Some Tips on Generating Color Signatures

The color filtering algorithm is good in the sense that it can process an entire frame, 50 times a second. But discrimination can sometimes be a problem – false positives and false negatives. False positives are when Pixy thinks an object matches a particular signature, but it's not the object you want to detect. It's often an object with a similar hue. For example, Pixy thinks your light green shirt matches a green ball. False negatives are when Pixy fails to detect an object that you intend to detect with a particular signature.

These errors have a fair amount to do with the lighting. Dim lighting can sometimes be difficult for Pixy. Below are some things that you can adjust. We're working on improving, making this automatic, by adding more statistical measurements to the generation of signatures.

1. **Adjusting the "Brightness" parameter** Pixy has automatic exposure correction, which is just a fancy way of saying it will make dark scenes lighter and bright scenes darker. But sometimes this correction needs some tweaking, because if the object is too dark or too bright, it will adversely affect Pixy's hue discrimination abilities. So if the object you're interested in looks dark when viewing through PixyMon, then increase the Brightness parameter. If the object looks too bright, decrease the Brightness parameter.
2. **Adjusting the "Min saturation" parameter** Try adjusting this first. This parameter determines how unsaturated the colors are in the color signature. If Pixy is rejecting objects that you try to teach it, you can try decreasing the Min saturation parameter. This will open up the object possibilities, but it may lead to more false positives. For example, it might think your hand looks like an orange or reddish object. Increasing the minimum saturation to say 20 should help with this, but it may lead to more false negatives. Trying a few values usually leads to a good balance for your situation, but note that new values of Min saturation will only apply the when **teaching** a color signature. So modify Min saturation and *reteach*. A minimum saturation more than 40 is rarely useful though, so keep it below 40 as a rule of thumb.
3. **Adjusting the "Hue spread" parameter** If adjusting the Min saturation parameters doesn't seem to work, try adjusting the "Hue spread" parameter. This parameter determines how inclusive the hue should be when creating a color signature. By decreasing the hue spread parameter, the color signature is more exclusive and leads to less false positives. Increasing has the opposite effect – more false negatives, potentially. Modify Hue spread and reteach. (New values of Hue spread only apply when teaching color signatures.)
4. **Use the mouse to teach Pixy your object** There are two ways to teach Pixy an object: the button-press method and the mouse-select method. They are both described here. The mouse-select method makes sure that no unintended pixels make it into the teaching set when making a color signature.