

A FAST AND DYNAMIC REGION-OF-INTEREST CODING METHOD BASED ON THE PATTERNS IN JPEG2000 IMAGES

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ABSTRACT. *It is important for dynamic region-of-interest (ROI) coding method provided by JPEG2000 to process quicker than any other methods. In this paper, a fast and dynamic ROI coding method, which is based on the patterns, achieved by making up for the implicit ROI coding method and the modified implicit ROI coding method, is proposed. This new method reduces the time taken to distinguish the ROI without affecting algorithm complexity by scanning some parts of mask information and encodes the ROI based on the patterns immediately. It is suitable for applications by which it may be desirable to encode the ROI to a higher quality level than the background. Experimental results demonstrate that the proposed ROI coding scheme not only decreases the time of ROI coding dramatically but also improves compression efficiency and combines the advantages of the implicit ROI encoding method (low complexity) and the modified implicit ROI coding method (good ROI rate distortion performance).*

Keywords: Region-of-interest (ROI), Dynamic ROI coding, JPEG2000

1. Introduction. Images are used in diverse applications, such as mobile applications, medical diagnosis, web applications and image databases, associated with developing technologies of the Internet and multimedia [1,2]. It is difficult to transmit and display the images in diverse applications quickly, because they require large amounts of bandwidth and memory. In order to cope with this problem, ROI coding provided from JPEG2000 is needed. ROI coding is capable of delivering highly reconstructed quality of user-specified spatial regions in a limited time. These regions are encoded into higher quality than the background. As a result, they will first be transmitted with higher priority during the transmission of the image [3,4]. The advantage of ROI coding provides low bit-rate operation with rate-distortion and subjective image quality performance. ROI coding is critical in applications where certain parts of an image such as the low depth of field (DOF) introduced by K. Zhang [5] are more important than others, such as background.

ROI coding methods are classified into two methods based on the time on which the ROI is defined. They are the static method and the dynamic method. Users are able to define ROI by themselves; it can also be done automatically by using the features of an image. Recent studies in automatic ROI definition have been discussed by T.-C. Chen [6], J.-B. Li [7], and M. Weng [8]. The static method specifies the ROI over encoding an image. This method, including Maxshift [9] and general scaling-based [10] and so on, is sufficient enough for a lot of applications. In some cases, the dynamic method is necessary when the ROI information is unknown until the time of decoding in interactive environments. The dynamic method specifies the ROI over decoding an image, in which the ROI was not coded [4]. This method is valued in interactive server/client applications