Application of Virtual Reality Technology in Garment Industry

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Abstract. This paper describes and discusses the use of virtual reality (VR) technology, in combination with big data platform, in computer-aided garment design, innovative clothing marketing and interactive fashion experiencing. It also predicts the future development of VR in the clothing industry.

Introduction

According to research report on VR user behavior in China (March, 2016), the number of potential VR users among Chinese citizens is fairly large, reaching more than 200 million [1]. What is more, the number of frequent VR users is about 960,000, and more than 70% of them use VR every day. This clearly indicates that VR has become an important part of people’s work, life and entertainment etc.

In all walks of life, there are always leaders who have a keen sense of trends and know that in this era of rapid development, those who first find new opportunities and/or master new technology will be winners in their respective industries or fields. Traditional as it is, the apparel industry is actually a high-tech industry, and naturally cannot miss this opportunity of new technology.

1. Application of VR in Garment Design

1.1 Garment design in virtual space

In recent years, major companies have been committed to research and development of new and high technology, and many industries have experienced great changes in their modes of operation, and some of the traditional industries have even faded out. The distinction between virtual and reality in the field of virtual reality in today’s new interactive mode is also becoming vague, as some new ideas are overwhelmingly changing the public.

In the field of clothing, we usually use CAD, Photoshop and other software in the early stage of design for effect. Just a decade ago, fashion designers used to draw on paper, and a single error in detail would result in the failure of the whole design. Nowadays, however, designers use computers instead of paper and tools, and by simple manipulation of the mouse they can easily complete the entire cycle of conception, drawing and platemaking. It is thus highly likely that in the near future we may use other new tools to go beyond the current design pattern.

In April 2016, Google released an application software Brush Tilt which placed designing in a three-dimensional space. This software may be called virtual reality photoshop. With Tilt Brush, we can experience the magic of a brush and a sense of accomplishment, for we not only can create in the three-dimensional space, but also can fully appreciate our own works from different angles.

Painting with Tilt Brush in the virtual space is like each of your hands holding a handle to simulate brush painting in the real space, where the left hand is similar to operating the menu and tools in Photoshop, and the right hand is responsible for painting. Like Photoshop, Tilt Brush also has many built-in brushes with which you can easily produce different styles of brushwork; Tilt Brush can even be used as game or social networking software with which the operator can choose some background and paint in the atmosphere of virtual reality.

It is still too early to predict whether the invention of Tilt Brush would be a milestone in the
design industry, but it will be a subversive advanced tool that may change designer’s drawing experience. Those who have had experience of using it will marvel at it, not only because it brings them a sense of satisfaction with curiosity about new things, but also because it is a real change in production and people’s life style. It helps the designer raise their operation directly from a two-dimensional surface to a three-dimensional space. This leap makes virtual reality artistic. More importantly, it brings out the operator’s creativity and imagination.

All new inventions experience a long growing process from birth to popularity. This is what happens in the development or transition of technology. It is difficult for the average people to readily adapt to the change in their habit, and the price of the new product is relatively expensive. But with mass production the price threshold may be reduced accordingly. As an application software at its beginning stage, Tilt Brush is not exceptional. The user needs to pay a high price. Equipment alone including VR glasses, laser localizer and two control handles will cost thousands of RMB. In addition to such essential equipment, better experience effects also require high-configuration computers, especially computer graphic cards. It is also important that the operation of Tilt Brush requires a minimum space of 20 square meters for free painting. Therefore, experiential use of Tilt Brush at present is acceptable, but there is still a long way to go before it can be owned and used like personal computers.

Everyone wants to keep up with the times. Creative products similar to Google’s Tilt Brush include several other applications such as Oculus’s Quill and Sony’s The Easel. In addition to these made by big companies, Strangers VR, which is developed by individuals, can be used not only for painting, but also for inviting friends to cooperate in the creation of products in a VR space. This latter feature with social interaction meets the needs of young people and constitutes a great advantage. All these products are very attractive. Although as the application has just started, their improvement needs time for the technology to gain popularity, the trend of development means all are advancing in leaps and bounds and its future is not to be underestimated.

