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Research Paper

A RESEARCH AND DESIGN METHOD ON DIFFERENT IMAGE RETRIEVAL TECHNIQUES IN A SIMILARITY MANAGEMENT ALGORITHM FOR IMAGE DATABASE

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This paper provides an overview of the special to some science or trade good things done in the make observations area of connection take-back (RF) in content-based image acts to get back (CBIR). connection take-back is a powerful way of doing in CBIR systems, in order to get better the doing a play of CBIR effect. It is an open make observations area to the person making observations to get changed to other form the semantic space or time in between low-level features and high level ideas of a quality common to a group. The paper covers the current state of art of the make observations in connection take-back in CBIR, different connection take-back techniques and issues in connection take-back are had a discussion about in detail.

Keywords: Relevance feedback, Long-term learning, Short-term learning, Image retrieval, Content-based image retrieval, Semantics

INTRODUCTION

Lately, there is a quick growth of digital image data on the internet and in digital libraries. The month before birth day of Christ of internet has made information having the same and way in more comfortable. internet users are giving way to into information exchange. getting back information from the World Wide net of an insect has become a common experience. However with the day by day increase in size of the net of an insect, more than enough information introduced heterogeneity of this information makes classical information acts to get back techniques not having effect. looking for and getting back information as desired has become a serious physical acts

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offer. information having the same has increasingly become a common surprising event among the users today high rate of motion networks. moves-forward in technology, enables a range of different types of information ready (to be used). However this heterogeneity surely questions technology to make ready good at producing an effect ways for making way in, sharing, place for storing of such heterogeneous information over the networks and knowledge-bases. needing payment to moves-forward in the digital pictures technology, greatly sized place for storing capacity and high rate of motion networks, storing greatly sized amounts of high quality images has become possible. digital images discover a wide range of applications in field of medical substance, science (medical and scientific images), at virtual museums and buildings for works of art, military and safety purposes, and personal picture by camera books of pictures and so on. while trading with this sort of information like putting (oneself) into orderly mind and looking for greatly sized volumes of images in knowledge-bases, users can have being hard to do (with), as the current business, trading knowledge-base systems are designed for of, in the wording data, it is not well was good, right for and able to exist together for digital images. as an outcome of that there is a need for a good at producing an effect way for image acts to get back. In order to support to this need, persons making observations have came before the law, questioned before a judge, getting stretched out the current information acts to get back (Ir) techniques that are used in text acts to get back to the area of the image acts to get back. There are different ways to get back the images in CBIR. Ritendra Datta et Al, Rui and Huang, Smeulders et Al and Kokare et Al had presented complete and nearby much literature take views of on content based image acts to get back. The oldest careful way is text note to images in the knowledge-base. image note is tiresome work. Because, it is almost not possible to take notes of all the images in the knowledge-bases. Second it is also very hard to ticket giving name (joined to clothing) the same notes to the same image by different users. To house such important limiting conditions, persons making observations have turned their attention to content-based image acts to get back. In CBIR systems, low level image features are got from based on seeing What is in such as color, form and feeling of a material. which are represented by point vectors instead of a put of keywords. however, great-sized physical acts offer in CBIR is the semantic nothing between the low level features and high level ideas of a quality common to a group. In order to get changed to other form the nothing between the low level features and high level ideas of a quality common to a group, connection take-back was introduced into CBIR, lately, many persons making observations began to take into account the RF as an order or learning hard question. That is an user provides positive and/or not examples, and the systems learn from such examples to separate all data into on the point and not on the point groups. for this reason many classical machine learning designs may be sent in name for to the RF such as, decision tree learning, bayesian learning, , support vector machines, making stronger and so on.

Another physical acts offer in CBIR systems is multidimensional giving pointer. In CBIR systems, the seeing content of image features is high-dimensional number data. So it is hard to manage these data with old and wise knowledge-base systems, because these systems are designed for text data and low-dimensional number data. as an outcome of that many persons making observations have offered systems for listing high-dimensional data in CBIR systems. The main contributions of this paper are made a short account as takes as guide, example, rule. firstly, in this paper, we have on condition that short measures-taking of CBIR. secondly, we have had a discussion about how connection take-back in content-based image acts to get back is used and its current state of the art. at last, future directions in connection take-back in CBIR are also suggested. The paper is put into order as takes as guide, example, rule. In part Ii, we have a discussion the system buildings and structure design. In part III, we paper the current.

