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A Real Time Virtual Fitting Room Application

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ABSTRACT

It is really time consuming activity to try clothes in clothing stores. In this paper we present a Real Time Virtual Fitting Room Application which allows customers to choose clothes in virtual environment. We provide an easier way to try & choose clothes virtually. Our application allows user to try clothes of various sizes, different styles & proper fittings in virtual environment rather than physically trying them. For this we use image of customer, models of different coordination and skin color of that customer. The presented application is used to improve accessibility of trying clothes and maximizing the time efficiency by introducing a virtual fitting room environment.

Keywords— Virtual Fitting Room (VFR), virtual space, 2D-modelKeywords— Social Wireless Network, Cooperative caching, selfish user, Content provisioning, ad hoc networks.

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I. INTRODUCTION

There is substantial, loss of time in don and doffing of clothes in stores which is one of the common tasks which requires most of the time. Generally more waiting time have to be considered, for example, when looking into the mirrors of changing rooms. Even, more time is wasted for don and doffing, and also most buyers doesn't like to purchase garments online directly or they are not satisfied with their online shopping experience.

Clothing descriptors of anatomical types are more mixed and less experimental, e.g. "outsize", "flat-chested" or, "pear-shaped". The available measurements about body shapes are largely unreliable and most clothing is made to fit a small number of stands, which are assumed to represent “average” sizes. The explanation is extraordinary custom and routine, with little regularity in the market place and continuing customer needs about fittings. Shape analysis allows the perfect and accurate averaging of body shapes which fall into a particular size category, allowing to improved mannequins (real and virtual) to be made.

The techniques discussed in this paper can enhance the shopping involvement. We are proposing a Virtual Fitting Room (VFR) system, which gives a answer for the above conditions. We are developing function that is based on software which helps in representing output from the structure, extracted from image (taken from camera).When the person is standing in front of the camera, he will be able to select clothes whatever he wants. We can also expand our system in future to recommend some clothes depending on his skin color which will suit on that specific person. We are virtually assigning cover of the selected garment with the image recorded by the camera.

ORGANIZATION

The paper is organized as follows: Existing System is presented in Section II.We present our scheme in Section III. The conclusion in Section IV .Future work in Section V

II. EXISTING SYSTEM

A system employs one Kinect sensor and one High-Definition (HD) Camera. System has been deployed since April 2012 in one of Singapore’s largest shopping centers. In order to get a convincing virtual try-on experience for the customer user, the Kinect sensors are being used. These sensors are built by Microsoft and are very expensive. HD camera is used to replace the role of Kinect’s built-in RGB camera included for HD recording. This necessitates a calibration process between the HD camera and the Kinect depth camera in order to map the 3D clothes seamlessly to the HD video recording of the customers.

Virtual try-on system consists of a vertical TV screen, a Microsoft Kinect sensor, an HD camera, and a desktop computer. Figure gives idea of the front view of the

Interactive Mirror together with the Kinect and HD camera. The Kinect sensor is an input device marketed by Microsoft, and designed as a gaming interface for Xbox 360 consoles and PCs. It includes a depth camera, an RGB camera, and microphone arrays. Depth and camera have horizontal and vertical viewing ranges of 57.5 and 43.5 degrees.

Kinect can also angle up and down within -27 to +27 degrees. The territory of the depth camera for normal mode is [0.8_4] m and for near mode it is [0.4_3] min. The HD camera supports a full resolution of 2080 _ 1552, from which Virtual Try-on using Kinect and HD camera.

Fig. 1 The front view of the Interactive Mirror with Kinect and HD camera placed on top.

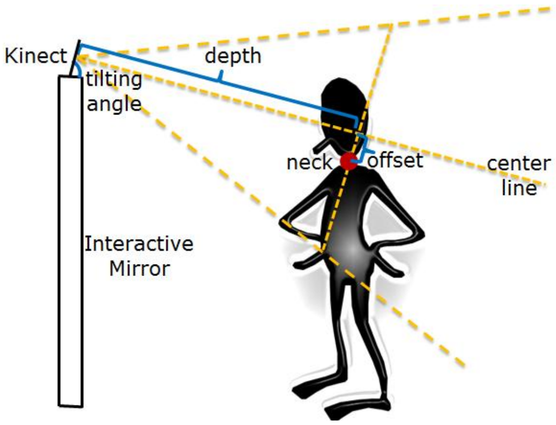

Fig. 2 Shoulder height estimation

Fig. 2 illustrates the major software components of the virtual try-on system. During the offline preprocessing stage, we need to calibrate the Kinect and HD cameras, and create 3D clothes and accessories. These two components will be discussed in more details in next sections respectively. During the online virtual try-on, we first detect the nearest person among the people in the area of interest. This person will then become the subject of interest to be tracked by the motion tracking component implemented on two publicly available Kinect SDKs, as will be discussed in Section 4. The user interacts with the Interactive Mirror with her right hand to control the User Interface (UI) and select clothing items.

