

# Appendices

“Non verbal expression of emotions through desirable Techno-Fashion”

Hugo Out

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# 1. Context factors

- 1 *Metallinou et. all. (2011)*  
Body language features that describe relative positions, orientation and approach/avoidance behaviors of the participants towards their interlocutor in an interaction, reflect their level of activation and dominance but are less informative about their valence (positive vs negative).
- 2 *Metallinou et. all. (2011)*  
Actors tend to walk more when increasing their activation, as compared to decreasing or keeping it stable.
- 3 *Metallinou et. all. (2011)*  
When decreasing activation, the actor tends to withdraw more and hold hands together
- 4 *Metallinou et. all. (2011)*  
Increase in activation is often displayed by more walking and more approach behaviors towards the interlocutor, compared to stability or decrease.
- 5 *Metallinou et. all. (2011)*  
Body language have been shown to convey emotional information
- 6 *Marianne LaFrance (1976)*  
Nonverbal behavior indicates something about the psychological state or trait of an individual, the nature of the relationship between two or more interacting individuals, or the regulatory and maintenance aspects of a communication system per se.
- 7 *Amy Cuddy, TED talk (2012)*  
Body language is all about poses and expressing power
- 8 *Amy Cuddy, TED talk (2012)*  
"Getting no non-verbal feedback. People hate that. It is like standing on social quicksand"
- 9 *Sherry Turkkle, TED talk (2012)*  
We remove ourselves from greef and our daydreams, and we go into our phones
- 10 *Sherry Turkkle, TED talk (2012)*  
Technology enables us to present the self that we want to be. We can delete and retouch everything we want to say.
- 11 *Sherry Turkkle, TED talk (2012)*  
We sacrifice the conversation for mere connection
- 12 *Robert Waldinger, TED talk (2015)*  
Good relationships keeps us healthier and hapier.
- 13 *Sherry Turkkle, TED talk (2012)*  
We're lonely but we're afraid of intimacy
- 14 *Sherry Turkkle, TED talk (2012)*  
Being alone feels like a problem that needs to be solved
- 15 *Nielsen.com*  
Overconsumption is deeply rooted in our culture
- 16 *Sherry Turkkle, TED talk (2012)*  
Solitude is where you find yourself, so that you can reach yourself out to other people and form real attachments. If we are not able to be alone, we are going to be more lonely
- 17 *Sherry Turkkle, TED talk (2012)*  
Technology appeals to us most where we are most vulnerable
- 18 *Sherry Turkkle, TED talk (2012)*  
It's when we stumble, hesitate or lose our words, that we reveal ourselves to each other.
- 19 *Sherry Turkkle, TED talk (2012)*  
We expect more from technology and less from each other
- 20 *Holman, 1980*  
The literature of consumer behavior provides numerous comments upon the phenomenon of products serving as a means by which consumers express something about themselves
- 21 *Rosenfeld & Plax, 1977*  
"People select fabric and color to help them conform to their image of the ideal self".
- 22 *Holman, 1980*  
Exposure of the body has been informally linked to perceived sexiness
- 23 *Holman, 1980*  
Cars and clothing are both products which are high in visual display and recognized in our society as "saying something" about a person
- 24 *The future 100*  
"Fashion and beauty brands are blurring gender lines"
- 25 *The future 100*  
"It's time to make amends by presenting a more nuanced version of masculinity"
- 26 *The future 100*  
Global consumers are now operating with a sustainability mindset. Products and services that provide convenient, effortless ways to contribute to regeneration efforts, will find favor with the mindful consumer.
- 27 *The future 100*  
"The number of single adults is growing across the globe".
- 28 *The future 100*  
"Adulthood, and the way people experience it, is shifting towards something much more individual as people choose different paths"
- 29 *The future 100*  
Adulthood now is about putting yourself on the map, by achieving something noteworthy
- 30 *The future 100*  
"Cultural shifts are dictating the colors of tomorrow to connect with the consumer on a deeper level".
- 31 *The future 100*  
34% of generation Z were quitting social media permanently, with 35% saying there's too much negativity and 29% stating that it "tears apart their self-esteem."
- 32 *The future 100*  
Technology is becoming more intuitive than ever, with new products and devices that can instantly adapt to their surroundings.
- 33 *The future 100*  
More and more tech companies are realizing the order of magnitude that their products have on societal issues like mental health, isolation, cyber-bullying and suicide.
- 34 *The future 100*  
Technology is becoming more intuitive than ever, with new products and devices that can instantly adapt to their surroundings.

- 35 *The future 100*  
Tech companies are shifting the dialogue away from the idea of giving up part of ourselves to a machine and towards services that are made to smoothly and reassuringly reconcile themselves to the user.
- 36 *The future 100*  
What beauty represents is being redefined and brands need to take note of the "imperfect" aesthetic highlighted by a subculture of experimental artists
- 37 *The future 100*  
The world of beauty moves beyond the human form.
- 38 *The future 100*  
It's 2018 and there's so much technology that enables us to truly make custom clothes for people and bring an entire new experience to market. This is the new era where clothes adapt to people.
- 39 *The future 100*  
An increased awareness of mental health is giving rise to public spaces designed to recharge and rebalance in hectic cities.
- 40 *The future 100*  
Big Tech brands are increasingly favoring an impeccably designed visual language that celebrates imperfection and tactility. The overall aesthetic is human, soft, fun and refined. Rather than using primary colors, it relies on a more muted digital palette.
- 39 *2019 trends by Ford*  
Adults:  
84% are driven for change by hope  
48% are driven for change by fear  
  
71% are energized by change  
33% are scared by change
- 40 *2019 trends by Ford*  
Adults:  
79% think technology is a force for good
- 41 *2019 trends by Ford*  
Today, self-improvement is having its moment, driven in part by a growing set of tools that make it easier to set, track, and achieve even the most ambitious of goals..
- 42 *2019 trends by Ford*  
When it comes to digital devices, people are increasingly concerned about overuse — wondering if they've become too dependent on digital tools. As such, they are becoming more mindful of the time they spend online, and the need to disconnect and pursue greater well-being in their offline lives.
- 43 *2019 trends by Ford*  
"I would like to undo some behavioral changes that have occurred because of technology."  
Generations who agree:  
Gen-z: 68%                      Millennials: 69%  
Gen-x: 62%                      Boomers: 53%
- 44 *2019 trends by Ford*  
"Artificial intelligence will be stronger than the human mind within 10 years."  
Generations who agree:  
Gen-z: 68%                      Millennials: 69%  
Gen-x: 62%                      Boomers: 53%
- 45 *2019 trends by Ford*  
Of the 36 percent of Gen Z and Millennials globally who said they have not tried meditating, 54% agreed that they should try meditating.
- 46 *David Matsumoto (n.d.)*  
The ability to have facial expressions of emotion is something that is biologically innate and that we are all born with
- 47 *2019 trends by Ford*  
"I'm more outgoing on social media than I am in person."  
Generations who agree:  
Gen-Z: 56%                      Millennials: 53%  
Gen-x: 35%                      Boomers: 17%
- 48 *Profita et. all., 2013*  
Some may find the operation of a system that employs non-traditional on-body interactions uncomfortable to perform in a public setting
- 49 *Profita et. all., 2013*  
What is considered socially acceptable today may not be common practice in 5 to 10 years
- 50 *Profita et. all., 2013*  
Within cultural settings, there are outfits deemed appropriate or inappropriate for particular social situations
- 51 *Profita et. all., 2013*  
Social acceptability involves the social skills and the presentation in which one comforts oneself so as to interact comfortably within society or to not embarrass or call attention to oneself
- 52 *Profita et. all., 2013*  
Social acceptability is culture- and time-dependent
- 53 *Profita et. all., 2013*  
Wearable technology usage can be heavily influenced by its perceived level of social acceptability.
- 54 *Hekkert & van Dijk, 2011*  
People of all cultures and throughout the ages wish to stand out from others
- 55 *Commandeur, 2019*  
Fashion is beneficial to our wellbeing, it helps to shape and reflect our personality and our identity
- 56 *Commandeur, 2019*  
Clothing concerns all of the human person, all of the body, all of the relationships of man to body as well as the relationships of the body to society
- 57 *Bruggeman, 2016*  
Designers explore the limits of the human body and play with the fluidity of the wearers identity. In that way, characteristics of the wearers body will become more like the characteristics of clothing itself: dynamic and fluent.

- 58 *Taylor, 2011*  
Popular culture manufactures "portraits" of who it wants us to be.
- 59 *Nielsen.com*  
For those willing to spend more [on Clothing], the findings show that personal values are more important than personal benefits, such as cost or convenience.
- 60 *Nielsen.com*  
Yearly, in the Netherlands alone, 688 million pieces of clothing are being thrown away by the consumer
- 61 *Bruggeman, 2016*  
Expressing yourself nowadays is all about flexibility, and the freedom to express who you want to be.
- 62 *Verywellmind.com, 2017*  
Body language may account for between 50 percent to 70 percent of all communication
- 63 *Rosenfeld & Plax, 1977*  
A study which shows a person's commitment to dressing and his or her personality
- 64 *Mehrabian (1968, 1969)*  
Posture was informative not only about one person's feelings toward another, but about his status as well
- 65 *Mehrabian (1968, 1969)*  
Females, but not males, who display leg and arm openness communicate positive attitudes
- 66 *Sherry Turkle, TED talk (2012)*  
We use conversations with each other to learn how to have conversations with ourselves. So a flight from conversation can really matter, because it can compromise our capacity for self reflection





# 2. Interview transcripts

## Interview Xander 06-06-19

Please explain to me what items you brought with you, in terms of colours, materials and styles.

My shoes are bought online, and are from a sustainable shoe brand, are off-white, and are my main easy to-go-to sneakers.

My trousers are from Levi's, and have been adjusted to become a little bit slimmer than they originally were. I always wear pants very skinny, that's where I got my nickname "Slimfit" from.

The T-shirt is a vintage bought Real Madrid football jersey, in bright blue. Its fabric assumes it is a regular cotton t-shirt, but its typical sports jersey fabric makes it very pleasant to wear. I was already in search of a sports jersey, but I bumped into this shirt randomly by passing by a vintage shop on my way to the train station. It was from a nice football club so I just bought it.

My vest is bright red, fleece fabric and in a loose fit. I bought it in a vintage store in Rotterdam, and I wasn't particularly in search of something specific. When I saw this vest I felt in love with it, and in the forthcoming months I wore it day in, day out.

Finally, I'm wearing a waistbag in brightblue, to give the outfit a more street style look.

But I almost forget my golden Christian cross earring. Normally I wear a regular ring, but this makes it more special and more outgoing.

When was the last time you wore this outfit? What was the occasion?

The last time was when I went to the skate park, about a week ago. The bag was used to carry my portable speaker and a small bottle of water. The jacket is easy to take off and the sports fabric jersey is of course usable when you work out, during skating.

When you think about these items, what feelings are triggered? What emotions are best to describe these feelings?

I have a particular strong feeling towards the items of this fit individually. About the fit totally, I have a strong feeling of freedom. That is because I don't feel that people have to take me seriously, which is why the randomness and weirdness reflects that freedom. I like it when you take life not too seriously.

I like to be a little eccentric in the way I dress myself. My friends don't have that, but I like it when it doesn't matter what you wear outside in public during your day off. I think that people, who think too much about what matters when you wear something in public, on your day off, take themselves and life too seriously. Of course you have to think about your appearance when you go to specific social events, but I think that doesn't matter when you are able to do whatever you want on your day.

About what emotions it triggers, of course it brings happy emotions. But what's interesting is that it brings a large dose of calmth. That is because for example when you go to a funeral, you have to wear rather tight and neat looking clothes, which can easily be sloppy when not worn right, which brings a certain need for attention.

This outfit I'm wearing right now can't fit tight or not tight, which doesn't need a lot of attention, and that brings calmth

Finally, when your outfit triggers angry and sad feelings, you have to wear another outfit!

When you think about the moment you last wore these items, what feelings are triggered? What emotions are best to describe these feelings?

I wore this outfit when I went out for skating. We talk a lot about skating, like that dictates my life and like I am a professional skateboarder, which is not true. I just started skating, but what I like about the skating lifestyle is that, even though those skaters are office workers during their daily lives, when they skate, they don't take life too seriously. We talked about this earlier, and I very much love that mindset. They are driven by this lifestyle and it brings them passion. I don't like people who are driven by making a career and bring passion to the second place. I think passion should come first, and making a career out of it comes second place. Finally, skating of course is an active, open air hobby, which triggers yourself to go outside instead of laying down on the couch. Don't think that I am a very rebellious person, because I also study, and follow multiple tracks laid down by society, but I just love that mindset of not taking life too seriously.

Can you go back to the day you first assembled this outfit? Did you buy these items in one go or where they assembled later? What feelings were triggered in that situation?

What I stated after the first question, is that the items have been individually bought, without the thought of coming together in this formation. I have worn this formation only ones or twice, and could easily be combined with other favourite items. It doesn't necessarily have to be completely matched, which is why it is easily combinable. The first time I assembled this outfit, I can't really remember what feeling it gave me. It was when I was planning to go skating, and I kind of grabbed together a few of my favourite items. When I was ready to go, it gave me a kind of complete feeling, like I was indeed ready to go. I have worn this outfit only ones or twice, and I liked the look because it gives a "street style" vibe. I actually don't know the definition of a streetstyle vibe, but I like this fit because, for example with the football jersey, it gives a certain "I don't care" attitude. I like that. The fleece vest is a very non-stylish 40's dad vest from a non fashion style brand, but I very much like that, also combined with the Real Madrid jersey. It's just weird. And the waist bag, well, it will probably make the whole outfit very much wannabe street, but it's very comfy. The whole fit has a certain randomness, and weirdness, but I like that. My friends will probably wear only one of these items, as their crazy item. I just wear all three of them.

Finally, to finish off with the golden cross earring, I bought that because the old regular golden earring felt too normal. I wore the earring to formal activities, so I needed something more special. The reason I chose a cross is because it reflects, something, something "tough like", and it doesn't reflect my believe in Christianity. I am 100% not Christian. It's just the typical tough like person it reflects what I like about it.

When I assembled an outfit for that funeral, I was more looking for an outfit that was better matched. The trousers matched the shoes, etc. Next time, I would assemble the exact same outfit, because it was matched, but it still had a small portion of eccentricity. That outfit gives me more of a "first time" assembling feeling.

That is also the way I style my outfit for a more formal situation. The whole look has a more neutral look, but with a focus on for example my trousers. The trousers in that case reflects that bit of eccentricity.

That outfit also gives me a more sophisticated and smarter look, in order for people to take me more seriously when I present myself. But still, I want to stand out from the others, and I want to be remembered by that.

Interesting last few minutes of the conversation, that really reflects Xander's way of dressing motivation

# Interview Julie 11-06-19

· Please explain to me what items you brought with you, in terms of colours, materials and styles.

The first part of the outfit is a white turtleneck. It fits really well! It's elastic and tight, and has little ridges in it. The second part is a dark blue jumpsuit with wide trouser legs. The jumpsuit on top also has a small part which is brown. I don't actually really like the colours, I will never choose something blue, because I have brown hair and dark eyebrows, and a white skin, and blue just looks really boring on me. The small brown part on the dress gives it something special, which I like, and fitted together with the white turtleneck does make the whole outfit really nice and special. Wearing something like coloured underneath the plain blue makes it better matched with my appearance. It breaks the plain appearance of the blue jumpsuit.

The fit of the jumpsuit is one part loose, which makes it easy and relaxed to wear. On the other part, it's also tight and fitted, which makes its appearance also a little neat. For me it's important for the item to feel relaxed when worn, but should look fitted and tight, and not sloppy. The outfit, and especially the jumpsuit, is a little crazy. When people give bad commentary about this suit, something like that's weird, and I very much like it myself, I am going to love it more and more.

When was the last time you wore this outfit? What was the occasion?

I wore this outfit to a social event of the company I am working for. It was quite fancy, with a lot of people, so I had to present myself quite well. People at my work always tell me I wear weird clothes, but I never have the idea that they mean it in a bad way. That event was 2 weeks ago.

I chose this outfit on more special occasions, when I will probably have to present myself in a nice way. I would wear it on normal occasions as well, but not often, because wearing this outfit needs to stay special.

When you think about these items, what feelings are triggered? What emotions are best to describe these feelings? ·

I don't like to wear suits or other very trim items. But this suits can be worn as trim, but still has a something a little eccentric. I like clothing that is quite eccentric. The funny thing is, my hair normally is curly, but wearing my hair eccentrically that way is not something I like, because that is something about me that I can't change. That is why I straighten it to make it less eccentric. Choosing clothing that is eccentric and wearing it eccentrically is something I can change, which for me creates a pleasant effect. In that way I can be a little weird. People often think about this jumpsuit that it is a little weird, and they would never wear it themselves. I like that, because that makes it special. People comment about me wearing this jumpsuit a little like that, which I think is cool!

In terms of feelings and emotions it triggers, I get really happy and excited. I wear this outfit when I am already happy, and it very much reflects that happiness.

On the 5 emotions skill, this outfit is very happy. I am already happy, and the outfit makes me even more happy, so it's very much on the top of the happy scale. It's all out crazy and happy, and reminds me of the fun stuff I am going to do.

When you think about the moment you last wore these items. What feelings are triggered? What emotions are best to describe these feelings?

Compared to other outfits I can choose, this outfit gives me a little more eccentric look, and I want people to have thoughts or comments about it. That is really something I love about this jumpsuit. It has really wide trouser legs, and it flaps around my legs. In that way I stay conscientious with what I am wearing. It makes it fun! People have their attention on me and comment on this fit a lot, which again I like!

Getting that attention makes me happy, and wanting that attention reflects my happiness. I think I particularly wear this outfit when I am already happy. So, it reflects my happiness and getting that attention is a kind of confirming.

