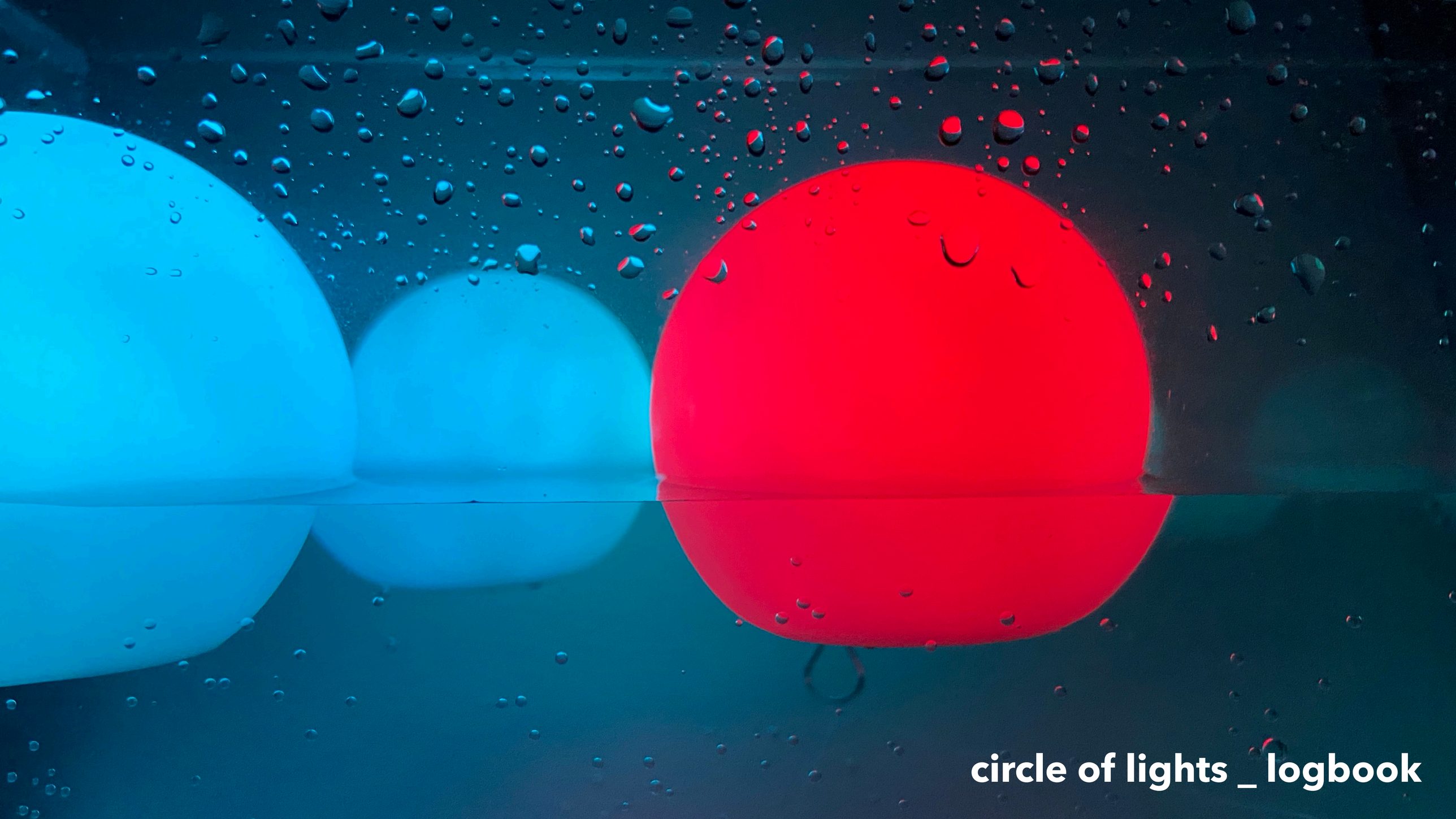
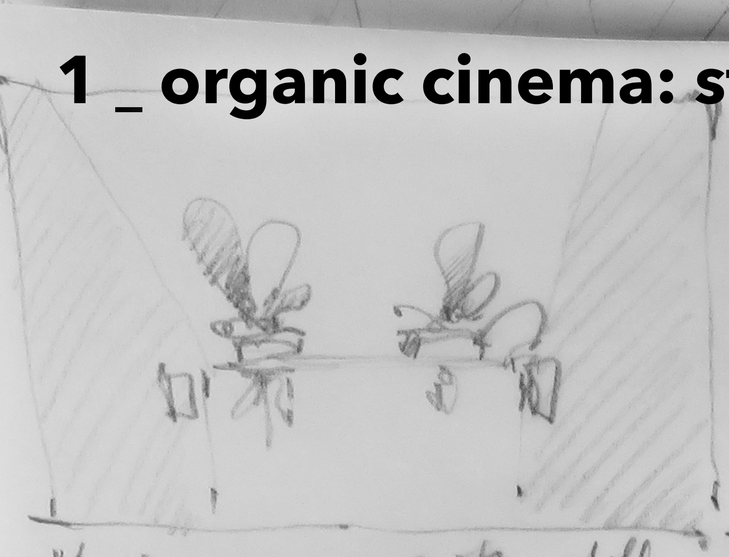
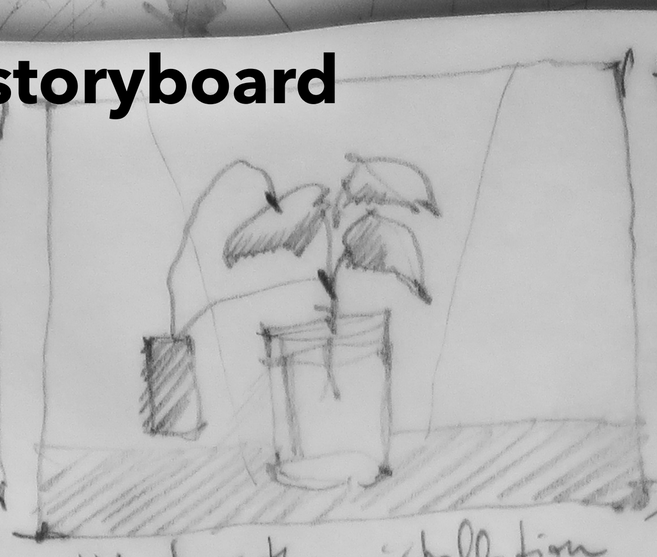

circle of lights _ logbook

0 _ logbook contents

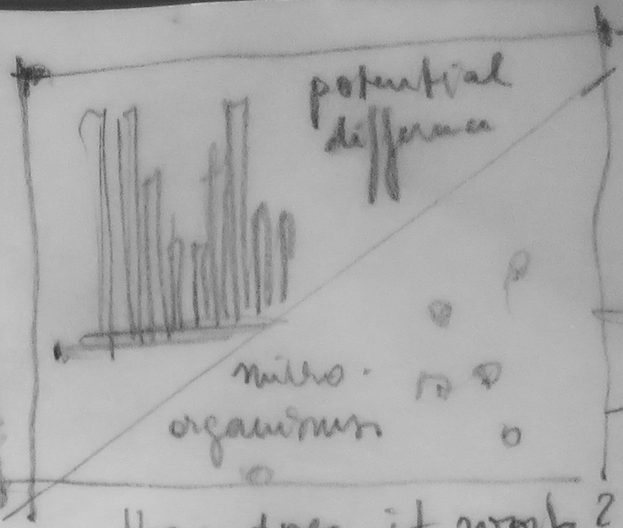
1 _ organic cinema: storyboard



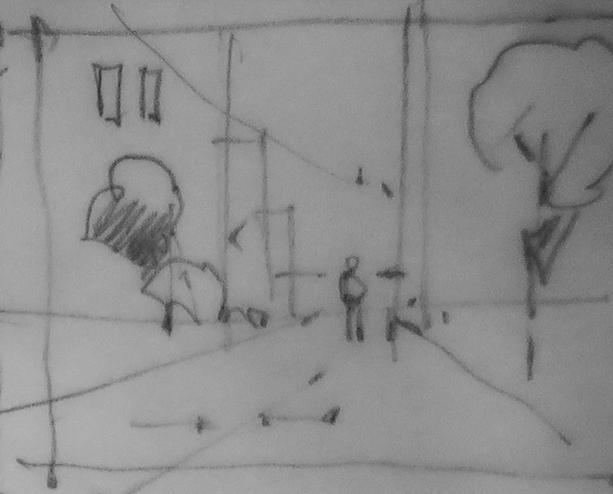
Movie opening with stills from installation - ①
- Quick overview -



- What is the installation made of.? ②
- Budget reproduction of the installation -

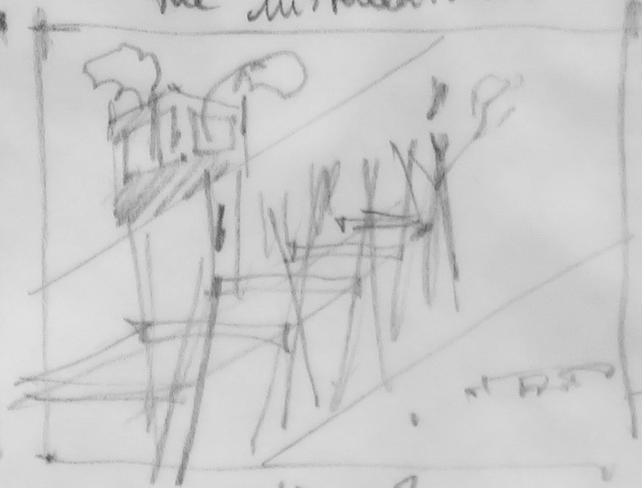


- How does it work? Explanation of the ③ technological part.

