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Human Activity Detection using RGBD Images

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Abstract: ***Human Activity Detection Using RGBD aims to solve problems by representing images with feature vectors (color, texture, shape) in the database. Those feature vectors are extracted from image without human intervention. Here, we are particularly focusing to create such a system which will helps us identifying, whether a person is suffering from cancer or not, with the help of RGBD images. The challenge is to develop a system that is low cost and reliable.***

Keywords: Oncogenic, correlogram, color histogram, RGBD, co-occurrence matrix

1. Introduction

Every day the average person with a computer faces a growing flow of multimedia information particularly via the internet. But this information would be useless without the ability to manipulate, classify, archive and access them quickly and selectively. While text indexing is ubiquitous, it is often limited, tedious and subjective for describing image content. One of the main problems was the difficulty of locating the desired image in a large and varied collection.

The text-based indexes for large image and video archives are time consuming to create. They necessitate that each image and video scene is analyzed manually by a domain expert so the contents can be described textually. The language-based descriptions, however, can never capture the visual content sufficiently.

The problems with text-based access to images have prompted increasing interest in the development of image based solutions. This is more often referred to as Content Based Image Retrieval. It relies on the characterization of primitive features such as colour, shape and texture that can be automatically extracted from the images themselves. Queries to Content Based Image Retrieval system are most often expressed as visual exemplars of the type of the image or image attributed being sought. For Example user may submit a sketch, click on the texture pallet, or select a particular shape of interest. This system then identifies those stored images with a high degree of similarity to the requested feature.

This chapter concludes with some of the key points and research findings on the utilization of data mining techniques in detecting novel oncogenic features that contributed significantly to cancer and their patterns of occurrence in the biological and clinical data. The findings of this research led to the formulation of novel feature selection and prediction techniques on oncogenic data of diverse nature. The designed Clinical Data Classifier was able to identify the target class for the possible biological and clinical ailments investigated in this research.

Exploration of data mining methodologies led to the detection of important oncogenic patterns by formulation of novel feature selection and predictive techniques.

Prediction of oncogene patterns from gene expression data was exigent due to the large number of genes and very low number of instances. Existing methods failed to identify the minimal set of oncogenes on gene expression data that required multi-class categorization.

As digital images bring impressive moments to our daily life, there is an ever increasing need to ensure effectively retrieve multimedia content in a wide range of environment. The massive volume of images has challenging many great researchers to investigate on the feasible methods for Cancer prediction using texture analysis applications; such applications could be used in medicine.

The conventional image database search based on semantic annotation or keywords, editing keywords or labelling images are time-consuming tasks, and sometimes semantic views are normally different for each user.

This system consists of three main phase:
1) Features extraction
2) Retrieving methods, and
3) Ranking results and present images.

2. Related Work

Wide variety of approaches has been used in image retrieval. These approaches have different costs and complexities. Two commonly used techniques are based on color and texture.

Color histogramis one of the earliest algorithms based on the color information of image. Although this method has low computational cost but it does not provide any information about the spatial distribution of colors. *Color correlogram,* is another useful technique in which the relation between different color levels is considered in spatial domain. Despite of its advantages, color correlogram depends on scaling, and illumination changes.

On the other hand, there are several approaches based on image textural information. Co-occurrence matrix and Gabor filter are two such methods that have been used many times. Despite of their high performance, they have high computational complexity.

In image processing and photography, a **color histogram** is a representation of the distribution of **colors** in an image. For digital images, a **color histogram** represents the number of pixels that have **colors** in each of a fixed list of **color** ranges that span the image's **color** space, the set of all possible **colors**.

The color histogram can be built for any kind of color space, although the term is more often used for three-dimensional spaces like RGB or HSV. For monochromatic images, the term **intensity histogram** may be used instead. For multi-spectral images, where each pixel is represented by an arbitrary number of measurements (for example, beyond the three measurements in RGB), the color histogram is *N*-dimensional, with N being the number of measurements taken. Each measurement has its own wavelength range of the light spectrum, some of which may be outside the visible spectrum.