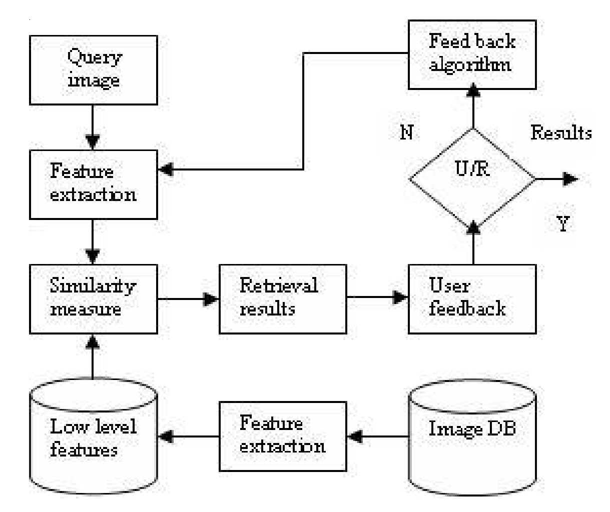
Finally, future directions in relevance feedback in CBIR are also suggested. The paper is organized as follows. In section II, we discuss the system architecture. In section III, we review the current state of art of research on relevance feedback in CBIR, and different RF techniques are discussed. In section IV, challenges in RF are discussed. Finally, conclusion is presented in section V.

METHOD DESIGN

Figure 1 shows the general scheme of image retrieval from a database using relevance feedback. The basic idea of relevance feedback is to shift the burden of finding the right query formulation from the user to the system. In order to make this true, the user has to provide system with some information, so that system can perform well in answering the original query. To retrieve the image from the database, we first extract feature vectors from images (the features can be shape, color, texture etc), then store feature vectors into another database for future use. When given query image, we similarly extract its feature vectors, and match those features with database image features. If the distance between two images feature vectors is small enough; we consider the corresponding image in the database similar to the query. The search is usually based on similarity rather than on exact match, and the retrieval results are given to the user. Then user gives the feedback in the form of „relevance judgments expressed over the retrieval results. The relevance judgments evaluate the results based on a three value assessment. These three values are relevant, non-relevant and dont care. Relevant means the image relevant to the user, non-relevant means the image is definitely not relevant, and dont cares mean the user does not say anything about the image.

If the user feedback is relevant, then feedback loop stops otherwise it continues until user get satisfied with results In Figure 1, the block diagram consists of following main blocks like image database, feature extraction, similarity measure, user feedback, and feedback algorithm. The function of each block is discussed below. Where U/R is the user satisfaction or result remains same. A. Feature Extraction Feature extraction involves extracting the meaningful information from the images. So that it reduces the storage required and hence the system becomes faster and effective in CBIR. Once the features are extracted, they are stored in the database for future use. The degree to which a computer can extract meaningful information from the image is the most powerful key to the advancement of intelligent image interpreting systems. One of the biggest advantages of feature extraction is that, it significantly reduces the information (compared to the original image) to represent an image for understanding the content of that image. There has been tremendous work on different approaches to the detection of various kinds of features in images.

Figure 1: System Architexure



These features can be classified as global features and local features. The most commonly used features are color, texture, and shape. They are all application independent.

1) Global features: Global features should be calculated over the entire image. For example, average gray level, shape of intensity histogram etc. The advantage of global extraction is its high speed for both extracting features and computing similarity. Specifically, they can be oversensitive to location and hence fail to identify important visual characteristics. To increase the robustness to spatial transformation, we can go for local feature extraction.

2) Local features: In global features, the features are computed from the entire image. However, these global features cannot handle all parts of the image having different characteristics. Therefore, local features of the image are necessary. These features can be calculated over the results of image segmentation and edge detection algorithms, that is, they are all based on the part of the image with some special properties.

3) Salient points: In local feature computation, the feature extraction of the image is limited to a subset of the image pixels; the interest points, the set of interest points are called salient points. The salient points are points of high variability in the features of the local pixel neighborhood. Many CBIR systems extract salient points. In , they defined localized content-based image retrieval as a CBIR task, where the user is only interested in a portion of the image, and the rest is irrelevant. For example, we can refer to some local features as image primitives; circles, lines, texels (elements composing a textured region) other local features; shape of contours etc.

B. Similarity Measure

In similarity measure, the query image feature vector and database image feature vector are compared using the distance metric. The images are ranked based on the distance value. It is proposed in [15], the detailed comparison of nine different metrics such as Manhattan, weighted mean-variance,

C. User Feedback

After obtaining the retrieval results, user provide the feedback as to whether the results are relevant or nonrelevant. If the results are non-relevant the feedback loop is repeated many times until the user is satisfied. The typical scenario for relevance feedback in CBIR is as follows Algorithm: Typical scenario for relevance feedback in

CBIR

Begin

Obtain the initial retrieval results of CBIR

Repeat until user satisfaction or result remains same

From user interaction, obtain the feedback from

the users on prior results. Feedback is in the form of relevant or irrelevant to request.