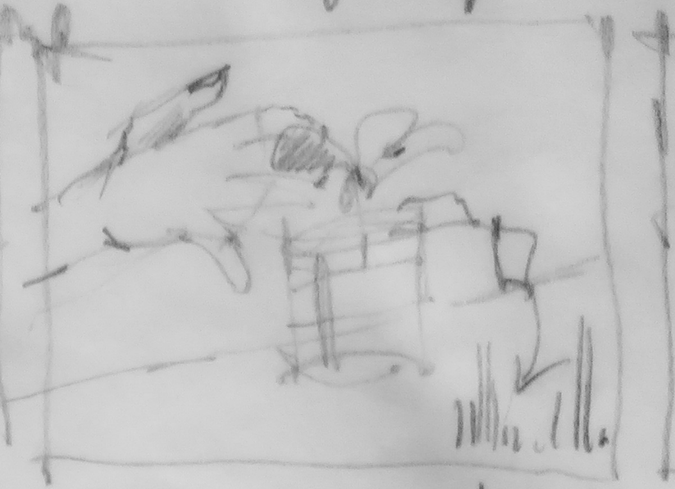


Purpose - ④
shots from the city - plants & urban nature -

Which are it's limitations ⑤
discussion of some critic points.



perspectives? ⑥
- debate outcomes
- stimuli for the brain



Good sensory art installation? ⑦
show involvement

(Parenthesis) 2'ass
Pistia Stratiotes -

1 _ organic cinema: text

Organic cinema, from World Wild Lab in Rotterdam, 2013

In short, Organic Cinema V 1.0 from the World Wild Lab is an art installation that allows plants to express themselves through direct stimulation which is translated to real time visualizations.

What is the installation made of?

The basic elements that make up the first version of Organic Cinema are water plants and a tank filled with water from a local pond. An electronical hardware captures the signals emitted by the plants and an audio-visual equipment serves as a mediator between the signals and the viewer. Urban facades serve as a screen for the visualisation algorithms that were coded by the artists. The specific electronical signals received from the plants then determine the order in which the visualisations are displayed.

The plant chosen by the artists is from the species Pistia Stratiotes. They describe it as a floating tropical invasive species. This plant is characterized by a fast grow rate and usually blocks the sunlight for other underwater growing plants in the habitat in which it thrives.

How does it work?

Custom made sensors called PlanEt, which are based on the processing hardware arduino, are the technical basis for Organic Cinema. The data is beeing transmitted through MQTT (an messaging protocoll) to software and then into visualisations.

The signals that are treated for the audio-visual display are received from two different locations. The first ones are directly taken from the plants with two electrodes that measure the electrical signal between the two points of a plant. These will react to immediate changes in the environment such as shouting, touching or cutting. The result is a set of varying vertical stripes that fluctuate depending on the action potential of the plant. With stimuli the vertical stripes grow higher. The second set of signals are taken from the water tank. There a microscope measures a sample of water every day and determines the level of microorganisms living in the tank. These signals are displayed as white dots on a black background symbolizing the quantity of microorganisms.

1 _ organic cinema: text

What is the point of the installation?

Organic Cinema is on a quest to render visible what escapes human perception and give importance to urban plants and urban nature in general. The art installation seeks to provide a platform through which the plants can express themselves and thereby alter city dweller's perception to view them as equal residents of the city. Humans tend to forget the fact that plants, microbes, insects and animals are cohabiting permanently with us and are a vital part for our urban environment and even mental health. The dissociation from nature through our actions is one of the causes that led to climate change and decreasing biodiversity. Through Organic Cinema, World Wild lab wants to push the dialogue between plants, nature and humans.

Which limitations has this installation?

The Nano signals emitted by the plants need sophisticated and sensitive hardware in order to be distinct. In 2014 World Wilder Lab wasn't able to distinguish signals from different species. The equipment that could perform such tasks exist but not within the ideology of the WWL. Indeed, WWL looks for solutions in open source and open hardware equipment.

The second problem arises from the electrical signals themselves. How are we to interpret these signals? Organic Cinema translates the signals into visualizations and claims that the plants behave than as actors since the generated visualisations are displayed according to the signals. However even though the plants decide the sequence of the images, humans are at their origin. Does that make the plants less like actors and more like film directors?

Finally, the plants react to environmental stimuli which they do not control. In a way that makes their reaction somewhat involuntary and them become "passive" actors.

Which perspectives does this kind of installation give us?

Organic Cinema leaves the viewer with a heightened sense of the urban environment. It raises questions about the possibilities of collaboration with urban nature rather than an opposition between urban and natural spaces. This also exposes the decisions of past architectural and urban planning concepts that have set walls and boundaries for plant life instead of integrating it. Furthermore, the species Pistia Stratiotes is proven to be useful for humans since it can be used to purify water in aquariums and ponds.

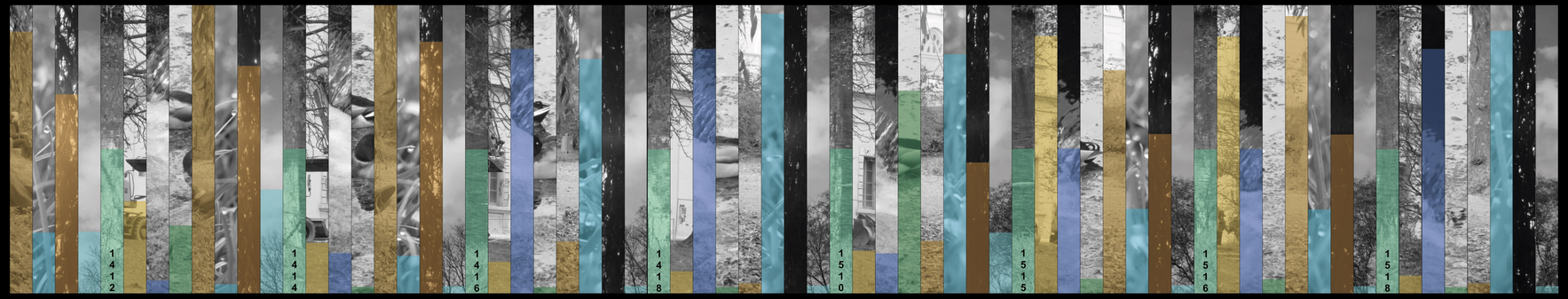
Why is Organic Cinema a good sensory art installation?

It involves the public since it partially requires their disturbance in the plants environment in order to see a change in the plant's electronic signals. It combines multiple disciplines, environments, senses and actors. It offers possibilities and opportunities to learn about the world surrounding us in an informal and thereby effectively educational way.

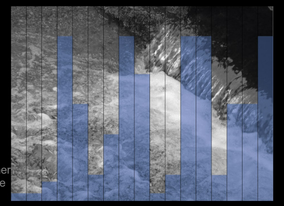
1 _ organic cinema: video link

https://www.youtube.com/watch?v=1D9GMnNkk1U

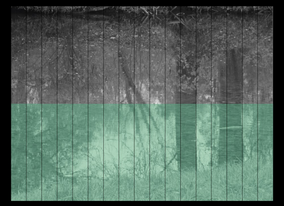
2 _ perception



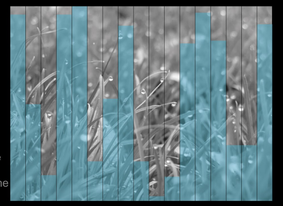
Artificial sounds:
these are man made sounds either by motorised vehicles, bikes or construction sites. The higher the bar, the louder the noise is.



