

## **A Virtual Dressing System**

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Virtual dressing rooms are a relatively new concept, which is slowly becoming a trend on various fashion websites. The virtual dressing room allows a customer who is at home, to virtually try on dresses, and other fashions online. This allows the consumer to gauge, if the style and the fit are an appropriate match before adding it to the virtual shopping cart of a webstore.

Customers are nervous about purchasing garments electronically, because they are unsure of what size to order, and how the clothes will look on them. Merchants are nervous about the high volume of apparel returns. For a merchant, the handling of an apparel return can cost up to four times what it costs to process the initial sale of the garment. Industry analysts have estimated that apparel returns for electronic merchants range from about 10% for very basic items to between 35% to 40% for high end clothing. The single biggest reason for returns of apparel purchased electronically is poor fit.

The objective of this research is to address the above stated issues. Firstly, to improve the ability to make the right buy, with better opportunities to experiment with the dress style. These are the competitive advantages. Secondly, to reduce the buying risk, time, effort, discomfort, queues at shops, and the proportion of returned items.

To address these issues, the technology of image processing, template matching (which is for finding small parts of the image) and thresholding, the simplest method of image segmentation was used. NET was the main framework for this application and C# and C++ are used as the language for the development. The OpenCv libraries were also used for this application. Main functions implemented in this system can be categorized as follows: 1. Loading the video stream to the form 2. Embedding textile images 3. Facilitating the user to move the textile image that was embedded to the video according to requirements.

Any user who is new to the system must select the given item and background. Selected values are written in a text file. These text file values are read by logic files and it would load the appropriate images into the forms. The function `cvtColor()` in OpenCv converts the input image from one color space to another. In the case of transformation to-from RGB color space the ordering of the channels is specified explicitly (RGB or BGR). In case of non-linear, the input RGB image is normalized to the proper value range in order to get the correct results. Image is scaled before a transformation. Transformations are done within the RGB space by adding or removing an alpha channel, reversing the channel order, conversion to-from 16-bit RGB color (R5:G6:B5 or R5:G5:B5), conversion to-from grayscale and the conversion from a RGB image to gray color.

The 8-bit and 16-bit images R, G and B are converted to floating-point format and scaled to fit in a range in between 0 to 1 and the values are then converted to the destination data type. The system is functioned by a threshold color and all the detecting functions are working according to these threshold colors. The OpenCv threshold method is used for the above. The Bayer pattern used in CCD and CMOS cameras allows color pictures from a single plane where R, G and B pixels (sensors of a particular component) are interleaved. The output RGB components of a pixel are interpolated from 1, 2 or 4 neighbors of the pixel with the same color.

The implemented system can be used to overcome the identified problems of this study. The system was a real success with the illumination conditions that were used to test the system.