Image-Based Virtual Try on Clothes

[1]Prof. Aarti Pimpalkar, [2]Shivani Shedage, [3]Sakshi Talekar, [4]Pooja Mokashe

[1]Professor, [2, 3, 4] Student

[1]Department of Computer Engineering,

[1]Sinhgad Academy of Engineering Pune, India

Abstract : The Virtual Try on Cloth is image-based technology to enhance the user experience on fashion-oriented ecommerce websites, it will help customer's satisfaction. To get perfect body fit cloth or exact cloth fitting on body through Imaged based - virtual try on, it's quite difficult. Here we present a virtual try on system to get photo-realistic images of clothed person and target clothing. Our project idea is applying some steps below to get exact results. Firstly, based on the pose of the given person our model adjusts the target clothing form to compatible with the given pose. After this next task is to generate the body segmentation map of the person wearing the target clothing, to better understand the body parts and clothing regions. Finally, the body segmentation map is fused together with warped clothing and a given person image for fine-scale image synthesis. The body segmentation map prediction using CNN, helps to guide image synthesis where body part and clothing intersects and it's useful to preserving clothing and body part details.

INTRODUCTION

There can be multiple problems a customers can face while he/she goes out to shop. When the cloth in shop tried by lots of people it may leads to various skin diseases to the customer, and it's also degraded the quality of cloth. Also, customers' needs a secure trail room, the chances of having camera in trail room is a major issue in India. If such problems are addressed by an effective solution of virtual try at home, then the pleasure of shopping can surely be increased leading to a huge profit to sellers as well. Nowadays Online shopping has getting speedy growth, instead of people walking in and out of the several shops to find their clothes, peoples using internet for shopping at home just with fewer clicks. One benefit of online shopping is we get a large verity of cloths at one place, so we can choose best one easily. With the help of internet and ecommerce websites, online shopping's becomes a trend these days. But as lots of people nowadays tend to go for online shopping, it's not the case that the customers are totally satisfied. Customers can only try on of the clothes only after the product is delivered to the customer. It's fair to customers to provide a way on website to try a cloth virtually, so person can get an idea how cloths is looking on him/her. Kind of virtual try on technology also useful to sellers, because after delivery when customers don't like a cloth or cloth doesn't come in fitting, customers return the cloths, which leads in excess of money waste to reverse procedure to get cloth back to seller. As this way, virtual try on cloth Beneficial's to both customers and sellers. Also, analysing look of cloths and garments is also big problems in online shopping as cloth may not be same in real which leads to customer's dissatisfaction, to avoid this virtual try on cloths can became a good solution to try cloth before purchasing it. This solution must be user friendly, efficient and embedded with advance technology. Virtual Try-on can be a great solution for eliminating the problems. It provides an option to try on the clothes virtually without visiting a shop in real and physically try on the clothes.

LITERATURE SURVEY

Han X et al. [2] propose a coarse-to-fine strategy to transfer a desired clothing item onto the corresponding region of a person. First it generates a coarse synthesized image with the target clothing item overlaid on that same person in the same pose. It further enhances the initial blurry clothing area with a refinement network. The network is trained to learn how much detail to utilize from the target clothing item, and where to apply to the person in order to synthesize a photo-realistic image in which the target item deforms naturally with clear visual patterns. Wang B et al. [3] propose a novel visual try-on network, namely Adaptive Content Generating and Preserving Network (ACGPN). In particular, ACGPN first predicts the semantic layout of the reference image that will be changed after try-on and then determines whether its image content needs to be generated or preserved according to the predicted semantic layout, leading to photo-realistic try-on and rich clothing details. Image-based virtual try-on systems based on deep learning have attracted research and commercial interests. Although they show their strengths in blending the person and try-on clothing image and synthesizing the dis-occluded regions, their results for complex-posed persons are often unsatisfactory due to the limitations in their geometry deformation and texture-preserving capacity. To address these challenges, Minar M et al. [4] propose CP-VTON+ for seamlessly integrating the image-based deep learning NCMRPE-23 methods and the strength of the 3D model in shape deformation.

METHODOLOGY

CNN image segmentation is used which involves dividing a visual input into segments to make image analysis easier. We follow a three-stage design strategy. The convolutional neural network for extracting high-level features of unreformed clothing contains multiple convolutional layers. First, it transforms the target clothing into a warped form compatible with the pose of the given person. Next, by using encoding layers and decoding layers it predicts a body segmentation map of the person wearing the target clothing. In order to preserve the features of both human body and clothing, segmentation map of the person wearing the target clothing before the final image is synthesized. Hence, the final image is guided by the generated segmentation map.

