REPORTS ON MECHATRONICS SYSTEM INTEGRATION

REPORT 9A

COLOUR DETECTION AND ANALYSIS

SECTION 1, SEMESTER 2, 23/24

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Table of Content

Introduction....2
Materials and Equipment....3
Experimental setup....3
Methodology/Procedures....3
Result....4
Discussion....6
    Hardware Discussion....6
    Electrical Discussion....7
    Software Discussion....8
Conclusion....9

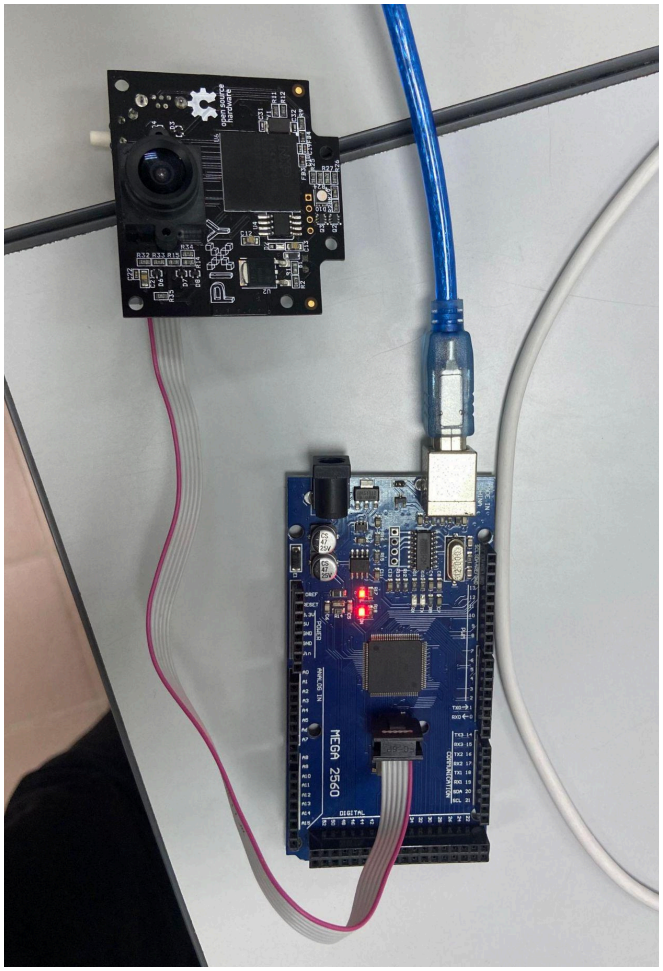
Introduction

The objective of this experiment is to detect object and colour data of the object using a system that consist of Arduino and pixy camera , after calibration of the pixy camera.

Materials and Equipment

Arduino Board	X 1
Pixy camera	X 1
USB cable	X 1

Experimental setup



Methodology/Procedures

1. Connect the Pixy camera to the arduino mega board correctly, as we are you using i2c interface, connect the GND, +5v, SDA and SDL pin

2.Connect arduino mega board to external power supply to make sure the arduino board is powered

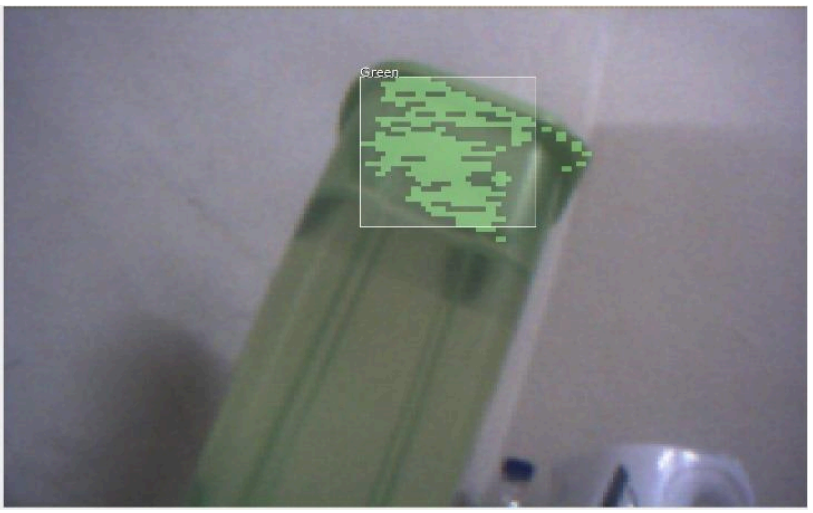
3.Download and install pixy library and insert it in the arduino

