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Virtual Dressing Room

Asst Prof. Mr. Basavesh D[1], Abhishek H[2], Manoj D[3], Mohammed Maaz[4], Veeresh Gowda[5]

[1]-Assistant professor, [2,3,4,5]-Student
Dept of CSE, Jyothy Institute of Technology

ABSTRACT

Trying on clothes in stores typically takes a lot of time. A virtual fitting room is an interactive platform used for clothing commercial transactions in real time. It has a bright future. Our goal is to speed up the process and make clothing more easily accessible. It directs the development of virtual fitting, which serves as the foundation for life like, three-dimensional simulations and visualisations of clothing. The user's and the cloth models' precise positioning, scaling, rotation, and ordering is the only issue. The technology is more adaptable and can support animation of clothes, body modelling, and garment creation. One of the first steps in solving the issue is identifying the user and body parts. Additionally, the system can assess a customer's compatibility to help them select appropriate clothing. Additionally, the system can assess a customer's compatibility to help them select appropriate clothing.

Keywords—Virtual exhbition;3D modeling ;virtual dressing ;implicit integration； collision dictation

I. INTRODUCTION

Three subsystems, namely the customer body-shape construction system, the calculation & simulation system, and the interactive 3D exhibition system, make up a cloth online virtual fitting room in general

The client's decision to purchase the items is influenced by how they feel after wearing. Customers may view static and dynamic 3D appearances of their virtual models dressed in various outfits by rotating and navigating with the mouse. Customers may readily assess the wearing effects of clothing online with the use of this virtual fitting method, just as if they were actually doing physical on-site trying-on in front of a mirror. It is challenging for consumers to accurately assess and regulate garment sizes in the retail clothes sector since various brands have varied materials and sizes.

The user may alter the fabrics and hues of clothing to achieve the method offers advice on how to dress. Additionally, changes may be made to the display scenery, lighting, and weather. This virtual fitting technique assists It was demonstrated how to model clothing by building virtual bodies using measurements. Splines are used to produce the 2D clothing patterns, which are then appeared around a computerised human body to give them their basic form. To create the appeared clothing, physical factors were applied based on actual fabric qualities Virtual fitting technology can help businesses gain more user data, analyse this data to accurately recommend products to users, design new products based on demand, and reorganise promotion in addition to significantly increasing the efficiency of consumer purchases and significantly lowering the return rate. A brand-new idea for changing rooms using augmented reality was presented. Customers may easily imitate trying on while also getting a feel for the textiles thanks to this technology.Instead of a mirror, the dressing room features a camera and a projection surface. Customers affix visible tags on their clothing. These Rules dictate the business's management approach, and our product fully complies in terms of detail and measurability. attainable nature of the product. It is based on time and is more realistic. The design item has been virtually correlated to the human body as part of preliminary work so that the user can stand in front of the automated embedded system mirror.

The method creates an accurate representation by electronically matching the clothing material to the body part. The system's inaccuracy in mapping the garments along the body object is a restriction of their job. The technology must exactly suit the clothes for a more realistic presentation that will satisfy the user. A social networking website focusing on fashion is how we plan to address the aforementioned issue.

The majority of the normal functions found on a social networking site, such as user profiles, adding friends, news feeds, etc., are included on Fashion Fit. A virtual fitting room solution, fashion search, and the ability for clothing suppliers to advertise their goods among website visitors are further aspects of Fashion Fix. Users of the virtual fitting room will be able to dress their virtual body model, which was produced using the supplied dimensions, in a variety of clothing models. A user may determine whether or not a certain dress fits by using the virtual dressing room. The user may utilise fashion search to look for and locate appropriate clothing. Personal information about the user, such as location, Applications for virtual changing rooms have drawn a lot of investigation.

A technique and system to make it easier to recognise body movements based on gestures that constitute orders to commence activities were offered in order to initiate actions inside an electronic marketplace on behalf of the user. such that a model of the user body is produced using the initial set of spatial data. The action machine then creates a second model using the second spatial dataset it has received.

The action machine, which is represented by a gesture and which, in turn, symbolises a command from the user, distinguishes the first model from the second model. A Kinect application for a virtual changing room was released. The suggested strategy was predicated on removing the user applications involving virtual changing rooms, an image processing design flow was described. The three steps of the algorithm used to build the user-friendly interface are body detection and size, reference point detection using face detection and augmented reality markers, and superimposing clothes over the user's image.