At the company event, I get feelings of enthusiasm, feeling like getting social. On that event, my project leader asked me to walk on stage, and he is a little weird. But I felt quite comfortable doing that, which I normally wouldn't be. That is because the combination of the outfit, and what it triggers in myself, combined with my already happy feelings.

Can you go back to the day you first assembled this outfit? Did you buy these items in one go or where they assembled later? What feelings were triggered in that situation?

I bought the jumpsuit at first, quite randomly. I was late for a meet-up, but I walked past a cute shop and felt the need to do a little bit of shopping. I saw this jumpsuit, which I thought was really cool, but the lady in the store told me it was 150 euros, which is a lot. I still liked it, and I send pictures to my friends to ask what they think. A moment later, the shop lady came back to me to tell me the suit was 80 euros instead of 150, so it was meant to be! Of course, 80 euros is still a lot to spend randomly on clothing, but I really felt like it.

But I had to find something to match with. I had something white-ish to match, but I already liked turtlenecks, so I looked for something like that to match the suit with. I found one, bought it, and the outfit was complete.

The first time I wore this outfit was when I went back to my hometown Eindhoven. Together with my parents I went downtown to do some shopping and to have a few drinks. It was a very sunny and relaxed day. There was one moment I walked into the Scotch & Soda story, and 3 shop ladies complemented me on the outfit! They asked me where I bought it, what brand it was, etc. That was so cool!

The feelings it triggered was happy, relaxed, and excited to visit my hometown and parents again.

What would be the ideal situation in which you would wear these items, thinking about it right now?

I would wear this outfit on somewhat special occasions, when I really want to look nicely. That can be when I visit my boyfriend's parents, or when I have another event at the company.

A specific moment I would like to wear this outfit is when I will go to downtown Rotterdam, which is a city I just moved to. I would like to have some drinks, and end up going out with my friends to some cool place. I definitely would love to dance in this jumpsuit, that would be so cool. That would be my perfect day, and it has to be very spontaneous, just like my outfit.

### Final comments

What became apparent is that I would also choose this outfit when I have to present myself nicely, and formally. Other options are for example gala dresses, but I don't like those. It gives me a look which is too cute for me, sweet, and I don't like that. The eccentricity of this jumpsuit has something a little more badass. It reflects everything I want to express.

I would wear this outfit when I have to study, but afterwards would go out. I would wear this when I have to attend a serious event at my job, but also when I visit my boyfriend's parents for a night out.

When the event is going to be chicer, I would maybe swap the white turtleneck for something less playful, something neater. Something that fits the chic occasion, because I still want others to think that the outfit is a little more chic than normal.

# Interview Jasper 12-06-19

## Smart outfit

Please explain to me what items you brought with you, in terms of colours, materials and styles.

For the smart look, the colours are very basic, light blue, dark blue and white. The trousers is very soft, almost like a sweatpants, but they are quite presentable and smart, which I like. I often get remarks on the fact that they are interesting, because they are smart but still look very comfortable. I wear them as a part of my more presentable outfit.

I like them because of getting those remarks. Moreover, they are very comfortable, but I use it as my smart trousers.

The T-shirt is a very basic white t-shirt, because you can't get wrong with a basic white t-shirt. I close my shirt, and you can't see it, except for the collar, which is nice. The t-shirt has a few stains and is old, but that doesn't matter because it's hidden underneath my shirt. I would never wear this t-shirt when it's shown. It's purely functional.

The shirt is casual and light blue. It has a thick fabric which adds to the casual look. Light blue is a colour which is easily accepted, and a safe choice. The shirt has no logos. I wore it the first day at my new internship. I use this outfit to present myself as a neat man, and show myself so the people so they could have high expectations.

I want people to have expectations like he's smart, neat and well groomed

Wearing a suit would be too much for me, too much standing out. At my application day I wore a white shirt from my suit, that is less casual and which in my opinion gives me a smarter look.

I sometimes roll up my sleeves, to make the look less neat and more me.. But I only do that after I've had the meeting, or I roll my sleeves back down when I am about to meet.

When was the last time you wore this outfit? What was the occasion?

The last time I wore this outfit was when I was about to meet a new colleague of mine. I knew he would be around, so I wore this outfit to be a little smarter than usual. The reason I chose this outfit was because I didn't want to risk any bad opinions about me from the people I had to meet. The outfit is very clean. I also want the outfit to match with the person I have to meet.

I want to show the people that I know what I am doing and that they can trust me with their work.

When you think about these items, what feelings are triggered? What emotions are best to describe these feelings?

This outfit gives me the feeling of going to work hard today, and that I am presentable. That I am about to talk to people that I don't speak to very often. This outfit gives me the feeling that I have everything under control, so I will be performing well with what I will be doing that day.

On the emotive scale, my emotions are more on the calm side. 80% calm, 40-50% happy. That is being triggered by me waking up in a good mood and by my expectations of having a nice and productive day. I also sometimes force myself to wear this outfit when my wake-up mood isn't that good, to be sure I look smart. Other moments my wake-up mood isn't that good, I choose to wear a sweater, that triggers less energy. The outfit gives me peace.

When you think about the moment you last wore these items, what feelings are triggered? What emotions are best to describe these feelings?

I find this hard, but I guess it's positive. The day went well, because the conversations went well, and I positioned myself as expected. I think about those moment positively, and that I succeeded in my expectations. I gave the right impressions.

On the emotion scale, my emotions are less calm because I was a little bit nervous. I've had a little more happiness thinking about it.



Can you go back to the day you first assembled this outfit? Did you buy these items in one go or where they assembled later? What feelings were triggered in that situation?

I was looking for a casual but smart shirt like this. I bought this very considered, especially for these kinds of occasions. The trousers I bought a couple of years ago. I can't really remember when and why, I just bought these trousers because I needed a new pair of trousers. I was searching for a more groomed pair of trousers, that made me look a little bit smarter. The pants were brought into this outfit because they had a smart look, and because people complemented me when I wore them. The funny thing is that I don't want people to complement me on my clothes in these kinds of situations. But people who are close to me saw the special characteristics of the pants after a few times, but thought it was a smart pair of trousers the first time. That's perfect. The first time I want to look smart, but after a few times I want people to notice I don't always wear these kinds of outfits.

What would be the ideal situation in which you would wear these items, thinking about it right now?

When I have to give a presentation, for example next week

## Casual outfit

This time, for the more casual look, I chose a more presentable white T-shirt with a blue logo. I wear a pastel pink identical shirt on top of it but unbuttoned. In this way, you can see the t-shirt I am wearing underneath. And, I chose the same trousers.

The first day I wore this outfit to my job, I immediately got a remark, about if I was feeling loosely that day. I thought about the remark, but I didn't care about it very much, because it was my free outfit. I wasn't expecting a presentable moment, so I deliberately chose my free outfit.

Still, because I take my job quite seriously, it's not desired to get any remarks on what I am wearing when I'm working. That is why the remark was unexpected and uncomfortable. I realized after the remark that it was my free outfit, so I understood where it came from. I thought about if I should change my outfit, but I then I realized I don't have to look smart every day, so it was all right. I can easily decide for myself to look smart or not.

Also, the weather was quite sunny, so I chose an outfit that matched the weather and that was more comfortable.

Normally this would be the outfit I choose when I am going into town on my day off. That gives me a feeling of freedom. I want people to see that it's my day off kind of outfit, and that I care less about what people think about me.

My ideal day off, I go into town with my girlfriend on a sunny day during the weekend. The weather is never too hot, nor too cold (typically Dutch). The shirt can be buttoned when it's colder, unbuttoned when it's warmer, and I can even take it off.

The outfit gives me a happy and satisfied feeling, like a day without worries, stress free. On the emotion scale, it gives me a 80% happy feeling. All of my outfits are quite calm, in general. But, compared to my smart outfit, it's less calm because it's a little more outspoken (40% calm). It creates more emotions than the smart outfit, because of the outspoken color and the logo.

I also have a woolen Scottish fabric like shirt, which sometimes is fun to wear. But it is a little too outspoken for me to wear on a regular day.

I want to look like a man who is dressed well, but is not taking part of the whole fashion trend thing. A little basic, so it is easily accepted. I don't want to make a statement with my clothes. I think some more outspoken items are quite cool, but I don't think it matches my style. I would love to see others wearing it.

## Desired techno fashion

I would love the clothing to be dynamic in creating nuances when I have to dress smart, on a presentable day. When you have one moment on your day when you have to be presentable, you have to dress according to that one moment. It would be nice if you could make a switch in your outfit, from presentable to a free form. I have to be more conscious about my outfit when I'm looking smart.

# Interview Hanneke 12-06-19

Please explain to me what items you brought with you, in terms of colours, materials and styles.

I am wearing a black pair of skinny jeans, that are tight, but they have a lot of stretch. The stretch makes them comfortable to wear. They also have a high waist. On top of that I am wearing a wide fit basic white T-shirt. Over that jacket I'm wearing a wide fit dark blue blouse, made from a soft corduroy fabric. I much like the tight stretch of the jeans because it gives me all the freedom to move. That makes it comfortable to wear in all kinds of different situations, like cycling, but also relaxing on the couch. Also, because they are tight, they look well to because it doesn't hide my figure. My oversized blouse also gives me all the freedom to move, which makes them very comfortable, but also I can take them off easily.

When was the last time you wore this outfit? What was the occasion?

The last time I wore this outfit I was studying at the faculty of Industrial Design Engineering at the TU Delft. The reason of wearing this outfit also when I go studying is because the jeans are comfortable enough for when I'm seated all day. But, they are also comfortable when I have to walk a lot, when I'm going into town. I also have other outfits that are comfortable when going into town, but they aren't comfortable enough when I have to sit all day. This chose outfit is very suitable for both activities.

When you think about these items, what feelings are triggered? What emotions are best to describe these feelings?

If I think about wearing a tight t-shirt and top, I don't feel that comfortable because it gives me the feeling I am too exposed. Wearing a skinny pair of jeans, but an oversized top, makes me feel more relaxed and comfortable, and also gives me a cosy feeling. Also, the combination of half skinny, half cosy/oversized gives me the correct dose of comfort and femininity, whereas wearing both parts skinny make me feel too exposed, but both oversized too sloppy. I always chose this tight bottom, cosy top combination when my day plans are still uncertain. It's nice for getting a coffee with friends, when I go into town, etc, and will always match my mood. When for example I chose to wear a tight turtleneck, that is very much dependant on my mood. The feelings that are triggered when choosing this outfit are easiness and comfortability, but also self-assurance. Sometimes, when I choose something else to wear that they, during my breakfast, I get the feeling of discomfort and it being a mismatch. When I'm trying to wear something else, most of the times I will choose this pair of jeans. These pair of jeans are always right, it makes me feel good, it accentuates my figure, and the black colour is always easy to wear, without compromising on style. Those things help me feeling more secure. The same goes for my blouse, also because of the option of taking them off, which gives the outfit a different vibe. A different mood gives me also other options to choose from, like for example when I am planning to visit a museum or go to a birthday party, which all makes me feel self-assured and all. But, again, those are much affected by what mood I'm in, and the outfit I'm wearing right now always hits the right spot.

Talking about the 5 emotion groups, this outfit got a high score on the calm side, because of the self-assurance, and because of the safe choice. It also triggers a fair amount of happiness of course.

When you think about the moment you last wore these items. What feelings are triggered? What emotions are best to describe these feelings?

Comfort. I'm not sure if that's a term for a feeling. Just what I've said earlier, comfort, assurance. I'm also getting the feeling of that it's also a little pretty cool and sturdy. I also think I kind of look cute, but I find it a little bit awkward to say it like that. I know it looks good, which makes me feel secure as well. Of course, you wear stuff because you think it looks good on you, but when saying it like that to you makes me feel a little vulnerable too. That is because I think people can easily make judgements when you are making statements like that, and that makes me feel judgeable, and therefore vulnerable. The funny thing is that this outfit is a bit plain. Again, I am feeling very well in this outfit, but it's plain, and therefore less judgemental. Therefore I find it awkward to feed those judgements by stating I look good. Controversially, when I'm wearing an outfit that is more outspoken, I feel like it's more judgemental and I am more willing to be more outspoken about the way I feel about this look. That also makes it easier to receive judgements, but I does not affect the way I feel about it myself. This is also based on my opinion about when I'm looking at someone else wearing these outfits, and the level of making judgements I have about it.

Can you go back to the day you first assembled this outfit? Did you buy these items in one go or where they assembled later? What feelings were triggered in that situation?

This blouse was stolen from my boyfriend. It was a little too small for him, so he never wore it. I quite liked it, and therefore I took it with me. The pair of jeans I already have for a long time. I don't like to wear this blouse with light trousers, which is a pity because these black jeans are getting quite worn out. The white t-shirt and the jeans are the basics, and the blouse finishes the outfit with something interesting. We didn't talk about my jewellery yet, but I just have 2 sets of earrings, a few necklaces and they are all easy to wear and interchangeable.

What would be the ideal situation in which you would wear these items, thinking about it right now?

The ideal situation would be when I'm going out of the house and I don't have a clear plan yet what my day would bring!

## Now talking about the more fancy kind of outfit

The fancy outfit I chose is a tight red jumpsuit, with a red ribbon around the waist.

I would wear this outfit for occasions like dinner parties, weddings, other parties, when I'm going into town for getting drinks or other celebrations. Compared to the other outfit, this outfit makes me feel more lady-like. I feel pretty, feminine and sexy, in a way. It makes me feel more special than the previous outfit, but it's still quite comfortable. That is why this outfit goes a little more towards the happy side of the spectrum, compared to the other outfit being more calm and secure.

I would not wear this outfit every day, because it needs to stay special. That feeling is best described by making the comparison with the use of make-up. When you are never wearing mascara, and only use it during the weekends, people will compliment you on the use of make-up. When you are always wearing make-up, but a little bit more during the weekends, nobody will notice. That is what I like about wearing clothing. When I'm dressing up, I want to feel special and I want people to notice that. Some people want to feel special every day, but that doesn't go for me.

# Gesprek Hanneke en Maaïke 12-06-19

## Problems

- Clothing that you can only use for one kind of event, which 99% of the time will not be used
- Clothing that looks nice but doesn't fit comfortably. The feeling that is matched with that item isn't a good one, so negative feelings are matched.
- The problem with sexy or nice looking outfits is often that it asks and needs a lot of attention. You are constantly checking and adjusting to make sure it stays nicely, or that there are no flaws. You are over conscientious.
- Maaïke and Hanneke both would like to dress sexier and nicer when they go for a day of studying, but the discomfort makes them wearing different clothes.

## Ideas

- A person wants to dress himself comfortably, but wants to look great as well
- Clothing should change dynamically according to a person's mood. One mood can decide for me to wear a stiff/rigid pair of jeans, but the other mood wants me to wear a stretch denim that is more comfortable to move in. A piece of clothing should feel what mood the wearer is in and should adapt to that mood.
- Some days you want to wear control the clothing, but other days you want to be controlled by what you are wearing. A good mood vs. a bad mood. A clothing should dynamically adjust to that. The same piece of clothing should fulfill both needs matching both kind of moods.
- Sometimes a mood does not always match what is comfortable to wear on that particular day. For example, when a girl wants to feel sexy during the day, but they go for a day of studying, it is not always desired to wear revealing clothes. When having a break, it is desired to wear sexy clothes, but when actually studying and going to the toilet, it is not always desired. Those little nuances in moods should be reflected in dynamic clothing.

## Insights

- Whether a piece of clothing, for example a pair of jeans, will make you feel styling or sexy depends on the mood you start your day with. When a day is started with a good and fresh mood, a pair of jeans can make you feel pretty and stylish. On another day, when you wake up with a bad mood, the pair of jeans all of a sudden feels sloppy. On such a day, a regular stylish kind of pants, like thin fabric wide legged pants, is an easier option to feel stylish than jeans.
- That is why some people can't think about what they should wear the day before the actual day, because it's very dependent on their mood.
- When the waking up mood is like feeling good and happy, that creates more mind space. More mind space gives the environment more room to affect you, so a rigid pair of jeans doesn't have too much impact on your mind. When waking up with a bad mood, there is not a lot of mindspace, so there isn't much room left for the environment to affect you, so there is a need for a more fluent and easy-to-go-to pair of trousers.
- A rigid pair of jeans needs to be worn by you, and you have to feel like it. You have to rock the jeans, in a way that your mood controls the way you feel when the jeans are worn. But, the more accessible thin fabric trousers wear you, and there is not much need for you to control those trousers.
- Some people have the attitude that they are wearing and controlling their clothing. Those are the more expressive kind of people. Others, who may find themselves less expressive, have more difficulties on wearing and controlling their clothes, so they are in need for more accessible pieces.
- Sometimes you buy a piece of clothing, and you are not sure whether it is going to be something that you are going to like to wear in the coming times. You have to start learning how to wear it and experiment with it, because on the one hand it needs to match your personal values in style expression, but on the other hand it needs to change your current style a little bit, or you need to find ways to combine it with other items. Sometimes it works out, and you will grow into that item, so to say, but with another item it just doesn't work out. Sometimes you really like an item, and the way it looks, but you can't find ways to wear it so that it suits you.



# 2. Design characteristics

## 2.1 Calm/subtle

Calm



Bedsheets

The softness and light colour of bedsheets visually creates a feeling of relaxation calm, because it reminds of laying comfortably in bed.

Calm



Dimmed sunlight

The dimmed sunlight gives a calm feeling and evokes positivity, because it reminds of life and invigoration

Calm



Cold nature surroundings

Cold nature gives a visually calming effect, because the scenery is wide and open, without a lot of urban distractions. The nature and the cold also reminds of the desire to get active, which gives a calm, healthy and fresh feeling.

