International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Impact Factor (2012): 3.358

Survey on Cancer Detection using Content Based Image Retrieval Technique

Aparna W. Bondade[1], Priti Saktel[2]

[1]M. Tech Student, Department of CSE, G.H Raisoni Institute of Engineering & Technology for Womens, Nagpur, Maharashtra, India

[2]Assistant Professor, Department of CSE, G.H Raisoni Institute of Engineering & Technology, Nagpur, Maharashtra, India

Abstract: ***With the increase use of medical images in clinical drug, disease do research, and education, the necessitate for methods with the purpose of efficiently archive, query, and retrieve these images by their content is underscored. In this paper, we illustrate the design and improvements of a multitier content-based image retrieval (CBIR) system for microscopic images utilize a location database that contains images of multi-disease of cancer. The CBIR system uses a multitier approach for retrieve and classifies main type of cancer disease and subtype of main cancer disease, which are generally complicated to discriminate and categorize. This system enables both multi-image query and slide-level image retrieval in order to care for the semantic stability among the retrieved images. Weighting terms, motivated from information retrieval theory, are defined for more than one image query and retrieval. This system also used the histogram and object learning dictionary CBIR system can work efficiently.***

Keywords: Content-based image retrieval (CBIR), information retrieval (IR), microscopy multi-image queries, weighting scores.

1. Introduction

In scientific advances in various modalities such as computed tomography (CT), X-ray and MRI, and their common use in clinical practice, the amount of medical images is ever-increasing every day. These medical images give necessary anatomical and useful information about different body parts for diagnosis, detection, monitoring and treatment planning, as well as give medical education. The huge amounts of medical images collection are used for the study for access different structure data for diagnostics, teaching and research. Radiological systems use for the patient information to index and look for the images; but content of the image is not utilized. Content-based image retrieval (CBIR) systems [1] for medical images are significant role to convey a secure platform to search, catalog and retrieve images based on their content.

Although several CBIR projects exist for radiology [7], there is an sensitive for a flexible and comprehensive CBIR system for medical microscopic images with direct implications for the cancer and pathology research. Microscopic images are difficult to present because they 1) are very large in size 2) express high degree of image variant due to large variation in research (e.g., staining, thickness), and 3) show biological variation. Therefore, a well-made CBIR system for microscopic images can be tremendously useful resource for cancer research, prognosis, diagnosis, teaching and treatment. Desing and development of CBIR system are used for the detecting the multidisese of cancer. CBIR—retrieving images and indexing in a database based can be manages for large images. CBIR systems using retrieval algorithms operating on one or two primitive features and also applying artificial neural network to classify directly to digitized images. However, the strength of retrieval based on common primitive features is mostly questionable due to the fundamental difference between image processing and numerical feature extraction, and the understanding of image semantics and visual language. The task of building an all-purpose CBIR system becomes virtually equivalent to building an image understanding system that duplicates human visual perception, reasoning, and specific domain knowledge. Therefore, we are investigating the capabilities of more limited systems using easily computed image features. Annotation of these images is a time-consuming process and those annotated images may not be easily available for clinical use. Therefore, one of the aims of this study is to organize the annotated microscopic images in a database and utilize these images for the training of a CBIR system for microscopic images with different disease types and with their subtypes.

2. Related Work

Hatice Cinar Akakin and Metin N. Gurcan,in paper [1] are exploring the features of content based microscopic image retrievals for multi image queries for detecting the cancer disease by using different dataset. CBIR are using image retrieval algorithm and slide level alogorithm for find main disease and their sub types. Texture and color extraction used the histrogram and co-occurrences histogram algorithm. Color extraction used three color code for differentiated chromatic and non-chromatic content.

H. Muller, N. Michoux, D. Bandon, and A. Geissbuhler [2] this paper also gives the study of content-based for access to medical image data and on the technologies used in the field. Gives an exclusive description of image archives, various indexing methods and common searching tasks, using mostly text-base searches on annotated images and using color, texture and image retrievals algorithm for given semantics. Gives the knowledge of shape and segmentation features Fully automated segmentation of images into objects itself is an unsolved problem. Partition of images using the local and global feature extraction. L. Tang, R. Hanika, and H. H. S. Ip, [3] this paper also gives the study of content-based image retrieval system by using image retrivals and low level feature extraction but using historological data to interpreted the images, texture and color Histological images, like other types of medical images, frequently give rise to ambiguity in

interpretation and in diagnosis. Medical images derived from a specific organ are similar visually and usually differ only in small details but such subtle differences may be of pathological significance**.**

L. Zheng, A. Wetzel, J. Gilbertson, and M. Becich, [4] this paper also gives the study of content based image retrievals system and using the retrievals algorithm for color histogram and image texture. The system retrieves images and their associated annotations from a networked microscopic pathology image database based on content similarity to user supplied query images

