

SUBJECT: Deep Learning and Computer Vision
SUBJECT CODE: ECS795P

Online Assessment-1

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Question to be answered (Q3.4)

1. *What is the typical numerical measure metric for quantitative analysis?*

ANSWER:

The Typical Numerical measure metric for the quantitative analysis is **Peak Signal Noise ratio (PSNR)**

PSNR:

- It is used to calculate the Peak signal-to-noise-ratio between two images.
- It is the ratio between the maximum power of a signal and Maximum power of distorting noise.
- Higher the Peak signal-to-noise-ratio(PSNR) better the quality of the reconstructed image. Whereas lower the PSNR higher the error and lower the quality of the image.
- It is measured in Decibels (i.e, unit of PSNR is decibels).

In Other hand, It can also be measured using MS-SSIM, Butteraugli methods. Among these, using PSNR we can compute with better accuracy also with better speed.

Exercise to be conducted (E1.5)

2. *To enlarge the current image by 3 times with bicubic interpolation algorithm*

SOLUTION:

```
def preprocess(path, scale=3):  
    image = imread(path, is_grayscale=True)  
    label_ = modcrop(image, scale)  
  
    # Must be normalized  
    label_ = label_ / 255.  
  
    input_ = ndimage.interpolation.zoom(label_, (1./scale), prefilter=False)  
    input_ = ndimage.interpolation.zoom(input_, (scale/1.), prefilter=False)  
    return input_, label_
```

code used to enlarge the current image by 3 times with bicubic interpolation:

```
input_ = ndimage.interpolation.zoom(input_, (scale/1.), prefilter=False)
```

For this we have assumed the scale =3, so that as per the code we can see scale divided by 1 which helps to enlarge the image

As, the actual size(shape) of the image is (85,85) which is enlarge 3 times and the output of the enlarged image would be 85*3 which equals 255, and the output will be (255,255).

OUTPUT:



input_.shape

```
torch.Size([1, 1, 255, 255])
```

Also we can observe this output in the groundtruth image shape:



```
#getting a groundtruth image
groundtruth_image = modcrop(HR_image, 5)
print(groundtruth_image.shape)
#save the groundtruth image
grimg = scipy.misc.imsave('groundtruth_image.jpg',groundtruth_image)
#plot groundtruth image
print("Groundtruth image")
plt.imshow(groundtruth_image,cmap='Greys_r')
plt.show()
```

```
(255, 255)
```

Groundtruth image

