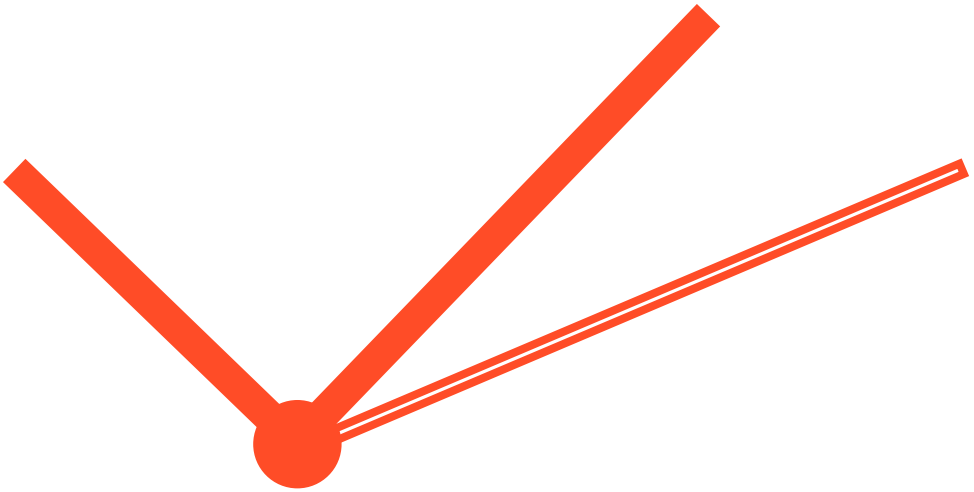

Lot Mars
0909132

Major: **Graphic Design**
Minor: **Digital Craft**

Uncontrollable. A ever-fixed rhythm without interruptions, without failure. Time is indestructible. It is the strongest weapon.

Why do we still hold on to an ancient time piece if time is more valuable than an object like this?

My quite big research was based on this question. I started with a very broad view to found out what part in the theme *time* I found the most interesting. To do this, I wanted to decompose the concept *time*.

foreword

Time has become a big part of our identity, in fact it is part of who we are. We started to use time as a measure instrument for everything. Apparently, it is something that we nééd to be conscious about. It has to be mentioned ***every time*** For ourselves or for others. Focus, support, trust. A starting point and a way of going further. It started at birth with the fact that this day has to be remembered every year.

Time is incredibly complex and at the ***same time*** so tangible. Time is the most collective language we know. Everybody understands it the same way. Every household has the same round object in its house. I find it fascinating how humans did ever started capturing time and since then we have a visual time system. This while time has so many different forms and we obstruct ourselves in further development of our experiences of time due to this (already anchored) time system. What is going on in our brain seems like having not as much value as our designed time piece. The clock is what the society is all about and everyone turns around it. Jetlag's as result.

I am fascinated by the inner clock. Fully focusing on the time it feels like and not the 'exact time'. I believe that this time is more valuable than the time indicated by the clock. The inner clock shows your emotions. The faster time goes, the more enjoyable you experienced the past few moments.

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side note: When I wrote this paper, I became more aware than ever of how often we use time itself or a form of time in our language. Even more than I wanted to. It felt like I cannot bypass it, it has to be said on that way. Seems reasonable if you think about how integrated time is in our society. I think that time has become a big part of our language. I found this quite funny, so I started to highlight these word(s parts) in orange and make you, reader, conscious about it too.

table of content

1.

decompose the concept time - running out of time

Time is a system that never seems to change. Our society, the language, our way of eating. Everything seems to change, went to an evolution. Except time. It is designed once, proved useful, fine-tuned and never changed again. Probably because it works well. And perhaps all systems of the world are based on this time system. And yet ... what if we let go of this certainty a little more ...

I think it is beautiful how people did succeed in capturing time. But time is much more than numbers. Time changes psychically constantly. It is related to speed, emotion, movement and effort.

