

**“MULTI-DIMENSIONAL CLOTHING”**

**by**

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## DECLARATION

I, Nayra Waddington Negrao, declare that the contents of this dissertation represent my own unaided work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Nayra Negrao  
Signed

25/10/10  
Date

## **ABSTRACT**

The main objective of the research is to unfold the necessary theory by using current and relevant information available, in the scientific and fashion department, to substantiate the exploration of dimensions and the associated human interpretation.

To produce two separate collections that combined illustrate my personal design identity, but when apart they demonstrate two parallel versions of the same concept.

The main collection is divided into two ranges, one commercial and another conceptual. The commercial pieces will present a more affordable ready-to-wear range to the consumer while the conceptual pieces will represent my own interpretation of the concept chosen for this research.

Together these designs will formulate a vision for the overall collection, reflecting my own meaning and interpretation of what dimensions are and the various techniques of representing them.

Extensive research will be done to unfold all the theory needed to substantiate my findings during this exploration into dimensions and the universe we live in.

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- Performance artists: Hannah Loewenthal and Mamelela.
- Photographer: Hayley Williams
- My family and Friends

## **DEDICATION**

**This dissertation is dedicated in my father's memory. May Zegui live in our hearts for the rest of time.**

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# **1. INTRODUCTION**

## **1.1 The setting**

In this study of how an understanding of dimensions and interpretation can provide meaning for multi-dimensional clothing I will explore a few theories which include the theories of relativity, both general and special, the string theory, and lastly, the M theory or otherwise called the theory of Everything. These theories combined explain what dimensions are and how they are linked to our understanding of the universe. Hermeneutics is, in addition, referred to briefly, adds a significant component which connects and explains why, the previously mentioned theories operate the way they do, in relation to the actual human body which is inevitably connected to all human interpretations of reality (Horn, 2005:15).

The second goal of this research is to explore a possible fusion of commercial design, which is simple and practical, with conceptual design, which on the other hand is complex and has a specific meaning attached to it, in order to generate a personal design identity. A brief explanation of each design style will be included, so that a better understanding can be easily acquired. The aim is to create a new design aesthetic that will involve a combination of complex three-dimensional structures, and more simplistic and flat two-dimensional ones, in relation to fashion design.

An object is considered three-dimensional or 3D when it has three measurements, length, width and depth. Similarly it could be said that dimensions are measured up or down, left or right and forwards or backwards (Kaku, 2007). When the depth measurement is taken away the object becomes two-dimensional or 2D.

## **1.2 Purpose Statement**

To what extent can an understanding of dimensions and interpretation assist in providing meaning for multi-dimensional clothing while simultaneously creating a merger of commercial and conceptual design in order to generate a new fashion identity inspired by three-dimensional shapes and nature?

## **1.3 Sub-Questions**

- What is the role of dimensions and interpretation in changing the significance of multi-dimensional clothing?
- What Fashion identity can be generated from different dimensional perspectives and the use of a three-dimensional concept while merging conceptual and commercial design to create a hybrid fashion expression?
- How will I apply different perspectives, derived from nature, and multiple dimensions on my range in order to cater for both personal creativity and also institutional commercial imperatives without obstructing the garments' practicality and functionality?

## **2. LITERATURE REVIEW**

### **2.1 Hermeneutics**

According to Hans-Georg Gadamer, Hermeneutics is the art of understanding something and not the presentation of what has been understood, in other words, what is imperative is not how well a topic is explained to others, but how much wisdom of the subject the observer acquires after evaluating it (Horn, 2005: 120).

The hermeneutics theory outlined in Gadamer's magnum opus *Truth and Method* (Muller-Vollmer, 1986:73), states that "human beings who are rational animals, have bodies thus rationality is embodied and/or directly influenced by how things are, and can be meaningful to people". I decided to use this specific theory because when compared to the rest of the theories chosen, it explains why humans behave in such erratic behaviors.

Gadamer's Hermeneutics suggests that reality is shaped by the human's body limitations conditioned by the outline of the spatial and temporal orientation; bodies are submitted to (Johnson, 1987:11). Simply put, where and when things happen affects our decisions and therefore our interaction with objects.

### **2.2 The theory of Relativity**

The Theory of Relativity by Albert Einstein is divided in two theories which are the Special Theory of Relativity (STR) and the General Theory of Relativity (GTR) (Harpaz, 1992:1).

The Special Theory of Relativity was introduced in Albert Einstein's 1905 paper "On the Electrodynamics of Moving Bodies" and it is a theory of the structure of space-time. It states that space and time are dimensions entwined together forming a kind of curved fabric described as space-time (Harpaz, 1992:5).

Although Einstein suggested that a missing theory would complete his already existing theories of relativity, he didn't live long enough to conclude it. After Einstein's death, other scientists developed theories, such as the string theory and what is known as the M theory, that completes Einstein's life research and they feel like the truth has finally arrived. Today scientists, such as Michio Kaku believe that we live in world with 11 dimensions, where 9 are spatial, of which humans can only sense three. Time is considered to be the 10<sup>th</sup> dimension, and a mysterious 11<sup>th</sup> dimension completes the diagram (Kaku, 2001).

### **3. RATIONALE**

The aim of this exploration is to produce a collection that represents the universe and its countless intricate mysteries. My theoretical research lead me to a very interesting conclusion, which is that we are not alone in the universe, in fact there are thousands or even millions of other universes that co-exist with ours.

To illustrate the above mentioned my main collection will be divided in two ranges, one commercial and one conceptual, where each range represents an alternative version of the previous, almost as if they co-exist in parallel universes.

To conclude my research, my collections will be showcased in a short improvised performance, done by a group of artists who are inspired by design and art. They will create their own interpretation of my theme, using my collection to their satisfaction.

## **4. METHODOLOGY**

### **4.1 Research Design 1**

4.1.1 What is the role of dimensions and interpretation in changing the significance of multi-dimensional clothing?

### **4.2 Research design 2**

4.2.1 What Fashion identity can be generated from different dimensional perspectives and the use of the three-dimensional concept while merging conceptual and commercial design to create a hybrid fashion expression?

- **Aim**

By posing these sub-questions, I aim to gather as much information as possible and summarise it accordingly, as well as learn from this process. I intend to reference correctly and to fully understand all theorists and their theories.

- **Techniques and methods**

Referencing will be done using the Harvard method. I will read and summarise content from books, journals, internet sources, magazines and documentaries.

- **Equipment**

Internet- for information

The CPUT Library- for information

Cell Phone- to make appointments

Printer- to print documents

### **4.3 Research design 3**

4.3.1 How will I apply different perspectives, derived from nature, and multiple dimensions on my range in order to cater for both personal creativity and also institutional commercial imperatives without obstructing the garments' practicality and functionality?

- **Aim**

To apply the correct theory to my practical component of this dissertation, in order to produce 3 ranges, a commercial, a conceptual and a avant-garde piece with distinct dimensional characteristics, by using all the resources available to me.

- **Techniques and methods**

A combination of methods of applying dimensions into my collection will be taken in consideration as well as other methods of embellishing the fabrics so that a false sense of depth is obtained. The lines, shapes and other design elements can be directly traced back to each respective inspirational visual, although they resemble each other so that an interconnectedness feel is acquired.

- **Equipment**

Industrial sewing machines for woven and knit fabrics, such as:

Over locker

Lockstitch

Button hole

Binding

Mock safety

Cover seam

Binding

Industrial Iron

## **5. DELIMITATIONS**

As inspiration, for both my theory and practical work, I will use the universe itself and visuals of items that can be found within nature in our planet, which I will source from documentaries, books and the internet. These visuals will be carefully selected to resemble each other so that a feeling of interconnectedness, which is what my theory suggests, is obtained within my collection.

The shapes of each design will be carefully designed in order to resemble existent three-dimensional shapes that are in fashion at the moment, and relate to the current trends.

## **6. ARGUMENTS**

The reason for applying the theory of relativity together with hermeneutics in my collection is that together they substantiate each other's assumptions perfectly. My topic choice is purely conceptual, and not a design problem as such. Because of this, different people will respond to it differently. When this has been proven, it will only add to my initial argument that multiple variations of people's own understanding of reality co-exist together and not necessarily against each other.

## **7. ASSUMPTIONS**

I assume that experimenting with pattern drafting techniques as well as sewing techniques will suffice for this year's research, which consists of construction methods that ultimately add dimensions to my clothing.

I also assume that in the near to distant future, according to how fast technology will advance, everyday people will own at least one multi-dimensional item of clothing, because of the storage facility it provides as well as other related benefits.

## **8. CONCLUSION**

In conclusion, I will ensure that this year's work will have a set of strategic products that have visible dimensions represented within the outfits. From the theory unpacked I can conclude that the world we live in is mysterious, and as humans, we can only recognise a small percentage of a greater, more complex understanding.

If we discard all inhibitions and allow ourselves to think freely, we might find the solution we seek so desperately. Whatever the problem may be, there is always a solution, even if it seems unreachable.



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## **CHAPTER 1: INTRODUCTION**

### **1.1 Introduction**

In this chapter I introduce the research problem I intend to solve, my concept, its background and the relevant sub-questions the dissertation focuses on.

### **1.2 Statement of the Research problem**

To what extent can an understanding of dimensions and interpretation assist in providing meaning for multi-dimensional clothing while simultaneously creating a merger of commercial and conceptual design in order to generate a new fashion identity inspired by three-dimensional shapes and nature?

### **1.3 Background to the Research problem**

In this study I will be exploring how an understanding of dimensions and interpretation can provide meaning for multi-dimensional clothing. In order to do this I will review the available information on dimensions in relation to fashion design and the range that is being produced.

As an individual, I am fascinated by our universe and its millions of surprises and I wish to continue exploring them. Although there are gaps in the theories I choose to explore, they are the most consistent and authentic explanations of everything in our multiple universe, otherwise known as a multi-verse (Kaku, 2001), as is further explained in chapter three. Everyday scientists continue to discover new possibilities and they believe that sometime soon, we will succeed on a Theory of Everything.

This dissertation is the theoretical component to the end of year range. I will explore here the concept of dimensions, which are described in chapter two. An understanding of basic principles of physics is required for the full understanding of such a complex topic and with the aid of academically viable sources of information I managed to gather all the necessary information for this study.

The second goal is to explore a possible fusion of commercial design, which could be considered to be relatively conservative and straight forward, with conceptual design, which on the other hand could be considered more extreme and flamboyant (The terms commercial and conceptual are explained in chapter 4: methodology). The aim is to create a new design aesthetic that will involve a combination of complex three-dimensional structures, and more simplistic and flat two-dimensional ones that will be used in the range's designs. Figure 1.3.1 is an example that clearly shows the differences between the two-dimensional state of an object and it's three-dimensional one.



