

Clothing and Pattern Recognition of Cloths for Visually Impaired People

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Abstract

Choosing clothes with complicated patterns and colors may be a difficult task for the visually impaired individuals. Automatic clothing pattern and color can bring the independence in their lives. Clothing pattern recognition is a camera-based paradigm system that acknowledges coloring patterns in four classes. They are plaid, striped, pattern less, and irregular and this system also identify eleven colors. The system integrates a camera, raspberry pi and a speaker or earphone for audio description of clothing colors and patterns. A camera is used for capturing the images of cloths. Choosing clothes with suitable colors and different patterns is a difficult task for visually impaired people. Blind people manage this task with the help of others. So such a system would improve the independence in their lives.

Keywords--NumPy, OpenCV, CNN, Machine Learning, Tensor Flow, Raspberry Pi.

I. INTRODUCTION

Based on statistics from the global World Health Organization (WHO), there are about 161 million visually impaired individuals round the world, and thirty seven million of them can't see. By referring the data provided by World Health Organization (WHO), low vision is outlined as acuity of 20/200 or less. Close to 100 percent of the male population in Europe suffers from some style of vision deficiency (blindness), the foremost usual case being the inability to differentiate between different colors. Choosing clothes with suitable colors and pattern is a challenging task for these peoples. They manage this task with the assistance from their family members, or by exploitation plastic Braille labels or differing types of sewing pattern tags on the garments, or sport in garments with an identical color or with none patterns. Automatic camera-based pattern recognition may be a difficult task because of several clothing pattern and color styles. Here, we tend to introduce a camera-based system to assist visually impaired individuals to acknowledge pattern and colors. We have used the camera, raspberrypi and a speaker for designing this system. The camera is used for capturing the image of the clothes and these images are used to determine the color and pattern of the clothes. The output is provided by the speaker.

II. LITERATURE SURVEY

[01] Selecting garments with advanced patterns and colors is a difficult task for visually impaired peoples. They have developed a camera-based advanced system that recognizes patterns in four classes (plaid, striped, pattern less, and irregular) and identifies eleven colors. The system integrates a camera, electro-acoustic transducer, a computer, and a Bluetooth earphone for audio description of covering patterns and colors. A camera mounted upon sunglass is employed to capture pictures. This method is controlled by speech input through electro-acoustic transducer. To judge the effectiveness of the planned approach, they have used the CCNY Pattern dataset. Their approach achieves ninety two percent recognition accuracy.

[01] In some systems the image is captured by the camera and then processed to spot the pattern of the garments that are chosen. The pattern may be classified by the support vector machine formula. The features are extracted by using various descriptors. The statistical features are identified by radon signature descriptor and global features are extracted by wavelet sub bands. This gets combined with the local features present to get the required pattern of the clothes. The system uses the CCNY Pattern dataset. This technique may be an efficient method for all the visually impaired people which will help them in identifying various clothing colors and patterns.

[02] Selecting garments with confused examples and hues may be a testing assignment for visually impaired people. Programmed at tire style acknowledgment is in addition a craving analysis issue owing to pivot, scaling, enlightenment, and significantly intensive intra class style varieties. This approach is used to set up a model that may helping nursing, ongoing item advancement for disabled people. Such a system of recognizing patterns having completely different colors makes their life easier and improves their life quality. The designed paradigm can include most of the pattern like fabric, striped, pattern-less, irregular and can acknowledge eight style of colors. The system includes a speaker, a computer and MATLAB. The output of this technique is given by audio signal. Sound flag is used for this framework.

[03] Several essential daily chores can be a tough task for people who are visually impaired. Automatic pattern recognition will bring the lot of required independence in their lives by using a camera-based image system that identifies patterns in four classes. These are plaid ,striped, patternless and irregular. It also identifies sixteen colors. The system integrates a camera, a mike, a computer, and a ear-phones for audio description. The technique used by them is edge detection for pattern recognition. To identify the colors they have used the threshold technique.

III. METHODOLOGY

The various techniques used in this project are summarized as follows:

A. *Open laptop Vision (OpenCV)*

A prior information on Python and Numpy array is required before beginning OpenCV. Numpy could be a extremely optimized library for numerical operations. It provides MATLAB-style syntax. The entire Open CV array structures area unit regenerates to-and-from Numpy arrays. Therefore no matter operations you'll be able to do in Numpy, you will be able to mix it with OpenCV that will increase variety of weapons in your arsenal. OpenCV could be a cross- platform library exploitation that we are able to develop period of time laptop vision applications. It mainly focuses on image process, video capture and analysis together with options such as face detection and object detection.

