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Virtual Trial Room using Deep Learning

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Abstract

A new approach to cross-scenario clothing retrieval and fine-grained clothing design identification is proposed in this paper. Query clothing images captured by cameras or other mobile devices are packed with a noisy backdrop, whereas online shopping product clothing images are typically viewed in a pure atmosphere. We're taking two steps to fix this issue. Firstly, in order to obtain the intact query clothing object, a hierarchical super-pixel merging algorithm based on semantic segmentation is proposed. Second, we suggest sparse coding based on domain-adaptive dictionary learning to boost the accuracy of the classifier and adaptability inorder to solve the issue of clothing style recognition in various scenarios. Virtual clothing animation based on dynamic data is a fantastic application that is gaining popularity these days. Many different options are provided so that users have a larger selection and can receive better deals. We must create a shopping application in which the user credits his account with a certain amount so that he can see his balance when making a purchase. In the event of clothing purchases, the customer will have the option of trying on the garment online in a virtual trial room through the Android application. The user will also be able to add money to their wallet. This makes it easy for them to make decisions. There has been a significant surge in thepopularity of internet shopping. When purchasing things such as clothing, it is important to have a sense of how the clothing will fit on a person. This is one of the main reasons why less people purchase for clothes online. As a result, a virtual dressing room that allows individuals to see how clothes fit them would be a tremendous luxury for online retailers who want to offer a wide range of options to their customers. This would be a fantastic tool for web marketers looking to expand their market. Trying on clothes in stores is typically a time-consuming process. Furthermore, in some circumstances, such as internet buying, it may not even be able to try on garments. By building a virtual dressing room setting, we hope to maximize time efficiency and improve the accessibility of clothing try-ons. We provide a virtual dressing room application that utilizes the Microsoft Kinect sensor in this paper. The major components of our proposed method are the extraction of the user from the video stream, model alignment, and skin colour recognition. In order to align the 2D cloth models with the user, we employ the modules for joint locations for positioning, scaling, and rotation.

***Keywords**: Stubble burning, Virtual trails system, pre-processing, classifier algorithm ,feature extraction, NLP, machine learning algorithm etc..*

1. INTRODUCTION

The fashion industry has something new to offer with every passing season Creativity is the essence of fashion and our system enhances this very essence We propose an approach for our System to generate new styles of clothing with virtual try-on's We take an image of the person and the desired style or texture to manifest it to a new clothing In this system we use Single-path Encoder-Decoder and Convolutional Neural Network. There has been an increase in internet use in all categories in recent years, especially in the last five years. Due to advancements in the field of information technology, the number of people who use the internet and use it for shopping continues to rise. Producers may use online marketing to get their various goods in front of a large audience in the most efficient way possible. Customers will benefit from more information and selection of all types of goods in any stream if they shopped online. This brings every product to the consumer's doorstep and allows them to choose their favorite flavor and buy. When it comes to dressing, though, the amount bought is significantly less. A few trail rooms are accessible in a shopping centre to see how the cloth would look on the customer's body. When there is a festival or a holiday, there is a large crowd in the shoppingmall, and there is a long line in front of the trial room, which makes customers annoyed and bored. There are also restrictions on the amount of clothing that can be worn during a single trial for safety reasons. As a result, the average amount of time spent shopping increases. According to merchants, a large amount of robberies occur as niggling in garments while in the trial room. Customers are also unable to see all of the clothes because shops are unable to display them all of them. To overcome these problems, it is better to shop online. A lot of customers have encountered problems while shopping online as they have no clue how the particular cloth will suit on them while purchasing the item. Due to this problem various customers avoid online shopping. Our daily lives are greatly influenced by smart systems that facilitate our activities as a result of the rapid advancement of technology. For example, online shopping has grown rapidly. People are becoming moreaccustomed to using internet shopping, online auctions, and other similar methods to obtain their desired goods. This method of transaction has become the norm, and it provides clients with a great deal of convenience. However, one disadvantage of buying garments online is that the customer cannot try on the itembefore purchasing it. The client's decision to buy garments is influenced by how they feel after dressing. As a result, there is a growing desire for virtual dressing rooms that imitate dressing imagery.

2. LITERATURE REVIEW

[1] Implementation Of Virtual Fitting Room Using Image Processing

Author: Srinivasan K., Vivek S.

