

The Discussion of Clothing Form with Geometric Modeling

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Abstract: First of all, this research was begun by collecting historical researches then integrating and analyzing the consequences, which effected by geometrical form in the design fields. Further it goes to a trial is to draw out the inwardness of geometrical elements those possibly could be transferred into fashion design. Then following process is an experiment which is to work out the possibilities by utilizing the geometric forms, fitting in different situations such as topic, time, space, concept of value then observing how did the tolerances of styles come out? Finally, determining the scale of this research by aesthetic perspectives with judge metrical approval to the multi-dimensions of current fashion styles.

Except for this, when the processes of experiments was going, the technicalities of flat pattern making, draping skills, theories and concepts of tailoring construction were linked up with new materials development. Returning the clothing construction and inspiration to the most primal and simple elements, achieving a new silhouette in a modern and chic view, creating a new determination of beauty.

1. Research Background and Motivations

Straight line, round, triangle, square, rhombus and other simple geometric modelings often appear in ancient works, such as the painted-pottery culture and traditional sculptures in China's neolithic age, the western murals in ancient Egypt, the continuous patterns in Greece, the folk arts in Africa, etc, which fully reflect the creativity and out limit of space-time as well as region of these primitive simple geometries. In the fashion trend, geometric modeling has been applied by many designers to clothing design; However, whether the geometric modeling has other new development space in different historical times? How does a rising star challenge the existing trends with innovative ideas? And what is the relationship between geometric modeling and clothing structure? Madeleine Vionnet, a French clothing designer once said "garment making is just like factory organization; and clothing design is also like geometrist regarding human body as the perfect combination of geometric figures and cloth." It can be seen that there is a subtle interaction among geometric modeling, human body and clothing.

2. The Overview of Geometric Modeling

The word of "geometry" and "modeling" have a complex connotation, which has a great relationship with the whole historical development, the views of art at different ages as well as the interpretation and cognition of words in the Chinese and western cultures.

"Geometry" is one of mathematics and it is also called the science of form. Among them, related topics are extended, such as "geometrical element", "geometry school", "solid geometry", "geometrical image", etc. "Geometrical element" is the generic term of point, line and plane, namely, the most basic elements that form a geometrical figure. As for "geometrical image", it refers to the regular or irregular geometrical figures drawn by straight lines and quadratic curves, for example, the decorative continuous patterns can be made by rhombus, polygon, round or parabola.

Worringer argued that geometrical figures must be the origin of all decorative arts and original

artistic style. He explained “geometrical style” meant using straight line, curve, round, triangle, square, rhombus and so on to form various regular or irregular geometrical patterns as the decorative patterns.

Kirke also proposed that “geometry” was derived from 4000~3000 B.C. and it was a principle deduced first by Egyptians when they were drawing a right triangle. And then, combining other design elements, such as rectangle and round, Greek drove its development.

“Modeling” is the perception of vision on the external form of things, and the form is an indispensable basic element in visual modeling. The co-called form refers to the shape and manner. The shape is not only the figure, outline and appearance, but also the structural style of objects. Namely, the double realm of “shape” and “form”.

Yang Qingtian thought in the principle of forming modeling, “shape” should be the necessary element of forming form, while “form” should be the formed pattern. Yang put forward “modeling” was closely related to “modeling art”. It’s a particular form of art and an art of “modeling form”.

3. The Clothing with Geometric Modeling

The composition form of clothes takes the relevance of geometry, human body and clothing as the main axis and regards three images of human-body modeling, shape and form and natural modeling as the development direction in the clothing creation. In addition, it manages to make the clothing creation achieve the balance between function and modeling in geometry, human body and clothing.

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Since 1910, Japanese designers have broken the traditional design thinking and adopted the thinking mode of geometric modeling to think about the clothing pattern. Taking the prototype version of Japanese culture as an example, the basic clothing prototype starts with a certain anchor point (e.g. back neck point), and then links points into lines, finally forms plane geometric figures that relatively conform to the human-body curve. The process of disassembling human body’s three-dimensional structure into a plane is the basic condition for the geometric principle to constitute the lines of clothing structure. Japanese designers have developed the conventional thinking of clothing pattern into a creative geometric version, which makes the conventional clothing design become a three-dimensional one and differs from the common clothing outline.