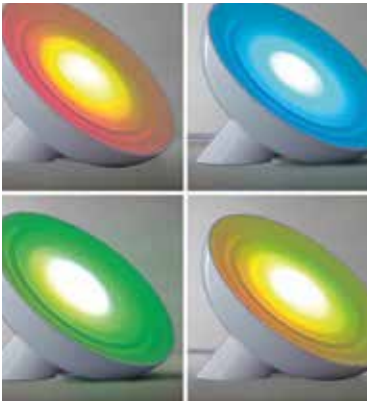
Calm



A warm bath

A warm bath gives a visually calming effect, because of the fresh water, the possible bath soap, maybe candles, and because of the steamy air around it. It reminds of a relaxing time with no distractions

Calm



Mood lights

This mood light brings a feeling of calmth, because it represents nice moods and it presents a dimmed hue, which colour can be changed, according to the need of the user

Calm



Dimmed lights

The dimmed hues and colours of these lights give a calming effect, because of the fact that the lights are peacefull for the eye, being the opposite of flashy and undesired

Calm



Taylored garments

Taylored garments can give people a visually calm feeling, because the clothing fits the wearer perfectly, and it looks well groomed



Calm



Clouds

Clouds in a blue sky can give a visually calming effect, because it reminds of the airy character, and because of the soothing shapes and colours.

Calm



Asian-inspired interiors

Asian-inspired interiors give a calm and airy visual appearance. That is because of the very aesthetic and minimalistic interior, and because it reminds the honourfull asian traditions.

Calm



Visuals of an aquarium

The hues and the movement of the water gives a content and calm feeling, because of the soothing blue-ish colours and the slow movements of the fish in the water

Calm



Soft grass

The soft and moist texture, and the healthy deep green colour of grass, when laying in a park, has a calming en stress free effect, because it reminds of a healthy and relaxed environment. It also creates nuances of hapiness, because of the freeing effect of fresh nature

Calm



An old-fashioned comfortable chair

The soft, foamy, leathery and robust texture of an old-fashioned chair gives a calming and relaxing visual effect, because it reminds of a comfortable support and because of the old-fashioned genuine build, robust feeling.

Calm



A fireplace

The flickering flames and the orange colour of the fire in a fireplace has a calming and relaxing effect, because it reminds of coming home and relaxing in the cozy and warm living room

Calm



"Van Gogh Path" by Daan Roosegaarde

This bike lane, designed by Daan Roosegaarde, bring a feeling of calmth, because it enlights the dark surroundings, it gives guidance, but foremost it reminds people of the stars

## 2.2 Happy/expressive

Calm



Bedsheets

The softness and light colour of bedsheets visually creates a feeling of relaxation and calm, because it reminds of laying comfortably in bed.

Happy



Christmas tree

A Christmas tree gives people happy feelings, because the colours and the lights remind people of good times with family and friends during the Christmas holidays.

Happy



High contrast

The large contrast between the black and neon green colour gives excitement, and therefore evokes happiness.

Happy



Round puffy shapes

The round puffy shapes of these lights give a joyful and happy experience, because of the playfulness and childlikeness.

Happy



Leaves

The shapes and colours of plants, leaves, and other green nature evoke happy feelings, because it reminds people of life, freshness, and healthiness.

Happy



Rainbow

The combined colours of a rainbow give people happy feelings, because it's special and unique, and it reminds people of good weather, and fairytales.

Happy



Hearts

The red colour and the shape of hearts bring joy and happiness, because it reminds people of love.



Happy



Flowers

Flowers generally evoke a happy and energetic feeling, because of its bright colours and liveliness



Exotic fishes

The colours of these exotic fishes gives a happy and joyfull feeling, because of the small and curved shapes, the innocent expressions and the lively colours



Expressive artworks

The combination of the artcity and the expressiveness of this artwork wall gives happy feelings

Happy



Balloons

The balloons, with it's filled and round shape, and the often bright colours that are used, evoke happy feelings, because it reminds people of parties and other fun festivities.

Happy



Disco ball

The disco ball, and it's reflection of light, evokes a feeling of hapiness, because of the bright lights and the reminder of fun parties, dancing and disco music

Happy



Stage lights

The flashiness and colours of these stage lights gives an euphoric, energetic and happy feeling, especially in combination with the intense experience of music.

Happy



Lace fabric

The embroidered flowers and the partially see-through of lace fabric gives a happy feeling, because it reminds of intimacy and lust, and makes a person feel sexy.

Happy



Soap bubble

A soap bubble, especially with kids, brings a very happy feeling because of its shape, colours and playfulness. For older people, it can evoke the same feelings, but foremost nostalgia.

Happy



Playfull shapes

The soft organic shapes of the objects, combined with bright colours, express playfulness and evokes hapiness

Happy



Non matching pair of shoes

The combination of two different shoes, with different colours, but worn together, brings joy and hapiness, because it looks funny and weird in the first place, but when styled right, it looks good and shows not taking life so seriously.



## 2.3 Animal expressions

Blue morpho butterfly



**Characteristics:**  
The large blue wings aren't actually blue, but reflect light in a certain way. The other side of the wings are brown and have a print with eyes, which is used to misguide predators by letting them think the eyes are from a larger animal.

Buff-breasted sandpiper



**Characteristics:**  
The sandpiper shows the bottomside of their wings, which are silver coloured. When wooing a mate, the male birds flash their wings and show their 'armpits'. The female then can decide whether to mate, or just move on.

Peacock Spider



**Characteristics:**  
These spider have long third legs and a very flashy rear flap. When trying to impress a female, they raise their third legs and send out vibratory signals. Moreover, they lift their rear flap and show off their decorations, trying to impress.

Hooded Seal



**Characteristics:**  
The Hooded Seal have a large inflatable balloon on top of his head. When showing off to a male in order to win the female, they blow up the balloon in order to scare away the other male. The stronger the Seal, the larger the balloon, the less chance the other male will win from this Seal.

Poison dart frog



**Characteristics:**  
The poison dart frogs are very small, but have a smooth and very colourful skin. The patterns warn their predators of their toxicity.

Swallow-tailed hummingbird



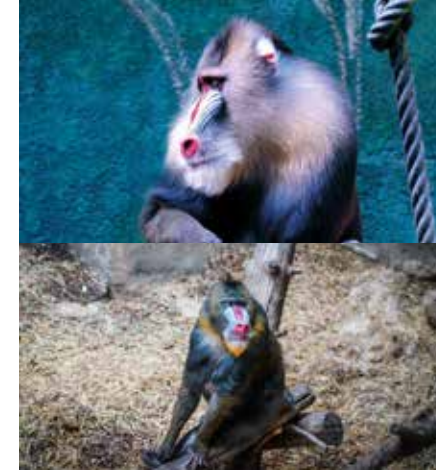
**Characteristics:**  
The colours of the plumage of this hummingbird is a mixture of green, blue and purple, and the bird has long forked tail and a long and sharp and long beak.

Bird of paradise



**Characteristics:**  
The bright coloured birds try to impress a female by performing a dance, before dancing, they push their feathers up to form some kind of skirt.

Mandrill



**Characteristics:**  
The mandrill has a very colourful nose. The colours are used to show excitement, and become brighter once the mandrill gets more excited.



## Greater Sage Grouse



**Characteristics:**  
The Sage Grouse comes together in a group with 70 others to compete for female attention. They do so by fanning their tail feathers and filling air sacs in their chest. Finally, they produce sounds of vocalisation to also gain attention.

## Great frigatebird



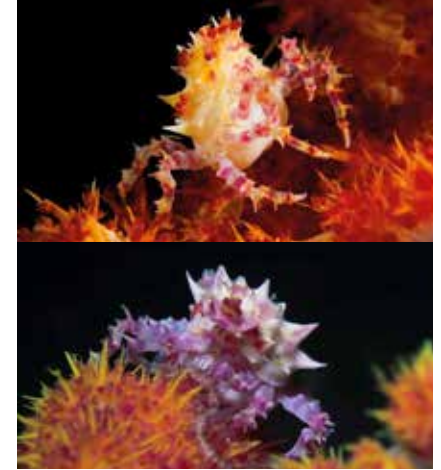
**Characteristics:**  
These birds inflate their red throat sacs with air, in order to attract the attention of the female birds. When they succeed, she will fly down and land alongside the male bird.

## Tiger



**Characteristics:**  
The hairy and striped fur of the tiger are meant as a camouflage in warm countries like in Southeast Asia. In this way they can get camouflaged in long grass when approaching their prey.

## Candy crab



**Characteristics:**  
The pointy and sharp shell of the candy crab can change of colour, like red, white, yellow and pink, so it can camouflage itself between the coral reef.

## Flamingo



**Characteristics:**  
The flamingo is characterized by its long and thin legs and neck, and its bright pink colour. They are well known for their flamingo mating dance, in which they move completely synchronized with a certain coreography. Furthermore, their pink colour comes from eating certain algae. The more efficient they search to get the algae, the pinker they get, which means they become more attractive for mating.

## Sunset moth



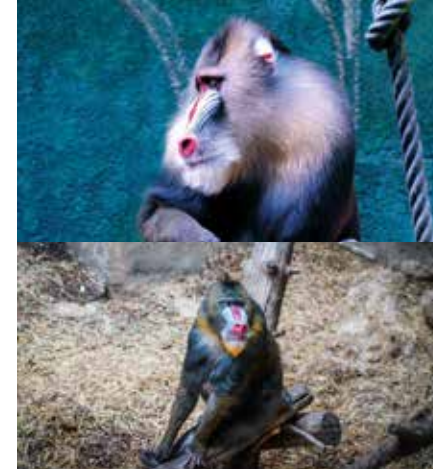
**Characteristics:**  
The patterns on the wings of the sunset moth are extremely colourfull and asymmetric. The colourfull appearance warn predators of their toxicity. The the skin of the wings are iridescent.

## Squid



**Characteristics:**  
The squid can change their colourful skin in an instant, in order to become camouflaged in their surroundings. The tiny dots in their skin can become bigger and smaller, due to small pigment muscles that are called cephalopods

## Mandrill



**Characteristics:**  
The mandrill has a very colourfull nose. The colours are used to show excitement, and become brighter once the mandrill gets more excited





# 3. Techno-Fashion benchmarking

Foil that changes in transparency



Intimacy 2.0 by Studio Roosegaarde

This suit is constructed from leather and smart e-foils, that can become less transparent in response to the wearers heartbeat.

Tiny LED's embedded in jacket



Bright Jacket for Holst Centre, by Marina Toeters

Tiny LED's are embedded in flexible smart fabric with interconnected technology, and miniaturized technology



Phosphorescent compound engineered membrane



Solar Charged Jacket by Vollebak

The jacket consists of a translucent mesh that houses a ultra thin membrane, made from a phosphorescent compound that absorbs sunlight. It's extremely responsive, and reflects fluorescent light when it's exposed to dark environment.



Glas spheres embedded in resin, added to fabric



Black Squid Jacket by Vollebak

The resin the jacket has been treated with contains 2 billion black glass spheres. The glass spheres let's light travel through them, and reflects it to the original light source together with scattering away from it simultaneously. It looks like it's emitting light.



A smoke generator embedded in a 3d printed structure



The Smoke Dress by Anouk Wipprecht

This dress had a smoke generator on it's back, releasing smoke surrounding the wearer when someone is approaching. It also has a LED system.



A touch sensitive garment with reacting lights



Tender by Matthijs ten Bohmer

The garment is made from touch sensitive fabrics, with embedded LEDs that react on different ways of touching. By stroking, it is possible to move the lights, for different functionality.



Loosely woven heat reactive textile



Dynamic Colour Textile

The strings of this textile can be individually heated, and have been treated by thermo sensitive pigments. Thus, they can individually change colour. Because of the loos woven structure, the threads can be moved individually as well, which can be used to create interesting patterns.

Moveble patterns with integrated shape memory alloy



SKORPIONS by XSLabs

The patterns cut in the dresses of XSLabs can be adapted, by activation controlled electronics. That trigger shape memory alloys to change it's shape.



Light patterns underneath cut structures



AWE Goosebumps by Sensoree

The structure is cut out of the fabric, showing lights that show breathing patterns. The sides also show silicone inflatable that lets the Kirigami to stand on end like goosebumps.



Constructed dresses that transforms



Rise by Hussein Chalayan

Nothing about integrated technology, but these dresses by Hussein Chalayan can be transformed with a single tuck.

Laser cut patterns that open up when exposed to air streams



SKYNEEL Apparel by Paulien van Dongen

The dragonfly patterns are cut in such a way that they open when exposed to air streams, in this case when flying through the air.



Multiple treated fabric layered garment



Chameleon by NEFFA

The scarf consists of 3 layers. The first layer has been thermogonically treated, so that the green colour disappears. The second layer has been treated with photoluminescent ink, which shows a green-bluish colour when exposed to darkness. The final layer reacts to UV light, in which it shows it's orange colour when exposed to day light.



Colour changing costume reactive on (body) heat

CHACUN(E) by Kristy Kuusk

The costume is made from crochet fabric that has been dyed with thermo sensitive pigments. When heated, the black colour changes transparency, and reveals the original colour of the fabric.



Folded fabric with imbedded motors, triggered by light sensors

Living Pods by Ying Gao

The curls made from folded fabric are connected to tiny electro motors, and can be triggered and moved by light sensors.



Fibre optic crochet

Fiber optic crochet by Kristy Kuusk

Crochet with fibre optics to generate light and energy. Light is sent through the origin of the piece of fibres, and the fibres starts to light up. Different colours can be sent through to create the desired effect.



Mechanical legs reacting on approaching and breathing sensors

The Spider Dress by Anouk Wipprecht

The legs of this spider dress react on people who approach the person, who is wearing the dress, in a certain way. They can expand aggressively or inviting. It also has a LED system.



Folded garments with hidden pneumatic pumps, triggered by movement and sound

Walking city by Ying Gao

The origami folds of the first dress are triggered by movement sensors, and are dynamic by filled air with the use of dynamic pumps. The second dress works the same way, but the pumps are triggered by microphones and sound.



Robotics with twisting and turning fibrous panels, animated in the presence of strangers

Animated dresses by Ying Gao

The nylon mesh panels are twisted and connected to rotary motors. These motors are triggered by a finger print scanner in the neck of the dress. When the finger print of the stranger has not been recognized, the panels start to twist and turn.



Tiny motors that move around parts of the fabric, that illuminate in the dark

(No)where, (Now)here by Ying Gao

The left dress is covered in tendrils of photoluminescent thread, that lights up when it's dark and which moves around when the person is being stared. The right dress works in the same way, but unformed threads are the basis, on which ribboned cut fabric is put on top, that can be moved around.



Series of dresses: Rights one has movement and stretch sensors that control LED's

Beta Textile project dress, by NEFFA and

The left dress on this picture has moving and stretch sensors that enable the arm to control lighting in the shoulder, by moving the arm around. The concept version also has push sensors inside a pair of gloves.



Memory metals in dynamic dresses

Spring 2007 collection by Hussein Chalayan

In 2007, Hussein Chalayan amazed the world with memory metals embedded clothing, that could be remotely controlled to change it's shape. This revealed dress designs from different eras.



Lights embedded in 3d layered dresses

Spring-summer 2016 by Ilja Haute Couture

This spring-summer 2016 collection by Ilja Visser has lights embedded in it's 3d layered dresses. The colours represent skin tones, like nude, pale pink and emerald green, and show the skin interaction with the environment.



Interconnected garments

Elephantasia by by-wire.net

A set of 3 garments that are interconnected. One skirt manages the wireless connection, but can disconnect by creating another silhouette, made possible by magnets. The jacket can get more or less isolated through shape change by electro magnets. The shirt measures body warmth.



Lace with flowers that appear when heated

Abloom (G) by Marina Toeters

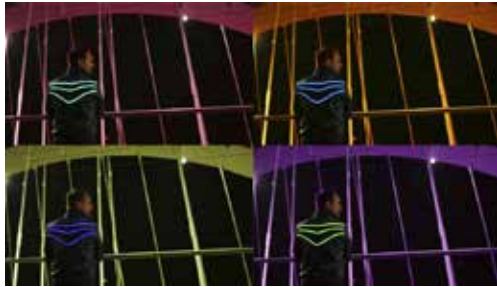
The flowers printed on the textile appear when the fabric becomes too hot. The print reacts on warmth and will appear and disappear.



A jacket with embedded electroluminescent wires

Lighting Jacket by NEFFA

The jacket has electroluminescent wires embedded in the back of the jacket. The wires are made from copper covered in phosphor, that glows when being powered.



Clothing with embedded lasers



Laser Dresses by Hussein Chalayan & Moritz Waldemeyer

This dress by Hussein Chalayan embedded hundreds of moving lasers, that is being refracted by crystals. They are all embedded in the fabrics.

Soft robotics with embedded LED's



Soft robotics by Jasnarok

Jasnarok made a few examples of soft robotics with embedded lighting. The pieces, all in- and deflatable, show different structures, like spikes, dotted textures and pointed domes. They show different haptic and visual experiences based on different emotions.



