

FLO



LUND
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Flo: Intuitive Music Device Design

An attempt to increase the tactile and sensory experience.

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Degree Project for Master of Fine Arts in Design

Main field of study Industrial Design

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abstract

FLO is designed and dedicated to creating intuitive music playing with tactile and sensory experience for advanced music producers as well as beginners, even with minimal skills.

The inspiration is from the traditional Chinese instrument, the Guzheng. Thinking in a counterfactual way, as most of the synthesizers in the market present a western symbol as the piano keys, I investigated whether there were new ways that might yield interesting results, where the synthesizer would have a different logic of operation as well as the appearance of design.

This project aims to hopefully help beginners boost confidence in music creation, at the same time for music pros to overcome bottlenecks in music creation with possible playability.

**keywords:
music synthesizer,
tactile experience,
sound visualization,
interaction design**

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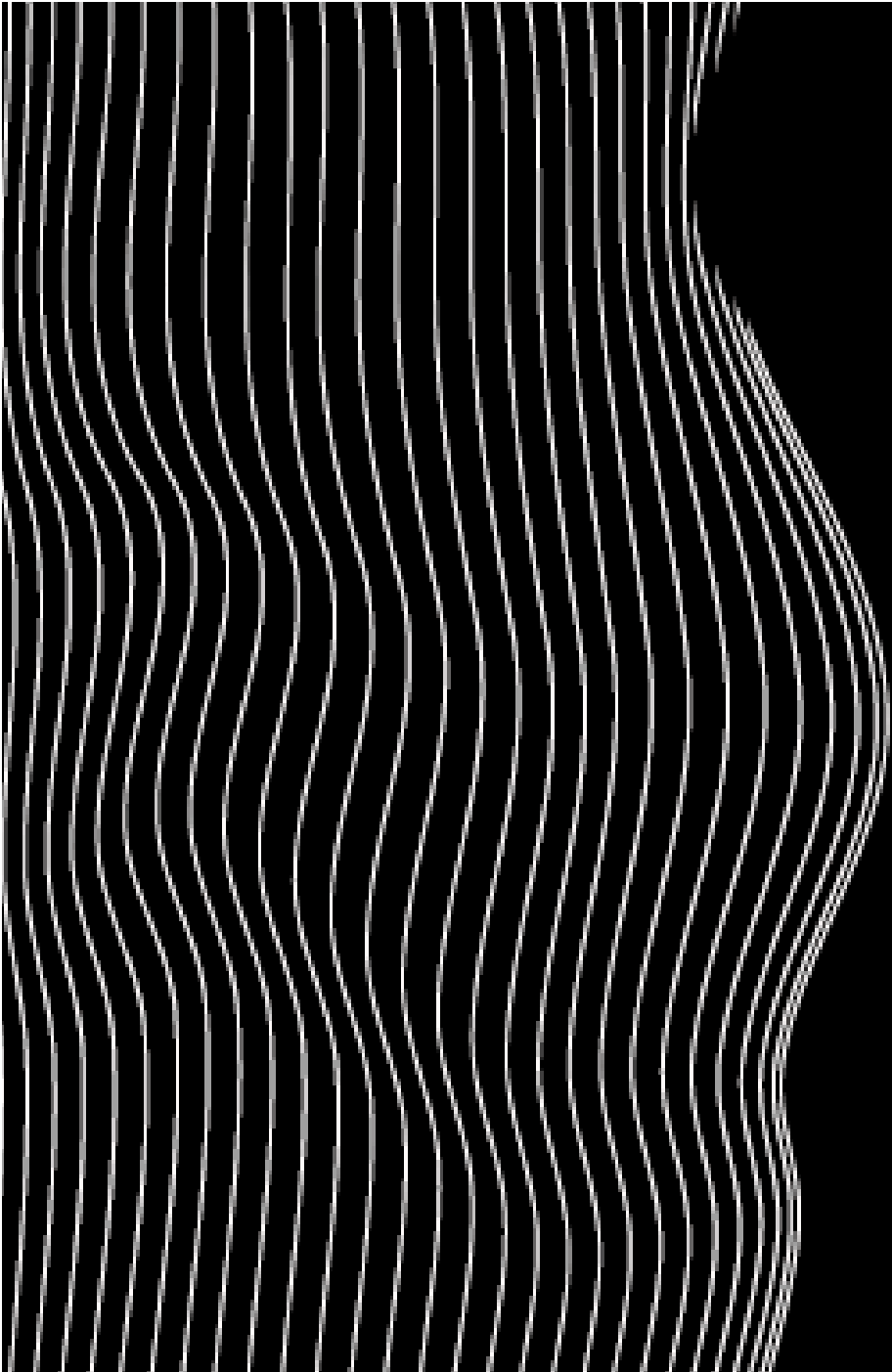
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introduction



introduction

design process
motivation
demarcations

initial beirf

do a project
related to music.

initial research

dive deep in the
music industry and
music learning

research 2.0

interviews

38 questionnaires and 2
interviews to understand
what seems to be the most
common problems.

how might we

new brief

Create a music device which enhance tactile experience and visual experience a

ideation

physical aspect

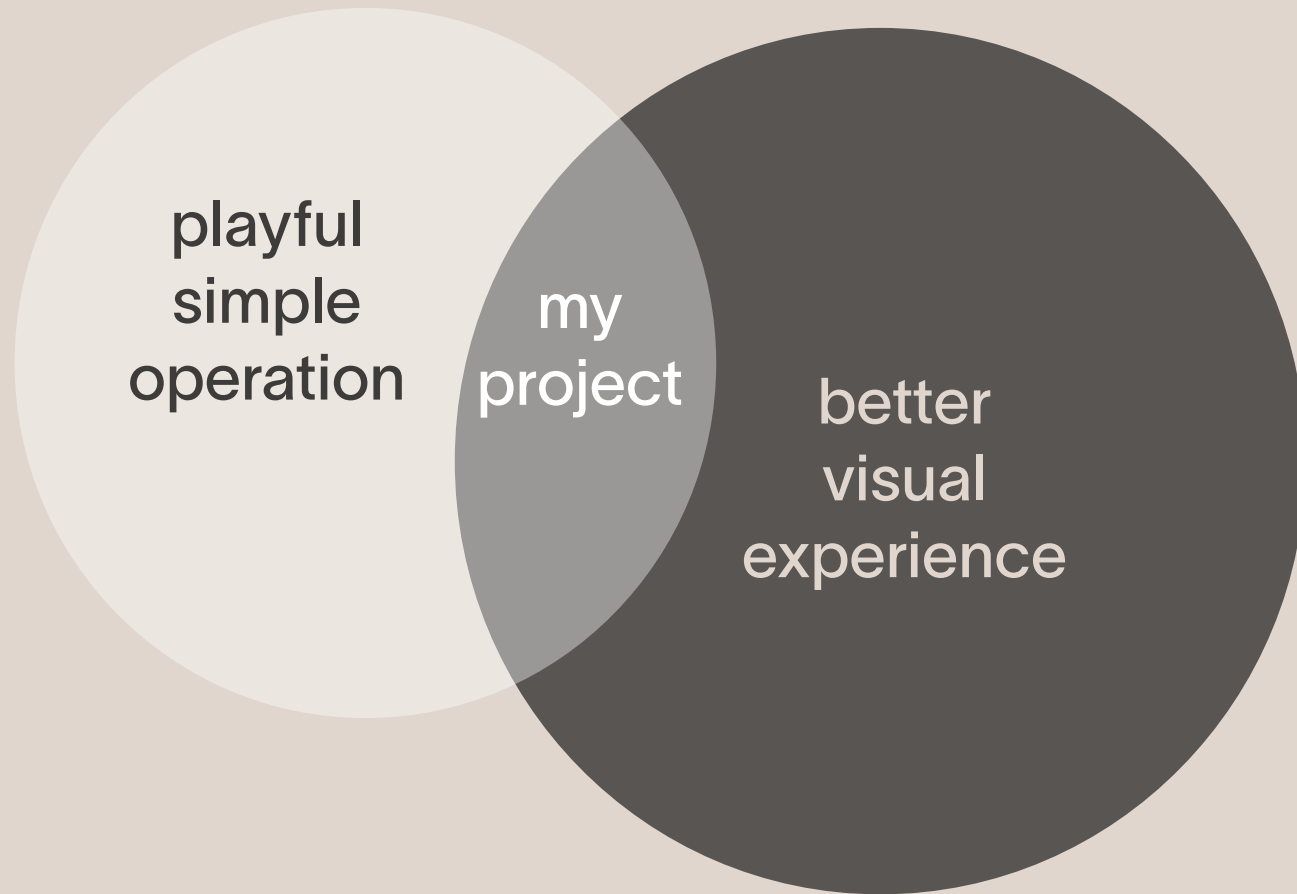
visual aspect

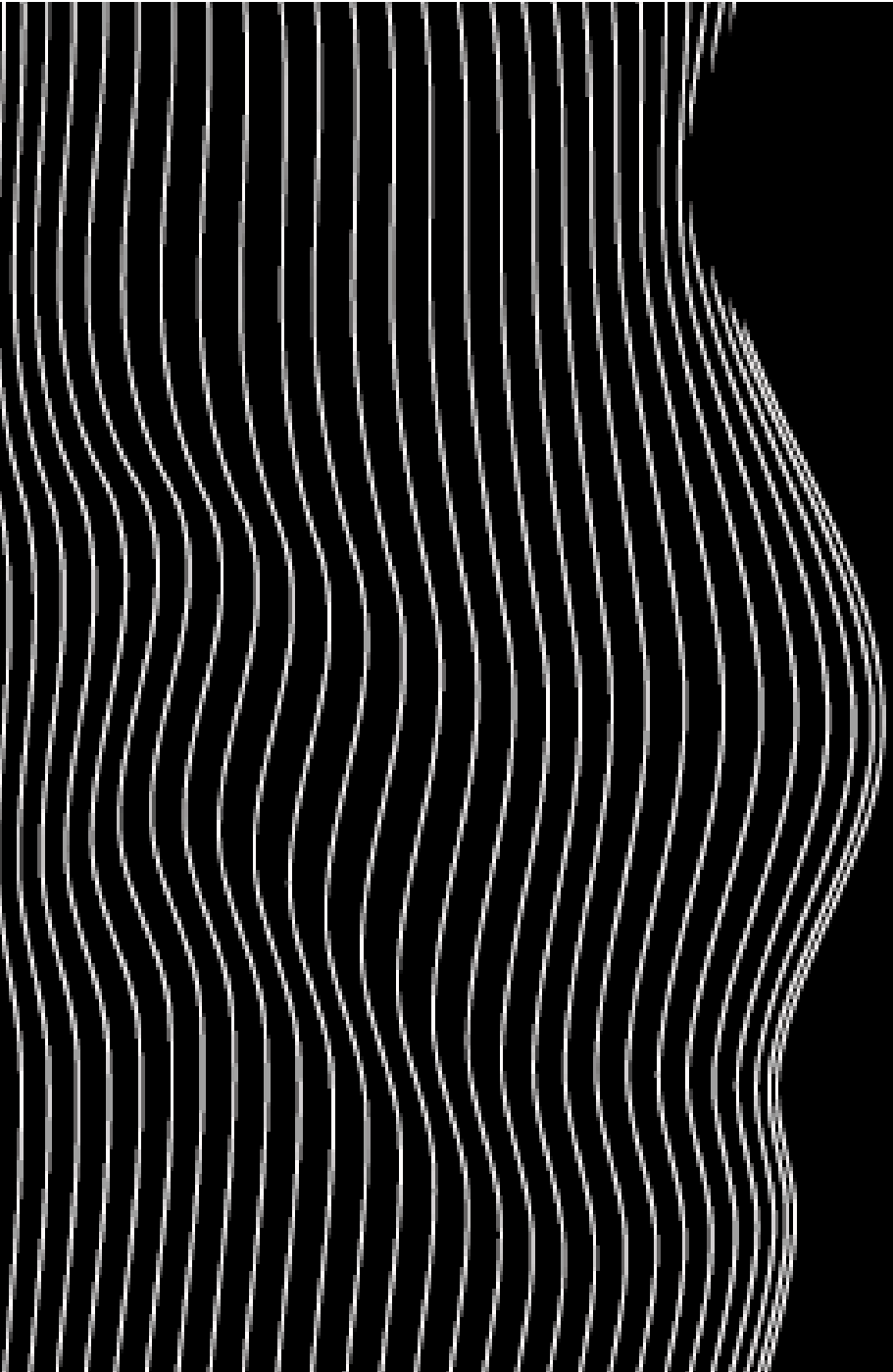
final result



This project started with my passion for music with a broad brief and was later narrowed down to a more specific one. The focus has mainly been on the research, and the final outcomes of the product are a way of visualizing the findings.

what I will focus on



An abstract graphic consisting of numerous thin, white, wavy vertical lines that create a sense of depth and movement, resembling a stylized wave or a textured surface. The lines are set against a solid black background.

research

Research

- interview
- observation
- initial brief
- persona
- market research



history

History of synthesizer and its impact on music industry (Chinese music specifically)

Most people heard about synthesizers in the 1980s when electronic music in China was just getting started. Chinese people's knowledge of synthesizers originated from electronic pianos and many still today call it "electronic piano". In the early days of Chinese electronic music, when players had to label their unique music, they invariably chose the word "electric piano".

