ECS795P Deep Learning and Computer Vision, 2018

**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)

Assuming a stride=1 then

(9 + 3 + 5 – 1 -1)^2 = 15x15

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

* More pixels are used compared to sparse-coding methods.
* Inputs don’t have a lot of preprocessing involved, no need to build or reference dictionaries, etc.
* All channels at the same time

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)

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| GT |
| HR-BI (PSNR=xx) |
| HR-SRCNN (PSNR=xx) |