

# Thresholding Neural Network Image Enhancement Based on 2-D Non-separable Quaternionic Filter Bank

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**Abstract:** The thresholding neural network with a 2-D non-separable paraunitary filter bank based on quaternion multipliers (2-D NSQ-PUFB) for image enhancement is proposed. Due to the high characteristics of the multi-bands 2-D NSQ-PUFB (structure “64in-64out”, CG<sub>2D</sub>=17,15dB, CG<sub>2D</sub>=17,15dB, prototype filter bank (8×248×24) Q-PUFB), which forms the basis of the TNN, the results of noise editing in comparison with the approaches based on the two-channel wavelet transform in terms of PSNR are 1dB–1.5dB higher.

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