Chapter 9
Review on Image Representation Compression and Retrieval Approaches

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ABSTRACT

Image representation and compression is one of the important fields of computer vision that contribute to the reduction of size of an image and other types of application areas such as image restoration, retrieval, etc. Image representation is important with respect to storage of image information, and it further extends to the compression, which may be lossy or lossless. Image compression can be applied to various applications which mainly include medical imaging, traffic monitoring, military, multimedia transmission, smart cell devices, and almost in all the domains that require less transmission and storage cost, specifically image retrieval processing. This chapter presents the various image representation compression and retrieval approaches. The retrieval approaches on personal computer and smart cell devices are discussed. Finally, the key issues are identified for image representation compression and retrieval on the basis of performance evaluation parameters like encoding time, decoding time, compression ratio, precision, recall, and elapsed time.

INTRODUCTION

A two dimensional image is a finite set of digital values generally call it as pixels or picture element. The images display on the digital computing system having a unique representation and that is mostly belongs to the type of binary, gray, color or indexed color. The representation of images are related to the space and time required to store and display and depending upon the type of images space required to store may vary. For example if we consider the binary image having a resolution of 200×200 then according to one 1 bit/pixel it will required 400 bits . For the comparable gray images it will take 3200

and color images it will take 9600 bits. Although True color image take lot of space to store and almost three times the gray images hence indexed images minimizes the intensity values up to 4, 16 and 256 which will ultimately leads to the memory saving but it compromises the quality. The significant role performs by the mechanism of image compression which removes the redundancies and not only reduced the space but also reduces the accessing or display time for the images or multimedia transmission. In the context of multimedia domain variety of application areas are present which specifically include the image transmission of query image and retrieval of image data from the server side stored in the repository.

But the retrieval of images takes more time to access data from the server side when images need to be displayed on Mobile devices as in Figure 1 and having a less computational power. Hence, the compression is playing important role in the multimedia domain. There are good no. of literatures are available which mainly dealing with the image processing operation like image representation, compression and retrieval which is discussed in the next section.
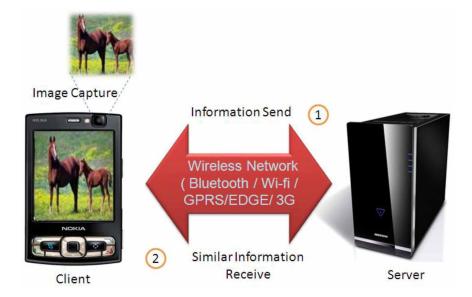
RELATED WORK

Various authors contributed for the image representation scheme applied on various domain of application, such as image restoration compression, retrieval etc. The following section contributes towards the image representation, compression and retrieval approaches.

Image Representation on PC

For the retrieval and image recognition, image representation using low dimensional features is important. X. He et al. (2016) proposed a image representation technique based the perspective of statistical design. The proposed algorithm called A-optimal having better representation capability and gives the

Figure 1. Query image send over wireless channel for retrieval

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