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A Texture Extraction Technique for Cloth Pattern Identification

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Abstract

Cloth Pattern Identification system and image segmentation has been an active research area for visually impaired people and normal people. The main aim of this research is to increase the efficiency of indexing and image retrieval performance and also increase the similarity distance computation in cloth pattern identification. In existing system that provides a cloth pattern identification that uses color and texture as visual descriptor to retrieve the similar cloth pattern images. Our proposed system contribution is of three directions. Initially, the images are trained along with the audio and text description. First, our proposed system use color based feature extraction to extract the local and global color features. These extracted features are grouped or combined by using SVM classifier and generate the pattern. The pattern is recognized by using Texture estimation algorithm. Here, each pixel is divided into backbone blocks and perform solid color estimation and uniform color estimation to extract the texture of the image. Finally, extracted texture of trained image and tested image is compared and respective sound and text file is displayed to the user.

Keywords: Texture estimation, segmentation, indexing, visual descriptor

1. Introduction

Cloth Pattern Identification (CPI) is used to retrieve the image based on their features such as color, texture and shape [3]. The primary use of the cloth pattern identification is to retrieve the data from the database by using color and shape features. The main aim of the CPI is to increase the efficiency during image retrieval and image indexing. Therefore, human intervention in the indexing process is reduced. Here, we develop a camera-based system specifically for visually impaired people and also common people to help them recognize clothing patterns and colors. To overcome this issue, our proposed system introduces texture extraction technique to extract the texture pattern from the image by using Fast Texture Extraction Algorithm. This algorithm works by each pixel in the target image is divided into high level which is called Back bone blocks. Each block will undergoes solid color estimation and uniform color estimation. Now, the blocks are assigned with the values. Extracted texture pattern will verify with the trained images in the database. Hence, the matched trained image will be displayed as the output to user along with the audio and textual description.

2. Literature Survey

Nidhi Singhai et al A Survey On: Cloth pattern Identification system provides the analysis and comparative study of different techniques of Content based Image retrieval. Research papers also implements the features like Color histogram fuzzy technique, texture and edge density for accurate and efficient cloth pattern Identification System [1].

Szabolcs In Content-Based Image Retrieval Systems analyses Color Histogram Features Based Image Classification. Researchers introduced a novel approach from the low level image histogram features [5].

Lin, Chen and Chan introduced a novel approach for image retrieval. System implements three image features and a feature selection technique are used in that approach. The first based on color and the second feature is based on texture. This is called co-occurrence matrix (CCM) and (DBPSP) Difference Between pixels of scan pattern. Third image features for color histogram K-means (CHKM) [4].

Ritendra Datta et al related to new trends in image retrieval, a comparative study of results around 300 key empirical and theoretical contributions of the modern decade related to image retrieval and regular annotations. Researchers also spoke about noteworthy challenges included in the adaption of existing image retrieval techniques to build systems that can be useful in the real world.

QBIC system is compatible to queries which are based on example images. The visual feature used in the system includes color, texture and shape. In this system, the color are expressed in K-bin color histogram and the texture was described by an improved tamura texture the visual features [6].

Texture measures are based on visual patterns in images and how they spatially defined. Textures are represented by Texel's where the number of sets and number of textures identify in the image. Those sets are not only defines the texture, but also the texture location is detected [2].

The identification of specific textures in an image is achieved primarily by modeling texture as a two-dimensional gray level variation. The relative brightness of pairs of pixels is computed such that degree of contrast, regularity, coarseness and directionality may be estimated. However, the problem is in identifying patterns of co-pixel variation and associating them with particular classes of textures such as silky, or rough [4 and 5].

3. Proposed Work

Our proposed system has the advantage of increasing the retrieval accuracy and decreasing the retrieval time. Initially, the images are trained along with the audio and text description.

