Final Project Report

Part A: Data Construction and Parameter-Setting:

Figure from Matlab:

Noisy Barbara image

Figure from Matlab:

Cropped Barbara image

Insert PSNR value of noisy image:

Part B: DCT Dictionary

How is the error constraint satisfied for each patch in batch mode?

Insert average MSE of the reconstruction:

Insert average number of non-zeros of the reconstruction:

Discuss the obtained values below:

DCT reconstructed image:

Figure from Matlab:

DCT reconstructed image

Enter epsilon value:

Enter PSNR of reconstruction:

Discuss the obtained results below:

Part C: Procrustes Dictionary Learning

The obtained learned dictionary: Discuss the obtained dictionary:

Figure from Matlab:

Learned dictionary

Average MSE and number of nonzeros as a function of the iteration:

Figure from Matlab:

Average # nonzeros vs. # iterations

Figure from Matlab:

Average MSE vs. # iterations

Discuss the obtained curves:

Procrustes reconstructed image:

Figure from Matlab:

Procrustes reconstructed image

Enter epsilon value:

Enter PSNR of reconstruction:

Discuss the obtained results below:

Compare the results of the DCT dictionary and the learned dictionary:

Part D: SOS boosting

SOS-boosted reconstructed image:

Enter epsilon value:

Enter rho value:

Enter PSNR of reconstruction:

Discuss the obtained result and compare to DCT and learned dictionary: