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Cloth Pattern Recognition for Visually Impaired People

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ABSTRACT

Visually impaired people face several challenges in their day to day lives such a picking up clothes of their interest, Our system will help them assist in this task and works in an effort to encourage their individuality without any human supervision. Matching clothes is a challenging task for many blind people, The use of an efficient computer vision-based system to match clothes with multiple colours and complex patterns helps assist visually impaired and blind people by distinguishing both pattern and colour information. The three main components in our methodology for clothes matching: Colour detection and matching, Pattern detection, Pattern matching. The test feature extraction from the image is comprising of RADON signature curve, DWT pattern and SIFT results. The resulting output shows whether the cloths are of matching colour or patters or both.

Keywords: - Radon transform, Discrete wavelet transform (DWT), Scale-invariant feature transform (SIFT).

I. INTRODUCTION

There are several algorithms that exist which use the computer vision and image processing features to identify or distinguish between test images which are used in few real life applications such as currency detection, obstacle detection by vehicles and cloth pattern recognition. Our method for recognising the cloth patterns is based on 3 characteristic features,

1) Colour detection and matching

2) Pattern detection

3) Pattern matching.

There are several challenges that one faces in recognising patterns using images such as lighting, wrinkles and angle adjustments. Texture analysis methods mainly try to focus on textures with large changes in viewpoint of the observer, orientation, and scaling, but with less intra class pattern and intensity variations. These complex textures and patterns and lighting changes are analysed by combining techniques using the Radon transform, SIFT (scale invariant feature transform),wavelet features.To evaluate the proposed prototype, we took challenging databases including clothes without any pattern, or with multiple colors and different patterns under different conditions of lighting and rotation. The output from the feature extraction process can be given through an audio stream for the convenience of visually impaired people.

II. PROBLEM STATEMENT

To provide an efficient algorithm that is both effective and economical in performing the cloth pattern detection task without compromising on lighting, wrinkles or orientational parameters.

III. LITERATURE SURVEY

Hasanuzzaman, X. Yang, and Y. Tian, "Robust and effective component-based banknote recognition for the blind," IEEE Trans. Syst., Man, Cybern.C, vol. 42, no. 6, pp. 1021–1030, Nov. 2012.

FAIZ .M. Hasanuzzaman proposed a system to automatically recognize banknote of any currency to assist visually impaired people. This is also a camera based computer vision technology. This system has features like high accuracy, robustness, high efficiency, ease of use. This system is robust to conditions like occlusion, rotation, scaling, cluttered background, illumination change, wrinkled bills, and also eliminating false recognition and can guide the user to properly and correctly focus at the bill to be recognized using speed up robust features(SURF).

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D. Dakopoulos and N. G. Bourbakis, "Wearable obstacle avoidance electronic travel aids for the blind: A survey," IEEE Trans. Syst., Man, Cybern. C, vol. 40, no. 1, pp. 25–35, Jan. 2010

Dimitrios Dakopoulos and Nikolous developed a vision substitution system for travel aid for blind . Out of the three main categories of navigation systems (Electronic Travel Aids, Electronic Orientation systems, Position Locator Aids) here the focus is on Electronic Travel Aids. In all these three systems the needs of blind people are considered but there is a need to also consider the need of an assistive system for the color blind people. The main area where a color blind person faces a problem other than the traffic signals is in a cloth shop for selecting clothes of desired colors without the help of a second person. The proposed assistive system here depicts the same.

X. Yang and Y. Tian, "Texture Representations Using Subspace Embeddings," Pattern Recognition Letters, vol. 34, no. 10, pp. 1130-1137, 2013.

In this system the textures are analysed using mapping techniques on the subspace embeddings proposed a texture representation framework to map local texture patches into a low dimensional texture subspace. In natural texture images, textons are entangled with multiple factors, such as rotation, scaling, viewpoint variation, illumination change, and non-rigid surface deformation. Mapping local texture patches into a low-dimensional subspace can alleviate or eliminate these undesired variation factors resulting from both geometric and photometric transformations. We observe that texture representations based on subspace embeddings have strong resistance to image deformations, meanwhile, are more distinctive and more compact than traditional representations.

