

Supplementary Material for CVPR 2022 paper

Transformer-empowered Multi-scale Contextual Matching and Aggregation for Multi-contrast MRI Super-resolution

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1. The pelvic and brain Datasets

Two in-house private datasets: pelvic and brain and one public dataset: fastMRI are utilized in our experiments. For the private data, all studies have been approved by the local Institutional Review Board (IRB). The IRB asked us to protect the privacy of participants and to maintain the confidentiality of data. Since we cannot make the two datasets publicly available, we won't claim them as our contribution.

2. FLOPs and Parameters

We compare the FLOPs(G) and Parameters(M) of all mentioned methods in Tab. 1.

Table 1. The FLOPs(G) and Parameters(M) of all comparison methods and McMRSR.

Algorithm	FLOPs(G)	Params(M)
EDSR [3]	16.275	1.518
MCSR [5]	103.812	3.396
MINet [1]	866.933	6.898
MASA [4]	180.134	4.027
SwinIR [2]	116.699	0.879
Restormer [6]	282.151	26.098
McMRSR	258.595	4.080

For a fair comparison, we increase the number of feature maps of other methods (EDSR increased from 64 to 124, MSCR from [32, 64, 128, 256] to [48, 96, 192, 384], MASA from 64 to 68, and SwinIR from 60 to 150) to increase their FLOPs and parameters, as follows: EDSR: 243.069/5.686;

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MSCR: 247.780/6.363; MASA: 257.318/4.546; SwinIR: 705.080/5.405. The metrics values for these adjusted methods results on fastMRI [7] dataset with UF=4 in Tab. 2.

Table 2. The PSNR, SSIM, and RMSE($\times 10^{-2}$) values for these adjusted methods results on fastMRI dataset with UF=4.

Algorithm	PSNR	SSIM	RMSE
EDSR [3]	25.05(1.18)	0.70(0.02)	5.77(1.52)
MCSR [5]	28.74(1.42)	0.82(0.03)	3.14(1.10)
MASA [4]	31.41(1.17)	0.86(0.02)	2.58(0.77)
SwinIR [2]	31.08(1.28)	0.86(0.02)	2.67(0.93)
McMRSR	33.28(0.97)	0.90(0.02)	1.82(0.85)

The results demonstrate that McMRSR still outperforms other comparison methods, because the multi-scale contextual matching and aggregation scheme enable the target images to take full advantage of the really common information of the reference MRI.

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