Relating innovative 2D ideas into 3D garments, in terms of structure, using 'Sculptural Form Giving' as an intermediate step in creation

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Publication date:
2011

Relating Innovative 2D Ideas into 3D Garments, in Terms Of Structure, Using 'Sculptural Form Giving' as an Intermediate Step in Creation

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Abstract

This research focuses on finding a fashion design methodology to reliably translate innovative two-dimensional ideas on paper, via a structural design sculpture, into an intermediate model.

The author, both as a fashion designer and a researcher, has witnessed the issues which arise, regarding the loss of some of the initial ideas and distortion during the two-dimensional creative sketch to three-dimensional garment transfer process. Therefore, this research is concerned with fashion designers engaged in transferring a two-dimensional sketch through the method 'sculptural form giving'.

This research method applies the ideal model of conceptual sculpture, in the fashion design process, akin to those used in the disciplines of architecture. These parallel design disciplines share similar processes for realizing design ideas. Moreover, this research investigates and formalizes the processes that utilize the measurable space between the garment and the body, to help transfer garment variation and scale.

In summation, this research proposition focuses on helping fashion designers to produce a creative method that helps the designer transfer their imaginative concept through intermediate modeling.

Keywords： Dimensional Transformation, Sculptural Model, Spatial Parameter, Fashion Design Method.

1. Introduction

1-1. Background and Problem

This research focuses on finding a fashion design method to reliably realize a two-dimensional sketch, on paper, via a structural design sculpture, into an intermediate model. Kawamura (2004:207-8) pointed out that the renowned fashion designer Rei Kawakubo's designs has suffered from problems in the transfer of her ideas into finished garments. Her technicians, with experience of working with spatial forms, were known to produce a volume of samples from her sketches, but ultimately own experience of working corresponded with trial and error. The author also witnessed this transfer problem for herself, and by her colleagues and design teams, primarily because the two-dimensional sketch represented the 'volume' of the design concept ambiguously. This misunderstanding of the sketch affects technicians' ability to realize the design at the earliest stage of its conception. Time was wasted in trial and error at the modeling stage. Therefore, a three-dimensional intermediate model would give an actual spatial form to solve this problem and represents the design concept visually.

This literature review applies the intermediate modeling method of architecture disciplines to fashion design. This addresses the problem of translating the sketch to its best advantage, through an intermediate model, to provide a simpler pathway for fashion designers and technologists. This study is, therefore, a pathway to realize the sketch, on a sculptural model clearly, by including space and size measurements.

1-2. Aims and Objectives

The aim of this work was finding a suitable intermediate model, which is 'sculptural form giving', a fashion design methodology to reliably translate a 2D sketch from paper to a practical design model. The objective in this study was to develop a transferring formula for the scale of sketch to the mannequin.

2. Literature Review

2-1. Principles of Two-Dimensional Design

According to Wong (1977:5), two-dimensional design is a man made creation in which length and breadth are two key elements. These two factors establish a visible surface without depth and thickness. Drawing, painting, printing and dyeing, can be represented in two-dimensional design.

2-2. Principles of Three-Dimensional Design

Three-dimensions include length, breadth and depth. Wong (1977:5-14) and Thomas (1969:11-12) illustrated that three-dimensional design reveals depth in a third dimension. Three-dimensional design establishes spatial relationships. The major differences between two-dimensional and three-dimensional design are depth, measurements and three basic views which are depth, length and width. These elements help to realize a two-dimensional idea in actual three-dimensions.

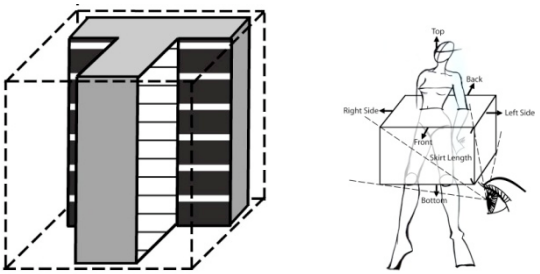


Figure 1. Three-dimensional design characters on a cube and a garment.

