Sensors and Instrumentation (EPJ)

Project review 3

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Course Name: Sensors and Instrumentation

Course Code : ECE1005

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Smart Street Light using LDR and Ultrasonic sensor

Components required:

- Arduino Uno
- Breadboard
- Ultrasonic Sensor (HC-SR04)
- LDR
- 10k ohm resistor
- Jumper wires
- LED

Arduino:

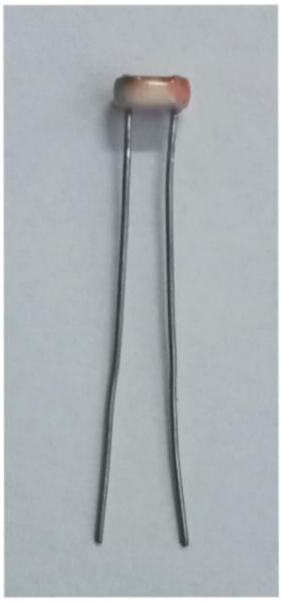
Arduino uno is a microcontroller .It was developed by Arduino cc. The board contains set of digital input and output pins. That pin interfaced with multiple boards and circuits. It is main component of this project. Which helps LDR and Ultrasonic sensor interface.

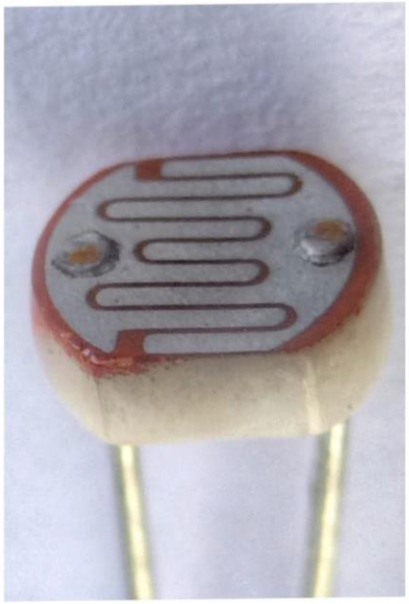
Ultrasonic sensor(HC-SR04):

Ultrasonic sensors are is a device that sense ultrasound energy. An ultrasonic sensor measures distance of emitting ultrasonic sound and energy. Ultrasonic sensor's sound more faster than human's audible sound. Which detects ultrasonic waves.

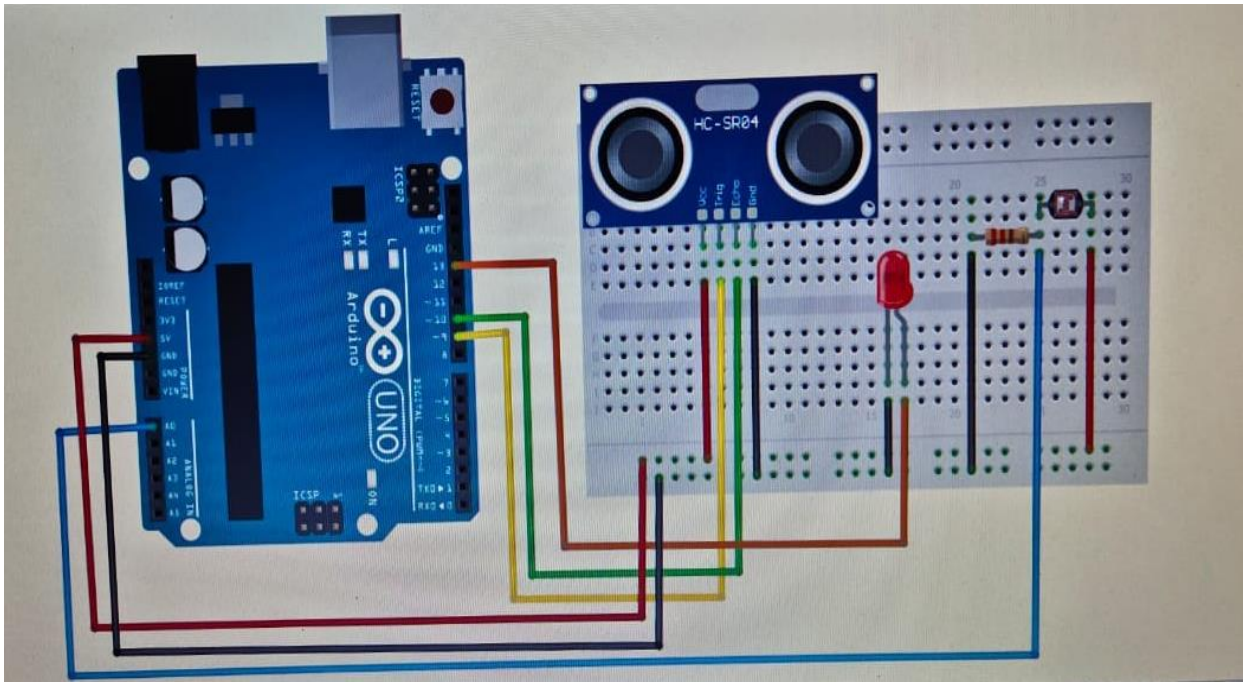
LDR:

LDR stands for Light dependent Resisitor,which is a passive electronic component,basically a resistor which has a resistance that varies depanding of the light intensity.LDR act light sensor when light is falling on LDR and LDR act dark sensor when light not falling on LDR.





Schematic circuit diagram:



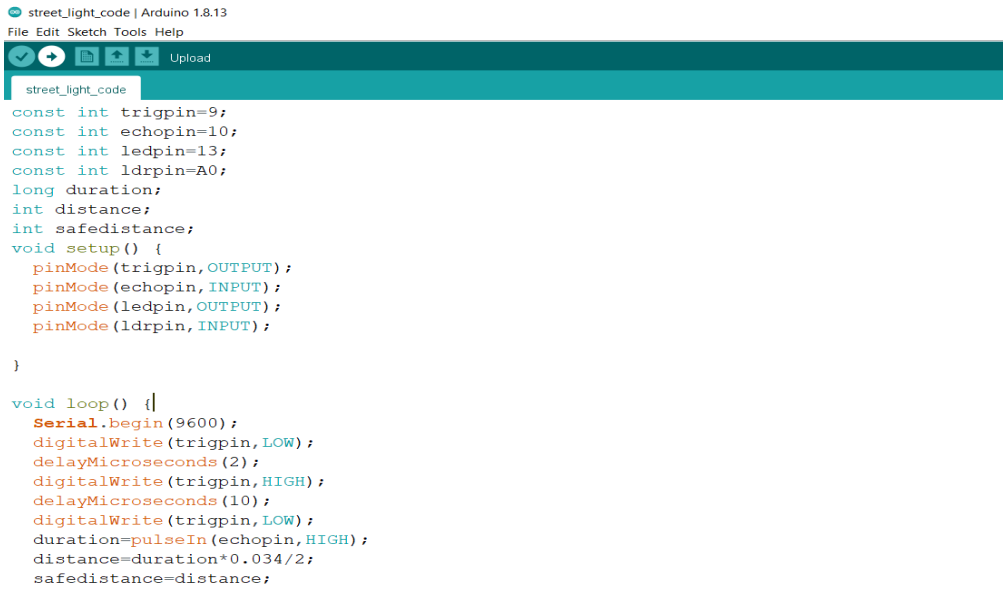
Principle:

Now a days the street lights, we are not using smart. To make them more smart here is the project. That glows LED automatically when a vehicle is moving on road during night time. This project will help night time street light using Arduino Uno, Ultrasonic sensor and LDR. The working principle is very simple. The Arduino Uno checks communication from ultrasonic sensor and LDR. The LED will be ON when the light intensity low and the vehicle's distance from ultrasonic sensor also very near. Otherwise the LED will OFF. This is the working principle of Smart Street Lights using LDR and Ultrasonic sensor. So that we minimize the power consumption of street lights.

The connections are followed:

- The HC-SR04 Ultrasonic is at the centre of the vehicle. The distance can be taken when the vehicle reaches the LED.
- I am using Arduino Uno, Breadboard, LED , Ultrasonic sensor, LDR, 10k ohm resistor and jumper wires for this project.
- I was buy all the components and check if LED, LDR and Ultrasonic sensor are working fine or not.
- I was connect cathode of the LED to GND pin and anode to 13th pin of Arduino.
- And I connect the Ultrasonic sensor pin VCC to 5V, GND to GND, Trig pin to 9th pin of Arduino and Echo pin to 10th pin of Arduino respectively.
- And finally I connect one end of LDR to 10k ohm resistor to A0 pin of Arduino and other pin end to 5Voltage supply. The another pin of resistor to GND pin of Arduino Uno.

