

Scientific Highlights

PIQE—Super Resolution* in High-Contrast Regions: A Phantom Study

Purpose of the Study

PIQE, a deep learning based Super-Resolution* Reconstruction (DLSRR) is an innovative image reconstruction technology designed to enhance spatial resolution and reduce noise.¹

This study evaluated the image quality achieved with PIQE (DLSRR) and explored its potential to deliver superior diagnostic performance in clinical practice.¹

- PIQE (DLSRR) showed the greatest noise reduction and the highest spatial resolution compared to FBP, HIR, MBIR, and DLR.¹
- Detectability index was highest for PIQE, indicating improved ability to visualize details.¹
- PIQE provided improved image quality in high-contrast regions compared with conventional iterative and deep-learning methods.¹

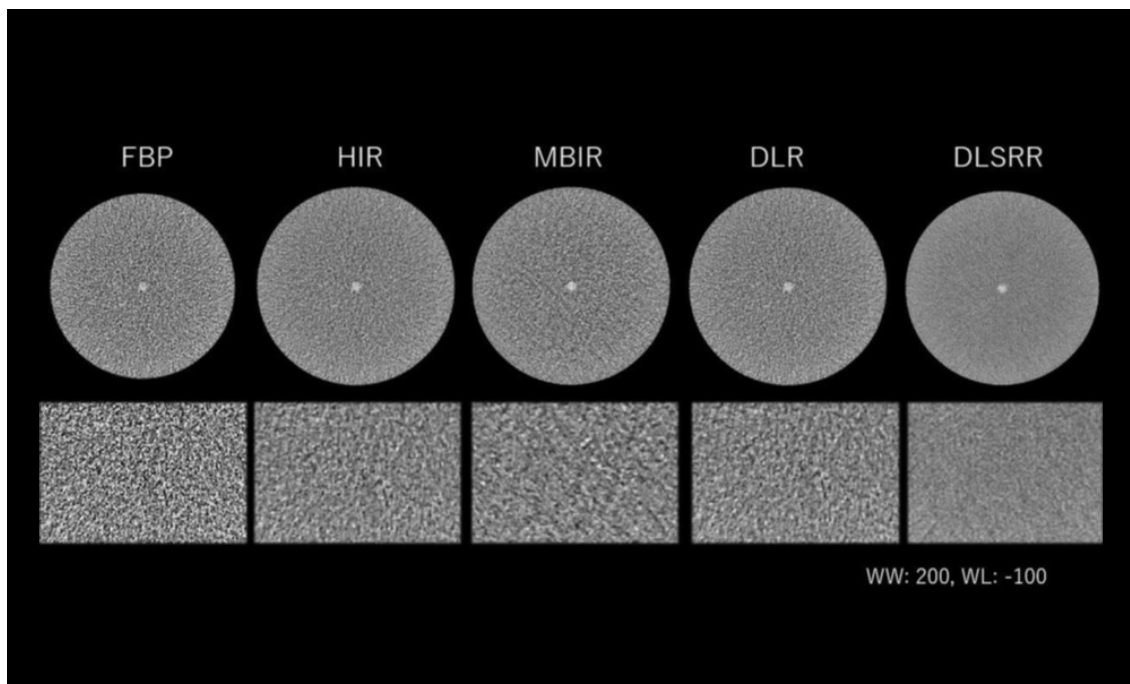


Figure 1: Noise level images obtained using each image reconstruction technique (reconstruction strength level: standard). The finest and lowest noise levels were obtained with DLSRR (PIQE).

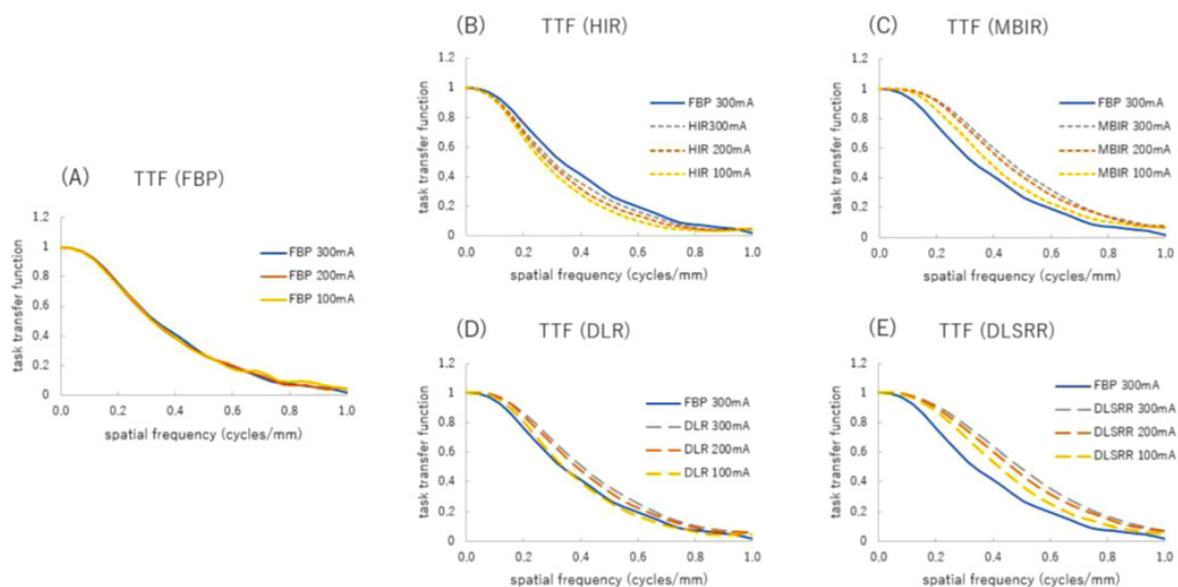


Figure 2: Across reconstruction strength levels, noise decreased while resolution (TTF) remained stable.

Conclusion

The findings of this study indicate that PIQE, deep learning based Super-Resolution* Reconstruction (DLSRR) provides significant improvements in image quality compared to conventional iterative and deep-learning reconstruction techniques.¹

PIQE achieved the greatest noise reduction and highest spatial resolution among all methods evaluated, while maintaining resolution stability across reconstruction strength levels.¹ Additionally, the highest detectability index observed for PIQE suggests enhanced capability for visualizing fine details.¹ These results support the potential of PIQE to improve diagnostic performance, particularly in high-contrast regions.¹

REFERENCE

* PIQE is designed to fully utilize the maximum resolution of the detector.

1. Impact of a Deep Learning-based Super-resolution Image Reconstruction Technique on High-contrast Computed Tomography: A Phantom Study, Academic Radiology, Volume 30, Issue 11, 2023, Pages <https://www.sciencedirect.com/science/article/abs/pii/S1076633222006961>.

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These results are based upon the customer's specific experience. There is no guarantee that other sites will achieve the same results due to variations in clinical setting, patient presentation and other factors.

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