2-2.1 Model Realization in the Fashion Design Process

Eckert (1997:36), McKelvey and Munslow (2003:32-101) and Burns and Bryant (2007:176) illustrated that pattern-making and draping are two major existing methods in the sampling stage of the fashion design process. Jones (1992:72-3) pointed out that in a fashion design sampling process, after the fashion designer draws the sketch, technicians realize the sketch shape and details to form garment samples. However, pattern-making methods of the 'plus size' by Deckert (2002:52-119), artistic dress by Silberberg and Shoben (1992:2-3), flared pattern shape by Shoben and Ward (1990:76-79) were limited to build a model from two-dimensions, due to space measurement difficulty. Moreover, draping builds samples in three-dimension, but the difficulty is in measure the space on the mannequin against the sketch.

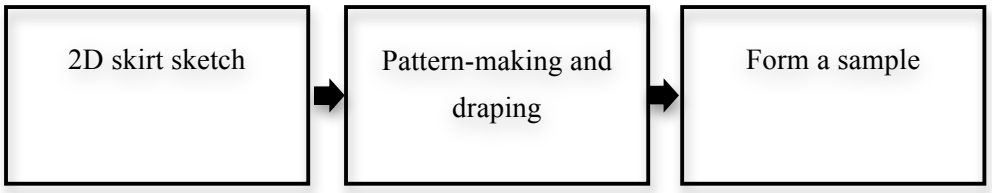


Figure 2 Modeling process in fashion design

2-2.2 Model Realization in the Architecture Design Process

In architectural design, Taylor (1971:2) pointed out that a study model is used to review shapes, in the architectural design process. Winslow (2008:20-22) and Mills (2005:17) defined the intermediate model, which is the white card model and development model.

These types of intermediate model have the same functions. The major function of the intermediate model is a temporary model before the presentation model. The functions of the intermediate model are to view a three-dimensional diagram, show technical aspects, construction, conductive exploration, abstract representation of buildings and show the need for modification and refinement. The author summarizes the intermediate model transferring processes in the books of Winslow (2008:155-161) and Mills (2005:212-3) in the following figure.

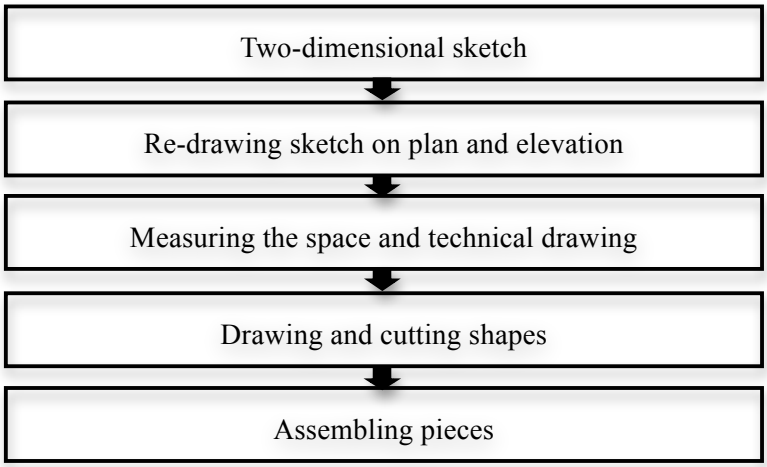


Figure 3 Intermediate Modeling Process in Architecture Design

3. Experimental Work and the Sculptural Form Giving Method

From the crossovers in the parallel disciplines, the experimental work in this study was divided into three steps, which are preparation, calculation and model realization.