1.2 Three-dimensional virtual design based on computer platform

The preliminary design stage of clothing is very important and is the center part of the whole process of garment design. However, three-dimensional design as mentioned above has just started, and it is not perfect and popular enough. Although fashion designers are still unable to take this as their main design tool, using computer to simulate the 3D virtual space design seems more plausible and some software is basically mature. With the core technology of 3D visualization, designers can design clothing in the virtual space, modify and view in advance its try-on effect. This technology is now widely used in the design process of apparel, clothing industry and clothing display advertising.

Currently, CLO 3D is very popular. Unlike Marvelous Designer, which is mainly used for simulating games and animation clothing, CLO 3D is a special clothing fitting software. Both Marvelous Designer and CLO 3D offer similar interface and operation, the difference lies in the details of their respective professional fields. Good software is probably for extensive use, while at the same time with no lack of expertise. CLO 3D has been called the best software in the field of garment fitting.

In the virtual space created by CLO 3D, the designer tailors sewing pieces, simulates the wearing of garment by the model, and views the fitting effect at the same time. The computer gives a simulation of the 3D human body wearing fabric with real texture, displaying realistic and dynamic simulation of fabric affected by gravity, wind and other factors. By adjusting parameters, we can get real showing effects of virtual clothing.

Some of the more outdated fitting software can only be used to stitch up pieces and put them mechanically on the model. The showing effect tends to be false and it is hard to gain any reference for better fitting and appreciation of beauty, because the effects from the appearance of the model, body movements, feeling of gravity, and cloth gloss are relatively poor. CLO 3D, on the other hand, not only can easily create simple styles of T-shirts and pants, but also realistically present physical properties of buttons, belts and other accessories. These functions and features are diversified and user-friendly and make the designing of folds, texture, darts, and folding etc. very simple.
These are not the most important. Instead, the brightest spot and the core is the synchronization of clothing style design and its 3D fitting effect. In traditional clothing design, the designer has to, in any case, wait until after the end of the design process and after the garment has been made before he can see the effect. If he finds anything unsatisfactory, he will need to modify the design and reproduce the garment. This procedure is impossible to change. However, the CLO 3D platform can help the designer achieve the perfect loop connection between production and modification. When designers find garment tailoring unsuitable or wrong, they can modify immediately, with synchronized modifications of the effect of three-dimensional clothing in the 3D window. This means the tailoring process is reversible and changeable. This kind of interaction design is very intuitive. Behind it are high efficiency, high quality and better environmental protection, all highly consistent with the current concept of social development.

It can be expected that its future will be bright. Combining CLO 3D with Tilt Brush, the designer will be able to overcome limitations of plane design on the computer. He will be able to design in a free space. He will no longer need to control the computer to observe different effects from different perspectives or angles, but can instead go behind or even inside the garment to see and observe. He will no longer pull the clothes by clicking the mouse, but can instead directly lift clothes by hand to observe its internal lines. Therefore, even those who are not good at computer can use the software, because it not only offers a real feel of fashion design, but its operation is reversible - they do not need to worry about making any mistake!

2. VR Garment Innovative Marketing Applications

With rapid development of e-commerce, more and more people choose to purchase clothing online. But online purchase often leads to some undesirable consequences, such as wrong size, inappropriate style and so on, which often results in returned purchase. This is a headache for buyers and sellers as well as major e-commerce platform providers. But it brings business opportunities for other companies. They have developed virtual fitting rooms to provide online fitting for businesses and customers. Supported by 3D visualization technology, customers can upload their body information, the type of clothes they want to try on, and then the virtual dressing rooms can show them real-time effects. Customers are free to change styles or sizes. The operation is simple and they can enjoy private room service, free from the cumbersome process at a real store dressing room and other customers’ waiting anxiety. With continuous improvement of technology and constant upgrading of software, the background scene at a virtual fitting room will be diversified and open for selection. When trying on a piece of clothing, customers can at the same time simulate the corresponding scene to find out if their choice of clothing is really suitable for the occasion they choose. The whole process will not only bring customers a lot of surprise and fun, but also save them a lot of shopping time.

