System Design Project 2016
USER GUIDE

Group 4

February 28, 2016

Vision

Calibration

If running vision for the first time on the particular machine, color settings must be calibrated. This can be done by following these steps:

1. run `xawtv` commad via terminal and manually adjust brightness and contrast, so that colors would be clearly visible;

2. Run following via terminal: `python color_calibration.py -p [Pitch number, either 0 or 1]`. Note: 3.D04 is pitch room 0, while 3.D03 is pitch room 1. This should output camera feed;

3. Click corresponding color character ('b' for blue, 'c' for light_blue, 'p' for pink, 'y' for yellow and 'g' for green) and click with mouse arrow on couple of corresponding colors. Each time color character is pressed, all previous pixel values of that color is deleted and thus you can redo by clicking on colors in the camera feed again. Therefore, once character is pressed, it is enough to click one or two colors, then click another character in order to proceed, or pres `Esc` to finish clicking (check Figure 1 as example).

4. After pressing `Esc` to proceed, video feed and separate window with slide bars will appear, change `S_low` and `V_low` bars until all objects of particular color are visible in the mask. It is not recommended to change `H_low` and `H_high` values, also better results are obtained with lower `S_low` value (usually slightly below 100) and higher `V_low` values (usually above 150). Once you think objects in the mask are correct, pres `Esc` to proceed to another color, until no colors left. Once no windows with the mask and video feed left and in terminal message of successful calibration is printed, color setting are written in the 'json' file.

5. If you want to test whether calibration really works, simply run `robot_tracking.py` file and check whether robots and the ball is recognized correctly (example shown in Figure 2).

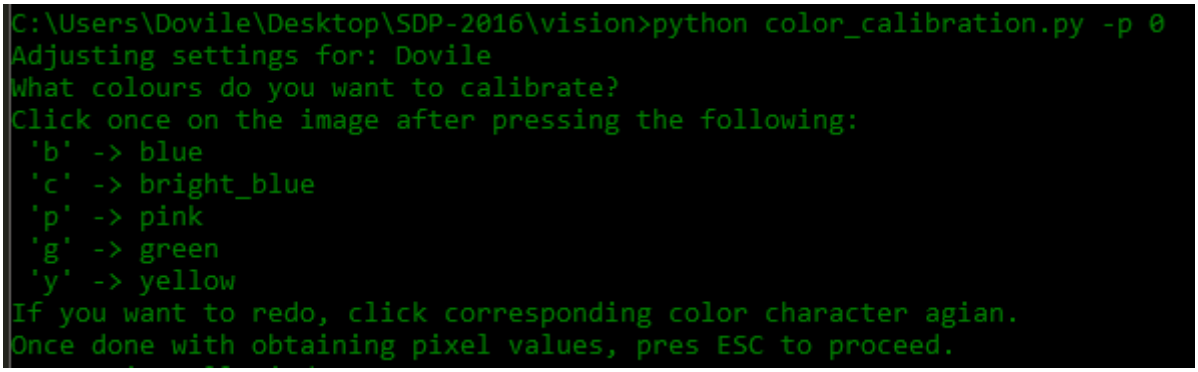

Figure 1.

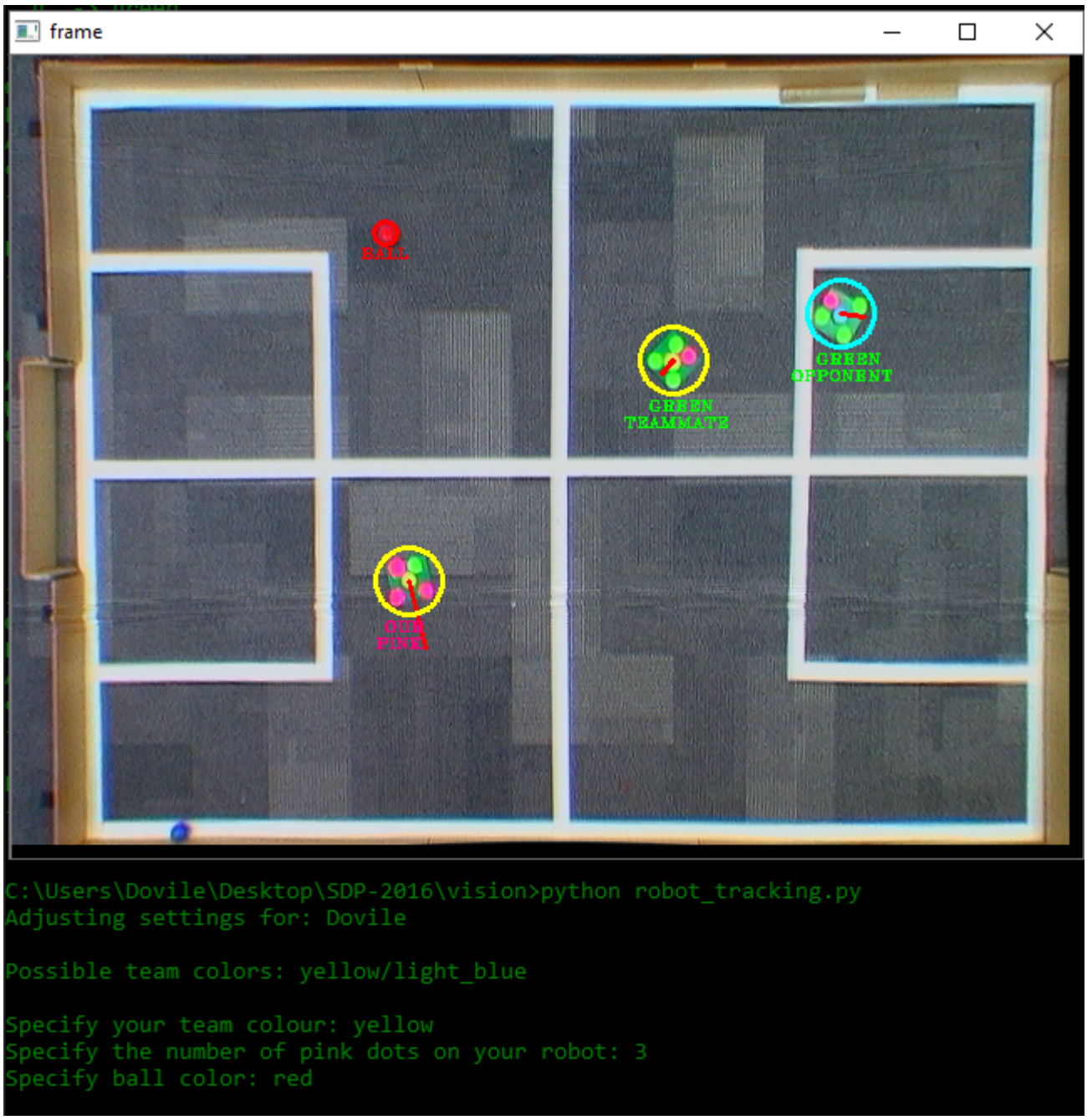
frame
BALL
GREEN TEAMMATE
GREEN OPPONENT
OUR PINK
C:\Users\Dovile\Desktop\SDP-2016\vision>python robot_tracking.py
Adjusting settings for: Dovile
Possible team colors: yellow/light_blue
Specify your team colour: yellow
Specify the number of pink dots on your robot: 3
Specify ball color: red

Figure 2.