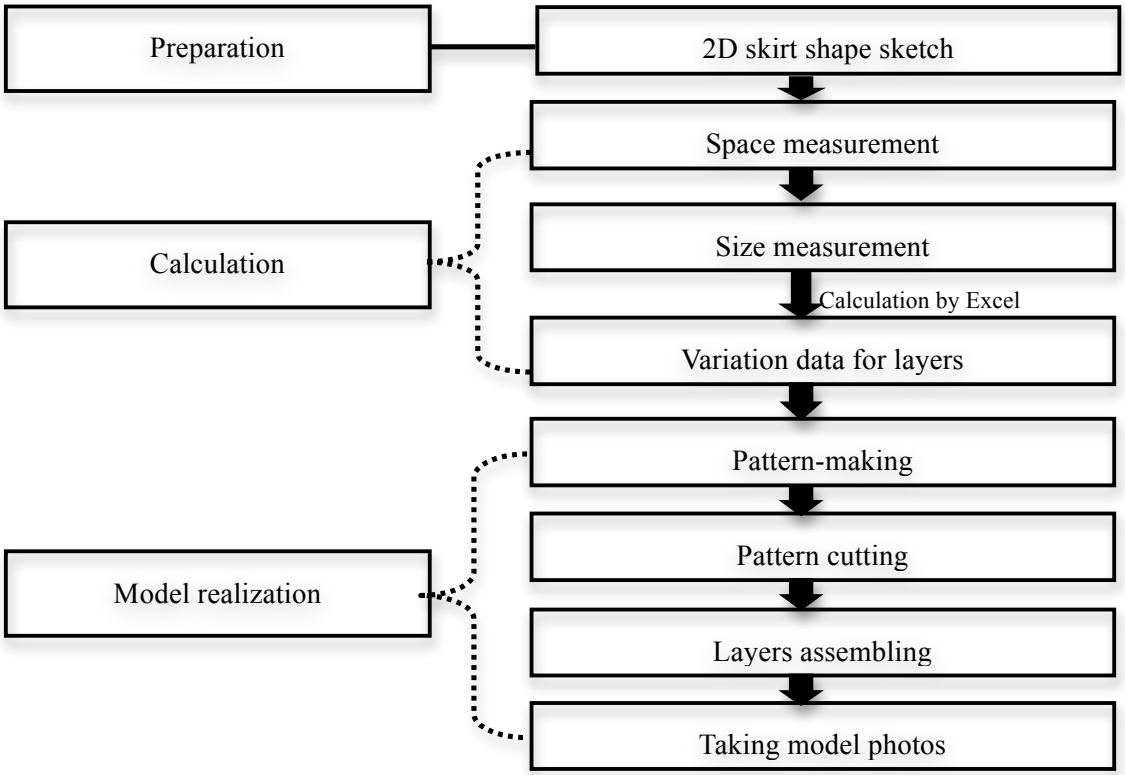


Figure 4 Experimental Work Process

3-1. Preparation

The author captured a heart shape from parts of her previous drawing (Figure 5) and illustrated the heart shape on a skirt sketch by front (Figure 6) and left side view (Figure 7).

Figure 5 Front View of Heart Shaped Skirt Sketch

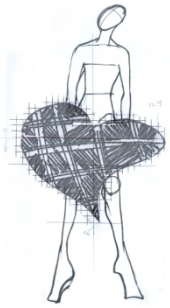


Figure 6 Heart Shaped Sketch in Design Research

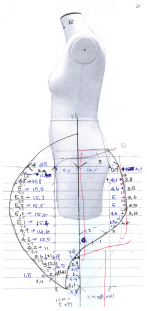


Figure 7 Left Side View of Heart Shaped Skirt Sketch

3-2. Space Measurement

Firstly, in figure 8, the front and left side view sketches were drawn on the scale grid sheet. Secondly, Figure 9 shows a re-drawing of the sketches of the front and left side views on the standard garment sheet.

