

# CV\_HW1

February 19, 2021

## 1 ECE 5973 - Computer Vision

### 1.1 Homework 1

#### 1.1.1 Sarah Brown

- Setup the OpenCV environment and capture a short video of yourself. Please submit a screenshot of running your code (5 points).
- Segment all blue pixels (with H values between 99 and 125 in the HSV color-space) in a captured frame. Display the segmentation result (all segmented pixels shown as white with the rest shown as black) along with the captured frame (10 points).
- Display the ratio of the segmented pixels over all pixels on the frame (5 points).

```
[3]: import cv2
import numpy as np
from matplotlib import pyplot as plt
%matplotlib inline

cap = cv2.VideoCapture(0)
window_name='camera'

font = cv2.FONT_HERSHEY_SIMPLEX
fontScale = 0.8
color = (255, 0, 0)
thickness = 2

blueMatrix = cv2.cvtColor(np.uint8([[0,0,255]]),cv2.COLOR_BGR2HSV)
lower_blue = np.array([99,0,0])
upper_blue = np.array([125,255,255])

cv2.namedWindow(window_name,cv2.WND_PROP_FULLSCREEN)
cv2.setWindowProperty(window_name,cv2.WND_PROP_FULLSCREEN,cv2.WINDOW_FULLSCREEN)

fourcc = cv2.VideoWriter_fourcc(*'XVID')
out = cv2.VideoWriter('output.avi',fourcc, 30.0, (640,480)) # capture 30 frame
↳per second
# video resolution 640x480

while (True):
```

```

ret, frame = cap.read()
pixelsInFrame = np.size(frame)
# print(pixelsInFrame)
hsv = cv2.cvtColor(frame, cv2.COLOR_BGR2HSV)
mask = cv2.inRange(hsv, lower_blue, upper_blue)
countBlue = cv2.countNonZero(mask)
mask = cv2.cvtColor(mask, cv2.COLOR_GRAY2BGR)
countBlue = np.sum(mask)/255
ratio = (countBlue/pixelsInFrame)

hori = np.concatenate((frame, mask), axis=1)
hori = cv2.putText(hori, str(ratio), (20,20), font, fontScale, color,
↳ thickness, cv2.LINE_AA)
cv2.imshow(window_name, hori)
out.write(hori)
if cv2.waitKey(1) & 0xFF == ord('q'): # btw, you need to click the screen
↳ first. And then
# press q to quit
break

cap.release()
out.release()
cv2.destroyAllWindows()

```

```

[4]: %matplotlib inline
import matplotlib.pyplot as plt
rgb = cv2.cvtColor(hori, cv2.COLOR_BGR2RGB)
plt.imshow(rgb)

```

[4]: <matplotlib.image.AxesImage at 0x7f23285f2220>