Interview with

Bin Xiang

Bin is one of the member of Chinese Musicians Association and China National Musical Instruments Association, with representative work "Guzheng Ensemble Course II". She devoted herself to teaching Guzheng (a traditional Chinese instrument) for over 20 years.

How do you think is the current situation of contemporary Chinese music creation?

We once had great music, but there was no composing profession, and the composer's name was never recorded. Because we are a way of inheritance, in the process of the formation of works, people continue to add, and finally form a song. But what we use in our compositions, from genre form to connotation expression, is fundamentally derived from European music. While constantly emphasizing the roots of our national music, it is important

to have this courage and vision to see this and acknowledge it.

Though I'm respected in Chinese musical circles, and have Guzheng followers who play the pieces I have premiered, I'm h famous like Lang Lang [the pianist]." Quite so. In China the piano has now eclipsed the Guzheng, to a point where its future also lies more with enthusiasts in the West.

What do you think of the appearance of New Chinese Folk Music in these couple of years?

This is definately a controversial topic.

New Folk Music used modern technology to either adapt or recreate it, combining traditional Chinese folk instruments with modern Western pop music arrangements to form a new audiovisual effect with distinctive contemporary style.

From your experience, what would you say are the biggest challenges for Chinese traditional instrument like Guzheng?

I think the biggest challenge is to deal with the issue of how to further develop in the intersection with the West.





What do you think of the threshold for being a musician?

I think there is no threshold for being a musician. Anyone can be a musician because music itself is the greatest release of human temperament. Whatever music...Lip-sync songs and serious music have their audience.

But we have to clarify "playing music" from "learning music" because the latter must have a threshold. The music profession is a science of human understanding of self and explore the world!

Will there be a day in the future when songs will no longer be accompanied by instruments but synthesizers?

There is no denying that synthesizers have played a very important role in modern pop music. However, the dynamics of the fiddle bow are different every time, and synthesizers can't do that.

The chord breakdowns in guitar playing are limited in range, and there are dynamics in continuous overtone playing that synthesizers can't handle. The synthesizer can't really do it. But who knows...a synthesizer itself is a musical instrument as long as we can create.



Interview with

FAX

Beatboxer, music producer for over 10 years. He is dedicated in creating lo-fi hiphop music and electronic music.

**"anyone can be
a musician."**



observation

Why is it possible to compose even if you have not studied music theory?

Music is similar to language. Composing music is sometimes like talking, which is an instinct.

Music theory and grammar are mainly used to save time and improve efficiency. At the same time, creativity and imagination, which are basic human abilities, need to be enhanced by studying mature works, recombining and experimenting with them, and pursuing the production of highly finished works. Or what do a bunch of abstract symbols and linguistic hypotheses have to do with the music itself? And you should further distinguish what is abstract or concrete experience generalization, regular process or pattern, production tools use symbolic notation, thinking inspiration and so on different roles, rather than generalized take music theory refers to.

Moreover, the current way of basic education and skills education is basically against the way of human thinking and learning, leading many people to think that learning a bunch of isolated simple theories and concepts in a step-by-step manner will be able to take for granted the illusion of the final complex finished product, the right way is to start with the complex finished product or its simplified form, it is important to establish the overall impression of thinking, and then in the process of deep understanding of the basic theoretical concepts and achieve mastery of the details.

Just go for it

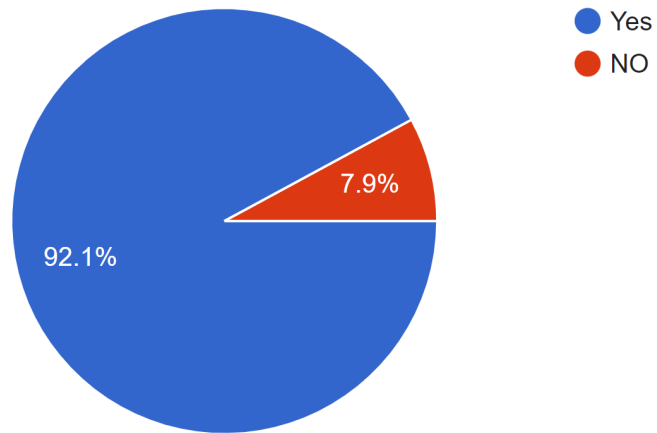


Questionnaire

on music and music making/ perception when listening to music

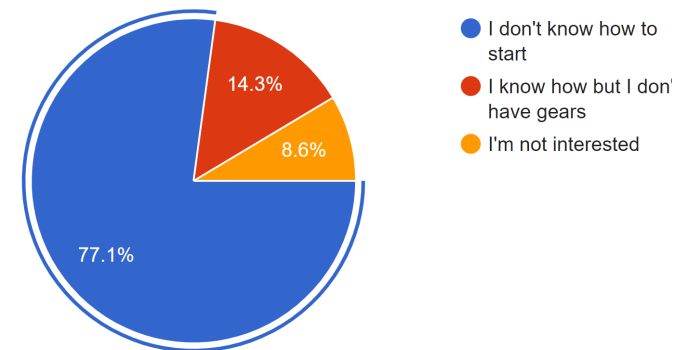
Do you like music

38 responses

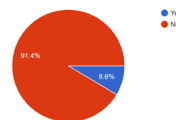


What do you think is the biggest reason that you cannot make a song

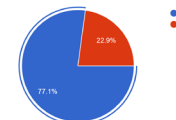
35 responses



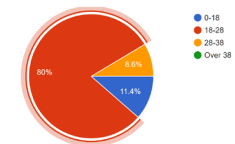
Are you familiar with any music-making software or gears?
35 responses



Have you ever paid attention to the tracks/terms in a song (different horizontal layers that form a song)?
35 responses



Your age
35 responses



To find out the most problematic aspects of keeping music lovers away from music production, we conducted a questionnaire asking about music and music production and their perceptions when listening to music. These 38 participants were between 18-38, and they became my target group for the latter period. 60% of them are Chinese, and the rest are Europeans.

When I asked about their love for music, almost everyone said yes. When it comes to keeping them away from the most problematic aspects of music production. Over 77% said they don't know how to start, and even knowing the device, it's hard to figure out which button or which knob is responsible for what function.



1.complex
2.not appealing



▲ arturia microfreak



keys of piano

▲ teenage engineering op-1

While observing the existing synthesizers in the market, I found that they look extremely complicated to new beginners and are not appealing to aspiring musicians as well.

Moreover, most of them present western symbols such as keys of piano due to the history and development background.

initial

brief

Writing music is a varied process, each person having their own preferences to suit their style of music. one thing most people have in common is that often the most challenging part of songwriting is starting. I wanted to investigate whether other approaches might yield interesting results, particularly at the ideation stage of making music, helping people produce and evaluate ideas quickly. The synthesizer would have a different logic of operation and the appearance of the design.



li lin

**24 years old
student**

knowledge in music



passion in playing music



"I want to get into the field but the threshold is a little high for me."

goals frustrations

- to get into the field
- to be an entry-level takes much time and effort.
- to be able to create his own music and express
- know little about music device and music theory
- operation of music device is complex

Li is a person who is easy to follow the crowd and is very impatient.

He tried to learn piano but didn't make it when he was little. He's very into listening to music in all kinds especially electronic music, and hopes to immerse himself into the music world to make his own songs someday in the future.

After watching some videos online of people playing with synthesizers, he was eager to try. But he is a total newbie of this field of knowledge



lu jie

**28 years old
musician**

knowledge in music



passion in playing music



"Playing around with music,
I never limit my style."

goals frustrations

- to enjoy more playfulness of music device
- to be able to create his own music and express
- to explore more ways of creating music
- the bottleneck of music creation
- limited options for choosing a new music synthesizer

Lu is a person who loves to explore and never limits her style.

She plays several instruments and has been covering other's songs since middle school, and after a few years she started adapting songs and adding her own style to them.

With many kinds of music equipment at home, she switch or combine equipments at her will.

Li,24
beginner

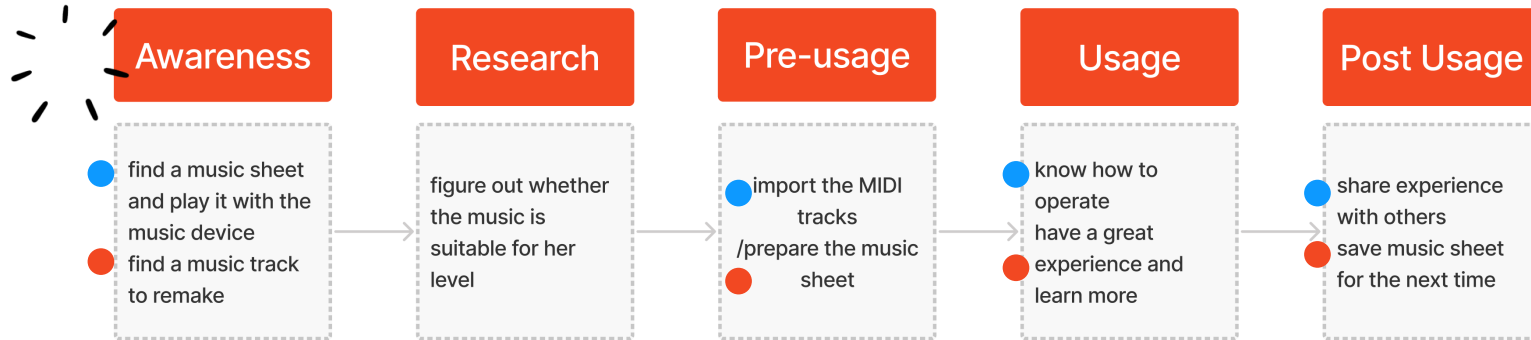
Lu,28
pro

The Scenario...

Lin and Lu want to find a music sheet/track to play and remake with the music device

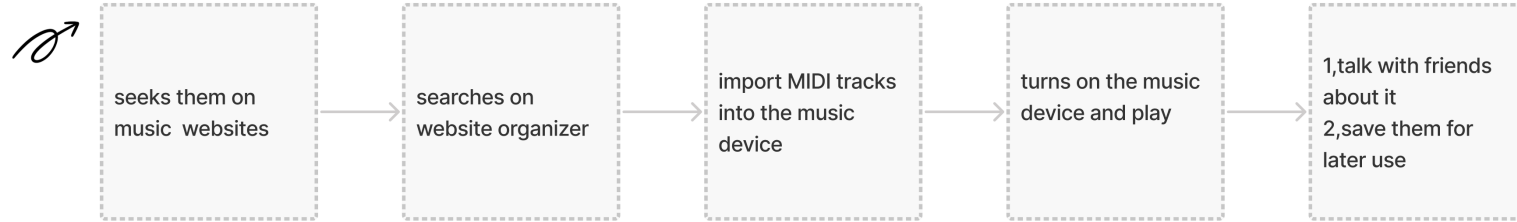
User need or problem

What is the user trying to accomplish? What is the problem to be solved?



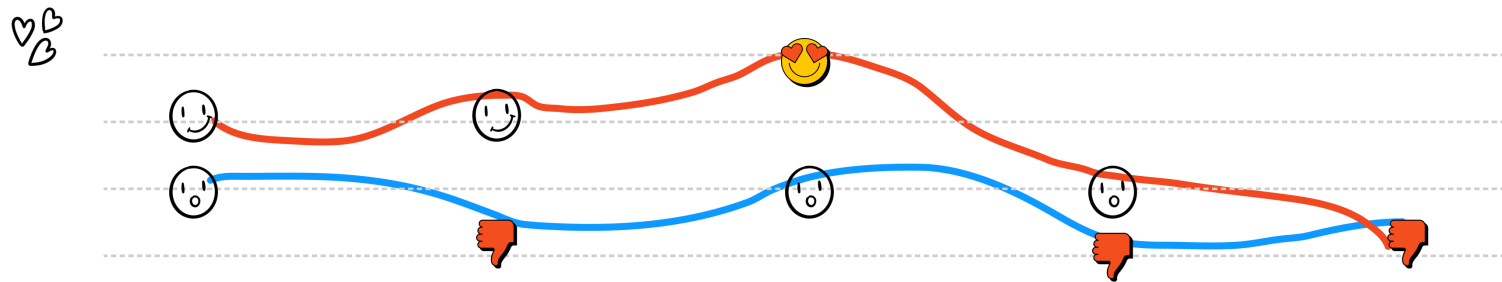
User action

What actions are currently taking? How does the user doing it? What information is the user seeking?



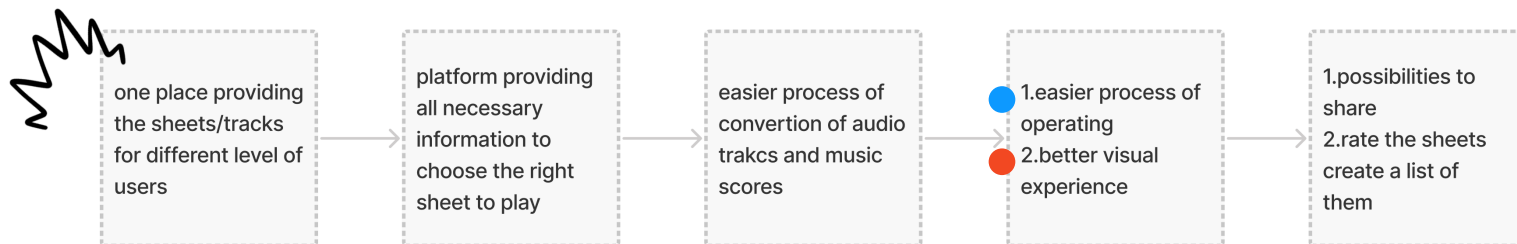
Quotes and sentiment

How do they feel in this moment?