Figure 1.3.1

Fehrenbacher, *Representation of an object in 2D and 3D*

(inhabitat.com, 2010)

An object is considered three-dimensional (3D) when it has three given measurements which are length, width and depth. Similarly it could be said that dimensions are measured up or down, left or right and forwards or backwards (author, date). When the depth measurement is taken away the object becomes two-dimensional (2D). The 2D system is mostly used as a representation system to copy the outside world on paper by imposing certain illusions that would trick the mind into believing that depth is present on flat surfaces. These tricks or techniques are to compel the viewer into accepting the third dimension of depth even though it is not necessarily there.

#### 1.4 Topic area

This research is a study of dimensions and interpretations in our four-dimensional reality (this will be further explained in chapter 2) which will allow for a comparison between commercial and conceptual design in relation to three-dimensional shapes.

Clothing itself is flat and 2D because the depth measurement is so small it can be neglected. Fashion designers have discovered clever ways of creating volume, by applying certain techniques, but not necessarily a third dimension. While this allows the wearer to feel comfortable while wearing clothes because they become 3D when worn, they are in essence still flat and two-dimensional.

I will be referring to two main theories, the theory of relativity and the special theory of relativity, by Albert Einstein. These explain what dimensions are and how they are linked to our understanding of the universe, in terms of space and time. I will also be analysing the theory of Hermeneutics by Hans-Georg Gadamer, which studies the relation between humans and interpretation and how people relate to situations differently.

My combined range is purely conceptual, which means that, even though the clothes are wearable, their main function is to tell a story, to make a statement and to prove a point. I choose to focus on the multi-dimensional aspect because I have always been very passionate about patterns and I want to demonstrate how pattern making, as an intricate skill, can be used to manipulate fabric into its most extreme three-dimensional form.

Even though current designers have unconsciously created multi-dimensional garments, their focus lies elsewhere thus only a portion of what could be done has been experimented with. I choose to research dimensions for my thesis because it allows me to create unique wearable clothing that probably hasn't been done before because of its intricate pattern drafting techniques as well as complex sewing procedures. These add extensive value to the products, decreasing the chances of the commercial manufacturer's interest on mass producing them, which further categorises this collection as conceptual. On my avant-garde item, I intend to stretch the dimensional concept to its extreme when it comes to its pattern drafting techniques and sewing construction methods.

## **1.5 Objectives of the research**

I hope to present the fashion industry with an unusual alternative towards fashion design which is Multi-dimensional clothing. As a designer I believe that fashion can portray a secondary connotation to its aesthetic, practicality and functionality which is the actual *meaning* behind a range.

The main objective of this research is to explore to what extent three-dimensional clothing can be made by creating a range that has complex structures of visible dimensions. My range will have the third dimension incorporated into, both by the body of the human wearing and by projections into space.

I hope to provide my costumers with an exhilarating experience rather than just products that will end up in someone's closet, or conversely at an art exhibition. Seeing that I am comparing people's perspectives, once the range is finished, I will source a performance group that will improvise, while wearing my clothes, a short version of their own understanding of my theme. A photographer will also add his/her interpretation by putting together his/her own understanding of dimensions. This will later be used to justify, or not, my argument that because peoples' perceptions differ the truth will always be prejudiced and that we are actually living in a world that is filled with multiple parallel universes, thus multiple parallel realities can co-exist.

I wish to stimulate a fresh design aesthetic, which is multi-dimensional clothing, where complexity is not necessarily the opposite of simplicity but the chosen thinking process, while developing a unique style that characterises me as a young designer and ultimately characterises my personal identity. I believe that Multi-dimensional clothing will be the dress code used in a near future because of its advantageous spatial compartments. These will allow for things to be incorporated into the clothes, for example specialised electronic chips for medical care needs, as is further explained on chapter three.

## **1.6 Research question and the sub-questions**

To what extent can an understanding of dimensions and interpretation assist in providing meaning for multi-dimensional clothing while simultaneously creating a merger of commercial and conceptual design in order to generate a new fashion identity inspired by 3D shapes and nature?

- What is the role of dimensions and interpretation in changing the significance of multi-dimensional clothing?
- What Fashion identity can be generated from different dimensional perspectives and the use of the three-dimensional concept while merging conceptual and commercial design to create a hybrid fashion expression?
- How will I apply different perspectives, derived from nature, and multiple dimensions on my range in order to cater for both personal creativity and also institutional commercial imperatives without obstructing the garments' practicality and functionality?

## **1.7 Summary**

To conclude, this chapter summarises the initial stages of the dissertation where the topic is introduced as well as the relevant sub-questions, topic area and an outline of the objectives of this research, is given. In the following chapter, the conceptual framework, I explain how the theory of relativity and the study of interpretation, which is known as hermeneutics, relate to my concept. As well as what exactly are perspectives and dimensions and how many of these exist in our universe. I also refer to examples of Multi-dimensional clothing that has been created previously and the relevant fashion designers who are the experts in this field.



## **CHAPTER 2: CONCEPTUAL FRAMEWORK**

### **2.1 Literature Review**

The purpose of this chapter is to provide a theoretical basis for this research. This is provided by unpacking the concept of dimensions, with reference to Albert Einstein and Richard Wolfson, who have inspired me in my work. An investigation into hermeneutics and the notion of interpretation is also relevant to this research, as Hans-Georg Gadamer said that we, as humans, are drawn into confusion because we are born at a certain time and space thus our engagement with the world is inevitably limited.

**What is the role of dimensions and interpretation in changing the significance of multi-dimensional clothing?**

### **2.2 Theoretical underpinning**

The theories upon which I am focussing are The General and the Special Theory of Relativity, by Albert Einstein and Hermeneutics by Hans-Georg Gadamer, with special reference to the M theory or the Theory of Everything. For a clear understanding of this topic I describe what human perspectives are and how it affects people's decisions as well as what dimensions are, how many have been proven to exist and how these affect our everyday lives.

#### **2.2.1 Perspectives: What are perspectives?**

A perspective is the ability individuals have to perceive things and their relevant spatial relationships according to their point of view (Johnson, 1990: 174). Perspectives depend on the viewers' positioning and therefore there are infinite possibilities from which I only considered linear perspectives and spatial perspectives.

While the first is a mathematical system for projecting the three-dimensional world onto a two-dimensional surface, the second is a model of the three-dimensional world on the human mind. I am comparing both kinds of perspectives because, as a fashion design student, I work on both 2D spaces, such as design boards and sketches and 3D spaces such as the final product or garments.

When viewing an object or a scene, people necessarily have a specific perspective on it thus perspectives are directly related to the viewer's point of view (Bloom, 1999:463). Although people cannot help but experience the world from their own limited point of view, taking other points of view is essential for their cognitive and social interactions and ultimately their realistic understanding of the whole signification of the object in question (Bloom, 1999:463).

Once established that perspectives are representations of reality in the human mind, I can assume that for each mind different perspectives will be relevant. Because of this I believe that reality is not a constant entity but a set of erratic perceptions that humans achieve at any given time and space. I can deduce that perceptions are mere mental recognitions of familiar objects or situations.

### **2.2.2 Hermeneutics**

Hermeneutics is the art of understanding and not the presentation of what has been understood. I focus on the hermeneutics of Hans-Georg Gadamer, outlined in his magnum opus *Truth and Method* (1975) (Muller-Vollmer, 1986:73) which states that human beings who are rational animals, have bodies, thus rationality is embodied and/or directly influenced by how things are and can be meaningful to them.

Reality is shaped by their bodily movements, by the contours of the spatial and temporal orientation and therefore the interaction with objects. In other words we are trapped in our bodies in a certain time and space and consequently, we experience limited realities (Johnson, 1990:57).

A good example of a limited reality is Language, it is directly associated with understanding and the ability of an individual to understand varies between individuals. Most importantly, I agree with Gadamer that hermeneutics is not a method for understanding but an attempt "to clarify the conditions in which understanding takes place" (Gadamer 1975: 358).

Our conditions of understanding are necessarily limited in scope, unable to encompass every aspect of every issue. Therefore our conditions of understanding reality, are lacking in the sense that we do not arrive at these conditions after a consideration of all the facts, we simply find ourselves already living under these conditions (Horn, 2005:9).

Gadamer further argues that we are currently experiencing the feeling of alienation because of

the inadequacy of the objective method applied by modern sciences “which stands or falls with the principles of being unbiased and prejudiceless”. This makes humans interpretations inaccurate seeing that each individual experiences reality in different ways thus ensuring knowledge to be undeniably biased as can be referred back with the twin example that will be discussed further (Horn, 2005:67).

### **2.2.3 The Theory of Relativity by Albert Einstein**

The Theory of Relativity by Albert Einstein is divided in two theories which are the Special Theory of Relativity (STR) and the General Theory of Relativity (GTR) (Harpaz, 1992:1). I have focused on the Special Theory of Relativity mainly because of its relevance to my argumentative point.

Albert Einstein was born in 1878 and died at the age of 77 in 1955. He was born in Germany and he began his scientific work at the beginning of the 20<sup>th</sup> century. During 1905-1906 he published 3 articles, all equally important. Each of them had a particular breakthrough in a different field but the one he became most famous for, was The Special Theory of Relativity published in 1905 together with the General Theory of Relativity published in 1915 (Harpaz, 1992:210).

The Special Theory of Relativity was introduced in Albert Einstein's paper "On the Electrodynamics of Moving Bodies" and it is a theory of the structure of space-time. It is called special only because it deals with *specific* cases of motion in *constant velocities* only or uniform motion thus it does not apply to systems moving in acceleration relative to the observer (Harpaz, 1992:6).

The STR states that:

1. “The laws of physics are the same for all observers in uniform motion relative to one another” (Wolfson, 2010);
2. In a vacuum the speed of light is a constant (Wolfson, 2010).

As Richard Wolfson said “Space and time are the fabric of physical reality, the underlying stage, in which all physical events take place” (Wolfson, 2010).

Relativity goes against common notions of space and time. A good example of how time can be bent and how strangely it behaves goes as follows: Two 20 year old twins, Cassandra and Keylina are separated on their birthday party because Keylina was sent to space. When she finally returns home her twin sister is celebrating her 80<sup>th</sup> birthday, while meanwhile she is only 25 years old. In a way one could say that Keylina time-travelled into Cassandra's future. Is time so volatile that two twins who start out at age 20 can find themselves later, 55 years apart? The event described above has been confirmed with sub-atomical particles and real sized clocks as being actually possible (Wolfson, 2010).

Richard Wolfson agrees with a phenomenon referred to as *Relativity of simultaneity* which says that two events which are simultaneous for one observer may not be simultaneous for another observer if the observers are in relative motion. The string theory, which will be discussed further on this chapter, goes on even further, saying that we are actually not made of particles, but tiny invisible strings that vibrate. That is how the same "particle" can be measured to be in two or more places at once. *Time dilation*, which states that moving clocks are measured to tick more slowly than an observer's "stationary" clock (Harpaz, 1992:67), which means that time is not equivalent everywhere, is a second example of how mysterious the universe we live in, really is.

Even though the GTR seems contradictory to classical physics the STR solves these contradictions by proposing that time and space are dimensions entwined together forming kind of a curved fabric described as space-time. Because they are connected, all events influence the entire structure.