When the user's feet are not in the field of view of Kinect. The tilting angle of the Kinect sensor, the depth of the neck joint, and the offset of the neck joint with respect to the center point of the depth image can jointly determine the physical height of the neck joint in the world space.

III. Proposed System

Proposed VFR is software based and designed to be universally compatible as long as the device has a camera. The use of web camera is a cheaper alternative to Kinect sensors. It does not require extra hardware support. The users can use the proposed system from their home itself. It provides real time access. Compared to other existing VFR systems, key difference is the proprietary hardware components or peripherals. The system makes the use of web cam to detect the human body. The body is then divided into upper body and lower body. Resizing of the images is done to superimpose the cloth image on the human body. This is cheaper version of the existing system which uses lot of hardware and cannot be used at home

Fig. 3 Proposed View Of System

OVERALL FLOW OF PROPOSED SYSTEM

The Fig. 4 .shows how proposed system will performs the operations.

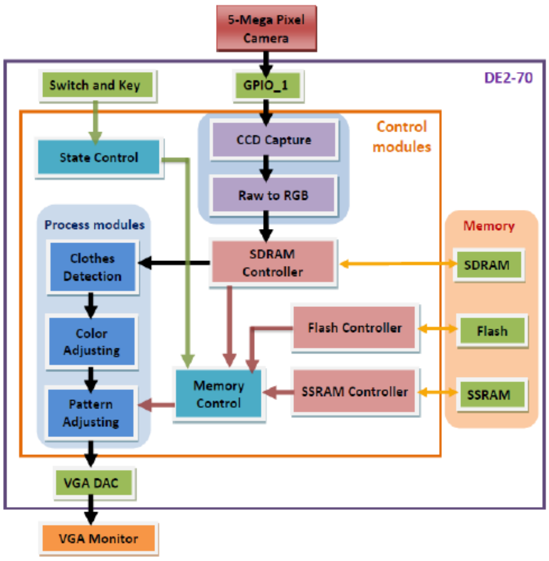

Fig. 4 System Architecture

3.1 User Extraction

Derivation of user allows us to create an augmented reality environment by isolating the user area from the image and superimposing it onto a virtual environment in the user interface. Additionally, it is very useful way to know the region of interest that is also used for finding skin color which is explained in further section The camera gives the image. When the device is used state, image is divided in order to separate background from the user. The background is discarded by blending the RGBA image with the divided image for each pixel by setting the alpha channel to zero if the pixel does not belong to the user.

3.2 Skin Segmentation

Since the model is superimposed on the upper layer, the user always stops behind the model which does not allow some capable actions of the user such as folding arms or holding hands in front of the t-shirt. In order to clear up that problem skin colour areas are searched and brought to the front layer. HSV and YCbCr color spaces are generally used for skin colour dividing. In this work we used YCbCr colour space and the RGB images are transformed into YCbCr colour space by following equations:

$$C_b = 128-0.169R-0.33G+0.5B$$

$$Y = 0.229R+0.587G+0.114B$$

$$C_r = 128+0.5R-5.419G$$

Fig. 5. Background removal. Depth image (left), color image (middle), extracted user image (right)

A threshold is applied to the color components of the image within the following ranges:

$$77 < C_b < 127$$

$$177 < C_r < 173$$

$$Y < 70$$

Since we have the extracted user image as a region of interest the threshold is given only on the pixels that belongs to the user. Thus, the areas on the background which may be similar with the skin colour are not processed. The skin colour segmentation is illustrated in Figure 6.

Fig. 6. Skin color segmentation. User image (left), segmented image (right)

3.3 HAAR Classifier

The core basis for Haar classifier object detection is the features which are similar to Haar. These features, other than using the force values of a pixel, use the different contrast values between neigh boring rectangular groups of pixels. The contrast differences between the pixel groups are being used to find whether relative light and dark areas are present. Two or three neighbouring groups with a relative contrast variance form a Haar-like feature. Haar-like features, as given in Figure are used to find an image . Haar features can simply be scaled by increasing or decreasing the size of the pixel group being determined. This uses features to detect objects of different sizes.