Opportunity

What are some things that could improve this moment? Could this be skipped or solved elsewhere?



multiple personas

This tool helped me to see from a different angle how the journey would look from the different perspectives with different pain points.

Two personas were created based on my research above. They represent two different user types that might use the product: the newbies and the pros. Because for beginners, the primary need is to get hands-on to play around as soon as possible. And for the pros who are already familiar with how the synthesizer works, it would be their interest that it can add some new and unique features or visual elements to enhance their sensory experience.

The blue mark is what Lin experienced as a beginner, and the red one represents Lu as a higher-level musician. I found that there are different needs for these two types of users and emotional flows during the journey.

For example, in the usage phase, the need for Lin is to know how to operate the device, while for Lu, she wants to have a great experience. According to two needs, there are accordingly different opportunities, for Lin as a beginner, it would be better to use an easier process of the operating system. But for Lu, as a pro, it is of her interest to have a better visual experience and more advanced or fun ways of operation.

This tool helped me see from a different angle what the journey would look like from the different perspectives with different pain points.

Two personas were created. They represent two user types that might use the product: the newbies and the pros. Because for beginners, the primary need is to get hands-on to play around as soon as possible. And for the pros who are already familiar with how the synthesizer works, it would be their interest that it can add some new and unique features or visual elements to enhance their sensory experience.

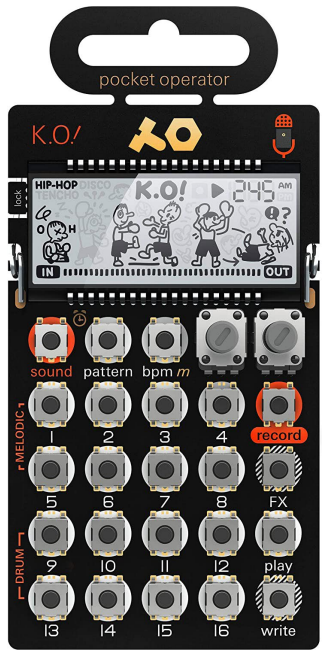
problems & opportunities

1.operation experience ●——● HMW make it playful but simple

look extremely complex with many buttons on the interface so its not friendly to new beginners

2.sensory experience ●——● HMW improve for a better visual experience

not appealing to advanced users and aspiring musicians as well





market research

The first key competitor is teenage engineering, based in Sweden. It has a series of well-designed products with the OP-1, which debuted a decade ago and remains a hit even now. Their looks are deceiving. Its size and simplicity of design make it seem toy-like but also with much playfulness.

The second key competitor is Roland, a leading manufacturer of electronic musical instruments in Japan. Roland is known for changing the electronic musical instruments market through groundbreaking innovation (Roland Corporation, 2019). Therefore, the brand prides itself on being one of the major supporters of the music industry.

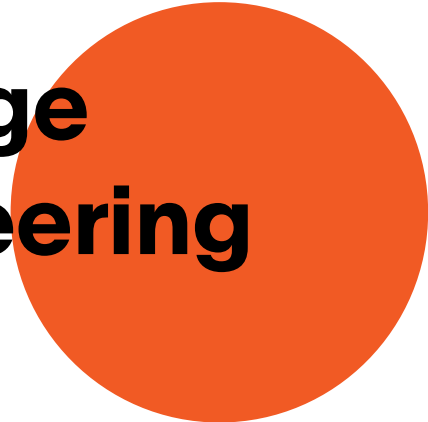
KORG

MOOG

YAMAHA

luxury

Teenage Engineering



innovative

traditional

YAMAHA

Roland

Casio

value

Teenage Engineering

Roland

target market

In order to position, let's have a look at The segment of the market. It has KORG and MOOG as classic brands that appeal to the high-end market, and there are brands like YAMAHA, Roland, and TE that have different products for the various market segments. I found that there's an opportunity in the segment of innovative music products, so I target a segment here where the audience appreciates design and performance.

To consider who the customers are as people, I asked myself these three questions
1. What do they value?
2. What is their lifestyle?
3. What do they enjoy doing with their spare time?
The answers to these questions helped me understand the target market on a deeper level.



18-38

"premium lifestyle"

Explorer, Aspirer, Succeeder

Occupation:

Professionals, Students, Employees

competitiveness audit

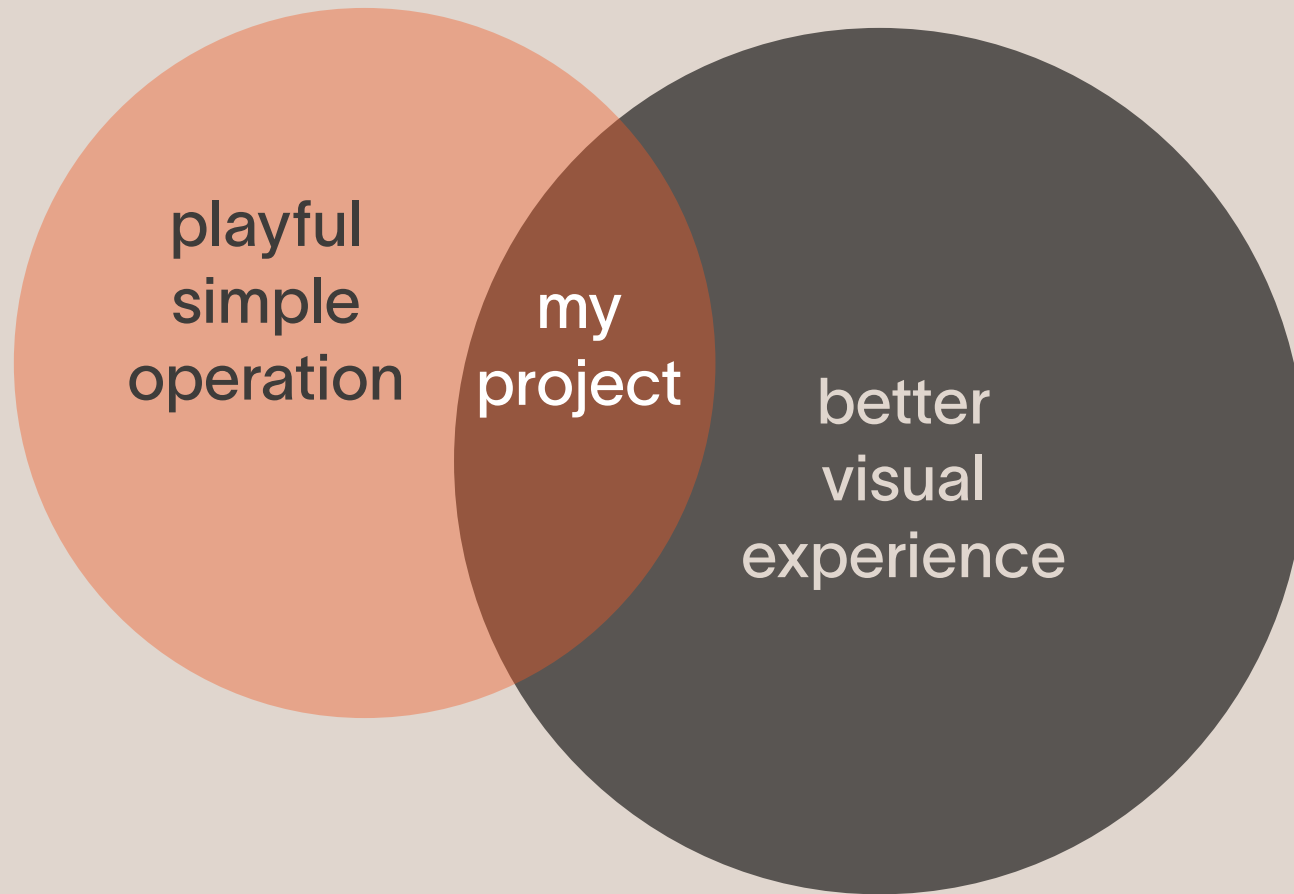
	Teenage engineering	Ronland	Yamaha	KORG	MOOG	Casio
Location	Sweden	Janan	Japan	Japan	USA	Japan
Price	1k-20k	2k-8k sek	3k-30k	2k-20k	5k-20k	1k-2k
Target audience	Appeal to a high-end market	Appeal to a high-end market	different products for varied market segments	high-end market	high-end market	different products for varied market segments
Unique value proposition	design driven	brand image is premium because it is rarely associated with the production of entry-level pianos	best-known for piano & keyboard	-	classical	its integration of new technology in the production or manufacture of its musical instruments
First impressions	Outstanding + Strong brand identity including colors, fonts, style, and imagery	Good				
Physical aspect	clean, modern	Engaging, concise, and informative				
Visual aspect	Outstanding + Strong brand identity including colors, fonts, style, and imagery	Outstanding+ Modern and trendy design				
Interaction aspect	Outstanding	Good				

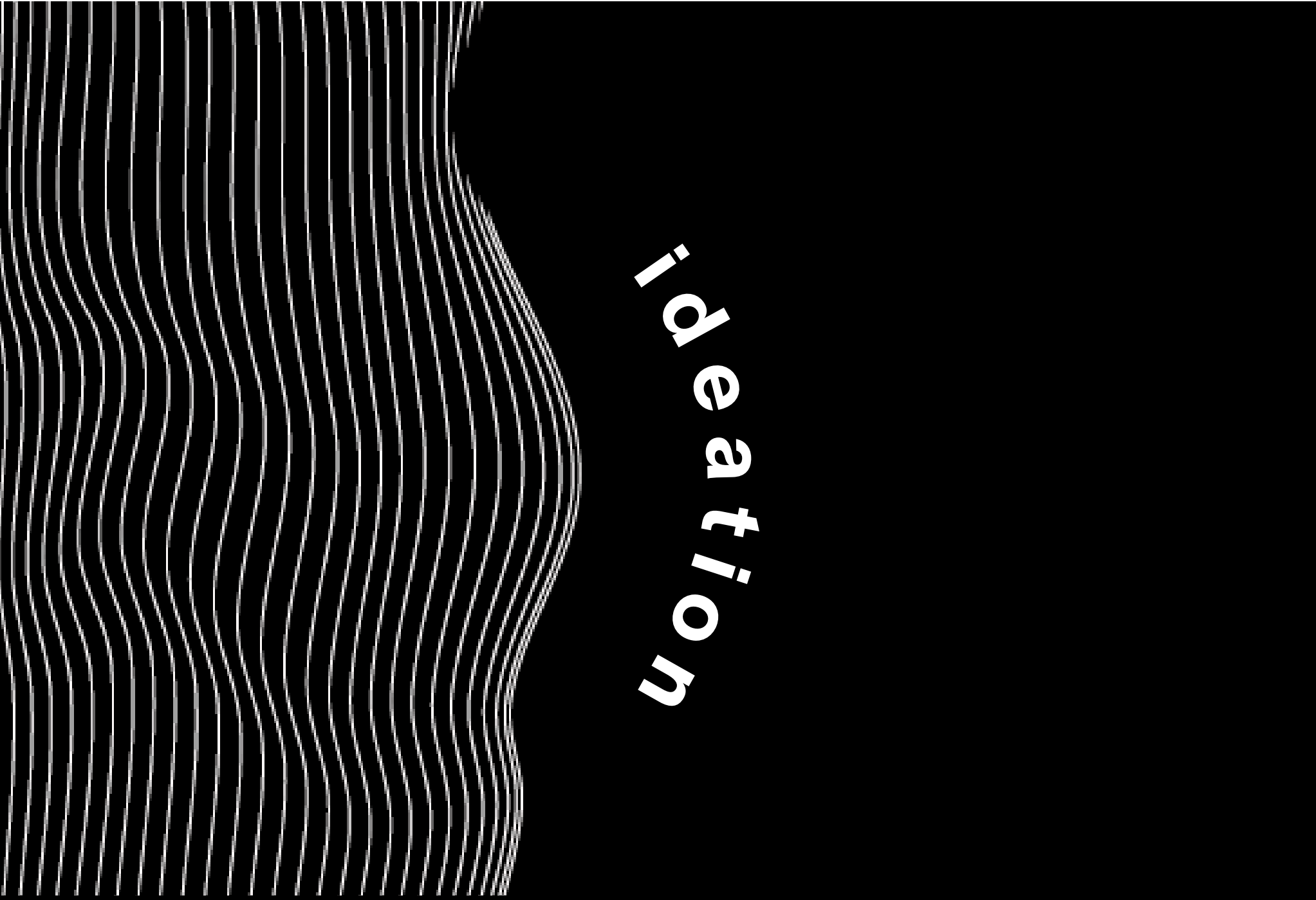
First impressions	Outstanding + Strong brand identity including colors, fonts, style, and imagery	Good
Physical aspect	clean, modern	Engaging, concise, and informative
Visual aspect	Outstanding + Strong brand identity including colors, fonts, style, and imagery	Outstanding+ Modern and trendy design

brief 2,0

Create a music device that enhances the tactile experience and visual experience in a playful and simple way for advanced music producers and beginners, even with minimal skills.

what I will focus on



An abstract graphic design featuring a black background. On the left side, there are numerous thin, white, wavy vertical lines that create a sense of movement and depth. The lines are more densely packed and curved towards the center, where they meet the text. The text 'ideation' is written in a bold, white, sans-serif font, rotated 90 degrees counter-clockwise, and positioned in the center-right area of the image.