In this minor I really want to make a new time system. A system which shows time from another perspective. I do not want to change our time system at all. This one is good as it is. I only want to let people see what kind of diversity time has. Time is not only the well-known 24-hour system. Time is rich and influences more things than we are aware of. I want make people conscious about that. And I think, creating another time system will help me with that.

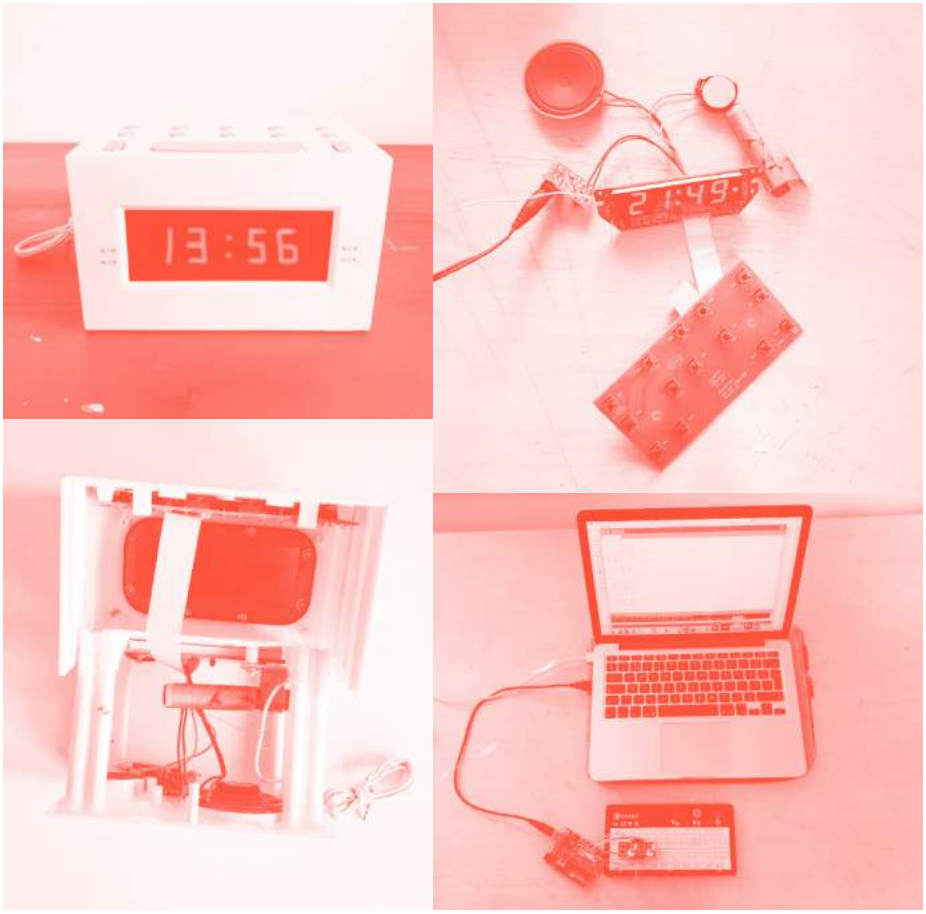
the black box

In the *black box* assignment I did research in how to visualize time in a not so ordinary way. How can I influence/hack the display to let people believe in another time system?

I like the relative aspect of time. Time is much more feeling than data for me. When you know what time it is, you live in a common reality, because then you fit in the common rules. When you aren't able to do this for a long time, you start to live in your own reality. I think this is beautiful!

I created a system that fit my feelings about time. This alarm clock isn't based on logic and rules, but only based on rhythm. The Abstract visuals change into a random order, so you are never able to hunt down the time of earth!

The outcome of this project is an alarm clock which shows (instead of numbers) an abstract figure that changes within a steady rhythm. The viewer experience only the rhythm of time and can visualize time for themselves. It is all about your imagination!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How do we percieve time?

To dive deeper into time perception, I did a small research in this.

Time perception refers to a person's subjective experience of the passage of time, or the perceived duration of events. We do not so much perceive time itself, but changes in or the passage of time, or what might be described as "events in time". In particular, we are aware of the temporal relations between events, and we perceive events as being either simultaneous or successive. We also have a perception of the sequence or order of these events.

Our sense of time seems to have originated as a product of human evolution, and it is not a purely automatic or innate process, but a complex activity that we develop and actively learn as we grow. Humans are, as far as we know, the only animals to be consciously aware of the passage of time and our own impermanence and mortality, and to have a consciousness of the past that is anything more than pure instinct and behavioral conditioning.

Although psychologists believe that there is a neurological system governing the perception of time, it appears not to be associated with specific sensory pathways, but rather uses a highly distributed system in the brain. Time perception therefore differs from our other senses – sight, hearing, taste, smell, touch, even proprioception – since time cannot be directly perceived, and so must be "reconstructed" in some way by the brain.

Neurotransmitters such as dopamine and norepinephrine (adrenaline) are integrally involved in our perception of time, although the exact mechanism is still not well understood. The human brain appears to possess some kind of "internal clock" which is linked to specific dopamine levels.

When the brain receives new information from the outside world, the raw data does not necessarily arrive in the order needed to process it properly. The brain therefore reorganizes the information and presents it in a more easily understandable form. In the case of familiar information, very little time is needed for this process, but new information requires more processing and this extra processing tends to makes time feel elongated. The more familiar the task, the less new information the brain needs to process, and the more quickly time seems to pass.

Time perception is a strange thing, because it does not actually exist, because time itself does not actually exist. When you talk about perception we think of our eyes or ears that absorb a certain energy. This way an eye can catch light and because of this we can see. Ears absorb sound vibrations and that leads to hearing. But there is no organ that can capture a time particle. There are also no time particles at all. You cannot actually observe time. Time and experience is something your brain constructs itself.

the many different types of time

For my research I wanted to dive deeper into the concept time. What is time and in how many different forms does it behave? Time is related to speed, emotion, movement and effort. I want to be very open in this definition ‘time’.

I researched the different causes of time. Or actually, the different ways to visualize time. Every visualization let people experience time in another way. I feel like time behave different in every man-made system. I love how even the politics can have influence on our feeling of time. Time is a strange thing!

I did research all these causes to help me come up with another cause/system of creating time. It helps me to be very open in this system and think further than the well-known two arms upon a circle (the clock). This will help me to come up with a whole different time system.

The sun as a time system

Ever since man first noticed the regular movement of the Sun and the stars, we have wondered about the passage of time.

The sundial is the oldest known time-keeping device found out in 1500 BC. It tells the time by the position of the sun: as the sun moves across the sky, shadows change in direction and length. It was quickly noticed that the length of the day varies at different times of the year.

Gravity as a time system

The hourglass needs to be carefully calibrated to measure the correct length of time. It must have a rate of flow that does not fluctuate. Factors affecting the time interval measured include sand quantity, sand coarseness, bulb size, and neck width.

Power supply as a time system

Back in January this year all the digital clocks in Europe running slower due to disagreements between several East-European countries. Normally, the power grid in Europe runs at a pretty steady 50Hz, and all a digital clock does is count the cycles in the electric supply. This becomes a problem if the frequency drops over a sustained period of time. And this is what happened.

Politics as a time system

The European Union said in august this year it would propose a legal change that would end the ritual of switching between summer and winter time, leaving it up to governments across the bloc to agree on whether to permanently use summer time or winter time. This can lead to different time systems in Europe.

new time systems made by other designers

Various designers and artists have already thought about time and how to visualise this in another way ***before*** me. I can learn from these people: how they think about time, how they measure time and how they have designed this new system.

Ice Watch *by Olafur Eliasson*

Twelve large blocks of ice cast off from the Greenland ice sheet are harvested from a fjord outside Nuuk and presented in a clock formation in a prominent public place. The work raises awareness of climate change by providing a direct and tangible experience of the reality of melting arctic ice. People are coming by fascinated, most needing to touch the ice.

TRACE *by Studio Ayaskan*

TRACE is a clock that visualises the passage of time by leaving a trail of color as time passes. In today's world we all live very fast paced life style, and we constantly worry about what's ahead of us. TRACE visualises the connection between the past, the present and the future. By materialising time it aims to connect people with the concept and perception of time, thus encouraging a moment to slow down and reflect on the present.

Oo'clock *by Ooclock-design*

Ooclock is a completely new clock concept. With its impressive 70 cm diameter and 3 rotating elements, absolutely silent witnesses of time. The inner element indicates seconds, the middle ring indicates hours, while the outer indicates minutes.

Slow watch *by Slow Swiss Made*

Slow watches were created to shift the way people read time. So rather than focusing on the second or the minute they have produced an instrument that measures the moment. Slow does not describe a speed. It's a mindset that most of us somehow lost. As a result of our busy lifestyles, we often forget that we actually have a choice of how to live. The slow watch is a subtle reminder that time is the most precious thing we have so we should enjoy everything we do and stop chasing every minute.

Hands of time by *Wisse Trooster*

With discarded sanding discs used by designers from the Design Academy Eindhoven, these clocks designer Wisse Trooster breathes new life into this old tools.Like rings on a tree trunk, these clocks illustrate the concept of time through their physical markings. The intensity of use and the type of materials that were sanded give each clock its unique characteristics. Procurement of the discs themselves take time as Trooster has to wait until the sanding discs are completely worn off before he is able to collect them.

Sand *by Studio Ayaskan*

Sand, inspired by the landscape art of kare-sansui– Japanese Zen rock garden, is the gradual formation and flattening of a ripple pattern over a period of twelve hour cycles. In the daytime the hour hand draws ripple patterns on the sand whereas during the night these patterns are gradually flattened out to restart a new cycle.

Chameleon Clock *by Wisse Trooster*

Reflective like a mirror, ones living room is reflected in this clock as time passes by and yet it changes in color as you walk by. From sky blue, to deep purple or even red. From a certain angle the clock face seems to disappear.The color changes as the sun passes by the window or when a light is switched on. Depending on the angle the light hits the clock face you will see a specific color.

Graphic Time *by Raw Color*

Graphic Time is a graphic interpretation of a functional clock. The 3 colored half circles represent hours, minutes and seconds. The moving discs, perforated to reduce weight, are continuously creating different appearances by the passing of time. The object is a combination of movement and ever-changing compositions that displays time in a subtle manner.

L1 watch *by Loyto watches*

The inspiration for the L1 Watch design is observation. While still respecting the analogue spirit, the watch challenges you to read time in a different way and forget what you have seen before.The watch features two arcs. The outer arc helps you tell the hour through using numbers, tick marks, and a color change that slowly fills up the arc. The inner arc helps you read the minutes.

The real time *by Maarten Baas*

The real time is a video recording of twelve hours. On the dial of Baas' giant clock time is not indicated by the usual hands, but a shadowy figure captures the passage of time with the help of paint and brush. In this way a hyperrealistic feeling of the passing of time arises.

This research brought me insight in the many projects that has been done with the concept time. Some project do have a whole different starting point but are illustrate the best into a time system. Because of this I realized that I also should have a side-subject or goal that does not necessarily have anything to do with time. Something that I can work towards through the theme of time. Precisely because time itself is a very broad subject. I would otherwise be drowned in this great theme.

To find a good theme or goal I started to read more and watch some video’s about time.

2.

focusing on the brain - color, motion and shape

I saw a television program where the dimension of time was explained. One thing they explained was that what we observe has actually already been. Information takes 70 to 80 milliseconds to move from your retina to your cortex. That seems very little, but that is seriously a time we can perceive. Yet you do not notice this delay at all. Your brain solves this with images from the past.

So even though you do not realize it yourself, we are visually constantly living in the past.

Another thing they explained was that observations such as shape, color and movement are processed separately and at different speeds. It takes longer for the brain to process the motion direction of an object than to process its color. Processing its shape takes even longer. As a result, the brain cannot simply combine the continuously incoming information about an object's various features. If it did so, then a moving red ball would fall apart into a kind of train, with vague shapeless redness trailed by formless motion, in turn followed by a colorless sphere.

I was really interested in this theory and wanted to know more of this phenomenon. In the television program Hinze Hoogendoorn explained a lot of this topic. I decided to google him to hopefully find more information.

Hinze Hoogendoorn is a Senior Research Fellow and he is also an Honorary Research Associate of the Department of Experimental Psychology. His primary research interests lie in visual time perception. Using psychophysical, behavioral, and neuroimaging techniques, answers questions such as how time is encoded in the brain, and how the brain keeps track of time. He is especially interested in how the brain solves the computational problems that result from processing different visual features at different locations in the brain – at different speeds.

Very little research has been done in this topic. In contrast to this, Hinze has done a lot of research in this subject. **He and his research was very valuable in my project!**

Time in our brain

Time seems a simple, intuitive notion: a single dimension on which the world smoothly evolves, from future to present to past. Time passes irrespective of what does or does not take place in the meantime; it seems in many ways nearly epiphenomenal. And yet, temporal relationships define the most fundamental properties of the world. For example, causes must precede effects: an event cannot be caused by another event that occurs later. All changes in the states of physical objects, as well as internal mental processes, are defined with respect to time. And finally: all processes take time.

We generally take this in stride, without realizing that it has direct and striking implications for our experience of awareness. Mental processes, including the neural processing of perceptual information, take time. When you open your eyes and see the world, by the time you are aware of that visual information, the world has evolved: what you perceive as present, has already happened and as such is the past. Despite these delays, we experience that we are aware of, and able to act in, 'the present'. Ingenerating awareness, the brain therefore takes into consideration the time lost during processing. This is anything but a trivial task. It does so with great efficiency, allowing us to interact accurately even with very fast moving objects. In professional baseball or tennis, for example, a ball might move as much as 5 meters or more in the time it takes the brain to process visual information pertaining to its position. Furthermore, different sensory information is processed in different parts of the brain and with different neural latencies. Even within a single modality, such as vision, different features, such as color and motion, are processed at different rates

and in different places (e.g.,Zeki, 2005). Sensory information pertaining to a single given moment therefore becomes scattered over different brainareas, with different fragments of information becoming 'available' to awareness over a range of times. Nonetheless, we experience a single, smoothlyevolving, coherent stream of awareness, indicating that the brain is able to bind(multi-)sensory information across these variable delays into awareness of a single instant. But how does the brain piece together the stream of consciousness from information that is distributed over both time and space? Because becoming aware is a process which itself takes time, studying the timecourse of perceptual processes together with the perception of time itself gives unique insight into the neural mechanisms underlying the realization of conscious awareness in the brain. Hoogendoorn approachs awareness from a temporal angle, in order to gain insight into the generation of awareness in the human brain. He studies the role of time within visual perception specifically, but also investigates other perceptual and cognitive functions in-volved in the generation of awareness, including attention, causality, and the perception of time itself.

In the brain, visual information about an ever-changing outside world is parcelled off to dedicated mechanisms in specialized regions, each responsible for processing specific visual features, such as colour, form, motion, etc. To further complicate matters, different visual features are processed at different speeds. The brain therefore not only has to figure out what belongs to what, it also has to keep track of what belongs when.

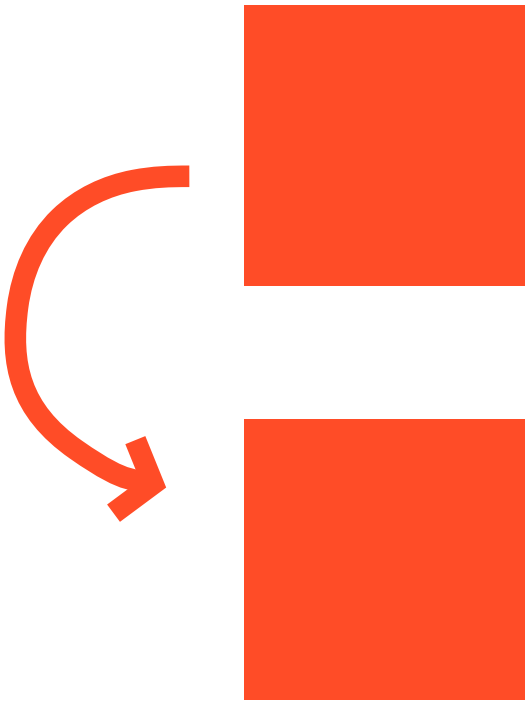
The baseball player below would look like the baseball player below right. Instead, the brain somehow is able to compensate for its own delays, setting straight its own internal timeline to allow us to act in the world with phenomenal temporal accuracy.