G.-H. Liu, L. Zhang, Y.-K. Hou, Z.-Y. Li, and J.-Y. Yang, [5] in this paper are gives the information about the multi-texton histogram by using Image retrieval. Image retrieval are gives the details about three methods text-based, content-based and semantic-based. is evaluated based on four image feature types: color histogram, image texture, Fourier coefficients, and wavelet coefficients, using the vector dot product as a distance metric. W. Hsu, L. R. Long, and S. Antani, [6] in this paper are gives the information about the use of medical application, information retrievals shapes and storage. The goal of this paper is to develop a retrieval system that implements recent developments in shape representation, efficient indexing, and similarity matching

3. Feature Extraction

a) **Color Features:** H& E using the limited color spectrum. Used two color for representing images i.e. red–green–blue (*RGB*), CIE*Lab (Lab*) and hue–saturation–value (HSV) color spaces. In the *Lab* color space, *L* corresponds to illumination, and *a* and *b* channels correspond to color components. features extracted from the *Lab* space characterize the intensity and color information of images separately., HSV space can separate the achromatic and chromatic components, i.e., hue. Histrogram algorithm used for differentiated color space.

b) **Texture Features Extraction**: Texture are used for differentiated the diseases type and sub types.Co-occurrence histrogram method used for texture feature extraction. co-occurrence histogram is computed, a variety of features can be extracted related to texture characteristics, higher and lower order statistics, correlation measure and information-theory-related features.

4. Image Level Retrieval Algorithm

Support Vector Machines (SVM) is used for finding the main type of the cancer disease. CBIR algorithm are used them for the content finding the similarity between the images i.e. image retrieval algorithm. This algorithm forming the clustering in images and find the nearest neighbor by using KNN classifier. After that gives the score of that images output.

5. Slide Level Retrieval Algorithm

Slide-Level retrievals algorithm work on the images level algorithm. this algorithm are also finding the similarity between images conventional way gives the ranking of that similar images to give query set by sorting the higher score of similar images and getting the sub type of the main disease of cancer.

6. Conclusion

This paper presents the survey of various techniques for cancer detection using CBIR technique. CBIR technique are gives the novel content of the Image and slide level retrievals algorithm. In the weighted scheme Slide level retrievals algorithm CBIR system gives better result than image retrieval algorithm [1].CBIR system are used for only one or two images feature at a time i.e. color and texture [4].

References

[1] Hatice Cinar Akakin and Metin N. Gurcan, *Senior Member, IEEE* "Content-Based Microscopic Image Retrieval System for Multi-Image Queries" IEEE Transactions On Information Technology In Biomedicine, Vol. 16, No. 4, July 2012
[2] H. Muller, N. Michoux, D. Bandon, and A. Geissbuhler, "A review of content-based image retrieval systems in medical applications clinical benefits and future directions," *Int. J. Med. Informat.*, vol. 73, no. 1, pp. 1–23, 2004.
[3] L. Tang, R. Hanka, and H. H. S. Ip, "Histological image retrieval based on semantic content analysis," IEEE Trans. Inf. Technol. Biomed., vol. 7, no. 1, pp. 26–36, Mar. 2003.
[4] L. Zheng, A. Wetzel, J. Gilbertson, and M. Becich, "Design and analysis of a content-based pathology image retrieval system," IEEE Trans. Inf. Technol. Biomed., vol. 7, no. 4, pp. 249–255, Dec. 2003.
[5] G.-H. Liu, L. Zhang, Y.-K. Hou, Z.-Y. Li, and J.-Y. Yang, "Image retrieval based on multi-texton histogram," Pattern Recognit., vol. 43, pp. 2380– 2389, Jul. 2010.
[6] W. Hsu, L. R. Long, and S. Antani, "Spirs: A framework for content- based image retrieval from large biomedical databases," Stud. Health Technol. Informat., vol. 129, no. Pt. 1, pp. 188–192, 2007
[7] L. Yang, O. Tuzel,W. Chen, P.Meer, G. Salaru, L. Goodell, and D. Foran, "Pathminer:Aweb-based tool for computer-assisted diagnostics in pathology," IEEE Trans. Inf. Technol. Biomed., vol. 13, no. 3, pp. 291– 299, May 2009.
[8] T. Ojala, M. Pietik¨ainen, and T.M¨aenp¨a¨a, "Multiresolution gray-scale and rotation invariant texture classification with local binary patterns," IEEE Trans. Pattern Anal. Mach. Intell., vol. 24, no. 7, pp. 971–987, Jul. 2002.
[9] Olivier Chapelle, Patrick Haffner, and Vladimir N. Vapnik "Support Vector Machines for Histogram-Based Image Classification" IEEE Transactions On Neural Networks, Vol. 10, No. 5, September 1999
[10] R. H. Choplin, J. M. Boehme, and C. D. Maynard, "Picture archiving and communication systems: An overview," Radiographics, vol. 12, no. 1, pp. 127–129, 1992