As Richard Wolfson mentioned some of the results of General Relativity are for example: Gravitational time dilation, Frame-dragging and that the universe is expanding, while the far parts of it are moving away from us faster than the speed of light (Harpaz, 1992:6). Gravitational time dilation is when time goes more slowly in higher gravitational fields. Frame-dragging occurs in which a rotating mass "drags along" the space-time around it.

As Amos Harpaz once wrote "Since Einstein, we know that, everything is relative" and because humans are trapped in bodies which infinitely undergo the presence of time, their brains can only process a small percentage of the complexities of the universe. Similarly humans can not feel or recognise any other than the already known 3 spatial dimensions, and a 4<sup>th</sup> dimension – time.

The GTR and the STR combined don't explain the whole spectrum of reality leaving out a gap, which some consider very important. When Einstein's theory of relativity is extrapolated back to the beginning of time, known as the big bang, scientists discovered what is known as a

singularity, which is the single major gap in the theory; the missing link. Something that when solved can answer the most important question of all: What caused the big bang?

Everything began when scientists were unsuccessfully trying to make sense of a very uncomfortable discovery. They found that it was utterly impossible to predict the exact pin-point location of any particle and the only explanation was that the particles fell into existence in other universes simultaneously (Kaku, 2001). In essence, anything that can happen happens in one of the alternative universes, which make them superimposed on top of the universe we know of.

In order to find a plausible explanation about the impossibility of deducing the exact location of a particle scientists suggested a second theory which suggested matter is not made of tiny invisible particles, but of tiny invisible strings that resonate like music (Kaku, 2001). This theory called String Theory, had a rival theory, the Super Gravity, which disagreed with it by one detail: The number of dimensions that exist in the universe (Kaku, 2001).

After a decade of efforts to explain the biggest gap of all times, the singularity, while String Theory proven to fail to explain the birth of the universe another discovery was made. When physicists began to agree with the 11<sup>th</sup> dimension continuum proposed by the Super Gravity theorists, they found that the 5 different manifestations of the String Theory were actually 5 variations of a more fundamental theory that they called M Theory.

After combining the String Theory and the Super Gravity Theory into M Theory physicists began to feel positive that eventually all questions on our universe can and will be solved.

The M theory goes even further, by proving that gravity is not leaking from our world to the eleventh dimension but it is leaking from the eleventh dimension into our world, and this is the reason why when it reaches us it is a mere faint signal, thus its weakness. After more research physicists began to find that there are infinite numbers of parallel universes that together consist of a large group of membranes called the multi-verse (Kaku, 2001).

#### **2.2.4 Dimensions: What are dimensions and how many exist?**

In everyday life the number of dimensions refers to the minimum number of measurements required to specify the position of an object, such as latitude, longitude and altitude (sometimes referred to as length, width and depth) assuming that space is smooth and obeys the laws of classical physics (Scientific American, 2008). Until recently the universe was measured in 4

dimensions which are time, the first dimension, and the 3 spatial dimensions already mentioned above. Figure 2.2.4.1 below shows one possible approach to represent dimensions.

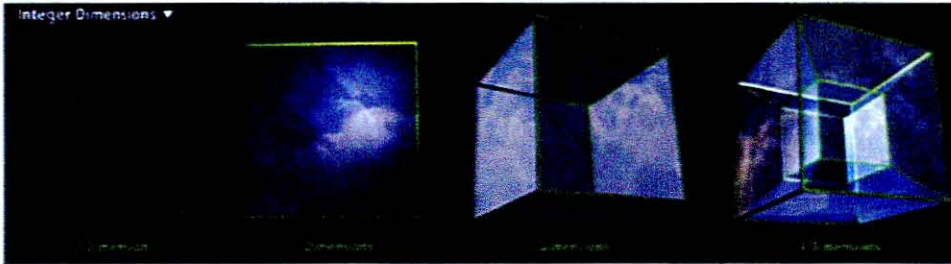


Figure 2.2.4.1 Dimensions represented  
(Thunderbolts, 2010)

Time is considered to be the fourth dimension as without it the description of the three-dimensional world would give us a static picture of the world, which is exact for the moment it was taken. In order to have an accurate process of evolution we have to obtain a sequence of static pictures taken in a certain order in time (Harpaz, 1992:57). A four dimensional coordinate system comes naturally together with the 3 spatial coordinates and thus it forms a 4-D continuum which we believe to be a more accurate and complete description of this evolving universe. Without time our universe would be stagnant and no event would occur (Kaku, 2007).

The M Theory concludes that our universe has a total of 9 spatial dimensions, where only three can be seen or sensed by our human bodies, length, width and depth. The other two dimensions are time as the 10<sup>th</sup> dimension and an 11<sup>th</sup> dimension which consists of millions of unknown other possible universes (Kaku, 2001).

## 2.5 Contextual and Conceptual weakness

Although the three-dimensional concept has been used extensively in architecture, interior design, product design and many other fields, in fashion design only the most simplistic versions of it have been attempted by designers such as Jean Paul Gaultier, Issey Miyake, Martin Margiela. This shows a clear weakness within this field, the field of three-dimensional clothes.

I believe that it is only natural to design in a three-dimensional way as we live in a three-dimensional world and I hope I can instigate a trend that supports this belief. Personally I chose to do three-dimensional garments because it is a challenge and it has not been done before, except perhaps in theatre and film or costume design.



Figure 2.5.1 Christian Dior, *2008 Spring Couture Collection*, 2008. France  
(style.com, 2010)



Figure 2.5.2 Jean Paul Gaultier, *2010 Spring/Summer Collection*, 2010. France  
(style.com, 2010)

In the past many designers have experimented with forms, thus creating illusions of three dimensions but skilled designers such as Christian Dior (figure 2.5.1) (English, 2009:32) and Jean Paul Gaultier, (figure 2.5.2) have taken the concept to the next level (English, 2009:44). Above are two examples of designers who epitomise the application of multiple dimensions on their designs.

By using shape, as a concept, and sewing techniques such as darts, gathering and pleats the garments acquire bold shapes filled with volume for a more accentuated and dramatic effect, as has been proved by experimenting with pattern drafting techniques throughout the year. Although this method doesn't fully portray three-dimensions, it allows flat pieces of fabric to be

joined in shapes that are three-dimensional when worn, even though the actual fabric is still flat, the overall shape of the garment becomes three-dimensional once on the body.

A second alternative is to use fabrics that are slightly three-dimensional in their nature, such as wool, velvet or fur or even to incorporate actual three-dimensional items on the clothing such as small lightweight metal or wood pieces. Lastly the product could be embellished with techniques that create a sense of volume or dimensions applied and examples are braiding, knitting, folding (origami) and literally layering of fabrics (Sorger & Udale, 2006:94-106).

## **2.6 Conclusion**

In conclusion, chapter 2 gives an idea about the theory used to support the end-of-the-year range while in chapter 3, the understanding of how dimensions relate to fashion, I explain how my practical component ties together with the theory unpacked on the previous chapter, as well as describe some possible future uses Multi-dimensional clothing would have and the relevant experts on the field.



## **CHAPTER 3: UNDERSTANDING HOW DIMENSIONS RELATE TO FASHION**

### **3.1 Introduction**

My aim in this section of the research is to explain how my theory is connected with the practical component of the research. Once I found my personal fashion expression and the garments had been designed, I began experimenting with the 5 chosen concepts of adding dimensions into my collection. Lastly, I will explain the outcome of this exploration by extending the theory with reference to inspirational designers.

### **3.2 Making the connection**

The theory unpacked on the previous chapters suggests that our universe is one, of many infinite parallel universes, where each one has its own fundamental physics laws that completely contradicts a large amount of information thought to be true. In essence, these parallel universes are variations of our own reality.

My range is a conceptual range which was divided into 3 parts. The commercial version would be what can be found in our universe, the conceptual version could be found on one of the parallel universes found in the 11<sup>th</sup> dimension while the avant-garde one comes from yet another parallel universe. Each collection represents a different version of the same design, in other words, each design exists in our universe as well as in some other parallel universe, where I might for example, have never been born.

My multi-dimensional range was designed in mind for possible future applications of electronic devices, in between the 3D "vacuum" layers the clothing will include. These devices should ensure the wearers safety and fast response in case of emergencies (Kaku, 2007). Other than the above mentioned applications the choice of the concept was purely for a personal satisfaction. I wanted to prove to myself that by manipulating pattern and sewing construction techniques I could in fact create a third desired dimension that will qualify the clothes as multi-dimensional.

### 3.3 Experts on the three-dimensional field outside fashion design

When considering our everyday lives, most of the major film, animation and game studios companies have slowly incorporated multiple dimensions in their depiction of graphics. In the film industry the latest example is Avatar done by 20<sup>th</sup> Century Fox, and the latest Shrek film released by DreamWorks Pictures. When it comes to video games the three-dimensionality aspect is evident in most of them, and a good example of how this industry evolved can be followed in Super Mario. The first game was called Super Mario Bros and was drawn in two dimensions on computer while the latest game is called Super Mario Galaxy which is drawn in three dimensions and the improvement is vast. Today 3D movies and video-games are the latest sensation and I believe that fashion design is following a similar path (Kaku, 2007).

This suggests that flat representations of reality may become outdated and a new urge to signify life as it is, in multiple dimensions, has emerged. I believe that in fashion design the three-dimensional principle can be applied even though while still serving their specific function, which is practicality and functionality.

