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A Survey on Content Based Image Retrieval using Neural Network

Manoj Panthi[1], Prof. Jitendra Mishra[2]
[1]**M. Tech Scholar, Department of EC, PCST, Bhopal (India)**
[2]**Head & Professor, Department of EC, PCST, Bhopal (India)**
[1]**jlpmanoj6591@gmail.com**, [2]**jitendra.mishra260@gmail.com**

ABSTRACT
In present scenario, content-based image classification has become research focus of multimedia Information retrieval. Usually, low-level visual features of images, such as color, texture, and shape, are used to describe images and to measure the content similarity between two images. In this paper we presents the survey for the image retrieval and classification for various number of application using the machine learning, data mining and other techniques.

Keywords: Image classification, Image retrieval, Neural network, Multimedia, texture classification.

INTRODUCTION

With advances in the computer technologies and the advent of the World-Wide Web, there has been an explosion in the amount and complexity of digital data being generated, stored, transmitted, analyzed, and accessed. Much of this information is multimedia in nature, Including digital images, video, audio, graphics, and text data. In order to make use of this vast amount of data, efficient and effective techniques to retrieve multimedia information based on its content need to be developed. Among the various media types, images are of prime importance. Not only it is the most widely used media type besides text, but it is also one of the most widely used bases for representing and retrieving videos and other multimedia information [1, 2].

CBIR is an important alternative and complement to traditional text-based image searching and can greatly enhance the accuracy of the information being returned. It aims to develop an efficient visual- Content-based technique to search, browse and retrieve relevant images from large-scale digital image collections. Most proposed CBIR [2, 3, 4] techniques automatically extract low-level features (e.g. color, texture, shapes and layout of objects) to measure the similarities among images by comparing the feature differences. Color, texture and shape features have been used for describing image content. Color is one of the most widely used low-level visual features and is invariant to image size and orientation [1, 5, 9].

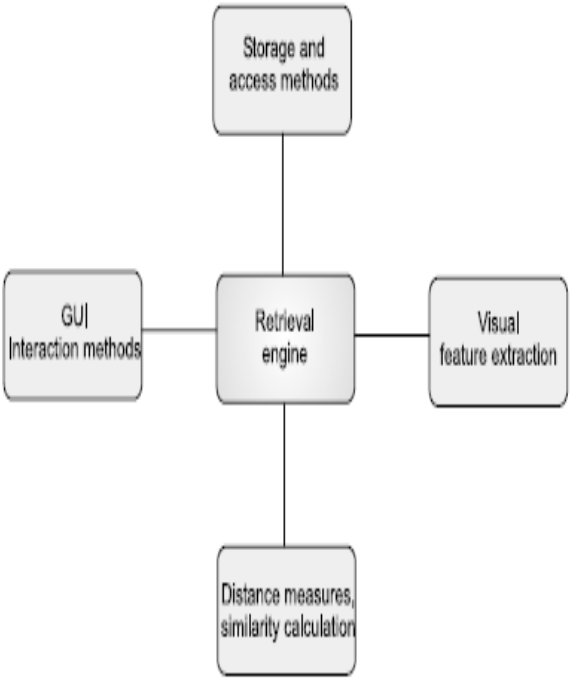

Fig 1: The principal components of all content-based image retrieval systems.

Image classification is basically the task of classifying the number of images into (semantic) categories based on the available training data. The objective of digital image classification procedure is to categorize the

pixels in an image into land over cover classes [10]. The output is thematic image with a limited number of feature classes as opposed to a continuous image with varying shades of gray or varying colors representing a continuous range of spectral reflectance [11]. The range of digital numbers in different bands for particular features is known as a spectral pattern or spectral signature. A spectral pattern can be composed of adjacent pixels or widely separated pixels. Digital image classification technique can generally be classified into two types: Unsupervised classification Techniques and Supervised classification Techniques [12].

The rest of this paper is organized as follows in the first section we describe an introduction of about the content based image classification introduction. In section II we discuss about the Texture classification. In section III we discuss about the rich literature for content based image classification. In section IV we discuss about the problem formulation and statement as we getting from the rich literature survey, finally in section V we conclude the about our paper which is based on the literature survey and specify the future scope.

II TEXTURE CLASSIFICATION

Texture is also one of the important types of classification and is being widely intensively used in pattern recognition. Although texture perception indicates that humans discriminate natural texture patterns in three important dimensions i.e. repetitiveness, directionality, and granularity [9]. We have to address two issues when we use texture for image retrieval: (i) a texture model that captures human perception of texture; and (ii) a distance function that measures the similarity between texture patterns. We can examine several texture-based CBIC systems. For the computation of “periodicity”, “directionality”, and “randomness” for texture modelling and retrieval [10]. However these features approximate the three important dimensions of human texture perception mentioned earlier. This approach extracts two sets of texture feature vectors for the structured texture pattern and the random texture pattern, with a posterior probability value indicating the confidence level.

III RELATED WORK

In this section we discuss about the rich literature survey for the image retrieval and classification.

