



Content Based Image Retrieval with SURF, SVM and K-Means

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Abstract—Medical images are decisive field of knowledge for a positive effect on the body or mind. The growth of these medical images is increasing in recent years due to the advancement of the digital technology. In this paper we have proposed three techniques – SURF, SVM and K-Means to find the accuracy in medical images.

Here we present an efficient algorithm based on SURF (Speeded up Robust Features), SVM (Support Vector Machine) and K-MEANS. The method applies the SURF algorithm in the detection, description, extracting references images and matching feature points in the image respectively. In the process of feature point matching, the false matching points are eliminated through this algorithm. Finally, according to the rest of the match point, it can estimate the space geometric transformation parameters between two images and thus matching process is completed. For the Content-Based Image Retrieval, our proposed method is more sophisticated and gives better accuracy, less matching time and less feature point as compared to the previous method. SURF is fast and robust interest points detector which is used in many computer vision applications. For the implementation of this proposed work we use the Image Processing Toolbox under MATLAB software.

Keywords— Decisive, Image Processing, Matching Points, Robust Interest Points, Support Vector Machine, Robust interest points.

I. INTRODUCTION

CBIR or Content Based Image Retrieval is the retrieval of images based on visual features such as colour, texture and shape. Reasons for its development are that in many large image databases, traditional methods of image indexing have proven to be insufficient, and extremely time consuming. These old methods of image indexing, ranging from storing an image in the database and associating it with a keyword or number, to associating it with a categorized description, have become out of date. These old methods are not relevant to used for image indexing which ranging from storing an image in the database and associating it with a keyword or number or other symbols to associating it with a categorized description. In CBIR, each image that is stored in the database has its features extracted and compared to the features of the query image.

CBIR process involves two steps ;

- **Feature Extraction:** The process of extracting images features to a distinguishable range.
- **Matching :**It involves matching these features to yield a result that is visually similar.

Applications of CBIR are;

- **Medical Diagnosis:** Using CBIR in a medical database of medical images to aid diagnosis by identifying similar past cases.
- **Crime prevention;** Used by police forces for Automatic face recognition systems.
- **Security Check:** Retina scanning and finger prints for access privileges.
- **Intellectual Property:** Trademark image registration, where a new candidate mark is compared with existing marks to ensure no risk of confusing property ownership.

II. LITRATURE SURVEY

In recent research, despite the huge number of description has been given in the published paper. But few reliable solutions have been presented in the medical images by the researchers. [1]Anna Wojnar et al. worked to represent for the medical images annotation based on the SURF descriptor and the SVM classifier. Training and Testing have been done the IRMA radiographic images in database [2]. Wang Chuan-xu et al. presented binocular depth measurement based on Speed-Up-Robust-Feature and Grubbs method to remove outliers of visual disparities and found the accuracy and robustness [3]. Stevan Rudinac et al. proposed quality of image retrieval and reduce the processing time using feature vector and feature vector reduction [4]. Jingxin Hong et al. taken an image mosaic algorithm for better improvement based on SURF feature matching and applied on different scale and moving objects to calculate their speed [5]. Zianlin Zhang et al. have taken all colour edge direction features for the content based image retrieval helpful for uses the edge direction feature as the colour feature's weight which belongs to the same colour features for each sub-block [6]. Xe Chen et al. worked for matching images captured at particular locations or places of interest by selecting representative

images from an image collection using SHIFT [7]. Yi Yang et al. has done to recognize gestures analysis of cartoon images using features including methods - global colour histogram, local colour histogram, edge feature and motion direction feature for the content-based cartoon image retrieval and interactive cartoon clip synthesis.

III. PROPOSED METHODOLOGY

In this we have used three techniques - SURF, SVM and K-Means for the Content Based Image Retrieval for the accuracy of the medical images. SURF (Speeded up Robust Features) is a robust local feature detector. It has one of the famous feature-detection algorithms using a Hessian matrix-based measure for the detector, and a distribution-based descriptor and by simplifying these methods to the essential. SVM is a classifier for classification of the data. The SVM classifier is widely used in bioinformatics (and other disciplines) due to its highly accurate, able to calculate and process the high-dimensional data such as gene expression. K-Means is an iterative refinement Heuristic algorithm that works faster. K-Means clustering helps in procedures which can be applied for scalable image retrieval from large databases.

IV. FACILITIES USED FOR PROPOSED WORK

MATLAB

Mat lab is a programming environment and a high level, interpreted, dynamically typed language, supporting functional, object oriented language. Mat lab is a high-performance language for technical computing. It integrates computation, programming and visualization in a user-friendly environment where problems and solutions are expressed in an easy-to-understand mathematical notation. It is best suited for numerical computation, particularly computations involving matrix operations and linear algebra. Matlab has excellent support for data visualization. Matlab features a family of application-specific solutions which are called toolboxes. Matlab is a matrix-based programming tool. Its operations can be classified into the following types of operations;

- Arithmetic and logical operations,
- Mathematical functions,
- Graphical functions,
- Input/output operations.

V. CONCLUSION

In this paper, CBIR maintains a steady pace of development in the research field. Development promises an immense range of future applications using CBIR. The medical images for content based image retrieval are more suitable. We have researched various modes of representing and retrieving the image properties of colour, texture and shape. Our proposed method is more suitable as compare to the previous method. Even if image is tampered with our Accuracy is not affected and thus our purpose is fulfilled. We will increase the accuracy more than 95 percent. In future, to improve the accuracy for the medical images in CBIR, take other classification techniques for the further work..

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