### 3.4 3D Inspirational Fashion Designer

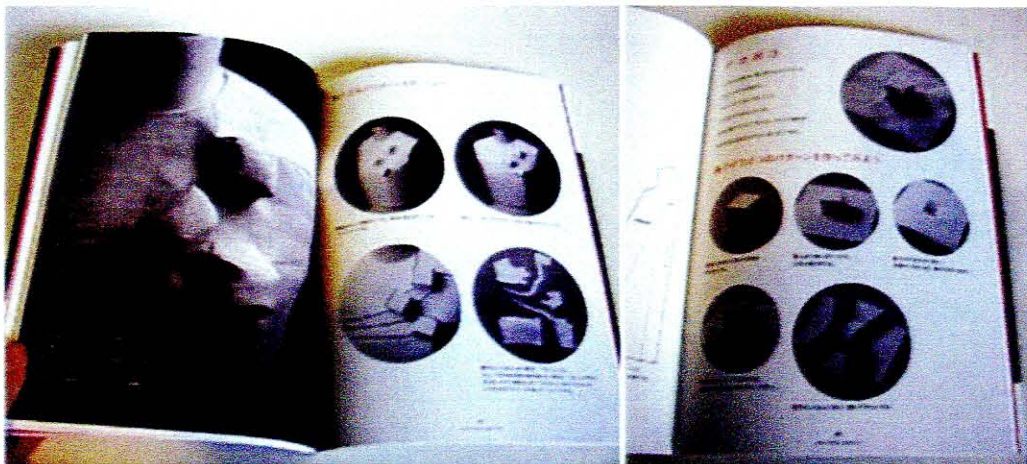
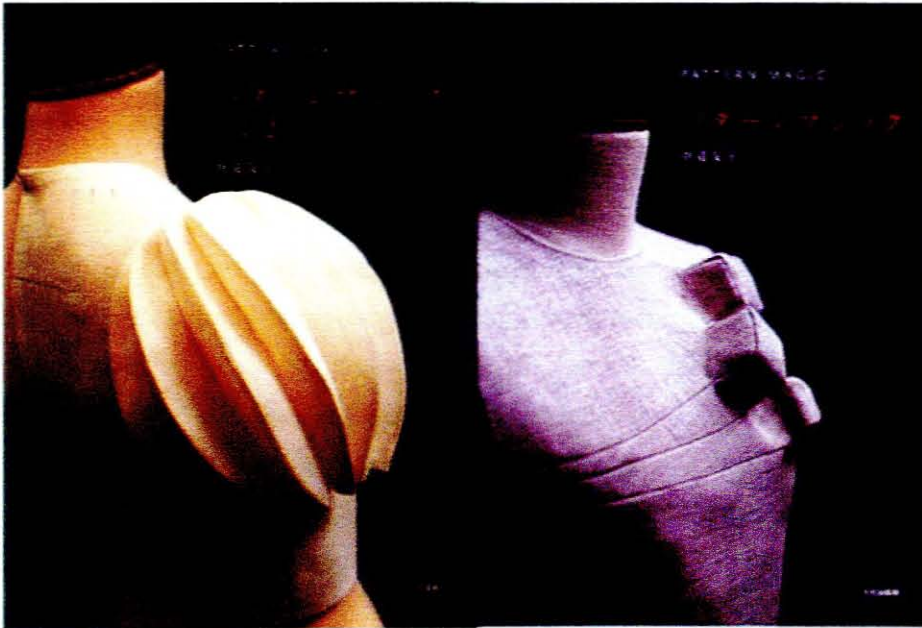


Figure 3.2: Nakamichi Tomoko, Pattern magic.

(Kristin Blogger, 2010)

I choose to focus on a Japanese designer called Nakamichi Tomoko, because from all the current designers, she was the one that best depicted multiple dimensions on her clothing line. I managed to get access to two of her books where her designs are photographed and a brief explanation of how to draft the patterns is available. The book is called Pattern Magic and its

clothes derived from a free idea, as the author says, decorated with innovative and beautiful shapes and designs that are illustrated as if a puzzle is solved in the process of pattern drafting. I intend to use her pattern drafting techniques to inspire my avant-garde item.



**Figure 3.1:** Nakamichi Tomoko, Pattern magic.  
(Kristin Blogger, 2010)



**Figure 3.3:** Nakamichi Tomoko, Pattern magic.  
(Kristin Blogger, 2010)

### **3.5 Possible future applications of multi-dimensional clothing**

As Michio Kaku, who is a renowned physicist, predicts, future clothing, at around the year 2057, will have dozens of tiny computerised chips and sensors embedded onto the fabrics monitoring the wearer's health, which basically means that, whoever is wearing these clothes will be constantly online. In the event of an accident, the clothes will automatically identify his/her coordinates, alert the authorities and upload his/her entire medical history before the ambulance arrives (Kaku, 2007).

This technology is still in the development stage but, Sundaresan Jayaraman has already developed a first sample with this technology that is both wearable and washable. Currently this technology is being used for sportswear and in medical centres but soon it will be fully developed and standardised, thus ready for mass production (Kaku, 2008).

To simplify the process of having to weave the sensors onto the fabric which is a complex process that requires skilled professionals, my 3D clothes will have empty spaces where the sensors could be applied into. The three-dimensionality of my clothes will provide extra warmth to the body because the garments will have a "vacuum" in between layers.

Once the technology is available and the garments are made up in advanced fabrics they will have such a high degree in elasticity that a much wider range of body shapes will possibly fit into one size (Kaku, 2008).

### **3.6 Conclusion**

This chapter outlines the most important experts on the field as well as the relation dimensions have with fashion design. In the following chapter, the methodology, I demonstrate which methods were used to research the necessary hypothesis that is being argued in favour, while simultaneously designing the methodology of how all this data would be collected, organised and analysed. A brief explanation on the difference between commercial, conceptual and avant-garde design is also given.

## **CHAPTER FOUR: METHODOLOGY**

What Fashion identity can generate from different dimensional perspectives and the use of the three-dimensional concept while merging conceptual and commercial design to create a hybrid fashion expression?

### **4.1 Introduction**

The purpose of this chapter is to provide an insight as to how the theory of relativity and hermeneutics are connected to my product and how dimensions can be represented in my collection as well as what are the main differences between commercial, conceptual and avant-garde design.

### **4.2 Distinction between commercial, conceptual and avant-garde design**

In theory, designers can either adapt an existing style, in order to better accommodate the current trends, the commercial designers, or create something totally new and unique (Hawkins, 2001:6/107), by defying human expectations and standards, the avant-garde designer. The majority of designers though, fall into a third group that uses both adaptation and creation within their designs; I will call these conceptual designers.

The purpose of avant-garde design is to make a statement, to stimulate inner depths and to create truly unique and innovative garments that inspire creative minds. Most of the times the items are meticulously ground-breaking or their concept has never been applied before (English, 2009:7). Avant-garde designers such as Yohji Yamamoto and Martin Margiela strive to create new concepts and use fashion design as a means of telling a story or even criticising some current social occurrence by conveying a deliberate message to the public (English, 2009:102). The public doesn't necessarily have to understand the designers' point of view, but the designer's vision brings change to the industry. Most times this change is necessary and inevitable, thus making their products extremely desired.

### **4.3 Primary Data**

The forms of data that will be involved in determining whether the application of multiple dimensions on my range is successfully done and which techniques will best suit each

respective design involve discussion sessions with experts on the field as well as informal interviews.

#### **4.4 Data collection**

In order to fully comprehend space and time and how these dimensions can be signified into fashion design, I had to understand some of the basic principles of physics first. My data collection consists of a series of recorded lectures done by Richard Wolfson, where he clearly explains what dimensions are and how they behave, according to the latest scientific discoveries done by researching this subject. I also reviewed some relevant books and other related documentaries to further enrich my research.

For this study I have approached firstly some experts on the dimensional field such as architecture and industrial lecturers from Cape Peninsula University of Technology, who have confirmed my research and taught me that, determination and precision are key ingredients to a successfully done task. They told me that the only reason I should not be able to design and produce multi-dimensional clothes is if I cannot envision them. I learned a series of basic paper construction techniques used to create dimensions that will help me assemble what my imagination can already see. To further enhance my research I was in constant discussion with my current fashion design lecturer, Maryna Bezuidenhout, who has plenty of experience with transforming a two dimensional flat piece of fabric into a three dimensional structure that will dress the body accordingly, as well as some post-graduate students to assemble ideas on methods of construction to generate accentuated dimensions on garments.

At a later stage I approached random fashionable people with some of my final garments, on campus and shopping centres such as Gardens and Cavendish to question how effectively my concept was coming through in my range. The response was positive yet some people seem to have a doubtful attitude towards my chosen theme.

- Discussion sessions: Three main focus groups were created, in the different discussion sessions, and were divided evenly amongst the final year surface and fashion design students, fashion design postgraduates as well as fashion, industrial and surface design lecturers.
- Informal Interviews: A total of 10 informal interviews took place, which consisted of lecturers from CPUT and some designers that are already established in the industry. In

order to discourage intimidation informal interviews took place in a dialogue format.

The target research group, the intellectual and creative community, will be approached during the exhibition as they would be able to provide me with a realistic reflection of how up and coming designers in Cape Town feel about multi-dimensional clothing, my range and which advantages and disadvantages it adds to the fashion industry.

#### **4.5 Data analysis**

In general people found it hard to relate to my topic because of its intricate reasoning and complex level of understanding, but the general feedback of the actual range was very positive. The target market I consulted was particularly impressed by the re-fabrication done in the garments to craft a sense of depth within the range, which further proves my initial fear that only a small percentage of my target market would actually understand my theme. Although they found it hard to understand my research and what the point of the range was, or even why I choose such an intricate topic, a small number of people were patient enough to listen to my explanation of how I could accentuate dimensions on garments or what possible function they might have in the future. Those people became very interested about the reasoning behind my range and have constantly motivated me to conclude my research.

#### **4.7 Conclusion**

This chapter outlines the methods to gather information, as well as how I will research my theory. In the following section I focused on the practical outcome of the research, which is the actual products and their inspiration sources and the reason behind them, in order to exhibit my own interpretation of the three-dimensional concept within fashion design, as well as distinguish the main strategic methods of creating three dimensions in clothing.

## **CHAPTER FIVE: THE PRODUCT**

In this chapter I will further extend theory into an empirical setting in the development of the practical component of this research. I will first explain the chosen categorisation of my clothing range as well as the relation to the inspiration behind the garments and how the selected theme has been translated into my range.

How will I apply different perspectives, derived from nature, and multiple dimensions on my range in order to cater for both personal creativity and also institutional commercial imperatives without obstructing the garments' practicality and functionality?

Field: Fashion and Surface Design.

Approach: Qualitative research.

Method: For my method I choose Conceptual research because it is based largely on secondary sources, and engages with the understanding of concepts. It aims to extend an existent body of knowledge and understanding, of space, time and our universe.

### **5.1 My Clothing Range**

This range has been divided into three categories:

1. Commercial Wear (7 outfits)
2. Conceptual Wear (7 outfits)
3. Avant-Garde (1 outfit)

To best depict dimensions I divided each category into two sub-categories which are garment construction and surface design. Garment construction refers to the overall silhouette of the garments which have visible three-dimensional shapes, on the conceptual range. While "false" visual illusions of three-dimensional patterns are being used on the commercial range which represents the Surface design that refers to the manipulation of fabric surfaces in order to create texture. I used a series of visuals that represent the interconnectedness found in nature as my inspiration for all garments.



My range is divided in two, which are commercial wear and conceptual wear. In order for an instantaneous recognition of the two opposing ranges I choose to separate blue and red from each collection. I believe that people will effortlessly identify the colour palette used which is warm colours combined with shades of grey for the commercial wear range, while mostly cold colours combined with shades of grey will be used for the conceptual wear range. Both Woven and knit will be used according to its characteristics. Thin/light-weight fabrics will be used against hard, structured and heavy fabrics, where best applicable, to acquire a complete range of textures and thicknesses so that dimensions are made more evident.

## **5.2 Product type**

My collection consists of 15 outfits in total (27 items) of which 7 are commercial, 7 conceptual and 1 is avant-garde. The main collection is divided in 2: the commercial side and the conceptual side. Each commercial outfit resembles the conceptual one, the only difference being in its price point; fabrics used and garment construction methods used.

My range is designed for a niche target market which includes young women, between the ages of 18 and 35, who aspire to be extremely innovative and daring and have an edgy sense of style. I focused on woman's wear because I believe that there is more versatility in women's clothing and being a woman myself I can relate to specific issues addressed. I chose this particular target market because my style relates to their way of living and I believe that they would most benefit from my products because their curious intellectual minds have higher chances of experimenting with new concepts in comparison to sceptical people who find hard to adapt to new situations.

