A Review on CBIR System for BI-RADS Standard Mammogram Images

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Abstract

The mammogram images are highly informative in respect of breast health. The medical format of mammogram images is BI-RADS (Breast Imaging Reporting and Data). Content-based image retrieval (CBIR) does not require any extra data, as it extracts image features directly from the image data and uses these, coupled with a similarity measure, to query image collections. By sorting the results into standard categories, doctors all over the country can describe what they find on a mammogram using the same words and terms. This makes accurately communicating about these test results and following up after the tests much easier.

1. Introduction

When the same query image is presented to the system more than once, there are even chances that the results may differ in terms of number of retrieved images or some new images may retrieve or some image may be missed. This relevance feedback i.e. images of close similarity, is to be analysed and additional or missed images are to be carefully examined so that either they may be removed from all results or made part of the result in each query for the same image. If relevance feedback is not taken care-off, the precision and recall indices will deteriorate.

2. TESTS AVAILABLE FOR DETECTING BREAST CANCER

 There are various tests available for detecting breast cancer. These are mentioned below:

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CBE: It is a Clinical Breast Exam. During this the Doctor will physically examines your breast and other parts of body like lungs heart etc. The movement, size of breast as well as other organs will be checked. And it is also checked if they tare not causing pain on touch.

Pathology test: in this type of test to detect whether cancer is present in breast or not, a piece of breast tissue is removed. This process is called biopsy. Then this tissue is tested by pathologist. Then pathologist gives the result of cancer availablity in breast or not. If result comes out to be positive then he performs more tests on tissue to know more about cancer type.

Breast imaging Tests: These are the tests in which image of the breast is taken and then the cancer is identified on the image. This image or picture is called as mammograms.

3. Literature Survey

Computational complexity is decreased because we have successfully transferred the image retrieval problem to strings comparison. For obtaining large amount of accuracy in finding the results for image retrieval, this content based approach can be used. [1]

To figure out the similarity of content based visual information drawn out from low level features these methods are used. For generation of database indices these features are grouped. To discuss the benefits of pattern recognition for content based image and video retrieval, a survey is provided. [2]

By using video segmentation that video will be divided into number of frames and for offering a visual guideline for navigation of video content detection of key frame is applied. Through key frames we draw out the textual metadata by using video Optical Character Recognition (OCR) technology. For video browsing and search by content, keyword extraction is done by finding and transcripts slide text using OCR through which all keywords are draw out. [3]

Many interesting features drawn out from video data are analyzed for retrieval and indexing including similarity measurement methods in this survey. In the study of video based content retrieval systems we recognize current research matters. [4]

It is believed that an approach which engages many factors for indexing and retrieval would be more powerful in the discrimination and search tasks of videos. For the justification of this

claim, indexing and retrieval system based on content executed using color histogram, numerous texture features and other approaches. In Oracle 9i Database, videos were saved and a user study evaluated exactness of response. [5]

In CBVIR system, based on ongoing position of research, we determine the approaches of video retrieval from spatial and temporal analysis. Later on, we show the video classification approaches from multidimensional distributed Hidden Markov Models. Ultimately, we are provided with abstract of future trends and open problems of video modeling, retrieval and classification based on content. [6]

Video Segmentation, Key frames Selection, Feature Extraction these various steps consists of video retrieval system. From warehouse for extracting the video, the presented query is processed by the retrieval subsystem, carry out similarity matching operations and all this can be performed using Euclidian Distance Algorithm, and at the end the result is results is displayed to the end user. [7]

By applying a similarity measure that is the Euclidean distance texture vectors are correlated, at inquiry time and the best identical image is extracted. Further, applying the neighbourhood of the best identical image from the clustered text file through SOM other appropriate images are also extracted. [8]

The procedure of selecting, indexing, arranging the archive is depending upon the human visible judgment. This analysis concentrating on video frame search, such as, try to detect the boundary and key image retrieval, various feature retrieval techniques along with SIFT, SURF, measures for similarity, video ordering and browsing. [9]

Image pattern features are discussed in texture, color and radial domain for pattern identification and classification. The feature base can be used in BIR system for object extraction. [10, 11]

Video indexing and retrieval stimulates the attraction of researchers globally, have a broad spectrum of favorable applications. We presents a tutorial and an analysis of the landscape of common methods in video indexing and retrieval based on visual content, concentrating on techniques for analysis of video structure, along with shot boundary detection, key frame extraction and scene segmentation, withdrawal of features as well as static key frame

features, object features and motion features, video annotation, video data mining, video retrieval as well as query interfaces, similarity measure and relevance response, video browsing. Lastly, we examine directions of future research. [12]

4. Literature Summary

Based on literature study, it is observed that the breast images are analysed after wavelet decomposition for breast cancer or injury detection. However, the image become smaller and crucial information may be loosed by virtue of image decomposition. And when region of interest is applied only on the specific segment of image as above said some information get lost. Further, the high pass decomposed image using wavelet transform over enhance the intensity variation that may be falsely detected and injury or cancer characteristics leading to erroneous analysis. These limitations could be overcome by de-noising the given input image using the wavelet transform and analysis made on inverse transformed image. The texture features should also be considered while analyzing an image for cancer related analysis as the texture plays an important role in decision making.

5. Conclusion

The proposed work is targeted to be implemented on mammogram images as obtained from the hospital as well as on online image data base. The speed of the algorithm primarily depends upon the image size and therefore is expected to vary from image to image. The accuracy of retrieved image to that of the query image depends primarily upon the quality of query and data base image. Mammograms are usually at high noises. Therefore, it is recommended to use de-noising algorithm before retrieval. The precision, recall and accuracy are discussed in result table and show a fine accuracy in retrieving the mammograms based on query mammograms.

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