THE FOURTH DIMENSION TODAY

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I get lost very easily in movies of cute kittens, or dogs that cuddle kittens. Have you ever been in that corner of not knowing where you are anymore? Clicking website after website, feeling drowned in a world that actually does not exist?

Plain shapes that evolve out of digital environments that feel cold, untouched. I look at them with a freezing stare, feeling myself drifting. I feel a strong connection though, even though it looks cold, the environment feels lukewarm, comfortable. So comfortable that almost all of us decided to stick both our hands in by embracing smartphones and other technological developments. Soon we will long for the bath of technology, we will long for the warm water to surround us and take us in. Embrace us. This longing drags us between the dimensions of our existence.

The Internet has been making time move faster. The seconds wasting away after being absorbed in another website. Maybe the Internet should distract me; maybe it should lead the way into new kinds of corners, new kinds of exploitations that I would have never come across by myself. Can I waste away in another Tumblr page or do I need to still my hunger for completion elsewhere?

We shift between the virtual and the substantial. We travel across dimensions; 2D, 3D and we could call the virtual world our fourth dimension. I am interested in how this fourth dimension will develop in relation to the actual world. How we will live in a mixed reality, making this virtual world tangible. How people in the near future will wear garments in this hybrid existence between digital and actual. The goal is to develop a virtual collection that will be displayed in the actual world. It will show the advantages of virtual garments, like virtual fabric of the clothing, it is endless and does not contribute to any extra waste of material.

There are three main themes that will underpin the beliefs grown from these interests: shifting, recursion and functionality, which are followed by transition in which I explain the translation of these three themes to my collection. The first is shifting, which has to do with how speed and dimensions push us to question the perception of the rapidly transforming world around us. The Futurists were already thinking about this in the early 20th century and the Post-Internet art movement is doing that now. The second is recursion in which questioning this perception then rolls into how the perception changes into an endless environment I call the fourth dimension. Patterns and loops that are vaguely recognizable but can’t be placed exactly take
us to get lost in the random flow of imagery, like a recursive process. After the chaos I would like to explain the third theme, functionality. One of the first revolutionary thinkers in clothing design was for instance Thayaht with his “TuTa”. There are many aspects in which virtual garments can be much more efficient than actual garments. But first, let us get lost in dimensions and endless patterns before we fall down to reality again.
The Industrial Revolution, progress, speed, capturing dimensions onto a canvas was what the Futurists did in the beginning of the 20th century. This social and artistic movement was founded in Italy around 1911 and the artists questioned a new reality they saw around them. They played with a perception of the world, which was filled with all kinds of machinery that was invented around the turn of the century (Dunbar, Barker, 1972, p. 1-14). Machinery generated speeds that could never be reached by man and horse alone. The translation of speed and progression into art by the futurists evolved into a movement that is still one of the most influential art movements of all time, because the artists understood and worked with the perception of a future that lay in front of them.

From the initial Manifesto of Futurism by Marinetti: “We declare that the world’s splendor has been enriched by a new beauty: the beauty of speed” (Dunbar, Barker, 1972, p. 25). The futurists analyzed movement in such a way they could put it in a still image. They captured the air around the dynamism itself, trying to shape what it would look like if it were visible. Vibrant colors depicted the bright future, nothing to be scared of, rather to look forward to and leave everything from the past behind.

During the past couple of decades another revolution has started. The digital revolution is in full bloom. Smart phones, laptops, tablets and the Internet are essential for modern life to exist as it does today. According to a study done by Gallup (Saad, 2015) nearly half the smartphone users cannot imagine life without them. The smartphone is transformative for those who use it, not only by making their lives better, but also by becoming something of a fifth limb. Most take it with them everywhere and sleep with it, and if it goes missing

Figure 1: Study for Dynamism of a Cyclist by Umberto Boccioni in 1913 (Dunbar, Barker, 1972, p. 14)

Right: Figure 2: Dynamism of a Cyclist by Umberto Boccioni in 1913 (Dunbar, Barker, 1972, p. 14) The dynamism is suggested by several layering of geometric shapes in the direction of the movement the cyclist makes. Diagonal brush strokes, bright colors and gradients that suggest depth make up for a harmonious and bright future.
- even for a day - four in ten would feel a significant level of stress (Saad, 2015).