LED's connected with conductive fabric and glue



Led prototype for MaanR&D by Marina Toeters

The MaanR&D logo is laminated on Lycra fabric, with LED's glued on the fabric with conductive glue



15000 leds embedded beneath fabric

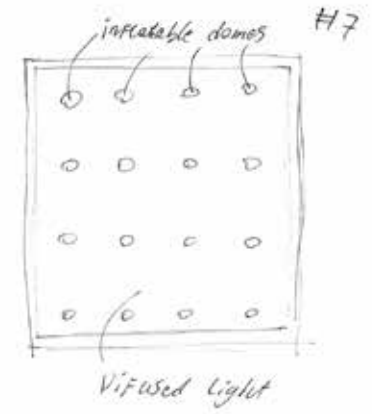
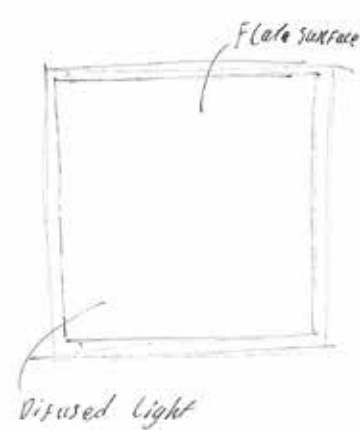
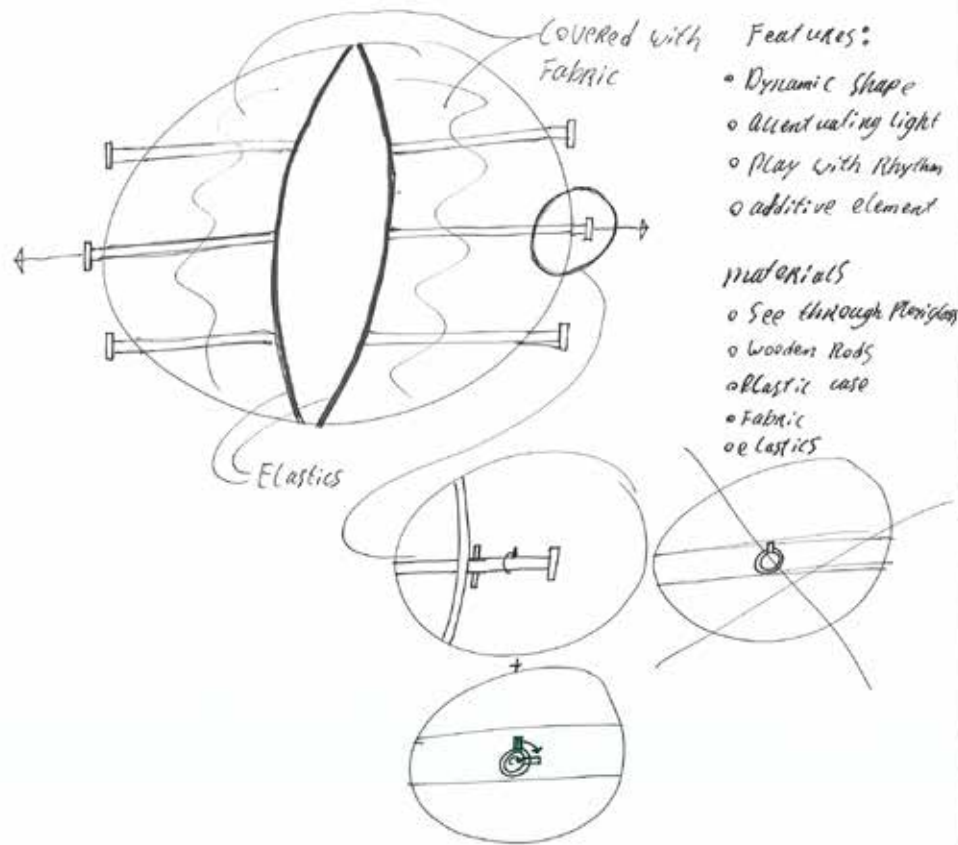
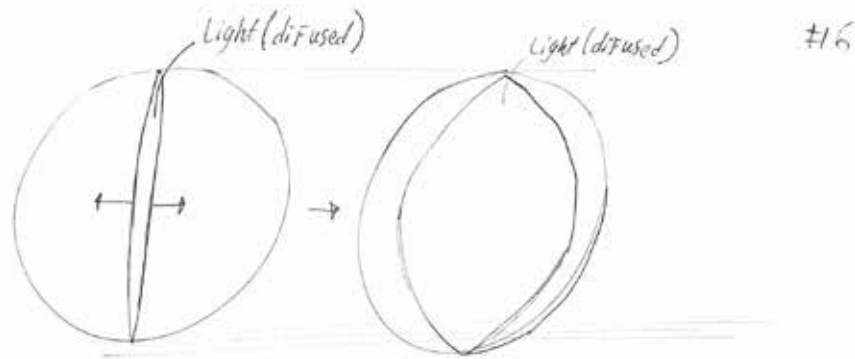


The video dresses by Hussein Chalayan & Moritz Waldemeyer

The video dress by Hussein Chalayan and Moritz Waldemeyer presents 15000 leds that can show moving images, like silhouettes of sharks or a sequence of a blooming rose.



# 4. Initial form principle ideas



SOFE Robotics inflatable  
(Like Yasna Rok)

- Features:
- Dynamic patterns
  - attenuating lights
  - additive elements
  - play with Rhythm

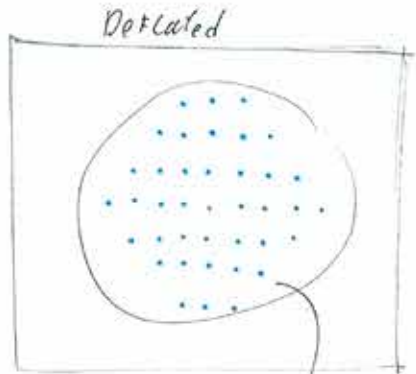
- materials:
- Silicones
  - Plastic casing
  - LEDs
  - See-through Plexiglas
  - air pump



8

# Inflatable dome

#12



small holes  
no light

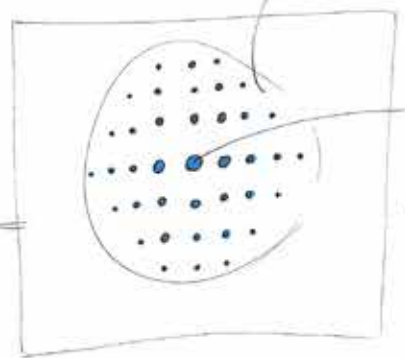
Size: 30x30 cm

## Features:

- Dynamic shape
- accentuating lights
- play with rhythm of inflating/deflating
- additive element

inflated

flexible/elastic



too-though holes  
(but air tight)

larger holes  
letting light through

## materials:

- OLED's
- 
- plastic casing
- pneumatic pump
- air vent
- wooden baseplate (MDF)



De flated



inflated

With Pneumatic pump

With gas?!  
stage effects

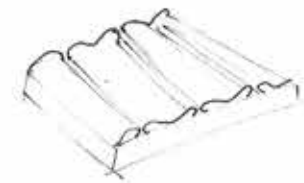
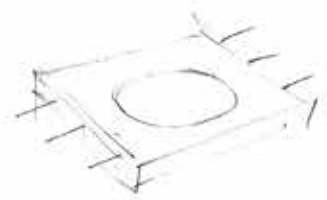
# Modular plastic box



Buy?  
make?

Plastic box to house the electronics.  
Enables to fit multiple test

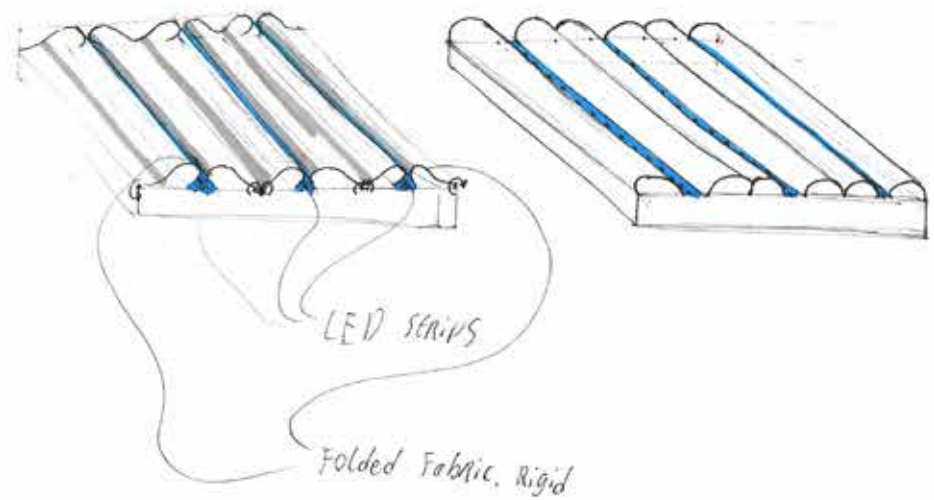
Different mock-ups can fit on top



# Folded Fabric with LED strips

#11  
R

3D-view



Andere Newyinger?

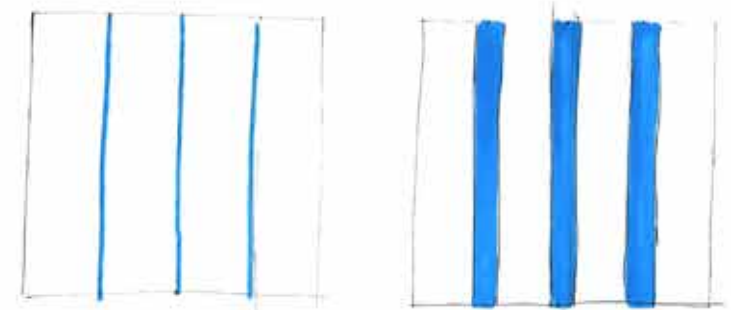
## Features:

- Dynamic shape and pattern
- Use of dynamic lights
- Slow change of dynamic pace
- Total silhouette of dress

## materials:

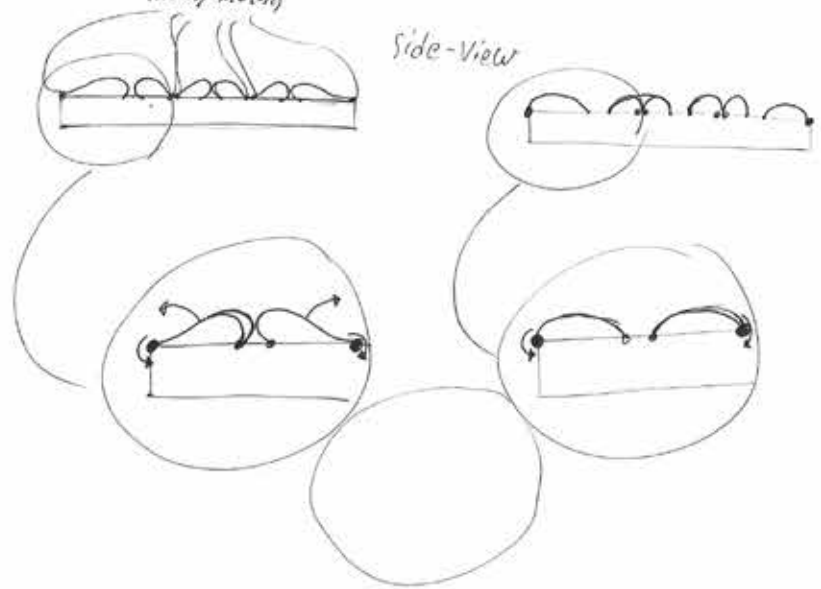
- Plastic casing
- LED STRIPS
- Rigid non see-through Fabric
- Steel Rods
- Rotary motors

## Top-view



Rotary motors

Side-view



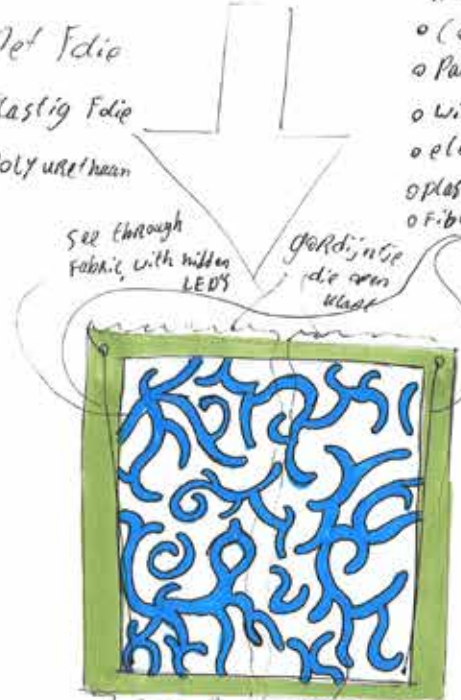
# Flipover Print Reveal



#2  
2<sup>e</sup> Ronde  
Van #2  
vorm  
analyse op  
lichaam

Pet Fdie  
Plastig Fdie  
Poly urethaan

- materials:
- Coloured Fabric
  - Patterned Fabric
  - Wires
  - electro motors
  - plastic case
  - fiber optics
  - Wires



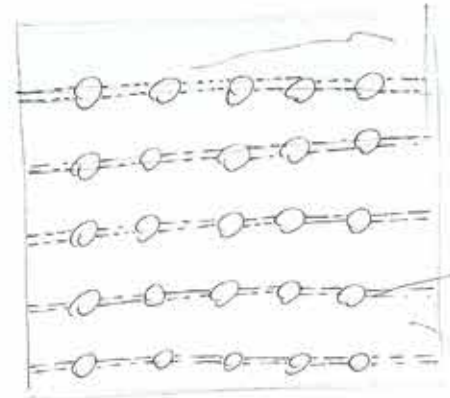
(lined by  
Rotary  
electro  
motor)

- Features:
- Dynamic pattern
  - Accentuating lights
  - additive element

Nylt snijden  
just met een gordijn  
die omhoog gaat

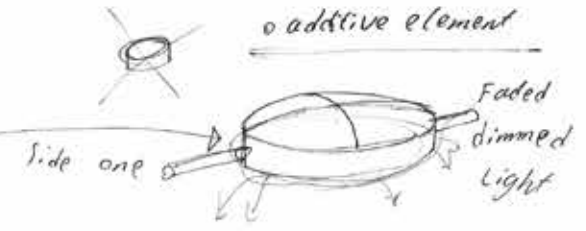
Can change colour  
Fiber optics

# Turn around dimmed/bright lights

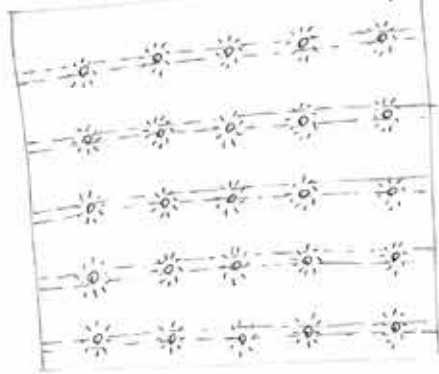


met rooll  
of wolkjes  
stof

- Features: #9
- Dynamic lights &
  - Dynamic texture
  - play with Rhythm
  - additive element



all lights turned around



Fabric



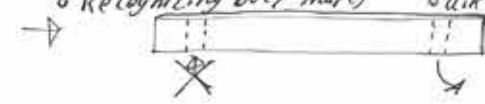
- materials:
- Steel Rods
  - LED'S
  - Small plastic domes (3d print) (thermovolm)
  - plastic casing
  - Fabric

# air wave

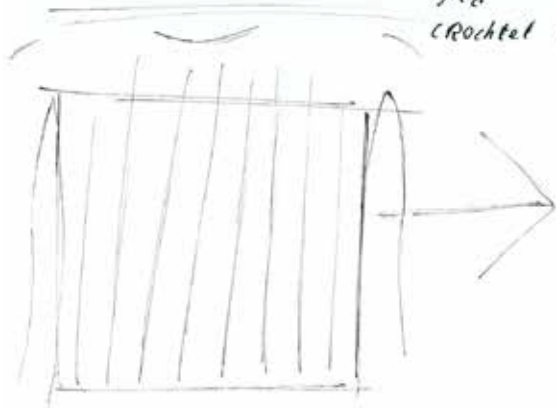


- Features:
- Dynamic and moving shapes
  - play with Rhythm
  - Recognizing body shapes

- materials:
- plastic casing
  - air vents
  - soze plastic fabric
  - air pump



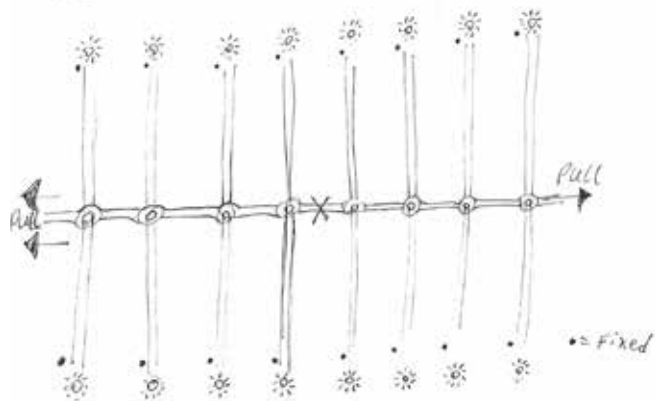
# First ideas



Straight Fiber optics

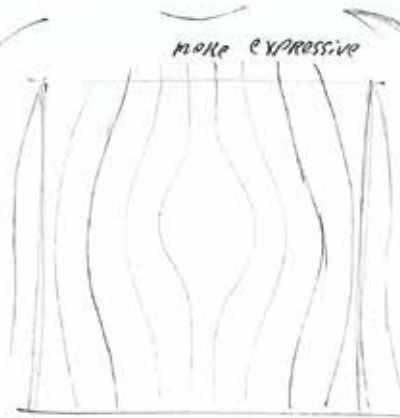
Colour: a shade of (icy) blue

Technical:



# Play with moving lighted whiskes #4

Mid (Richtel)



make expressive

Features:

- Dynamic patterns
- Concentrating lights
- Recognizing body shapes

materials

- Plastic case
- Fiber optics
- LEDs
- see through wires
- Electro motors

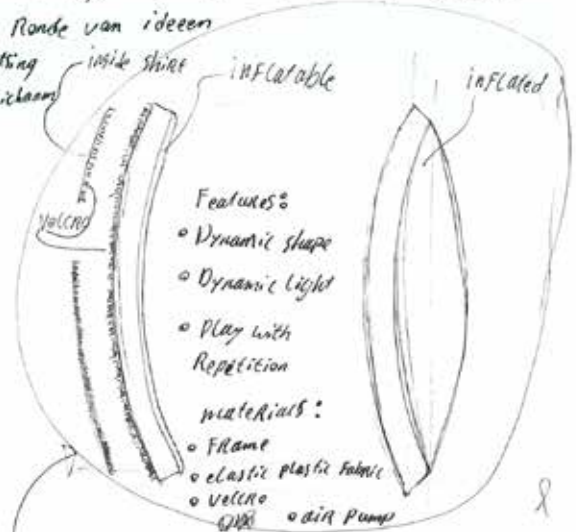
(Curved Puffy Shaped

Fiber optics

Colour: a shade of Bright green (grass)

# Play with inflatable shapes #5

2e Ronde van ideeën  
Plaatting op lichaam

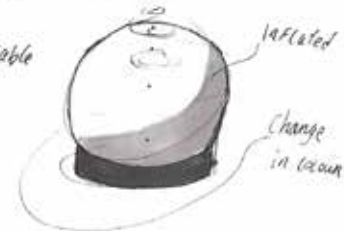


Features:

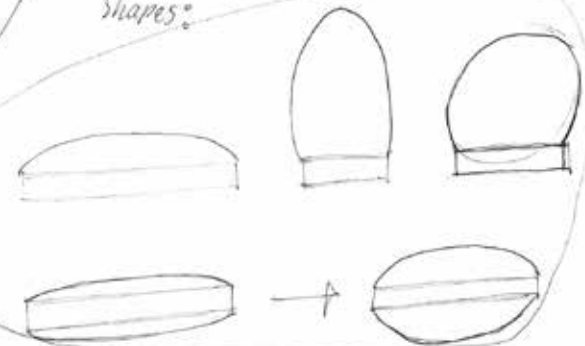
- Dynamic shape
- Dynamic Light
- Play with Repetition

materials:

- Flame
- elastic plastic fabric
- Velcro
- dirt Pump



Shapes:



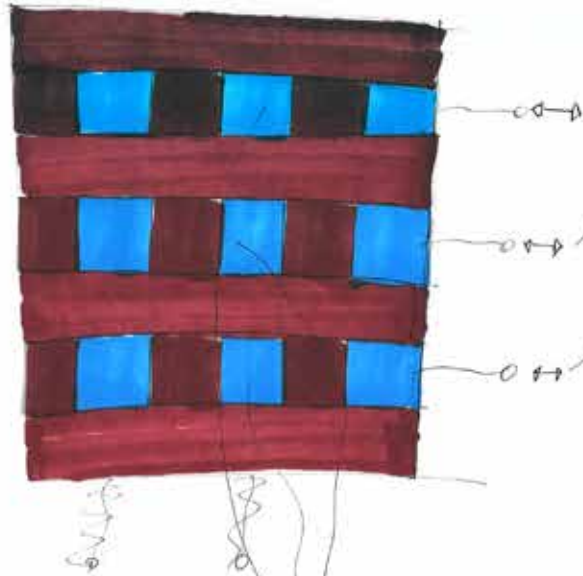
maybe

Ribbed? Small effect, need to test on body!



# Light Reflection in moving fabric

#1



waves, which creates a light effect in the fabric's texture (elastic, so it responds)

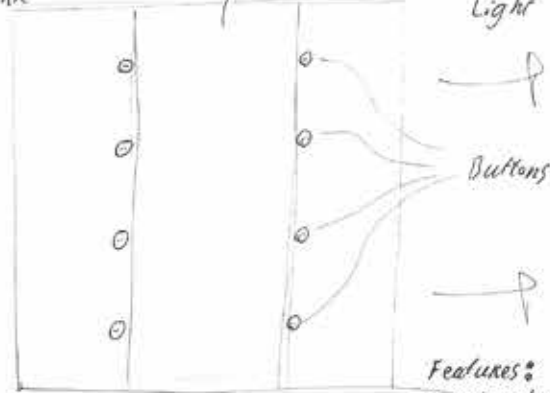
- Features:
- Dynamic pattern
  - Play with rhythm
  - extra features

- materials
- plastic casing
  - natural fabric
  - reflective elastic material
  - wires

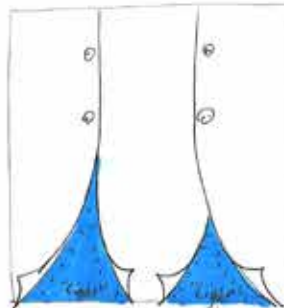
Reflective/satin/light diffusing fabric

# Deformed non see-through fabric

#13



Buttons

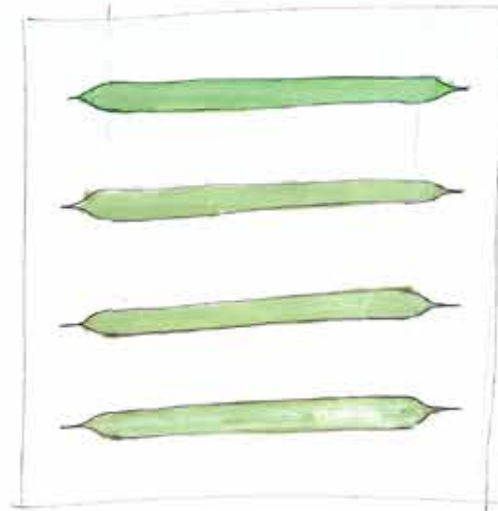


- Features:
- moving shape
  - all-encompassing contours
  - total silhouette

- materials
- plastic casing
  - fabric + buttons
  - diffusing plain glass
  - LEDs

# Inflatable cylinders, with LEDs

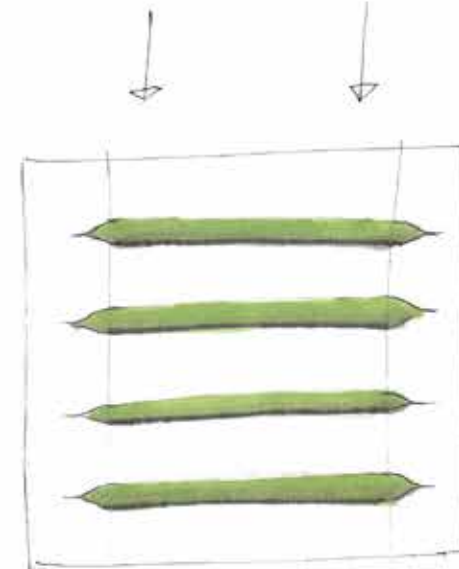
#2



Deflated, very dimmed lights

- Features:
- Dynamic patterns
  - Dynamic lights
  - play with rhythm
  - Recognizing body shape

- materials:
- plastic fabric (see through)
  - plastic casing
  - MDF base plate
  - LED strips



Inflated, lights on (bright)

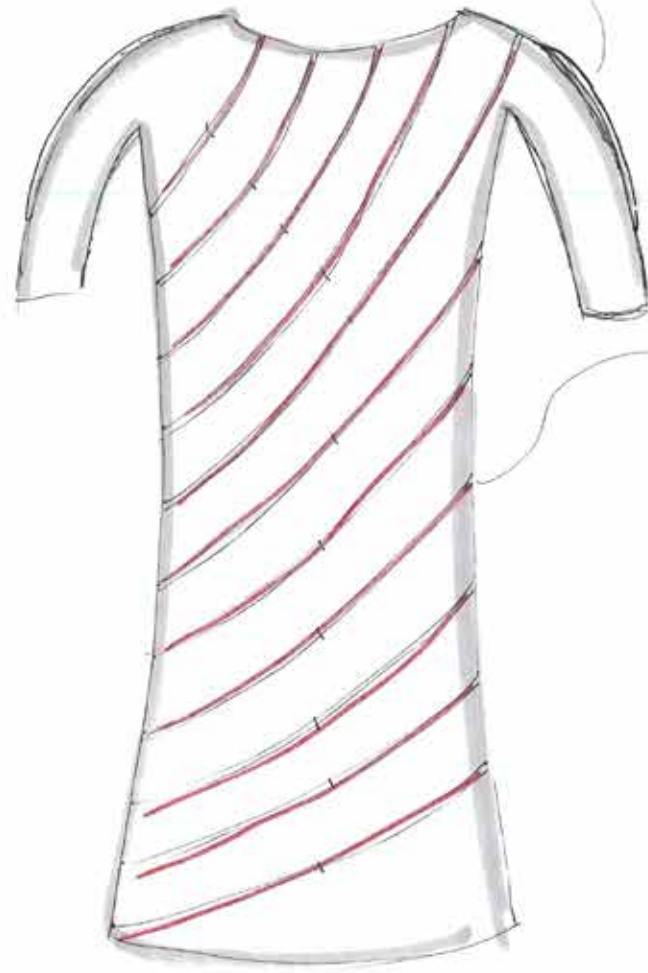
- air pump



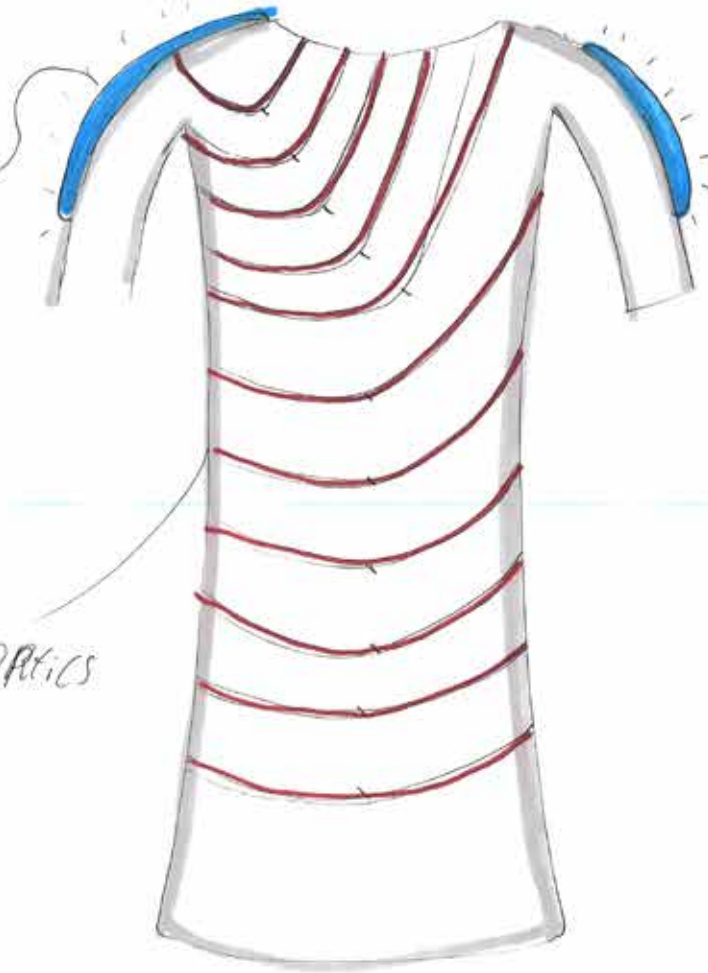
# 5. Form principle dress designs



# GARment #02

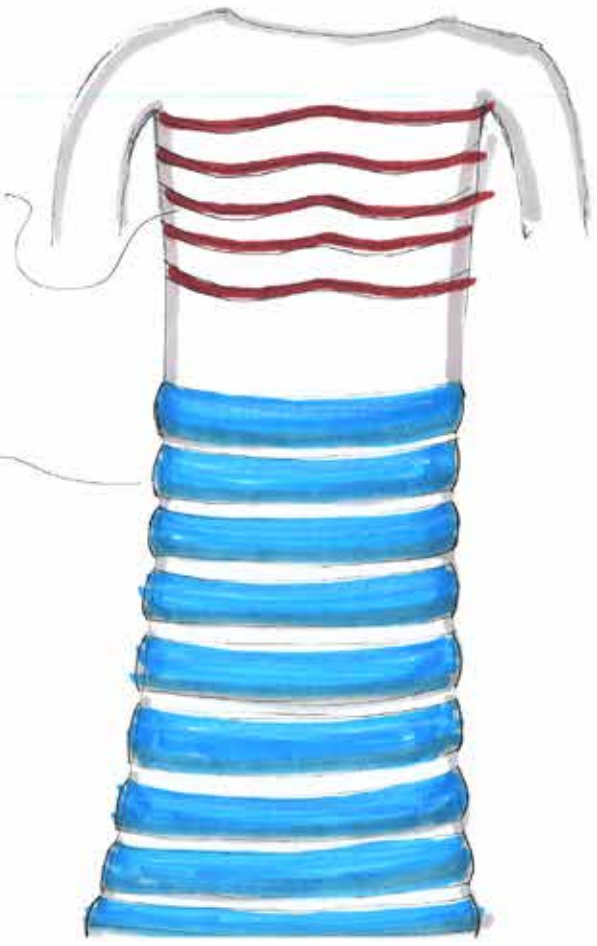
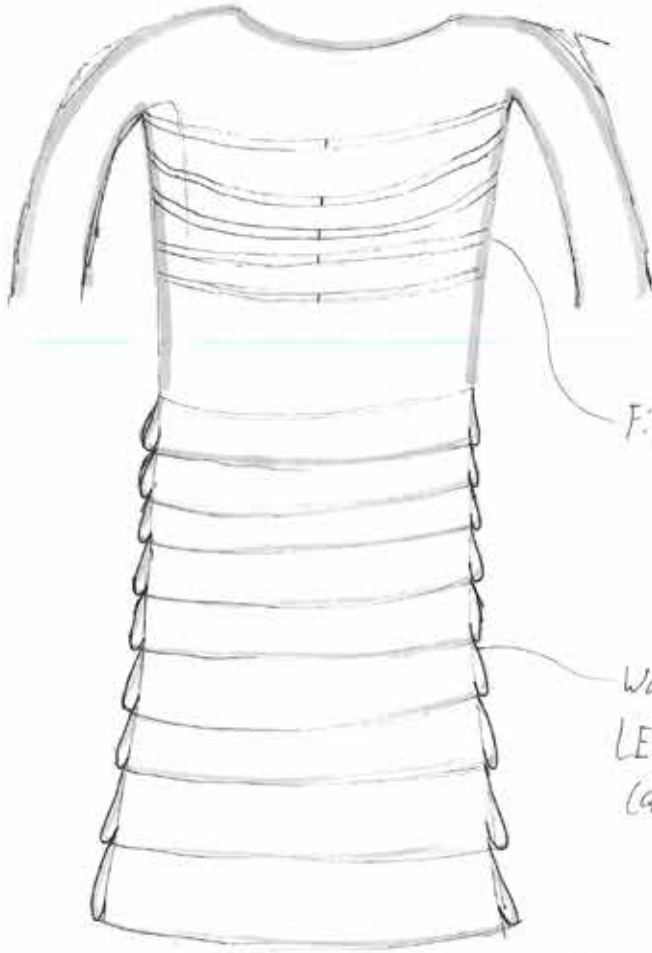


inflatable  
LEDS inside



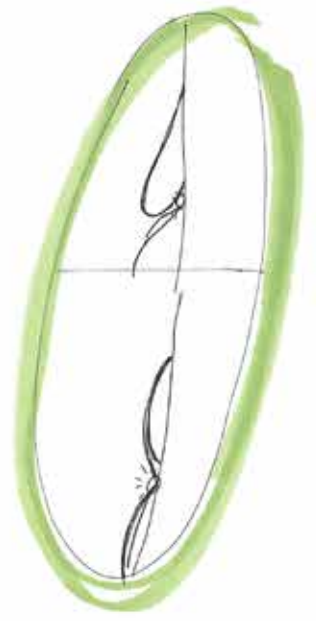
Fiber optics

# GARMENT #03

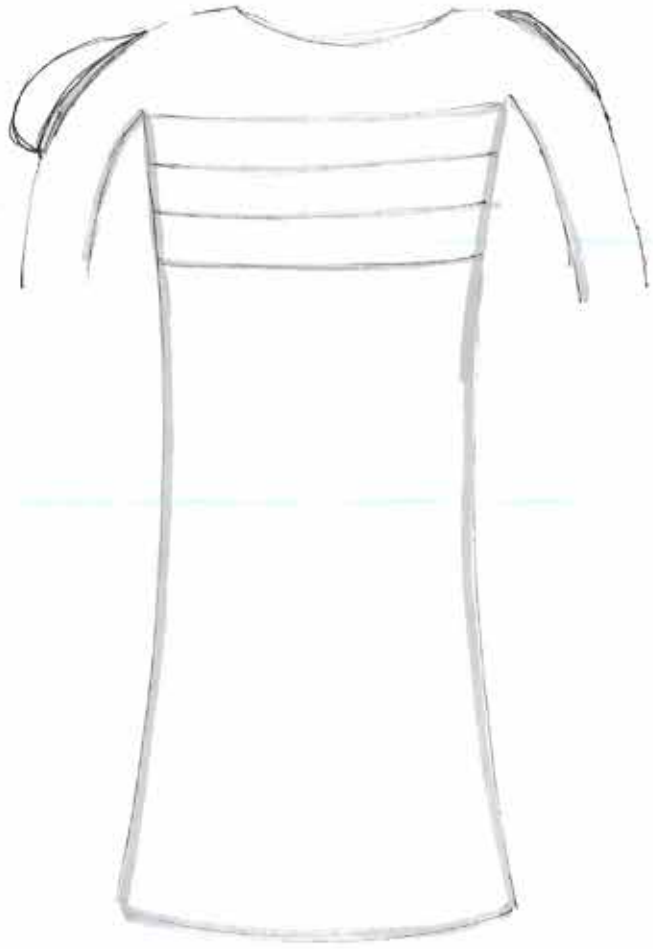


Fiber optics

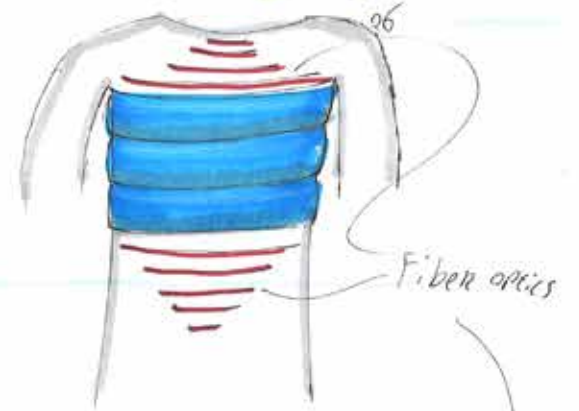
Wave Folds  
LED'S inside  
(or not?)