A system and technique for digitally fitting garments on an accurate representation of a user's body generated through 3D scanning were described. The technology gives the user access to a database of available clothing and accessories. To calculate the geometry of the user's combined body and clothing as well as a precise visual depiction of the chosen accessory or outfit, finite element analysis was used. constructive opinion, and enhances the user's clothing match experience

II. LITERATURE SURVEY

1. introduced garment modelling, which is based on building virtual bodies using accepted dimensions. Splines are used to produce the 2D clothing patterns, which are then appeared around a computerised human body to give them their basic form. To create the appeared clothing, physical factors were applied based on actual fabric qualities. A web browser incorporated in real-time platform was employed as the internet's interface after the invention of the garment.
2. The difference between the first model and the second model is the action machine, which is symbolised by a gesture and which, in turn, symbolises a command from the user. The authors offer a virtualized dressing room application that makes use of Kinect sensors. The proposed approach made use of model alignment, user extraction from a video stream, and skin colour identification.
3. To align the 2D fabric models with the user, the joints' 3D locations were used for positioning, scaling, and rotationFrom the author's standpoint, a set of software programmes and a collection of digital photo databases were provided. The image database includes images of apparel as well as a basic model's physique. The consumer may now choose and try on any of the numerous garment photographs in the database on their own thanks to this. With the user's distinctive bulges, curves, and height that correlate to the client's physical attributes, the system builds a representation of the client's body in the garments.
4. The author presented the concept of clothing modelling, which would include creating virtual bodies based on standard measurements. The 2D clothing designs are created using splines and then appear around a computerised human figure to give them their basic shape. Physical elements based on the actual fabric properties were used to make the shown garment. After the creation of the garment, a web browser with a real-time platform was used as the internet's interface. The author presented the concept of clothing modelling, which would include creating virtual bodies based on standard measurements.
5. The 2D clothing designs are created using splines and then appear around a computerised human figure to give them their basic shape. Physical elements based on the actual fabric properties were used to make the shown garment. After the creation of the garment, a web browser with a real-time platform was used as the internet's interface. The author claims that a new virtual reality concept has been introduced to dressing rooms. Thanks to this technology, customers may simply simulate trying on while also obtaining a feel for the fabrics. The dressing room has a camera and a projection surface in place of a mirror. Customers sew tags in plain sight to their apparel. Then, utilising the capabilities of the AR Dress Code programme, an AR video stream is taken and made accessible on an AR mirror using.
6. The author presented an image analysis design pipeline for applications using virtual changing rooms. Body identification and sizing, reference point detection utilising facial recognition and augmented reality markers, and superimposing clothing over the user's image are the three phases of the algorithm used to create the user-friendly interface. The author claims to have developed a method and system for precisely replicating a user's physique using 3D scanning to digitally fit clothing. The user has access to a database of readily available apparel and accessories thanks to technology. Finite element analysis was utilised to compute the geometry of the user's combined body and clothes as well as an accurate visual representation of the selected accessory or outfit.

Applications for virtual changing rooms have drawn a lot of investigation. A technique and system to make it easier to recognise the body based on gestures that signify orders to commence activities were presented in [7] in order to initiate actions inside an electronic marketplace on behalf of the user. such that a model of the user body is produced using the initial set of spatial data. The action machine then creates a second model using the second spatial dataset it has received. The action machine, which is represented by a gesture and which, in turn, symbolises a command from the user, distinguishes the first model from the second model.

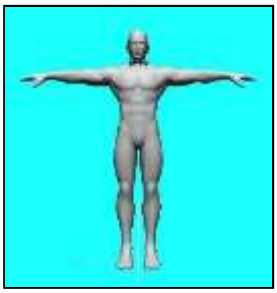
8proposed a Kinect sensor-based application for a virtual changing room. The suggested method relied on skin colour recognition, model alignment, and user extraction from a video feed. The 3D joint positions were employed for positioning, scaling, and rotation to align the 2 D cloth models with the user. 9provided a software programme system and a database of digital photographs. A basic model body picture and photos of clothing are included in the image database. This enables the customer to pick and try on any of the many garment photos from the database on their own. The system creates a

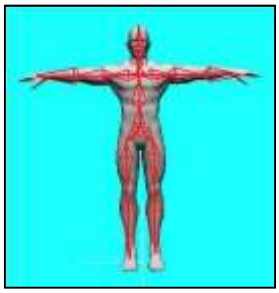
representation of the client's body in the arguments, complete with the user's unique bulges, curves, and height that correspond to the client's physical characteristics.

