Partial Differential Equation and Image Processing

-A Week Summary

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Peak signal-to-noise ratio(PSNR)

- Wiener, L-R, Regularized, Deconvblind, NNCGM
- The PSNR, defined by

$$PSNR = 10 \log_{10} \left(\frac{(2^n - 1)^2}{MSE} \right)$$

MSE-MeanSquareError

Test nncgm algorithm

sigma	image	Wiener	LR	Regularized	Decon	NNCGM
		psnr	psnr	psnr	psnr	psnr
15	satellite	3.6086	22.1536	21.8713	23.8652	26.1569
30	satellite	3.9532	22.8697	23.7966	26.2953	27.8230
45	satellite	3.9358	22.8958	23.7578	26.0631	27.8472

Table : Result with PSF=5X5, noisevar=0.001

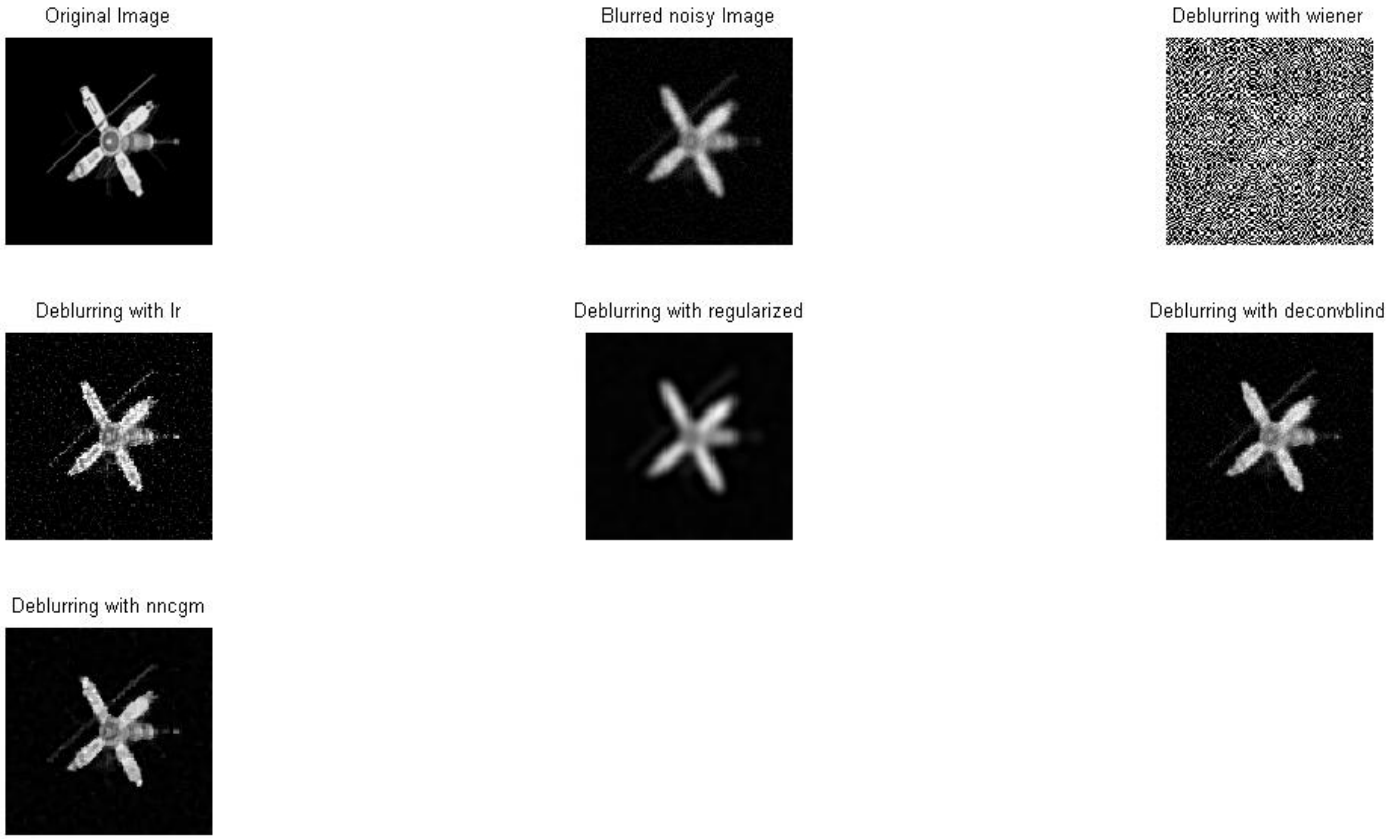

Figure : result with PSF=5X5, sigma=15, noisevar=0.001

sigma	image	Wiener	LR	Regularized	Decon	NNCGM
		psnr	psnr	psnr	psnr	psnr
15	license	4.9973	19.8336	29.2548	25.4769	21.5675
30	license	5.0245	19.7909	27.2769	25.4637	21.4644
45	license	5.0195	19.7975	27.2420	25.5416	21.4976