Water sounds:
these are created by the springs that flow into the Ilm. The higher the bar, the louder the noise is.



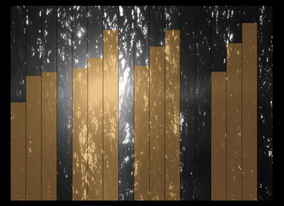
Water flow:
this is the speed at which the Ilm flows. The higher the bar, the the faster the river is.



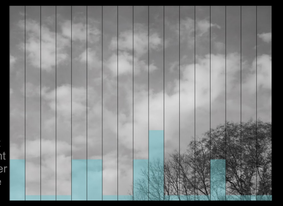
Humidity:
this is measured by looking at the relative wetness of the lawn. The higher the bar, the wetter the grass is.

Animal sounds:
these sounds are produced mostly by birds by either singing or influencing the environment. The higher the bar, the louder the noise is.

Human flow:
this is the quantity of visitors of the Ilm park. The higher the bar, the more people are present at that moment in the park.



Light intensity:
this is the amount of light and relative light intensity at that moment. The higher the bar, the stronger the ambient light is.



Wind flow:
this is the relative speed of the wind felt at the chosen moment in the park. The higher the bar, the faster the wind is.

3 _ analysis & context

_ signs & symbols:

tower: meeting & orientation point

bridge: portal , viewing point , crossing & dividing element

street: traffic & noise ; abrupt park boundary

sphinx: artwork & historic value ; connecting place

directions: integration in path structure; access

axis: different viewing points & perspectives

water: interellation leutra, ilm & spring ›ochsenauge‹

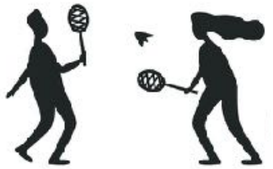
3 _ analysis & context

bridge passengers:
people crossing the bridge without visiting the park

walking:
people crossing the bridge / walking through the park

riding bike:
people crossing the bridge / people visiting the park

jogging:
people using the park for solo sports & enjoyment



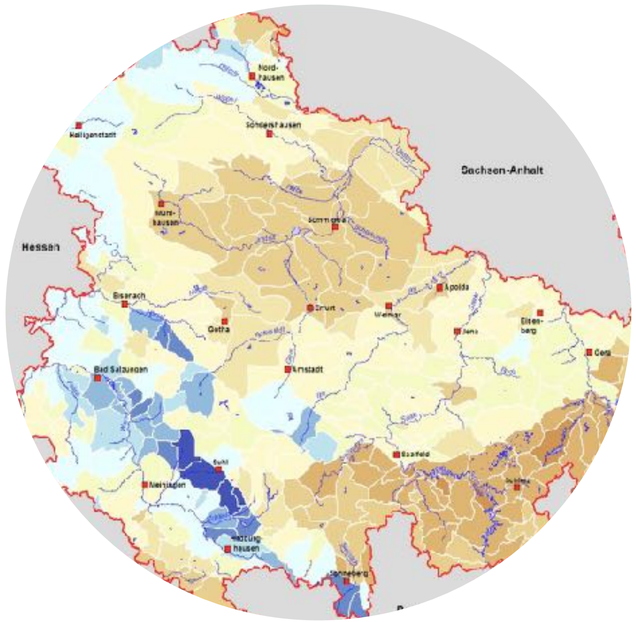
(team) sports:
people meeting & staying at one location in the park, usually sports

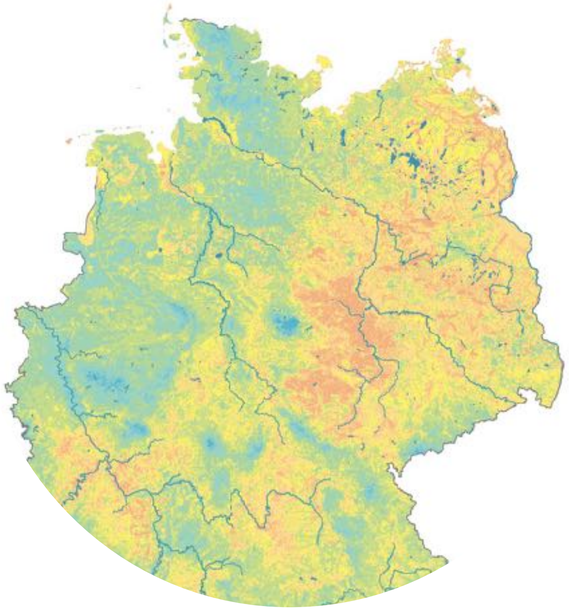
3 _ story & narration

new nature
depends on

collaboration between
man and water

3 _ story & narration





From last time: groundwater diminishing in Thuringia and Weimar at a rate of up to 100mm/year and replenishment at a rate of up to 75mm/year

Which means a general loss of 25mm/year: **How to visualize this amount? At park level, human scale?**

3 _ story & narration

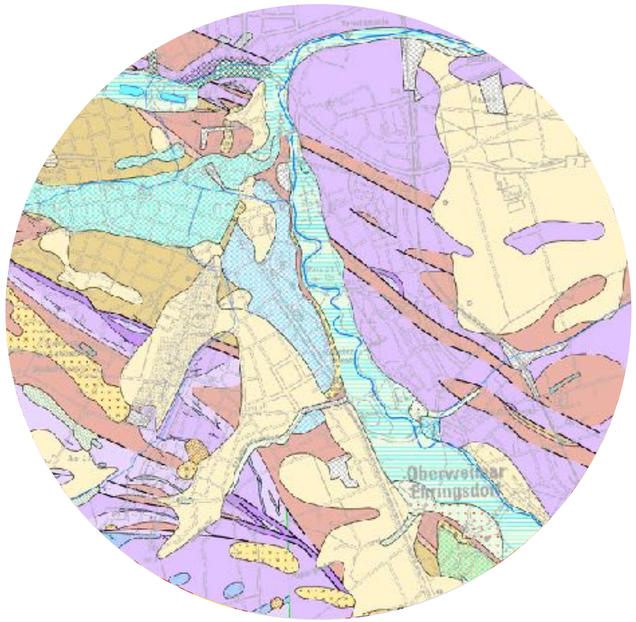
Time scale change

Volume of lost groundwater

Translation into liters

Translate 25 mm/year into more relatable scale
Change of years into minutes
Liters as a everyday value
Calculation of Volume according to 25mm

3 _ story & narration



Geology of Ilm park

Porosity of Ilm park

Size of Ilm park

Translate 15 mm/year into more relatable scale
Main components of the park: clay (61%), travertine (25%), sandstone (keuper 9%) (
Average porosity of the park: 39%
Size of the park: 48ha
Result: 5,3 l/min

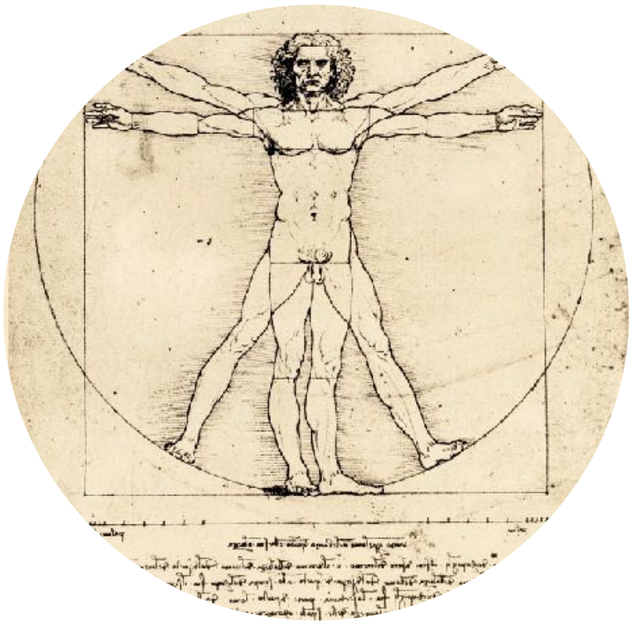
3 _ data: input & output

water input:

either data from ph-value, tds (cleanliness), oxygen level or turbidity

water output:

influence on color lighting patterns through movement



human input:

either data heart pulse or heart rate variability

human output:

influence on frequency of lighting ; mechanical movement of lights

3 _ action & interaction

missing lighting situation in the park, light source as attraction for visitors, visible from afar (bridge)

meeting point for park visitors, exchange about different heart rates, relation to water

participants & spectators as moving canvas for the water reflection

use of sustainable energy for powering the installation (solar, photovoltaik, water movement etc.)