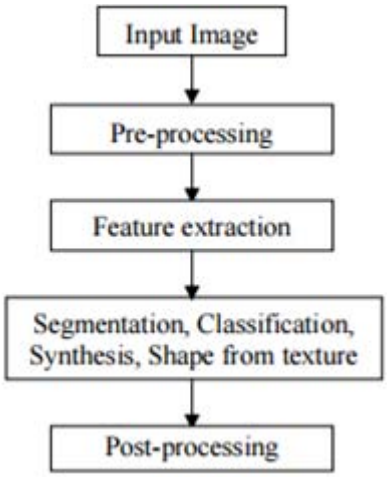
Texture Extraction

We have used two texture analysis techniques: co-occurrence matrix and Gabor filter. Co-occurrence matrix extracts texture information relevant to higher frequency components more accurately, while Gabor filter is more powerful in extracting lower frequency components. Therefore, by fusion of these two techniques, both low and high frequencies analysis can be obtained.

A **co-occurrence matrix** or **co-occurrence distribution** is a matrix that is defined over an image to be the distribution of co-occurring pixel values (grayscale values, or colors) at a given offset.

Many techniques have been used to extract features from images. Some of the commonly used methods are as follows:-

- Spatial features
- Transform features
- Edge and boundary features
- Color features
- Shape features
- Texture features



3. Our Approach

Human Activity Detection using RGBD is used to retrieve images which are similar to a particular query image given as an input. This system will then extract the colours of reach image present in the database (jpeg/jpg only) and calculate the distance between the query image and other database images to find the similarity. All the image processing and interpolation will be done using JAI (java advanced imaging) API. Moreover, the database images being searched are collected from the parent directory of the particular image. We can also search the similar images not only on the basis of colour content but also the shape, texture and other feature vectors so as to get better accuracy.

Cancer Detection Using RGBD Technique

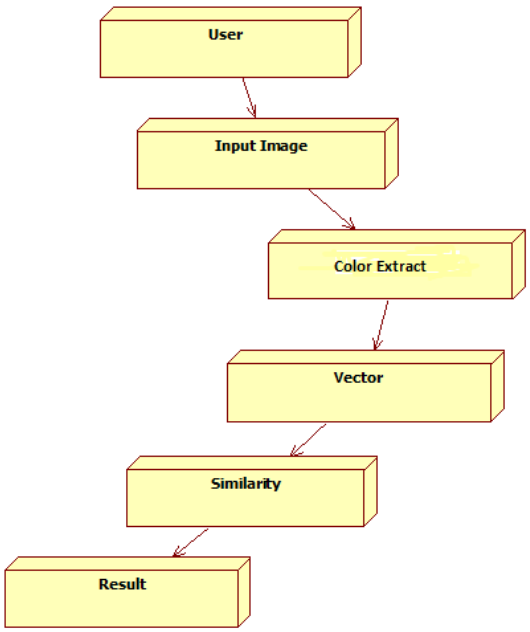
This capability is particularly well-suited to medical applications, especially those that depend on complex proteomic and genomic measurements. As a result, texture analysis is frequently used in cancer diagnosis and detection. More recently texture analysis has been applied to cancer prognosis and prediction. This latter approach is particularly interesting as it is part of a growing trend towards personalized, predictive medicine.

Implementation Details

The feature extraction is the essential process of Human Activity Detection Using RGBD system. First, this retrieval system selects appropriate feature space and explores various visual features to represent an image. Second, based on the selected features, the images are represented by feature vectors. A retrieval system searches the nearest neighbors in the feature space by weighting different feature vectors and computing a similarity measurement for these feature vectors. The special measuring algorithms are designed to search the most similar image from database.

With the help of RGBD technique in cancer testing system, we can identify, is anyone afflicted of cancer or not. If a person is desecrated with its virus will be given suitable treatment.

In our system user will upload picture, as a query image. System will then take this query image and will compare it with the images stored in its database to find similar image. After locating similar image in the database, system will produce that image as an output with image name. System generate output in the form of image, which is similar to the query image and also specify at what stage the person is in and type of cancer cells he or she has, moreover what doctoring shall be given to the infected person. The whole process is explained by flowchart given below-



4. Conclusion

"Human Activity" means that the search makes use of the contents of image themselves, rather than relying on human-inputted metadata such as captions or keywords. The similarity measurements and the representation of the visual features are two important tasks in **Human Activity Detection using RGBD**.Given a query image, with single object present in it; mission of this work is to retrieve similar kind of images from the database based on the features extracted from the query image.

Limitation of our system is that, the result displayed does not give 100% accuracy, as image similarity is based on many feature vectors collectively, but we are limiting our similarity measurement to the color and space matching.

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