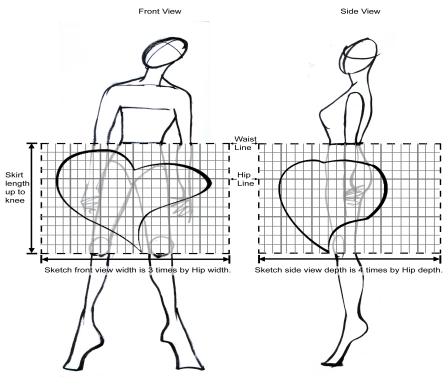


Figure 5 Drawing of the Front and Left Side View Skirt Sketches on the Scale Grid Sheet

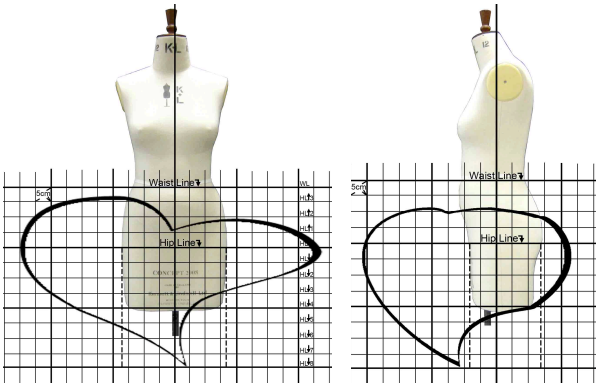


Figure 6 Re-Drawing the Front and Left Side View Sketches on a Standard Garment Sheet

Next, the gray areas were used to represent the space between the shape and the mannequin. Each grid scale represents 5cm length and 5cm width on the mannequin. The author measured the space from the standard garment sheets and the gained space measurement data.

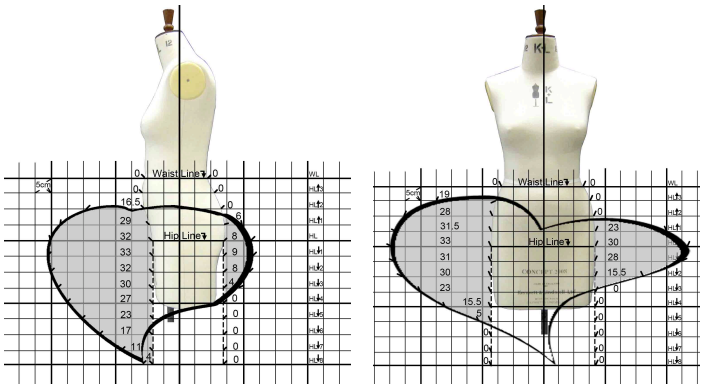
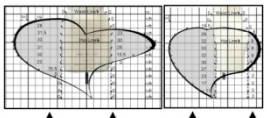


Figure 7 Space Measurement

3-3. Size Measurement by Microsoft Office Excel 2007

Figure11 reveals the Excel program that was set to calculate space data and Figure 12 represents the horizontal layer map. The author entered the space measurement data in the blue area of the Excel program. The next step in size measurement was to get the size measurement data (Table 1).



Depth / Length / Width	Front Central	Back central	Right Side	Left Side
WL	0	0	0	0
HL↑3	0	0	19	0
HL↑2	16.5	0	28	0
HL↑1	29	6	31.5	23
HL	32	8	33	30
HL↓1	33	9	31	28
HL↓2	32	8	30	15.5
HL↓3	30	4	23	0
HL↓4	27	0	15.5	0
HL↓5	23	0	5	0
HL↓6	17	0	0	0
HL↓7	11	0	0	0
HL↓8	4	0	0	0