4 _ final summary

What is New Nature in context of the Ilmpark for us?

New Nature is the present day utopia of the Ilmpark that has been historically manicured to fit certain esthetic taste. Nowadays climate change is endangering this neat picture. The gardeners have to work harder in order to preserve the image of the park. One of the main problems that the park is facing in the next generations has to do with water supply. So new nature is a close collaboration between man and water.

4 _ final summary

How severe is the water loss in the Ilmpark?

Thüringen is one of the regions that suffers the most from deficient groundwater renewal. Due to it’s geological heritage and location the park is losing water. We chose the worst case scenario for the water loss according to “Klimawandel in Deutschland” Kunstmann et al. So that when we take in account groundwater levels loss and renewal we end up with a deficiency of 15 mm/year.

4 _ final summary

Why choose the Ochsenauge as a location for our project?

The Ochsenauge plays an important role in the esthetic quality of the park since it is part of the historical landmarks. It plays an important role in supplying it's surroundings with water and will be even more important as water supply becomes problematic. Furthermore, the spring is a karst type source of water and depends on rainwater and thus will be affected by climate change.

4 _ final summary

How do we tie all these aspects into our project?

Our scenario requires three players: humans, the park and the spring. The humans are at the heart of the problem since they are responsible for diminishing resources. The park relies upon human aid in order to maintain its image. And the spring is influenced by human behavior concerning climate change. So we need a common denominator to raise awareness about the situation. To this effect we want to compare the liquids in each actor. The human blood cycle, the groundwater loss and the spring output. For this we chose the same scale which is understandable at a human level: l/min. Our goal is to show the difference between the blood circulation, groundwater loss and spring output in l/min.

4 _ final summary

weimar

STADT KULTUR TOURISMUS

STADT WEIMAR APPELLIERT ZU VERANTWORTUNGSVOLLEM UMGANG MIT WASSER

18.08.2020 | Meldung | Erstellt von Sachgebiet Kommunikation und Protokoll

Die Stadt Weimar ruft die Bürgerinnen und Bürger angesichts wiederkehrender Trockenwetterlagen und sinkender Wasserstände dazu auf, das vorhandene Grund- und Oberflächenwasser mit Bedacht zu nutzen und Verschwendungen zu vermeiden.

„Die Stadt Weimar ruft die Bürgerinnen und Bürger angesichts wiederkehrender Trockenwetterlagen und sinkender Wasserstände dazu auf, das vorhandene Grund- und Oberflächenwasser mit Bedacht zu nutzen und Verschwendungen zu vermeiden."

„In view of recurring dry weather conditions and falling water levels, the city of Weimar calls on citizens to use the existing groundwater and surface water carefully and to avoid waste."

„In den letzten Jahren hat die Grundwasserneubildung auch in unserer Region abgenommen. Die Niederschläge erreichen das Grundwasser kaum, da die Böden ausgetrocknet und wenig aufnahmefähig für kurze und intensive Niederschläge sind."

„In recent years, the renewance of groundwater has decreased in our region. Precipitation barely reaches the groundwater because the soil is dried out and not very receptive to short and intensive precipitation."

„Der Grundwasserpegel an der Messstelle am Theater fällt nach einer kurzen Erholung im Frühjahr stetig. Ähnlich sieht es mit den Oberflächengewässern in Weimar aus: Ilm, Asbach, Kirsch- und Lottenbach haben über das Jahr zeitweilig sehr niedrige Wasserstände. Die Brunnenstube im Rabenwäldchen, die zur Versorgung innerstädtischer Laufbrunnen dient, war fast versiegt[…]"

„Dennoch wird Wasser auch hierzulande ein immer kostbareres Gut, das nicht unendlich zur Verfügung steht."

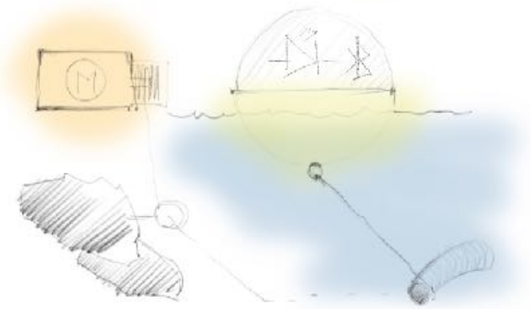
„In this country, too, water is becoming an increasingly precious commodity that is not infinitely available."

5 _ design concept

_ traction system:

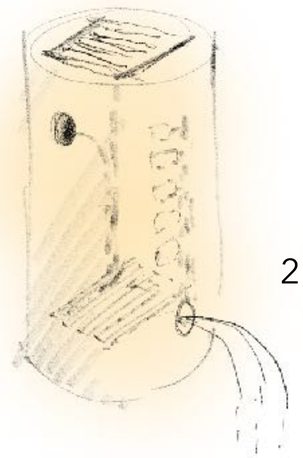
7 _ motors

5 _ lights

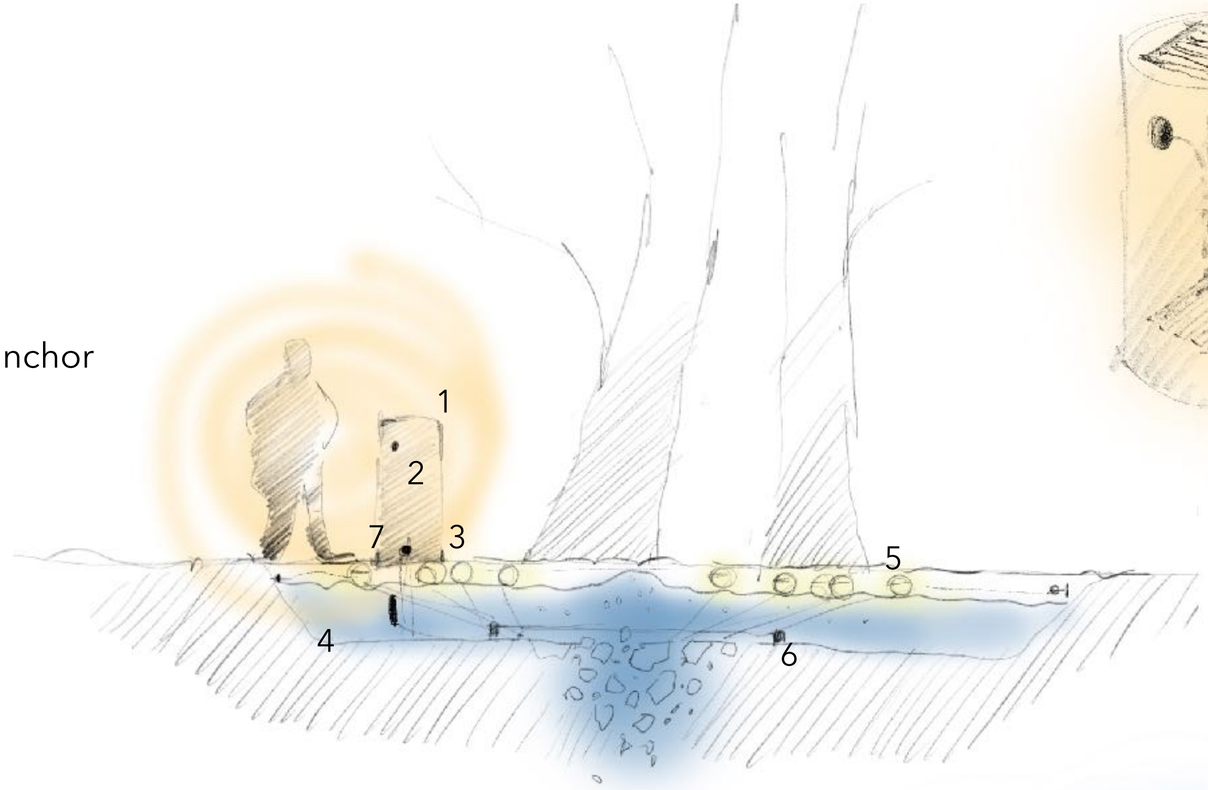


6 _ anchor

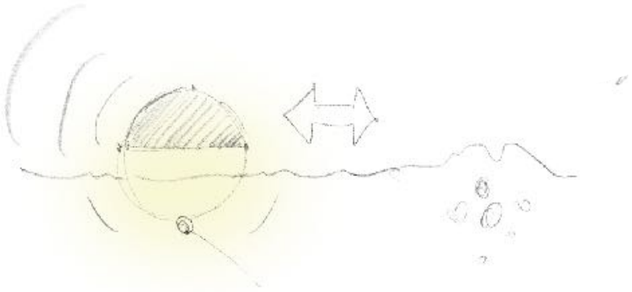
1 _ interface



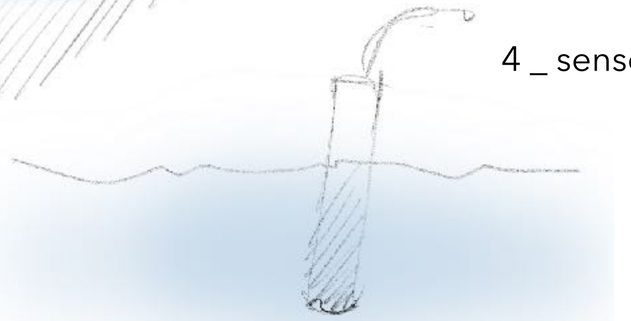
2 / 3 _ data input



_ movement & frequency:



4 _ sensor



5 _ design concept of installation



light circle: Floating lights, Led, changeable colors, 12pcs, diameter 8cm. Anchor for lights, filled with water, covered by sediments, circuit for nylon cables



interface: Envelope for the Arduino and other electronic equipment, height: 1m, a hidden Arduino board and motor



sensors: Flowrate measuring equipment, Pulse sensor on interface

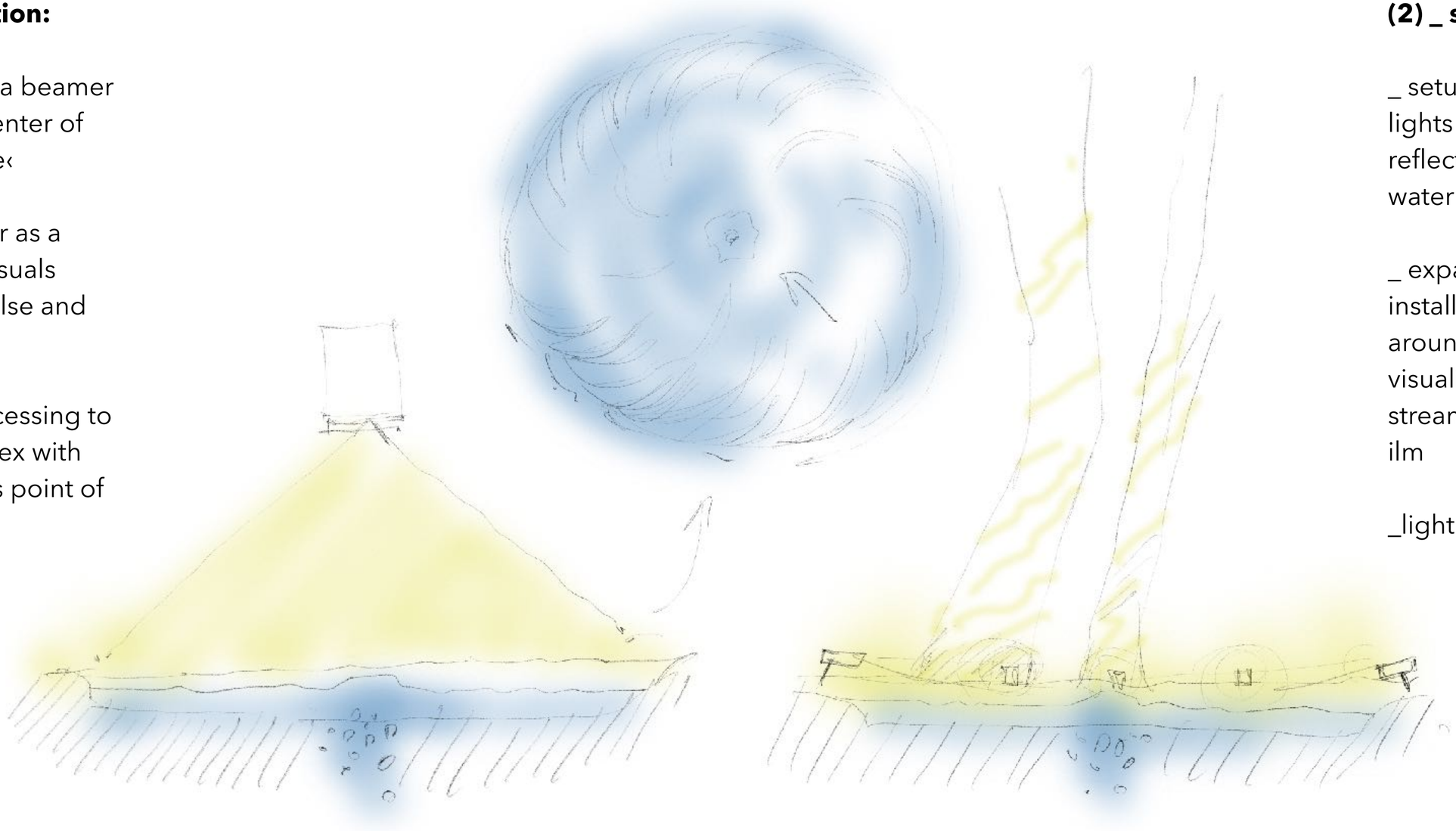
5 _ alternative concept

(1) _ projection:

_ setup with a beamer above the center of ›ochsenauge‹

_ spring floor as a canvas for visuals based on pulse and water data

_ use of processing to create a vortex with the spring as point of origin



(2) _ shifting lights:

_ setup with multiple lights & focus on the reflection of light and water

_ expansion of the installations scale around the ›leutra‹ to visualize the springs stream leading to the ilm

_light up the park

6 _ interface concept

(1) _ bpm:

… put your finger on the fingerprint icon

… a buzzer underneath the icon vibrates with your heart rate

… the color of the balls changes to a red

… the lights pulsate with your heart rate

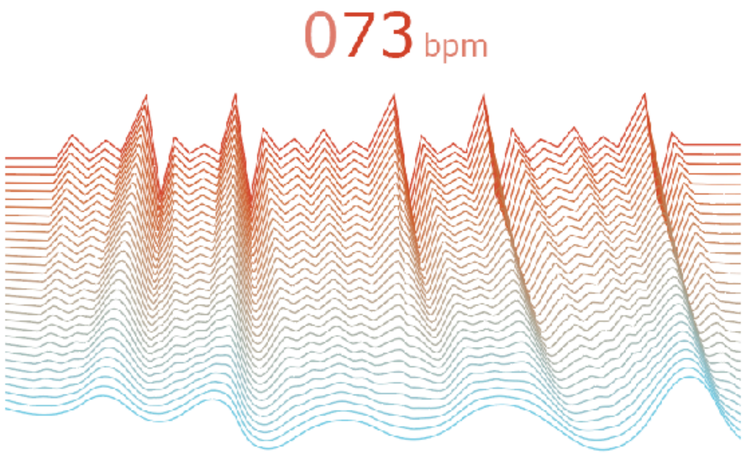
(2) _ cardiac output:

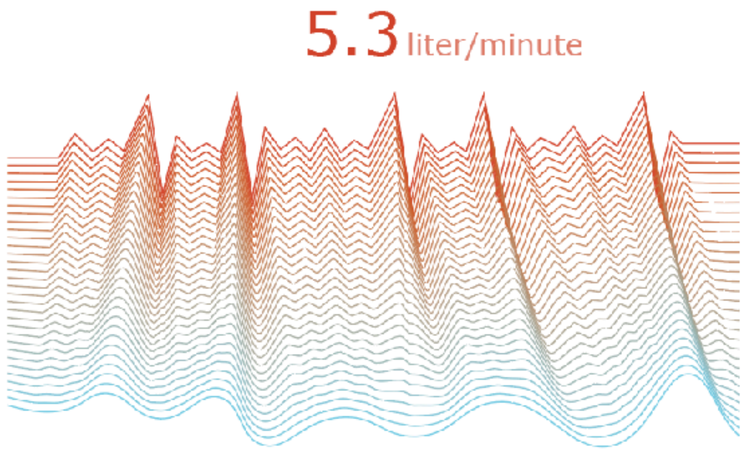
… press on one of the buttons to key in your age-group