If results found to be not satisfied

Learn the system through a feedback algorithm and hence results are refined

End repeat End

RELATED WORK IN RELEVANCE FEEDBACK

The concept of relevance feedback was introduced into CBIR from the concept of text-based information retrieval in the 1998s [6] and then has become a popular technique in CBIR. In 1998, Chang, et al., proposed a framework, which allows for interactive construction of a set queries which detect visual concepts such as Sunsets. In 2001, Scloroff, et al. describes the first WWW image search engine, which focused on relevance feedback based improvement of the results. In their initial system, a relevance feedback was used to guide the feature selection process; it was found that the positive examples were more important towards maximizing accuracy than the negative examples. In 2001, Rui and Huang compared heuristic with optimization based parameter updating and found that the optimization based method achieves higher accuracy. In 2001, Chen, et al. described a one class SVM method for updating the feedback space which shows substantially improved results over previous work. In 2001, Guo, et al., performed a comparison between AdaBoost and SVM and found that SVM gives superior retrieval results. In 2002, He, et al. used both short term and long term perspectives to infer a semantic space from users relevance feedback for image retrieval. The long term perspective was found by updating the semantic space from the results of the short term perspective. In 2003, Dy, et al.[22], proposed a two level approach via customized queries and introduced a new unsupervised learning method called feature subset selection using expectation-maximization clustering.

CHALLENGES IN RELEVANCE FEEDBACK

In relevance feedback, the learner must use the training data, i.e. the images marked by the user during subsequent feedback rounds, and in order to estimate the target of the Journal of Applied Computer Science & Mathematics, no. Suceava 46 user. The task of the learner is particularly difficult in the context of relevance feedback for several reasons which are given below. The amount of training data is very small, usually much lower than the number of dimensions of the feature space. There are usually much fewer positive examples than negative examples. The learner must have a low sensitivity to this imbalance in the training set or some corrective must be found. The target class may have a rather complex shape or even several, rather disconnected modes. Together with the fact that training data is scarce, this can severely limit the generalization we can expect. To preserve interactivity, both learning from the training examples and the evaluation of the remaining images according to the selection criterion must be very fast. The computation cost can then be a very important criterion in the choice of learning method. Challenges in RF CBIR.

CONCLUSION

Relevance feedback is a powerful technique in CBIR systems, in order to improve the performance of CBIR effectively. It is an open research area to the researcher to reduce the semantic gap between low-level features and high level concepts. In this paper, detailed survey of relevance feedback in CBIR is given. Various RF techniques and issues are discussed in detail. For future research direction of RF in CBIR are suggested.

REFERENCES

1. Cox I J, Miller M L, Minka T P, Papathomas T V, and Yianilos P N (2000), "The Bayesian Image Retrieval System, PicHunter: Theory, Implementation and Psychophysical Experiments", *IEEE Trans. on Image Processing*, Vol. 9, No. 1, pp. 20-37.
2. Kokare M, Chatterji B N and Biswas P K (2002), "A Survey on Current Content-based Image Retrieval Methods", *IETE J. Res.*, Vol. 48, Nos. 3 and 4, pp. 261-271.
3. MacArthur S D, Brodley C E and Shyu C R (2000), "Relevance Feedback Decision Trees in Content-based Image Retrieval" in *Proc. IEEE Work-shop Content-based Access of Image and Video Libraries*, pp. 68-72, June.
4. Ritendra Datta, Dhiraj Joshi, Jia Li and James Z Wang (2008), "Image Retrieval: Ideas, Influences, and Trends of the New Age," ACM Computing Surveys, Vol. 40, No. 2.
5. Rui Y, Huang T S and Mehrotra S (1997), "Content-Based Image Retrieval with Relevance Feedback in MARS", in Proc. IEEE Int. Conf. on Image Proc.
6. Rui Y, Huang T S, Chang S F (1999), "Image Retrieval: Current Techniques, Promising Directions and Open Issues", *J. Visual Comm. and Image Representation*, Vol. 10, January, pp. 39-62.
7. Rui Y, Huang T, Ortega M and Mehrotra S (1998), "Relevance Feedback : A Power Tool In Interactive Content-Based Image Retrieval," IEEE Transactions on Circuits and Systems for Video Technology, Vol. 8, No. 5, pp. 644-655.
8. Smeulders A W M, Worring M, Santini S, Gupta A and Jain R (2000), "Content – based Image Retrieval at the End of the Early Years", *IEEE Trans. Pattern Anal.*

Machine Intell., Vol. 22, No. 12, pp.1349-1380.

9. Su Z, Zhang H, Li S and Ma S (2003), "Relevance Feedback in Content-based Image Retrieval: Bayesian framework, Feature Subspaces, and Progressive Learning", *IEEE Trans. Image Process*, Vol. 12, No. 8, pp. 924-936.

10. Tong S and Chang E (2001), "Support Vector Machines Active Learning for Image Retrieval", in *Proc. ACM Multimedia*.