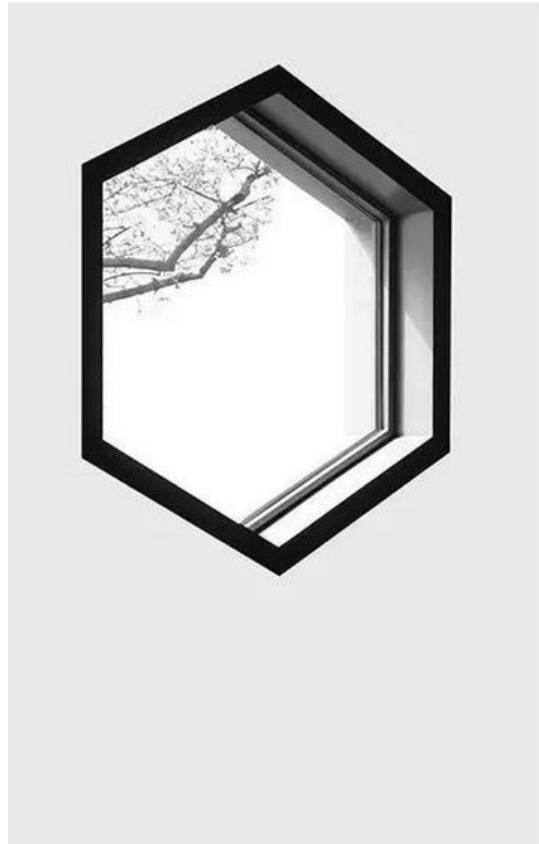
ideation

ideation

visual identity
sketch
moodboard
paper mockups

playful
&simple
operation

Thinking in a counterfactual way, also from observing the market, I found that most of them present western symbols as the piano keys due to the history and development background. So I naturally think of how can I make new ways that might yield interesting results, that synthesizer would have a different logic of operation as well as the appearance of the design, no matter due to the reason of culture or just another new look.





This inspiration was derived from the instrument I play. It is played by picking or plucking the strings with the right hand and pushing or pulling the strings with the left hand to change the pitch and create vibrato. This operation system of making sound and effect aligns with how a synthesizer works.

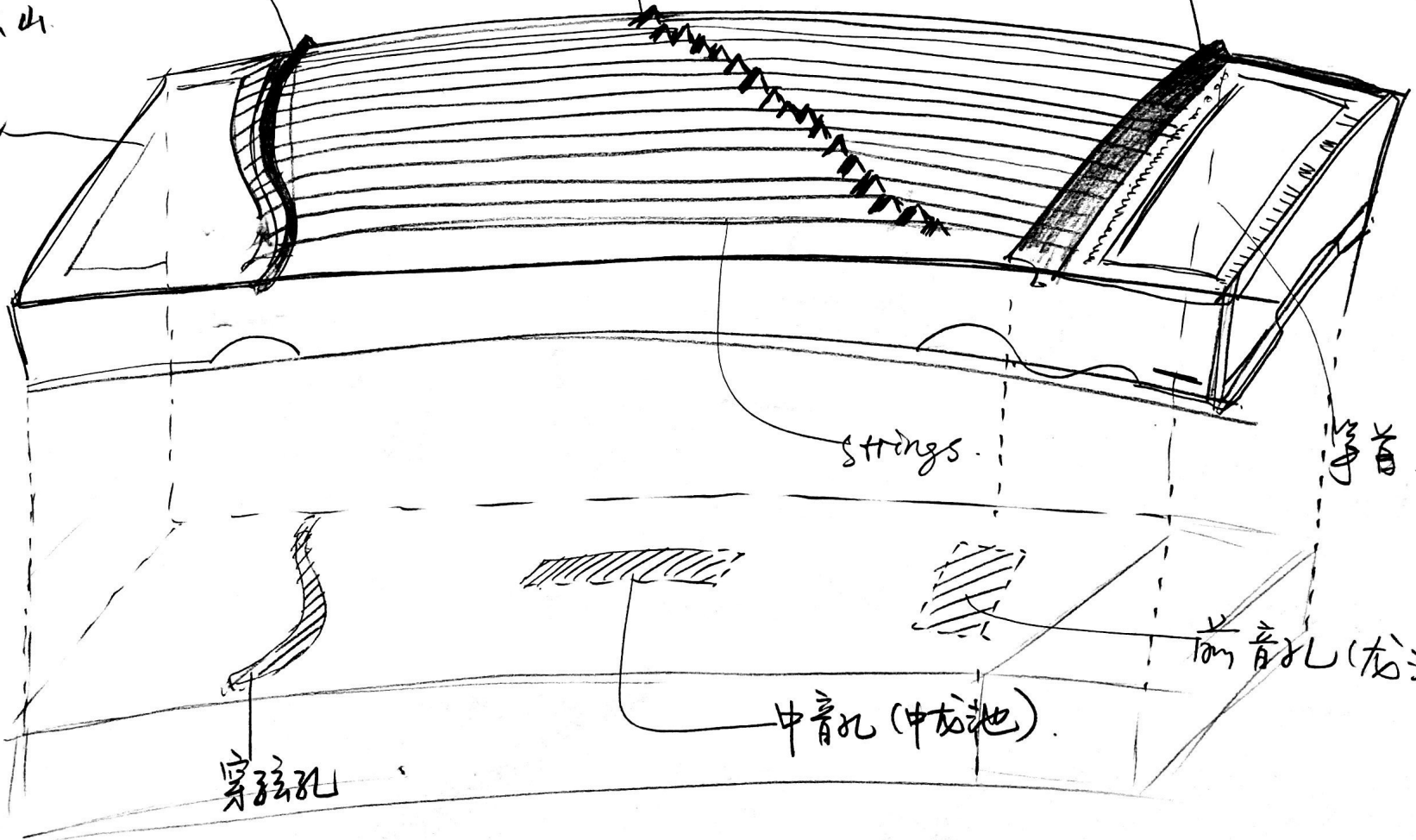
竹首
面板
竹尾
岳山

后樑(岳山)
YUE SHAN.

石弓子(雁柱)

前樑(岳山)
YUE SHAN.

