International Journal on Future Revolution in Computer Science & Communication Engineering
Volume: 4 Issue: 1
ISSN: 2454-4248
226 – 228

2D Virtual Trial Room using Augmented Reality

1 Vinaya Kulkarni, 2Sailee Morde, 3 Bhairavi Pawar, 4Supriya Mahadik, 5 Rutuja Dahore
1,2,3,4 Department of Computer Engineering,
Bharati Vidyapeeth's College of Engineering of Women
Savitribai Phule Pune University, Pune, Maharashtra, India

Abstract- Real Time Virtual Trial Room application using Augmented Reality is used in any shopping centers, malls, shops.Itallows a user to try on virtual clothes. Trying clothes in a malls are usually time consuming. Our aim is to build an interactive and highly realistic virtual system where the customers can choose many different clothes and proceed to simulate on users. Here, this paper gives user friendly interface which auto-detect human face and merge the chosen clothes on the users by using webcam as an input device and displays on the screen. Our motivation is to increase time efficiency and improve the accessibility of clothes try on by creating virtual dressing room environment.

Keywords-*Virtual fitting room, face detection, Augmented Reality, Human Friendly Interface.*

******

1. Introduction

1.1 Problem Definition

Trying different clothes in shops and finally selecting the right one is a time consuming and tedious task. So, Real time virtual dressing room is the concept where the customers can buy clothes without wearing it actually. Virtual dressing environment is online equivalent of the in store changing room. It enables the shoppers to try on clothes virtually rather than physically.

In shopping mallsdue to security reasons, there is also a restriction on the number of garments that can be taken at one instance of time for trial. It increases the overall shopping.

Recently, virtually try on clothes has received much attention due to its commercial potential. This can be very useful for online shopping or intelligent recommendation to narrow down the selections to a few designs and sizes.

1.2 Project Scope

This project aims to create an augmented reality dressing room. This requires real-time tracking of the user pose as well as realistic virtual clothing. The focus of this project is on realistic interaction between the user and the virtual clothing.

- be aligned correctly with the user position and pose.
- Move and fold realistically.
- be realistically rendered into the environment

To provide the e-shopping customers with an interface to try on cloths virtually, to allow the customers to try the apparels in different sizes, to let the customers enjoy a stand away, physical-touch free experience while using the system. To provide real time customization of the customer's outfit.

1.3Analysis of Modules:

1. Webcam-interface,Image Processing
2. Authentication
3. Image Preparation
4. Gesture Detection

2. System Architecture:

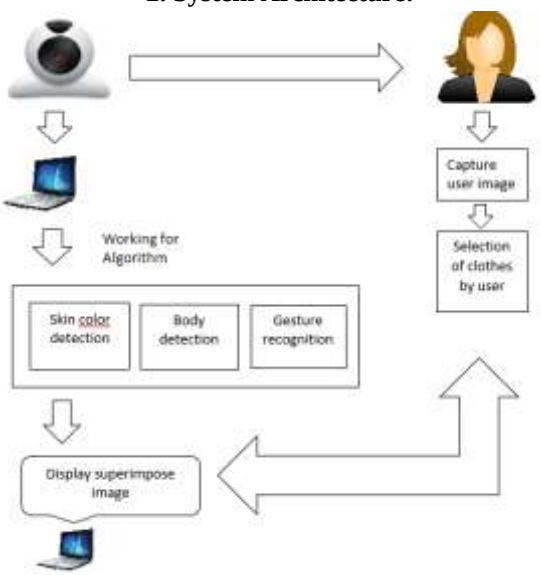

Fig.4.1 System Architecture

In system it has a flow in which all the related and has a functional dependency. Input should be form the user that is customer should be stand in front of the webcam as shown in figure flow will be same of the processing shown it will detection of body after that the alignment of cloth and manage to adjust using the gesture and also recognized the movement of the body after that it will be done all the processing.