In addition to the virtual fitting on the digital platform, immersive shopping experience may better meet the psychological needs of consumers. Virtual fitting can bring time convenience to consumers, for it can help them quickly and accurately choose the appropriate clothing they need. Immersive shopping expands in space, making it easier for consumers to shop at malls thousands of miles away from them.

In March 2016, Alibaba group announced the establishment of its VR laboratory and simultaneously launched the BUY+ program, hoping to lead the future of a new shopping model. When technology is mature, users would only need to wear VR glasses or some more advanced and convenient equipment to walk into any store in the world, and with the help of a sensor, can interact with any goods and personnel in the virtual space - trying on clothes at any time would not be a problem. These virtual stores in distant places would not make people think they are simply built models, but 100 percent recovery out of real scenes made possible through advanced technology. Consumers would feel immersed in real shopping.

Once launched, and with continuous upgrading, this program would devour the business of the traditional store whose survival would be challenged—the greatest crisis in its history. Consequently, VR shopping will completely change the mode of commercial operation.
3. VR Interactive Fashion Experience Applications

At the present time when the current VR technology gradually steps into mass consumption, it is important that more and more groups of people feel the charm of VR technology. It is the market that determines the life of a new product since consumers’ interest in it is the basis and premise of the success of any product.

According to the Research report on VR user behavior in China, Chinese VR users are interested in quite a few applications. Among the interests of frequent VR users, 67.2% of them ranked VR fashion show as their fifth most interested application, 35.6% of whom were very interested in this application. Among the interests of less frequent users, 48.2% of them ranked VR fashion show as their eighth most interested application. From the survey we can see bright prospects for the fashion industry combined with new technology.

It can be said that in fashion industry it is the catwalk that was first exposed to VR. For the curious general public, the catwalk in VR is of great interest, so many fashion brands of clear vision are actively cooperating with VR companies. They shoot 360 degree panoramic videos of their fashion shows and upload them onto the web or APP platforms for the public to watch. With head-mounted 3D display equipment, people can see and enjoy at their own homes well-known fashion shows exhibited abroad. What they see is not traditional visual 3D, but free viewing from their own angle by manipulating the mouse and keyboard. This form of panoramic viewing and feeling makes the viewer get rid of the video editor’s selective clips. The camera is now in the viewer’s own hand. This can be termed as an interactive video work, and this viewing mode can bring people a better sense of immersion and more autonomy.

At the end of 2015, the Russian fashion week used VR technology to record a 360 degree virtual reality experience named Mirror to the Soul. It recorded a series of real scenes, including the whole show field, the backstage, the dressing room, and the catwalk, and presented the audience a fashion show at zero distance, meeting their needs and desire to visit big show fields, have close contact with all kinds of stars and big names in the fashion world.

Some fashion brands have VR equipment in their retail stores so that customers can put on a display device and view fashion shows in the form of virtual reality. Dior even customized VR glasses with a logo for offline stores. Although this is a means of marketing, and direct profit so made is difficult to calculate, we can see through virtual reality a shortened distance between the customer and the brand.

Conclusion

Since the beginning of 2014, VR has been hot in the fashion industry, and we see no declining of the trend. Instead, more and more brands have actively joined this forefront business model. But it is now time for us to ponder this question: after satisfying people’s curiosity, what other attraction does VR have so that it can hold people’s attention? After all, the public is eager to see technological innovation in the real sense of the word.

The purpose of all innovations in science and technology is to bring changes to our mode of production and life style so that people’s lives will become more convenient and better. Fashion and technology can be mutually beneficial. With a fashion factor included, science and technology will not only be able to exhibit its highest and brightest sides, but also be able to gain popularity among the general public to a greater extent and at a faster pace. Similarly, combined with science and technology, fashion will be standing at the forefront of the times, leading the trend. VR will continue to progress, and technological innovation will always appear. If the clothing industry wants to keep close cooperation with VR in the future, any quality combination of the two should start from customers’ needs to position the right breakthrough point.
References