The cold tech\(^1\) has been evolving towards a tactile universe and it is beginning to come extremely close to the body. Next Nature (Olivo, 2015), a network of sharing ideas about the future of humanity, explains how technology is becoming more and more sensitive. Researchers in Korea for example are experimenting with a compress electronic skin able to multitask, like human skin, feeling temperature, pressure and sound all at once (Olivo, 2015).

Again, like a hundred years ago with the Industrial Revolution, there is this shift between dimensions. Today the virtual is becoming a part of the actual and art develops that contemplates just that. The Post Internet Movement has been tapping into these developments and feeding itself with these transitions (Wallace, 2014) (Archey, Peckham 2014). Anne de Vries for instance prints out digital imagery and makes sculptures with it, as if it were tangible objects (Figure 5). Hito Steyerl (2015) says: “The Internet is a spatial dimension, it starts moving outward into new directions, it has started moving offline.”

The Post-Internet movement is shoving this digital layer; somehow our fourth dimension, inside the actual reality, the third dimension. Just like the Futurists shoved the speed inside a still image. They are both capturing the shift between dimensions in a paradoxical way because it does not completely fit together. There is always this screaming contrast between the warm, familiar human

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1 Cold tech is everything that has to do with computing technologies that does not possess any kind of natural conscience or life.
body and the cold estranged technological medium. It is almost awkward, it is not possible to capture movement in a still image but the image the Futurists portrayed is almost like a dissonant harmony.

“The Unconscious of the automation is the material hardware of electromagnetic machinery that is called the Net. The human Unconscious is fleshy, marked by ambiguity, inconsequentiality and (most importantly) death” (Berardi 2009). Flesh and bone decay, metals and other hardware materials do not. A computer does not decay, which creates a paradox between something being and creation.

Some people might find the utterly compelling developments from the virtual world scary; other people might tap into this flow and ride along the wave that drags them offshore. The futurists pledged for a better world with all new industrial improvements and displayed this as a harmony. Today due to the Internet and technology the road to improvements is extremely bumpy and uneasy. The Post-Internet art movement picks up the clashes the Internet makes with fleshy life and tries to express the confusion into visual stimuli. The digital revolution brings a new dimension, and nobody can predict what this dimension will look like, feel or smell. It is vague territory ready to be discovered. As the virtual developments are still full of exploration,

Figure 6: Anne de Vries: E M E R G E, Exhibition in the Foam Museum Amsterdam. De Vries sulpts with printed imagery to create a clashing contrast between 2D and 3D.
there is room for improvements in the way people dress. Technology is still not incorporated in garments worn day to day. The fluidity of dress contradicts with the static tech. Combining dress and technology can lead to extremely interesting findings as nobody knows what is out there in these mixed reality surroundings of the near future.

Figure 7: Approximation III by Katja Novitskova 2013 (Novitskova 2013) She places stock imagery of animals in space and photographs them again to create digital photo collages. She believes that technology will become like animals are today.
Life exists out of loops. Loops that are as small as brushing your teeth everyday to loops that are as big as giving birth to offspring. As Douglas Hofstadter\(^1\) states: you make decisions, take actions, affect the world, receive feedback from the world, incorporate it into yourself, then the updated ‘you’ makes more decisions, and so forth, ‘round and ‘round. In the end, we self-perceiving, self-inventing, locked-in mirages are little miracles of self-reference (Hofstadter 2007, p. 68). It almost sounds like a learning mechanism of intelligence. For computers, this self-reference learning mechanism is strenuous, not to say impossible. The virtual cannot yet learn from its encounters with the surroundings, it needs human programming.

Our experiences bring us further in life, so the loops become an ongoing process that constantly asks upon itself to happen again. This effect can be called ‘recursive’. The process becomes a network of small feedback loops that become part of a bigger understanding. Recursion is based on the “same” thing happening on different levels at once, but the events are not exactly the same – rather we find some invariant feature in them, despite many ways in which they differ states Hofstader (1979, p. 254). A recursive object exists out of infinite copies of itself.

In a way, the virtual world is also endless or recursive. Screen after screen after screen people can easily lose themselves in it. A great example of this is for instance the fact that people lose track of time when they are in this virtual environment. Social Media Addiction

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\(^1\) Douglas Hofstadter is a professor in cognitive computer science and studies artificial intelligence.
is becoming a real problem at the moment. Tweeting or checking emails may be harder to resist than cigarettes and alcohol, according to researchers who tried to measure how well people could resist their desires (Meikle 2012).

