One Click Intent Image Search

Pandav Anand, Muke Sonal, Kore Sudarshan, Sangade Komal

***Abstract:** Web-scale image search engines (e.g. Google Image Search, Bing Image Search) mostly rely on surrounding text features. It is difficult for them to interpret users' search intention only by query keywords and this leads to ambiguous and noisy search results which are far from satisfactory. It is important to use visual information in order to solve the ambiguity in text-based image retrieval. In this paper, we propose a novel Internet image search approach. It only requires the user to click on one query image with the minimum effort and images from a pool retrieved by text-based search are re-ranked based on both visual and textual content. Our key contribution is to capture the users' search intention from this one-click query image. Many commercial Internet scale image search engines use only keywords as queries. Users type query keywords in the hope of finding a certain type of images. The search engine returns thousands of images ranked by the keywords extracted from the surrounding text. It is well known that text-based image search suffers from the ambiguity of query keywords. The keywords provided by users tend to be short. For example, the average query length of the to 1, 000 queries of pic search is 1.368 words, and 97% of them contain only one or two words . They cannot describe the content of images accurately. The search results are noisy and consist of images with quite different semantic meanings. In order to solve the ambiguity, additional information has to be used to capture users' search intention. One way is text-based keyword expansion, making the textual description of the query more detailed. Existing linguistically-related methods find either synonyms or other linguistic-related words from thesaurus, or find words frequently co-occurring with the query*

***Keywords:** We do believe that adding visual information to image search is important. However, the interaction has to be as simple as possible. The absolute minimum is One-Click.*

I. INTRODUCTION

Web-scale image search engines (e.g. Google Image Search, Bing Image Search) mostly rely on surrounding text features. It is difficult for them to interpret users' search intention only by query keywords and this leads to ambiguous and noisy search results which are far from satisfactory. It is important to use visual information in order to solve the ambiguity in text-based image retrieval. In this paper, we propose a novel Internet image search approach. It only requires the user to click on one query image with the minimum effort and images from a pool retrieved by text-based search are re-ranked based on both visual and textual content.

Revised Manuscript Received on 30 January 2015.

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Our key contribution is to capture the users' search intention from this one-click query image in four steps.

(1) SimRank Algorithm
(2) Colour Moment
(3) Canny edge detection
(4) Texture extraction

This document aims at defining the overall software requirements for intent image search. Efforts have been made to define the requirement exhaustively and accurately

II. PROBLEM STATEMENT

In this project, we propose a novel Internet image search approach. It requires the user to give only one click on a query image and images from a pool retrieved by text-based search are re-ranked based on their visual and textual similarities to the query image. We believe that users will tolerate one-click interaction which has been used by many popular text-based search engines .For example, Google requires a user to select a suggested textual query expansion by one-click to get additional results. The key problem to be solved in this paper is how to capture user intention from this one-click query image.

Purpose

Every day the average person with a computer faces a growing flow of multimedia information particularly via the Internet. But this ocean of information would be useless without the ability to manipulate, classify, archive and access them quickly and selectively. While text indexing is ubiquitous, it is often limited, tedious and subjective for describing image content.

desired image from a small collection simply by browsing. More effective techniques are needed with collections containing thousands of items.

Existing Systems:

In Existing system, one way is text-based keyword expansion, making the textual description of the query more detailed. Existing linguistically-related methods find either synonyms or other linguistic-related words from thesaurus, or find words frequently co occurring with the query keywords.

Proposed system:

In Proposed system, we propose a novel Internet image search approach. It requires the user to give only one click on a query image and images from a pool retrieved by text based search are re-ranked based on their visual and textual similarities to the query image. We believe that users will tolerate one-click interaction which has been used by many popular text-based search engines.

For example, Google requires a user to select a suggested textual query expansion by one-click to get additional results. The key problem to be solved in this paper is how to capture user intention from this one-click query image.