竹尾



an original way

● oscillator of making sound effects

● filter

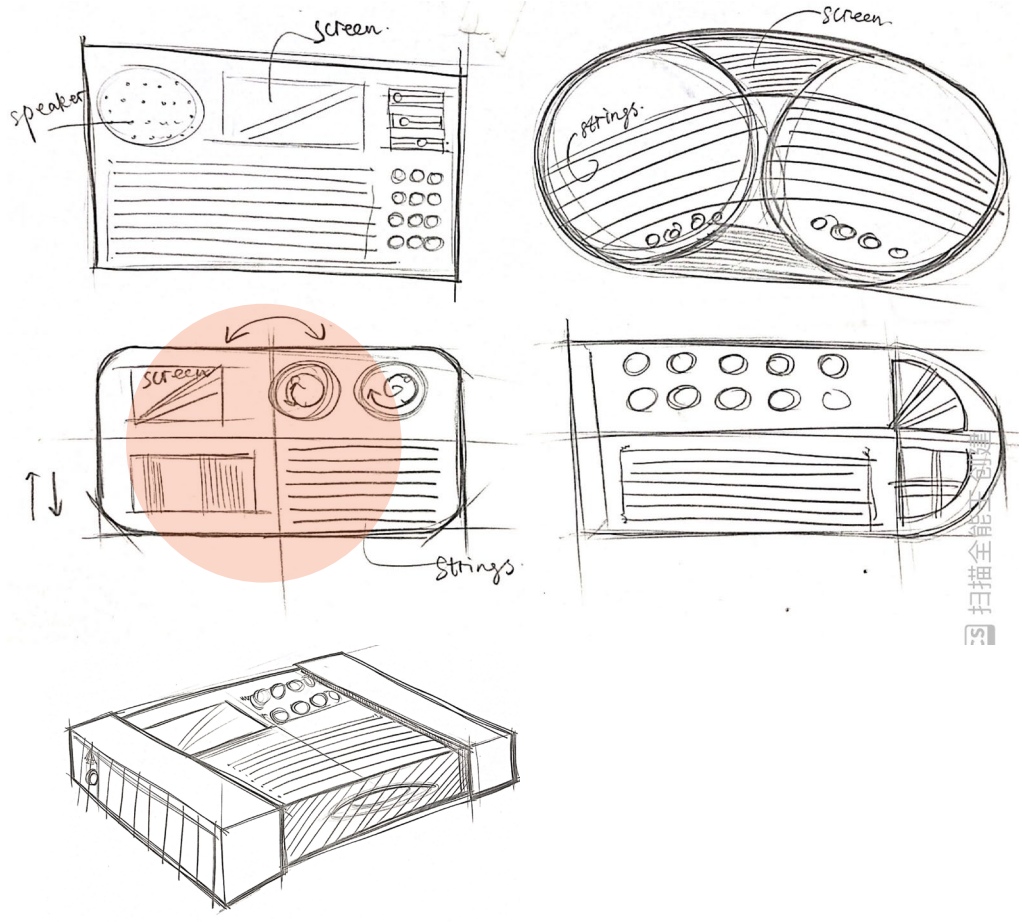
● amplifier

● modulator

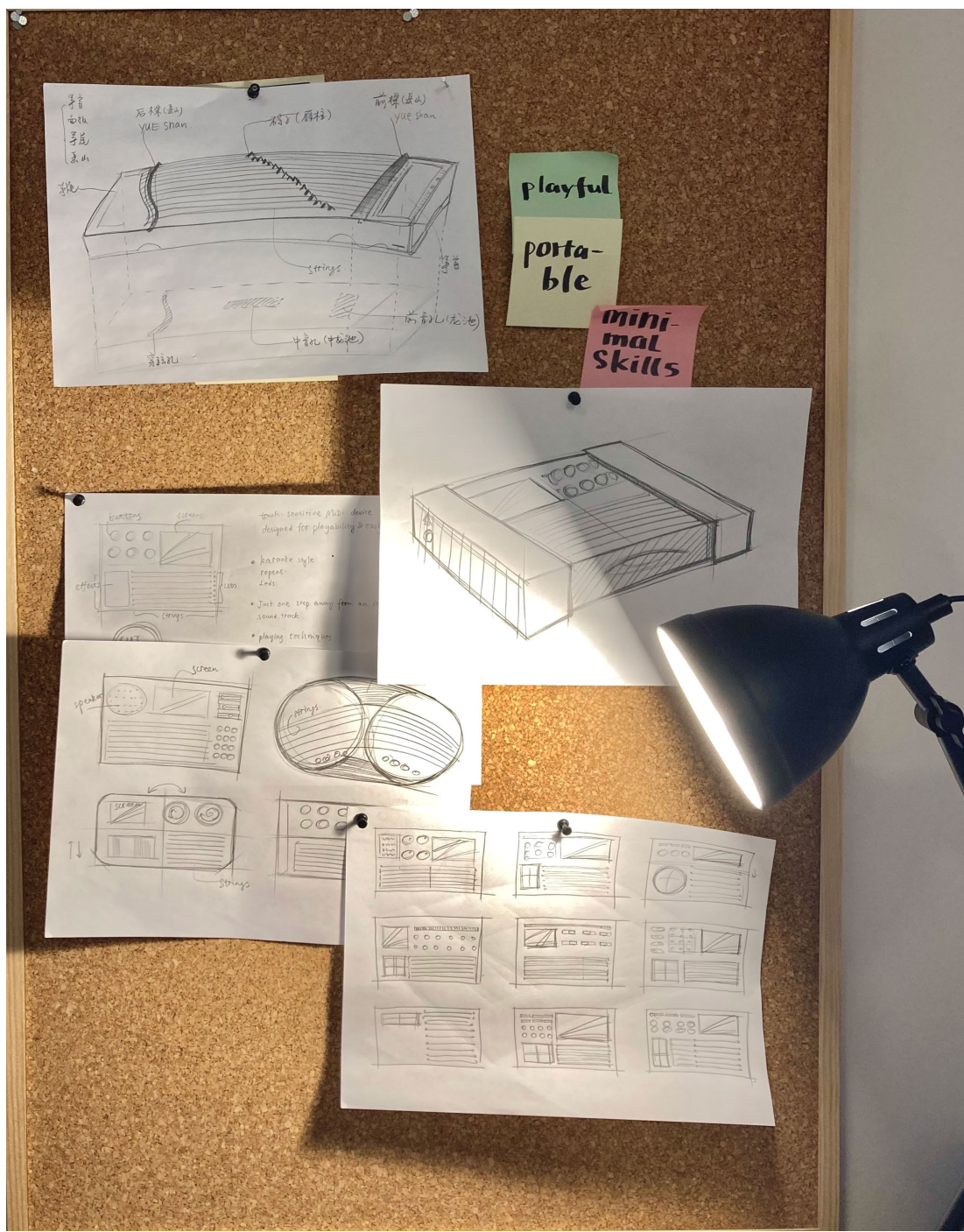


a more intuitive way

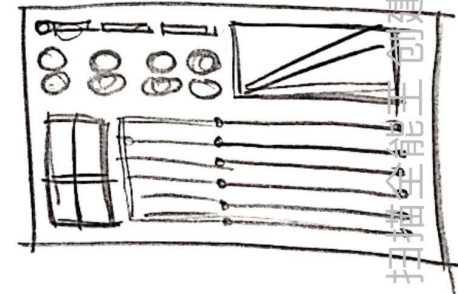
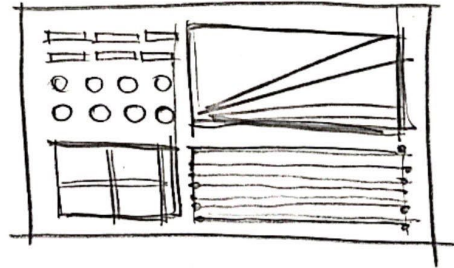
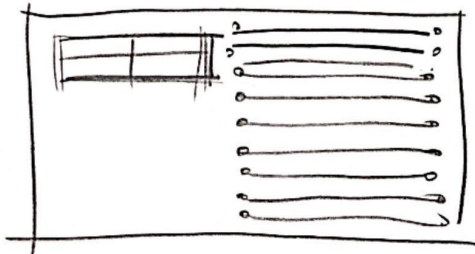
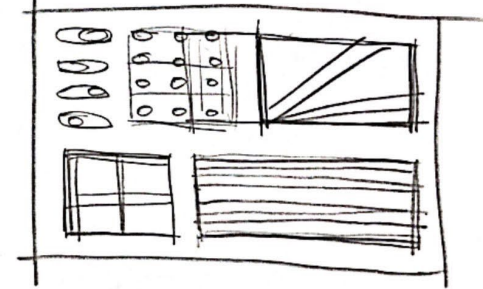
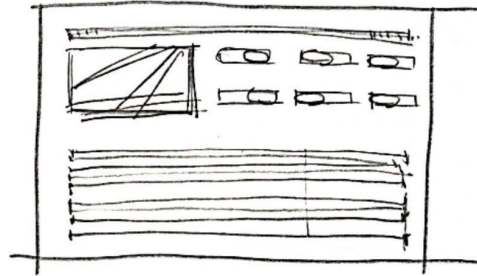
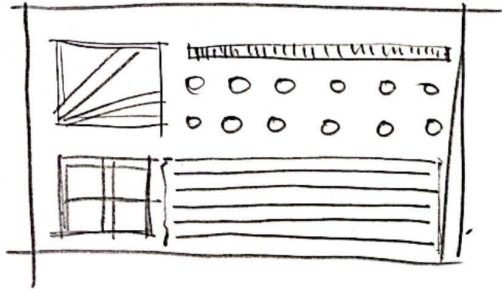
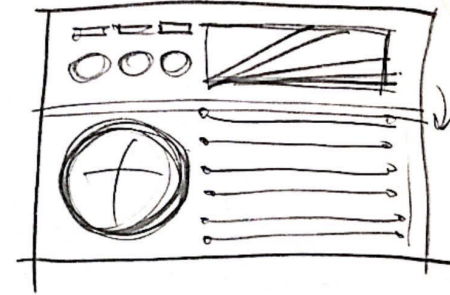
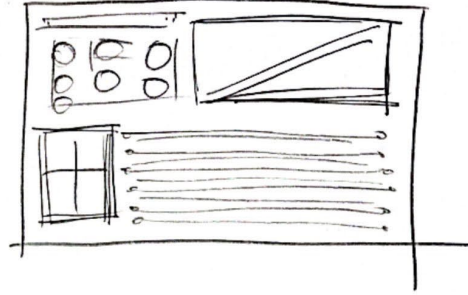
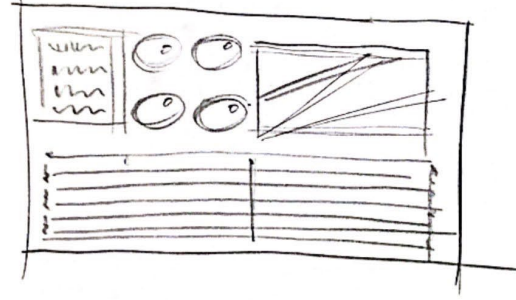




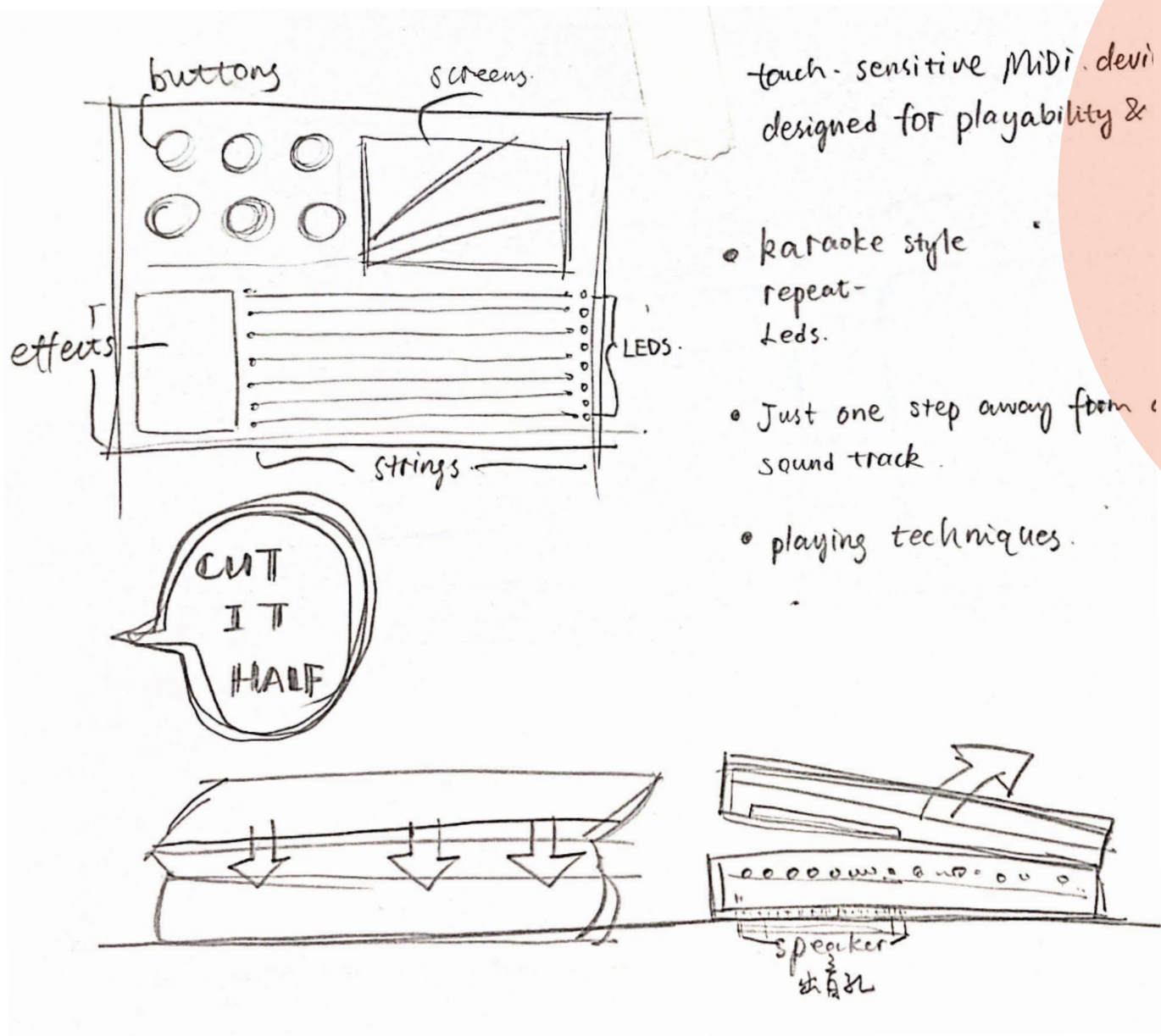
shape



arrangements



CS 扫描全能王 创建



touch-sensitive MIDI device
designed for playability &

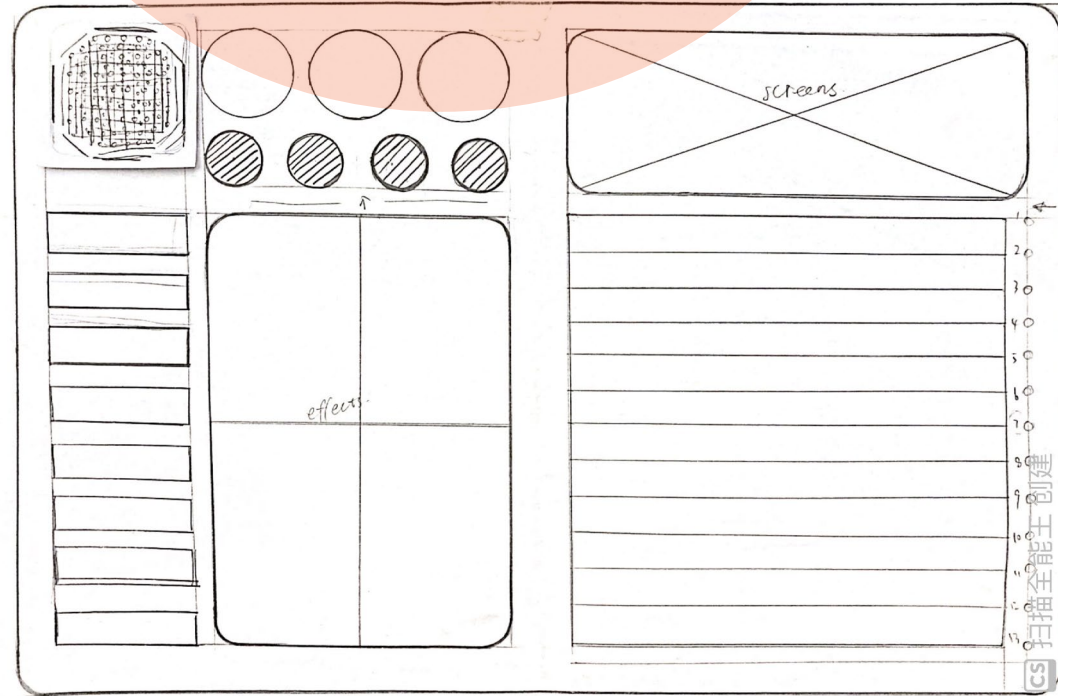
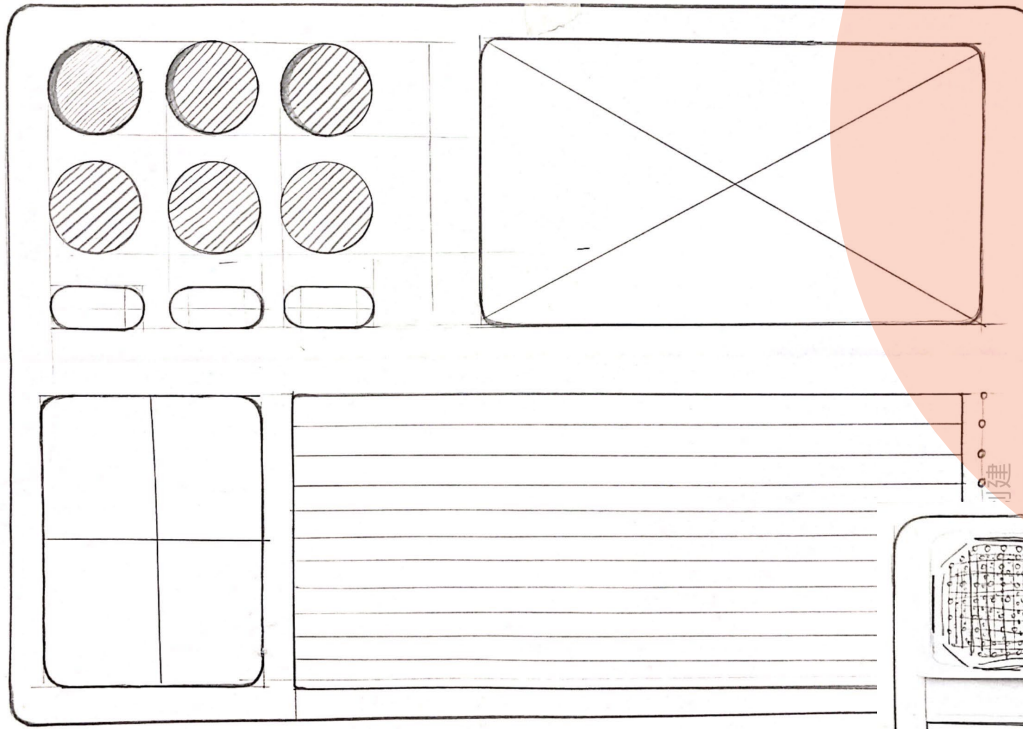
- karaoke style repeat-LEDs.
- Just one step away from sound track.
- playing techniques.