Table : Result with PSF=5X5, noisevar=0.01

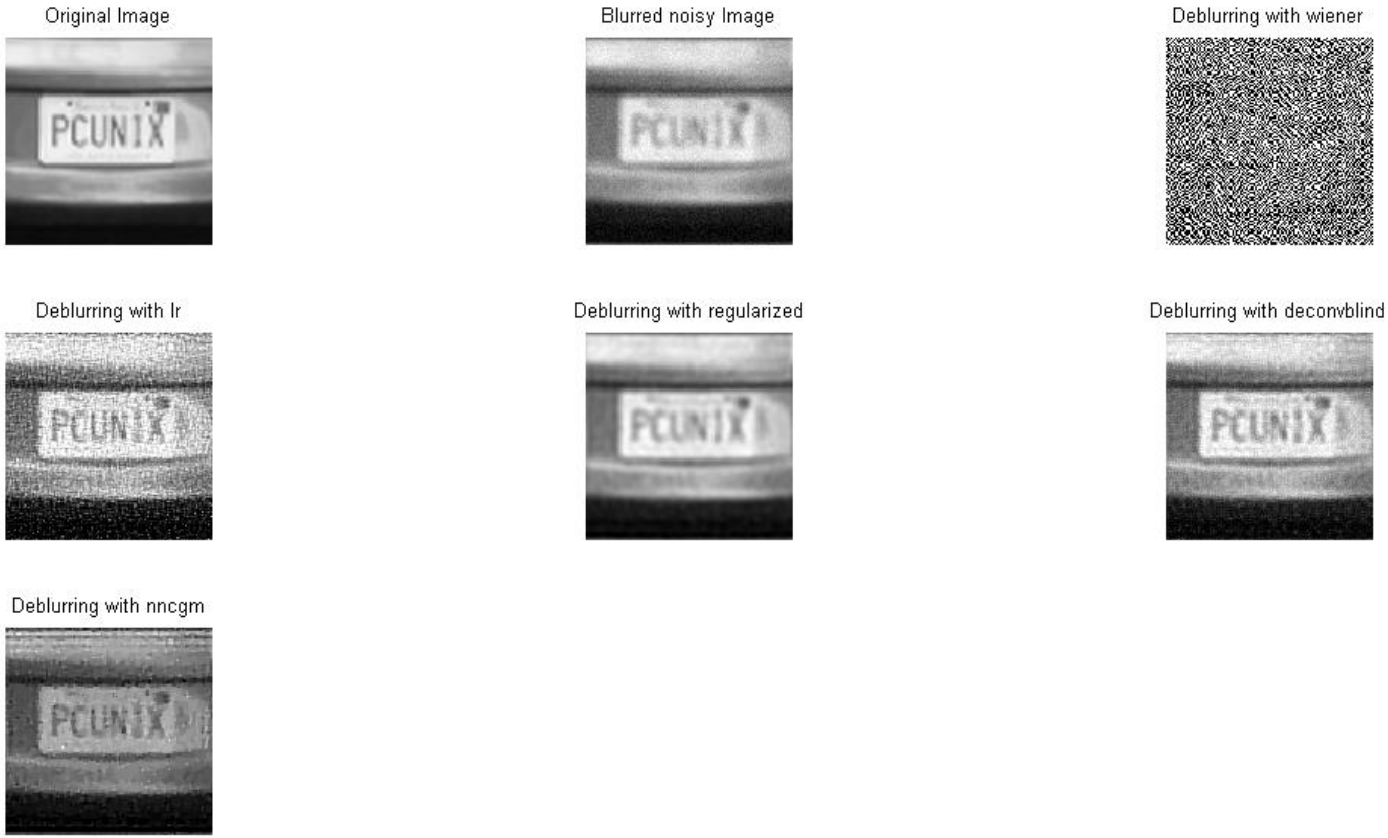

Figure : result with PSF=5X5, sigma=40, noisevar=0.01

psf	image	Wiener	LR	Regularized	Decon	NNCGM
		psnr	psnr	psnr	psnr	psnr
5X5	satellite	3.6140	15.5458	18.6767	20.4977	16.2139
9X9	satellite	3.4887	15.5262	17.3443	18.9824	16.9114

