

## ▼ Anirbaan Ghatak C026 Year 6

### Aim

Task 1: resize the given in multiples of 8

Task 2: Determine HoG features for 8x8 pixels per cell and 2x2 cells per block

Task 3: Visualize HoG features

Task 4: Change parameter values and observe the effects

```
from skimage.io import imread
from skimage.transform import resize
from skimage.feature import hog
from skimage import exposure, data
from matplotlib.pyplot import imshow, subplot, subplots
import numpy as np
import cv2
```

```
image = imread('puppy.jpg')
image2 = data.rocket()
```

```
imshow(image2)
```

```
↵ <matplotlib.image.AxesImage at 0x78509f9092d0>
```



```
image.shape
```

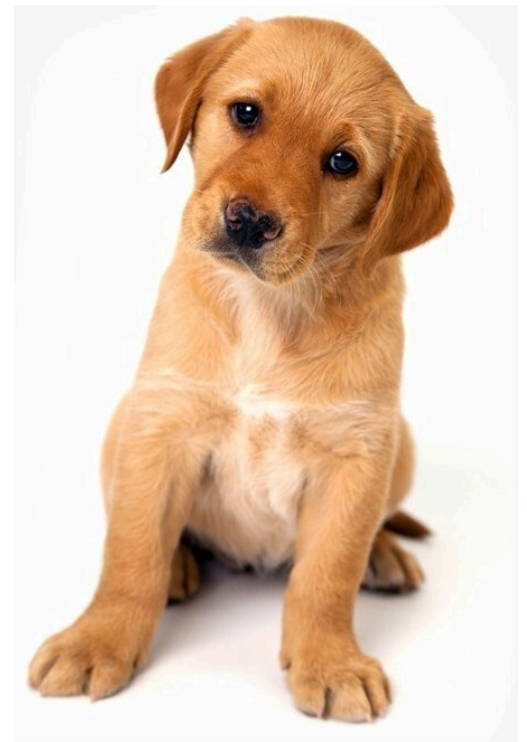
```
↵ (660, 450, 3)
```

```
image_resize = resize(image,(664,448))
```

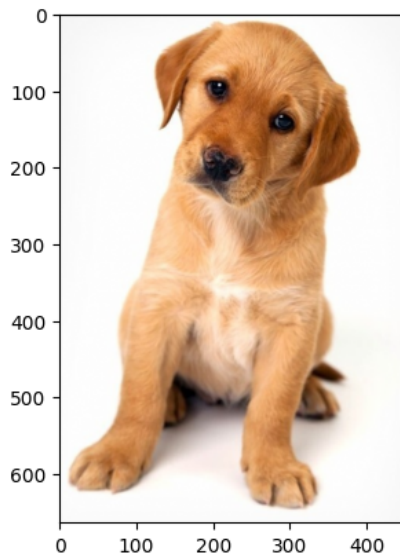
```
imshow(image_resize)
```

puppy.jpg ×

...



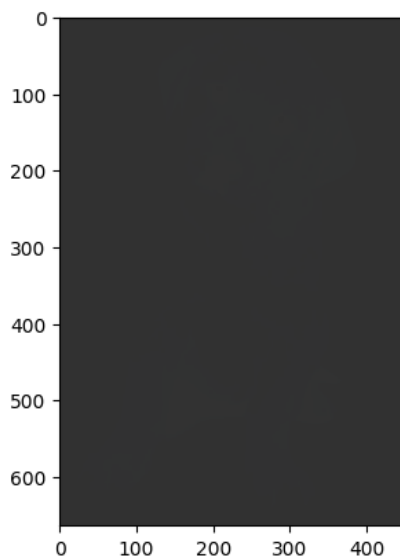
 <matplotlib.image.AxesImage at 0x7850a015f880>



```
img1 = image_resize
img2 = cv2.convertScaleAbs(img1, beta = -50)
img3 = resize(img1, (512,256))
```

```
imshow(img2)
```

 <matplotlib.image.AxesImage at 0x78509ffd5b70>



```
fd1,hog_img1=hog(img1,orientations=9,pixels_per_cell=(16,16),cells_per_block=(16,
fd2,hog_img2=hog(img2,orientations=9,pixels_per_cell=(16,16),cells_per_block=(16,
fd3,hog_img3=hog(img3,orientations=9,pixels_per_cell=(16,16),cells_per_block=(16,
fd4,hog_img4=hog(image2,orientations=9,pixels_per_cell=(16,16),cells_per_block=(1
```

```
image.size,fd1.size,fd2.size,fd3.size,fd4.size
```