The current algorithms, which impose restrictions on their own use, were created in order to reach out to all. This algorithm will allow people to try on different dresses with less constraints, which will be a huge plus for online shoppers. The algorithm will be changed in the future to locate a human silhouette in a noisy environment with a variable context.

[2] Towards an Inclusive Virtual Dressing Room for Wheelchair-Bound Customers

Author: Dr. Anthony L. Brooks , Dr. EvaPetersson Brooks

Cooperation, planning, connectivity, and teamwork issues plagued the development, preventing an early product release. As a result, further surveys were conducted, as well as the creation of this new work-in-progress. Key issues such as interface design, body measurement, and fabric representation in the VDR are addressed after the VDR is introduced.

[3] Image Processing Design Flow for Virtual Fitting Room Applications used in Mobile Devices

Author: Cecilia Garcia, Nicolas Bessou, Anne Chadoeuf and Erdal Oruklu

The Virtual Fitting Room (VFR) application described in this paper is a real-time human-friendly interface that allows users to try on new clothes through webcams or smartphones. We propose a three-stage algorithm that includes body detection and sizing, reference point detection using face detection and augmented reality

markers, and clothing superimposition over the user's image.

[4] Virtual Dressing Room Application

Author: Aladdin Masri, Muhannad Al-Jabi

In order to coordinate the 2D cloth models with the consumer, we use the modules for joint positions for positioning, scaling, and rotation. Then, on camera, we use skin colour detection to manage the user and model's unwanted occlusions. Finally, in real time, the model is superimposed on the consumer. For classication. To begin, we use a modified selective search algorithm to extract the region suggestion.

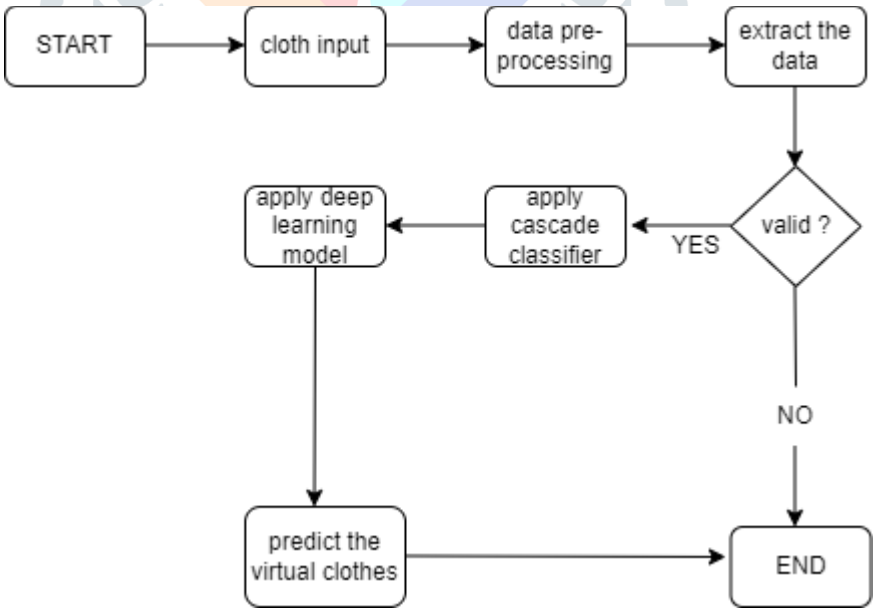
[5]Virtual trial Room using Face Detection: Android Application

Author: Rahul C. Salunkhe, Poonam V. Sadafal.

We believe that the proposed system would make it easier for individuals to reach out to stores physically by allowing them to try on clothes when shopping online. Future work will consist of exploring the areas where intelligent agents can be usefully implemented to meet the situation in more detail, which will also increase the accuracy of the developed method, taking into account the difficulties faced during the development of this Application.

PROPOSED MODEL

3.1 Architecture Diagram



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EXISTING TECHNOLOGIES

Various commercial applications are accessible as a result of home-based shopping. The current technique is to use Microsoft's kinect and Asus's Xtion gadgets, which are both functional and popular. In this technology, a person stands in front of the screen with a kinect scanner, which identifies the human body and generates frames accordingly. A three-dimensional model is developed while the construction is built.

The prototype may be rotated and a colour map can be used to assess the fit. These devices are extremely expensive.

A. Methodology:

The Virtual Dressing Room technique for virtual fitting of clothes to a person entails recognising a person from the background with respect to light variations and with the least amount of interference from other objects. Following that, the top and lower body contours will be detected using a laplacian filter, followed by edge detection.