trade-off 1

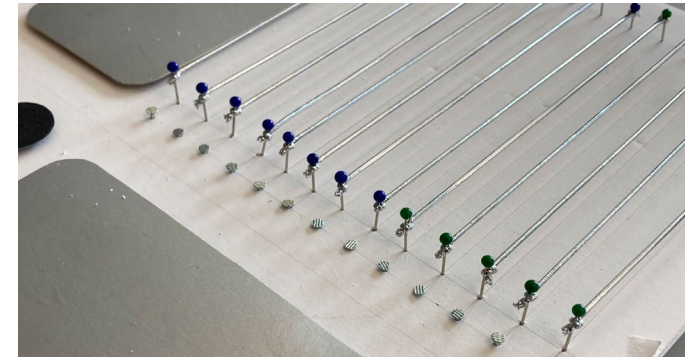
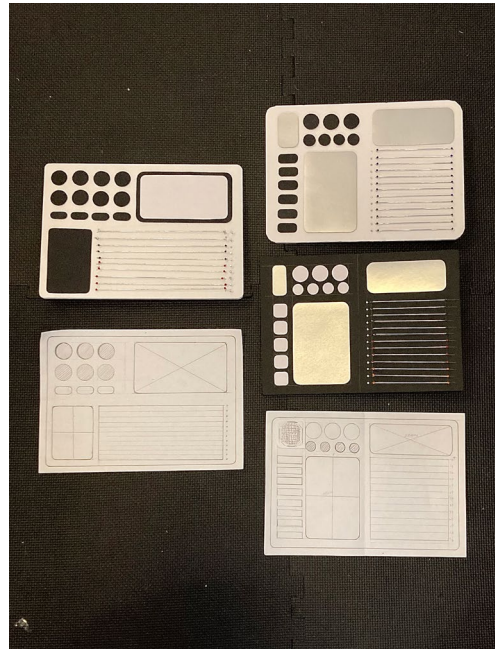
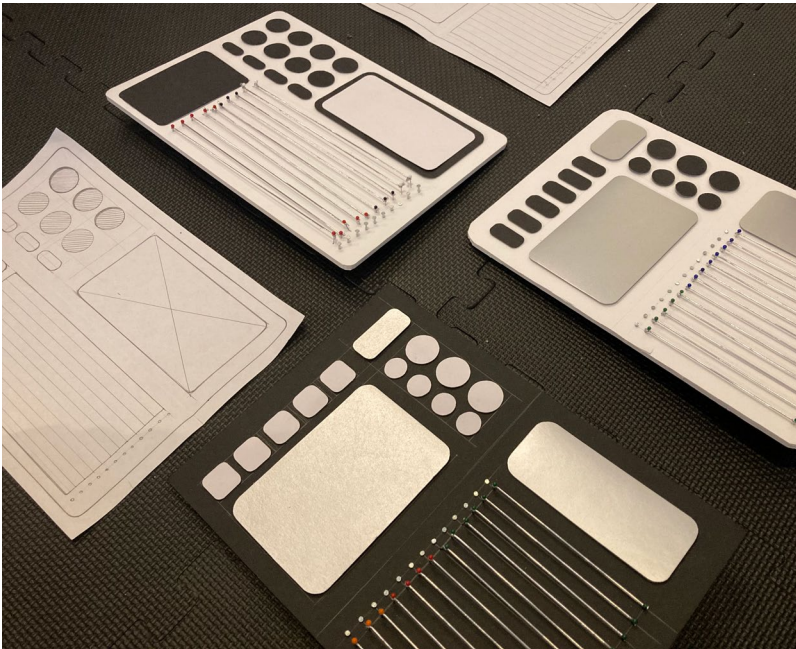
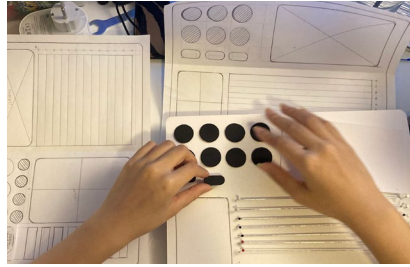
cut-it-half or one-piece

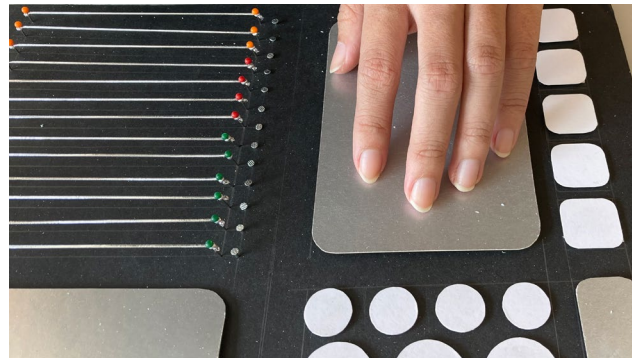
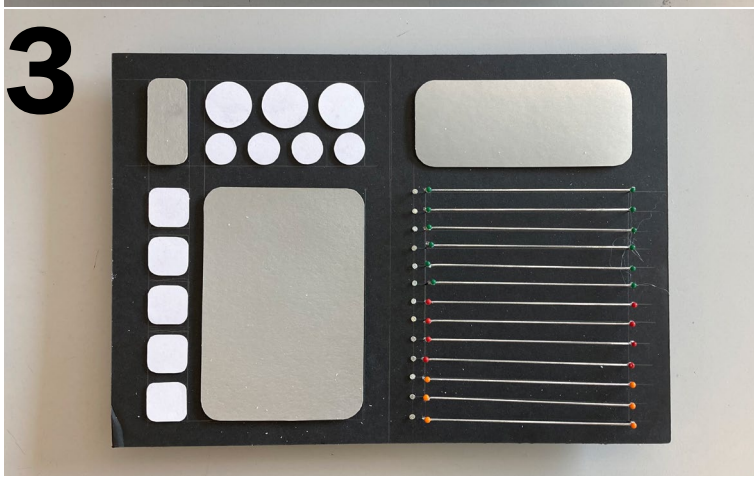
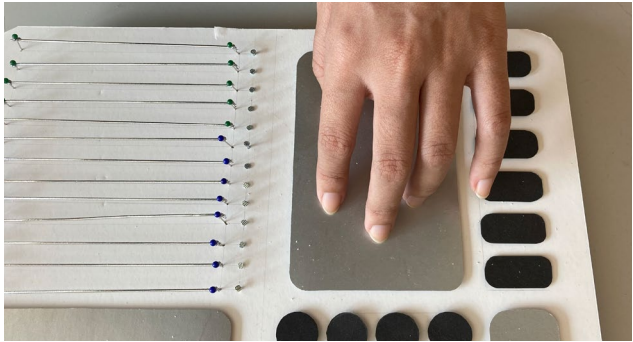
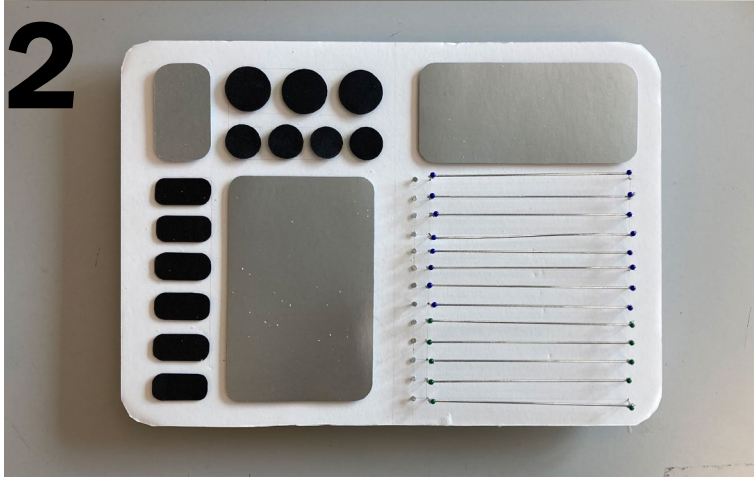
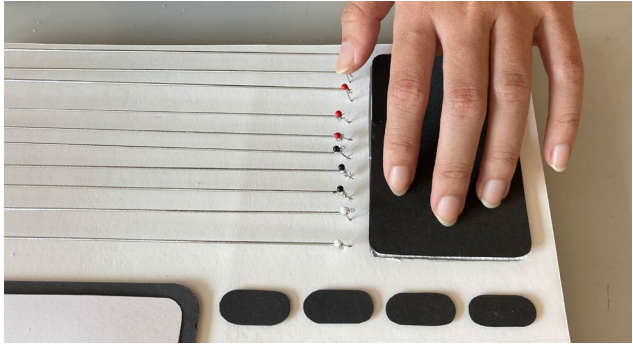
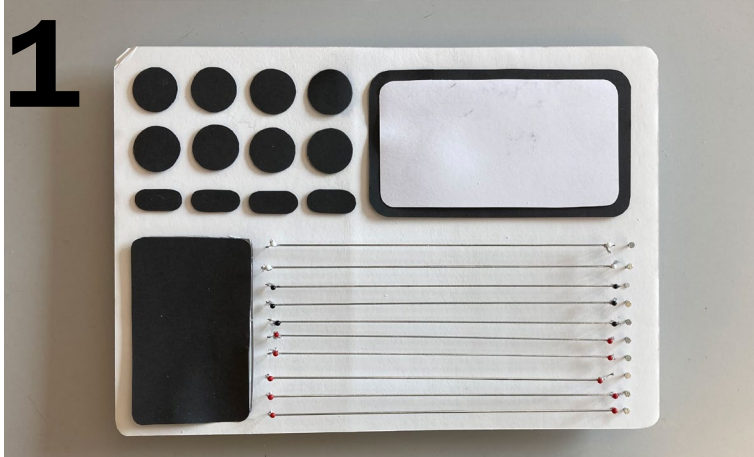
trade-off 2