III. System Architecture

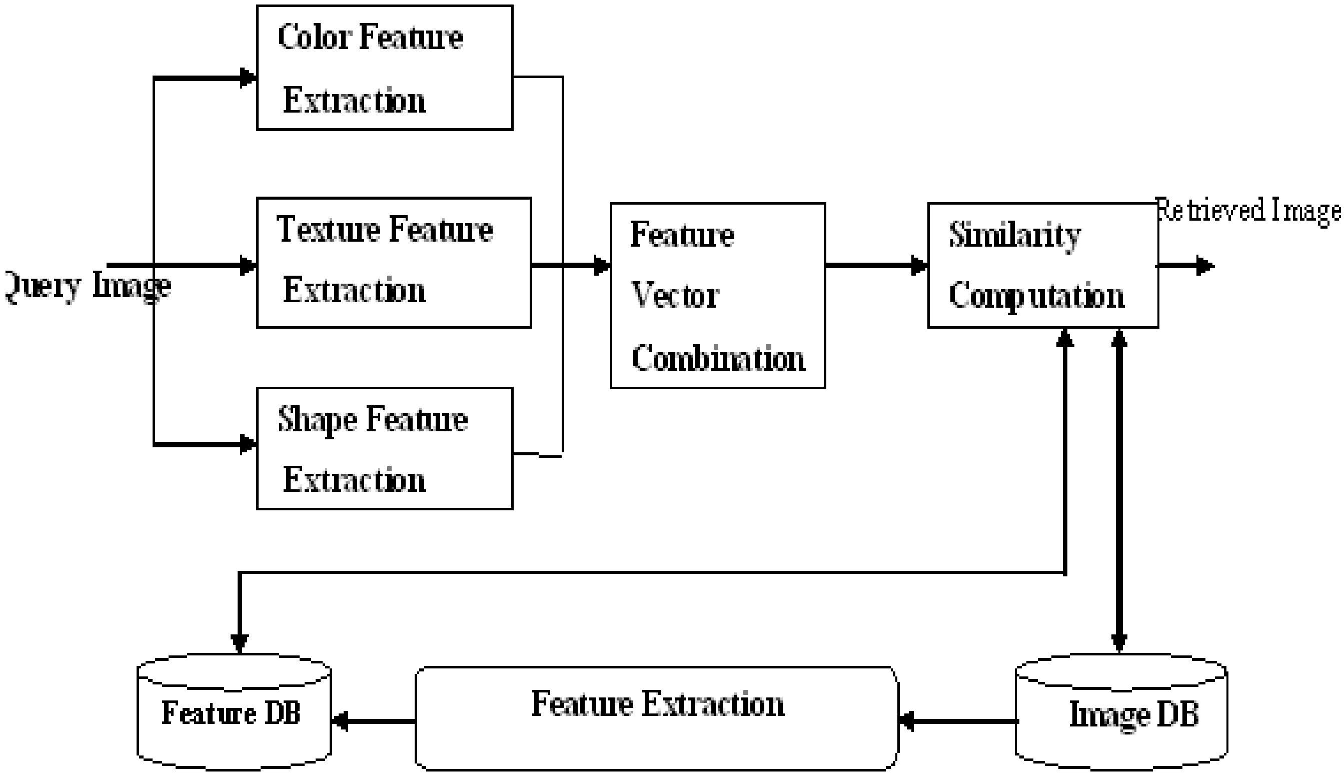

Fig1. System Architecture

We use four algorithm mainly in implementation

(1) SimRank Algorithm

(2) Colour Moment

(3) Canny edge detection

(4) Texture extraction

We will studied this algorithm in detail one by one

1) Simrank Algorithm

Many application require a measure of "similarity" between objects. One obvious example is the "find-similar-document" query, on traditional text corpora or the World Wide Web. More generally, a similarity measure can be used to cluster objects, such as for collaborative filtering in a recommender system which “similar” users and items are grouped based on the users’ preferences.

Various aspects of objects can be used to determine similarity, usually depending on the domain and the appropriate definition of similarity for that domain. In a document corpus, matching text may be used, and for collaborative filtering, similar users may be identified by common preferences. Sim Rank is a general approach that exploits the object-to-object relationships found in many domains of interest. On the Web, for example, two pages are related if there are hyperlinks between them. A similar approach can be applied to scientific papers and their citations, or to any other document corpus with cross-reference information. In the case of recommender systems, a user’s preference for an item constitutes a relationship between the user and the item. Such domains are naturally modeled as graphs, with nodes representing objects and edges representing relationships.The intuition behind the Sim Rank algorithm is that, in many domains, similar objects are referenced by similar objects. More precisely, objects and are considered to be similar if they are pointed from objects and respectively, and are themselves similar. The base case is that objects are maximally similar to themselves.It is important to note that Sim Rank is a general algorithm that determines only the similarity of structural context. Sim Rank applies to any domain where there are enough relevant relationships between objects to base at least some notion of similarity on relationships.

