

Image Retrieval Using Intensity Gradients and Texture Chromatic Pattern: Satellite Images Retrieval

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ABSTRACT

Methods to retrieve images involve retrieving images from the database by using features of it. They are colour, shape, and texture. These features are used to find the similarity for the query image with that of images in the database. The images are sorted in the order with this similarity. The article uses intra- and inter-texture chrominance and its intensity. Here inter-chromatic texture feature is extracted by LOCTP (local opponent colored texture pattern). Local binary pattern (LBP) gives the intra-texture information. Histogram of oriented gradient (HoG) is used to get the shape information from the satellite images. The performance analysis is land-cover remote sensing database, NWPU-VHR-10 dataset, and satellite optical land cover database gives better results than the previous works.

KEYWORDS

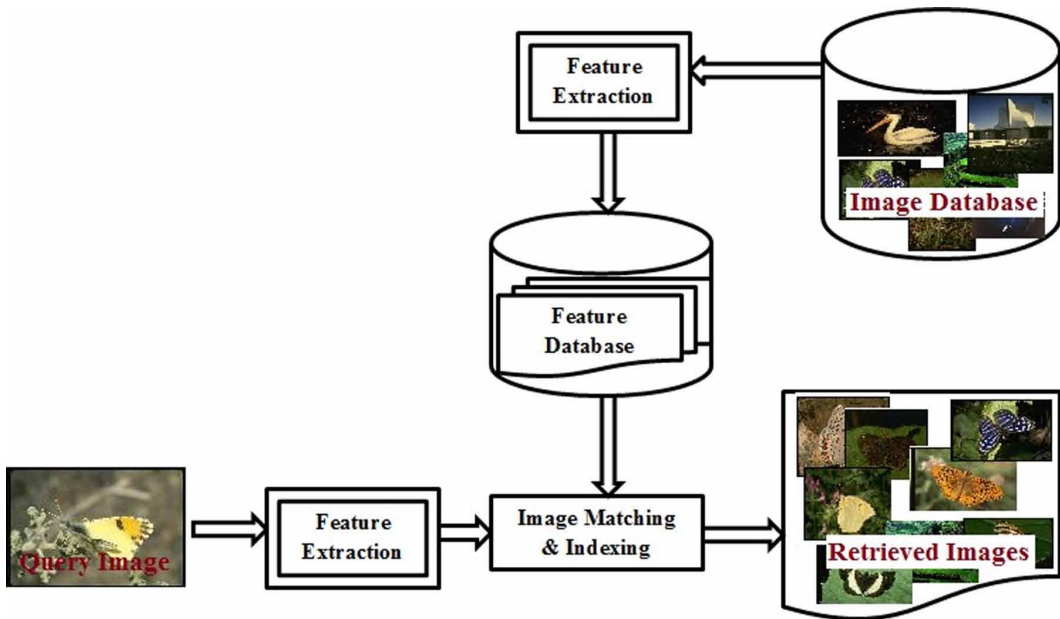
Accuracy, Histogram of Oriented Gradient, Image Retrieval, Satellite Images, Texture

INTRODUCTION

Images are used in diverse fields like medicine, education, advertising, journalism and entertainment. The enormous advances of technology resulted in inventions of electronic devices facilitate capturing and communication of images. Lot of users are attracted towards collection and processing of images in different application areas such as satellite, medicine and art works. These images should be collected and processed for retrieving the information. The uncontrollable increase in number of images make the retrieval from huge database very complex and devising an algorithm for gathering of information becomes the need of the hour. This led to a good drive for the text-based image retrieving system.

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Figure 1. General scheme of CBIR



Normal image retrieving system uses text to represent and retrieve images from databases (Del 1999). Text-based methods need artificial work to mark images with text labels. While artificial text labels are usually subjective, inconsistent and less expressive, these methods are very much time complex and not very effective. The annotator's perception of an image may not reflect that of the user necessarily since meaning and description of an image vary with individual understanding (Enser 1993).

Researchers conclude that effective retrieval of images is possible only by taking account of the visual content of them. This led to the development of CBIR, which retrieves images based on their content-based features. In CBIR systems, multidimensional feature vectors can be used to describe the visual contents of images, and these are stored to form a feature database. The flow of data that occurs during the execution of CBIR system is illustrated in Figure 1. The system converts the query image into feature vector representations based on the algorithm used for feature extraction. Likewise, the database images are also converted into their feature vectors. The image will be fed into the algorithm which extracts the features in terms of color, texture or shape or combination of these features are used for comparison. The similar images of the query are taken from the database based on the feature vectors. Remote sensing image retrieval methodology has observed the improved attention according to the huge collection of data from the satellites. The efficient retrieval of related data from the satellite images is required to provide the retrieval from CBIR technique.

RELATED WORK

The idea of using a picture for information extraction came into existence in the year 1979. It was proposed in a conference on Pictorial Applications which was held in Florence (Smeulders et al., 2000). Heavy explosion of pictures makes the effective managing of this a critical issue. In 1992, new directions in image database management were identified by another which was conducted by the National Science for Visual Information Management Systems (Hirata & Kota 1992). Since 1992, multidimensional researches were done for meeting the aim by using low level features. CBIR methods can be of three categories: unsupervised method, half supervised method and supervised method

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