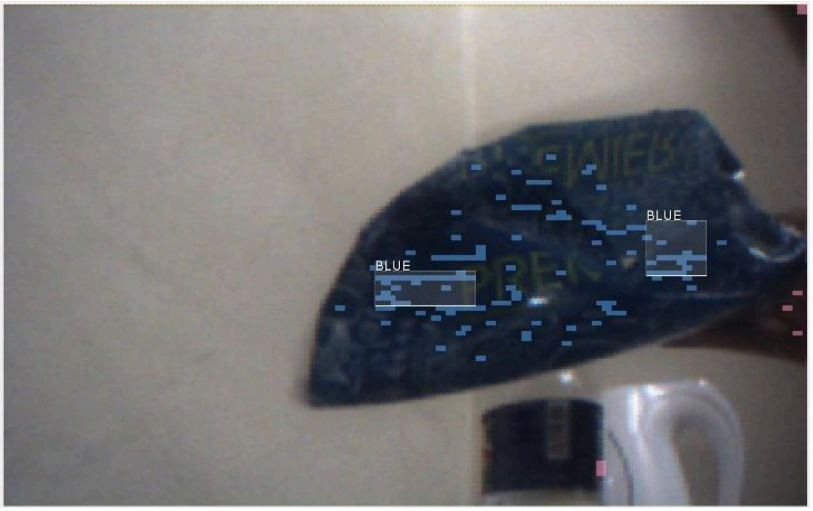
4.Write and upload the arduino code for the arduino to detect object and receive the colour data from the pixy camera.

5. Calibrate the pixy camera using pixymon software for object and colour detection set up

Result

The result of this experiment was acquired by constructing a basic circuit using a pixy camera sensor to detect object and the colour data of the object . Where the pixy camera connected to the circuit, the pixy camera will start operating to detect three different coloured object through the camera. It will show the colour data of the object at the serial monitor in the arduino ide.

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Discussion

Hardware Discussion

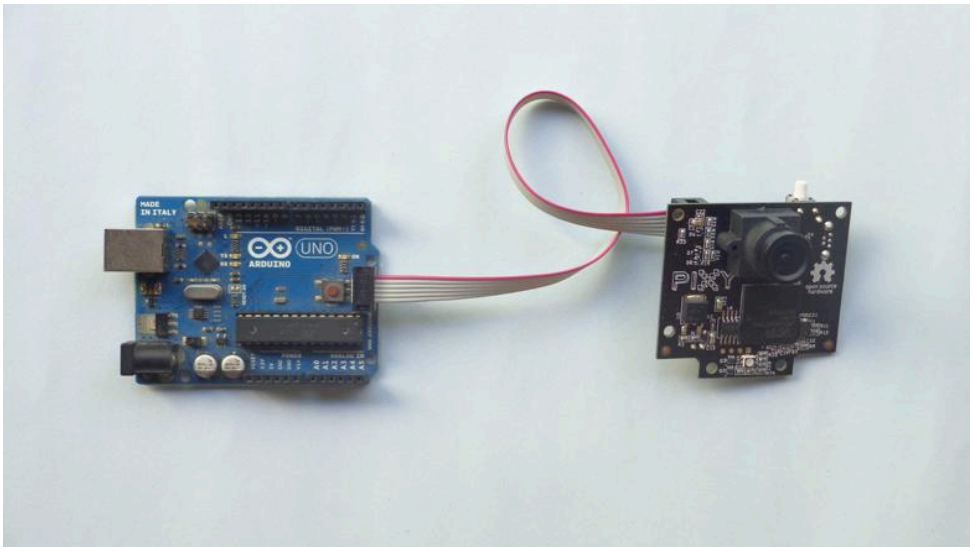
1) Pixy Camera

Pixy camera is used to detect object and colour's of the object

2) Arduino Mega 2560

Microcontroller used for our experiment is Arduino Mega 2560.

Electrical Discussion



Connect the pixy camera wire to the specific pin for the pixy camera to the arduino. Then connect the the arduino to the power supply / laptop to be powered using cable

Software Discussion

Attached below is the coding of the project. The software part of this mechatronic system project involves programming an Arduino Uno to interface with the Pixy Camera.

Arduino code

```
#include <SPI.h>
#include <Pixy.h>


Pixy pixy;
// PixyI2C pixy(0x55); // You can set the I2C address through PixyI2C object
```

```
void setup()
{
  Serial.begin(9600);
  Serial.print("Starting...\n");

  pixy.init();
}


void loop()
{
  static int i = 0;
  int j;
  uint16_t blocks;
  char buf[32];

  blocks = pixy.getBlocks();

  if (blocks)
  {
    i++;

    // do this (print) every 50 frames because printing every
    // frame would bog down the Arduino
    if (i%50==0)
    {
      sprintf(buf, "Detected %d:\n", blocks);
      Serial.print(buf);
      for (j=0; j<blocks; j++)
      {
        sprintf(buf, "  block %d: ", j);
        Serial.print(buf);
        pixy.blocks[j].print();
      }
    }
  }
```

```
}
```

Conclusion

In conclusion, the Pixy Camera is a very useful and commonly used electronic component used to detect of the object and colour of the object. With the right arduino coding and connection, this pixy camera component is able to detect the object and the colours of the object (after calibrate the pixy camera). Once there is , the MPU6050 sensor will automatically read and display the value recorded through the serial communication of the software.