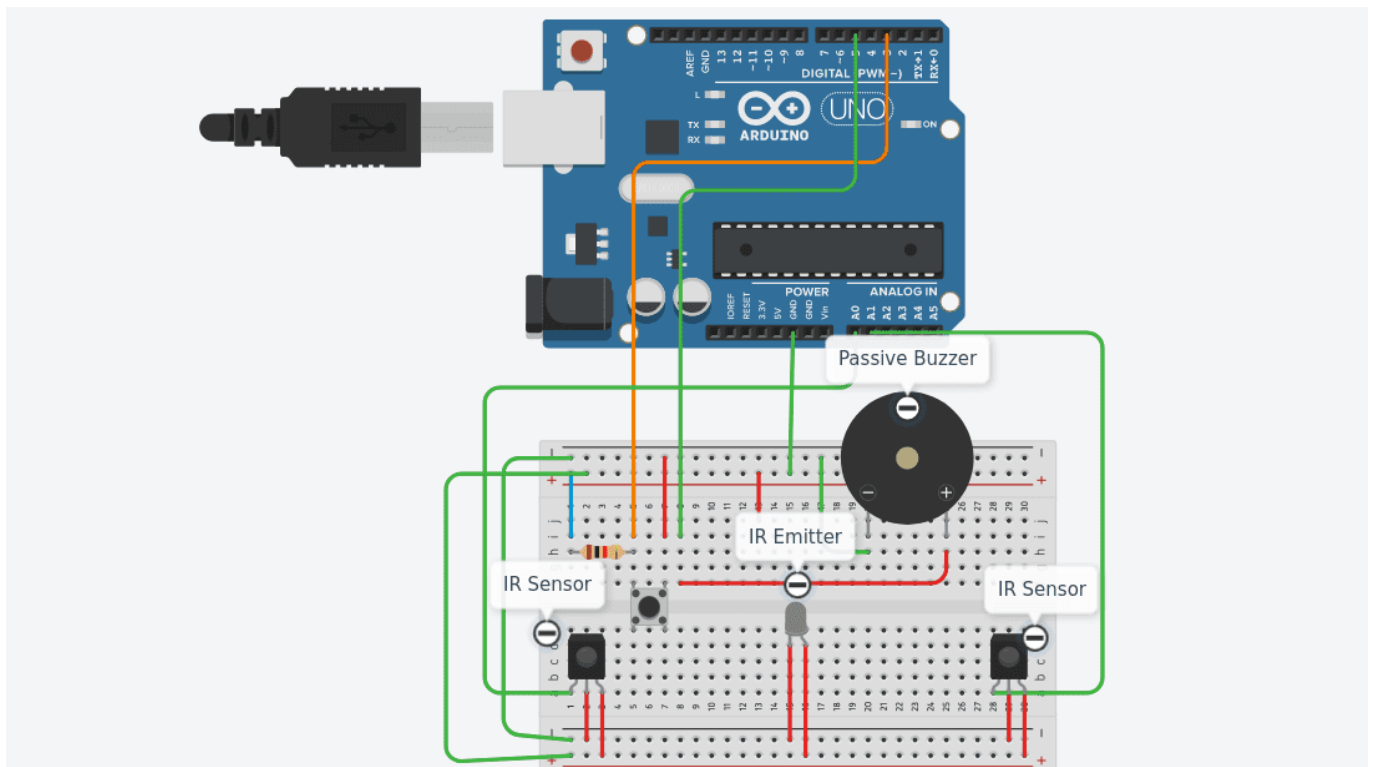
Block Scheme

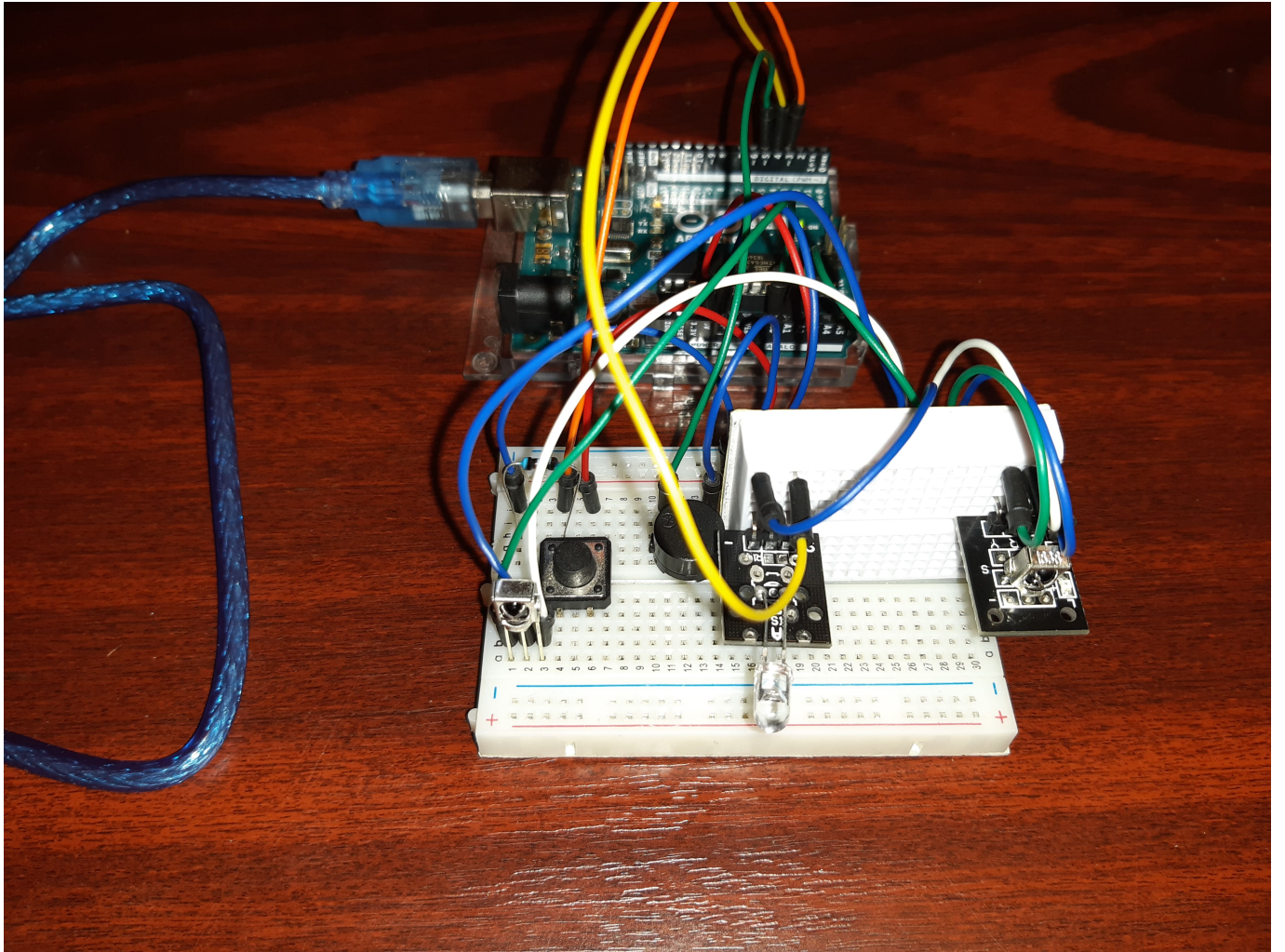


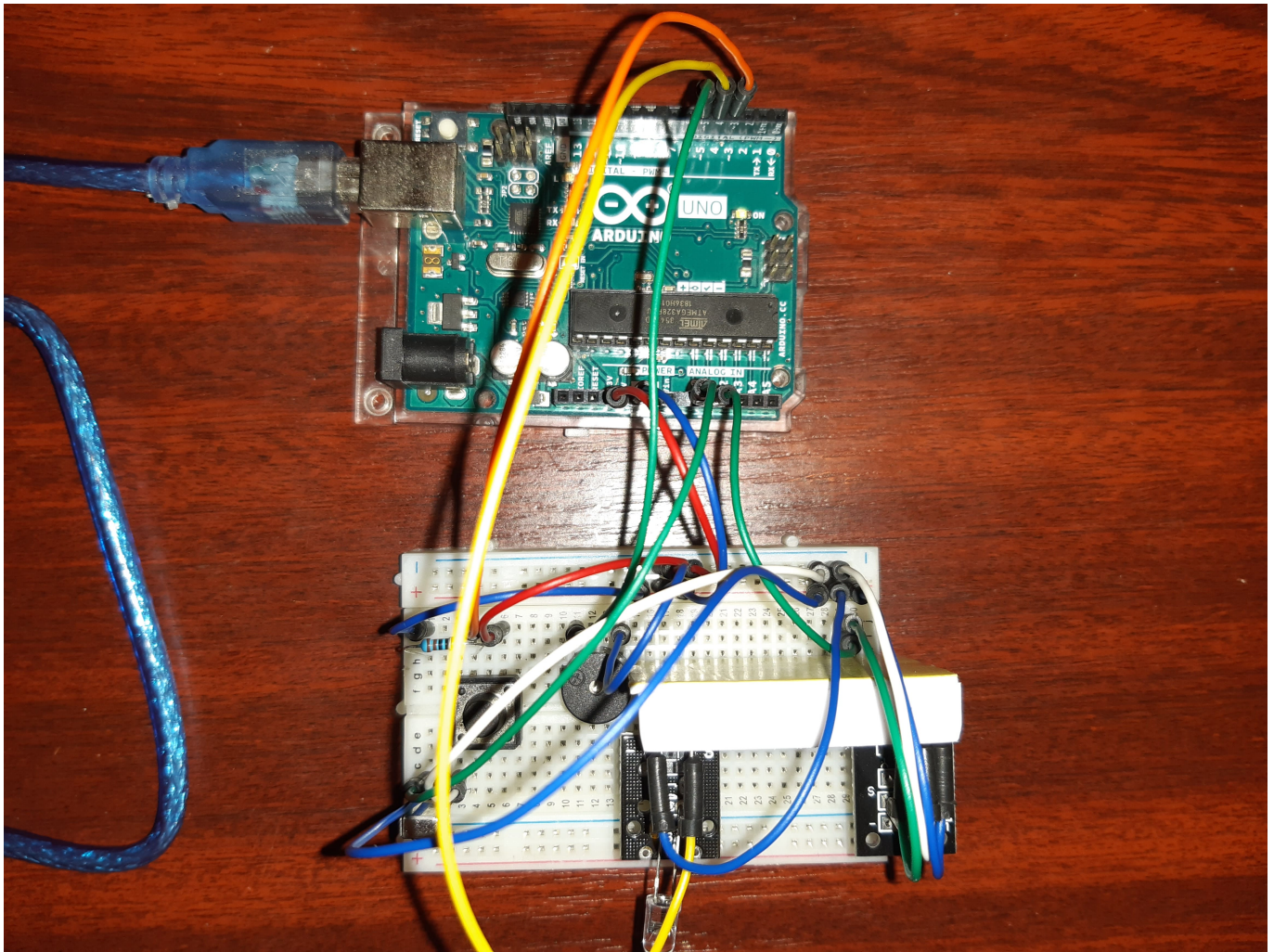
Required Components

- Arduino Uno
- Breadboard
- Wires
- Resistors
- 2 IR sensors
- IR source
- Passive Buzzer
- Button

Hardware Design







Software Design

Notes:

- The software was programmed using Arduino IDE. No additional libraries were used.
- The IR sensors were designed for interpreting signals from remote controls and are thus sensitive mostly only to 38kHz IR signals.
- The `tone()` function was used to generate this frequency for the IR emitter.

[project.ino](#)

```
const int buzzer=5;           //pin 5 is the buzzer output
const int ir_led=4;          //pin 4 is the ir_led output
const int push_button=3;     //pin 3 is the push_button input
volatile byte alarm = LOW;   //alarm state = on or off

int noteArray[] = {740, 587};

void setup(){
  Serial.begin(9600);
```

```
pinMode(buzzer,OUTPUT);      //configure pin 5 as OUTPUT
pinMode(ir_led, OUTPUT);    //configure pin 4 as OUTPUT
