3D MODELING IN FASHION INDUSTRY

Elena URSACHI[1*]

[1]Universitatea Tehnică a Moldovei, Facultatea Textile și Poligrafie,
Departamentul Design și Tehnologii în Textile și Poligrafie, grupa DVI-201, Chișinău, Republica Moldova

*Autorul corespondent: Ursachi, Elena, elena.ursachi@dttp.utm.md

Abstract. *The development of technologies in recent years has led to the evolution of the fashion industry. 3d modeling is a new stage and will allow the preview of the final product. There are many reasons to move from paper and pencil to the virtual design lab. Fisrt of all, speed-3d modeling helps designers to design and create 4 times more clothes per day. In fact, instead of using physical samples for e-commerce photoshoots, photorealistic designs could completely replace the existing trend for photos of actual, tangible products on websites. 3D design can help to cut down on waste by producing better, more thoroughly researched garments.*

Keywords: *designers, garments, brands, digital clothing, tehnology.*

Introduction

Artists, fashion designers, designers - all these creative personalities used to create on paper. That is, they drew a sketch of the future product, including in color, and only then proceeded to implement it. This approach had several disadvantages [1]. For example, it was impossible to predict how this or that material will fall, and in general, a two-dimensional drawing will never give a clear idea of the future thing (fashion and design). 3D modeling allows you to perform all manipulations in a special software environment, taking into account all the features, both material and shape, entourage, interior, etc. it is much easier to realize products that have photorealistic rendering. In addition, the client can make changes to his own taste and this will not entail any costs [2]. 3D modeling is used to solve a wide variety of design problems:

- interior design - starting with the design of furniture, curtains, choosing the color of walls or wallpaper and ending with the arrangement of furniture, choosing textiles, lamps, etc.;
- landscape design - selection and placement of plants on the site, placement of small architectural forms, laying of paths and selection of materials;
- design of clothes (figure 1) and shoes, taking into account the characteristics of the figure, taste preferences, etc.;
- design of jewelry (figure 2);
- development of sculptures, figurines and other similar design items.

How 3D Fashion Design Can Help Reduce Environmental Pollution

The fashion industry produces 20% of global wastewater and 10% of global carbon emissions. The following components are required to create a sample of clothes:

- a model of a person called an avatar. The designer can set all the parameters of the figure (height, waist, bust). For example, when designing clothing for athletes, avatars are used with specified parameters that are typical for a given sport.
- sewing patterns. Finished patterns can be imported into software packages or created from scratch directly in the program. In order to properly decompose the component parts of a product, experience in design and creation of real products is required.
- fabric parameters, accessories, prints.

On the basis of the components, the designer creates a product and models the behavior of an avatar (walking on a catwalk, running, dancing) in order to evaluate how the clothes will behave in real life (figure 3). An important component is the ability to unload patterns for subsequent transfer to production.

Figure 1. Design clothes [5]

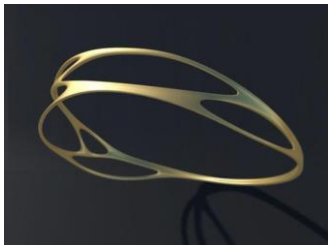

Figure 2. Design jewelry [6]

Figure 3. Model in motion [7]

Without diving into the details of production, let's divide the traditional process of creating clothes into stages: sketch / technical drawing; creation of patterns; bcreation of a test sample (sewing the first product); alteration. Now imaging technologies make it possible to simulate the behavior of the vast majority of tissues on a human model. Without using tissue for the first sample, it is possible to see where there are potential breaks in the event of hand waves and body movements [3]. You can also see all the sagging of the fabric and other moments that you will see only after sewing the first sample. Every 3D designer will confirm that the most difficult part of the job is to make the product as realistic as possible and then use the patterns for tailoring on an industrial scale. Despite not all the obvious advantages of using 3D technology, when creating the first samples of the collection, we save a tiny fraction of fabrics and resources. 3D technology reduces the risk of buying things that are not suitable for the buyer. In the traditional approach, brand catalogs use photos of products on models. Technically, there is no way to take into account the features of the figure of each person, so we mainly see photos of models in size S or M. In 3D modeling, it is possible to show clothes without a person, which allows the buyer to more accurately imagine himself in clothes (figure 4). We are also on the cusp of the massive use of virtual fitting rooms. All this reduces the risks when buying clothes from an online store, and then returning or throwing them in the trash can. All these factors reduce the amount of clothing that, for various reasons, is thrown away and not disposed of properly.

Digital clothing

What if people create digital clothing without tailoring it? For people for whom it is important to show their uniqueness and taste, it will be much easier and safer for the environment to order a unique digital item than to order real clothes that use a lot of energy to make and have a high chance of becoming trash (figure 5). Thus, humanity can get rid of excess clothing, which at the moment is an indicator of success and sometimes emphasizes a person's status [4]. Agree that it is more convenient to design sets of clothes for home, work, sports for yourself, and to implement all other ideas in digital samples. The development of 3D technologies for creating clothes makes it possible to reduce the consumption of fabrics and the use of fossil energy sources when sewing clothes at the following stages: creation of the first samples (minimal impact); reducing the risk of buying inappropriate clothing (medium impact); the transition of clothing from a real object that can be felt to digital (maximum impact).

Observing minimalism in clothing, humanity gets a chance to show its individuality and style by creating digital masterpieces of clothing and trying them on in virtual showrooms, posting images on social networks. We must admit that the basic needs for clothing are more met for the inhabitants of the planet, and at the moment there is technology that can transfer our desire for beautiful things into the digital world.

Figure 4. Example of clothes [**8**]

Figure 5. Clothes [**9**]

Conclusion

3D design isn't just a technological revolution, it's a people revolution too. For brands such as Tommy Hilfiger, taking on a 3D design promise as big as they have is a huge leap of faith. They're investing in training up digital tailors and designers, and getting people who are used to being armed with a pencil and a pad of paper up to scratch with 3D modelling. Once they're up and running, they're going to re-package the tech and the training, and sell it on to other brands, placing themselves at the forefront of the 3D design revolution. The rise of social media and the demand for constant content has put an end to fashion's seasonality. The brands that are going to make it big are those that can keep up with demand and optimise their processes by embracing technology.

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