B. Convolution Neural Network (CNN)

CNN uses special convolution and pooling operations and performs parameter sharing. To use CNN technique on the applying, there's a desire of Tensor Flow and Keras library for the feature extraction. In our application, we end to area unit exploitation 3 layers of CNN.

C. Tensor Flow

Tensor Flow is Associated in Nursing ASCII text file machine learning library for analysis and production. Tensor Flow offers A pis for beginners and consult ants to develop for desktop, mobile, web, and cloud. Tensor Flow could be a framework created by Google for making Deep Learning models. It can be used in machine training and deep learning applications. To develop and analysis on fascinating ideas on computing, Google team created Tensor Flow. Tensor Flow is intended in Python programming language, thus it's thought-about a simple to know framework. Tensor Flow is additionally known as a "Google" product. It includes a range of machine learning and deep learning algorithms. Tensor Flow will train and run deep neural networks for written digit classification, image recognition, word embedding and creation of assorted sequence models.

The steps that needs the execution and correct dimension of the whole network:

1. Embrace the mandatory modules for Tensor Flow and therefore the knowledge set modules, that area unit required to work out the CNN model.

2. Declare a perform known as `run_cnn()`, which incorporates varied parameters and improvement variables with declaration of knowledge place holders. These improvement variables can declare the coaching pattern.

3. During this step, declare the coaching knowledge placeholders with input parameters. Then reshape the tensor as per the needs.

4. Currently it's time to form convolution layers.

Let us flatten the output prepared for the totally connected output stage - once 2 layers of stride a pair of pooling with the scale of twenty eight x twenty eight, to dimension of fourteen x fourteen or minimum seven x seven x,y co-

Ordinates; however with sixty four output channels. To form the totally connected with "dense" layer, the new form has to be [-1, 7 x 7 x64].

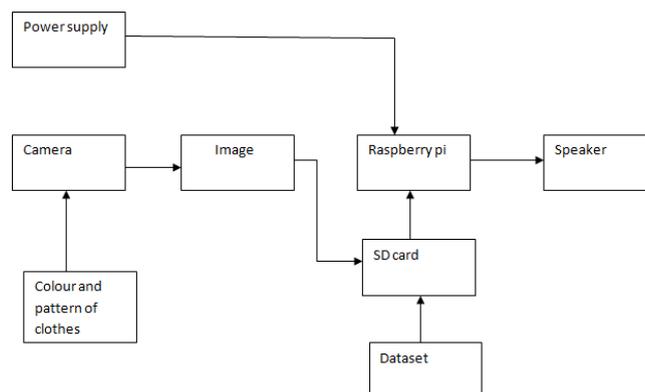


Fig.1: System Block Diagram

a) Camera:

- For taking photos of garments we tend to used USB a pair of 2.0webcam.
- The consumer goods pattern are classified into 5 sorts like (plaid, striped, pattern less,

horizontal- vertical, irregular etc.) and completely different colors that are scanned by using webcam.

b) RaspberryPI:

- The raspberry pi could be a credit-card sized laptop that plugs into a computer monitor.
- It is employed for computing and process of color pattern.

c) Speaker:

- The output is provided by the speaker.

d) Dataset

- CCNY data set is employed to store the pattern of clothes which can be used for comparison with here all time cloth image.

e) SD card

- It is employed to store the data.

I. EXPERIMENTATION AND RESULTS



Fig 2: InputImage

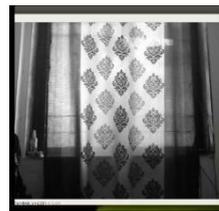


Fig 3: Grayscaleimage



Fig 4: Bilateral image



Fig 5: Canny image

The results were obtained by performing the preprocessing on the real time image. The gray scale image is obtained by processing the input image for reducing the complexity of the image. For this conversion, we add the three basic colors i.e. RGB and divide it by 3 to induce the specified gray scale image. A bilateral image is employed for non- linear, edge-preserving and noise-reducing smoothing of the gray scale image. It returns the in intensity of each pixel with a summed average of intensity values from neighboring pixels. The canny image detection is completed to detect a go orange of edge sin image. It is edge detection operate or that uses a more than ones a get detect the edge present in an image.