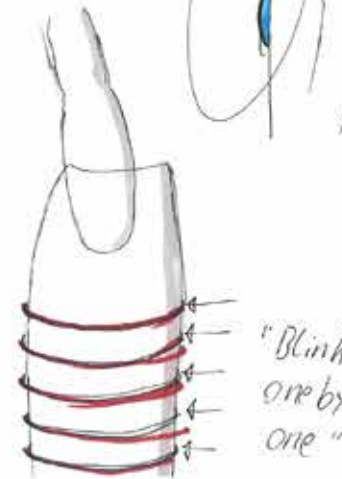
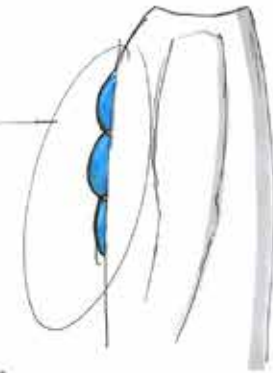
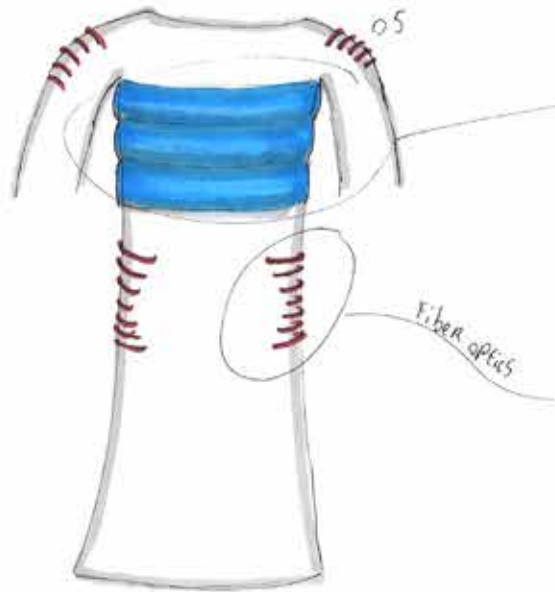




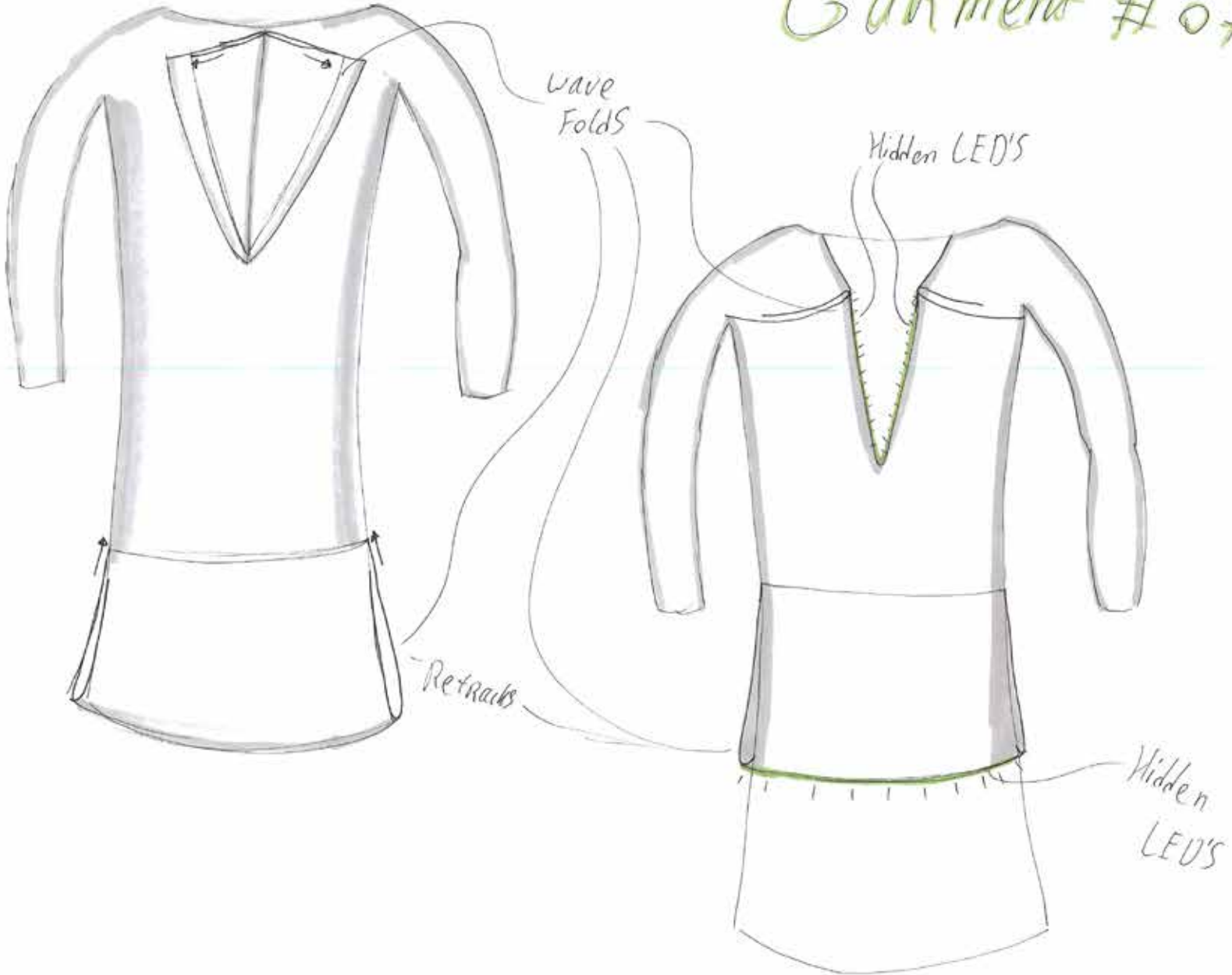
GARment  
#04 + #05  
#06



OR



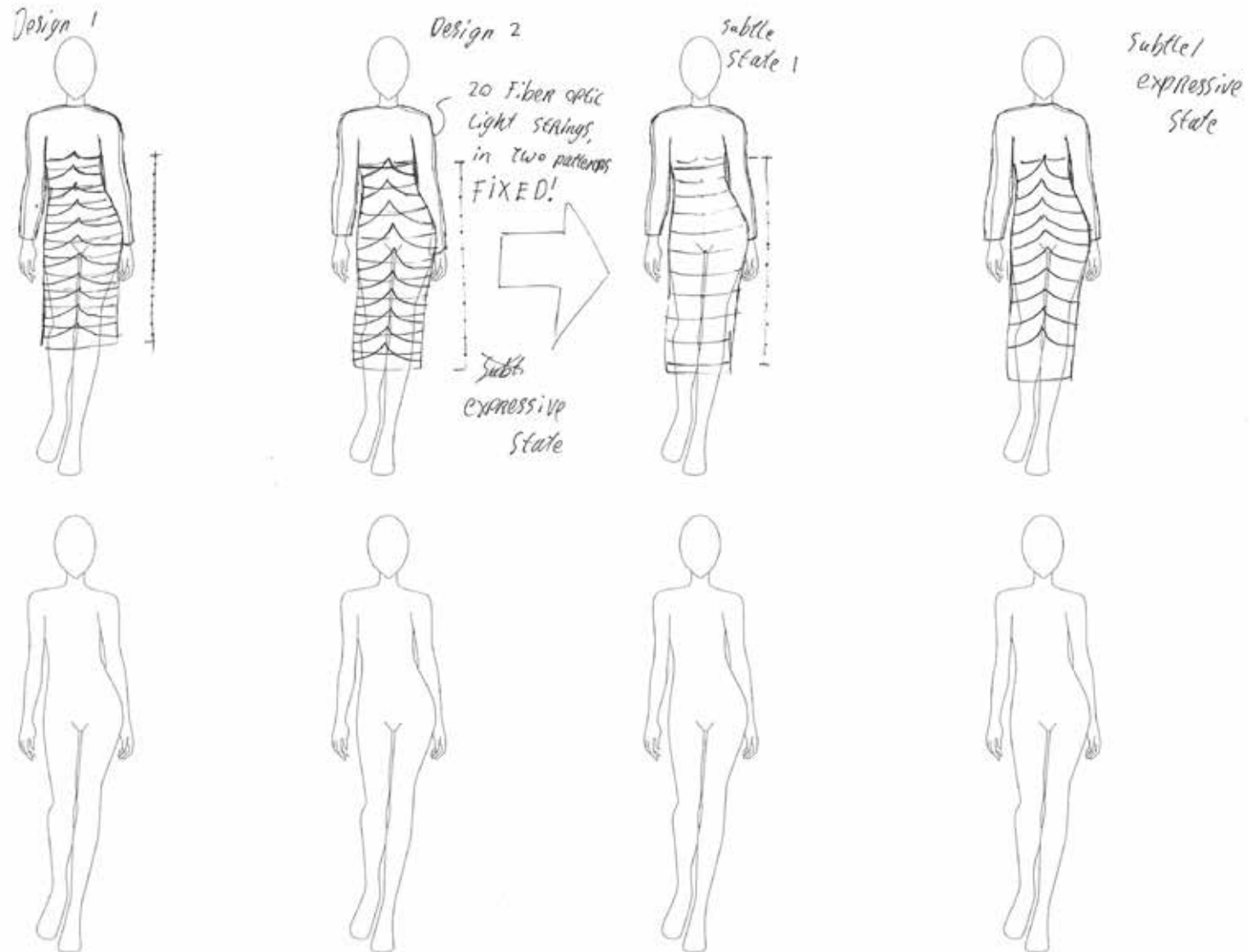
# GARMENT #07



# GARment # of

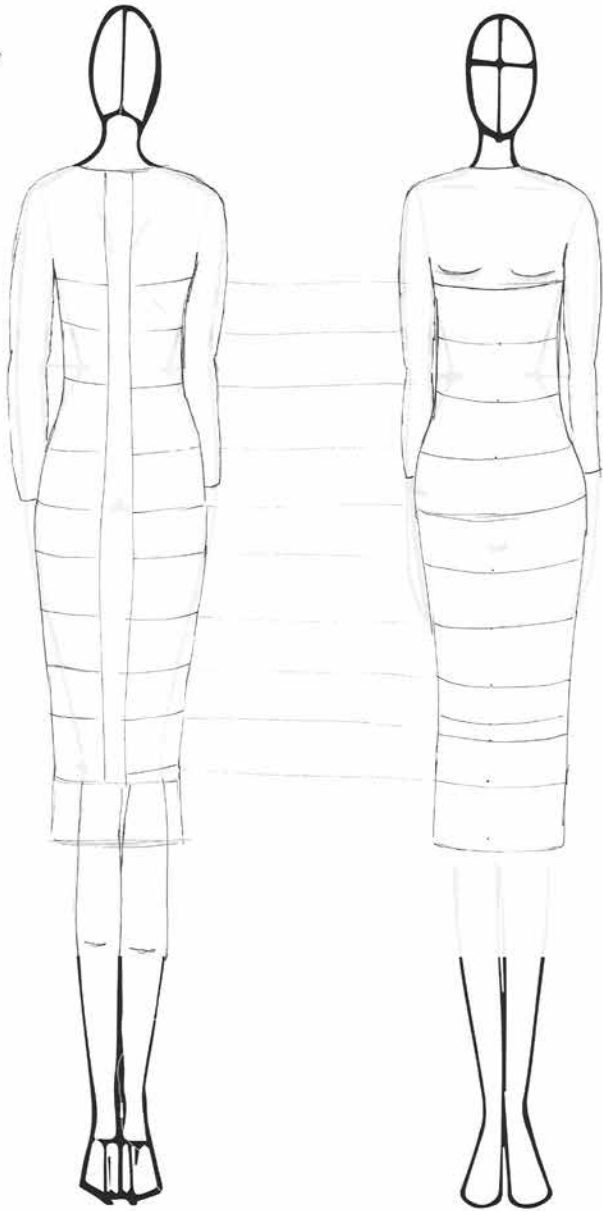


# 6. Dress pattern designs



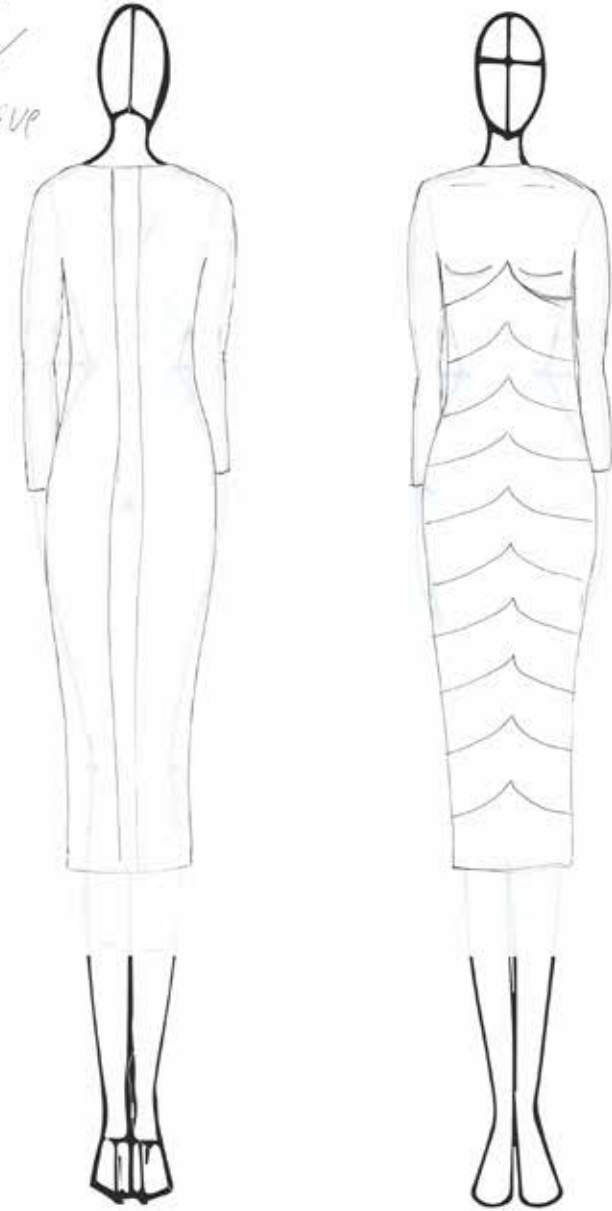
Design 2

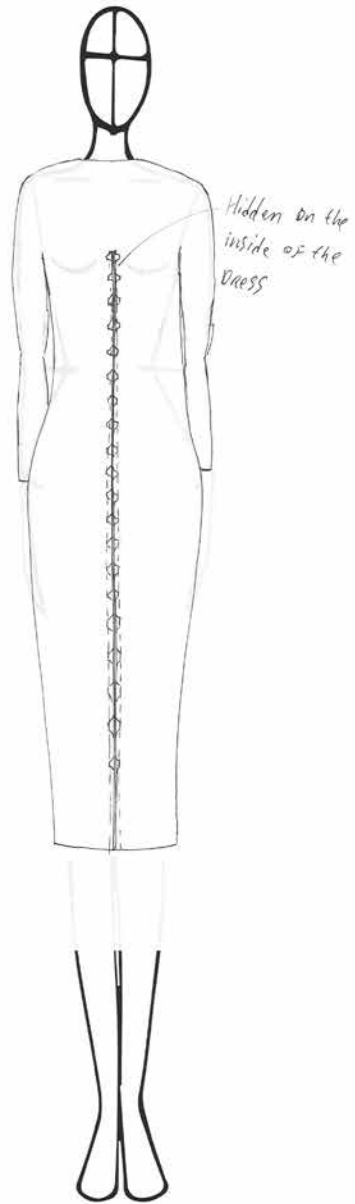
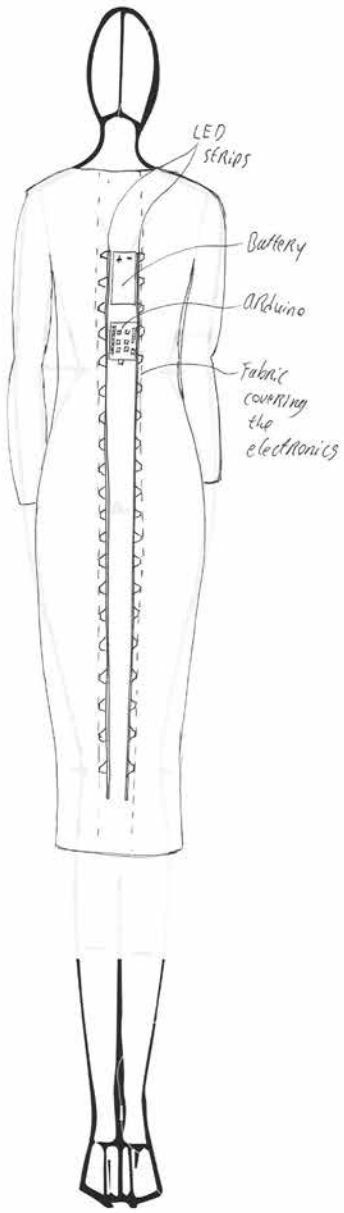
Subtle  
State