 (891000, 778752, 778752, 39168, 633600)

```
pl_2,pl_98=np.percentile(hog_img1,(2,98))
hog_img1_enh=exposure.rescale_intensity(hog_img1,in_range=(pl_2,pl_98))
```

```
pl_2,pl_98=np.percentile(hog_img2,(2,98))
hog_img2_enh=exposure.rescale_intensity(hog_img2,in_range=(pl_2,pl_98))
```

```
pl_2,pl_98=np.percentile(hog_img3,(2,98))
hog_img3_enh=exposure.rescale_intensity(hog_img3,in_range=(pl_2,pl_98))
```

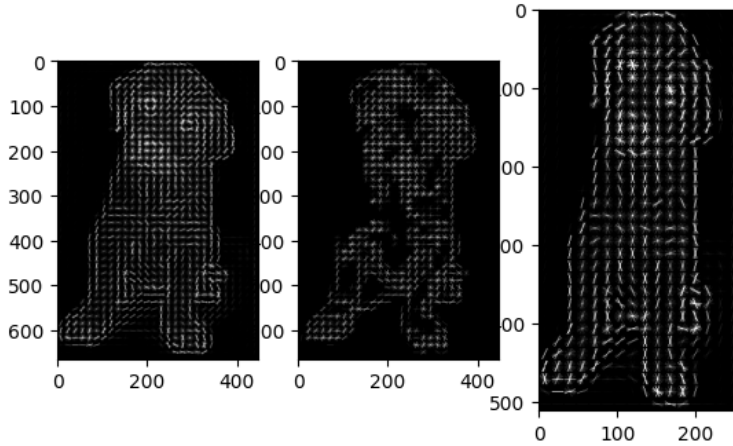
```
pl_2,pl_98=np.percentile(hog_img4,(2,98))
hog_img4_enh=exposure.rescale_intensity(hog_img4,in_range=(pl_2,pl_98))
```

```

subplot(1,3,1)
imshow(hog_img1_enh,cmap='gray')
subplot(1,3,2)
imshow(hog_img2_enh,cmap='gray')
subplot(1,3,3)
imshow(hog_img3_enh,cmap='gray')

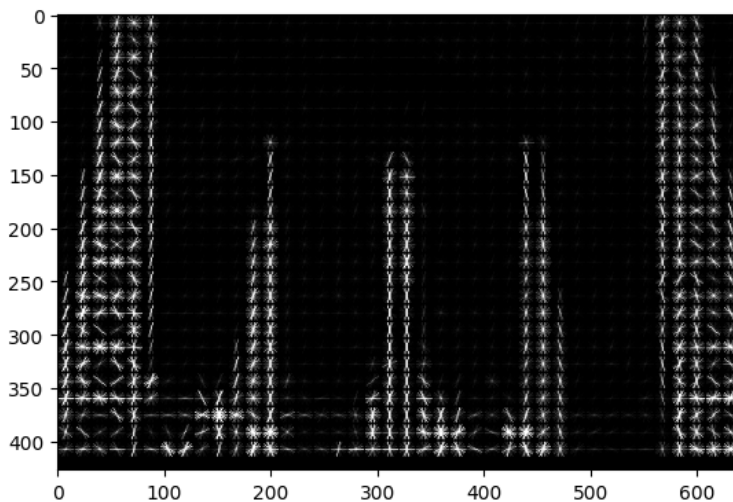
```

 <matplotlib.image.AxesImage at 0x78509ff9f310>



```
imshow(hog_img4_enh, cmap='gray')
```

 <matplotlib.image.AxesImage at 0x78509f888ee0>



## Conclusion

If cell size is increased from 8,8 to 64,64 pixels per cell, details like fur, paws and eyes in the image disappear, instead no. of cell per block is increased from 2,2 to 8,8 cells per block HOG of the image shows block-y effect, leading to the loss of finer details present in the image.

If intensity of all the pixels of the image is reduced then HOG of the image remains unaffected. If image is resized to smaller value then also the hog of the image remains the same.

original size of image = 891000

size of img1 & img2 = 778752

size of img3 = 39168