Noise suppression in image-domain material decomposition for triple-energy CT

Triple-energy CT Images

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Noise variance estimation:
$$= \mathrm{diag}(\,\mathrm{var}(n_{f1}), \mathrm{var}(n_{f2}), \mathrm{var}(n_{f3}))$$

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PWLS-TV material decomposition:
$$\min_{X}(AX - F)^{T}\Sigma^{-1}(AX - F) + \lambda\,\mathrm{TV}(X)$$
$$s.t. \sum_{i=1}^{3} x_{i,j} = 1, 0 \le x_{i,j} \le 1, \forall i, j.$$

↓

Final decomposed images
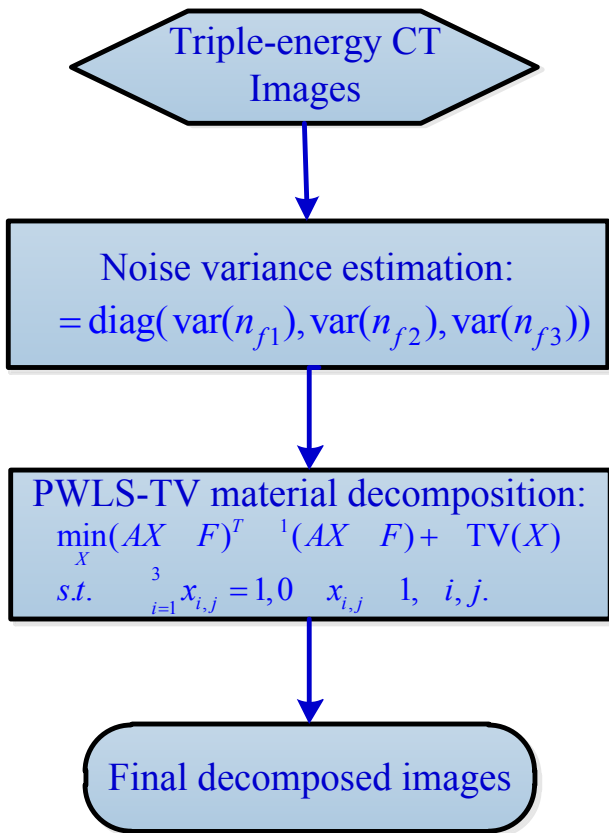
◆ **Analyzed the statistical properties of the material decomposition**

◆ **Developed a PWLS-TV method for noise suppression in material decomposition**
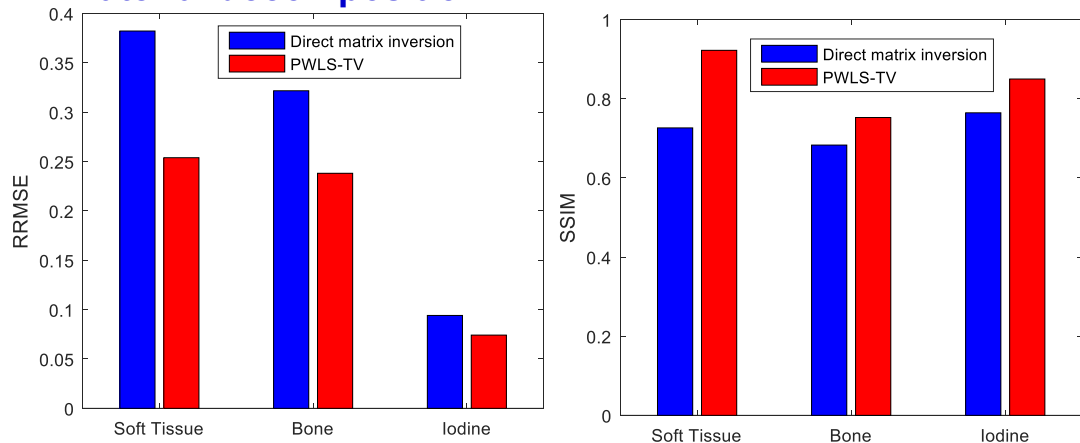
RRMSE and SSIM of the material decomposition images.

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