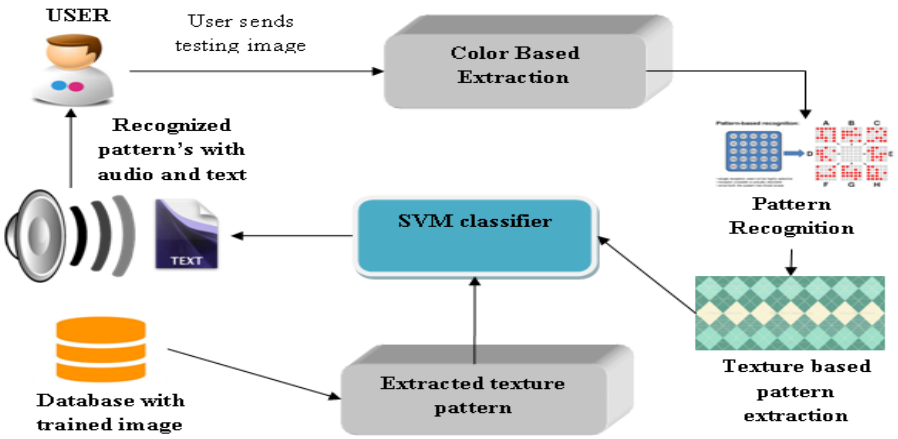

Fig.1 Overview of the System Architecture

First, our proposed system use color based feature extraction to extract the local and global color features. These extracted features are grouped or combined by using SVM classifier. Based on the extracted color features, SVM form a matrix structure pattern, which is called pattern generation. Then, it recognizes the pattern by each pixel which computes to get the fine grain segmentation. Our system introduces texture feature extraction technique by using the Texture Estimation Algorithm. This algorithm proposes a fine grain segmentation of each pixel to recognize and extract the texture features. In addition, description of the image is produced in audio and text format to the user. This makes our system more efficiency and high accuracy.

3.1 Feature extraction

3.1.1 Global Feature extraction

The extraction task transforms rich content of images into various content features. Feature extraction is the process of generating features to be used in the selection and classification tasks. Feature selection reduces the number of features provided to the classification task. Those features which are likely to assist in discrimination are selected and used in the classification task. Our system proposes a method combining advantages of both global and local features. The objective is to provide a reasonably short image hash with good performance, i.e., being perceptually robust while capable of detecting and locating content forgery. Our system use Zernike moments of the luminance/chrominance components to reflect the image's global characteristics, and extract local texture features from salient regions in the image to represent contents in the corresponding areas.

3.1.2 Texture Extraction

To achieve fine-grain segmentation at the pixel level, we must be able to define features on a per pixel basis. Extracting color information is straightforward. Texture feature extraction is very computationally intensive for individual pixels. In our approach, target image is divided into different high level blocks at each pixel. These blocks are called as backbone blocks. Fast Texture Estimation Algorithm is applied to each block and analyze the solid color estimation and uniform color estimation. Now, assign texture alignment to the each block. Since, the target image is analyzed at pixel by pixel it has more accuracy. Finally, handle the out of blocks pixel.

3.2 SVM classifier model

Our system employs Support Vector Machines (SVM's) as the classifier. The Support Vector Machines is used as the classifier in our clothes pattern recognition system. It is defined as the magnitude of confidence margin of the instance. SVM is fundamentally a two-class classifier. The one-versus-one approach is used to recognize and categories by training different 2-class SVMs on all possible pairs of classes. An instance is recognized as the category with the highest number of votes. There are four categories in the clothes pattern dataset. So, no matter what dimension of original features their confidence margin representations are all with the same dimension.

3.3 Pattern Recognition

Here, set of images are trained into the database along with the respective sound file and text document. From the pattern generated, global and local features are extracted. The extracted global and local features are combined to re-

cognize Patterns by using a support vector machines (SVM). SVM model used to compute the vector values from the pattern. Those vector values are compared with the values which already trained in the database. The matched vector values hold the respective audio and text file. Corresponding audio format and text document will be identified.

3.4 Audio and Textual descriptor

3.4.1 Audio descriptor

To find the similarity of the trained image and tested image our system uses the vector value to identify the exact sound and database. This process identifies sound and it will be shown as output.

3.4.2 Textual descriptor

From the extracted texture features of the tested image, it will match the similarity of the image and retrieve the respective image along with the textual descriptor. This process increases the accuracy of the system. In addition, this avoids the pronunciation error.

4. Conclusion

Cloth pattern Identification is a challenging task to capture the related images from the big data collection. In our proposed work, Global features extracted from an image are useful in presenting textured images that have no certain specific region of interest with respect to the user. These extracted features are grouped or combined by using SVM classifier. Based on the extracted color features, SVM form a matrix structure pattern, which is called pattern generation. Then, it recognizes the pattern by using Texture estimation algorithm each pixel is divided into backbone blocks. This backbone blocks perform solid color estimation and uniform color estimation to extract the texture of the image. Finally, extracted texture of trained image and tested image is compared and respective sound and text file is displayed to the user.

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