I decided to divide my range in two and make two variations of the same design because I want to provide the consumers with a choice between simple items and more complex ones as well as demonstrate 2 visions of the same concept, or as my theory refers to: a parallel version of the first range, almost as if it exists in another dimension.

My ultimate goal is to create multi-dimensional garments, showing how many stages of three-dimensionality one can actually obtain in clothing (conceptual range). Note that, the fashion industry does not encourage this because of the high costs involved. After designing my conceptual range I adapted the designs in order to create an equivalent, yet inexpensive, commercial range that will ultimately generate profits.

#### Commercial wear:

1. Corset + Leggings
2. Pants + Top
3. Short loose dress
4. Long loose dress
5. Short fitted dress
6. Shorts + top
7. Skirt + top

#### Conceptual Wear

1. Corset + Leggings
2. Pants + Top
3. Short loose dress
4. Long loose dress (Jumper suit)
5. Short fitted dress
6. Shorts + top
7. Skirt + top

#### Avant-Garde:

15. Fitted Jumper suit

The size chart chosen for this range is what is known in the industry as model size, which is a size 12 in South Africa. Different sizes exist because peoples body shapes are so varied, for example a Foschini's size 10 is a Europe's size 6. Because my clothes will project into space thus creating undesired volume a slimmer taller figure will best complement my range, and this is the main reason why I choose to work with model sizing. Ultimately I needed a standardized size so I compared the dummies' most significant measurements, which are bust, waist and hips to industries measurements, for example Woolworths and Truworths, and overseas measurements to my initial size chart and then found an average middle point in between those measurements always keeping in mind the proportions of the human body.

### 5.3 Product development

To create a range that arises from a fresh and innovative source I will seek inspiration from anything and everything that is three-dimensional in its nature, which can be found in our current world, such as mushrooms, leafs, wood, fences and many more. All my visuals represent interconnectedness because my research taught me that everything is connected in our universe. Later I will find examples of man-made objects such as buildings, furniture, cars and appliances to compare to my initial inspiration sources, derived from nature. These will act as corresponding designs existent in the universe which represent the concept of parallel universes referred to in the M Theory.

Bellow are examples of what I understand as parallel realities found in nature when considering its shape only which represents interconnectedness. As the pictures show the same basic structure is being repeated in each visual with small dissimilarities perceptible. These are visuals

of different organic structures that have comparable designs, almost as if they were created from the same basic structure, but got lost somewhere in time or space thus characterizing themselves with their own unique individuality.

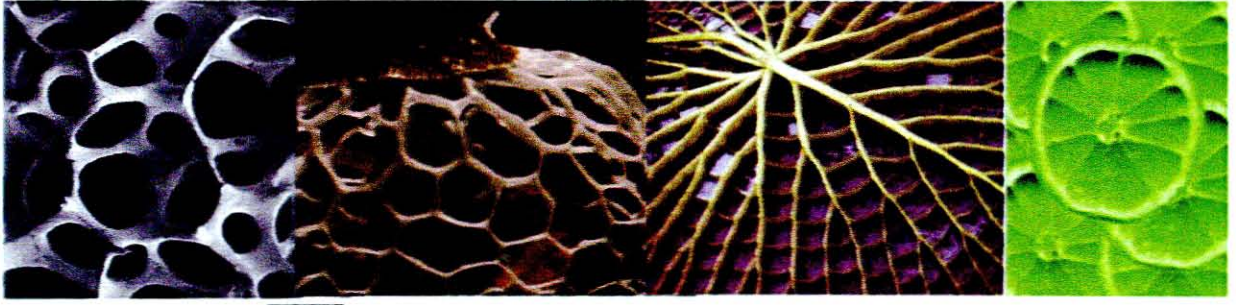


Figure 5.3.1 Representation of parallel themes in nature  
(Planet Earth documentary, 2010)

I intend to use the concept of dimensions to its extreme when it comes to embellishing my fabrics, in other words I will make sure that my garments have their 3 dimensions drastically accentuated in either their construction or re-fabrication. Most fabrics will undergo a process of re-fabrication so that I can get the exact motif or feel needed according to my reference visual which is where my inspiration comes from. By finding visuals from different sources, that resemble the same motif, the re-fabrication process proved to be easier than if I had chosen different visuals altogether.

In order to create a 3D effect on my garments, I have integrated webbing in between layers of fabric as well as batting, sponge, boning and fusing. In conjunction with this I used techniques such as Appliqué, dyeing and Macramé to further embellish the fabrics as well as topstitching and cut-outs.

## 5.4 Findings

After all the informal interviews and discussion sessions I decided upon 6 methods of representing dimensions on my range which are:

1. **Simple Pattern manipulation:** Creating volume which includes gathering and pleats.
2. **Complex Pattern manipulation:** Creating volume with complex methods of pattern drafting.
3. **Panel manipulation:** Playing with pattern manipulation using panels to create volume such as when opposing curves are used to generate shapes that are raised away from the natural body shape.
4. **Boxing out of shapes:** Literally boxing out shapes with noticeable depths, filling them in with batting to provide extra stability.
5. **Raising surfaces upwards:** By literally stacking shapes over one another to create height or by sewing shapes perpendicularly to the body in between seams.
6. **Colour block effect:** Creating a false sense of depth by strategically positioning different shades of colours.

## 5.5 Garment Break down: Commercial and Conceptual Wear

### 5.5.1 Outfit 1: Commercial and Conceptual Corset:

This design consists of 2 layers, the inside corset or inner layer has 3 separate layers, one of which carries the boning for extra structure. The outer layer is connected with the inside corset with small transparent press-studs, so that if the client desires it can be taken off completely. This design was inspired by both a mushroom formation, for the conceptual version and a leaf nerve patterning, for the commercial version.

The top layer fabric of the commercial corset was re-fabricated by top-stitching onto it so that it resembles my inspiration visual while the fabric of the conceptual corset already has the motif desired printed onto it, but for extra emphasis topstitching was added and chord was sandwiched in between two layers of fabric to add texture. The top layer of the corsets has been filled with batting to create a deeper sense of volume. The shape of the outer layer of both corsets projects into space accentuating the hips from the waistline. (This design uses method 4: Boxing out of shapes)

**Commercial and Conceptual Leggings:**

This design was inspired by the muscles existent on the human leg. Appliqué was used by accentuating the muscle shapes on the leg and topstitching these onto the fabric.

By using techniques such as superimposition and overlaying, multiple dimensions where depicted in this particular design such as the volume created which adds a sense of dimensions. By underlining the muscle shapes existent on the human leg and accentuating them with over layering of fabrics a greater three-dimensional effect is acquired. (This design uses method 5: Raising surfaces upwards)

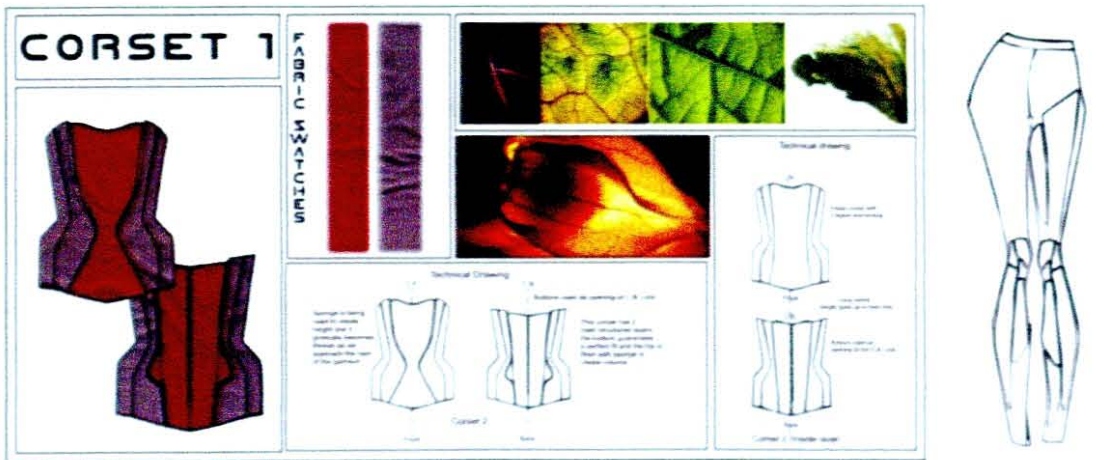


Figure 5.5.1.1 Commercial Corset and Leggings  
(Nayra Negrao, 2010)

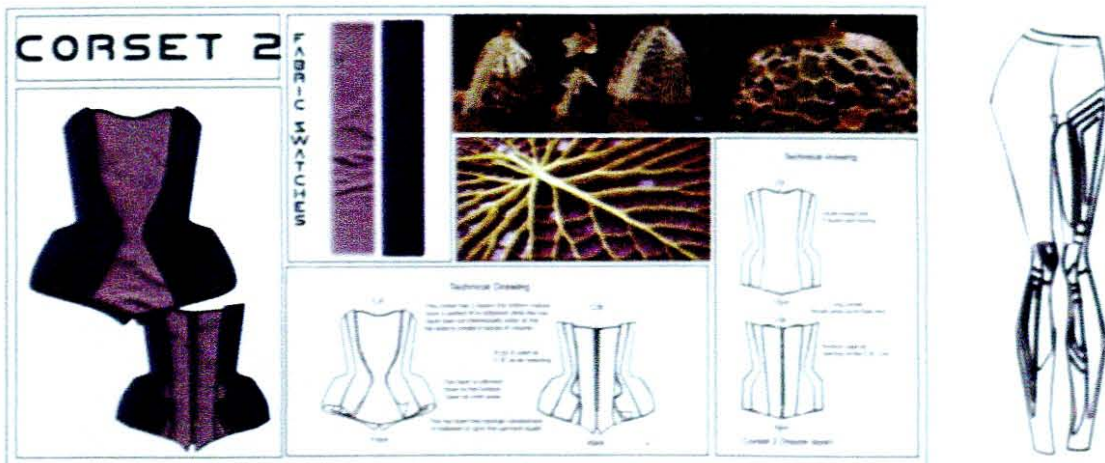


Figure 5.5.1.2 Conceptual Corset and Leggings  
(Nayra Negrao, 2010)

## 5.5.2 Outfit 2: Commercial and Conceptual Pants:

The commercial version of the pants outfit design was inspired by the bottom surface existent on a mushroom which consists of multiple thin fins placed parallel to each other as can be seen in figure 5.5.2.1 The pants have a high-waist waistband that is made out of one panel piece which is then folded onto upwards knife pleats that represent the inspirational visual. The back has thin jet pockets that represent the mushroom fins. (This design uses method 1: Simple Pattern manipulation)

The conceptual version of the pants design has 2 layers. The inside layer was done with upholstery fabric and it resembles the pattern existent on snakeskin so no extra alterations where needed. A skinny jeans fit was acquired and a high-waist waistband divided into 4 horizontal panels that resemble upwards knife pleats, but consists of separate completely boxed out panels was used.

