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ABSTRACT

Since shape is the most important feature for recognizing objects, it has to be extracted accurately in order to enhance the content based image retrieval system, but challenges prevailed in extracting shape features of an object in an image due to inability of shape descriptor which extracts a limited number of different shapes that are not invariant, alongside the inability to extracting features of overlapping objects, and the shape connotation gap problem between low level and high level features. In order to overcome these problems, this work proposes a Superintend Gross Silhouette Descriptor which uses pixel coordinates on spatial domain of the image for finding the real shape of the object by means of straight lines so it has the ability to detect the overlapped objects as well as the polygonal shapes. After being extracted, features would be trained using a random woodland classifier which classifies the features into a group of classes at maximum convergence for mitigating the shape connotation problem. At the time of retrieval, the features of the query image would be tested with trained features for measuring the similarity by the dynamite correlation coefficient method, which is a measure of the linear correlation so it would render the absolute value of the correlation coefficient which maintains the relationship strength among features.

KEYWORDS

Dynamite Correlation Coefficient, Random Woodland Classifier, Superintend Gross Silhouette Descriptor

1. INTRODUCTION

Developments in data storage and image acquisition technologies have empowered the creation of large image datasets. In this state, it is essential to develop suitable information systems to proficiently manage these collections (Narmadha, Ranjithapriya, and Tamil Kannaambaal, 2017). Image searching is one of the most important services that need to be supported by such systems. In general, two different methodologies have been applied to permit searching on image collections: one based on image textual Meta data and another based on image content information (Ping, 2013).

Text based picture recovery is an old technique for recovery of required picture among the mass measure of information so the search word might be by picture name, date of including, erasing, adjusting. Principle issues of the search by text are unexpressed sentiments, feelings, and numerous methods for saying a similar thing, equivalent words and homonyms, incorrect spellings (Da Silva Júnior et al., 2014).

DOI: 10.4018/IJSI.2020100101

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By using the Contour based techniques boundary information will be extracted. The contour-based shape representation technique will be further separated into global approach and structural approach. Global approach will not divide the shape into subparts and the complete boundary information will be availed to derive the feature vector and for matching process, so it is also known as the continuous approach (Thakore, Darshak, and Trivedi.2010). A structural method breaks the shape border information into segments (subparts), called primitives, so this method is also known as the discrete approach. Generally, the final representation of the structural method is a string or a graph (or tree), which will be used for matching for image retrieval process (Yang, Jun, and Zhu, 2012).

Global contour-based shape descriptor techniques take the whole shape contour as the shape representation. Global region-based method considers the whole region for shape representation, so, it effectively uses all the pixel information within the region (Mehtrre, Babu Mohan, Kankanhalli, & Lee, 1997). Grid strategies are not revolution invariant for locale-based shapes because the major axis is sensitive to the noise. Form based techniques are more prominent than the area-based strategies, since people are thought to segregate the shapes fundamentally by their form highlights. In some shape applications the inside substance isn’t imperative, just the shape form is critical, in this way, shape-based procedures are generally utilized for that sort of applications. (Zhang, Dengsheng, and Lu, 2002). There are some obstructions of the contour-based methods: (i) They are experiencing very noise sensitive and variation problems, because they only avail a little bit of data regarding contour information (ii) Region content is more significant than the outline features.

These impediments can be overthrown by the region-based methods. Region-based methods are more preferred to the contour-based methods, since methods based on region avails all the available shape information (Patel, Narottambhai, & Tandel, 2016). Region based methods provide more accurate retrieval. The normal troublesome of the shape-based strategy is that they cannot adapt well to shape damage, which is overwhelmed by local-based strategies, since area-based techniques utilize all the accessible data of the shape. Auxiliary methodologies are more intricate than worldwide ways to deal with execute (Yang, Mingqiang, Kpalma, and Joseph Ronsin, 2008).

Since Content-Based Image Retrieval has been employed in several applications such as historical research, medicine, biodiversity information systems, digital libraries, crime prevention and fingerprint identification, it requires efficient descriptor to represent the features of an input image as well as similarity measure technique to fetch images which is corresponding to query image. Since shape is the most important feature for recognizing objects, this work is mainly focusing on designing a shape-based descriptor for retrieving images and it would help to achieve a high recognition rate for a content-based image retrieval system.

Rest of the paper is as follows: Section 2 reviews the conventional researches of this process; Section 3 explains the proposed methodology and its execution. Section 4 discussed the results obtained from the proposed methodology and a brief discussion over the conventional techniques. Conclusions are made in Section 5.

2. LITERATURE SURVEY

Guoqi Liu, Ming Deng (Liu, Guoqi, and Deng, 2018) introduced a method of multi-objects extraction with parametric active contour model. Initially an edge map was computed then the decomposition and sparse representation for edge map was used to obtain a new edge maps which describe the objects clearly. Subsequently vector fields were generated using new edge maps. Finally, one initial contour was evolved in every vector field to extract corresponding objects. The efficiency of this system was based on the decomposition value.

Hui Li, B. S. Manjunath, and K. Mitra, (Li, Hui, Manjunath, and Mitra, 1995) presented two contour-based methods which use region boundaries and other strong edges as matching primitives. The first contour matching algorithm is based on the chain-code correlation and other shape similarity criteria such as invariant moments. Closed contours and the salient segments along the open contours.
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