H. Hogendoorn et al. (2015)

The brain corrects for its own processing delays. If it did not do so, the baseball player on the left would look like the baseball player on the right, with his shape, motion, and colour appearing in different locations due to their different processing speeds.

How does the brain prevent visual information from different time-points from blurring together?

It seems that all incoming information flows have their own internal clock. but that our brain can measure time is confirmed. If you look at two red squares in succession that are both on the screen for less than a second, you can indicate which was shorter in the picture.



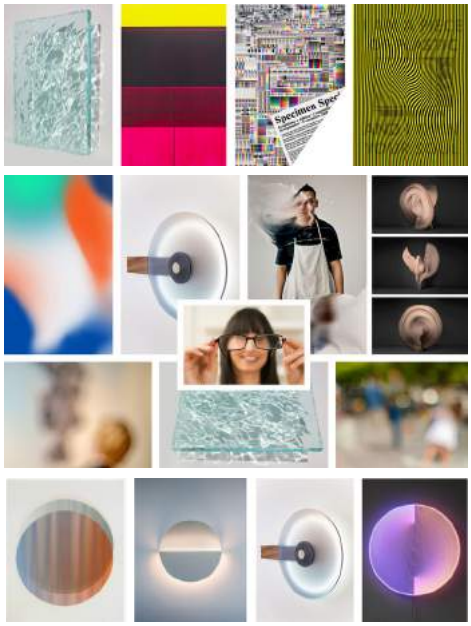
H. Hogendoorn et al. (2015)

The visual brain chops up the continuous stream of visual input into discrete frames, just like the shutter mechanism of a traditional video camera.

This phenomenon can be seen as a time system. The processing process of the brain is controlled by time. The brain has to recognize information and process incoming properties, which takes time. I think this distortion can deliver a very nice vision! unfortunately, we never get the chance to see this! I want to make this hidden view visible. Just making visible what our brain seems to filter out.

I am really sure this phenomenon can show the best as a time system. At first because time plays a major role in this effect. At second because time can give the outcoming images an extraordinary dimension. It is a different way to look at the view of our eyes. At last, I think it would be more clear for the viewer to understand what is happening in our brain.

I thought of different ways to create this time system: creating a **video** that shows this effect, making **glasses** that have distorted lenses, making a new **optical illusion** and present it on posters or in GIF's, put an ***e*xtension on the internet** or on Instagram where this clock works, playing with **light** in a room or creating an **object** on the wall that constantly displays this distortion.



My 5 different ways to create a time system in images

My major is graphic design, so at first I wanted to involve graphic design into my project. The distortion view can fit very well in graphic design and I could have imagined plenty projects out of it. But in this minor, I wanted to let people fully experience this effect. Not just an experience from a poster or website. It has to be touchable and people should get involved in it.

3.

building a time system
- how time creates image

The process of creating the actual time piece was the most interesting research I have done. But it was a quit hard process. I had to find out how I could show color separate from shape. We are never able to see this. The color you see is always shaped. So, I had to find out how I could reach this effect anyway.

Kinetic Art - De Kunsthal

To find inspiration, I went for two times to the exhibition Action <-> Reaction in De Kunsthal in Rotterdam. I hoped I could get some ideas for my project out of the experiences the kinetic art gave.

Pol Bury, Punctuation (Ponctuation), 1959, Wood and electric motor

In this artwork I really like the layers. Shapes disappear and become visible again.