The outer layer of the conceptual pants was inspired by the process of transformation a snake undergoes when it loses its skin. It has 3 arched hip panels representing the skin shedding and is boxed out with a 1.5cm depth to give the garment extra dimensionality. (This design uses method 2, 3 and 4: Complex Pattern manipulation Panel manipulation, boxing out of shapes)

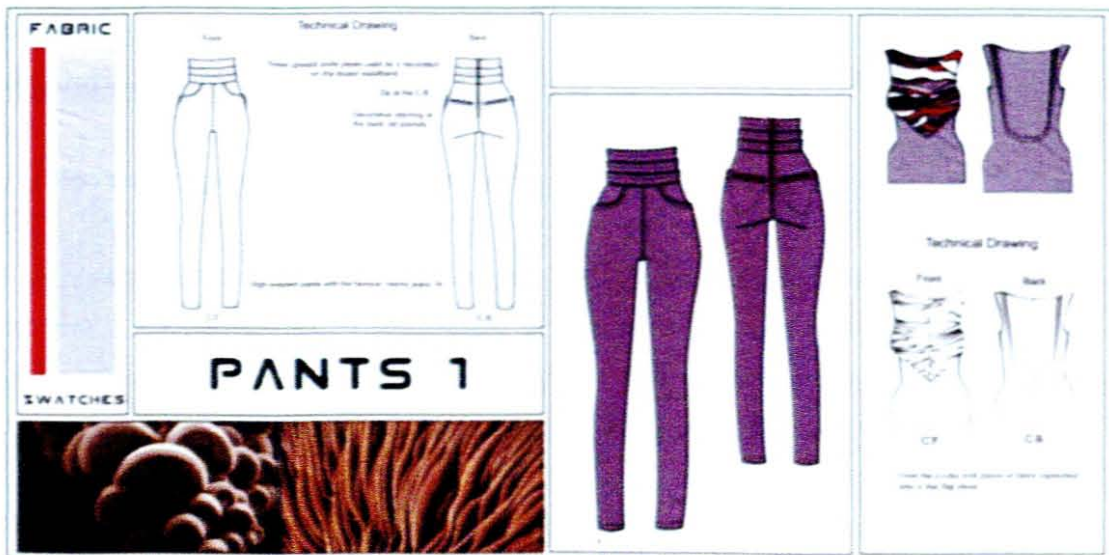


Figure 5.5.2.1 Commercial pants and top  
(Nayra Negrao, 2010)

### Commercial and Conceptual Top:

The conceptual top was inspired by dimensions and volume and as a simple knit top it has a boat neck neckline with central pleats finished off with binding. This gives the garments a soft representation of dimensions and complements the complex pants beautifully. The commercial top has the same shape as the conceptual one but with insets of fabric instead of knife pleats. (This design uses method 1: Simple Pattern manipulation)

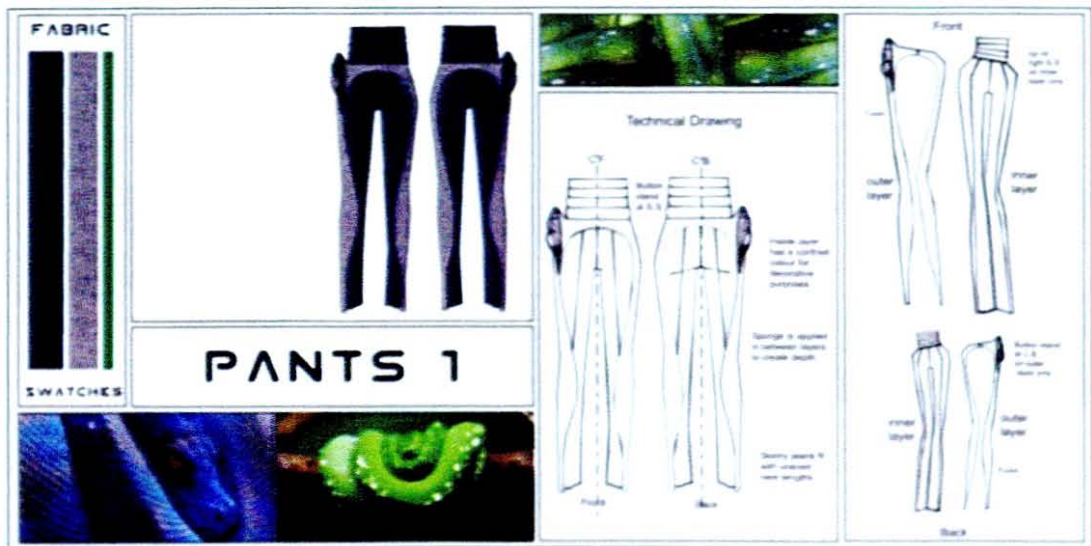


Figure 5.5.2.2 Conceptual pants and top  
(Nayra Negrao, 2010)

### 5.5.3 Outfit 3: Commercial and Conceptual Short loose dress:

This design was inspired by the famous phrase: "Everything is connected".

Both commercial and conceptual versions consist of 2 layers, the inner layer being a short waist-corset that is connected to the outer layer at the top right hand side of the garment, on the commercial version, and on the conceptual version, it is a short one sleeve fitted dress instead of a short corset, because of technicalities that had to be solved by using upholstery fabric.

The bottom part of the outer layer (the draped part), was drafted with one side seam only to represent a circular connected link. A combination of Knife pleats and Box pleats develop into fabric excess that allows for draping and creates more volume, as it reaches the hem of the dress. On the conceptual version a double pleat system was applied to create even more

volume. The conceptual top layer is not connected with the inner layer because it has a slider that functions as a fastening device instead, that goes around the arm and can be adapted accordingly. (This design uses method 1: Simple Pattern manipulation)

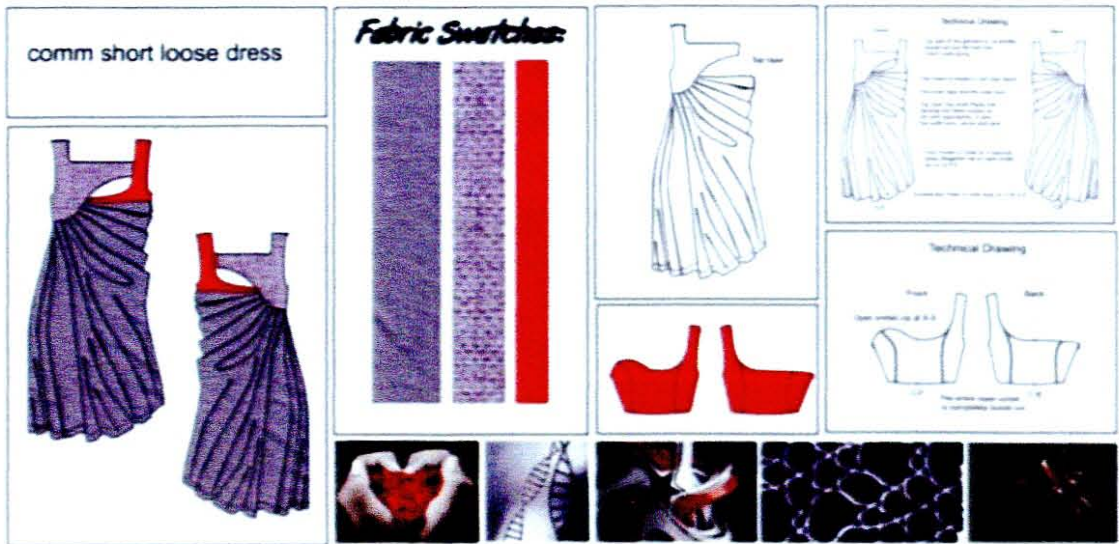


Figure 5.5.3.1 Commercial short loose dress  
(Nayra Negrao, 2010)

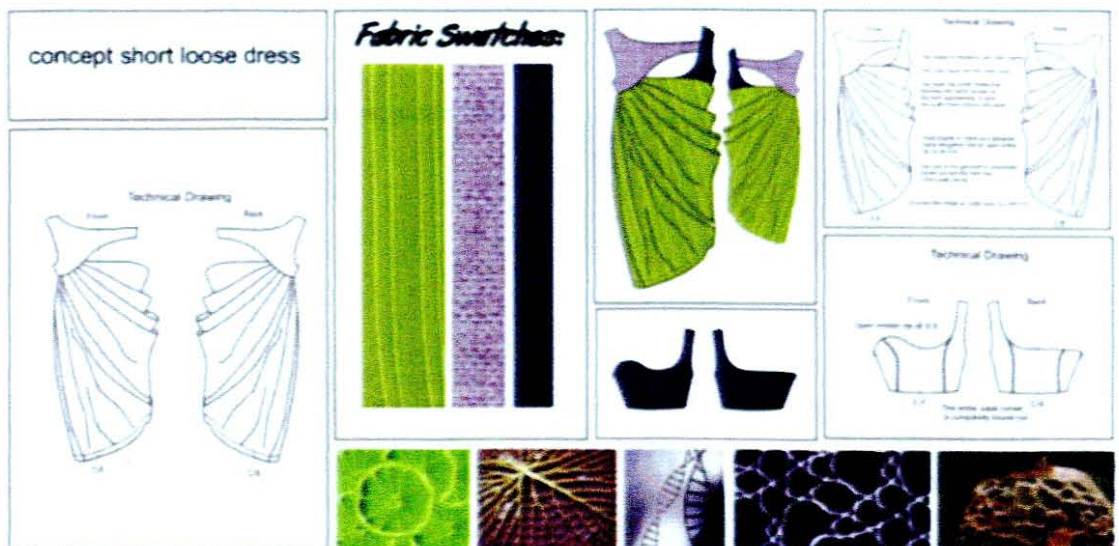


Figure 5.5.3.2 Conceptual short loose dress  
(Nayra Negrao, 2010)



### 5.5.4 Outfit 4: Commercial and Conceptual long loose dress:

The commercial version of this design was inspired by the texture existent in wood and the leaf shape that can be seen in visual 5.5.4.1. Topstitched lines have been used to create the leaf patterning on the bust area and the hem band. The dress has a baby doll shape, a boat neck neckline, on the conceptual version, and a curved sleeveless open neck shape on the commercial version. The skirt of the dress is extensively gathered under the bust to create volume, and it has 2 layers, both with a 10cm wide facing as a hem finishing.

