VIRTUAL FITTING SPACE FOR DRESS TRIALS

Dr. K. Mohan Prasad,
Associate Professor
Dept of cse
School of Computing
Sathyabama Institute of Science and Technology
Chennai 600119, Tamil Nadu, India
mohanaprasad1983@gmail.com

R. Sri Kavya,
Dept of cse
School of Computing
Sathyabama Institute of Science and Technology
Chennai 600119, Tamil Nadu, India
rkavya125@gmail.com

S. Bhuvaneswari Devi
Dept of cse
School of Computing
Sathyabama Institute of Science and Technology
Chennai 600119, Tamil Nadu, India
bhuvanasayapaneni8888@gmail.com

Abstract - People buy clothes in stores which may take a lot of time for them to try their fitting and in online shopping there is no possibility where people can try-on the clothes which they want to buy. Our intention is that by creating a virtual fitting room environment we can improvise approachability of trying clothes on and need not have to waste time we need to have the correct measurement of the user and the dress model with correct rotation, measurement, location. Even people are interested more in online shopping and do buy a lot of things, but buying clothes online is still considered as ineffective way because people don’t have enough knowledge about dress fittings in online shopping and it is not even possible to try-on the clothes. In order to improvise this drawback we can use the virtual fitting room which would provide the online customers with a wide range of options and a great delight to the vendors online. This concept of e-clothing helps you decide whether the dress fits you or suits you in an easy and efficient manner. Our analysis about customers provides a great fitting of dress to the person as per their requirement. To identify a human we use skeleton detection and to find the outline of human we use human contour detection method. Different positions of human body are detected using Haar cascade classification method and warping process is used to resize the outfit according to the size of the human body.

KEYWORDS: Skeleton detection, Human contour detection, Haar cascade classification, warping.

1. Introduction

The computers show an image or video as a 2D representation of a 3D image. As in Fig 1 a Kinect sensor consist of an infrared light source, RGB camera and four microphones. Unlike computers Kinect sensor can use all the data produced by cameras and microphones to detect the objects infront of it, determine the direction of sound produced by using signal processing hardware.
Fig 1: Kinect Sensor

A part from the two cameras in the middle there is a light source in the left and the microphones are present along the bottom of the Kinect sensor. The Kinect sensor has the ability to see object in 3D view. It has a depth sensor that can measure create its own depth map of area present before it. RGB camera is used by most of multimedia applications because of the depth information provided by it. This camera helps us in creating a visual dressing model. Each pixel has a colour. The colour is a 32-bit integer. As in Fig 2 Red is determined by the first eight bits, green by the next eight bits, blue by the next eight bits, and the remaining eight bits the transparency of the Pixels.

Fig 2: 32-bit integer colour pixels

Visual dressing is nothing but the user wearing the 3D designed outfit instead of manually trying it out. Visual dressing helps in me efficiency and majorly fills the gap in the existing online based shopping system by helping a customer to analyse if outfit suits them or not. There are a few challenges that we face during virtual dressing. In the existing model, we only have a 2D model. To develop a 3D model for virtual dressing we need to develop a skeleton detection method, and many methods have been proposed for skeleton detection, and they work very effectively. But most of them are inefficient when they are used in virtual dressing. This is due to the lack of synchronisation of the human body and outfit model. It is important to have an effective deformation model. In our proposed work, we would like to introduce a 3D model for virtual dressing. The formation of this model can be done by using a Kinect sensor. It is used for skeleton detection through the joints of the human body. We use Mat lab acquisition pre-processing and DAC algorithm for 3D model development. It is also an important task to check the synchronization of the human body and the developed 3D outfit model. This smart shopping method can be very useful to people which helps in me efficiency and gives effective way of shopping.

2. Existing Method

3D model and 2D image are the two major models in the existing virtual fitting model. Certain systems give results of 3D simulations of the human model and outfit using the size limitations of the outfit. In recent dressing simulations that can generate a perfect fitting on various different body shapes. In the above systems the generation of outfit are done with the help of a predefined human model. Depth camera is used to give a good 3Dimensional model of human body. Virtual fitting room concept works by imposing the 3Dimension model or picture with live video of the customer. In the video view the customer can feel the outfit or the accessory virtually according to the movement of the customer with the help of superimposed 3D model or picture. Real 3D fitting rooms has the properties of both 3D models and photo accurate fitting. A 3D figure is generated based on the photo and simple body measurements, in which the customer can visualize themselves in theirs chosen outfit. Human Contour detection it will detect the edges with respect to the coordinates or high peak value.
Warping serially randomly will capture the body and merge part by part. KNN Classifier (Need to set same body position with dress position)