[1] In this work, they propose a novel unsupervised visual hashing scheme, termed as semantic-assisted visual hashing (SAVH), to effectively perform visual hashing learning with semantic assistance. The key idea is to extract semantics automatically from the noisy associated texts to enhance the discriminative capability of hash codes, and thus facilitate the performance improvement of visual hashing. SAVH works as follows: First, hash code learning is formulated in a unified unsupervised framework, where relaxed hash codes are learned by simultaneously preserving visual similarity of images and considering the assistance of texts.

[2] In this paper, they investigate a novel scheme of online multi-modal distance metric learning, which explores a unified two-level online learning scheme: (i) it learns to optimize a distance metric on each individual feature space; and (ii) then it learns to find the optimal combination of diverse types of features. To further reduce the expensive cost of DML on high-dimensional feature space, they propose a low-rank OMDML algorithm which not only significantly reduces the computational cost but also retains highly competing or even better learning accuracy.

[3] In this paper, they present a novel unsupervised multi-view alignment hashing approach based on regularized kernel nonnegative matrix factorization, which can find a compact representation uncovering the hidden semantics and simultaneously respecting the joint probability distribution of data. In particular, they aim to seek a matrix factorization to effectively fuse the multiple information sources meanwhile discarding the feature redundancy.

[4] They have proposed a joint learning scheme for simultaneously modeling label graph learning and multilabel classification. The proposed learning scheme explicitly models the inter-label correlations by label graph learning, which is jointly optimized with multilabel classification. As a result, the learned label correlation graph is capable of well fitting the multilabel classification task while effectively reflecting the underlying topological structures among labels.

[5] This paper presents a technique for Content-Based Image Retrieval (CBIR) by exploiting the advantage of low complexity Ordered-Dither Block Truncation Coding (ODBTC) for the generation of image content descriptor. In encoding step, ODBTC compresses an image block into corresponding quantizers and bitmap image. Two image features are proposed to index an image, namely Color Co-occurrence Feature (CCF) and Bit Pattern Features (BPF), which are generated directly from ODBTC encoded data streams without performing the decoding process.

[6] The paper aims at improving the performance of content based image retrieval using saliency detection

approach. Several methods have been developed to extract the saliency information from an image. They use the state of the art Quaternion transform for to detect the saliency. The paper focuses on the content based image retrieval systems based on scale invariant feature transform and region segmentation. Experimental results prove that the proposed technique outperforms the existing techniques and produce better retrieval results.

[7] In this scenario, re-ranking methods have been proposed to exploit the contextual information and, hence, improve the effectiveness of CBIR systems. Besides the effectiveness, the usefulness of those systems in real-world applications also depends on the efficiency and scalability of the retrieval process, imposing a great challenge to the re-ranking approaches, once they usually require the computation of distances among all the images of a given collection. In this paper, we present a novel approach for the re-ranking problem.

[8] In this paper, they adopt joint kernel-based supervised hashing (JKSH) for fusion of complementary features. Multiple-feature hashing is transformed to a similarity preserving problem with linearly combined kernel functions, which are associated with individual features. An alternating optimization algorithm is performed to learn both the kernel combination and hashing functions efficiently. Superior to traditional multiple-feature hashing methods, the proposed approach can adopt several kernels, therefore it is more suitable for heterogeneous features.

[9] In this paper proposes a novel method for image description with multichannel decoded local binary patterns. They introduce adder and decoder based two schemas for the combination of the LBPs from more than one channel. Image retrieval experiments are performed to observe the effectiveness of the proposed approaches and compared with the existing ways of multichannel techniques.

[10] In proposed system a novel unsupervised visual hashing scheme, termed as semantic-assisted visual and Text hashing (SAVTH), to effectively perform visual hashing learning with semantic assistance. The main concept of the proposed work is to extract images from the website automatically from the noisy associated texts, and stores them in the repository for future image and text based searches. Current research objective is to efficiently retrieve content based images and texts from large databases using text and image inputs.

[11] In this article we introduce a novel CBIR scheme that abstracts each image in the database in terms of statistical features computed using the Multi-scale Geometric Analysis (MGA) of Non-sub-sampled Contourlet Transform (NSCT). Noise resilience is one of the main advantages of this feature representation. To improve the retrieval performance and reduce the semantic gap, our system incorporates a Relevance Feedback (RF) mechanism that uses a graph-theoretic approach to rank the images in accordance with the user's feedback.

IV PROBLEM STATEMENT

Image Classification and retrieval is current research trend in computer vision. The application of image classification used in various field such as remote sensing, Photo Gallery and Medical diagnosis. In concern of classification, the rate of classification depends on the feature attributes of image data and depends on behavior of classifier. In process of survey study paper and journal of image classification based on various data mining approach and neural network. Some Classification based on binary classes and some other one are multilevel classification. The binary classification generate a issue for MSE(Mean Square Error) and degrade the rate of prediction in classification such as Decision Tree , Navie Bayes etc. In another approach multilevel classification generates large number of confusion matrix and suffered rate of classification. Now in my base paper used SVM classifier with DAG and improved accuracy and rate of classification, but it also suffered from multiple hyper plane class. So, we are motivated for doing work in the field of image classification and improved the rate of classification.