According to Richardson and smith(1993) to make the model more effective and efficient the selection criteria for the shares in the period are: Shares with no missing values in the period, Shares with adjusted $R^2 < 0$ or F significant (p-value) >0.05of the first pass regression of the excess returns on the market risk premium are excluded. And Shares are grouped by alphabetic order into group of 30 individual securities (Roll and Ross, 1980).

SYSTEM ARCHITECTURE

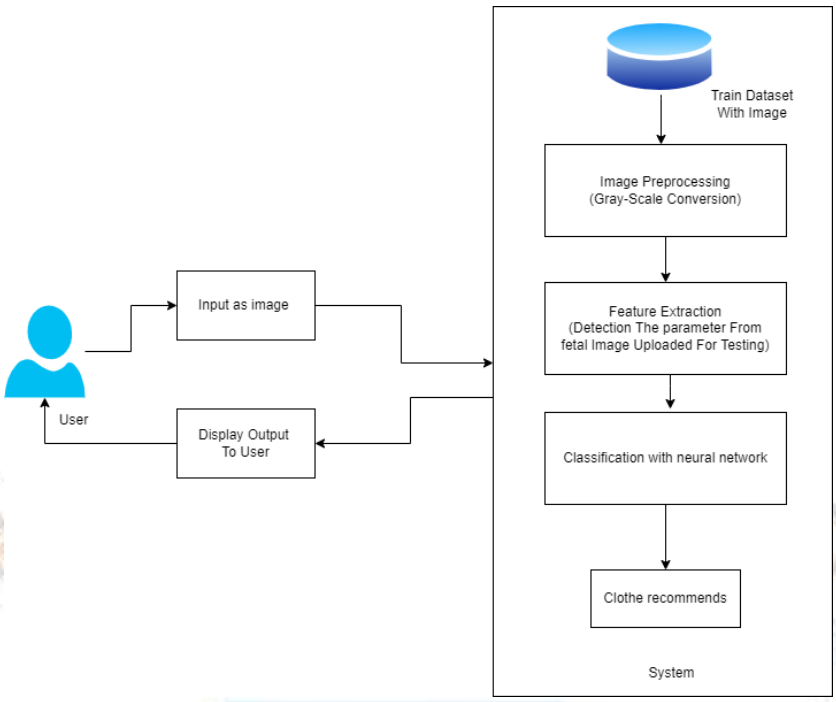

fig.1. shows the overall system architecture. the user will upload the person image and garment image and then the model will append the garment on the user image and output the 2d image.

IMPLEMENTATION

5.1. **Dataset**

The images used for training the model are from VITON [2]. The dataset contains 19,000 images, which includes a frontal-view women image and a top apparel image. The invalid images are further removed and split into a training set and testing test.

Fig. 2. Shows the dataset containing clothe images and model image

5.2. **Training**

Architecture contains Semantic Generation Module (SGM), Clothes Warping Module (CWM) and Content Fusion Module(CFM). SGM and CWM generators both follow same U-net structure. The structure of Spatial Transformation Network (STN) in CWM begins with five convolutional layers and then max-pooling layers. The training and testing images have the resolution of 256×192. We first predict the reference image semantic layout and then start preserving the image content. We trained clothe and model image independently and also combine the Results for try on image. Reference images used are the same as the target clothes image used in the training process. Each module in this system is trained for 20 epochs by setting the weights of losses $\lambda r = \lambda s = 0.1$, $\lambda 1 = \lambda 2 = 1$, and batch- size 8. The hyperparameters adjusted are $\beta 1 = 0.5$ and $\beta 2 = 0.999$ and learning rate is initialized as 0.0002. All the codes are implemented in python using PyTorch Deep Learning toolkit and runtime environment used is google colab for graphical processing unit.

5.3. **Testing**

The testing is performed on the unseen new images different from the ones used in training. We test our model in easy, medium and hard cases, independently, and estimate the results.

RESULT

The output result shows the transformation of the desired clothing item onto the corresponding person image.