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Obviously, similarity of other domain-specific aspects are important as well; these can — and should be combined with relational structural-context similarity for an overall similarity measure. For example, for Web pages SimRank can be combined with traditional textual similarity; the same idea applies to scientific papers or other document corpora. For recommendation systems, there may be built-in known similarities between items (e.g., both computers, both clothing, etc.), as well as similarities between users (e.g., same gender, same spending level). Again, these similarities can be combined with the similarity scores that are computed based on preference patterns, in order to produce an overall similarity measure.

2) Canny edge

The purpose of edge detection in general is to significantly reduce the amount of data in an image, while preserving the structural properties to be used for further image processing.

John F. Canny proposed edge detection algorithm (JFC) in 1986 . Even though it is quite old, it has become one of the standard edge detection methods and it is still used in research.

The algorithm runs in 5 separate steps:

1. Smoothing: Blurring of the image to remove noise.

2. Finding gradients: The edges should be marked where the gradients of the image has large magnitudes.

3. Non-maximum suppression: Only local maxima should be marked as edges.

4. Double thresholding: Potential edges are determined by thresholding.

5. Edge tracking by hysteresis: Final edges are determined by suppressing all edges that are not connected to a very certain (strong) edge.

Implementation of Canny Edge Detection

1. The (source) image and the thresholds can be chosen arbitrarily.

2. Only a smoothing filter with a standard deviation of A= 1.4 is supported

3. The implementation uses the “correct” Euclidean measure for the edge strengths.

4. The different filters cannot be applied to edge pixels. This causes the output image to be 8 pixels smaller in each direction.

3) Color Model

Color moments are measures that can be used differentiate images based on their features of color. Once calculated, these moments provide a measurement for color similarity between images. These values of similarity can then be compared to the values of images indexed in a database for tasks like image retrieval.

The basis of color moments lays in the assumption that the distribution of color in an image can be interpreted as a probability distribution. Probability distributions are characterized by a number of unique moments (e.g. Normal distributions are differentiated by their mean and variance). It therefore follows that if the color in an image follows a certain probability distribution, the moments of that distribution can then be used as features to identify that image based on color.

We calculate six values for color model

1.Mean

2.Skewness

3.Mean Deviation

4) Co-occurrence matrix

A co-occurrence matrix or co-occurrence distribution (less often co occurrence matrix or co occurrence distribution) is a matrix or distribution that is defined over an image to be the distribution of co-occurring values at a given offset. Mathematically, a co-occurrence matrix **C** is defined over an **n × m** image **I**, parameterized by an offset **(Δx,Δy)**, as:

$$C_{\Delta x,\Delta y}(i,j)=\sum_{p=1}^{n}\sum_{q=1}^{m}\begin{cases}1, & \text{if } I(p,q)=i \text{ and } I(p+\Delta x,q+\Delta y)=j\\ 0, & \text{otherwise}\end{cases}$$

where *i* and *j* are the image intensity values of the image, *p* and *q* are the spatial positions in the image **I** and the offset **(Δx, Δy)** depends on the direction used θ and the distance at which the matrix is computed *d*. The 'value' of the image originally referred to the grayscale value of the specified pixel, but could be anything, from a binary on/off value to 32-bit color and beyond. Note that 32-bit color will yield a $2^{32} \times 2^{32}$ co-occurrence matrix!

IV. CONCLUSION

In this topic, we propose a novel Internet image search approach which only requires one-click user feedback. Intention specific weight schema is proposed to combine visual features and to compute visual similarity adaptive to query images. Without additional human feedback, textual and visual expansions are integrated to capture user intention. Expanded keywords are used to extend positive example images and also enlarge the image pool to include more relevant images. This framework makes it possible for industrial scale image search by both text and visual content. The proposed new image re ranking framework consists of multiple steps, which can be improved separately or replaced by other techniques equivalently effective. In the future work, this framework can be further improved by making use of the query log data, which provides valuable co-occurrence information of keywords, for keyword expansion.

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One shortcoming of the current system is that sometimes duplicate images show up as similar images to the query. This can be improved by including duplicate detection in the future work. Finally, to further improve the quality of re-ranked images, we intent to combine this work with photo quality assessment work in to re-rank images not only by content similarity but also by the visual quality of the images.

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