… depending on your age and bpm your specific cardiac output gets displayed

… the light balls move inside in a circular movement

… the radius displays the amount of blood your heart pumps per minute





6 _ interface concept

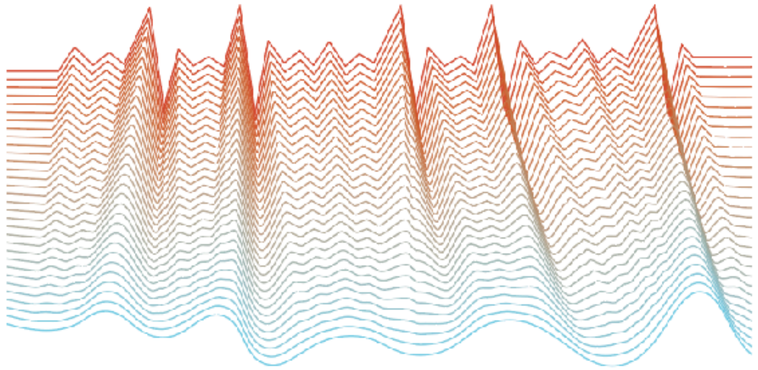
(3) _ water flow:

… press on the button to see the current water flow of the spring

… the color of the balls changes to a blue

… the light balls move outside in a circular movement

… the radius displays the amount of water emitted by the spring each minute



67.0 liter/minute

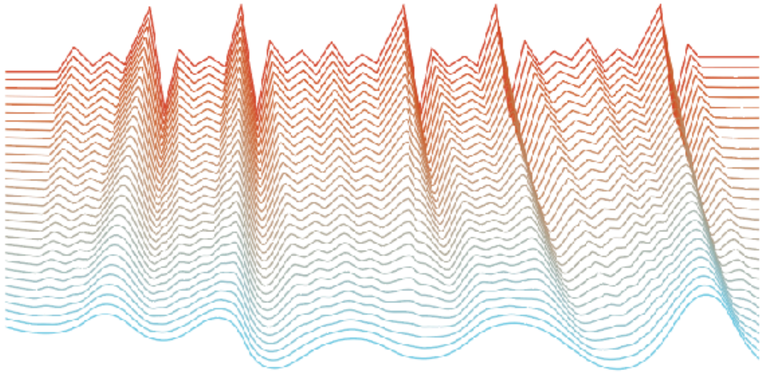
(4) _ depletion:

… press on the button to see the water depletion of the park

… the light balls move inside in a circular movement

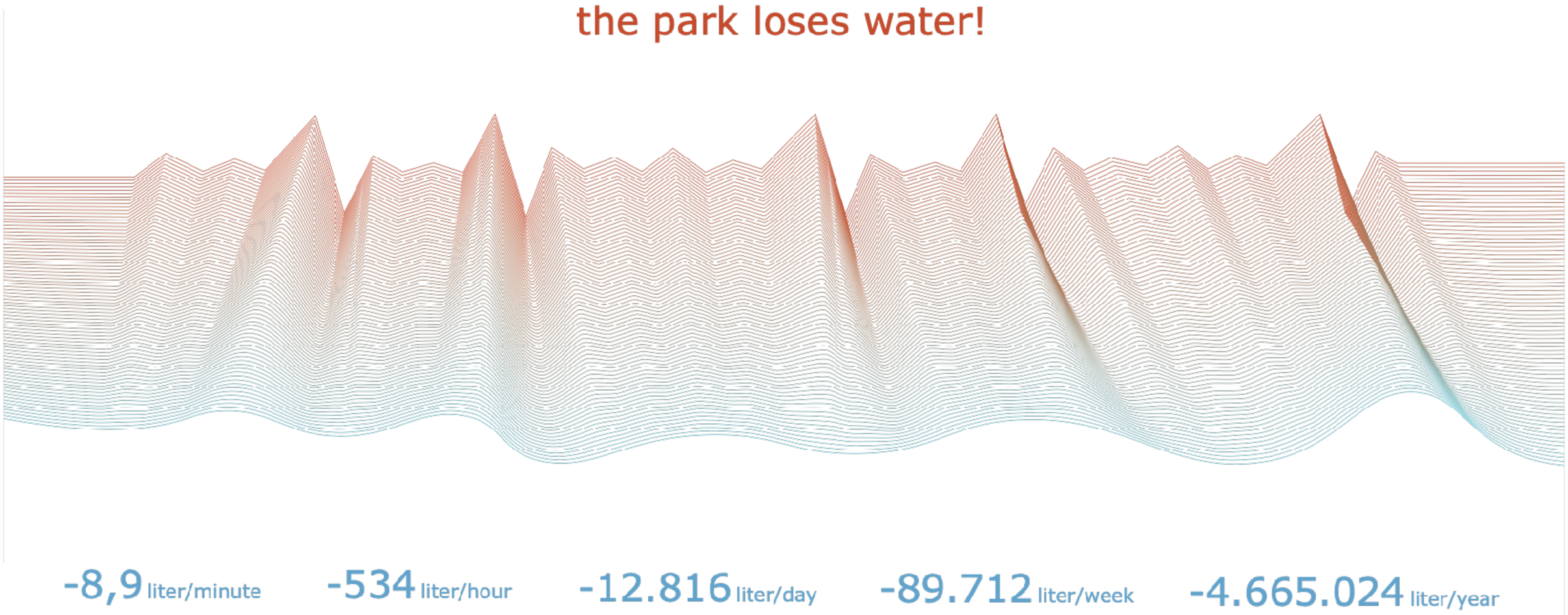
… the radius displays the amount of water the park loses each minute

