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Clothing Image Retrieval Based On Multiple Features for Smarter Shopping

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Abstract

Modern life is truly fast paced and lives of most people are overburdened. In such a scenario online shopping is a great and time saver. Ladies clothing cannot be easily specified like grocery or furniture items. Normally, ladies clothing has numerous characteristics that are hard to describe like texture, shape, color, print, length etc. In this work, we propose a way to search for clothes where the query is in the form of image in place of descriptive set of words. The first step of the procedure is to identify in accordance with the length of the dress and sleeves. Next features like color and texture are obtained. To detect the best close match, human intervention is not obligatory. A data set of 1500 images is created. The dataset is built up from craftsvilla, jabong, voonik, myntra, amazon, snapdeal, flipkart, fashionara, shoppersstop. The outcomes confirm a precision of 89.25% and recall of 87.00%.

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Keywords: image retrieval, feature extraction, pattern matching

1. Introduction

With the advent of smart phones and shopping android applications, online shopping has come in a big way. One can shop from the comforts of one's home – no travel time, no parking hassles and no going from shop to shop looking for a particular item. The internet has revolutionized shopping; online shopping has turned into the modern, current trend of shopping.

However, a major problem in online shopping is searching through a huge collection of items for a desired product.

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The problem becomes even more pronounced when buying ladies clothes. The dresses come in multiple colours, pattern and varying length which make it a challenging task to match and retrieve them [1]. In this work, we propose a method where a user gives an image as a query instead of a set of key words describing the dress. We identify the style of the dress by identifying the length of the dress and the type of the sleeves – sleeveless, half sleeve or full sleeves. Other features used are colour and texture.

2. Proposed Framework

Here we discuss the clothing image retrieval framework using which the user can come up with images of clothes in which they are interested. And they can find out the similar dresses in the database with the help of this framework. The proposed framework is shown in figure 1. It has 3 phases i.e. pre-processing, feature extraction and classification. In this section, each phase is described in detail. The proposed method provides a self-operating procedure to look for a matching dress and gives a good retrieval and recognition outcome on the dataset of women's dresses.

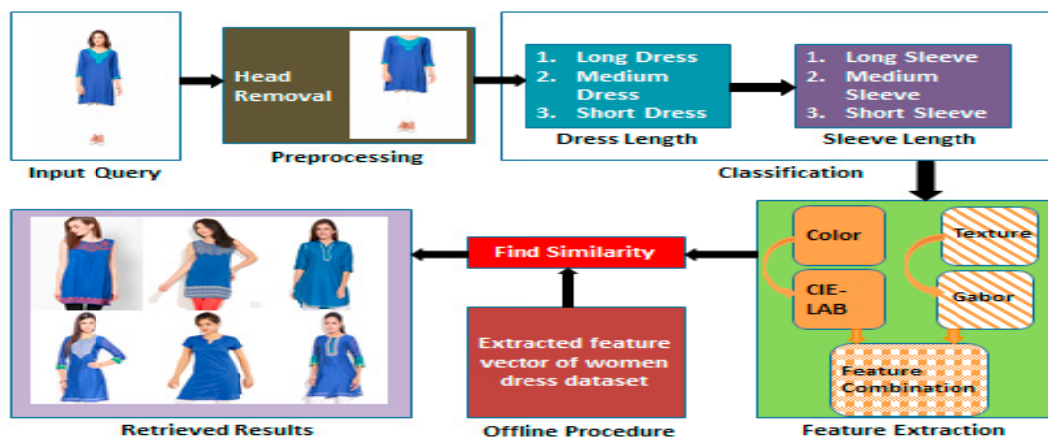


Fig. 1. Clothing retrieval system framework

2.1. Pre-processing

In this step, we first computed the region of interest by removing the head portion with the help of the Viola Jones algorithm [2]. The scale and relative position of each identified face is used to prognosticate a bounding box around the face.

2.2. Classification

In the proposed approach the dress is classified depending upon its length and sleeves.

We use horizontal projection histogram [3][4] to find out the length of the dress. The usage here is to discover the top and bottom place of the clothing. After binarization of the image [5], we get the upper and the lower bounds of the dress. The gap between the upper bound and the lower bound is noted as the length of the upper body dress. The length of the lower body clothing can be calculated as the length from the lower bound to the end of the image. To put the length of the dress under the category of long, short and medium, we calculate the ratio between the upper body and lower body by setting the threshold empirically for classifying the dress.

Like dress length, sleeves are also categorized into three types, sleeveless, full sleeves and half sleeves. Preliminary manual tagging is used to know the sleeves of clothing. S.liu et al. In [6] wielded the mechanical turk website to automatically tag the image. To automate the procedure of finding the sleeve length, we have introduced an algorithm. We explore the idea that, the sleeve length can find out with the help of skin color pixel. We can easily find out the length of the sleeves by taking the ratio of skin color and dress color.

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