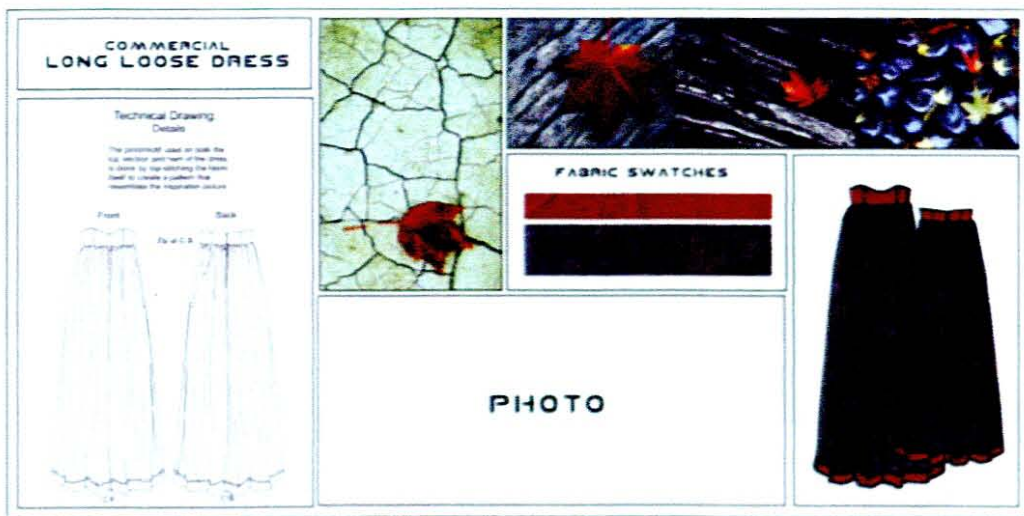


Figure 5.5.4.1 Commercial long loose dress  
(Nayra Negrao, 2010)



Figure 5.5.4.2 Conceptual long loose dress  
(Nayra Negrao, 2010)

The conceptual version has a separate vest that resembles a bulletproof jacket, with four front and back panels, which are boxed out and have batting inside it. It was inspired by the organic formation that can be seen in figure 5.5.4.2. (This design uses method 1: Simple Pattern manipulation; Method 3: Panel manipulation; Method 6: colour block effect)

### 5.5.5 Outfit 5: Commercial and Conceptual short fitted dress:

This design was inspired by the volume existent underneath mushrooms and the volume existent in fence installations. It is made out of knit fabric and has a circular neckline faced with sponge or shoulder pads inside it, on the conceptual version. The commercial version is very plain, and was divided in 5 colours with panel lines that resemble the corset shape to create a colour block effect.

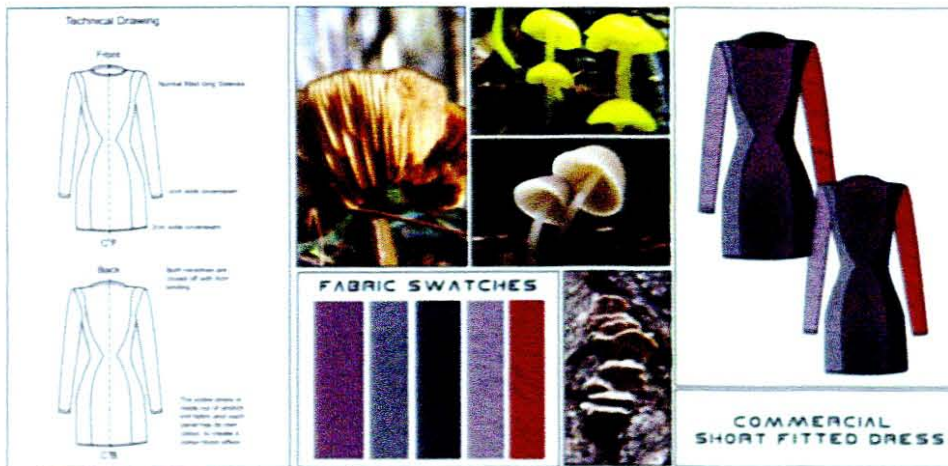


Figure 5.5.5.1 Commercial Short fitted dress  
(Nayra Negrao, 2010)

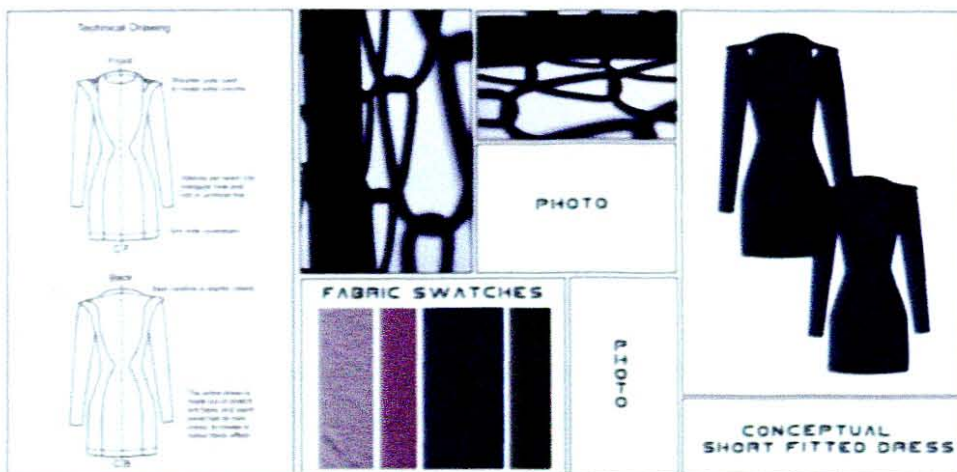


Figure 5.5.5.2 Conceptual short fitted dress  
(Nayra Negrao, 2010)

The conceptual sleeve is sewn 2cm inwards, where the armhole line is supposed to be, so that a small cap sleeve emerges. A separate woven dress is made out of small boxed out shapes that will be bar-tacked into each other with a combination of macramé that will be used to represent the fencing patterning.

Fabric was sewn in between the multiple panel lines perpendicularly to the body shape, as well as across them with some ease allowed, to create a sense of height and reproduce the inspiration motif. (This design uses method 1: Simple Pattern manipulation; method 2: Complex Pattern manipulation; method 3: Panel manipulation; method 5: Raising surfaces upwards method 6: colour block effect)

### 5.5.6 Outfit 6: Commercial and Conceptual shorts and top:

The commercial version of this design was inspired by the pattern existent in leaf nerves which also represents interconnectedness. The commercial top is a simple vest made out of grey knit fabric, with contrasting shoulder pad panels and two thin cap sleeves like panels on the armhole.

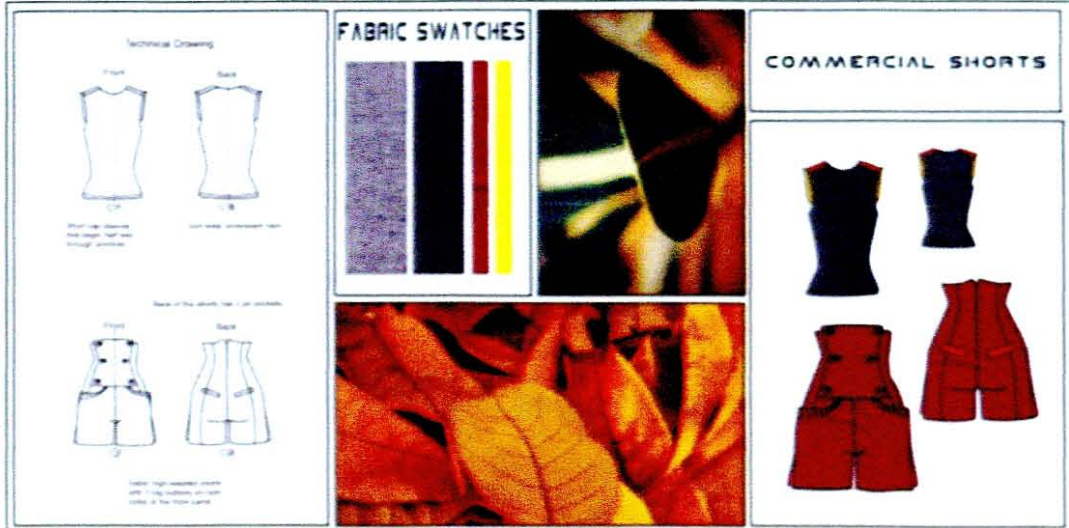


Figure 5.5.6.1 Commercial shorts and top

(Nayra Negrao, 2010)

This conceptual version was inspired by the texture found in stone pavements. The fabric already has this motif but extra alterations have been done to further accentuate it. The vest has 2 organic shapes top-stitched to the front panel to add volume. The shorts have a central yoke with downwards knife pleats. (This design uses method 1: Simple Pattern manipulation)

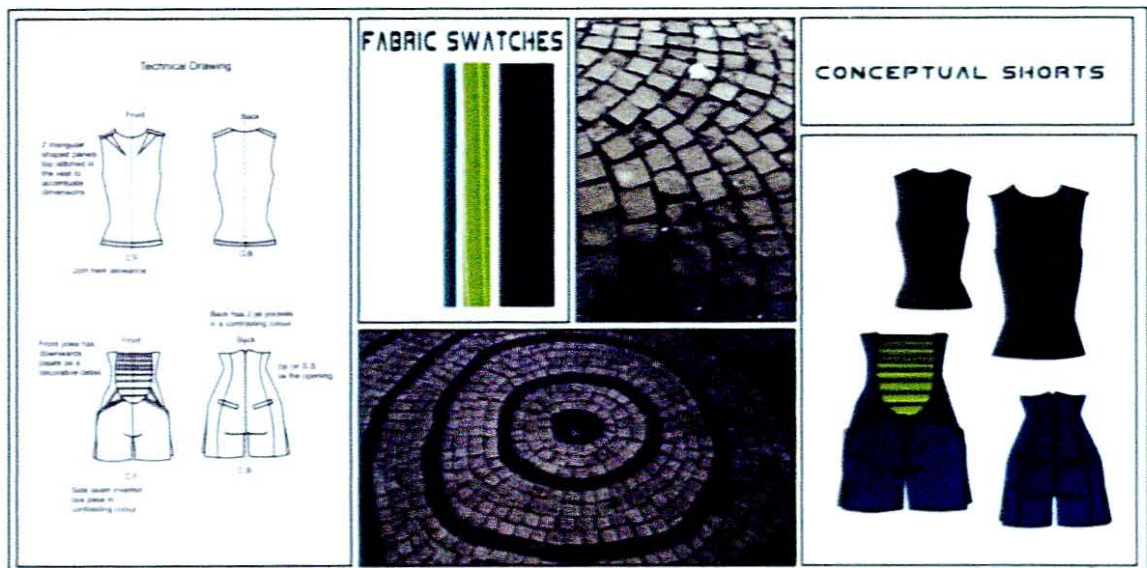


Figure 5.5.6.2 Conceptual shorts and top  
(Nayra Negroa, 2010)

### 5.5.7 Outfit 7: Commercial and Conceptual skirt and top:

This design was inspired by cracks that are found on the desert ground or tree trunks. These represent interconnectedness and allow for beautiful patterning decoration that will be done by topstitching the fabric with accent colour threads. The commercial top has red chord sewn in between princess line panels to create a sense of depth and its correspondent high-waist skirt has reflective piping in between the curved panel lines.

The conceptual version of this design was inspired by the grid existent in fences. The top is made out of knit and has thin stripes running down the neckline at both front and back, with an added panel on its neckline that adds a dimension to the item. These are finished off with binding.