… the lights slowly fade out visualizing the end of the spring



-8.9 liter/minute

6 _ interface concept



6 _ interface concept

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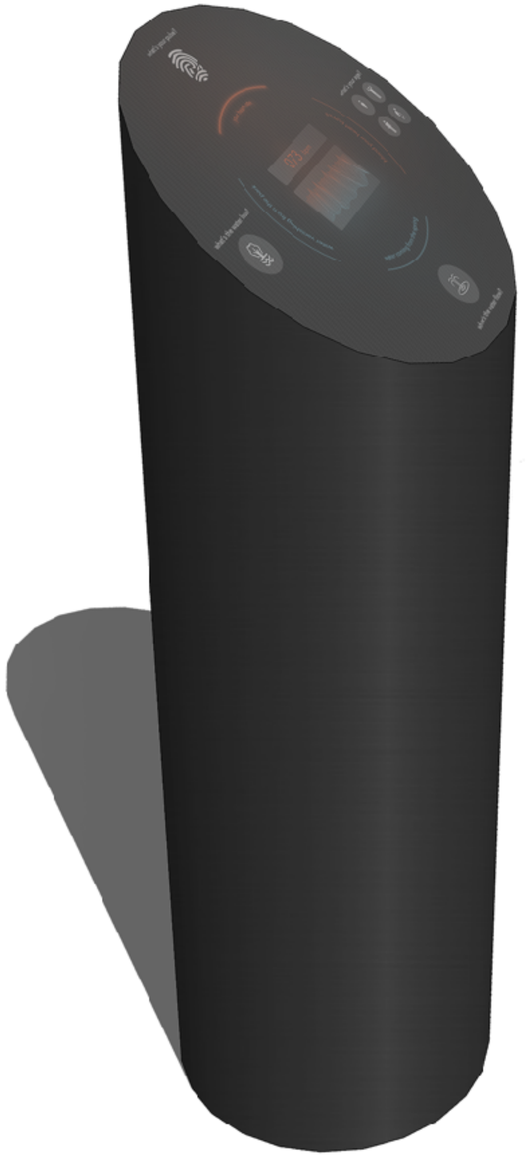
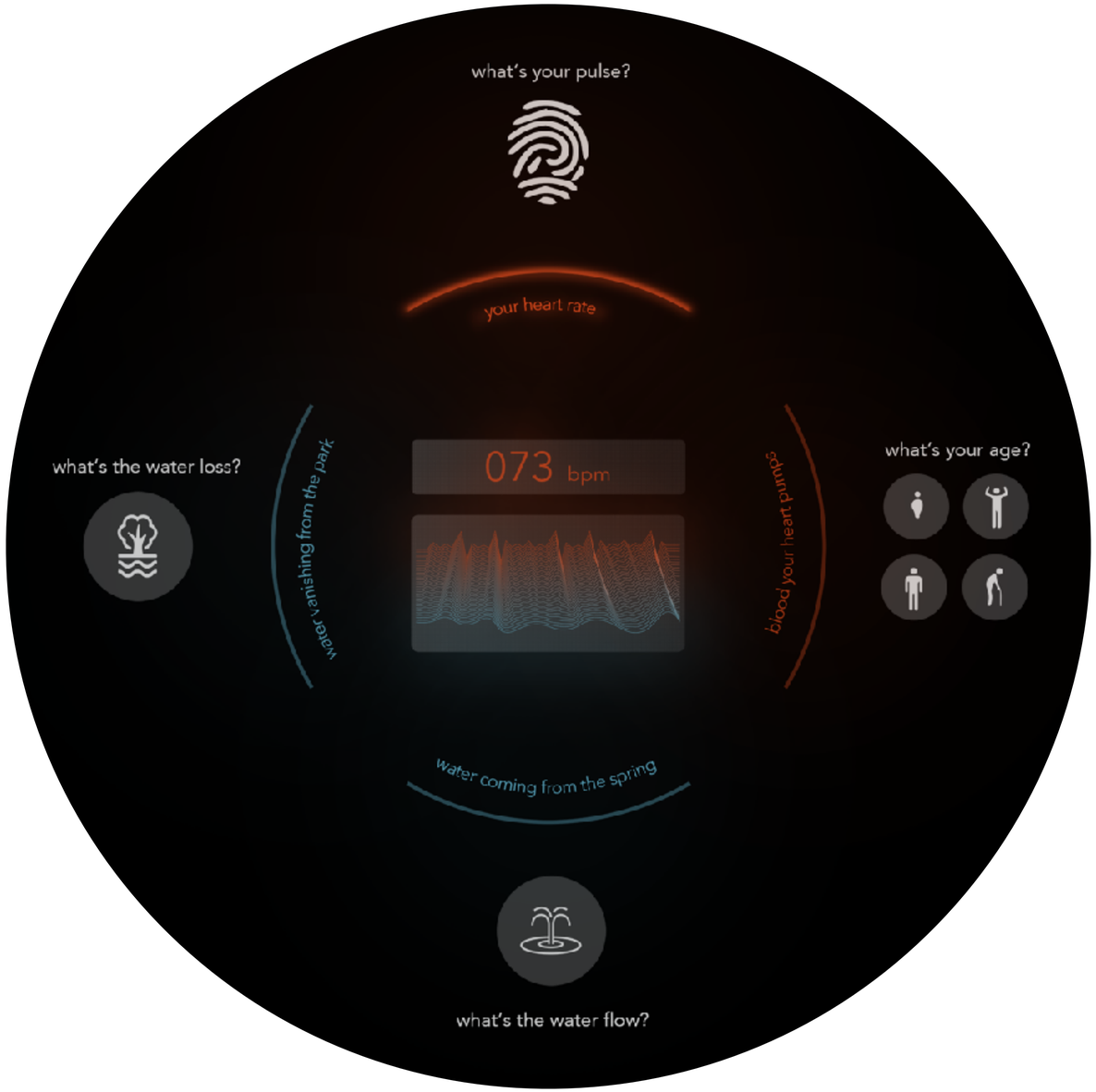
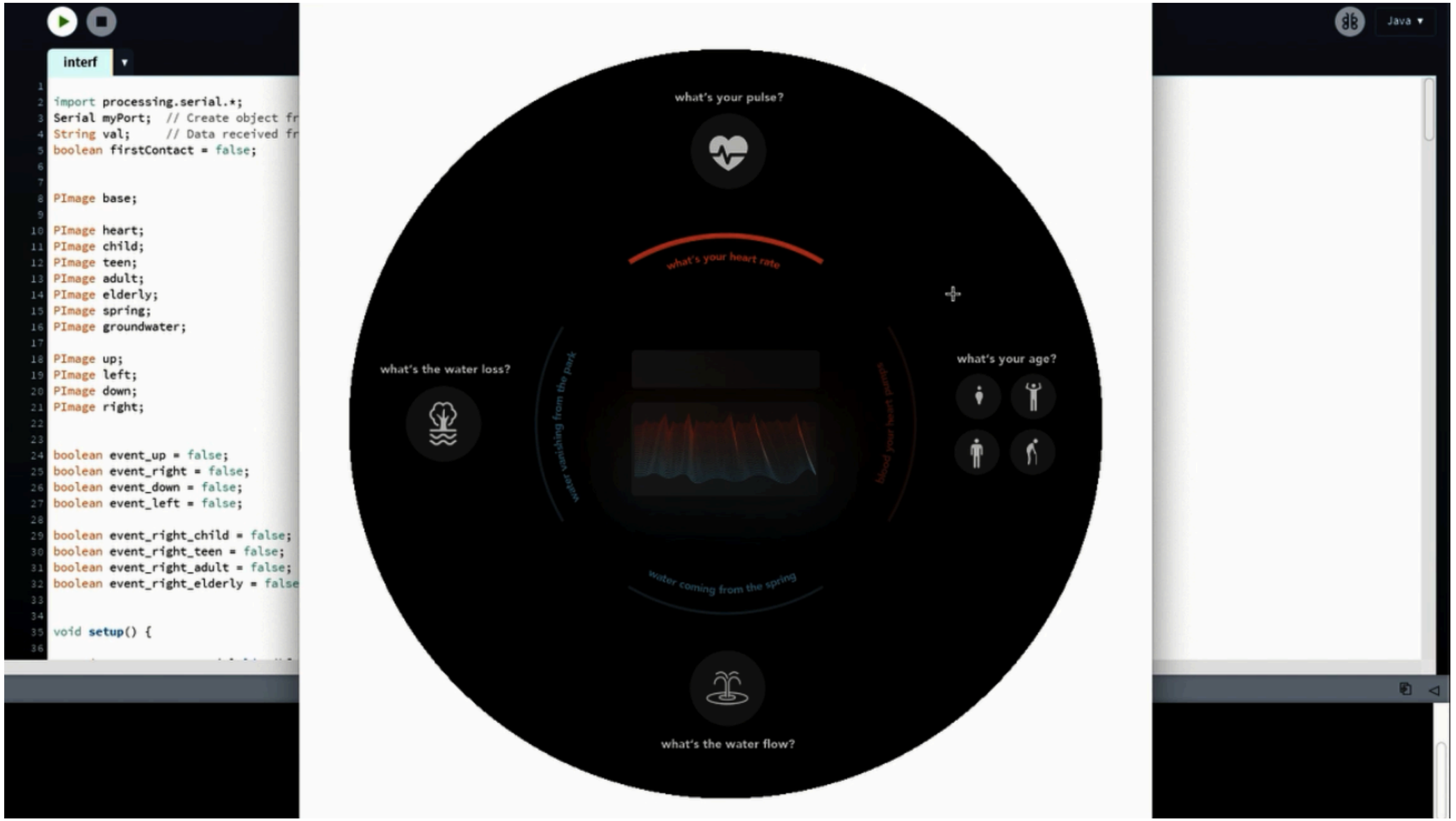




7 _ processing interface

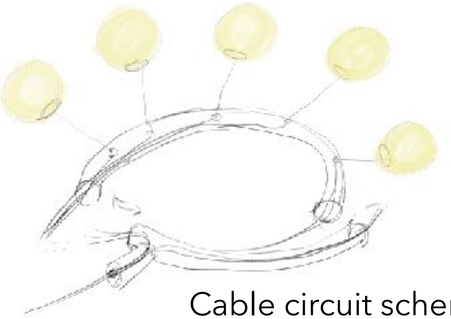


8 _ prototype concept

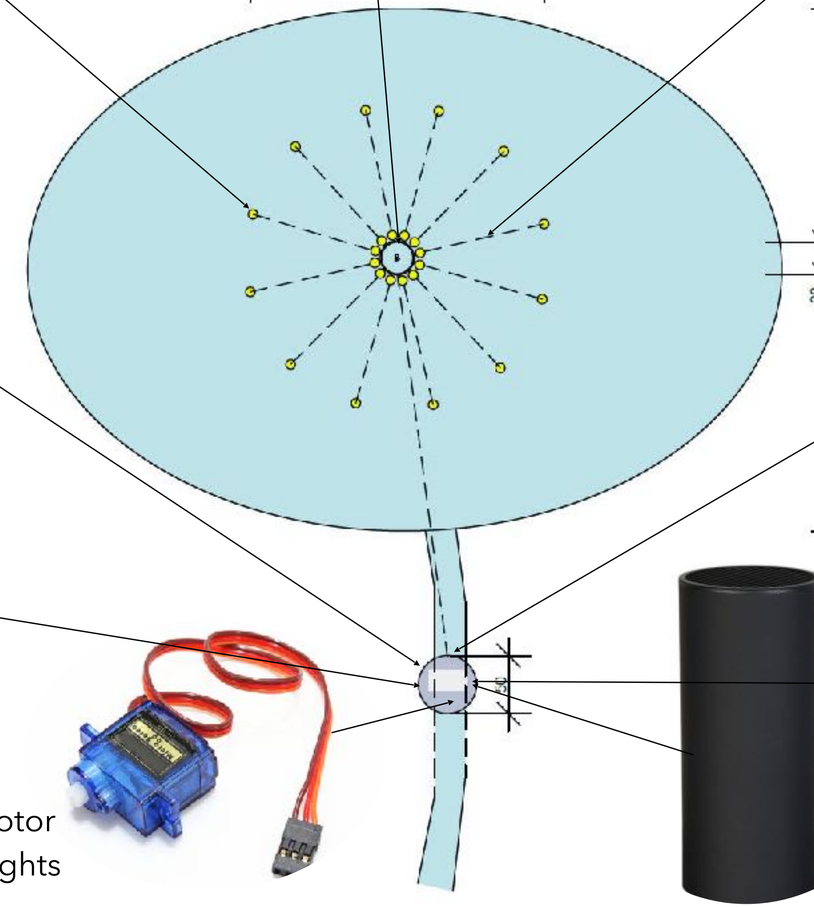
Floating lights, Led, changeable colors, 12pcs, diameter 8cm

