

SUPPORT VECTOR MACHINE (SVM) BASED IN CBIR SYSTEM USING QUERYING IMAGE DATA-BASE

Miss Vanita M. Yadao¹ Asst. Prof. Ashish B. Kharate²

¹*PG Student, Sant Gadge Baba Amravati University, Amravati (M.S.)
Department of Electronic & Telecommunication Engineering
Email: vanitayadao@gmail.com*

²*Sant Gadge Baba Amravati University, Amravati (M.S.)
Dept.of Electronics and Telecommunication Engineering
Email id: abkharate.2011@gmail.com*

Abstract – *In this paper we SVM (Support Vector Machine) technique for the purpose of retrieval of images similar to the image in the query. In this paper we primarily present the necessity or importance of support vector machine. The content based image retrieval techniques is the retrieval of images based on visual features such as color and texture Due to the enormous increase in image database size as well as its vast deployment in various applications . For example all users would like to get their desired result in the first time on the web, possibility of consuming a lot of time while searching for the results. In this paper we contemplate over the mechanism of support vector machine.*

Keywords— MATLAB, Data Source: Bunch of Images, support vector machine (SVM)

1. INTRODUCTION

Content-based retrieval working is based on the usage of contents for the retrieval of the image as well as for its representation. A traditional CBIR system works by using the technique of online image retrieval and off-line trait mining. The off-line feature extraction method works by retrieving the visual characteristics like colour, shape and texture of the image by calculating its pixel value and on the basis of that pixel value, these visual attributes are kept in a separate database which is called the feature database or trait database. This feature database represents only an abstract view of the images which are present in image database. The reason for this is that the part of the visual traits for any image is if we compare it with the image data. But in the case of other method which is known to be the on-line image retrieval, the system works for searching an appropriate image by firing a query to the system. The system addresses this query example as a feature vector in the database. Then dissimilarities or similarities are calculated as well as prioritized. The similarities or distance are calculated between the feature vectors of the query with the data of the whole trait database. For searching an image database in an effective and optimum manner the extraction is done with the usage of any scheme for purpose of indexing. In the last the search outcomes are numbered on the basis of most similar features and the one which are very similar with the image in the query example are retrieved. There is also an option for the relevance feedback to the system which is retrieving the image and this option works by knowing the user information needs. There are mainly three components of any CBIR system in which first is Query image which is defines as an image which can be present in the image database, the similar image can be or cannot be in the database and also the number of images of the similar type are present there or not present. The next important component is the Image database which is containing a variety of images on the basis of user need. There can be a huge number of images present in the image database. The last but the most crucial component is the Feature extraction. It is the most crucial process for the purpose of classifying the image in CBIR. The information related to appearance of the image is taken and is stored as a feature vector in the feature database. For example all users would like to get their desired result in the first time on the web, possibility of consuming a lot of time while searching for the results. In this paper we contemplate over the mechanism of support vector machine (SVM) and also explain some other method for extracting images.

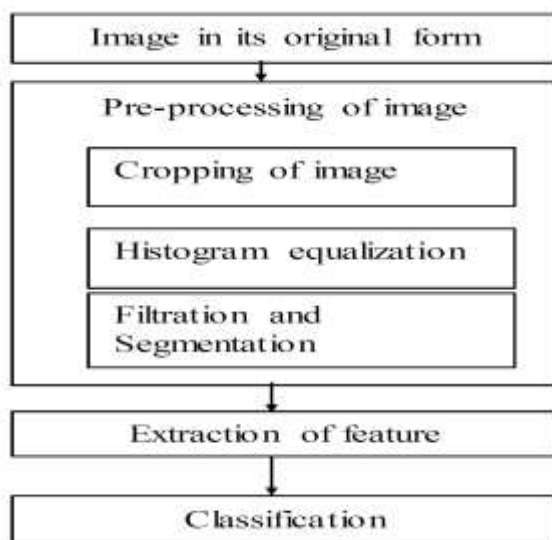


Fig 1.1 Image Classification

The feature extraction is done for the estimation of traits of the image as some value or a collection of value which is called the feature vector of an image. And these feature vectors are actually matching the image in the query with the other images in feature database. This process works by extracting out all the appropriate or inappropriate traits of the particular image which are driven from the classification. There are generally many features of an image for extracting the features but the most complicated task is to extract the features which are appropriate for the user need. The features of the image are further classified into two parts as the semantic features and the features which can be retrieved by the human eyes that means visual features. Now again these features can be the general features or specific ones. In the general features we consider only the colour, shape, texture for the image.

