Tutorial 1

Pixy2 Introduction: The Pixy2 is a compact robotics camera that can detect and track objects, follow lines, and read barcodes. The Pixy2 can connect directly to an Arduino or Raspberry Pi, and the software, firmware, and hardware is entirely open-source.

Tutorial Overview: This tutorial will teach the user how to configure their Pixy2 camera and connect it to an Arduino Uno or Mega microcontroller. The user will then be able to upload the included Arduino sample sketch, which will allow them to track the position of an object and indicate on the serial monitor whether the object is located at the LEFT, RIGHT, or CENTER of the camera's view.

Req'd Hardware:
- Personal Computer running Windows, MacOS, or Linux
- Arduino Uno or Mega Microcontroller
- Pixy2 Camera

Req'd Downloads:
- Arduino IDE (https://www.arduino.cc/en/software)
- PixyMon v2 (https://pixycam.com/downloads-pixy2/)
- Pixy2 Arduino Library v1.03 (https://pixycam.com/downloads-pixy2/)

Instructions:
1. Ensure that the latest version of Arduino IDE is installed on your computer.
2. Download **PixyMon v2** and the **Arduino Pixy2 library (zip)** from the provided links.
3. Connect the Pixy2 camera to your computer with the included USB cable
4. Open the PixyMon v2 application and verify that your Pixy2 is properly connected and set to run the 'color_connected_components' program. You can also set the color signature for the object you wish to track at this time.
5. Disconnect your Pixy2 camera from the computer.
6. Connect the Pixy2 to your Arduino microcontroller as shown in Figure 1.
7. Open Arduino IDE and make sure to add the required 'Pixy2' library (Sketch > Include Library > Add .ZIP Library…)
8. Connect the Arduino microcontroller to your computer via USB, and upload the attached sketch **integrationTutorial1**.
9. Test for mission success by moving your specified object in front of the camera and checking the serial monitor's output.
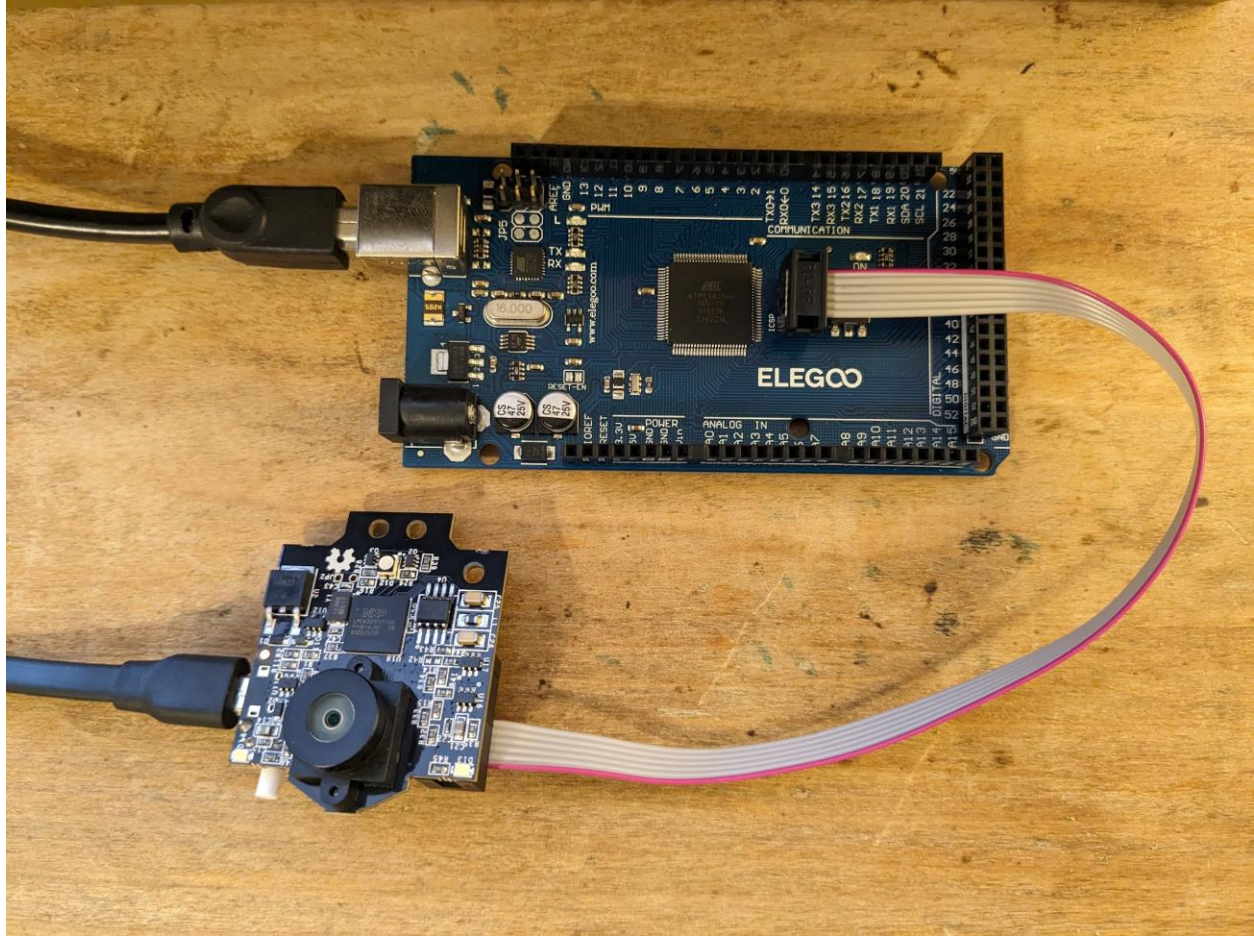
Figure 1 - Pixy2 connected to Arduino Mega Microcontroller. The black cables on the left side are connected to the computer via USB.

```
//integrationTutorial1.ino

#include <Pixy2.h>
Pixy2 pixy;

void setup()
{
  Serial.begin(115200);
  Serial.print("Starting...\n");

  pixy.init();
}

void loop()
{
  int i;

  pixy.ccc.getBlocks();

  if (pixy.ccc.numBlocks)
  {

    for (i=0; i<pixy.ccc.numBlocks; i++)
    {

      if (pixy.ccc.blocks[i].m_x > 214) {
        Serial.println("Right");
      }
      else if (pixy.ccc.blocks[i].m_x > 104) {
        Serial.println("Center");
      }
      else {
        Serial.println("Left");
      }
    }
  }
}
```