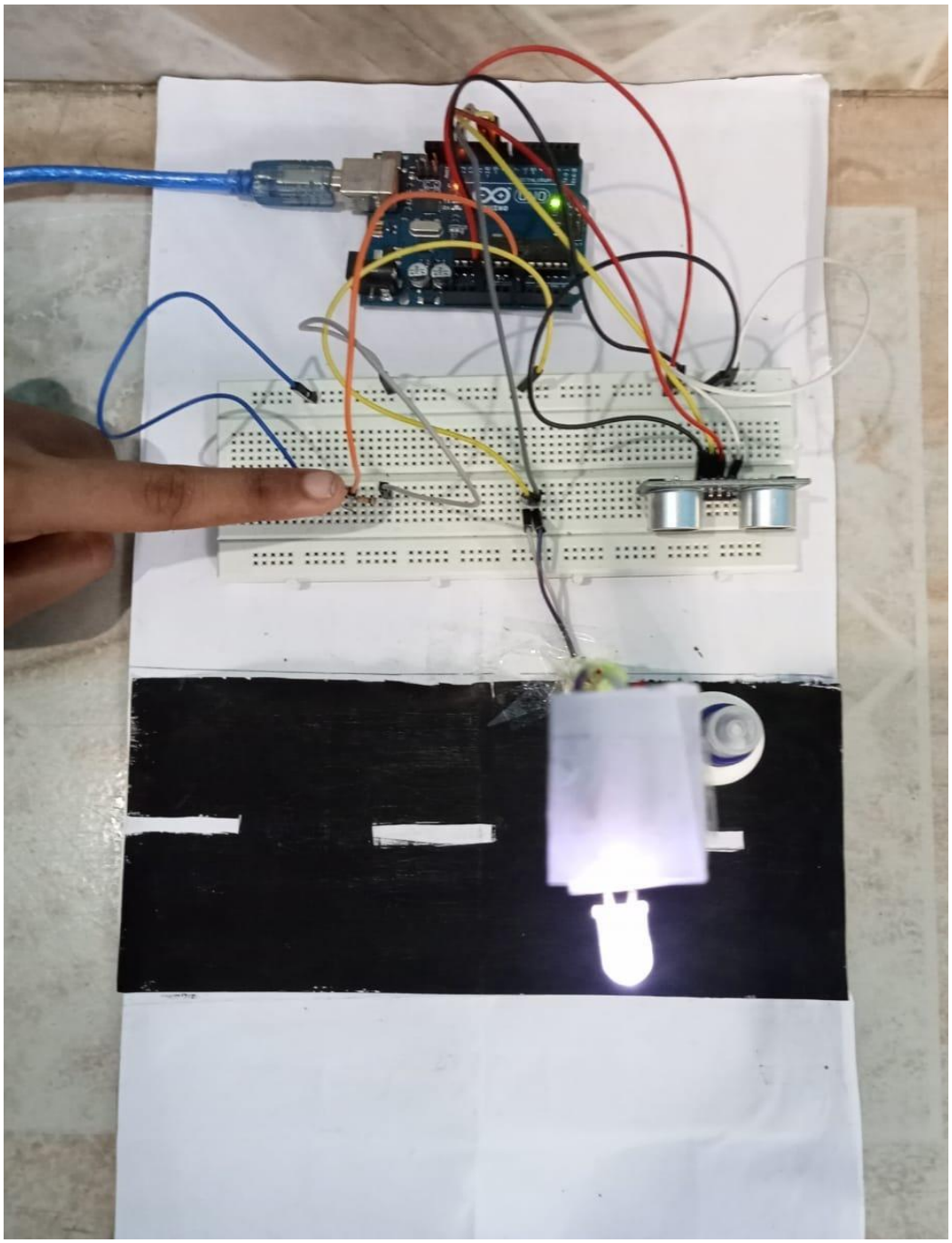
Arduino code for smart street light:

