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Promising Large Scale Image Retrieval by using Intelligent Semantic Binary Code Generation Technique

Anuja khodaskar[a] , Siddarth Ladhake[b] *

[a]*SIPNA COET, Badnera Road,Amaravti- 444607, India*
[b]*SIPNA COET, Badnera Road,Amaravti- 444607, India*

Abstract

A scalable content based image retrieval system for large-scale www database is designed and implemented. Million images on internet is big challenge for accurate and efficient image retrieval as per user requirement. Proposed system exploits semantic binary code generation techniques with semantic hashing function, fine and coarse similarity measure technique, automatic and manual relevance feedback technique which improve accuracy, speed of image retrieval. With dramatic growth of internet technology, scalable image retrieval system is a need of recent web based image retrieval applications such as biomedical imaging, medical diagnosis, space science application etc. Proposed system accomplish requirement of scalable, accurate and swift image retrieval system. Experimental result clearly shows that performance of image retrieval is improved in term of accuracy, efficiency and retrieval time.

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Keywords: Accuracy; content based image retrieval; hashing function; large scale database; retrieval time; web based image retrieval;

* Corresponding author. Tel.: +91-721-252-2341; fax: +91-721-252-2341.
*E-mail address:*annujha51@gmail.com

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1. Introduction

Advance development in Internet technologies result in generation of large-scale image data which help to decipher crisis in existing computer vision and numerous real-world applications. These large scale image dataset need competent large-scale processing techniques for efficient and effective image retrieval system. For browsing and searching image from large data, user necessitates compelling interfaces and functionalities for capturing visual attributes. Image retrieval is related to the fields of image processing, multimedia, digital libraries, remote sensing, astronomy, database applications and others related area.

1.1. fundamental of content based image retrieval

Image retrieval is deal with searching and retrieving digital images from a huge database. An effective image retrieval system is able to operate on the collection of images to retrieve the relevant images based on the query image which conforms as closely as possible to human perception. According to database management and computer vision communities, there are two different perspectives, text-based and content or visual based. Text-based image retrieval techniques use text to describe the content of the image and content based image retrieval used image visual features to describe the content of images.

- Conventional or text based image retrieval

Conventional image retrieval is text based retrieval system where keywords are used as descriptors to index an image. Text-based image retrieval techniques use text to describe the content of the image which often causes vagueness and insufficiency in performing an image database search and query processing. Weakness of text based image retrieval is difficulty in specifying exact terms and phrases in describing the content of images as keywords. Textual annotations are based on language, difference in annotation change retrieval result totally.

- Content or visual based Image Retrieval

Visual Image Retrieval is content based image retrieval system use visual features such as colour, texture, shape and spatial relations and or high level which extracted from the image itself.

1.2. Need of improvement in large scale image retrieval

Large scale image search is challenging search for particular image through a large database to find similar target images. It involve internet search to find similar images. Basic requirement of today's search engine is that it should be fast, accurate and scalable to large data set. As per prerequisite of many real word application such as medical application, space application etc., they need fast and accurate retrieval result. Internet is full of millions of images which increase rapidly as with growth of internet, hence, it is really challenging to measure similarity between images and image retrieval system with large and growing database. Existing image retrieval systems are slightly imprecise, time consuming and not scalable. To overcome these issues, research need to improve accuracy and speed of existing image retrieval system.

2. Recent related work

In this section, we discuss some recent innovative development in large scale image retrieval field such as Sentiment of image detection, image search boosted with iterative quantization hashing method, removal of noisiness in retrieval by two sage searches with query log analysis. New-fangled techniques in large scale image retrieval technique are also involved such as latent semantic analysis, query-adaptive reranking, and dimensionality reduction methods, a novel indexing based on a graphical model or a matrix factorization.

Coupled Binary Embedding for Large-Scale Image Retrieval is introduced with successful and accurate image retrieval [1]. Proposed system exploits multiple binary features at indexing level, multi-IDF scheme, hamming embedding and the fusion of binary colour feature into image retrieval. Content-based large-scale image retrieval using framework of VLAD and Product Quantization is proposed [2]. The system is employing more efficient and discriminative local features, improving the quality of the aggregated representation; and optimizing the indexing scheme. Latent semantic analysis is applied successfully and cost effectively to large-