Figure 8 Space Measurement Data is Entered in the Excel Program

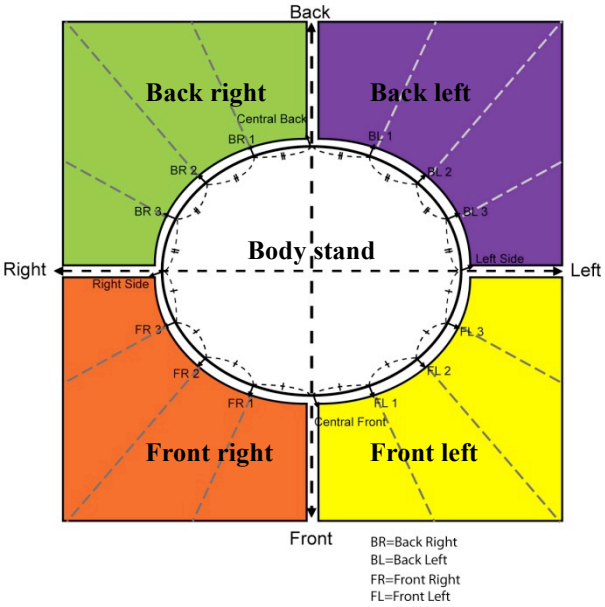


Figure 9 Map of Horizontal Layers by Four Colors

Table 1 Size Measurement Data Lists

Table A Size measurement data of Front Left					
Layer Seam	Left Side	Front Left3	Front Left2	Front Left1	Front centr
WL	0	0.0	0.0	0.0	0
HL↑3	0	0.0	0.0	0.0	0
HL↑2	0	4.1	8.3	12.4	16.5
HL↑1	23	24.5	26.0	27.5	29
HL	30	30.5	31.0	31.5	32
HL↓1	28	29.3	30.5	31.8	33
HL↓2	15.5	19.6	23.8	27.9	32
HL↓3	0	7.5	15.0	22.5	30
HL↓4	0	6.8	13.5	20.3	27
HL↓5	0	5.8	11.5	17.3	23
HL↓6	0	4.3	8.5	12.8	17
HL↓7	0	2.8	5.5	8.3	11
HL↓8	0	1.0	2.0	3.0	4

Drawing Vertical Layers Using the Columns Data
Drawing Vertical Layers Using the Rows Data

Table B Size measurement data of Front Right					
Layer Seam	Front Central	Front Right1	Front Right2	Front Right3	Right Side
WL	0	0.0	0.0	0.0	0
HL↑3	0	4.8	9.5	14.3	19
HL↑2	16.5	19.4	22.3	25.1	28
HL↑1	29	29.6	30.3	30.9	31.5
HL	32	32.3	32.5	32.8	33
HL↓1	33	32.5	32.0	31.5	31
HL↓2	32	31.5	31.0	30.5	30
HL↓3	30	28.3	26.5	24.8	23
HL↓4	27	24.1	21.3	18.4	15.5
HL↓5	23	18.5	14.0	9.5	5
HL↓6	17	12.8	8.5	4.3	0
HL↓7	11	8.3	5.5	2.8	0
HL↓8	4	3.0	2.0	1.0	0

Table C Size measurement data of Back Right					
Layer Seam	Right Side	Back Right3	Back Right2	Back Right1	Back Centr
WL	0	0.0	0.0	0.0	0
HL↑3	19	14.3	9.5	4.8	0
HL↑2	28	21.0	14.0	7.0	0
HL↑1	31.5	25.1	18.8	12.4	6
HL	33	26.8	20.5	14.3	8
HL↓1	31	25.5	20.0	14.5	9
HL↓2	30	24.5	19.0	13.5	8
HL↓3	23	18.3	13.5	8.8	4
HL↓4	15.5	11.6	7.8	3.9	0
HL↓5	5	3.8	2.5	1.3	0
HL↓6	0	0.0	0.0	0.0	0
HL↓7	0	0.0	0.0	0.0	0
HL↓8	0	0.0	0.0	0.0	0