Geometric modeling is point, line, surface and body. In clothing construction, the square structure in plane geometry is transformed to clothing, and then it is restored to the application design of simple geometric figures, angle twisting and the principle of three-side composition through the component element of geometric modeling, finally, the concept of geometric modeling is integrated into clothing construction.

In the early 20th century, Soviet artistic style referred to “absolutism”, “constructivism” and the artistic ideas of “Tathin”. These artistic styles originated from the early 1910s and caused by Soviet artists. Influenced by modernism, these artists represented them in geometric abstract art.

As an innovative element, the sense of structure of geometric modeling produced by folding, splicing and dressing on the human body makes the clothing convey a geometric effect from two dimensions to three dimensions. The two-dimensional clothing geometric modeling design, for example, the popular art flourishing in the 1950s that combined “geometric abstract artistic style” and the idea of “full of strong political characteristic”, is reflected in the style of clothes and the pattern design for printing & dyeing of shell fabric to form a special clothing aesthetic characteristic; The three-dimensional clothing geometric modeling design, for example, the designs of Hussein Chalayan, has strong experimental style and it is good at splicing the demonstrated clothing pattern into clothing clipping way to highlight the characteristics of deconstruction. At the same time, the presentation on the whole clothing of three-dimensional geometric modeling can be presented.

There are three common structures in three-dimensional geometric modeling: round structure is

common for shoulder design and skirt type in shaping round fashion; triangular structure is the common geometric figure in fashion, a proper utilization can beautify the figure; stacked geometric figure is the refinement of geometric figure and representation in the way of stacking to show the sense of delicate and feminine.

The inspiration comes from the adoption of angle transition for making three-dimensional modeling in origami. Therefore, the concept is applied to the same template to extend another clothing appearance with the folding ways from different angles. The cloth must have a certain stiffness to fix pleats and highlight such dog ear design. It is the “Lifetime Pleat” that becomes famous with the principle.

The clothing designer Issey Miyake once said that he was influenced by Madeleine Vionnet’s adoption of tailoring method and the design of ruff collar. Madeleine Vionnet’s another concept interpretation on geometric modeling can be seen from other part of her works. Issey Miyake analyzes the beauty of clothing structure from the angle of spatial aesthetics. He makes a certain spatial distance between clothing and shell fabric and constructs clothing modeling with geometric forms. He is known as the pioneer who creates the deconstruction design style of clothing design. The personal design philosophy of Issey Miyake shows compared with the statement that clothing is just the other skin of human body, it may be more important to explore the connotation brought by clothing.

In recent years, Japanese designers have devoted themselves to adding “time” and “action” to clothing design so that the clothing design can have the possibility of “four-dimensional space”. For example, Vandalize and Watanaba use the same concept in clothing design coincidentally. Taking clothes’ front center-line as the axis and designing one of the clothing slips as the mobile one is one such. For example, when the right body piece covers the left one, the front center-line of the whole clothes will change with the axis. The art that brings “action” into it and creates the action like spatial-temporal trajectory is one of the four-dimensional space expression techniques.

4. The Development of Clothing with Geometric Modeling

Due to the simplicity, clearness and ornament, geometric modeling has been popular ancient times. People of different times, regions and nationalities endow different connotations and personalities to geometric modeling. Geometric modeling is a concrete and connotative form. In terms of its manifestation, in addition to the exterior appearance, shape, line, space and texture, it also includes the form, style, modeling thought and other characteristics. For example, the construction experiment of “shape” and “form” can be designed and developed towards other forms (triangle, round) and the structure of material application can be considered being emphasized through material comparison and organization effect. In terms of the “closed three-dimensional space” of clothing structure created by human-body modeling and natural modeling, the subsequent research can take “open three-dimensional space” as the development goal.

More and more clothing brands are dedicated to the development of geometric clothing, so how to show the traditional geometric modeling elements in modern clothing in a three-dimensional way is a key to our design. It is hoped the possible clothing design forms derived from the geometric modeling can be explored through sorting out the influence of geometric modeling on the field of clothing design and analyzing the elements that can be transformed to apply to the creation of clothing design.

References

- [1] Yongyan Li. A Study on the Application of Elements of Ethnic Dress in Modern Fashion Design[J]. Canadian Social Science, 2009, 5(2).
- [2] Zhang Yi. Modern Fashion Design Based on Virtual Reality[M]. Springer London: 2013.
- [3] Tao Guo. Fashion Design Professional Basis Based on Design Process[J]. Advanced Materials Research, 2014, 3326(989).