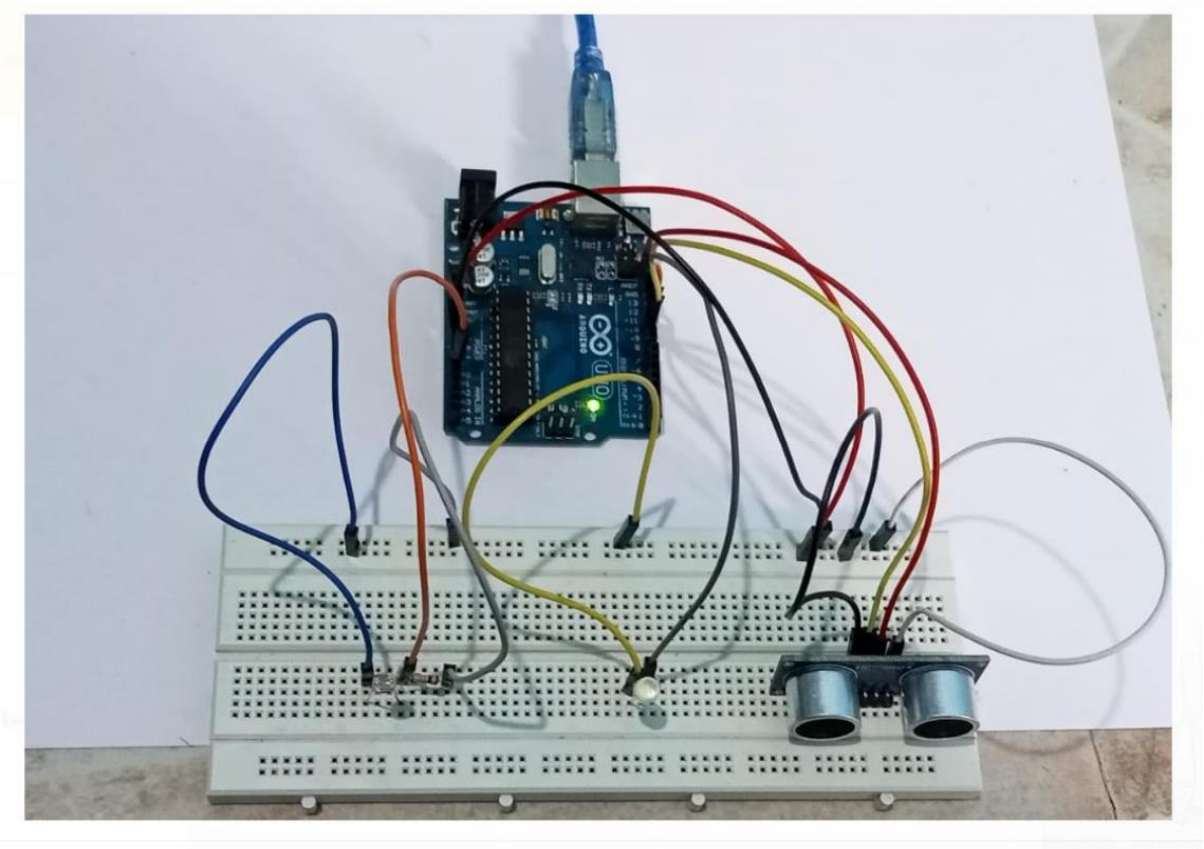


```
  int light=analogRead(ldrpin);
  if(light<=400){
    if(safedistance<=5){
      digitalWrite(ledpin,HIGH);
      delay(10);
    }
    else if(safedistance>5){
      digitalWrite(ledpin,LOW);
      delay(10);
    }
  }
  delay(200);
}
```

Done compiling.

Images on my project:





Report:

My project is smart street light using LDR and Ultrasonic sensor. I connect all the components with breadboard and Arduino. Next the code is run without error. The Arduino Uno continuously checks for the communication from ultrasonic sensor and LDR. When the night time the light intensity is very low and the vehicles are the cross the road the ultrasonic sensing and give signal to Arduino and then the LED will be ON. This project is very useful for night time automatic street light. Lastly my project is successfully completed sir.

Thanking you sir