The fashion industry is a positive feedback loop. Cause and effect amplify one another, which will lead to an inflation of the aspect. Almost like exponential growth (Graph 1). Multiple factors influence each other to create a complicated circle that is almost unbreakable. The media/commercial brands tell people to buy certain clothes, they wear it, industry comes up with another trend, people buy new clothes and the waste level just goes up. Material gets wasted and the environment takes the hit. “The solution is obvious: cut down on the mass-production, the collections, the shows, the more-more-more. And in that, the solution is totally impossible. Money, after all, speaks louder than sense.” (Madsen 2015)

What would happen if a negative feedback loop were created for garments? Could there be a way to create garments and not waste exponentially but rather cancel out elements? Maybe it would reach a certain balanced equilibrium of buying and wearing, but not wasting (Graph 2). Virtual prototyping software\(^1\) makes the process of garment creation zero waste. The software uses endless fabric, and undo and redo are easy without wasting anything but data\(^2\). Virtual fabric extends to infinity and therefore working in the software provides a constant equilibrium.

Loops become a soothing rhythm of action, gain, repetition that stimulates growth (positive feedback loop) or perseverance (negative feedback loop). But the loops can also be hypnotizing and cause abandonment of priorities. Positive or negative, feedback loops are the natural fabric of being and facilitate innovation.

Previous right: Figure 7: Video feedback loop in the music video of Kool & The Gang - Get Down On It. (Kool & The Gang 1981)

1 3D Design software lets the user cut, drape and stitch a garment virtually.
2 Wasting data is of course still using energy and space, but it is far less harmful than what the fashion world wastes at the moment.
Comfort and fit are extremely important when buying a garment. Within our busy lives it would sometimes be easy to just quickly put on our clothes and go. Thayaht was one of the first designers to think about comfort, speed and efficient use of materials in one garment back in 1920. He thought out a no waste jumpsuit that was comfortable, cheap and sustainable. “The tuta created by Thayaht was meant to be suitable for everyone and every occasion: it was a „universal“ garment, extremely simple to realize, and particularly cheap.” (Loscialpo 2014). The pattern of the Tuta was published in the paper in Italy, including instructions of how to put it together (Figure 5). Thayaht saw people moving faster and faster and decided they needed a garment to fit that activity. “The overall by Thayaht needs to be contextualized within the Futurists proposals of renovating every aspect of modern life. The tuta responds indeed to those formulations, expressed in the several manifestoes, according to which fashion should promote practicality, action and dynamism.” (Loscialpo 2014).

Thayaht’s Tuta was extremely popular during that time period in Italy says Dr Flavia Loscialpo (2014), fashion theorist, but after a while it started to become merely an inspiration for work-wear and other functional activities. It has been a major game changer within the garment industry, but how come suits like this are not worn everyday? Even though the Tuta would be one of the most sustainable solutions to the industry today, it would not be sufficient to the human of today.

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1 Thayaht is a pseudonym for Ernesto Michahelles, who was an active member of the Futurist movement and later on, together with Madame Vionnet, invented the bias cut.
Most people have a wide variety of garments to choose from when they get dressed in the morning and to abandon this freedom is no solution.

But what if wearing a garment like the TuTa would still allow us to express ourselves, still be able to have this variety in choice of garments. What if there could be a way to wear and create garments without actually wasting any material. The one-piece would provide comfort and practicality, while there could be a personalized layer of garments on top. Imagine virtual garments could be worn in the actual world. No fabric would be wasted and expression comes through using the space that floats around the body.

This could take shape in a holographic\(^1\) representation of the clothing, which would not be there physically. The virtual layer could be seen by for instance a Microsoft Hololens\(^2\) (Microsoft Online) or even more interesting the Magic Leap\(^3\) (Magic Leap Online) (figure 6).

As founder of Magic Leap Rony Abovitz states; “The physical being and digital imaginative thing they want are becoming one” (Abovitz, 3 June 2015). The screen in people’s heads that sees the world is an awesome place to start, instead of using devices for computing says Abovitz (Abovitz, 3 June 2015). The software works with continual interactive loops that will do things with life, as it will come to humans and humans do not have to come to it.