10introduced garment modelling, which is based on building virtual bodies using accepted dimensions. Splines are used to produce the 2D clothing patterns, which are then appeared around a computerised human body to give them their basic form. To create the appeared clothing, physical factors were applied based on actual fabric qualities. A web browser incorporated in real-time platform was employed as the internet's interface after the invention of the garment.

III. OBJECTIVES This study's primary objectives are

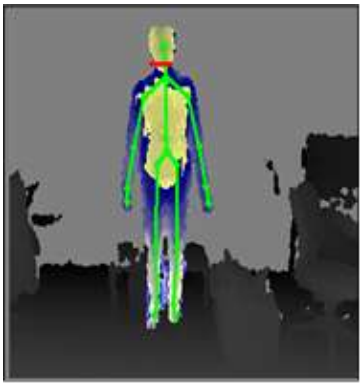
1. Allows people to complete their tasks in a smooth and timely manner
2. Gives the shoppers access to various more options to try & check.
3. Convenient and faster shopping experience.
4. Quicker and Easier to try clothes.
5. Reduces Exchange and Return Polices.
6. No hidden camera issues as for female customers.
7. Drawing customers in notably greater turnover.
8. Positive image of your brand





- Because to the arm's restricted region, a value less than the real value was acquired. Despite continually accumulating, the value could not always be attained. Because it was calculated using the data from the previous times, the value seems less than it actually is. As a precaution, it is also possible to estimate the circumference by measuring the diameter in the same way as measuring the neck's thickness.
- Get the height of a person The height of a person was acquired and compared with actual data. The acquired image is At this time, the actual height was 174 cm, and the acquired value was 170 to 175 cm.
- Acquisition calf width rangeWe measured the individual's calf breadth and contrasted it with the real data. Shooting is done while standing upright. We determine if the spine is straight and show that on the user interface. The acquired value is currently between 20 and 23 cm, whereas the real calf width is currently 23 cm. It was common to find that the inaccuracy, which ranged from -3 to +0 cm, was less than the real number.

(A) RGB image

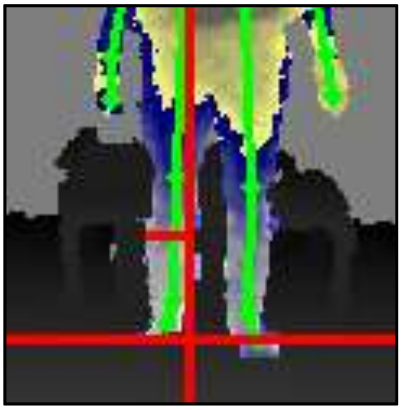


(b) Depth image

- The acquiring of a waist The waist of a person and real statistics were compared. The waist is gained from the front and the side, as seen in fig. 20. The obtained value was 88 cm at this point, but the real waist measurement was 89 cm. The statistics collected show an inaccuracy of roughly 10 centimetre
- An error larger than the actual value is because synthesis of the depth distance from two directions is not successful. As a countermeasure, we are planning to change the angle by several degrees and synthesize the depth distance each time. Since it is an error caused by combining large depth distances at the same time, we believe that errors will be reduced by doing it gradually.

Acquisition range of arm thickness

- The thickness of the arm of the person was acquired and compared with the actual data. As shown in Fig. 21, shooting is performed with the arms widened. It is judged whether or not the arm is opened, and it is displayed on the UI. At this time, the thickness of the actual arm is 25 cm, and the acquired value is 20 to 26 cm. An error of about -5 to + 1 cm was observed, and it was often found to be lower than the actual value.