Table : Result with sigma=15, noisevar=0.001

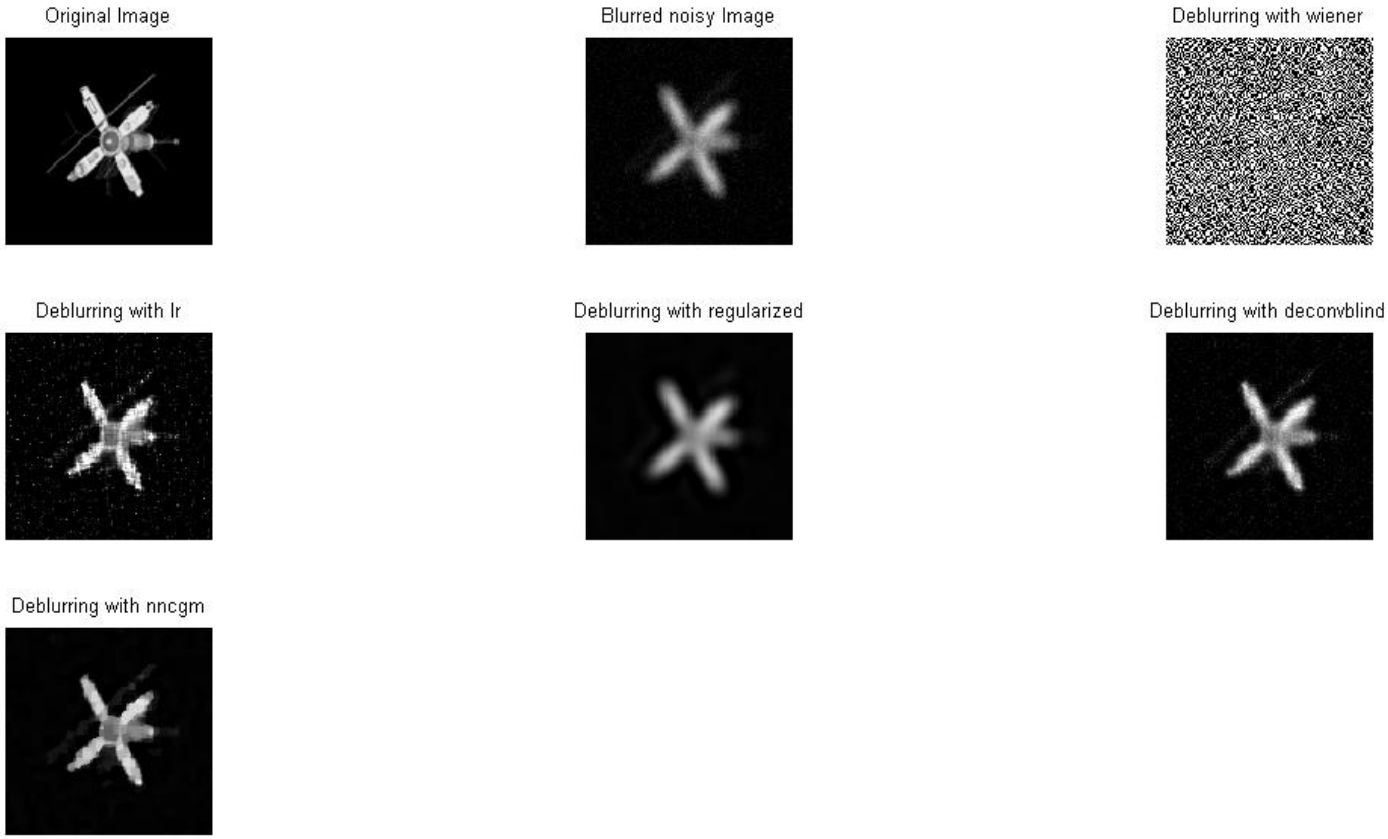

Figure : result with