The skirt has perpendicular strips that are vertically placed in between seams to add a sense of dimensionality. Both conceptual and commercial skirts have lining because of the unusual fabric choice. (This design uses method 1: Simple Pattern manipulation; method 5: Raising surfaces upwards)

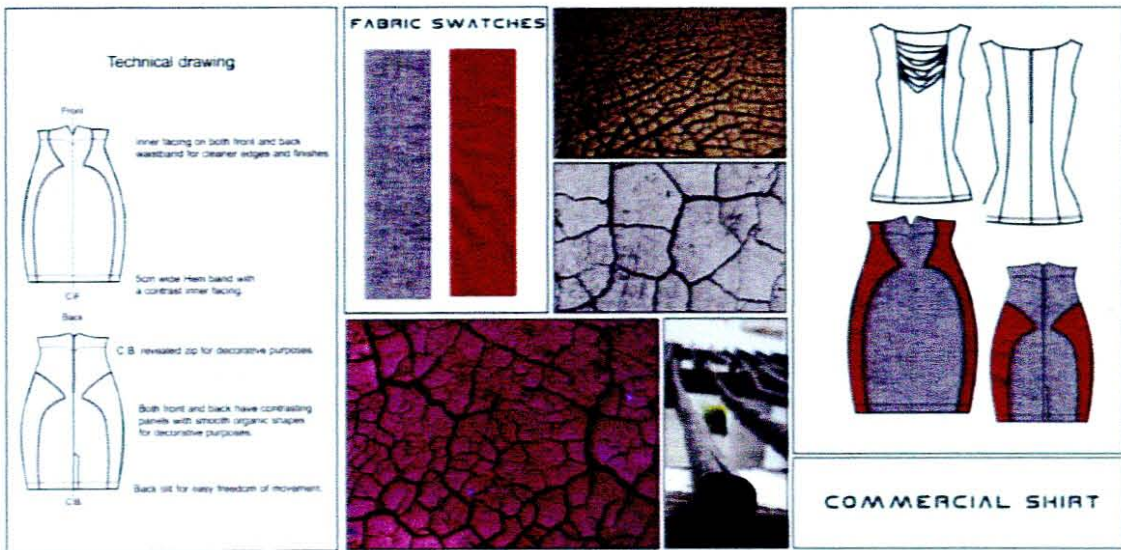


Figure 5.5.7.1 Commercial skirt and top  
(Nayra Negrao, 2010)

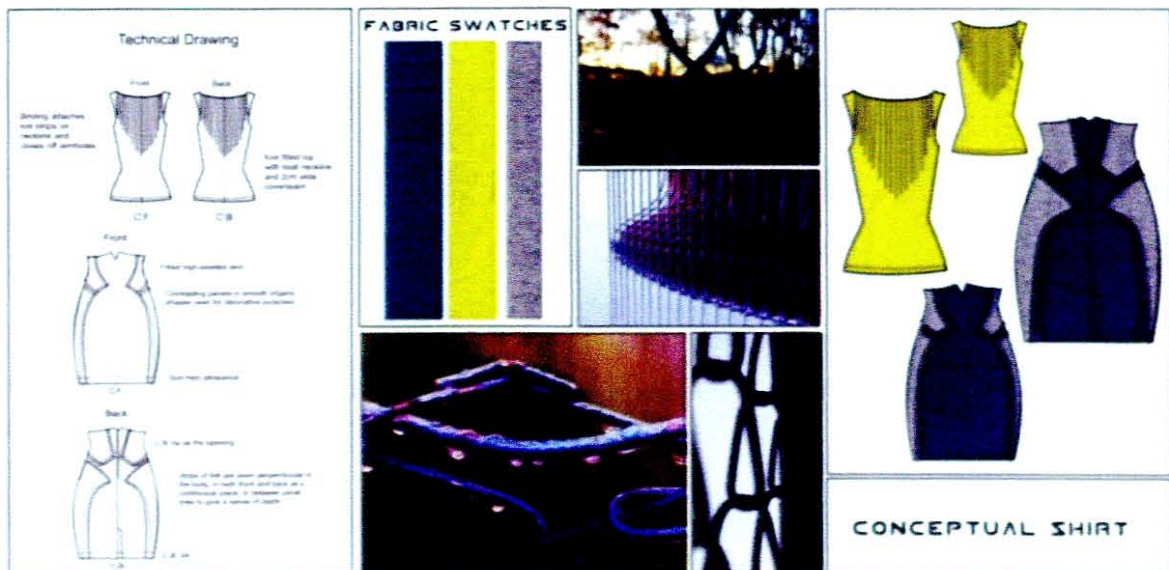


Figure 5.5.1.3 Conceptual skirt and top  
(Nayra Negrao, 2010)

### 5.5.8 Outfit 15: Avant-Garde:

The avant-garde piece will be displayed on the exhibition day at the centre of the area that will be allocated to display my year work. No sketches or technical drawings have been done ahead of time because I feel that this blocks creativity. Instead, by using CAD, I made a

collage/illustration of the supposed direction the garment should follow. A spontaneous, creative and unusual art piece will emerge and I would like to keep it surprisingly fresh.

The garment represents a comparison between two different aesthetics. The left side of the outfit is more three-dimensional in relation to the right side. This outfit is my interpretation of a clash of dimensions. Elements of 3D are scattered around the body in different manners. By using a combination of the 6 methods of adding dimensions onto garments I created my avant-garde piece. Calico is being used because it represents what is important, the process, and not end product, thus the feeling of rawness or incompleteness it implies.

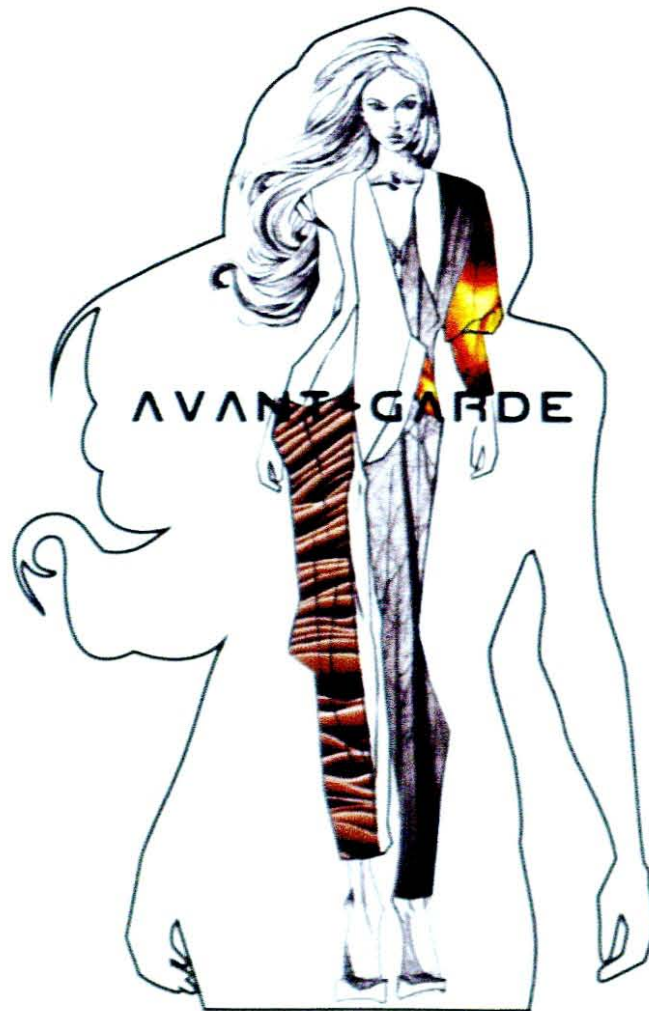


Figure 5.5.8.1 Avant-Garde  
(Nayra Negrao, 2010)

## CHAPTER SIX: MARKET FEASIBILITY

### 6.1 Market Feasibility

*Multi-Dimensional Clothing* is about versatility, meaning and uniqueness. What matters is the concept behind the garment and not the garment *per se*. The reason why consumers will buy these products is their precise fit, quality fabrics and construction techniques used; exclusivity and because its re-fabrication has been used to further personalise it, thus creating something truly unique.

The Multi-Dimensional Clothing consumer consists of a wide group because of the collection's price range division existent. The range will be divided in two, which are the commercial range (middle to upper-class women) and the conceptual range (upper-class women). The commercial range will be reasonably priced and less exclusive as its main purpose is to establish a sellable range and project it to the fashion industry, while the conceptual range will be custom made and personalised if required, thus not as affordable as the commercial one.

The target market, according to age and gender, consists of mainly women, who are in between the ages of 18 to 35 years, although any fashion forward woman who can identify herself with the brand style is welcome to purchase the products.

Research has been done to determine whether the industry will accept this range in terms of its price point and value. The results were as expected and it concludes that only the commercial range should be placed on the market because its price point makes it commercially viable.

The conceptual range has a very high price point and because of this it will perform as an art-piece collection, rather than wearable clothes. Its price point and unreasonable quantity and complexity of operations, such as decorative stitching lines, boxing out of shapes, to create a sense of dimensions add value to the pieces in such extremes that some items can be costed for more than R6000.00 a piece.

## **CHAPTER 6: CONCLUSION**

Multi-Dimensional Clothing as a collection has proven to successfully depict multiple dimensions on both its surface and garment construction. The commercial collection uses fewer accentuated techniques to demonstrate dimensions in relation to the conceptual range, nonetheless these proved to be efficient and not as time consuming as the conceptual ones.

All garments are inspired by Einstein's Special Theory of Relativity where two parallel versions of the same design were created to illustrate multiple possible interpretations of the same concept, while ensuring dimensions such as depth, height and volume were incorporated into the conceptual range only.

Most garments' surfaces have been inspired by visuals from nature which represent interconnectedness. As Albert Einstein once said "Everything is connected" and these visuals have a common attribute which is its similar pattern or design which was referred to as parallel realities earlier.

By ensuring that the garments have visible multiple dimensions I am integrating the concept of dimensions in my range. Einstein's Special Theory of Relativity aids my argument by saying that everything is relative and what could be considered wrong in our universe would be considered right in another dimension. Similarly what hermeneutics describes as perceptions where some people might consider something to be wrong, while others might consider it correct. As Albert Einstein said, until an observer decides in which position an object is, by looking at it, it is simultaneously at both places. This is further enhanced by String Theory, which says that since particles are strings they can, in fact be in two or more positions at once.

My ranges combined, show my own interpretation of this concept, almost as if the two parallel garments are the same, but located in different dimensional locations of time and space. According to Hans-Georg Gadamer humans understand reality in a limited scope and this is the reason why such implausible variations of reality emerge, almost as if contradictions were created by the universe to enlighten humans into believing that there is a greater unexplainable reason to the laws of life. Our understanding of reality is incomplete therefore biased and our decisions proceed accordingly. There are no certified conclusions of how many dimensions exist but the latest theory suggests that a total of 11 dimensions is the most accurate version of reality.



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