Fig. 3 Shows the output of virtual try on

FUTURE SCOPE

Automating the manual processes could be a nice accomplishment insured by technology advancements particularly within the laptop vision field. One in all the most important industries that's influenced by technology advancement is Fashion attire. Because of laptop vision high-powered tools, an excellent expertise is often born for each retailer and customers. making AI systems that may perceive fashion in pictures, will produce a next-level client expertise like on-line fashion searching as a result of the fashion business is essentially regarding visuals, thus, it is often coping with laptop vision to acknowledge pictures even as we tend to handle creating computers perceive pictures. Creating AI systems that can understand fashion in images, can create a next-level customer experience like online fashion shopping because the apparel industry is basically about visuals, thus, it can be dealing with computer vision to recognize images just as we do by making computers understand images.

CONCLUSION

As Customers can buy clothes from lots of shopping apps and websites but using guessing method of how a cloth will look on the customer. So here the solutions come in picture is virtual try on system. After Considering all possible advantages and disadvantages of existing models on Virtual Try on system, we propose new way of virtual dressing AI model. Virtual Try-On presented an efficient and affordable method for real time virtual dress up system, consists of two steps: exploring the shopping app/website and select the cloth and second is to try it on using the mobile camera. There were many benefits from this real time virtual dress up systems for customers, sellers and companies, such as space saving as there is no need for extra space for trail rooms and help to maintains the quality of cloths, as customer not actually trying cloth on body. Thus, it didn't require physical space and it was much easier to use. Our model firstly working on picture to get body segmentation map which is then used to find target cloth. As this is easy method to try cloth virtually, even after dressing up virtually, we can share this pic to get opinions of other people. It also made people easier to choose dress perfectly within a short time. In this way, our system is reliable to solve the promising and challenging real-time automatic dress up system.

This study proposes that online consumers' usage experiences with and attitude towards VTO technology play an important role in their online purchase decision intention. According to this tendency and the consumption trend, this study not only enhances the convenience and satisfaction level of consumers but also contributes to profit increase of online retailers.

REFERENCES

[1] He Huang, Philip S. Yu and Changhu Wang, "An Introduction to Image Synthesis with Generative Adversarial Nets,"17 Nov 2018

[2] Han, X., Wu, Z., Wu, Z., Yu, R., Davis and L.S., "Viton: An imagebased virtual try-on network. In", the IEEE Conference on Computer Vision and Pattern Recognition (CVPR). (2018)

[3] Wang, B., Zheng, H., Liang, X., Chen, Y., Lin, L., Yang and M., "Toward characteristic preserving image-based virtual try-on network," In: The European Conference on Computer Vision (ECCV). (2018)

[4] M. Minar, T. Tuan, H. Ahn, P. Rosin, and Y. Lai, ''CP-VTON+: Clothing shape and texture preserving image-based virtual tryon,'' in Proc. CVPRW, 2020

[5] Dong, H., Liang, X., Shen, X., Wang, B., Lai, H., Zhu, J., Hu, Z., Yin and J., "Towards multi-pose guided virtual try-on network," In: The IEEE International Conference on Computer Vision (ICCV). (2019)

[6] Yu Liu, Wei Chen, Li Liu and Michael S. Lew., "SwapGAN: A Multistage Generative Approach for Person-to-Person Fashion Style Transfer," IEEE Transactions on Multimedia (Volume: 21, Issue: 9, September 2019)

[7] Raj, A., Sangkloy, P., Chang, H., Lu, J., Ceylan, D., Hays and J., "Swapnet: Garment transfer in single view images," In: The European Conference on Computer Vision (ECCV). (2018)

[8] Ruiyun Yu Xiaoqi Wang Xiaohui Xie., "VTNFP: An Image-based Virtual Try-on Network with Body and Clothing Feature Preservation," Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2019, pp. 10511-10520

[9] Yuan Chang, Tao Peng , Ruhan He, Xinrong Hu, Junping Liu, Zili Zhang, Minghua Jiang, "DP-VTON: TOWARD DETAILPRESERVING IMAGE-BASED VIRTUAL TRY-ON NETWORK," Published in: ICASSP 2021 - 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

[10] Bin Ren , Hao Tang , Fanyang Meng , Runwei Ding , Ling Shao , Philip H.S. Torr5, Nicu Sebe, "Cloth Interactive Transformer for Virtual Try-On," arXiv:2104.05519v1 [cs.CV] 12 Apr 2021

[11] Assaf Neuberger Eran Borenstein Bar Hilleli Eduard Oks Sharon, "Image Based Virtual Try-on Network from Unpaired Data," Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2020, pp. 5184-5193

[12] Stefan Hauswiesner; Matthias Straka; Gerhard Reitmayr, "Virtual TryOn through Image-Based Rendering," Published in: IEEE Transactions on Visualization and Computer Graphics (Volume: 19, Issue: 9, September 2013)