A VQ COMPRESSION METHOD BASED ON THE VARIATIONS OF THE IMAGE BLOCK GROUPS

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Abstract. *The conventional LBG (Linde-Buzo-Gray) algorithm consumes a great amount of running time to generate a codebook. In addition, it gives more codewords for describing the image regions with higher pixel intensity variance, but fewer codewords for depicting those with lower pixel intensity variance. This paper proposes a group-based VQ codebook generation method (GBVQCG method) to build a codebook. It classified the image blocks of an image into groups and determines the number of desired codewords which will be extracted from the image blocks in each group according to the standard deviation and the number of image blocks in the group. The experimental results show that the GBVQCG method generally performs much better in terms of the running time and the quality of the decompressed image, compared with the LBG compression method.*
Keywords: VQ, Standard deviation, LBG algorithm, Codebook

1. **Introduction.** Vector quantization (VQ) [1,4,8,10,12,13,15,18,20] is one of the commonly used image compression techniques. This method is not only simple to implement but also provides a high compression ratio. It can quickly reconstruct a decompressed image. In addition, if some of the compressed data are changed, only the image blocks containing the changed data are damaged, but the other section of the decompressed image is not affected. Thus, except for image compression, the VQ technique has many other applications [9,14,15,19,21]. For example, it is suitable for compressing the secret images in the field of image hiding [7,22]. Hence further increasing the performance of the VQ technique is necessary.

Codebook generation is the most important task in the VQ technique. A good codebook is helpful to the quality of a decompressed image. Many codebook generating algorithms have been proposed, such as the LBG algorithm [18], FKM (fuzzy K-means) [7], FVQ