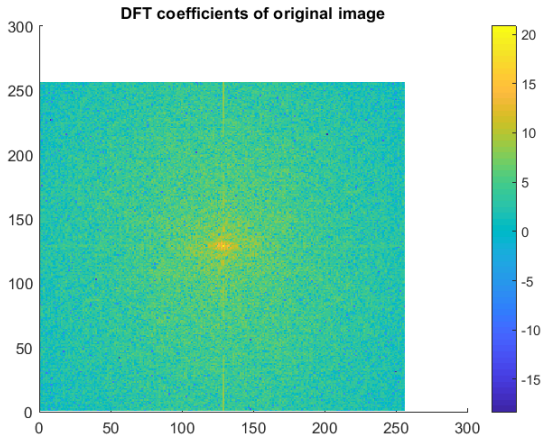
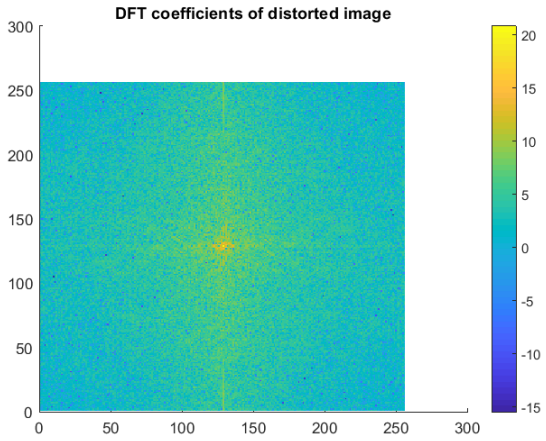
Matlab part

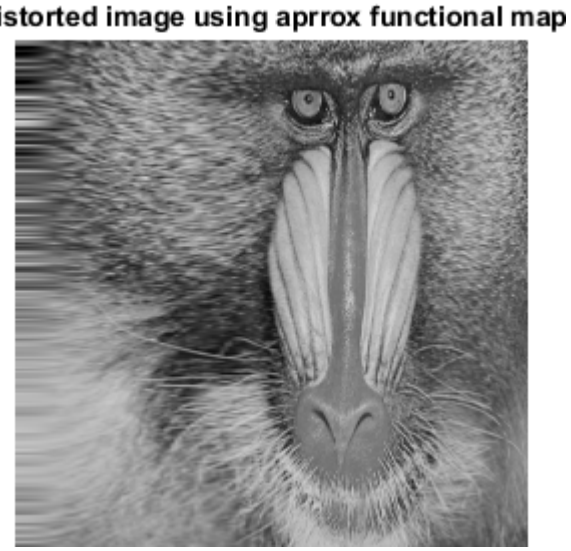
mandrill photo

The DFT of original and distorted image:





The given distorted image VS the obtained distorted image by the algorithm:



As we can see the two images are very similar, a mathematical evidence for that is the high PSNR value we got for the two images: $1.552137 \cdot 10^2$.

We computed the discrete Fourier transform of the two images, than we calculated(in Fourier domain):

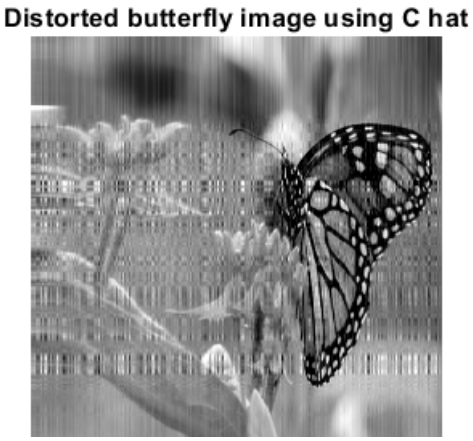
$$\hat{C} = (DFT\_original)^{-1} (DFT\_distorted)$$

and distorted the original image by(in Fourier domain):

$$distorted\_image = (DFT\_original) * \hat{C}$$

Butterfly photo

The distorted butterfly photo we got:



The image obtained by calculating(in Fourier domain):

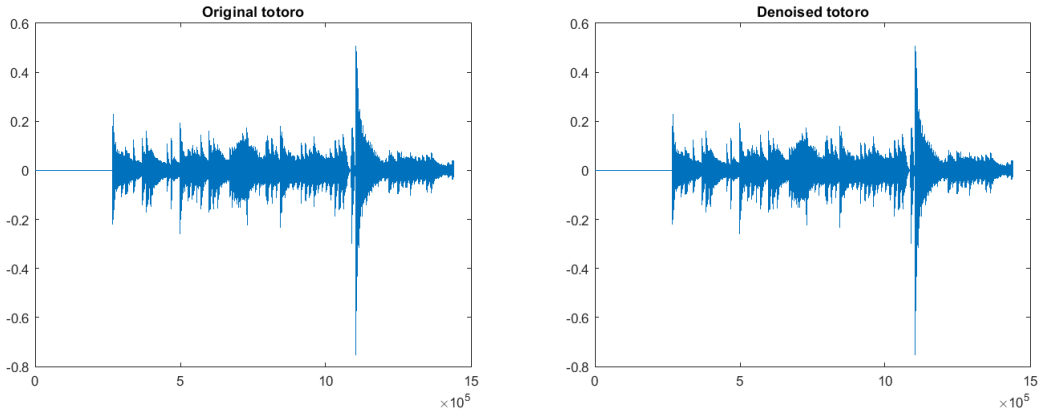
$$distorted\_image = (DFT\_original) * \hat{C}$$

Audio

The MSE error we got between original and denoised signal is:

$$5.831843 \cdot 10^{-2}$$

And the signal graphs:



As we can see both signals are very similar.

The denoised signal obtained by reshaping the original and distorted signals to a $2814x512$ matrix according to the distortion period, than calculating the DFT of both of them, and calculating:

$$\hat{C} = pinv\left(DFT\_skycastle\_distorted\right)\left(DFT\_skycastle\right)$$

and than getting the denoised signal(in Fourier domain) by:

$$distorted\_image = (DFT\_totoro\_distorted) * \hat{C}$$

and calculating the inverse Fourier transform, and reshape the matrix back to vector form.