



# CLOTHING PATTERN RECOGNITION FOR VISUALLY IMPAIRED PEOPLE

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## Abstract

**Choosing clothes with complex patterns and colors is a challenging task for visually impaired people. Automatic clothing pattern recognition is also a challenging research problem due to rotation, scaling, illumination, and especially large intra-class pattern variations. We have developed a camera-base application that automatically recognizes clothing patterns and basic colors. The result is given to the user through voice and text message.**

**Keywords: Assistive system, clothing color recognition, text to speech, visually impaired people, pattern recognition.**

## I. INTRODUCTION

Based on statistics from the World Health Organization (WHO), there are more than 161 million visually impaired people around the world, and 37 million of them are blind. At the same time, approximately 10% of the male population in Europe suffers from some form of vision deficiency (blindness), the most usual case being an inability to distinguish between certain colors (e.g. red/green/blue/yellow). In extreme situations, only shades of grey might be distinguishable. Color plays an important role in the everyday life of a normally sighted person. Choosing clothes with suitable colors and patterns is a challenging task for blind or visually impaired people. They manage this task with the help from family members, or by wearing clothes with a uniform color or without any patterns. Automatically recognizing clothing patterns and colors may improve their life quality.

Here we introduce a camera-based mobile application to help visually impaired people to

recognize clothing patterns and colors. The application contains camera which captures the cloth image and gives the color and pattern of the cloth through voice and text message. Our system can able to handle simple patterns and basic colors: Red, Black, Green, Blue.

## II. LITERATURE SURVEY

Assistive systems of different kinds are being developed for the visually impaired people to improve the life quality and safety of such people including indoor navigation and way finding, display reading, banknote recognition, rehabilitation, and many more.

**Xiaodong[3]** developed a system for blind people to select clothes based on cloth pattern and colors in a cloth shop independently. This is a camera based system that can recognize clothing patterns into four categories (plaid, stripped, pattern-less, and irregular) and identify 11 colors: red, orange, yellow, green, cyan, blue, purple, pink, black, grey and white.

**Hasanuzzaman[6]** 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).

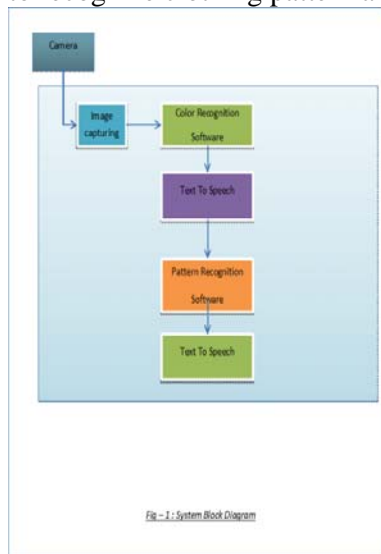
**Dimitrios Dakopoulos and Nikolous[2]** developed a vision substitution system for travel aid for blind. Out of the three main categories of navigation systems (Electronic Travel Aids,

Electronic Orientation systems, Position Locator Aids), they focus on Electronic Travel Aids.

In all these works, the needs of blind people are considered. But, 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 and patterns without the help of another person. The proposed assistive system here depicts the same.

### III. METHODOLOGY

In this document, "clothing pattern and color recognize" implies that the automatic system is capable of noticing the clothing pattern and colors. We introduce a camera based mobile application to help the visually impaired people to recognize clothing pattern and colors.

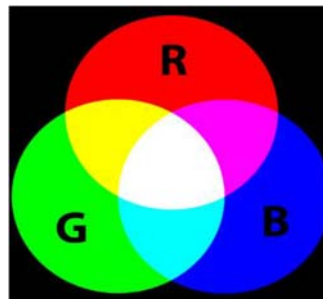


When user open the cloth pattern app and click on the camera to get the cloth image. The image is saved, when the user tap on the saved image the color of the cloth is detected based on the RGB value. For example: if the captured cloth image has RGB value less than 10 then the cloth color is detected as BLACK. Further pattern is detected based on pixel value. If the pixel value is uniform then it is patternless cloth, otherwise patterned. At last the color and pattern is given to the user through voice and text message. Since the color and pattern detection depends on camera resolution and lighting conditions.

#### A. Color Detection

Color is the most vital visual feature for humans. By representation, we mean the overall of image

content when used as a "global" feature. A space is defined as a model representing in terms of intensity values. There are different models: RGB, Lab, HSV, HSI, YCbCr, etc. Each of these has got specific applications and also has got advantages and drawbacks. In this system, RGB color model is used.



For this module, index matrix of the input image is obtained. In the next step, separate frames for each red, blue and green components is acquired from the index matrix. Then, each color component content is compared against a pre-set threshold as reference value. Using the algorithm, color content values less than the threshold are rounded-off to the lower limit and the ones above the threshold are increased to the upper limit. On the basis of these new, rounded-off values, the color percentage is calculated.

### CONCLUSION

For visually impaired people we have proposed a system to recognise clothing colors and patterns in their daily life.

To improve recognition accuracy the combination of multiple feature channels are provided. Based on a survey and a proof-of-concept evaluation with blind users. Experimental results demonstrate that our proposed method significantly outperforms methods in clothing pattern recognition. Keeping all these in mind we have tried to overcome the challenges of visually impaired people. Recognizing clothing colors and patterns will improve their daily life quality.

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