Visual Studio does not support any programming language, solution or tool intrinsically, instead it allows the plugging of functionality coded as a Package. When installed, the

 ISSN: 2454-4248
226 – 228

functionality is available as a Service. The IDE provides three services: SVsSolution, which provides the ability to enumerate projects and solutions; SVsUIShell, which provides windowing and UI functionality (including tabs, toolbars and tool windows); and SVsShell, which deals with registration of VSPackages. In addition, the IDE is also responsible for coordinating and enabling communication between services. All editors, designers, project types and other tools are implemented as VSPackages. Visual Studio uses COM to access the VSPackages. The Visual Studio SDK also includes the Managed Package Framework (MPF), which is a set of managed wrappers around the COM-interfaces that allow the Packages to be written in any CLI compliant language. However, MPF does not provide all the functionality exposed by the Visual Studio COM interfaces.The services can then be consumed for creation of other packages, which add functionality to the Visual Studio IDE.

Support for programming languages is added by using a specific VSPackage called a Language Service. A language service defines various interfaces which the VSPackage implementation can implement to add support for various functionalities. Functionalities that can be added this way include syntax coloring, statement completion, brace matching, parameter information tooltips, member lists and error markers for background compilation. If the interface is implemented, the functionality will be available for the language. Language services are to be implemented on a per-language basis. The implementations can reuse code from the parser or the compiler for the language. Language services can be implemented either in native code or managed code. For native code, either the native COM interfaces or the Babel Framework (part of Visual Studio SDK) can be used. For managed code, the MPF includes wrappers for writing managed language services.

3. Algorithm

- **Gaussian Blur:**

In image processing, a Gaussian blur (also known as Gaussian smoothing) is the result of blurring an image by a Gaussian function. It is a widely used effect in graphics software, typically to reduce image noise and reduce detail. The visual effect of this blurring technique is a smooth blur resembling that of viewing the image through a translucent screen, distinctly different from the booked effect produced by an out-of-focus lens or the shadow of an object under usual illumination. Gaussian smoothing is also used as a pre-processing stage in computer vision algorithms in order to enhance image structures at different scales see scale space representation and scale space implementation.

Mathematically, applying a Gaussian blur to an image is the same as convolving the image with a Gaussian function. This is also known as a two-dimensional Weierstrasstransform. By contrast, convolving by a Gaussian blur has the effect of reducing the image's high-frequency components.

The normal distribution above is one dimensional, the graph is two dimensional. We need two dimensional normal distribution.

The density function of normal distribution is called Gaussian function. The one dimension format is :

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/2\sigma^2}$$

Here μ is the average of x, Because center point is the origin point when calculating average value, so μ equals to 0.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-x^2/2\sigma^2}$$

Based on the one dimension function , we can derive the two dimensional Gaussianfunction.

$$G(x,y) = \frac{1}{2\pi\sigma^2} e^{-(x^2+y^2)/2\sigma^2}$$

With this function, we can calculate the weight of each point.

- **Blob Detection:**

In computer vision, blob detection methods are aimed at detecting regions in a image that differ in properties, such as brightness or color, compared to surrounding regions. Informally, a blob is a region of an image in which some properties are constant or approximately constant; all the points in a blob can be considered in some sense to be similar to each other. The most common method for blob detection is convolution.

One main reason is to provide complementary information about regions, which is not obtained from edge detectors or corner detectors. In early work in the area, blob detection was used to obtain regions of interest for further processing. These regions could signal the presence of objects or parts of objects in the image domain with application to object recognition and/or object tracking.

- **Thresholding:**

Thresholding is the simplest method of image segmentation. From a grayscale image, thresholding can be used to create binary images Colour images can also be thresholded. One approach is to designate a separate threshold for each of the RGB components of the image and then combine them with an AND operation. This reflects the way the camera works and how the data is stored in the computer, but it does not correspond to the way that people recognize colour.