Table D Size measurement data of Back Left					
Layer Seam	Back Central	Back Left1	Back Left2	Back Left3	Left Side
WL	0	0.0	0.0	0.0	0
HL↑3	0	0.0	0.0	0.0	0
HL↑2	0	0.0	0.0	0.0	0
HL↑1	6	10.3	14.5	18.8	23
HL	8	13.5	19.0	24.5	30
HL↓1	9	13.8	18.5	23.3	28
HL↓2	8	9.9	11.8	13.6	15.5
HL↓3	4	3.0	2.0	1.0	0
HL↓4	0	0.0	0.0	0.0	0
HL↓5	0	0.0	0.0	0.0	0
HL↓6	0	0.0	0.0	0.0	0
HL↓7	0	0.0	0.0	0.0	0
HL↓8	0	0.0	0.0	0.0	0

3-4. Model Realization: Pattern-Making

The first step involves reading the data lists of the size measurements for pattern-making of the layers'. The tables are matched with the corresponding colors in the map, in Figure 12. The red part of the Figure 13, for example, shows the data in table 1-B. The second step is to draw horizontal layers according to the data in the rows of size measurement lists. The third step is to use the column data of the size measurement lists to draw vertical layers. Figures 14 represents simulated images, when viewing the front view with a 22.5 angle, after assembling the horizontal and vertical layers. The fourth step is the cutting of the pattern pieces. Figures 15-A, Figure16, Figure 17 and Figure 18 illustrate the four side layers and 16-B presents an assembled view.

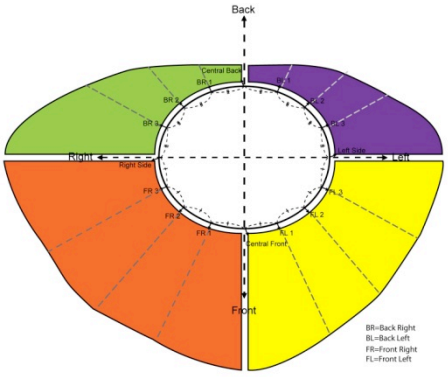


Figure 10 A Pattern-Making Example of the Horizontal Layers in Hip Line by Size Measurement Data

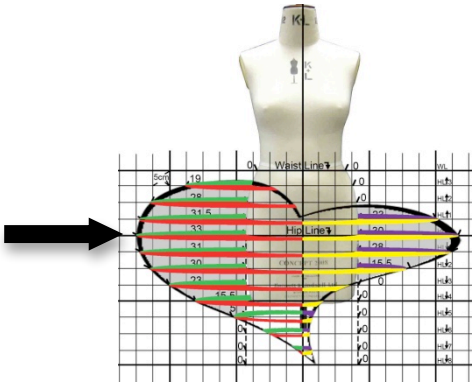


Figure 11 Front View with 22.5 Angle of Assembling Simulation of the Horizontal Layers

