

Competitive Learning/Reflected Residual Vector Quantization For Coding Angiogram Images

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Summary

Medical images need to be compressed for the purpose of storage/transmission of a large volume of medical data. Reflected residual vector quantization (RRVQ) has emerged recently as one of the computationally cheap compression algorithms. RRVQ, which is a lossy compression scheme, was introduced as an alternative design algorithm for residual vector quantization (RVQ) structure (a structure famous for providing progressive quantization). However, RRVQ is not guaranteed to reach global minimum. It was found that it has a higher probability to diverge when used with nonGaussian and nonLaplacian image sources such as angiogram images. By employing competitive learning neural network in the codebook design process, we tried to obtain a stable and convergent algorithm. This paper deals with employing competitive learning neural network in RRVQ design algorithm that results in competitive learning RRVQ algorithm for the RVQ structure. Simulation results indicate that the new proposed algorithm is indeed convergent with high probability and provides peak signal-to-noise ratio (PSNR) of approximately 32 dB for angiogram images at an average encoding bit rate of 0.25 bits per pixel.

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