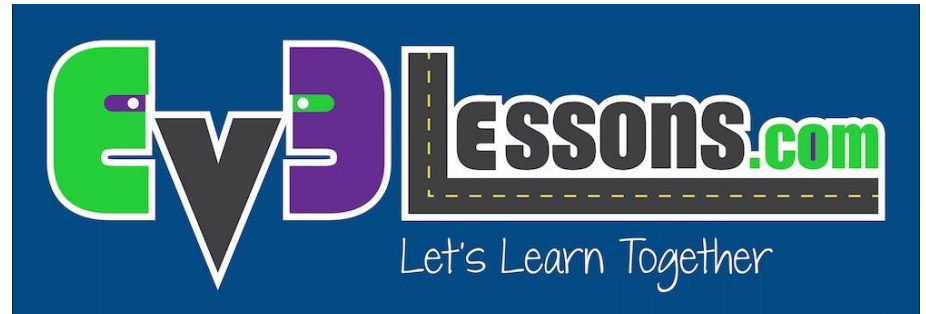
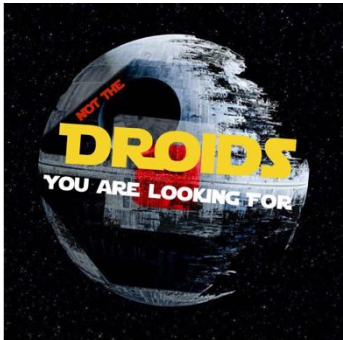


Bonus
EV3 Programming
Lessons



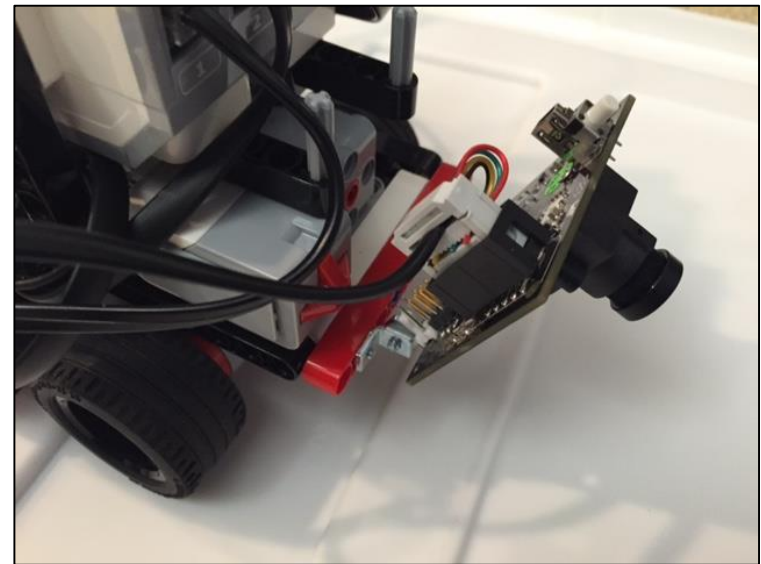
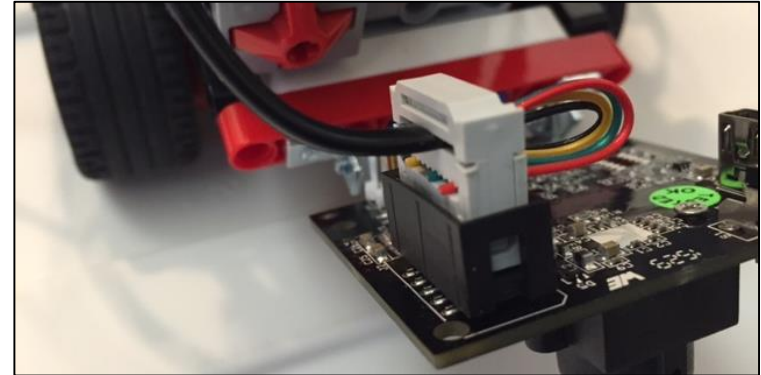
PixyCam for MINDSTORMS Color Identifinder



By Droids Robotics

Getting Started

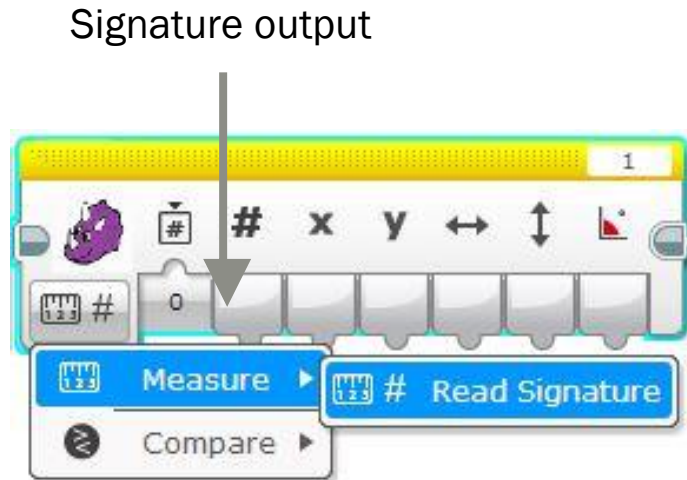
1. Make sure you have done the PixyCam Introduction lesson, have signatures for red, green, blue, and yellow LEGO blocks, and have installed the PixyCam EV3 blocks
2. Use the instructions on [Mounting Pixy with LEGO](#) to mount a LEGO piece on to the camera
3. Use additional LEGO pieces to connect your PixyCam to your robot wherever you decide
4. Use the wire provided to plug in your PixyCam to your robot in port 1



