

A Comparative Study of Smart 3D Body Scanning Technology

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Abstract: 3D body scanning and digitized images are used in mass customization of apparels, where the consumer is measured three dimensionally, and through the digitized image seen on the computer screen, he can choose a garment with a style that goes with his choice. In this paper, we discussed the 3D virtual fitting room system on web environment and compare the 3D body scanning technology which integrates several key techniques involved, including 3D Laser Scanner, Kinect and Computer aided Design. And we proposed a framework of the virtual Fitting Room. It leads the progress of virtual fitting that forms the basis of a realistic, three dimensional simulations and visualization of garments on virtual counterparts of real customers. The system is more flexible to enable garments designing, body modelling and clothing animation etc. Users can view the clothing animation on the various angles and the system can evaluate customer's match in order to guide them choose suitable cloths.

Keywords: Augmented Reality, Kinect, 3D Laser Scanner, Computer aided Design, Virtual Fitting Room.

I. INTRODUCTION

With the advancement in technology, our concern also obliges solving even smallest issues targeting large audience. One such problem is online cloth shopping. We were very happy when we found out that we can buy clothes anywhere and anytime but as they say every change has both sides (negative & positive). So, now the problem was how to try clothes online?? Then came 3D body scanner which technologically takes your body measurement and creates a virtual trial room to check your selected cloth fitting.

II. SCOPE OF THE PAPER

The scope of 3d body scanning is not limited to customers only as it can be used by manufacturers because with this technology the time required to manufacture the product can be reduced. Designers will be at ease with this technology and find it convenient to make rapid design decisions on how a garment will look in different colours, with different sizes of motifs and logos, and in different fabrics. Through the computer-aided design (CAD) pattern-making, the companies will reduce carbon footprint. As some companies checks the complete size range of a garment virtually, fewer samples have to be cut and sewn thereby reducing the millions of samples companies manufacture and reduces the energy used for shipping and transport as well as the amount of chemicals used for preparing, washing, dyeing, and treating fabric, and results in less waste from each operation in that process.

A. 3d Laser Scanner:

3D scanner technology consists of using laser rays to

project on the human body. Light sensors are used to capture the measurements. A laser beam scans the body of consumer in a fraction of a second. It is contact free and does not have any health hazards. Low power micro waves are used to illuminate the human body. The Waves easily penetrate the clothing and reach the person's body. To avoid improper behaviour of the light beam only eye-safe lasers are used. Software then analyses the high resolution pictures of the human body and decides the exact tailoring measurements for that individual. Hundreds of measurements are taken within seconds from head to toe to create the exact 3D data. The scan takes large no. of individual measurements, despite only a few will be used when tailoring the garments.

B. Kinect:

The Kinect sensor bar contains two cameras, a special infrared light source, and four microphones. It also contains bunch of signal processing hardware that is able to make sense of all the data that the hardware can generate. By combining the output from these sensors, program can track and recognize objects in front of it, determines the direction of sound signals, and separate them from background noise.

C. Computer Aided Design:

Using computer-aided design (CAD) systems, it is now possible to mingle with the body sizes and shapes of scanned data for 3D visualization. The procedure of creating avatars is critical to the provision of accessing adequate fit. Exporting 3D data for garment pattern modification is also possible. Integrated software is crucial to the process of linking the scan data to CAD patterns.

III. METHODOLOGY

Virtual dressing room process provides the customer with a virtual image of how he or she will look in a particular garment. General information about the consumer like, small waist, narrow shoulders etc is entered in the computer. The software in the computer develops an image of the consumer based on these descriptions and displays it on the screen. The consumer can make modifications on the displayed virtual image so as to match it with himself. The computer then displays various types of garments on the screen. The consumer chooses different types of clothing and tries them on his virtual image available on the computer screen.

The computer applies this clothing image on the virtual image of the consumer created and displays the picture

on the screen. The image is also rotated in 360 degrees so that the consumer can get a perfect idea of the fitting. The computer highlights areas of good and bad fit, and guides the consumer to select the most appropriate apparel.

The technology which is used that is Kinect. In the Kinect technology there is a infrared emitter which emits the rays onto the object and the infrared camera captures the image. There are 3 terminology which is used that is :

Motion Sensing: Kinect uses a motion sensor that tracks your entire body. So when you play, it's not only about your hands and wrists. It's about all of you. Arms, legs, knees, waist, hips and so on.

Skeletal Tracking: As you play, Kinect creates a digital skeleton of you based on depth data. So when you move left or right or jump around, the sensor will capture it and put you in the game.

Facial Recognition: Kinect ID remembers who you are by collecting physical data that's stored in your profile. So when you want to play again, Kinect will know it's you, making it easy to jump in whenever you want.

IV. COMPARATIVE STUDY OF 3D LASER, CAD AND KINECT

Parameters	3D Laser Scanner	KINECT	CAD
Accuracy	Quite Accurate	Very Accurate	Failure
Health Issue	None	None	Dangerous
Transmission Speed	Slow	Fast	Very Slow
Pattern Generation	Single Point	Speckled Infrared Dot Pattern	Plaster Face Mold
Depth	Outer Area	Very Focused	Outer Area
Real time application	Not Suitable	Suitable	Not Applicable

V. CONCLUSION

Exploring new technologies for managing and improving consumer's experiences and satisfaction is important in today's competitive retail environment. A basis for wider implementation of the 3D body scanner to be used for anthropometric procedures and ensuring

clothing fit has been implied. The association between garment sizes and body measurements also changes all the time. As a result, regular sizing surveys and measurement series have to be performed to provide a scientific foundation to these and to further provide information on the necessary size segments and their geographical market shares.

After comparing these three technologies on the basis of some parameters Kinect has come out as the best solution for 3D body scanning. Thus we can consider it as the best suitable for 3D body scanning technology

VI. REFERENCES

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