Noise Level Adaptive Diffusion Model for Robust Reconstruction of Accelerated MRI (supplementary materials)

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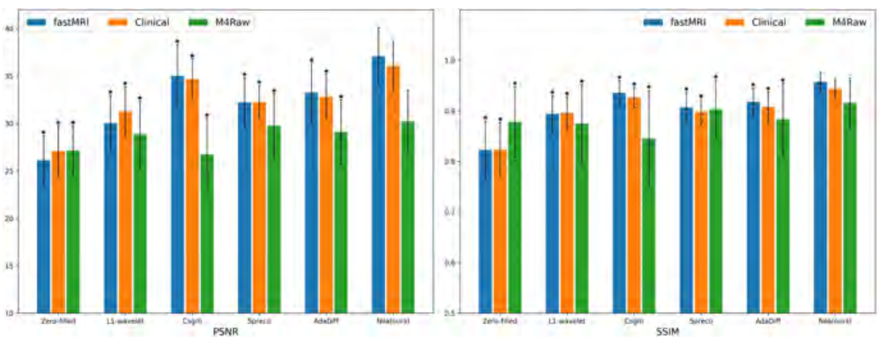

Fig. 1: Quantitative metrics (mean and standard deviation) and statistical analysis of different methods (6× on fastMRI and clinical dataset and 3× on M4Raw). ∗ means significant difference between the corresponding method and Nila method ($p < 0.0001$).

Table 1: Comparison of computation complexity of different methods on the clinical dataset. Input k-space matrix: (320×320). Hardware: GPU with Nvidia 4090 and CPU with AMD EPYC 9654 96-Core Processor.

Method	Step	Running time.(s)
CSGM	2000	107
Spreco	100	34
AdaDiff	1000	56
Nila(ours)	1000	31

Shoujin Huang and Guanxiong Luo contribute equally to this work.

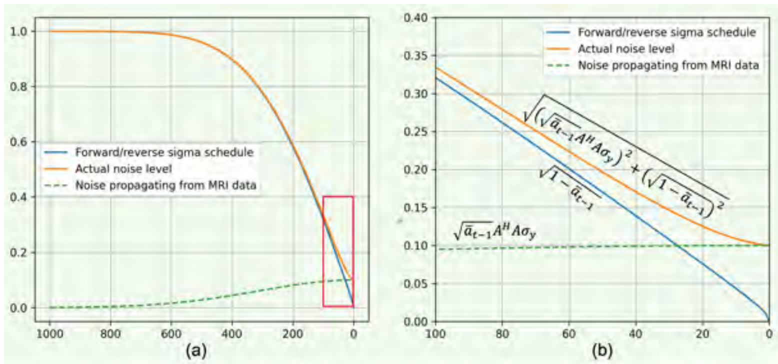

Fig. 2: An example of the reverse diffusion steps of diffusion model based MRI reconstruction, showing the effects from MRI noise interference. The X-axis represents T (index of reverse diffusion process), and the Y-axis represents sigma values of noise level/denoising schedule. (a) represents the global changes of the entire reverse process, while (b) illustrates the late stage of last 100 steps. Noise propagating from MRI data (green line) does not significantly affect the early-stage total noise level (orange line). However, it has a more pronounced impact in the later stages, as exemplified by the orange line deviating significantly from the blue line in (b).

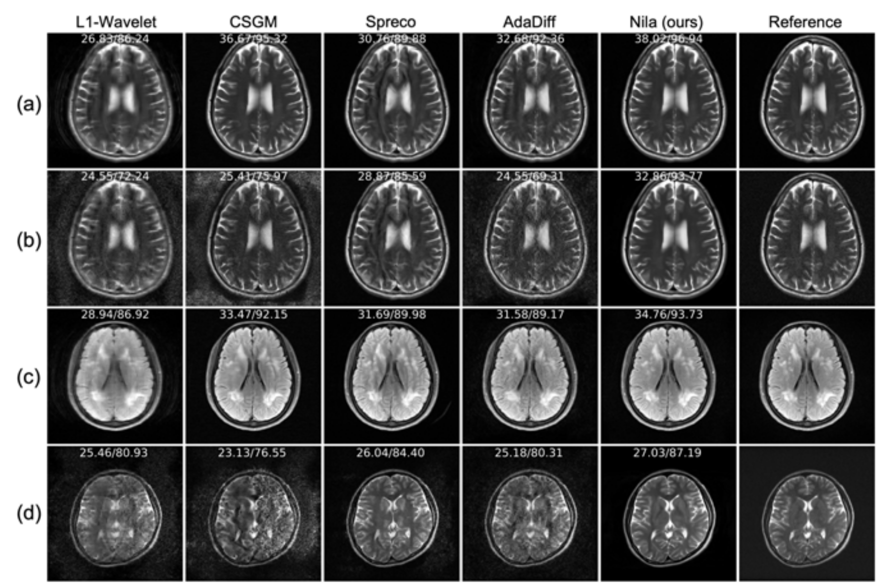

Fig. 3: Another set of typical reconstructed images. The white numbers indicate the PSNR/SSIM scores. (a) 6× acceleration on fastMRI. (b) 6× acceleration on fastMRI with added Gaussian noise. (c) 6× acceleration on the clinical dataset. (d) 4× acceleration on M4Raw.