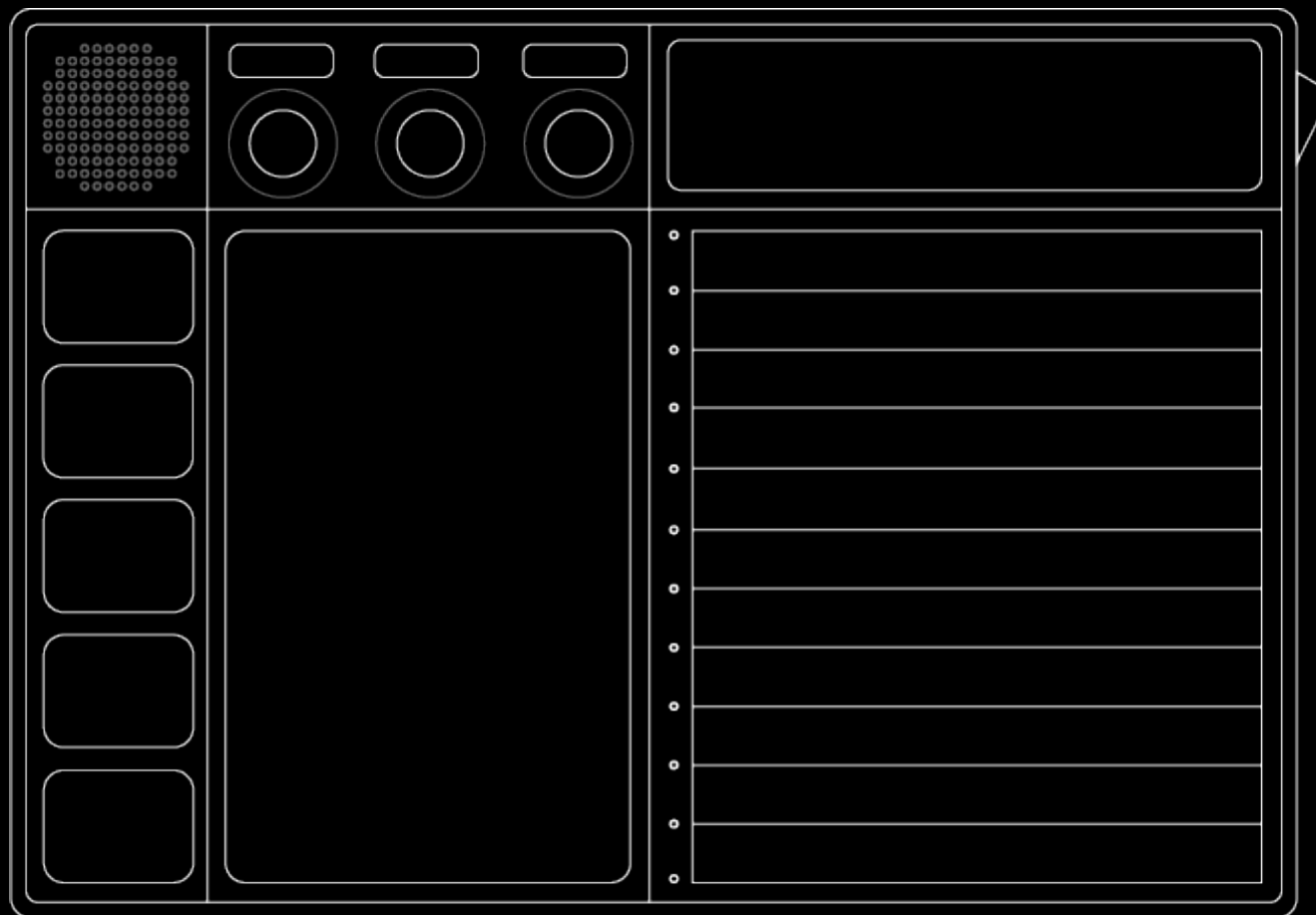
the size of the screen



paper mockups

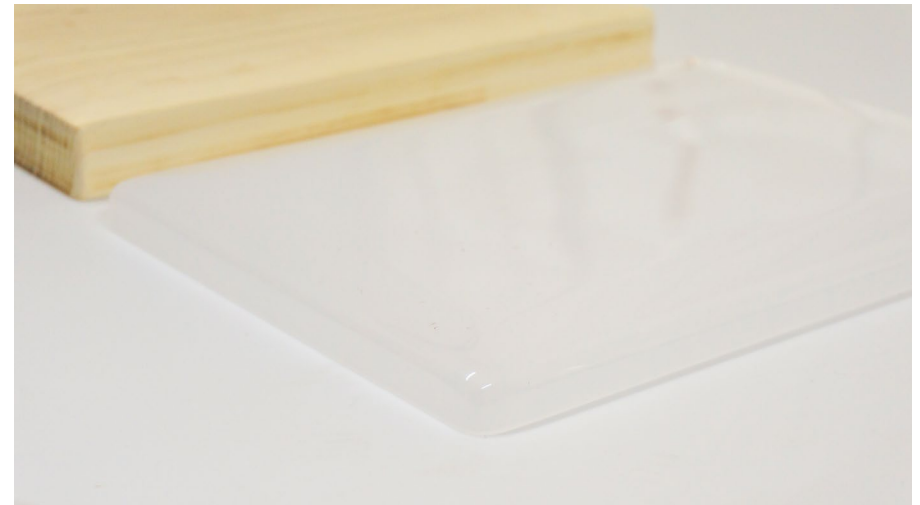
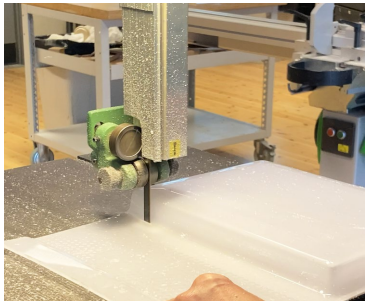


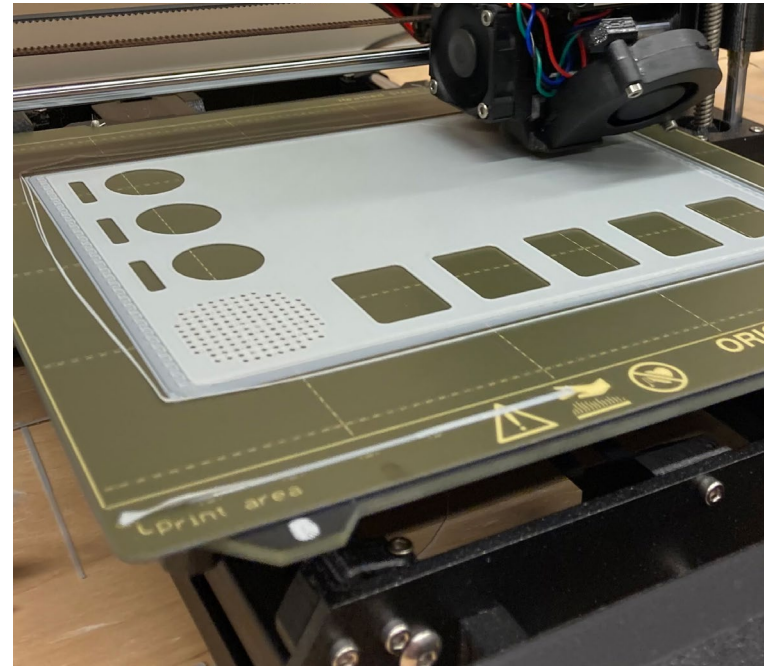


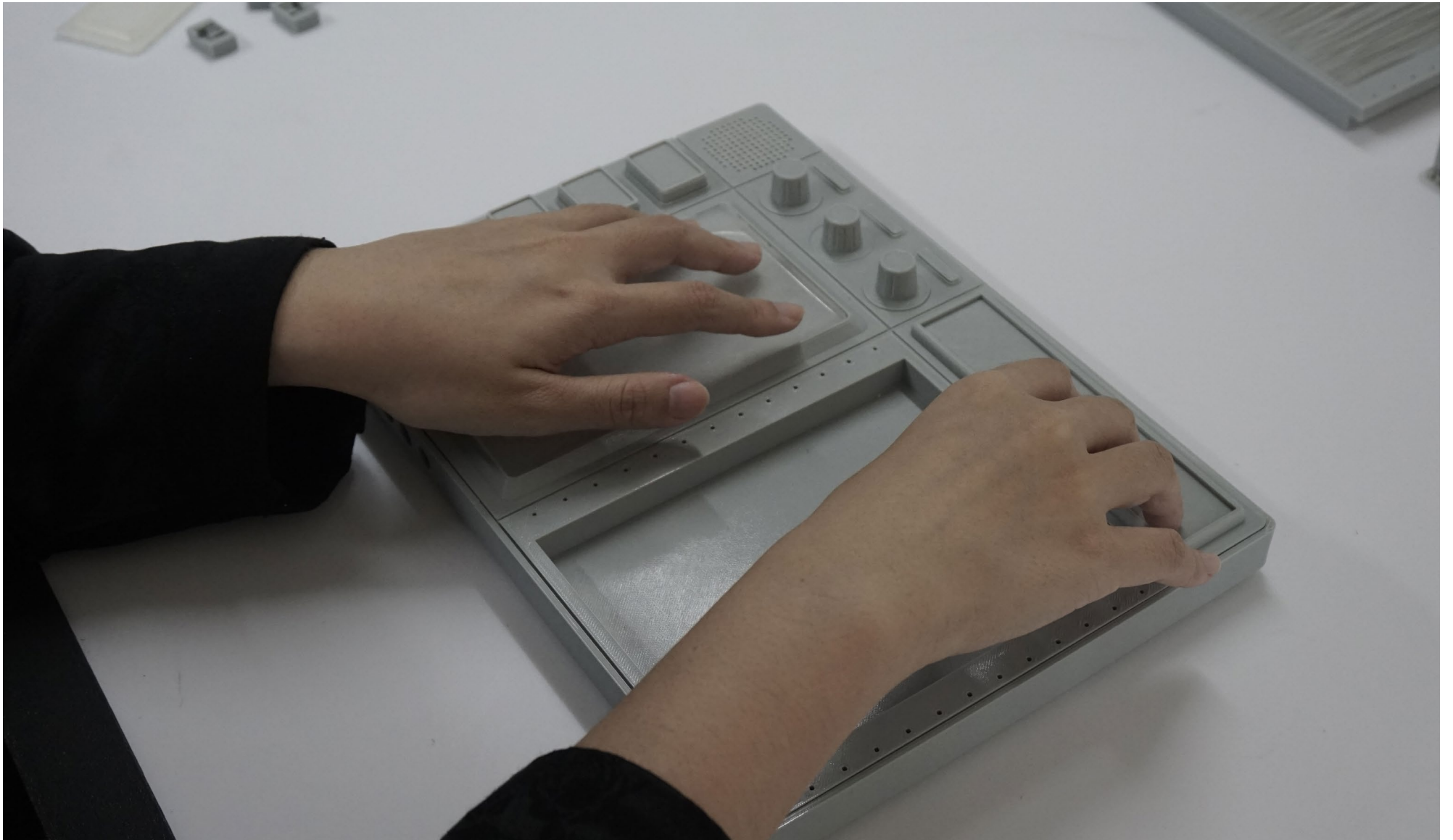


The initial scale mockups were crucial to understanding the scale of a product. During this phase, I narrowed down the spacing and positioning of the buttons and other parts. The final model was the result of many mockups and user testing. The aesthetic and ergonomics improved.