V CONCLUSIONS AND FUTURE WORK

A content based approach generally uses image as an input query and it generates the output of similar types of images or shows the image with same feature. Feature extraction is a means of extracting compact but semantically valuable information from images. This information is used as a signature for the image. Similar images should have similar signatures. Here we presents the various author study for the image classification and retrieval for the various application. In future we work in the image retrieval and image classification using classification and other techniques and improve the rate of classification in future work.

REFERENCES:-

[1] Lei Zhu, Jialie Shen, Liang Xie, and Zhiyong Cheng, "Unsupervised Visual Hashing with Semantic Assistant for Content-Based Image Retrieval", IEEE

Transactions on Knowledge and Data Engineering, 2017 February, Volume 29, Issue 2, Pp 472-486.

[2] Pengcheng Wu, Steven C. H. Hoi, Peilin Zhao, Chunyan Miao, Zhi-Yong Liu, "Online Multi-modal Distance Metric Learning with Application to Image Retrieval", IEEE Transactions on Knowledge and Data Engineering, 2016. Pp 454-467.

[3] Li Liu, Mengyang Yu, Ling Shao, "Multiview Alignment Hashing for Efficient Image Search', IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 24, NO. 3, MARCH 2015. Pp 956-966.

[4] Xi Li, Xueyi Zhao, Zhongfei Zhang, Fei Wu, Yueting Zhuang, Jingdong Wang, Xuelong Li, "Joint Multilabel Classification With Community-Aware Label Graph Learning", IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 25, NO. 1, JANUARY 2016. Pp 484-483.

[5] Jing-Ming Guo, Heri Prasetyo, " Content-Based Image Retrieval Using Features Extracted From Halftoning-Based Block Truncation Coding", IEEE Transactions on Image Processing, IEEE 2015. Pp 1-15.

[6] Chesti Altaff Hussain, D. Venkata Rao, S. Aruna Masthani, "Robust Pre-processing Technique Based on Saliency Detection for Content Based Image Retrieval Systems", International Conference on Computational Modeling and Security, 2016. Pp 571-580.

[7] Daniel Carlos Guimar aes Pedronette, Jurandy Almeida, Ricardo da S. Torres, "A Scalable Re-Ranking Method for Content-Based Image Retrieval", Preprint version of paper published in Information Sciences journal, 2013. Pp 1-29.

[8] Menglin Jiang, Shaoting Zhang, Junzhou Huang, Lin Yang, Dimitris N. Metaxas, " Scalable histopathological image analysis via supervised hashing with multiple features", Medical Image Analysis, 2016. Pp 3–12.

[9] Shiv Ram Dubey, Satish Kumar Singh, Rajat Kumar Singh, " Multichannel Decoded Local Binary Patterns for Content Based Image Retrieval", IEEE Transactions on Image Processing, 2016. Pp 1-16.

[10] G. Maheshwari, Prajitha.P, " Visual and Text Hashing Method with Semantic Association with Multi Intention Feature Mining Algorithms", Journal of Network Communications and Emerging Technologies, Volume 8, Issue 4, April 2018, Pp 172-175.

[11] Malay Kumar Kundu, Manish Chowdhury, Samuel Rota Bulo, "A graph-based relevance feedback mechanism in content-based image Retrieval", Elsevier ltd, 2014. Pp 1-11.

[12] Ji Wan, Dayong Wang, Steven C.H. Hoi, Pengcheng Wu, Jianke Zhu, Yongdong Zhang, Jintao Li, "Deep Learning for Content-Based Image Retrieval: A Comprehensive Study", Proceedings of the ACM International Conference on Multimedia: 2014, Pp 157-166.

[13] Meng Wang, Weisheng Li, Dong Liu, Bingbing Ni, Jialie Shen, Shuicheng Yan, "Facilitating Image Search With a Scalable and Compact Semantic Mapping", IEEE TRANSACTIONS ON CYBERNETICS, 2014. Pp 1-16.

[14] Bin Xu, Jiajun Bu, Chun Chen, Can Wang∗, Deng Cai, Xiaofei He, "EMR: A Scalable Graph-based Ranking Model for Content-based Image Retrieval", IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING, VOL. 6, NO. 1, JANUARY 2007. Pp 1-14.

Manoj Panthi received his Bachelor`s degree in Electronics & comunication, TIT, Bhopal, M.P., in 2013. Currently he is pursuing Master of Technology Degree in Electronics & comunication (Digital communication) from PCST, (RGPV), Bhopal, Madhya Pradesh India. His research area include Digital Image Processing.

Mr. **Jitendra Kumar Mishra** he is Associate Professor and Head of the Department of Electronics and communication Engineering in PCST, Bhopal (RGPV). His received Master of Technology and Bachelor's of engineering respectively in Digital communication from BUIT, Bhopal and from RGPV, Bhopal. He has more

than 10 years of teaching experience and publish 25+ papers in International journals, conferences etc. His area of Interests are Antenna & Wave Propagation, Digital Signal Processing, Wireless Communication, Image Processing etc.