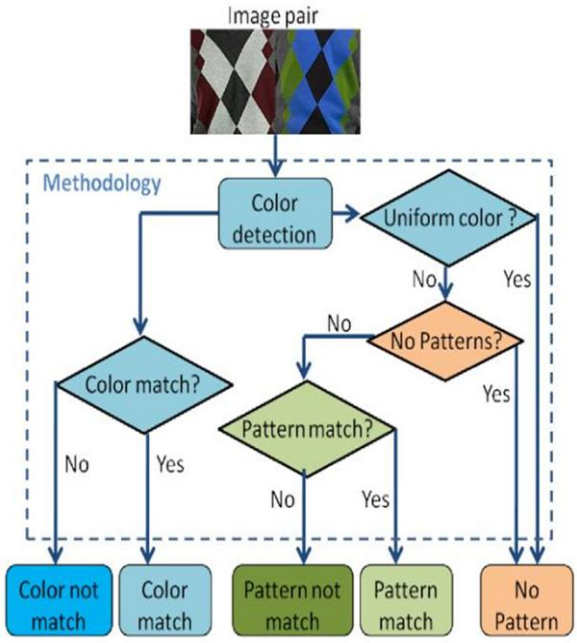
IV. EXISTING METHOD

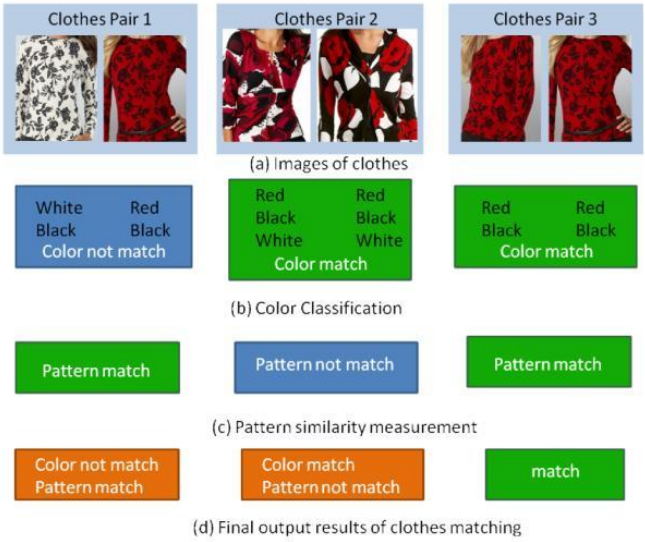
- Texture analysis methods mainly focus on textures with large changes in viewpoint, orientation, and scaling, but with less intra class pattern and intensity variations
- Shadows and wrinkles may be confused as part of the texture patterns or imagery of the clothing and thus cause errors
- The images of clothes can be imaged from arbitrary viewing directions. Methods of matching patterns require the input pair of images must be pattern rotation-invariant.

V. PROPOSED SYSTEM

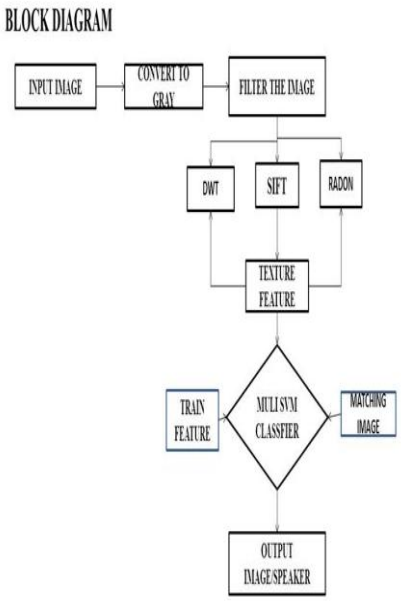
- The three main components in our methodology for clothes matching:
  1) colour detection and matching,
  2) pattern detection,
  3) pattern matching.

To handle complex texture patterns and lighting changes, we combine techniques using the **Radon transform, SIFT (scale invariant feature transform),wavelet features, ,** and co-occurrence matrix for pattern matching. Our algorithm for color matching is based on normalized color in HSI HSI color space and is able to detect multiple colors including red, orange, yellow, green, cyan, blue, purple, pink, black, grey, *white* colors including red, orange, yellow, green, cyan, blue, purple, pink, black, grey, *white*.





VI. BLOCK DIAGRAM



VII. ADVANTAGES

This pattern recognition technique primarily focuses on the texture analysis and matching the test set with the predefined data set, we have also included the functionality of colour detection and matching

- Reliable feature extraction regardless of the lighting, wrinkles and cloth orientation.
- Completely software based hence it is economical.
- Matching is twofold as in both colour matching and pattern matching are integral part of the classification

VIII. SOFTWARE REQUIREMENTS

Mat lab 2016(A)

MATLAB is a scientific programming language and provides strong mathematical and numerical support for the implementation of advanced algorithms.

It is for this reason that MATLAB is widely used by the image processing and computer vision community. New algorithms are very likely to be implemented first in MATLAB, indeed they may only be available in MATLAB.

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IX. CONCLUSION

We made an effort to produce a system that is more efficient and more economical than the existing systems without compromising on several fundamental parameters.

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