This could be a good starting point for my project. When the *shape* disappears, only the *color* would be visible. After a while the shape will be visible again.

gerhard von graevenitz, Objekt mit konkaver Ellipse, 1972

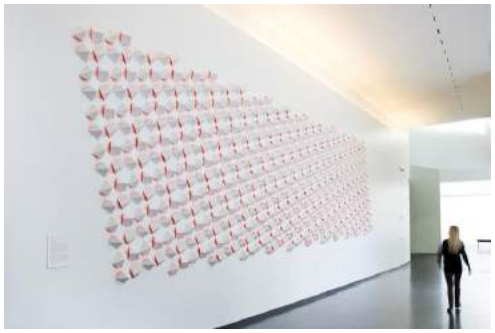
I love the two simple shapes with a very smooth motion. This object arouses curiosity, because it is not clear how the white shape moves.

Jean Tinguely, Meta-Malevich, 1954

The arms of a clock don’t have to start at the center. And they also don’t have to be square-shaped.

Jean-Pierre yvaral, instabilite no3, 1963-1965

My time piece can also be a motionless 3D-object that functions as an optical illusion. Your eyes and your perspective create the motion and let the shapes change (optically). So, it is your head which makes the time running. A nice metaphor for the brain, I think!



Luis Tomasello, Atmosphere Chromoplastique, 1970

In this object I was immediately fascinated by the color reflection. Luis Tomasello plays with this reflection and gives the object an extra dimension.

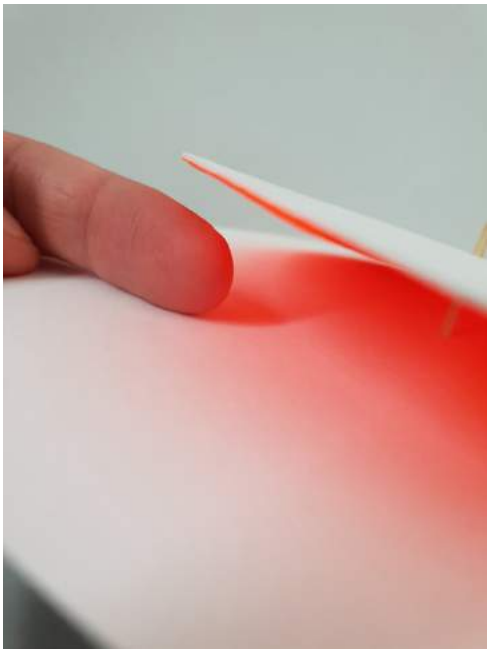
When I saw all the exceeding objects, I came up with another rotation idea. Maybe rotating the dice below and fix the upper parts could give a nice effect...

And I can play with the character of the material. Not just choose wood for practical reasons but also because it has a link with the brain for example...
In the end I couldn't find a strong material that also has a poetic link with the brain. But it a good starting point to keep in mind for my further projects.

Material research

I was really inspired by the kinetic object from De Kunsthal, so I decided to do a material research at home.

I come across the reflecting colors on paper. In the made prototypes I found out how bright the color still was when it is reflecting on another paper. I was really fascinated by this blurry/shadow effect. In a reflection is no line and no border recognizable. And I knew I found the key for showing only color!



This research was a valuable search for color, shape and motion. I already started this project with a research in the most abstract form of time and now this abstraction came back. I was searching for the purest form of color and the purest form of shape. Super interesting!

It taught me about how light interacts with color, how color interacts with shape and how shape interacts in motion. Actually, everything about image. It felt like making an image in an exploding view. Taking all components apart.

4. conclusion

How time creates image

In this conclusion I would like to shine a light on the title: '***How time creates image'***.

I chose this title because I was convinced it is time that is guilty for the delay in our brain. There is a sort of space in-between the observations and we call this time. The one comes after the other. A succession that did not exist without time. And I find it really beautiful how this can create image. It is a ***delay*** with a hidden outcome.

In my assessment Shailoh asked me if I knew for sure that time was the cause in this effect. This is a good question. You could also say: we only know what time is due to this kind of 'mistakes'. And then, time is only a consequence.

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