Learning the PixyCam Block

- Pixy Camera block

- It is located in the yellow programming tab
- We will be using it in Measure - Read Signature mode
- We will be using the Signature Output which outputs which signature the camera detects

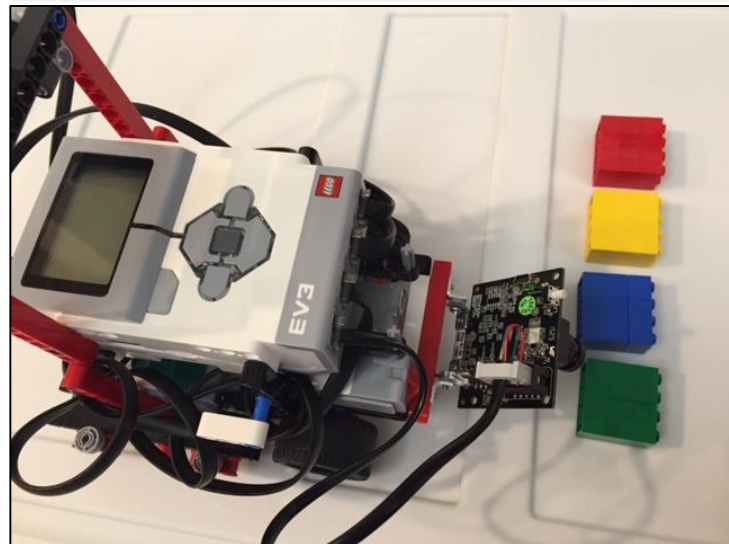
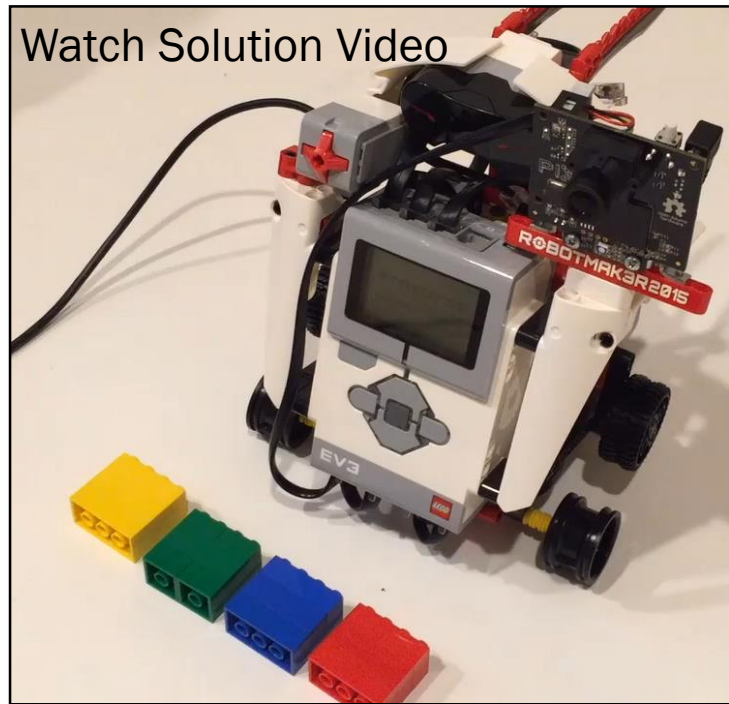


Challenge

- Use your PixyCam to have your EV3 recognize 4 different LEGO bricks (Red, Green, Blue, Yellow) and say which color it is
- Every time you show the PixyCam a different color, the EV3 will say the color out loud
- You will need the yellow Pixy Camera block, the Switch block in numeric mode, the Sound block and a Loop to complete this challenge