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1. Holography is a photographic technique that records the light scattered from an object, and then presents it in a way that appears 3D.
2. Microsoft HoloLens is the first fully untethered, holographic computer, enabling high-definition holograms to integrate with the world.
3. Magic Leap is a US startup company that is working on a head-mounted virtual retinal display, which superimposes 3D computer-generated imagery over real world objects, by projecting a digital light field into the user’s eye. It is attempting to construct a light-field chip using silicon photonics.
Figure 9: Magic Leap concept picture, visualizing how it is possible to see virtual objects without any glasses in the near future. (Magic Leap Online)
transition

When discussing shifting, a clear vision on how the clashing of dimensions takes shape. It feels rather awkward, as the dimensions do not fit together perfectly. This can be translated into merging misfits, like scorching fabrics mixed with flowing water like drapes in outfits, gives an impression of weary surroundings during this endless journey. Dry red, fresh lilac and luster surfaces combined with sandy structures feel like uneasy combinations, but when put together they form a lukewarm whole, ready to step in and drown.

Whenever the body moves, wide silhouettes move with it. Liquid it feels, almost fluid but movement can also be stiff. Fluid and stiff fabrics create perilous motion when merged in the same shape. It is about unusual combinations, with familiar repetitive references to tailoring and drapes from the 1920’s, the years in which women’s fashion was liberated from the corset and free to move wherever it wanted, together with the art from the Futurists (Figure 10). A dropped waist and bias cut are very important ingredients in the story.

Within the virtual prototyping software there is also a constant shift between 2D and 3D. Whatever is implemented on the 2D pattern immediately takes effect on the 3D garment displayed next to it as seen in figure 11. In this way the communication between pattern and garment is much easier to understand. Using this software, there is an incredible amount of knowledge to learn about spatial awareness and pattern cutting.

The garments are stitched and draped virtually, which means...
that there is more time to adjust the garment and make it perfect. No more being afraid to cut in it, or draw on it, or having to make another toile. No more wasting fabric. It leads to well thought through designs, because there is time to stand back and reflect on the process. It almost becomes endless.

The endlessness of recursion is something almost indescribable, but visualized quite well in the representation of the fourth dimension in the movie Interstellar (Nolan, 2014) (Figure 12). It is a kind of check pattern that has corners that dwell into the never ending deep. The check repetitive aspect is something vaguely recognizable, an understandable pattern, but still it is almost impossible to understand. The uneasy feeling of seeing patterns that can't be placed exactly is a big part of this fourth dimension. Checks are quite minimal but so versatile that even though it is abstract, it can still be recognizable.

The “sameness-in-differentness” in recursion is an element to build shapes with. Through endless repetition of recognizable elements shapes will develop, but also deform. The endlessness will stream away into deep.

Previous Left: Figure 12: The endless check pattern realized in the movie Interstellar. This represents the fourth dimension to them. (Ouellette, 2014)

Previous Right: Figure 13: Print design for the collection, built up from layering into deep corners. Corners in which you can drown.

Right: Figure 14: Detailing in the collection made with the virtual prototyping software.
The interplay with dimensions brings new ideas into fashion design. Creating a garment becomes fast and easy, therefore wearing and making can become a simultaneous process. Working with 3D virtual prototyping software can lead to interesting outcomes since the garment keeps on evolving into something new or better. Whenever it does not get better, the process can simply be restarted in a previous version by clicking ctrl+z. Basically, it is using virtual techniques to revolutionize the garment making process by speeding it up and making it more efficient. In a way it is a modern interpretation of the values resonating in the TuTa.

The question is, whether the software still lets it be a garment or not. Is it really a piece of cloth or is it merely a virtual representation of something that is not tangible enough to understand? The easy question that follows is: can anything that is virtual be real? When thought of all kinds of activities like social media, emotions which humans experience that involve virtual influence have been considerably high in the past decades. As stated in the recursion part, people are inescapably connected to technology and this all leads to ‘the virtual’ actually becoming pretty real. Therefore, in the future, a garment does not have to be physical to exist. People can
interact with it emotionally and maybe in the near future even feel it as haptic technology comes closer to the human body everyday.

In the future, there will be very little actual garments. The only ones that are worn are comfortable to wear, functional in their fit and easy to put on. On top of this layer will be a virtual representation of a garment, which can basically be anything. Let’s face it; everyone wants more clothes. Mass consumption cannot be stopped, but maybe it’s time to re-examine the fundamentals of how garments are produced and worn. The possibilities are endless but it all depends on whether all of us want to lose ourselves in this new dimension.


