MULTIPLE DESCRIPTION IMAGE CODING BASED ON FRACTAL

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ABSTRACT. *Multiple description (MD) has many applications in images transmission over unreliable channels or multiple path networks that can not guarantee lossless data delivery. In this paper, a MD method based on fractal image coding (MDFIC) is proposed. In the proposed scheme, after fractal image coding (FIC), MD scalar quantization(MDSQ) and MD lattice vector quantization(MDLVQ) are applied to create two descriptions for some FIC parameters. Meanwhile, a re-match scheme is proposed to create two descriptions for other FIC parameters. Compared with the referenced MDC approaches, the experimental results demonstrate that the proposed scheme yields acceptable performance even when only one description is received.*
Keywords: FIC, Multiple description, Estimation, Iterated function system

1. **Introduction.** Network congestion and delay sensibility pose great challenges for multimedia communication systems. This creates a need for coding approaches combining high compression efficiency and robustness. Multiple description coding (MDC) has emerged as an attractive framework for robust transmission over unreliable channels. It can efficiently combat packet loss without any retransmission, thus satisfying the demand of real time services and relieving the network congestion [1]. MDC encodes the source message into several bit streams, so called descriptions, carrying different information which can then be transmitted over different channels. If only one channel works, the description can be individually decoded to sufficiently guarantee a minimum fidelity reconstruction at the receiver. However, when more channels work, the descriptions can be combined to yield a higher fidelity reconstruction.

Recently, there have been lots of methods about MDC that use different strategies for coding variant data sources. A MDC based on scalar quantization is proposed in [2]. A MD scheme based on one dimensional image expansion is proposed by Gabrialla etc. which can achieve a good estimation of lost description when only one description is received [3]. This method is actually pre-processing in the encoder and post-processing in the decoder. Wang et al. propose a MD extension of a JPEG coder, using a class of pairwise correlating transform to create the multiple descriptions [4]. Servetto et al. apply MDSQ to wavelet-based image coders [5].

From the above analysis, we know that most MDC approaches are based on traditional coding methods, such as quantization, JPEG and wavelet. FIC is an intensively studied