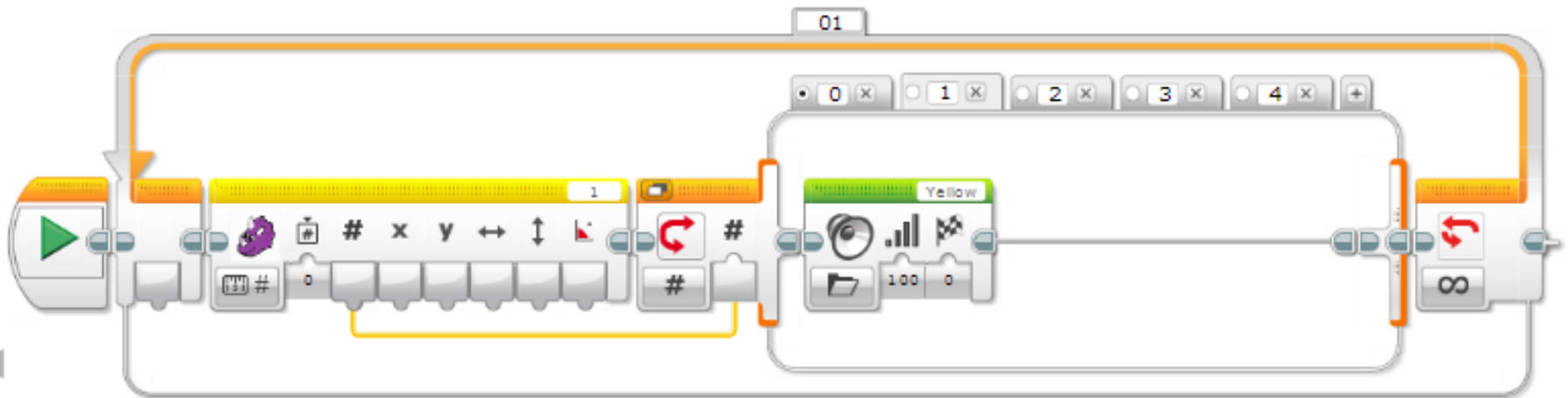
Pseudocode:

1. *Detect which signature the camera is seeing*
2. *Use the value of the signature to know which color to say*
3. *Repeat the last two steps*



Challenge Solution

Click on the “+” to create 4 choices/”cases” in the switch block

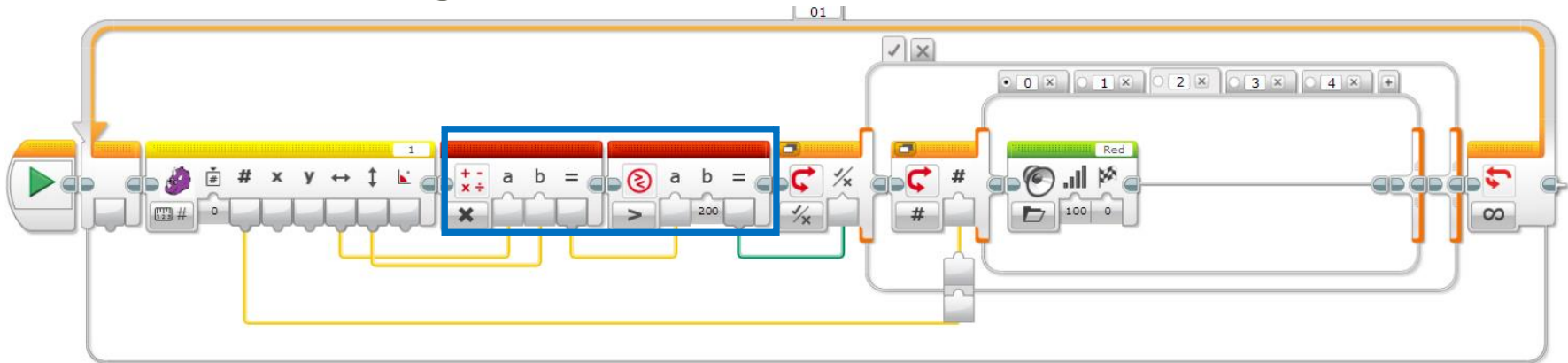


Use a data wire to connect the Signature Output (#) value to the Switch block which is in numeric mode

“0” will have no contents. Nothing will play if the PixyCam doesn’t recognize the object
“1”, “2”, “3” & “4” each have a sound block that will play Yellow, Green, Red and Blue sounds for its respective signature

Detecting Too Many Colors?

- If there are distractions in the background or foreground, you might get false positives
 - *Try recreating and tuning your signatures more for better results.*
 - *Add code so that the robot does not recognize smaller items of the same color in the background.*



Multiply together the width and height of the object by taking the output (dimensions) from the PixyCam block and putting them in a Math Block.

Take the result and put them into a Compare block. If the result is greater than “200”, it will be true. You have to use trial and error to get this “magic” number. (One trick is to hit play on your code in the software and look at the data going through the wire to get an idea for dimensions that would work as a threshold/minimum.)

We have a Switch Block inside a Switch Block. The sounds will play only when the outer switch is True which means that the object meets the dimension requirements we specified.

CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan from Droids Robotics.
- More lessons are available at www.ev3lessons.com
- Author's Email: team@droidsrobotics.org
- Thank you to Marc-André Bazergui for loaning us the PixyCam for this lesson, (<https://www.facebook.com/marc.a.bazergui>, info@bazmarc.ca)



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