

4 Conclusions

A new reconstruction method (PCA-RR) for highly undersampled MR images was proposed in this paper. When the k -space data is highly undersampled, it is important to draw on prior knowledge of the sample during the reconstruction. PCA-RR utilises the merits of a PCA-based pattern recognition procedure. In the meantime, it shares the benefits of reduced acquisition time as typical for CS schemes, filling the unsampled k -space data with an iterated procedure. The experimental results of two undersampled carrot images with different sampling rates were shown in this paper. The undersampled image via zero-filling FT can preserve more information when sampling at a higher rate. Furthermore, when the sampling rate is lower, more iterations are required to obtain the same result as with the higher sampling rate. Nevertheless, in both cases, the PSNR of PCA-RR is higher than PCA-CS, which demonstrated that PCA-RR was valid and superior to PCA-CS.

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