Anchor for lights, filled with water, covered by sediments, circuit for nylon cables

Nylon cables, use for holding back the lights



Cable circuit schema



Arduino board

Flowrate measuring equipment

Pulse sensor on interface

Servo or step motor to monitor the lights movement

Envelope for the Arduino and other electronic equipment, height: 1m

Interface

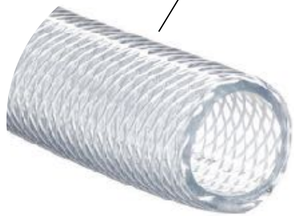
8 _ prototype concept

Arduino board

Pulse sensor on interface

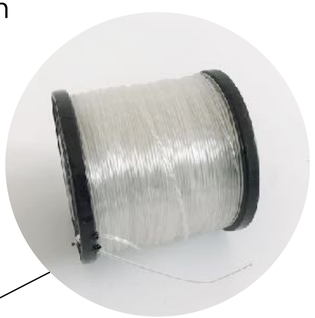
Servo or step motor to monitor the light's movement

Water tank long enough for movement



Anchor for lights, filled with water, circuit for nylon cables

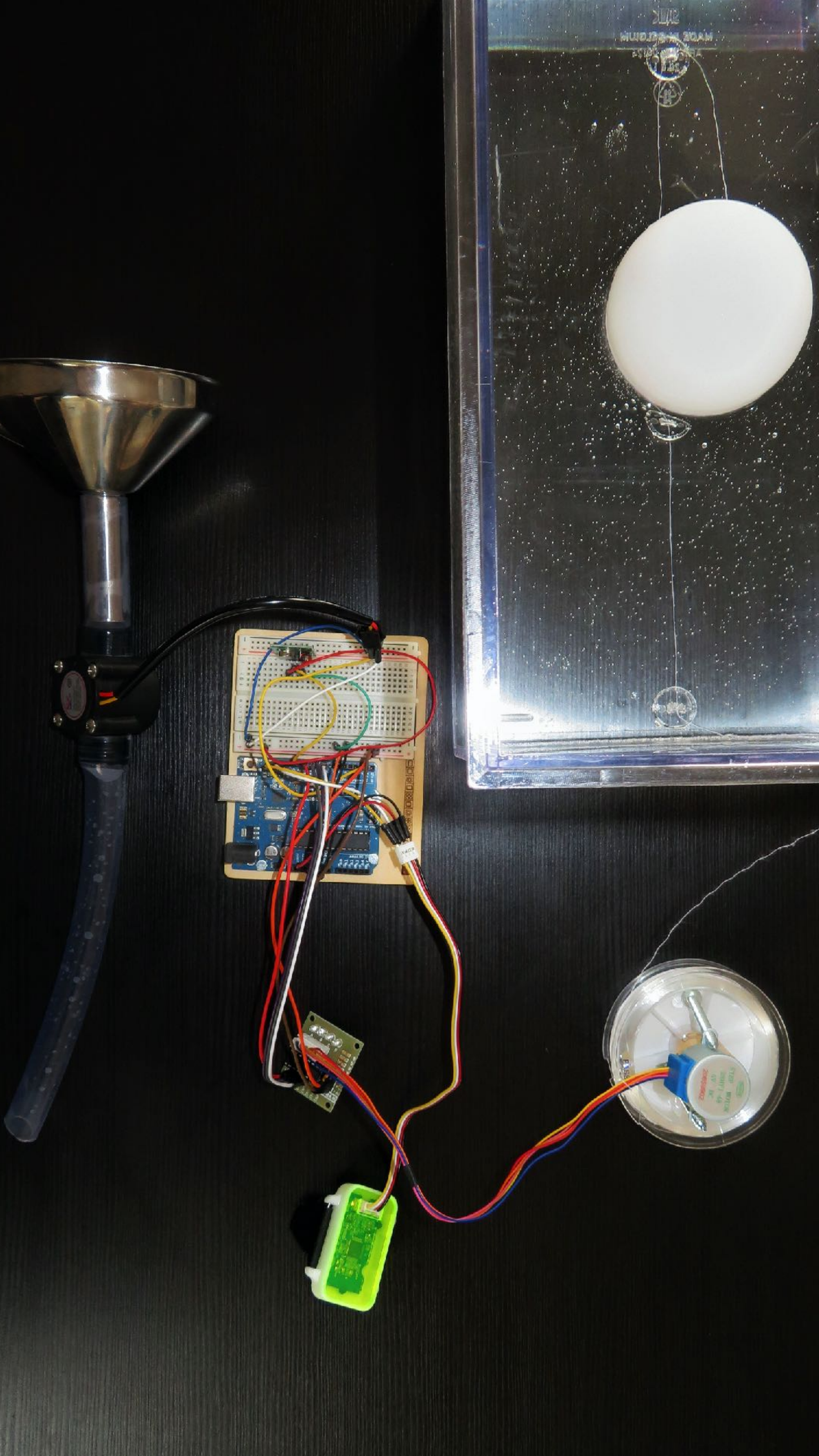
Floating light, Led, changeable colors, diameter 8cm



Nylon cable for holding back the light

Flowrate measuring equipment

Water input preferably through shower or waterhose



9 _ visualisation

9 _ visualisation

10 _ future developement








Arduino: **32 €**

Stepper motor Nema 23: **40 €**

Nylon and attaching equipment: **30 €**

PK Green outdoor floating light 12pcs: **1.080 €**

Cover for Arduino & electronics: **30 €**

Heart rate Sensor: **30 €**

Open channel flowrate sensor: **200-500 €**

Extras: **20 €**

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total sum: 1.612 €

10 _ future development

OCHSENAUGE – WHAT'S IN FRONT OF YOU

Ochsenauge is one of three springs in the Ilmpark, which belong to the so called Leutra springs. Leutra refers to the old german word „läutern" which means to wash or to launder and refers back to the initial use of the spring and the leutra river, which gets only a few meters long before it flows into the ilm river. Both the Ochsenauge and the Sphinxgrotto – which can be seen on the picture underneath – have been crafted artfully at the end of the 18th century. The Ensemble is one of the oldest facilities on the park and is part of the UNESCO World Heritage Klassisches Weimar. For more information about the springs and the Ilm park itself feel free to visit the website of the Klassik Stiftung Weimar.

GROUNDWATER – WHAT'S UNDER YOUR FEET

Ochsenauge is a karst spring, which means it is characterized by underground drainage systems typically with sinkholes and caves. Through these drains, karst springs represent a natural exit for the groundwater to the surface of the lithosphere.

Mainly through rain the groundwater in Weimar gets renewed by 85mm per year. These values were calculated during a research from the TLUG (thuringian state office for environment) between 2011 and 2013. [1] In the publication „Klimawandel in Deutschland" an estimated subsidence of 100mm per year is mentioned for the region [2], which leads to a total deficit of 15mm per year. Through an estimation based on the map service from the TLUBN, we came to the conclusion that the ground in the ilm park has the following soil conditions: clay (61%), travertine (25%), sandstone/keuper (9%). This composition leads to an average ground porosity of 39 %, which influences the amount of water the ground can store. The park itself has an estimated size of 48 hectars. The amount of water lost per minute in the park: 5,34 l/m.

For more information about the need to responsibly handle our water resources you can visit the press release from the city of weimar. For more information about the water balance you can use this link from the TLUG. Finally, if you need more information about the climate change and its effect on germany you can read the book „Klimawandel in Deutschland" here for free.

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