//pinMode(push_button,INPUT); //configure pin 3 as INPUT
attachInterrupt(digitalPinToInterrupt(push_button), on_off, RISING);
}

void loop(){
  if (alarm){
    int sensor0=analogRead(A0);
    int sensor1=analogRead(A1);

    Serial.println((String)"sensor0 = " + sensor0);
    Serial.println((String)"sensor1 = " + sensor1);

    if(sensor0 < 1000){
      buzzer_sound(true);
    } else if (sensor1 < 1000) {
      buzzer_sound(false);
    }
  }
}

void on_off(){
  static unsigned long last_interrupt_time = 0;
  unsigned long interrupt_time = millis();
  // if interrupts come faster than 500ms, assume it's a bounce and
  ignore
  if (interrupt_time - last_interrupt_time > 500){
    alarm = !alarm;
    //digitalWrite(ir_led, alarm);
    tone(ir_led, 38000);
  }
  last_interrupt_time = interrupt_time;
}

void buzzer_sound(bool in_out){
  noTone(ir_led);
  delay(100);
  if(in_out){
    for(int i = 0; i < 2; i++){
      tone(buzzer, noteArray[i], 750);
      delay(500);
    }
  } else {
    for(int i = 1; i > -1; i--){
      tone(buzzer, noteArray[i], 750);
      delay(500);
    }
  }
  noTone(buzzer);
}
```

```
tone(ir_led, 38000);  
delay(2500);  
}
```

Video Demonstration

<https://www.youtube.com/watch?v=9Z3g-g3RINs>

Conclusions

This project has taught me a lot about IR technology. For one, I've learned that working with IR was more complex than I anticipated. There's a lot of things that needs to be accounted for when choosing the proper IR component for your project, such as operating range, operating frequency, whether the IR sensor is sensitive to continuous rays or pulses, how the sensor handles noise etc.

Journal

2022/05/27 - Completed Milestone 2

Resources

<https://forum.arduino.cc/t/how-to-create-a-38-khz-pulse-with-arduino-using-timer-or-pwm/100217/>
<https://docs.arduino.cc/>

From:
<http://ocw.cs.pub.ro/courses/> - **CS Open CourseWare**

Permanent link:
<http://ocw.cs.pub.ro/courses/pm/prj2022/agmocanu/electronicdoorgreeter>



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