ECS795P Deep Learning and Computer Vision, 2021

**Course Work 1: Image Super-resolution Using Deep Learning**

1. Suppose the settings of a SRCNN as: f1=9, f2=3, f3=5, how many pixels of the low-resolution image are utilized to reconstruct a pixel of the high-resolution image with the SRCNN? (10% of CW1)

**ANSWER**: There would be 225 pixels as it is 15x15

1. Why the deep convolutional model is superior to perform image super-resolution? Give one reason to explain it. (10%of CW1)

**ANSWER**: It is superior because it directly learns an end-to-end mapping between low/high resolution image. The three convolutional layers like path extraction, non-linear mapping and reconstruction are effects well on image reconstruction.

1. Please explain the physical meaning of peak signal-to-noise ratio (PSNR) in the context of image super-resolution. PS: place here the ground truth (GT) image, and the high-resolution images by SCRNN (HR-SRCNN) and bicubic interpolation (HR-BI) for reference. Also put the PSNR value below the high-resolution images. (10% of CW1)

**ANSWER**: The PSNR in Super Resolution is the ration of maximum pixel value in the image to maximum MSE. Larger PSNR value shows better image reconstruction.

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https://medium.com/coinmonks/review-srcnn-super-resolution-3cb3a4f67a7c

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| --- |
| GT |
| HR-BI (PSNR=24.04) |
| HR-SRCNN (PSNR=27.58) |