3. Literature Survey

3.1 Dynamic context capture and distributed video arrays for intelligent spaces:

Human and machines combine to accomplish a task, for such kind of combinations can be possible by using intelligent environments. Human and computer interactions can be possible in multiple ways by maintaining a list of wide range of events. Some important functionality includes intruder detection, body pose, person identification, movement analysis. Useful intelligent spaces are identified by novel multi model sensor system. Cameras and microphones distributed all over will capture the audio and visual signals. Classification algorithm is used for taking high level semantic information from observed signals. Each signal have a specific task. Individual video analysis modules as well as to evaluate basic feasibility system are calculated by an experimental study in this paper.

Advantage: Time delay.
Disadvantage: Uniform distribution.

3.2 Computer modelling, analysis and synthesis of dressed humans:

CAD/CAM systems are used in garment design and manufacturing based on customer’s choice. They must be able to order dresses in the virtual way by trying over internet. In this model, Image formation scheme is used to represent the 3D structure of a human body. For this, two visual cues are used: occluding contours and stereo cue. They are used to monitor part positioning, orientation and deformation. 3D points provided by the stereo cue can filter the surface estimate and improve fitting of the dress. Arbitrary camera configuration, avoids overlapping of reconstructed surface. From the reconstructed human body, the body measurements are to be taken automatically and used in dress design on a virtual environment.

Advantages: Less distortion.
Disadvantages: Less speed.

3.3 Application of virtual reality technology in online fashion store development:

In recent times mannequins and dressing rooms have improved to a virtual environment. Virtual fitting environment provides a great help to online shopping. In few circumstances the clothes bought on online may disappoint the customer very badly. There may be a great difference of size, change of colour and may be dissatisfied with return policies. Virtual fitting clothes, consist of combination of virtual model creation, dress databases and methods of fitting the clothes. This research aims to develop a virtual fitting room toolkit. It consists of 3 main parts: mannequin modelling, clothes construction and clothes fitting. Finally, the whole process is integrated into an online fashion shop.

Advantage: Pixel calculation with high speed.
Disadvantage: x,y direction feature extraction.

3.4 A feasible face pose estimation by evaluating 3D facial feature vectors from 2D features:

Application for vision based human computer interaction is possible by having the head pose correctly from give input. Using features like skin colour and hair a 3D head pose is estimated. The 3D head pose of the 2D input face images is estimated using the primitive facial features. Skin colour is adapted by YCbCr model. By using 2D eye point, nose are used to get 3D head pose of input face image. This works with 3 major steps:

1. Facial region is separated by skin tone model.
2. Hair like features are used for detecting nose and eyes.
3. The head pose is modelled as mock face model with better result.

Advantage: Feature extraction of face in 3D
Disadvantage: No random distribution.
4. Proposed Method

In our proposed method to find the coordinates of a human body we use skeleton detection method and to find out the edges and outlines we use human contour detection. We use Kinect sensors for the detection of joints as in Fig 3.

For warping we use DRLBP and DRLTP (they extract pattern features of coordinates and will do warping parallel). Haar cascade classification is used to manage different positions of human body. Warping is a process in which we resize the outfit into the size of the person. The sample dress selected for fitting must be resized according to the size of person, this resizing is done by considering the feature points of the dress such that we can superimpose it over other similar texture. We perform interpolation technique on the dress that is divided to different regions of distinguished variations.

When we superimpose the warped dress on person as in Fig 4 there may be few flaws like hand size mismatch, hip size, overlay of dress etc… Firstly using the process of image fusion by blending. We impose the dress over the person. Skin matrix is used to correct the problems of overlaid sample dress and original image. Finally for the person who is virtually dressed we can use the same background or we can create a new background for the new and different look of the imposed outfit.

Fig 3: Skeleton Detection

Fig 4: Super imposing of Dress
5. Conclusion

The skeleton of the customer is detected by the Kinect device using IR-camera and RGB-camera based on the skeleton joints of the body. After knowing the joints we will frame the human structure. The dresses are then viewed on the human structure in a 3Dimension manner to give a lively look of dress on the customer. The dress image moves according to the motion of the human.