Design 2

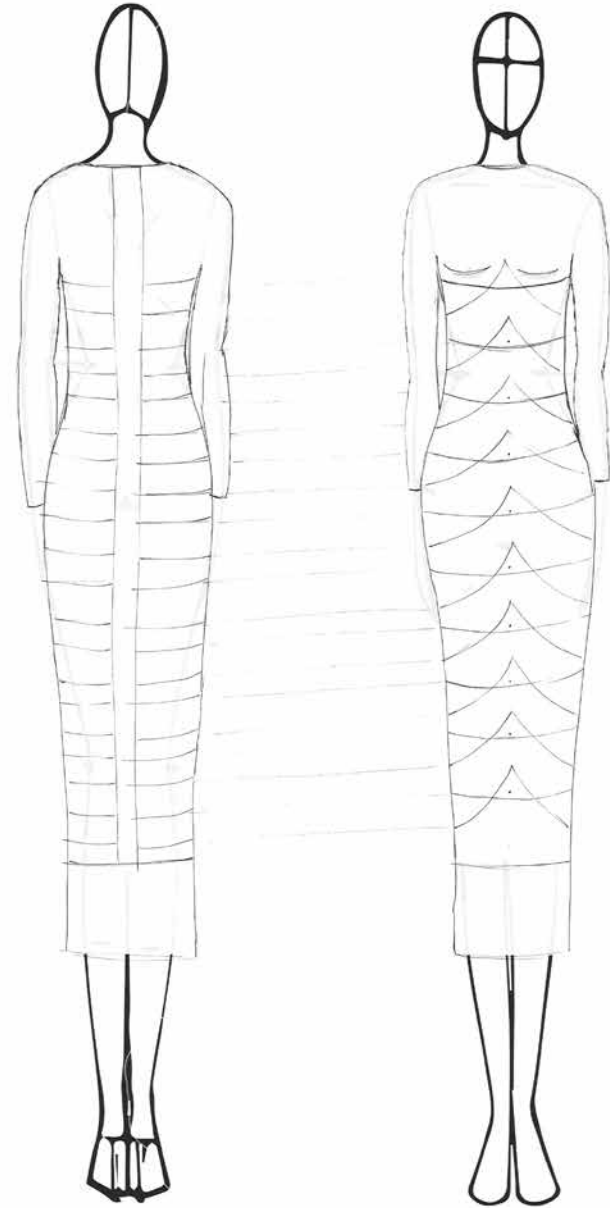
Subtle/  
expressive  
State





## Design 2

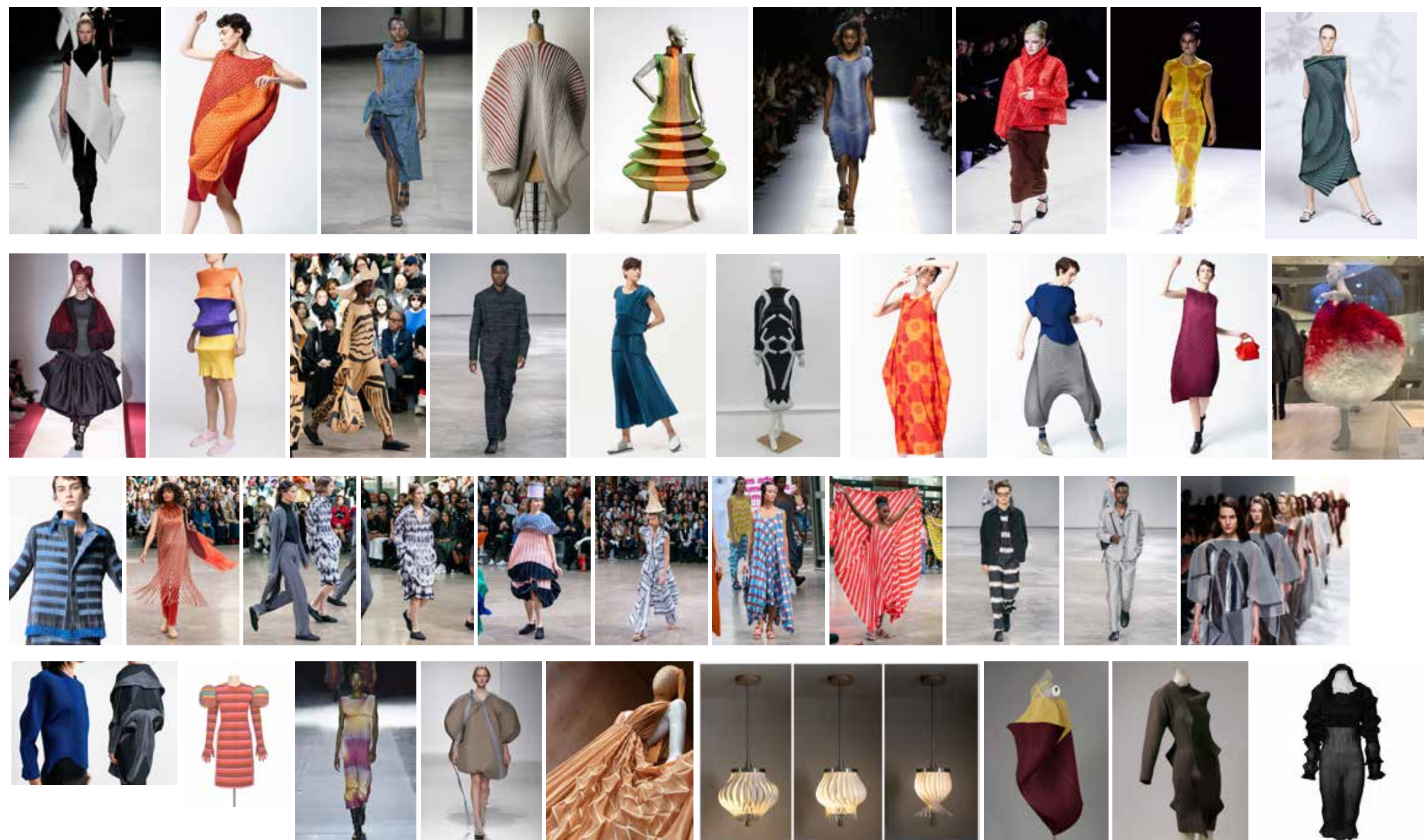
Expressive  
State





# 7. Dress design inspiration

All images by Issey Miyake, Comme des Garçons and LabeledBy. Lamp design by Leah KS Amick.



Personal pictures taken at the "Fashion Statements" exposition of the "Amsterdam Museum"







# 8. Folded shapes designs



# 9. Technical descriptions materials

## Lighting elements

### LED strips

"Adafruit Mini Skinny NeoPixel Digital RGB LED Strip - 30 LED/m - WHITE"  
Bought at: [www.Floris.cc](http://www.Floris.cc)

### LED/fiber optic mounts (front and back)

Custom designed 3d printed PLA  
Printed with an Ultimaker 2+  
Spray painted with black matt spray paint

### Fiber optics

"2.0mm Solid Core Side Glow Fiber Optic"  
Bought at [www.thefiberopticstore.com](http://www.thefiberopticstore.com)

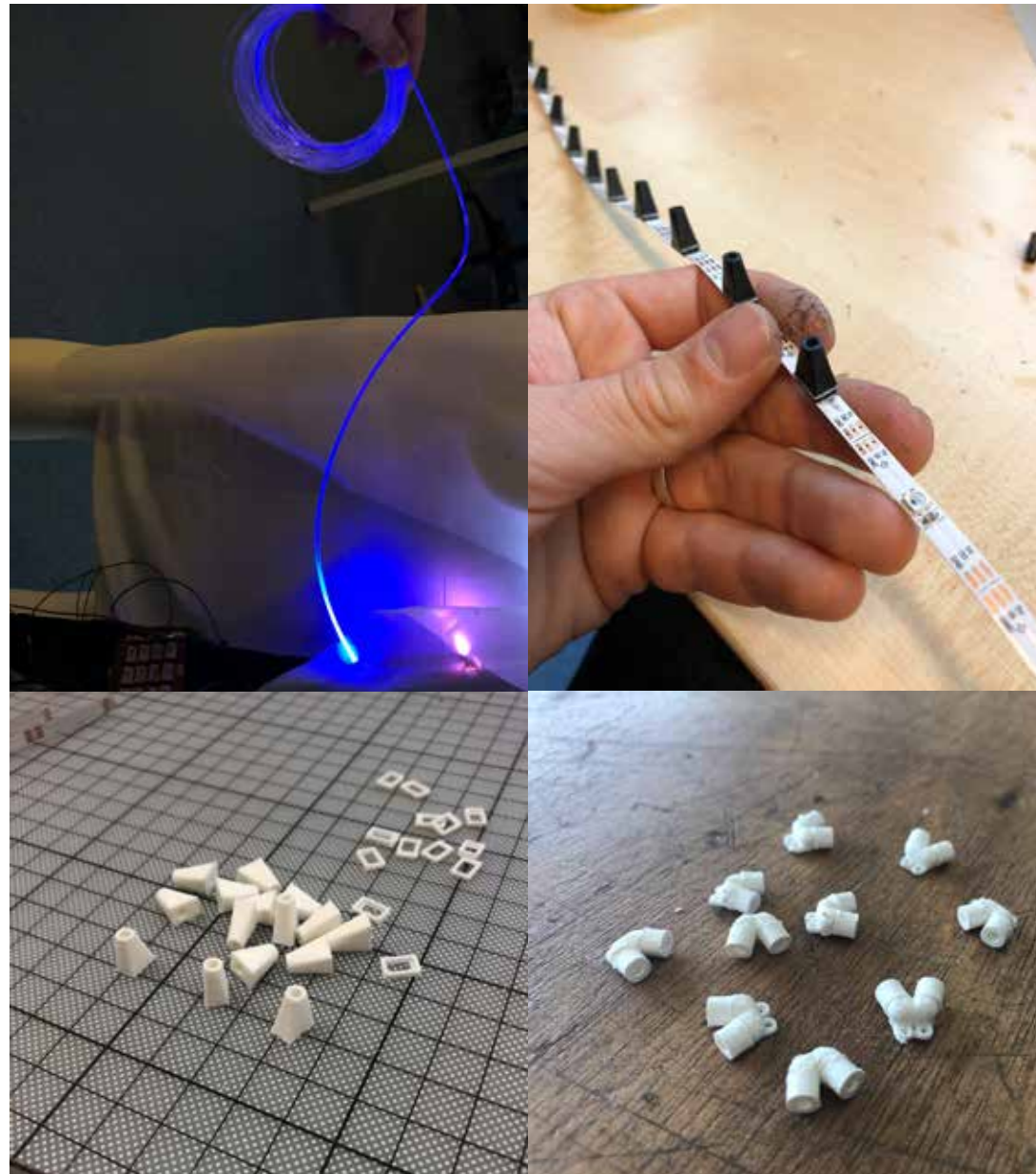
"5mX hoge kwaliteit side glow transparante solid core glasvezelkabel  
2mm/3mm/5mm/ 6mm/8mm/10 gratis verzending"  
Side glow 2mm  
Bought at [www.aliexpress.com](http://www.aliexpress.com), from KINGGREEN

### LED mount - LED strip fitting

Fast-acting super glue

### Fiber optics - LED mount fitting

2 components glue





## Dynamic front panel element:

2x micro metal gearmotors

Pololu 50:1 MICRO METALEN GEARMOTOR MP 6V, model 2365  
Bought at [www.opencircuit.nl](http://www.opencircuit.nl)

Motor mounts and shoulder plate:

Custom designed 3d printed PLA  
Small prototyping parts  
Small push button + diode

Motor covers

Anti slip mat, ribbed, transparent  
Bought at Action Rotterdam

Black Chiffon  
Bought at Schroder Rotterdam

Wires:

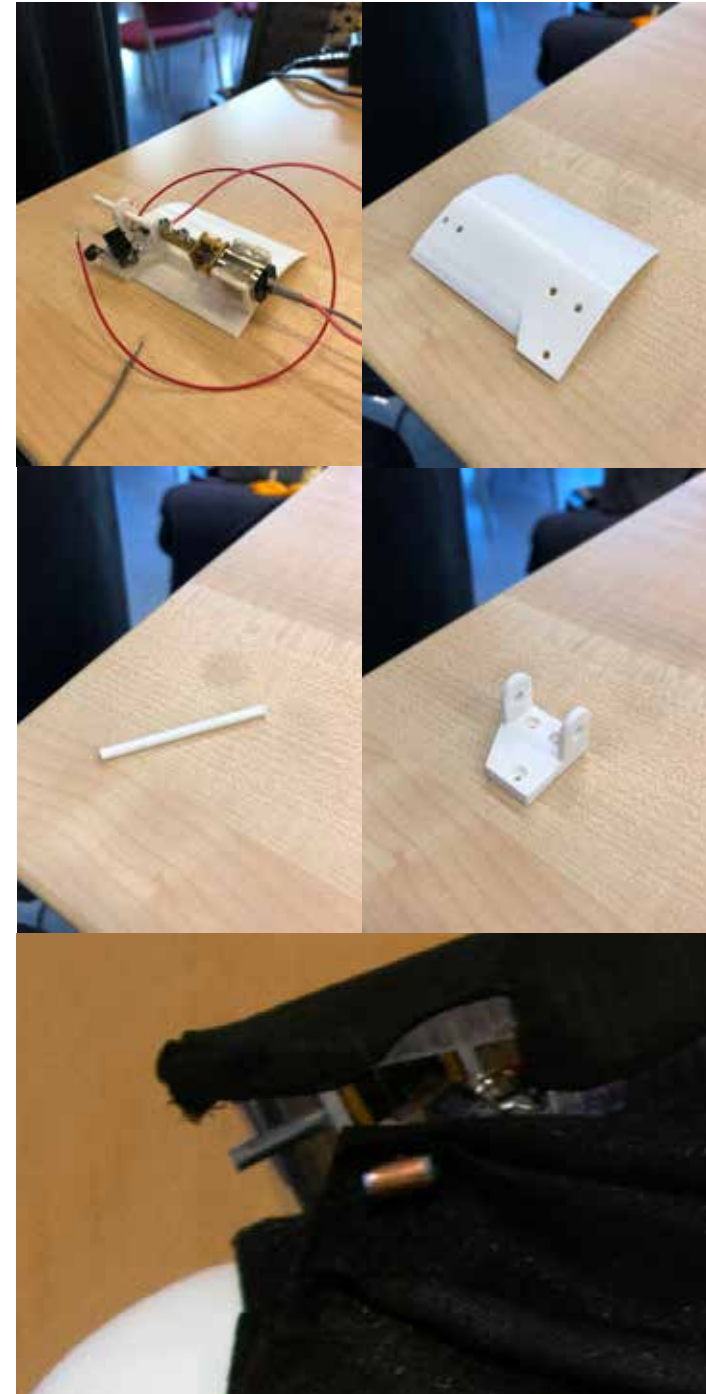
"Line Green Dark 300" fishing wire  
Bought at Decathlon

Fabric:

Black Organza  
Bought at Kniphall Amsterdam

Wire fittings:

Custom made 5mm copper rods



## Dress body:

2nd hand bought MEXX dress  
Custom taylored  
Bought at Sweet Rebels Rotterdam

Black Chiffon  
Bought at Schroder modestoffen Rotterdam

## Electrical circuit:

### Belt holder:

Fabric, elastics and velcro straps  
Bought at Schroder modestoffen Rotterdam

PVC sheet to assemble the electronics

### Electrical heart:

Arduino Micro zonder headers - ATmega32u4

2x Adafruit DRV8871 DC Motor Driver Breakout Board - 3.6A Max

RS PRO Wire Lead Terminal Lithium Rechargeable Battery,  
5200mAh 4 78 x 68 x 19 mm