Following that, feature points are extracted based on the human basic structure. The sample shirt is distorted to fit the person properly using these areas as a guide.

B. Related work:

Virtual cloth rendering is not a new concept; several applications, such as Amazon and Flipkart, use it because more and more consumers currently choose to buy clothes online rather than go to the mall. As a result, the virtual cloth's growth is accelerated. When a user visits an online purchasing website, the rendering of the fabricthat he or she prefers is done using a static image. Virtual cloth rendering isn't a new notion; it's used by a number of apps, like Amazon and Flipkart, because more and more people are opting to buy garments online rather than at the mall. As a result, the growth of the virtual cloth is hastened. When a user enters an online shopping website, a static image is used to represent the fabric that he or she prefers. This virtual dressing roomis also aimed at costume designers, allowing them to see how clothes look before they are manufactured, allowing them to try out new designs for both formals and casuals for men, resulting in the establishment of a new trend and the release of a diverse range of products to the market.

C. Face Detection:

In graphical media, a face detection method is utilised to locate real humanoid faces. A distinct appearance is accompanied by a size and coordination that is related. When a face is seen, the eyes and noise can be used to identify it. In this study, Android Studio 3.0 is used, which includes a built-in camera capability.
FaceDetectionListerner is the method used to detect the Face in this function. In the Camera Activity, this method is utilised when the camera opens and recognises the user's face. When the user's face is detected, a green rectangle canvas is drawn on the face as a Face Detection indicator.

D. Cloth Rendering

Cloth Rendering is the technique of imposing the user's chosen cloth over the human body. After face detection, a green colour canvas is drawn over the detected face, with the user-defined algorithm computing its coordinates. The material is then draped across the body.

E. Virtual fitting:

The next step is to superimpose the warped shirt over the person and correct any faults that may have occurred during the imposition process as a result of mismatched hand sizes, old shirt overlay, hip correction, and other factors. The shirt is first manufactured to impose itself on the wearer after beingwarped through the technique of picture fusion by blending. The mistake corrections are made by applying the skin matrix to the difference between the overlaid sample shirt and the source photos. Finally, the virtually dressed person is re-fused to the background, which can be the same or a different one for the sakeof virtual dressing aesthetics.

3.2 Advantages:

- Detect the virtual dressing trial room.
- Effective prediction technique.
- It's important to confirm who's infected in order to effectively handle and contain the virus. It will be difficult to evaluate the real rates of cases without accurate monitoring. As a result, it's important to understand what these exercises can and can't in order to use them effectively.

3.3 ALGORITHM - Making a Haar Cascade Classifier

The algorithm can be explained in four stages:

- Calculating Haar Features
- Creating Integral Images
- Using Adaboost
- Implementing cascading classifiers

It's important to remember that this algorithm requires a lot of **positive images** of faces and **negative images** of non-faces to train the classifier, similar to other machine learning models.

- **Calculating Haar Features**

  The first step is to collect the Haar features. A **Haar feature** is essentially calculations that are performed on adjacent rectangular regions at a specific location in a detection window. The calculation involves summing the pixel intensities in each region and calculating the differences between the sums.

- **Creating Integral Images**

  Without going into too much of the mathematics behind it (check out the paper if you're interested in that), integral images essentially speed up the calculation of these Haar features. Instead of computing at every pixel, it instead creates sub-rectangles and creates array references for each of those sub-rectangles. These are then used to compute the Haar features.

- **Adaboost Training**

  Adaboost essentially chooses the best features and trains the classifiers to use them. It uses a combination of "weak classifiers" to create a "strong classifier" that the algorithm can use to detect objects. Weak learners are created by moving a window over the input image, and computing Haar features for each subsection of the image.

- **Implementing Cascading Classifiers**

  The cascade classifier is made up of a series of stages, where each stage is a collection of weak learners. Weak learners are trained using boosting, which allows for a highly accurate classifier from the mean prediction of all weak learners.

3. CONCLUSION

- Customers frequently complain about having to spend hours physically trying on a range of garments while shopping for clothes.
- This might be exhausting, especially if you just have a limited amount of time. The usage of a Virtual Trials that acts as an augmented reality is recommended as a solution to this problem.
- It employs plot nodes to locations on the human body, and this data is then utilized to generate the image ofgarments over the user's body, obviating the need to try on clothes physically and therefore saving time.

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