References

[1]. B. Wu, T. Mei, W.-H. Cheng, and Y. Zhang, “Unfolding temporal dynamics: Predicting social media popularity using multi-scale temporal decomposition,” in Proc. 13th AAAI Conf. Artif. Intell., 2016, pp. 272–278.
[2]. Sankari.A, Albert Mayan.J, "Retrieving call logs and SMS by messaging services",International Journal of Pharmacy & Technology, Vol. 8 , Issue No.4 , pp.22951-22958,2016.
[3]. W. H. Hsu, L. S. Kennedy, and S.-F. Chang, “Reranking methods for visual search,” IEEE Multimedia, vol. 14, no. 3, pp. 14–22, Jul./Sep. 2007.
[4]. W. H. Hsu, L. S. Kennedy, and S.-F. Chang, “Video search reranking through random walk over document-level context graph,” in Proc. 15th ACM Int. Conf. Multimedia, 2007, pp. 971–980.
[5]. R. Yan, A. Hauptmann, and R. Jin, “Multimedia search with pseudo relevance feedback,” in Image and Video Retrieval. Berlin, Germany: Springer, 2003, pp. 238–247.
[6]. M. Wang, H. Li, D. Tao, K. Lu, and X. Wu, “Multimodal graph-based reranking for Web image search,” IEEE Trans. Image Process., vol. 21, no. 11, pp. 4649–4661, Nov. 2013.
[7]. J. Cui, F. Wen, and X. Tang, “Real time Google and live image search re-ranking,” in Proc. 16th ACM Int. Conf. Multimedia, 2008, pp. 729–732.
[8]. Y. Rui, T. S. Huang, M. Ortega, and S. Mehrotra, “Relevance feedback: A power tool for interactive content-based image retrieval,” IEEE Trans. Circuits Syst. Video Technol., vol. 8, no. 5, pp. 644–655, Sep. 1998.
[9]. M R Annish Brislin, J Albert Mayan, R Aroul Canessane, M R Anish Hamlin,"Blood donation and life saver app",2017 2nd International Conference on Communication and Electronics Systems (ICCES), pp. 446 - 451,2017.
[10]. Usha Nandini , Saravanan M , Albert Mayan J , Murari Devakannam Kamalesh , Mohana Prasad K (2018), " Automatic traffic control system using PCA based approach ", International Conference on Energy, Communication, Data Analytics and Soft Computing, pp.2387-2392.
[11]. X. S. Zhou and T. S. Huang, “Relevance feedback in image retrieval: A comprehensive review,” Multimedia Syst., vol. 8, no. 6, pp. 536–544, Apr. 2003.
[12]. K. Mohana Prasad, Dr. R. Sabitha “Meta Physical Algorithmic Representation for Flawless Clustering” Journal of Theoretical and Applied Information Technology (JATITT), ISSN: 1992-8645, Volume 76, NO 1,PP 82-87.
[13]. K. Mohana Prasad, Dr. R. Sabitha “Evolution Of An Algorithm For Formulating Efficient Clusters To Eliminate Limitations” International Journal of Applied Engineering Research (IJAEER), ISSN 0973 – 4562, Volume 9, Issue 23, pp. 20111-20118.
[14]. Albert Mayan J, Kaldeep Anand D.S, Neha Sadvhvi(2017),"Efficient and secure server migration on cloud storage with VSM and dropbox services", International Conference on Information Communication and Embedded Systems (ICICES), pp. 1-5.
[15]. K. Mohana Prasad, Dr. R. Sabitha,” Yoking of Algorithms for Effective Clustering", Indian Journal of Science and Technology, ISSN: 0974-6846 Vol 8(22), IPL0269, September 2015, pp 1-4.
[16]. S.Karthikeyan, S.Jayashri, “Proficient Data Gathering by Mobile Agent using Jade”;i-manager’s Journal on wireless communication networks,Vol.1, No. 2, 2012, pp. 32-40.
[17]. S.Dhamodaran, Dr.M.Lakshmi (2017), "Design and analysis of spatial-temporal model using hydrological techniques", International Conference on Computation of Power, Energy Information and Communication (ICCPEIC),pp. 023 - 028.
[18]. Mohana Prasad, K., "Efficient dynamic clustering mechanism through unfathomed clustering techniques" Journal of Advanced Research in Dynamical and Control Systems, 06-Special Issue, 2018,pp 934-939.