There are also some features for which it is very complicated to retrieve as these also contain some important or information related to the meaning of the image. These are called as the semantic features. For these features we use mean value, RGB value, Histogram value, Standard deviation and entropy etc. The componential structure of CBIR is as below

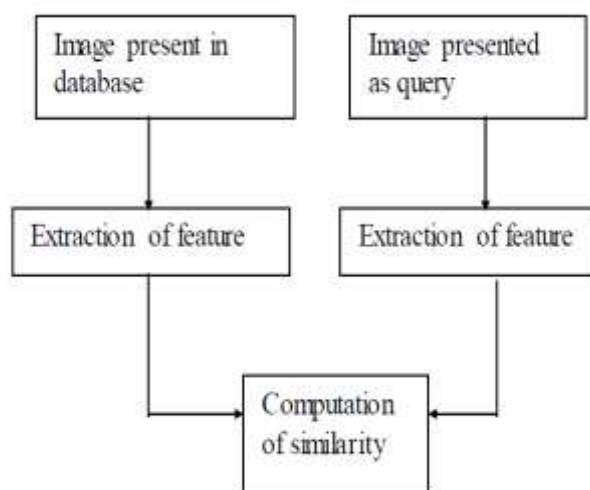


Fig 1.2 Componential Structure of CBIR

2. OVERVIEW OF SVM

The concept of SVM was firstly given by Vapnik and since then it has been attaining popularity because of its features which makes it attractive while doing real world performance. It actually provides the remarkable netter outcomes in classifying any image in comparison to other variety of algorithms or presented techniques for the same purpose. It is primarily dealing with the practical application problems normally encountered during voice recognition, recognition of tones, categorisation of text, classification of image as well as data. There are basically two terms present in the concept of machine learning. These are supervised and unsupervised learning. Supervised learning works on the basis of learning by result whereas learn by example is the main feature of unsupervised learning. In case of supervised learning the input is a collection of training data. Support vector machine works on the principle of supervised learning

technique by exploring the data as well as recognizing the pattern for classification purpose. It works by taking the whole set of input then reading it and then for each of the input, the relevant output is extracted. This whole process is assumed as classification. Now the result can be obtained in two forms either as discrete or continuous. In the case of discrete outcome the process of classification is performed and in the other one regression is done.

While discussing about the feature space the two important concepts named as feature value and the feature vector should also be considered. The main trait of any image is called its feature value and feature vector is vector in which these feature values are offered to the machine. Support vector is basically a point present in the feature space and these are separated by some distance. This point is present between the origin in the feature space and the point which is depicting the position of separator. In the image classification, the images of same kind are grouped into one unit which is called the cluster for that image. So the process of classification can be thought as the stimulating work to retrieve the correct result. For enhancing the performance of this classification it is possible to retrieve the nearby feature of the image as it will be helpful to attain the accuracy in the results

SIMILAR TO THE IMAGE DATA-BASE



3. CONCLUSION

In this paper this feature extraction was seen as the binary classification problem and SVM (Support Vector Machine) This paper content based image retrieval system traits depiction. Many further studies in this area have been recognised and also usage of this technique is shown in the same. It is concluded that to attain the extraction at the high speed for making it so flexible that it can also adjust with the images of large size, it is required to have an impressive multidimensional approach. In this SVM is used as the classifier which is performing the task of classifying the image and this process of classification is given to all the traits of the image which are extracted after the feature extraction process. It is mostly used for estimating the highest margin hyper planes within the feature space which is also a high dimensional feature space. The mathematical description of support vector Machine is also shown in this work. The earlier work in this area was based on the extraction of images with the use of textual information and then later it started the retrieval of images on the basis of content. this is called the term Content Based Image Retrieval or CBIR on which this study has been done. The aim of this paper is extraction of images from database in impressive and effective manner within the short period of time with the use of Support vector method (SVM).

REFERENCES

- [1] Dr. R. Usha Rani^{#1}, "Image Quantification Learning Technique through Content based Image Retrieval", International Journal on Future Revolution in Computer Science & Communication Engineering ISSN: 2454-4248 Volume: 4 Issue: 1 203 – 206 IJFRCSE | January 2018,
- [2] V. Ramya, "Content Based Image Retrieval System using Clustering with Combined Patterns", International Journal of Scientific Research in Computer Science, Engineering and Information Technology © 2018 IJSRCSEIT | Volume 3 | Issue 1 | ISSN : 2456-3307

- [3] Abdolraheem Khader Alhassan, Ali Ahmed Alfaki, “Color and Texture Fusion-Based Method for Content-Based Image Retrieval”, IEEE 2017 International Conference on Communication, Control, Computing and Electronics Engineering (ICCCCEE), Khartoum, Sudan
- [4] Abdolreza Rashno, Saeed Sadri, “Content-based Image Retrieval with Color and Texture Features in Neutrosophic Domain”, IEEE 2017 3rd International Conference on Pattern Recognition and Image Analysis (IPRIA 2017) April 19-20, 2017
- [5] Ms. Foram S. Patel, Prof. Dipali Kasat, “Hashing Based Indexing Techniques for Content Based Image Retrieval A Survey”, International Conference on Innovative Mechanisms for Industry Applications (ICIMIA 2017)
- [6] S. Vanitha Sivagami and K. Muneeswaran “Image Object Retrieval Using Distribution of Mixed Shape Descriptors”, Middle-East Journal of Scientific Research 24 (4): 1057-1062, 2016
- [7] R. Durga Prasad¹, B.V.K. Sai Kumar², K. Sai Ram³, B. Veera Manoj⁴, “Content Based Image Retrieval Using Dominant Color and Texture Features”, International Journal for Modern Trends in Science and Technology, Volume: 2, Issue: 04, April 2016
- [8] Zhijie Zhao¹, Qin Tian¹, Huadong Sun¹, Xuesong Jin¹ and Junxi Guo², “Content Based Image Retrieval Scheme using Color, Texture and Shape Features”, International Journal of Signal Processing, Image Processing and Pattern Recognition, Vol.9, No.1 (2016), pp.203-212, ijsip.2016.9.1.19