3.4 Integral Image

The simple rectangular features of an image are calculated using an intermediate representation of an image, called the integral image . Array which is also known as integral image which containing the sums of the pixels' intensity values located directly to the left of a pixel and directly above the pixel at location (x, y) inclusive . So if A[x,y] is the original image and AI[x,y] is the essential image then the integral image is computed as shown in equation and illustrated in Figure 7

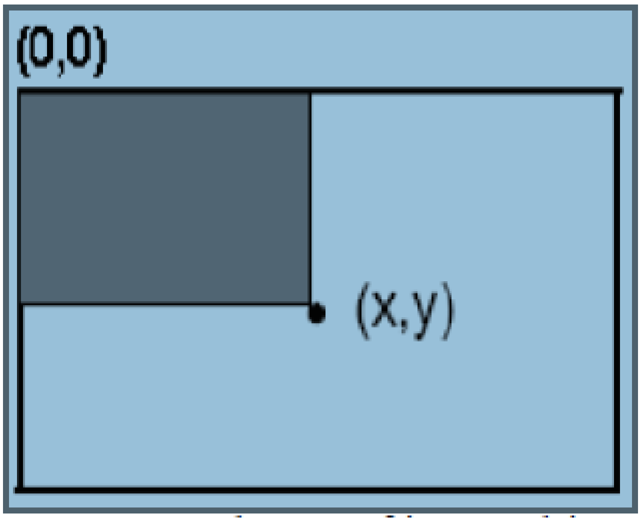

Fig. 7 Summoned are of integral image

3.5 Classifiers Cascaded

Although calculating a feature is extremely efficient and fast, computing all 180,000 features present within a 24 × 24 sub-image is impractical [Viola 2001, Wilson 2005]. Fortunately, only a tiny fraction of those features are needed to determine if a sub-image potentially contains the expected object. In order to discard as many sub-images as possible, only a few of the features that characterize an object are used when analysing sub-images. The goal is to discard a substantial amount, around 50%, of the sub-images that do not contain the object.

Haar classifiers continue, increasing the number of features used to analyze the sub-image at each stage. The cascading of the classifiers uses only the sub-images with the highest possibility to be analyzed for all Haar-features that discuss an object. It also uses one to find the accuracy of a classifier. One can maximize both the false alarm rate and positive hit rate by minimizing the number of stages.

The inverse of this is also true. Viola and Jones were able to accomplish a 95% accuracy rate for the detection of a human face using only 200 simple features. Using a 2 GHz computer, a Haar classifier cascade could detect human faces at a rate of at least five frames per second

IV. CONCLUSION

After an introduction, the related work was presented; starting with Cloth selection and virtual try-on, cloth recommendation system is also present there. Afterward a convenient look on the technologies and frameworks that are being used for the creation, like Haar classifier algorithm, of the Measurement of the tailoring and Virtual Try-on was taken. After this the different conditions of the design process up to the construction of the garment models were highlighted.

In the last section the tests was carried out, also discussion on outcome, the appearance and the interaction with the Tailoring Measurement and Virtual Try-on. Overall, the proposed Virtual Dressing Room is a good quick fix for easy and accurate try-on of garment. In this system compared to other technologies like augmented reality markers or real-time motion capturing techniques no expensive configurations and time-consuming build-ups are required. After this point of view it is an excellent addition for a cloth store.

Beyond that a simple setup of the system can also be assembled at home since the minimum requirements are a computer with a screen and a Camera. This can also outcome in an additional feature for a web shop, for instance. It would allow a virtual try-on of clothes before people are shopping it online, looking closer at the garment and even conveying the actual behavior of the real cloth. This gives a huge benefit over the common web shopping experience.

V. FUTURE WORK

Based on a acceptable duty and pricing case, a debatable model for the content provider's price computing is created. A cooperative caching method, Split Cache, is desired, numerically analysed, and theoretically confirmed to give best possible object placement for systems with homogenous content requirements. A benefit-based approach, Distributed Benefit, is used to minimize the provisioning price in heterogeneous networks consisting of nodes with different content request rates and patter.

VI. CONCLUSIONS

The main aim to this work was to develop a cooperative caching strategy for provisioning cost minimization in Social Wireless Networks. The key improvisation is to display that the best cooperative caching for provisioning cost reduction in networks with homogeneous content demands requires an optimal split between object duplication and individuality. In addition to that, we experimentally (using simulation) and analytically evaluated the algorithm's performance in the presence of user selfishness. It was well known that selfishness increases user rebate whenever there are selfish nodes in a Social Wireless Network having less than a critical number. It was given that with heterogeneous requests, a profit based heuristics methods gives better achievements compared to split cache which is desired mainly for homogeneous request. Ongoing work on this topic uses the development of an efficient algorithm for the heterogeneous call scenario, with aim of bridging the achievements gap between the profits Based heuristics and the centralized greedy method which was convinced to be optimal Removal of the no-collusion belief for user selfishness is also being worked on.

Future work on this topic have the development of an efficient algorithm for the heterogeneous demand scenario, with a goal of bridging the performance gap between the Benefit Based heuristics and the centralized greedy mechanism which was proven to be optimal in can be removal of the no-collusion assumption for user selfishness is also being worked on.

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