PSF=9X9, sigma=15, noisevar=0.001

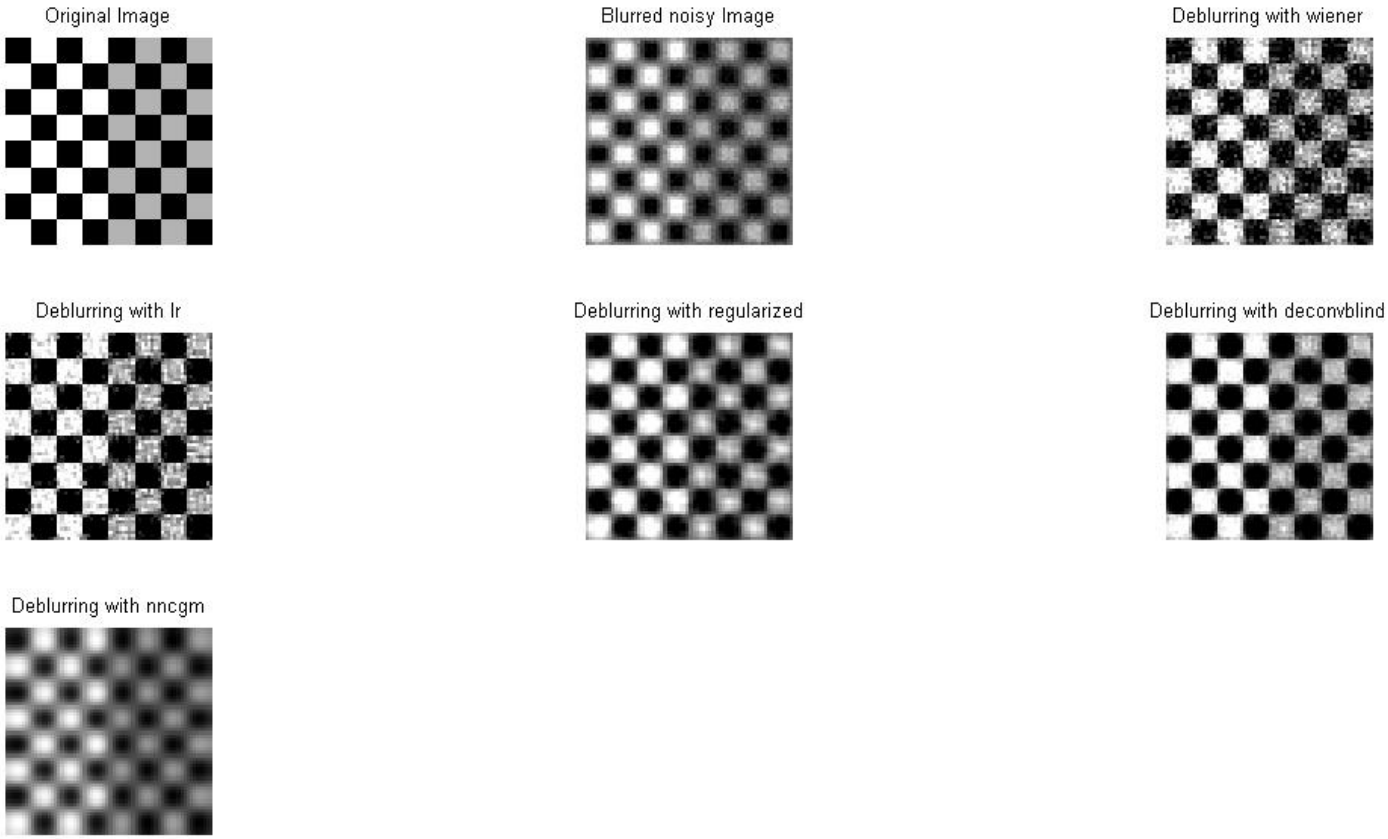

Figure : result with PSF=5X5, sigma=45, noisevar=0.001