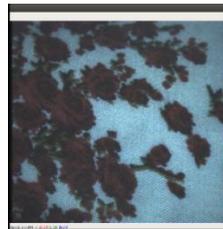


Fig 6:Input image

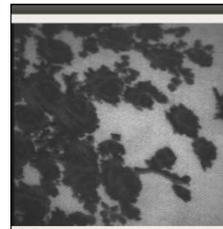


Fig 7: Gray scale image

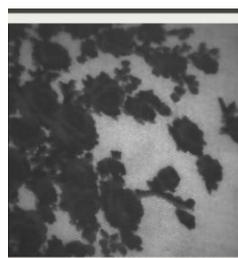


Fig 8:Bilateral image

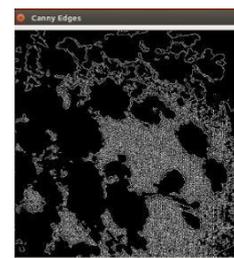


Fig 9: Canny image

The above four results were obtained after preprocessing another real time image. The first image is input image. After preprocessing it grayscale, bilateral and canny image are obtained. This images will be used for the further process of color and pattern detection.

Given below is the figure showing results of epochs.

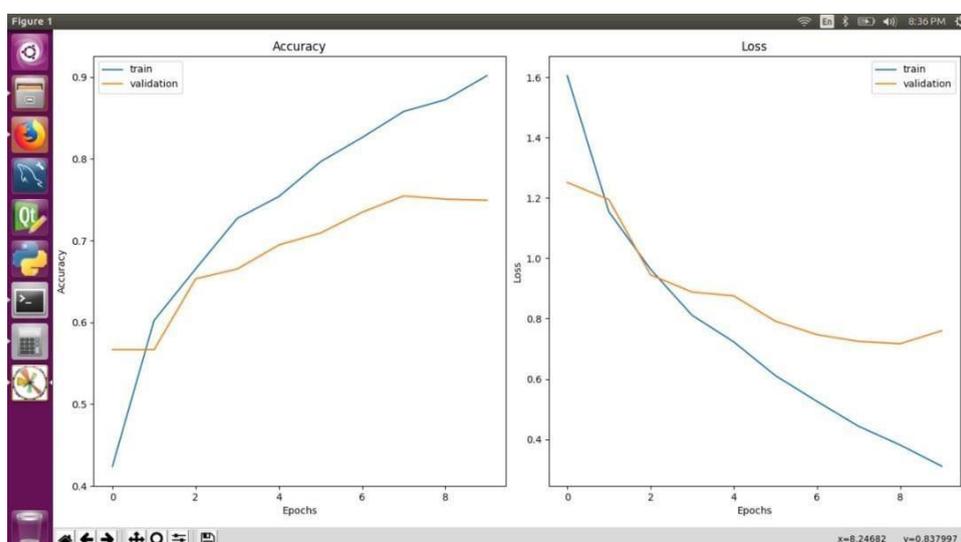


Fig 10: Result

In this, figure shows the accuracy and loss of the system with reference to the epochs. The first figure shows the accuracy with reference to epochs and second figure shows the loss with reference to epochs.



Fig 11: Input Image



Fig 12: Color detection

The above two figure shows the results after processing the given image. Fig. 11 shows the input image of the cloth which is taken for the color and pattern detection. The color detected after processing the image is blue which is shown in the Fig 12. This figure shows the detected color.

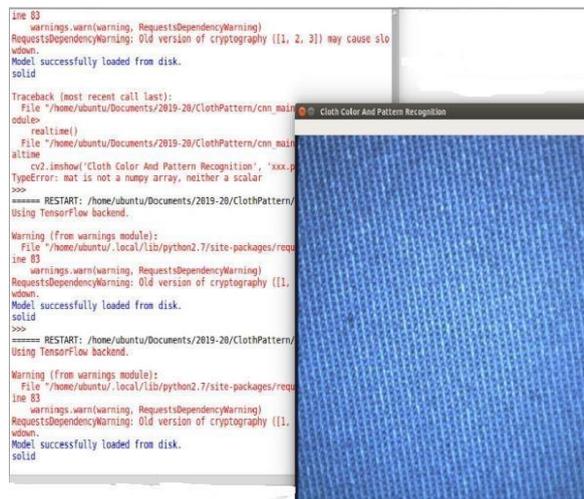


Fig 13: Pattern detection

The above figure shows the pattern which has been detected after processing the given image by using the Convolutional Neural Network algorithm. The Pattern detected is solid.

V. CONCLUSION

This technique can acknowledge patterns and colors to help visually impaired folks in their existence. The projected system detects the clothing colors and patterns. It offers some new approach to the visually impaired person. The clothing pattern is detected using the Convolutional Neural Networks. The system processes the images using OPENCV techniques. The output is provided by the speaker through which visually impaired people can acquire the colour and pattern of cloth. Hence, the system will help them in their daily chores.

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