- **Background Substraction:**

Background subtraction, also known as foreground detection, is a technique in the fields of image processing and computer vision wherein an image's foreground is extracted for further processing (object recognition etc.). Generally an image's regions of interest are objects (humans, cars, text etc.) in its foreground. After the stage of image preprocessing (which may include image denoising, post processing like morphology etc.) object localisation is

 ISSN: 2454-4248
226 – 228

required which may make use of this technique.
Background subtraction is a widely used approach for detecting moving objects in videos from static cameras. The rationale in the approach is that of detecting the moving objects from the difference between the current frame and a reference frame, often called "background image", or "background model". Background subtraction is mostly done if the image in question is a part of a video stream. Background subtraction provides important cues for numerous applications in computer vision, for example surveillance tracking or human poses estimation.
Background subtraction is generally based on a static background hypothesis which is often not applicable in real environments. With indoor scenes, reflections or animated images on screens lead to background changes. Similarly, due to wind, rain or illumination changes brought by weather, static backgrounds methods have difficulties with outdoor scenes.

- **Image Segmentation:**

In computer vision, image segmentation is the process of partitioning a digital image into multiple segments (sets of pixels, also known as super-pixels). The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. More precisely, image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics.
The result of image segmentation is a set of segments that collectively cover the entire image, or a set of contours extracted from the image. Each of the pixels in a region are similar with respect to some characteristic or computed property, such as color, intensity, or texture. Adjacent regions are significantly different with respect to the same characteristic.

4. Advantages:

- You can try on clothes before buying them. It shows you accurate fit and look
- There will be low chance of returns
- It saves customer from the long queues at the mall or store so time consumption will be less
- It saves the retailers from damaged garments due to heavy try on by the customers
- Don't have to go through wearing and taking off clothes again and again till you find the "one".
- It will profitability for the retailers
- It can also be used for security purpose from the hidden camera in trial room

5. Disadvantage:

- Only disadvantage is that if any problem is created in the system then function will not work properly.

6. Applications:

- It is basically used in shopping mall
- For online shopping
- Trial for various other clothing, accessories etc.

7.Conclusion:

Here the virtual dressing room application requires only a front image. For each product to superimpose it onto the user and the 2D graphics of the product seem to be relatively satisfactory and practical for many uses. The presented methodology tis used to align the models with the user and to test the procedure under different conditions. The experiments have resulted with acceptable performance rates for regular postures. There are many possible implementations regarding the model used for fitting. It is possible to apply a homographic transformation to the images rather than the simple scale-rotate technique in order to match multiple joints altogether although it would require more computation. Another alternative could be using many pictures at different angles so that it would be possible to create more realistic video streams. One could achieve a similar effect using 3D models and rendering them according to the current angle and positions. Second approach would also make it possible to implement a physics engine to go along with the model.

Reference:

[1] Jaychand Upadhyay, Divya Shukla, Nidhi Patel, Sheetal Nangare-"Virtual Makeover and Virtual Trial Dressing"-International Journal of innovative Research in Computer and communication Engineering (An ISO 3297: 2007 Certified Organization)Vol. 3, Issue 3, March 2015

[2] Iohannis Pachoulakis and Kostas Kapetanakis-"augmented reality platforms for virtual fitting rooms"-Proceeding of The International Journal of Multimedia & Its Applications (IJMA) Vol.4, No.4, August 2014

[3] http://www.openni.org/

[4] Real time apparel visualization By Shabbir Marzban Mohammad Haris Baig

[5] Shreya Kamani, Neel Vasa, Kriti Srivastava-"Virtual trial room using augmented reality" Proceeding in International Journal of Advanced Computer Technology (IJACT)2015

[6] Saurabh Botre, Sushant Chaudhari, Shamla Mantri-"Virtual Trial Room"-International Journal of Computer Science Trends and Technology (IJCST) – Volume 2 Issue 2, Mar-Apr 2014

[7] Prof. Cheng Yu 2. Dr. Akshay Kumar-"Intelligent virtual fitting room a future technology Approach"-Singaporean Journal of Scientific Research (SJSR) Journal of Technology and Engineering System (IJTES) Vol.8.No.3 2016 Pp.158-163 available at www.iaaet.org/sjsr