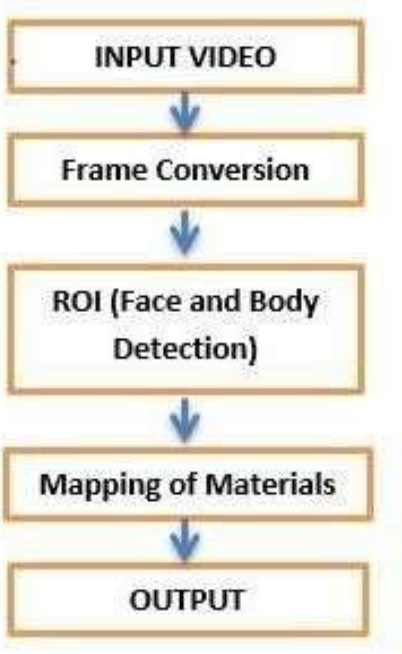


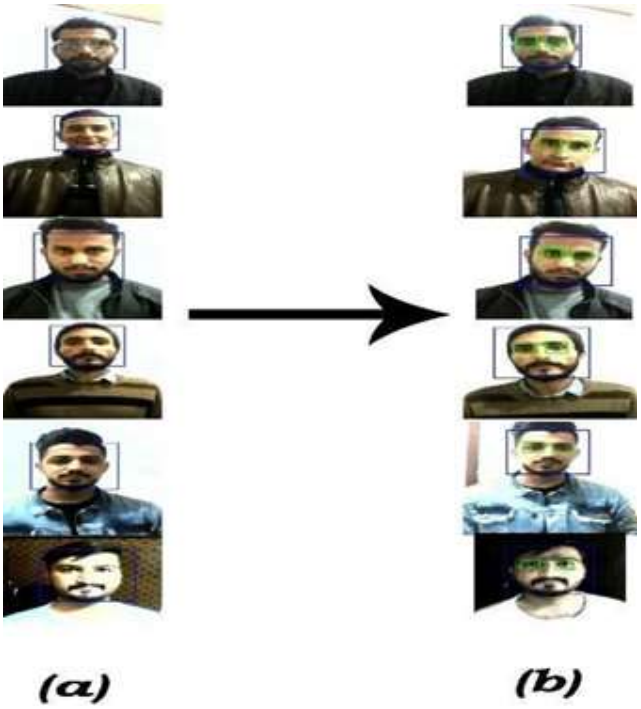
- Because the region to be acquired was chosen incorrectly, a value less than the actual value was obtained. The measurement is taken at a point just below the real thigh. As a result of data being jumbled up, such as ankle being thinner than thigh, an error occurred. This is due to the fact that the search for the location of the groyne began from a point outside the person's area. Due to slack in the clothing or similar factors, the location of the crotch may be mistakenly recognised lower than the true reason. As a valley part forms, it is possible to use the depth in the lateral direction to identify the crotch as a defence mechanism.
- Experiment's accuracy as the synthesis of the depth distance is unsuccessful, the waist measurement yields the poorest results. When the incorrect thigh region was mistakenly recognised and the thickness of both knees was discovered, the calf width measurement had the greatest inaccuracies. The body length other than height is the one with the best accuracy, followed by neck thickness. The former is due to the fact that skeleton tracking faults other than those specified were not as frequent, and the latter is due to the fact that no inaccuracy in the neck's distance between its two ends was discovered. Although it cannot be created in the shape of an ellipse like a waist, at a

IV. PROPOSED METHODOLOGY

1. This project's primary goal is to improve and simplify the online buying experience for users. In order to save time, it seeks to develop an "Augmented Reality" fitting room.
2. gives customers a way to try on different clothing without actually touching it before making a purchase.

3. Decreases the necessity for manual or physical clothing putting on, which also lowers the chance of contracting covid.
4. It enables consumers to make wiser decisions. The project's primary goal is to create a genuine connection between the user and virtual clothing.





(a) Face Detection (b) Region of Interest (ROI)

V. CONCLUSIONS

Due of crowding and privacy concerns, real-time virtual Dressing rooms are used in malls and shopping complexes. Our goal is to develop a cooperative and incredibly satisfying virtual changing room. Our suggested model consists of the following steps: face, skin, lower body and upper body detection this is followed by clothing mapping on the subject body. We provide a computationally cheap approach that uses webcam input as in and it produces a output whether the costume suits him perfect and it would be done without touching the dress material and even it takes comparatively less time than

actually trying it physically and even the scare of the spreading of covid-19 could be controlled by this process and even the security breach of female customers would be secured.

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