Push button



# 10. Arduino controlling code

```
#include <FastLED.h>
#define NUM_LEDS 20
#define DATA_PIN 3
#define DATA_PIN 4

//The two LED strips

CRGB leds1[NUM_LEDS];
CRGB leds2[NUM_LEDS];

int switchPin=2; //controlling switch
int motorPin1=5; //Breakout board 1
int motorPin2=6; //Breakout board 1
int motorPin3=9; //Breakout board 2
int motorPin4=10; //Breakout board 2
int motorSpeed=120; //Going down left motor
int motorSpeed2=150; //Going down right motor
int motorSpeed3=87; //Going up left motor
int motorSpeed4=120; //Going up right motor
int stap = 0;
int x=0; // x is een teller
int i;
int k;
int j;

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  pinMode(motorPin1,OUTPUT);
  pinMode(motorPin2,OUTPUT);
  pinMode(motorPin3,OUTPUT);
  pinMode(motorPin4,OUTPUT);
  LEDS.addLeds<SK6812,3,RGB>(leds1,NUM_LEDS);
  LEDS.addLeds<SK6812,4,RGB>(leds2,NUM_LEDS);

  pinMode(switchPin,INPUT_PULLUP);
}

void loop() {

switch (stap) {
  x=175;

  case 0: //Subtle state

    Serial.println("Subtle state");

    for ( int i = 1; i<= NUM_LEDS; i+=2){
      leds1[i]=CRGB::Black;
      leds2[i]=CRGB::Black;
    }

    x++;
    if (x<500) k=x/2; else k=(1000-x)/2;
    if (x==650) x=350;

    for ( int i = 0; i < NUM_LEDS; i+=2){
      leds1[i]=CHSV(k, 255,150);
      leds2[i]=CHSV(k, 255,150);
    }

    FastLED.show();

    if (!digitalRead(switchPin)) {
      stap = 1;
      x=0;
    }
    break;

  case 1: //Transition to expressive state

    // make motor turn up
    Serial.println("start turn up, going expressive");

    // Left motor
    digitalWrite(motorPin1,LOW);
    analogWrite(motorPin2,motorSpeed);
    //delay(7000);

    // Right motor
    digitalWrite(motorPin4,LOW);
    analogWrite(motorPin3,motorSpeed2);
    x++;

    // stop after 1100 counts (11 seconds)
    if (x==900) {
      Serial.println("end turn up, expressive");

      // Left motor
      analogWrite(motorPin2,0);

      // Right motor
      analogWrite(motorPin3,0);

      // go to next state
      stap = 2;
      x=75;
    }
    break;

  case 2: //Expressive state

    x++;
    if (x<380) k=x/4; else k=(760-x)/4;
    if (x==460) x=300;

    for ( int i = 0; i < NUM_LEDS; i++){
      leds1[i]=CHSV(k, 220, 255);
      leds2[i]=CHSV(k, 220, 255);
    }

    FastLED.show();

    if (!digitalRead(switchPin)) {
      stap=3;
      x=0;
    }
    break;

  case 3: //Transition to subtle state

    Serial.println("start turning down, going subtle");

    // Left motor
    digitalWrite(motorPin2,LOW);
    analogWrite(motorPin1,motorSpeed3);
    //delay(6500); //5000 is bijna beneden

    // Right motor
    digitalWrite(motorPin3,LOW);

    analogWrite(motorPin4,motorSpeed4);

    x++;
    if (x==750) {

      Serial.println("end turn down, subtle");

      // Left motor
      analogWrite(motorPin1,0);

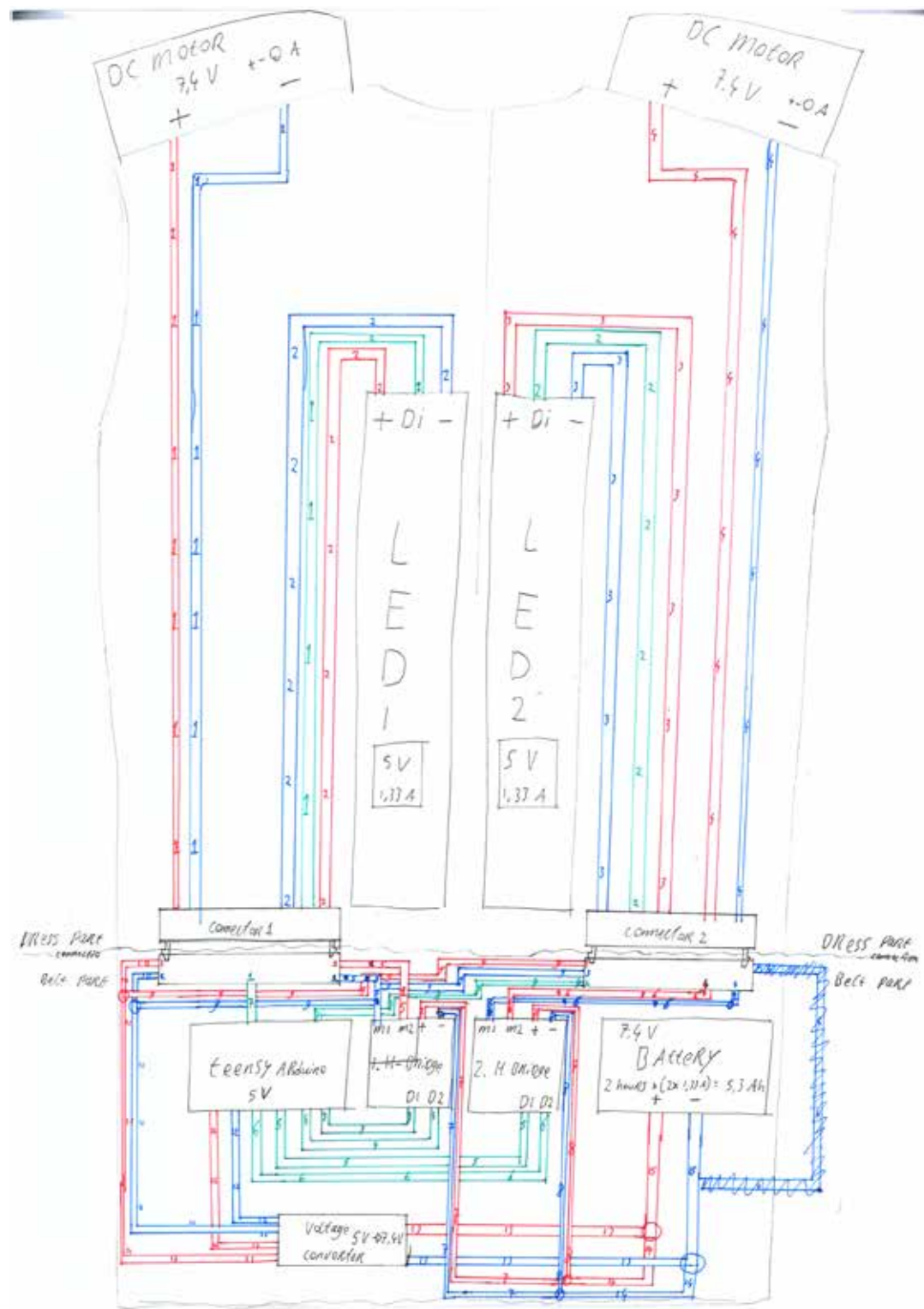
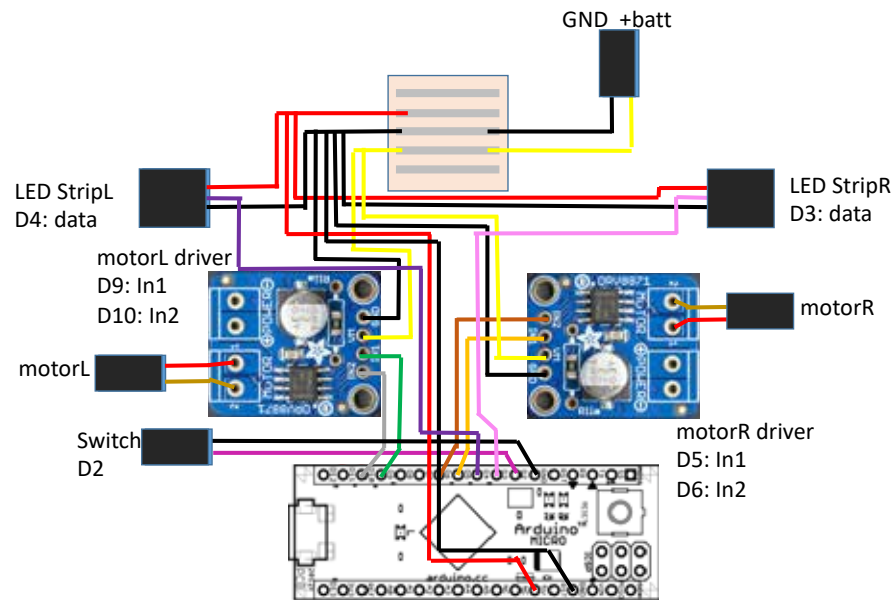
      // Right motor
      analogWrite(motorPin4,0);

      stap = 0;
      x=50;
    }
    break;

  default:
    stap = 0;
    break;
}

// execute loop every 10 ms
delay(10);
}
```

# 11. Electric lay-out



# 12. Questionnaire participants design suggestions

"I know the dress was not entirely finished yet. However, the visibility of the motors drew me the most attention which I thought was not beneficial for the dress. Try to cover it up"

"I would have maybe chosen for another structure of lights with the playful emotion. I really liked the extra layer of fabric with the other emotion"

Maybe you could explore different dress colors and forms as well. I found the black dress to be a little bit too 'formal' for an informal situation like that evening. It could be a bit more playful perhaps?

"Most important in my opinion is the intuitive transition between the states. Changes should be small and unconsciously be experienced"

"The particular length of the dress may bring down the overall aesthetic (a bit). Maybe making the dress shorter (above the knee) or longer (to the ground) will make the overall design with the lights look more high-end"

"I would avoid the curtain-like element and play more with the lights"

"If the silhouette of the dress was more intricate (perhaps with layers), the lights could be expressed more subtly through the dress's texture or the textile. For instance the layering required for Zac Posen's LED dresses. I can see the (soft) expression through light can be conveyed through (puffed up) sleeves"

"It would be nice if more of the dress could change colors"



"I think it's very difficult to calm and confidence in one state of the dress. I gave a 5 to this question because I thought the dress to give a very calm feel, but not as much a feel of confidence. Confidence is often seen in posture: straight back, chest forward and chin up. Although this "lack of confidence" could be partly because of the wearer, I think a dress could definitely stimulate a confident posture. But at the same time I believe that this confidence would go against the calmness of the dress. The subtle blue LEDs for instance in combination with the subtle silhouette of the dress provide for calm aesthetics, whereas for confidence I would expect a very expressive dress (which the other state is) with, for instance, very in-your-face bright red LEDs"

"However, how I understood it is that the subtle state would be for a professional environment whereas the expressive state would be for a more fun and social environment. I believe both states are very appropriate for their respective environment. I am just not sure if the casual Het Nieuwe Cafe was the appropriate setting for such a fancy looking dress"

Written in Dutch

"Allereerste - super interessant idee! Ik zou met je ontwerp een klein beetje uitkijken dat het niet een jurk is dat versierd wordt met licht, daar krijg ik zelf een beetje een kerstboom gevoel bij, maar dat het een meer een geheel wordt. Misschien door bijvoorbeeld een manier te zoeken het licht op een wat patroon achtigere manier te verwerken door het bijvoorbeeld te weven? Ik denk ook dat het nuttig kan zijn om eens echt te kijken naar jurken. Waar vrouwen zich op welke manier zich fijn voelen, vol zelfvertrouwen of ontspannen. Ik denk namelijk dat over het algemeen de plooiën (die bovenaan zitten) mooier tot z'n recht zouden komen op een andere plek - misschien heupen, of schouders?"

"For me the colours and the shapes of the dress matched the expressions really well. Both states felt natural in the social setting. I would however, change the shape of the ledlights for the expressive state, because for me the shape in combination with the lights is too much associated with a Christmastree and christmas lights. I don't even know if the changement in the shape is necessary for the expressive state. I think by just showing them more clear and changing the colours it's already quite expressive. Another interesting idea for the expressive state would be to tighten the led lights around the body so the dress gives more shape (for example around the waste). I think women, depending on how they feel on some days, or what kind of events they have, choose to wear wider or more shaping clothes. It would be interesting if you'd had both options in one dress"

# 13. Full video transcript (in Dutch)

## Video plan afstuderen

Duur: 1.30 minuten

### Doel

Een intieme weergaven van de details van de jurk en waar de design detaillering vandaan komt, en het laten zien van de 2 expressies.

### Onderdelen

#### Karakteristieke shots

Geeft het gevoel weer van 2 uitstralingen van de jurk, subtiel en expressief, en zijn de elementen die ervoor hebben gezorgd wat voor vorm en bewegings uitstralingen de jurk moet hebben. Deze shots dragen bij aan de mood van de video

#### Vorm concepten

Komen voort uit de karakteristieken, en zijn de eerste ontwerpstappen naar de fysieke elementen van de jurk. Deze shots dragen bij aan de opbouw naar het presenteren van de details van de jurk

#### Detail shots van de jurk

Laten detailleringen zien van de jurk die weer zijn voortgekomen uit de karakteristieken. Deze shots zijn de uitkomsten van de mood die gecreëerd is in de video, en zijn op zichzelf een opbouw naar de totaal shots

#### Overzicht shots van de jurk

Dit zijn de shots waar de video naar opbouwt. Eerst een mood en intimiteit creëren, en opbouwen met de detail shots. Dan als clue van de video de jurk in zijn totaliteit laten zien, en het dynamische element. De draagster van de jurk draagt bij door de statussen te uiten door middel van beweging en uitdrukking.

### Quotes

De eerste 2 quotes gaan over de rol van kleding en het sociale probleem binnen onze samenleving, en over onze expressieve behoeftes. Deze zijn niet van mij overigens

***In the current age, we expect more from technology and less from each other. We sacrifice the conversation for mere connection.***

***Clothing concerns all of the human person, all of the body, all of the relationships of man to body as well as the relationships of the body to society***

De tweede quote is van een iemand die ik heb geïnterviewd, en gaat over haar kijk op dat een kledingstuk op stemmingsveranderingen zou moeten kunnen inspelen.

***Sometimes a mood does not always match what is comfortable to wear on that particular day. Clothing should be able to change according to a persons' mood***

De derde quote gaat over de toekomst, waarin de rol van kleding is veranderd en een diepere betekenis krijgt. Dit is dus de wereld waarin mijn kleding een rol gaat spelen. Deze is wel van mij zelf

***In the future of fashion, technology enables clothing to be dynamically expressive, so as to make people feel more comfortable when expressing themselves, offline, and helps with the human value in interacting.***

### Doorloop

1. Starten met een quote als 'kick-off' van de video en het verhaal. De quote moet iets vertellen over de achtergrond van het project en het uiteindelijke doel van het ontwerp
2. Shot laten zien van design karakteristieken die te maken hebben met de subtiele uitstraling, en dus de emoties kalm, rust en vertrouwen. Dit zijn bijvoorbeeld shots van een boom, grasvelden of omaatjes die op een bakje zitten. Gepaard daar aan komen de detail shots van 2 of 3 van de ontwerp karakteristiek dozen, die dynamisch bewegen.
3. Detail shots van de subtiele uitstraling van de jurk, maar alleen detail

shots. De totale shots van de jurk komen later. Tijdens deze detail shots zie je al een uitdrukking (gezicht en/of beweging) van de draagster van de jurk.

4. Nog een quote, wat meer te maken heeft met hoe een persoon zich uitstraalt door middel van kleding
5. Nu komen shots van design karakteristieken die te maken hebben met de expressieve uitstraling, en dus de emoties blijheid, speelsheid en geluk. Ook hierbij komen de detail shots van 2 of 3 van de ontwerp karakteristiek dozen, maar je ziet ze veranderen van de subtiele uitstraling naar de expressieve uitstraling. Dit moet wel weer erg in detail gebeuren, want de focus moet niet te erg liggen op deze ontwerpen.
6. Nu weer detail shots van de jurk, maar in expressieve uitstraling. De focus ligt nu weer meer op detail shots van de jurk zelf. Dit deel moet een voorloop zijn van de volgende stap in het filmpje, waarin de jurk gaat veranderen naar expressief. Het creëert een opbouw naar het totaal shot van de jurk.
7. Nu komt het totaal shot van de jurk, waarin de draagster eventjes wordt laten zien in de subtiele staat, met subtiele bewegingen, maar ze stopt. De jurk verandert naar de expressieve staat. Op het moment dat de verandering wordt ingezet komen er ook een paar detail shots van dat de stof omhoog wordt getrokken. Op het moment dat de jurk is veranderd naar de expressieve status gaat de draagster zich ook ineens veel expressiever gedragen, in gezichtsuitdrukking en met bewegingen.
8. De video eindigt met een laatste quote van mezelf, van de 'design vision', waarin ik vertel wat het ultieme doel is van de jurk en de wereld waar die in leeft.

## Muziek

De muziek moet helemaal bijdragen aan de mood en de intimiteit die wordt gecreëerd door de shots. De muziek en de shots gaan hand in hand. De muziek bevat elektronische elementen, en veel "intricacy", als in lichte maar soms scherpe en snelle hihats, maar een monotone en simpele kick. Soms geen beat, soms wel, op de verhullende elementen van de video misschien wat 808's.

## Doorloop

1. De muziek begint heel erg rustig. Misschien alleen een ruis, of een heel rustig geluidje, opbouw van een synth, dat soort dingen
- 2 & 3. De muziek gaat meer doen, maar vooral rustig, wat de emoties becomplimenteert
4. De muziek komt weer tot rust, een terug stap van bij de stappen 2 en 3.
- 5 & 6. De muziek vertoont meer expressie, maar blijft nog steeds redelijk rustig. Er komen geluiden bij (meer in majeure?) die associaties hebben met de te representeren emoties (blijheid enzo)
7. De muziek maakt een opbouw naar de knaller van de video. Wanneer de jurk gaat veranderen van expressie is de muziek net omgeslagen naar expressief en geluk.
8. De muziek bouwt af naar een eind.

## Lieke

Lieke is degene die moet 'meebewegen' met het gedrag van de jurk. In de subtiele staat stelt ze zich wat subtieler op, en in de expressieve staat wordt ze expressiever. Af en toe maakt ze bewegingen dat refereert naar de expressieve staat waarin ze verkeert.

### Subtiele bewegingen:

Een klein loop beweginkje

### Expressieve bewegingen:

De soort van dans shake move van Lieke, beetje door de knieën en met de schouders bewegen

### Subtiele gezichtsuitdrukkingen:

Vertrouwd, zelfverzekerd, eigenzinnig, misschien een heel klein beetje verveeld achtig (?)

## Expressieve gezichtsuitdrukkingen:

Vrolijk, lachend (op een zelfverzekerde manier, niet alsof je ergens om lacht), speels, gevlijd (mix tussen genieten en zelfverzekerdheid).

## Make-up:

Er moet op het eerste oog geen groot verschil zijn in de make-up en haar uitstraling. Een verschil zou kunnen zijn dat wanneer de overgang naar de expressieve status over gaat, ze haar haar van een staart naar los gooit. Daarnaast zouden we gebruik kunnen maken van glitters over haar gezicht, dat alleen opvalt wanneer er licht op schijnt en camera wat dichterbij haar gezicht staat.

# 14. Appendix sources

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