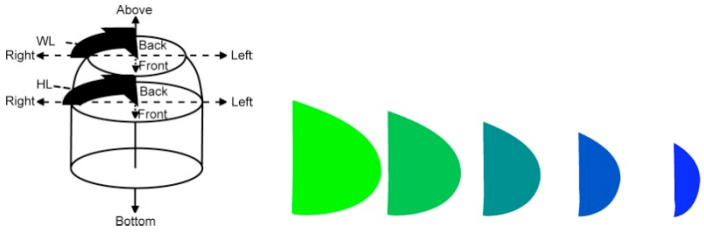


Figure 12-A Vertical Layers of Back Right

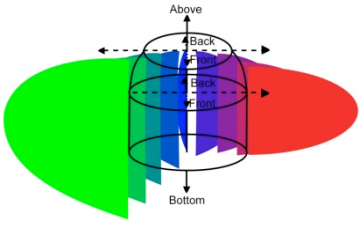


Figure 16-B Front Simulation View of Assembling Half Vertical Layers

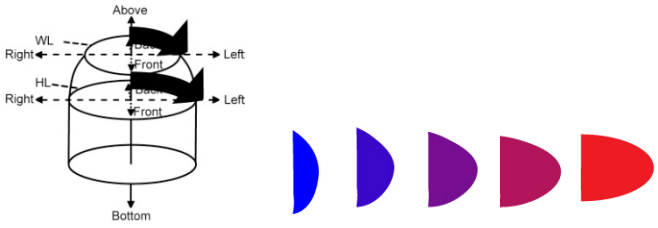


Figure 13 Vertical Layers of Back Left

Figure 14 Vertical Layers of Front Left

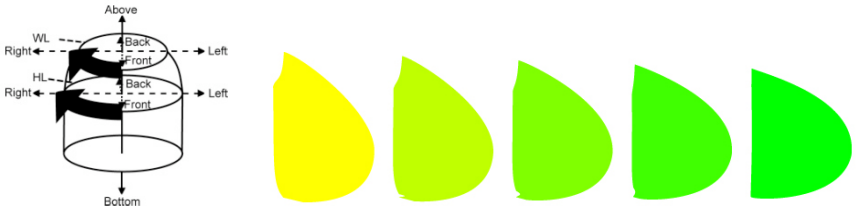


Figure 15 Vertical Layers of Front Right

3-5. Model Realization: Assembling Pattern Pieces

In the first assembling step, vertical layers were pinned against the mannequin. The author then gathered the hip line of horizontal layers around the front left, front right, back left and back right sides (Figure 19-A). And then according to the, Following figures 12 and 14, the other horizontal layers were placed above and below the hip line (Figure 19-B and 19-C).

Figure 19-A

Figure 19-B

Figure 19-C

Figure 16 The Process of Vertical and Horizontal Layer Assembling

4. Results and Discussion

4-1. The Three-Dimensional Sculptural Form Giving Model

There are four views of the heart shape sculptural form giving model in Figure 20. Draping on this sculptural model (Figure 21) gave 16 pattern pieces (Figure 22). After pattern cutting and sewing, a heart shape skirt was formed. (Figure 23).

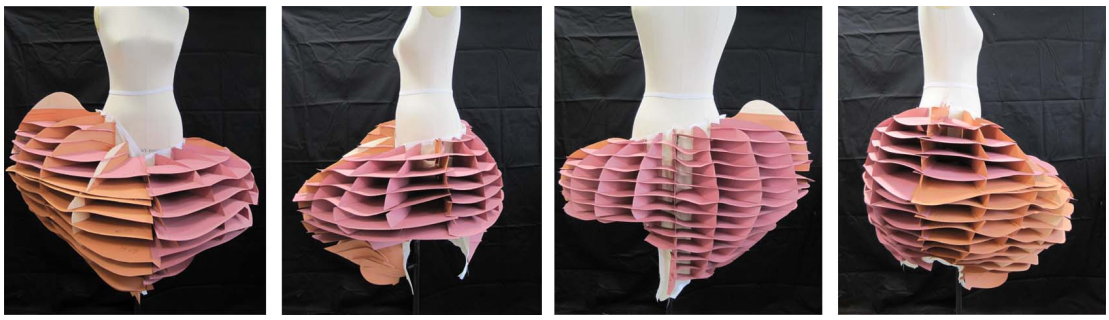


Figure 17 Heart Shape of Sculptural Model of Front, Left Side, back and Right Side Views

Figure 18 Four Views of Heart Shaped Skirt Draping

Figure 19 The Pattern Pieces of Heart Shaped Skirt

Figure 20 Four Views of Heart Shaped Skirt with Filler

5. Conclusion

This research has investigated a fashion design method to produce an intermediate model from a fashion design sketch. This research project has developed a fashion design method, described as 'sculptural form giving', to reliably translate innovative two-dimensional ideas on paper, via a structural design sculpture, into an intermediate model. This study intends to help designers in transferring their flat creative concept to form a practical sculptural model. According to the performance of the sculptural model, the author held a workshop with second year fashion design and technology students in Heriot-Watt University in November 2010. The students evaluated the procedure, was to understand the reliability of the method.

6. References

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