vacuum forming

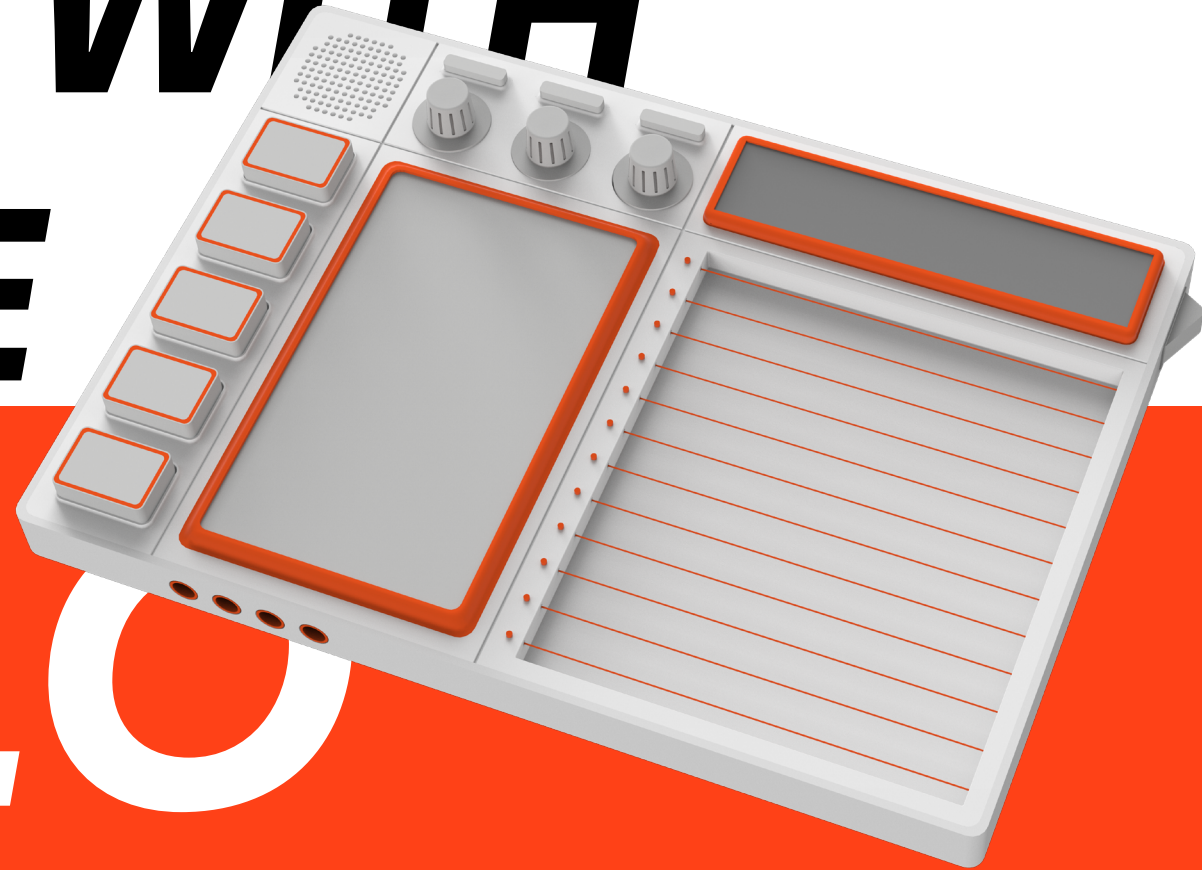


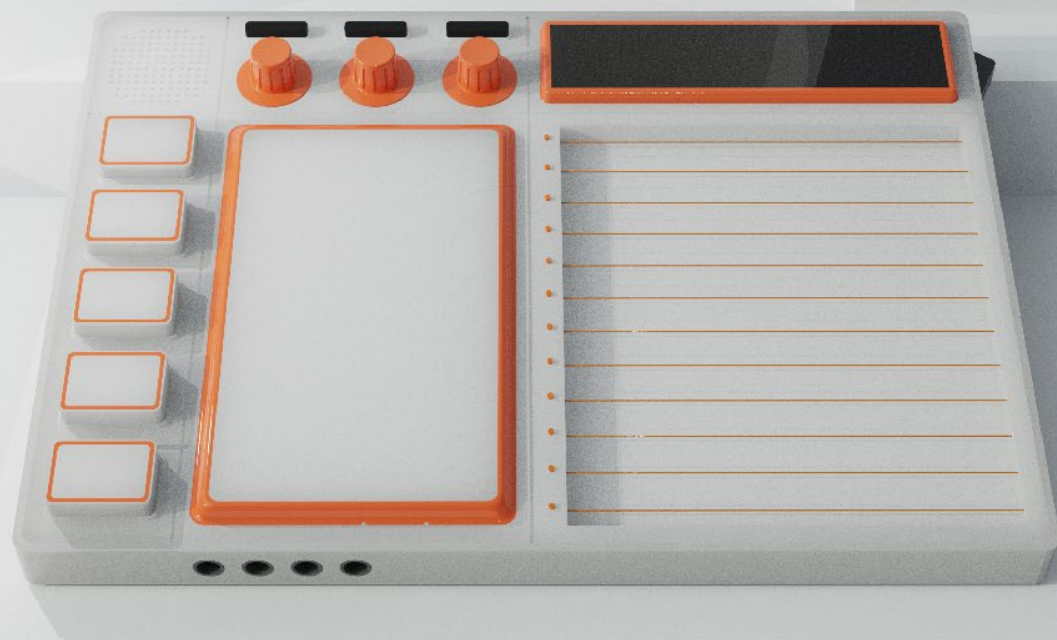




**GO WITH
THE**

FLO





gesture interaction



staccato

点音



vibrato

颤音



glissando

滑音



harmonics

泛音

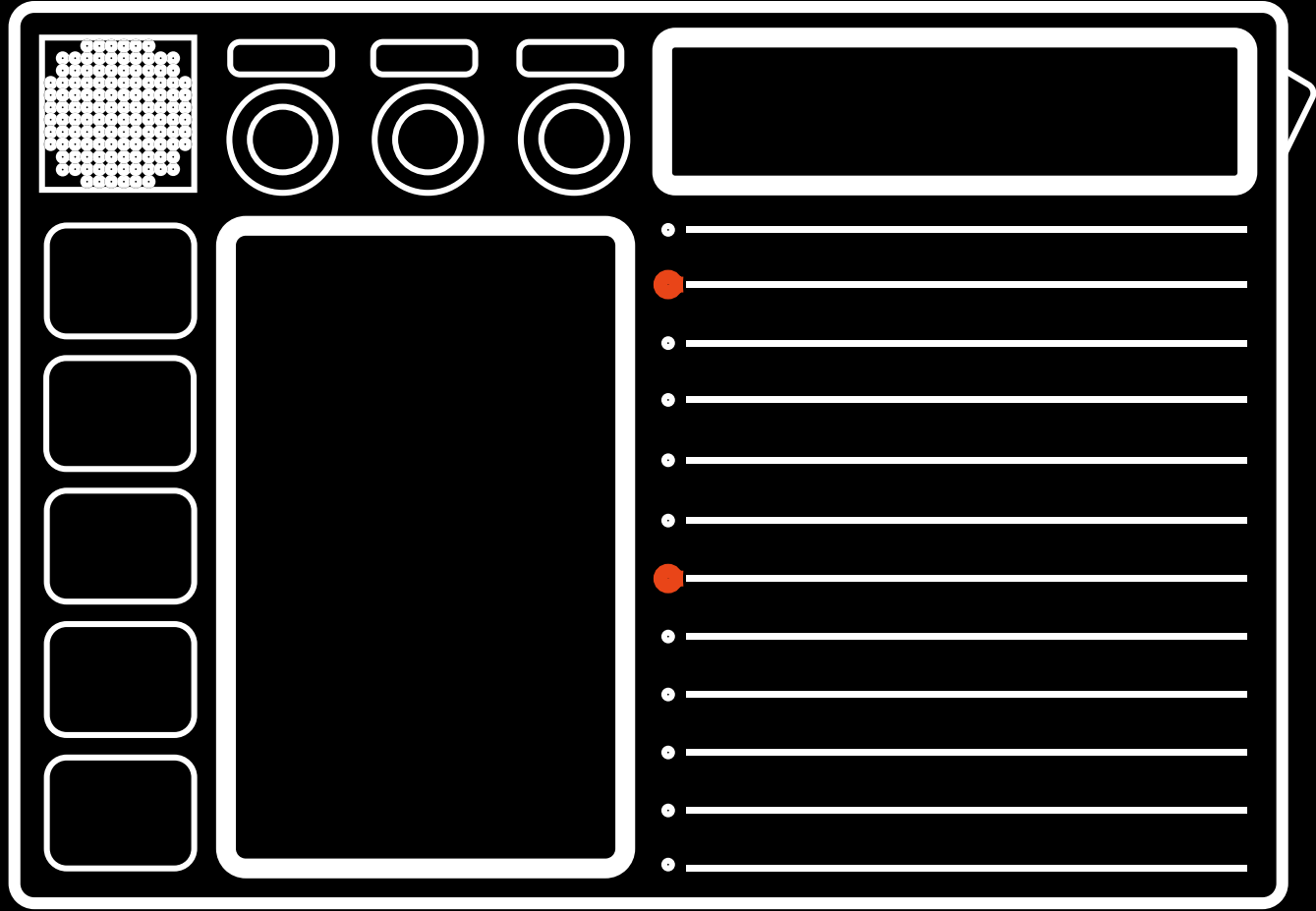


vibrato

遥指



**There is already a built-in karaoke style.
When you play, the lights next to the string
will light up so that you know which one to
pick.
With the effect pad, you can use your
fingers to realize some basic sound effects.**



the right amount

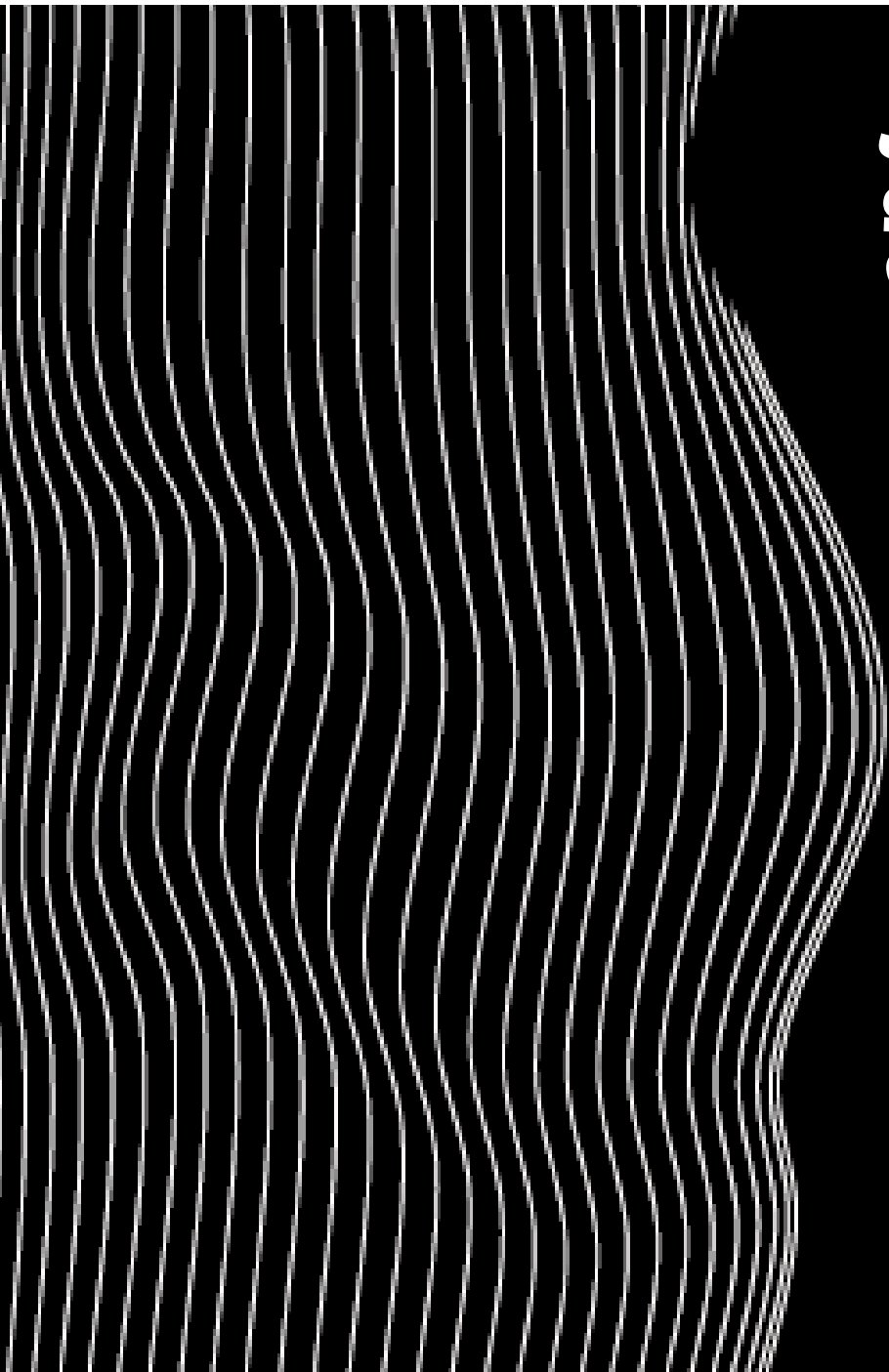
If you've ever used GarageBand, you know that you can spend hours playing with its loops, effects, amps, and virtual instruments. The menus and presets are so dense with options as to be overwhelming. It can feel like there are a million things to do other than actually performing and recording music.

FLO provided a refuge from the sensory overload of computer-based music. There's a natural feeling of restraint, of limiting the tweakable parameters only to the essentials so that you're never diverted from what matters—making music.

I wanted to push decisions and move people forward after spending a lot of time thinking about the right box to give people to play around inside—to give people just the right amount of freedom.



freedom



Just go with the

FLO

WU WU
WU WU

流水



The product name FLO derives from the best-known Guzheng music piece "高山流水", which means lofty mountains and flowing water in English.

The logo is simplified from the Chinese character.



logotyp

FLO



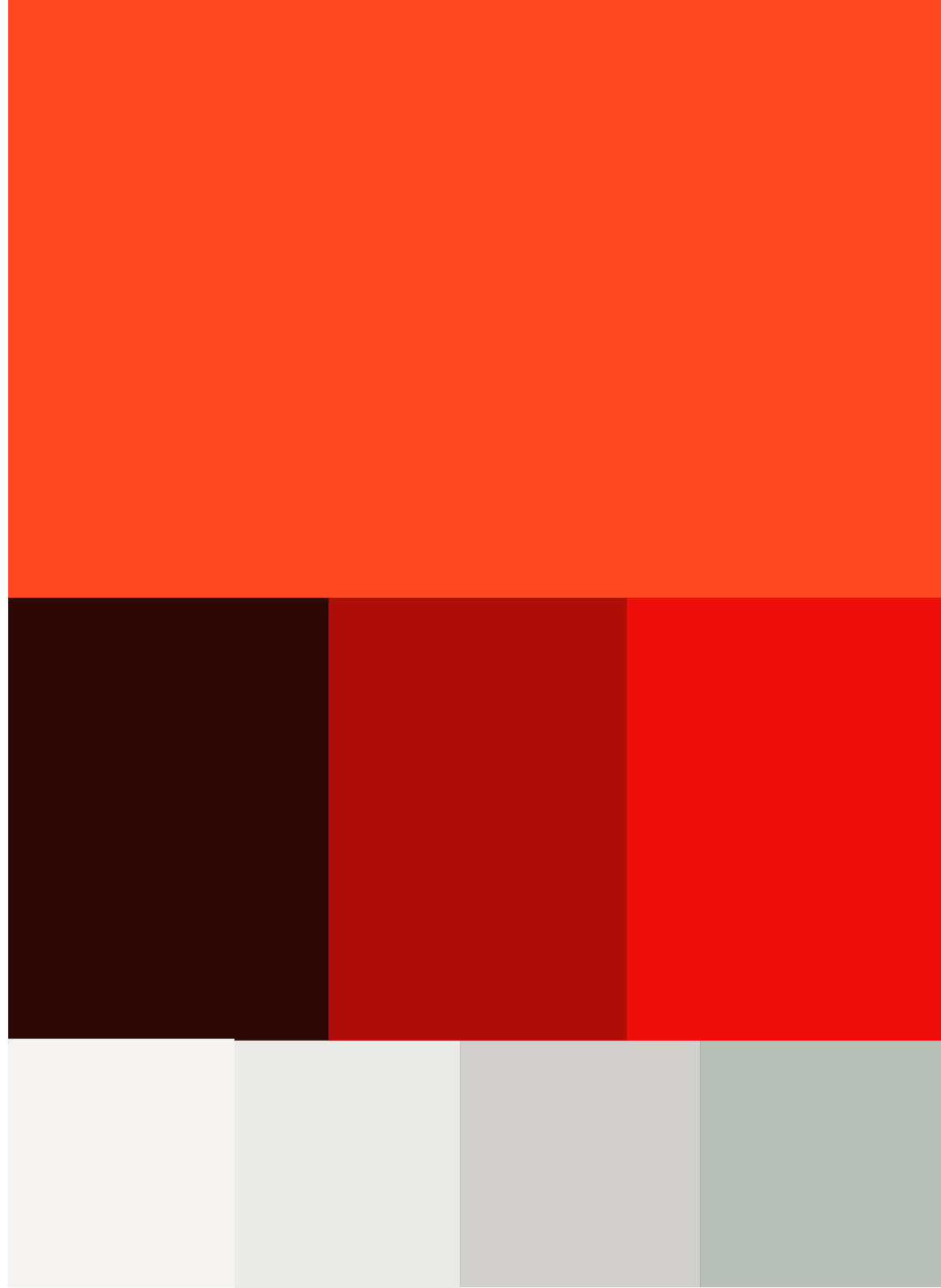
typography

TWK Lausanne 800

**ABCDEFGHIJKLMN OPQRSTU
VWXYZ,.
abcdefghijklmnopqrstu
vwxyz**

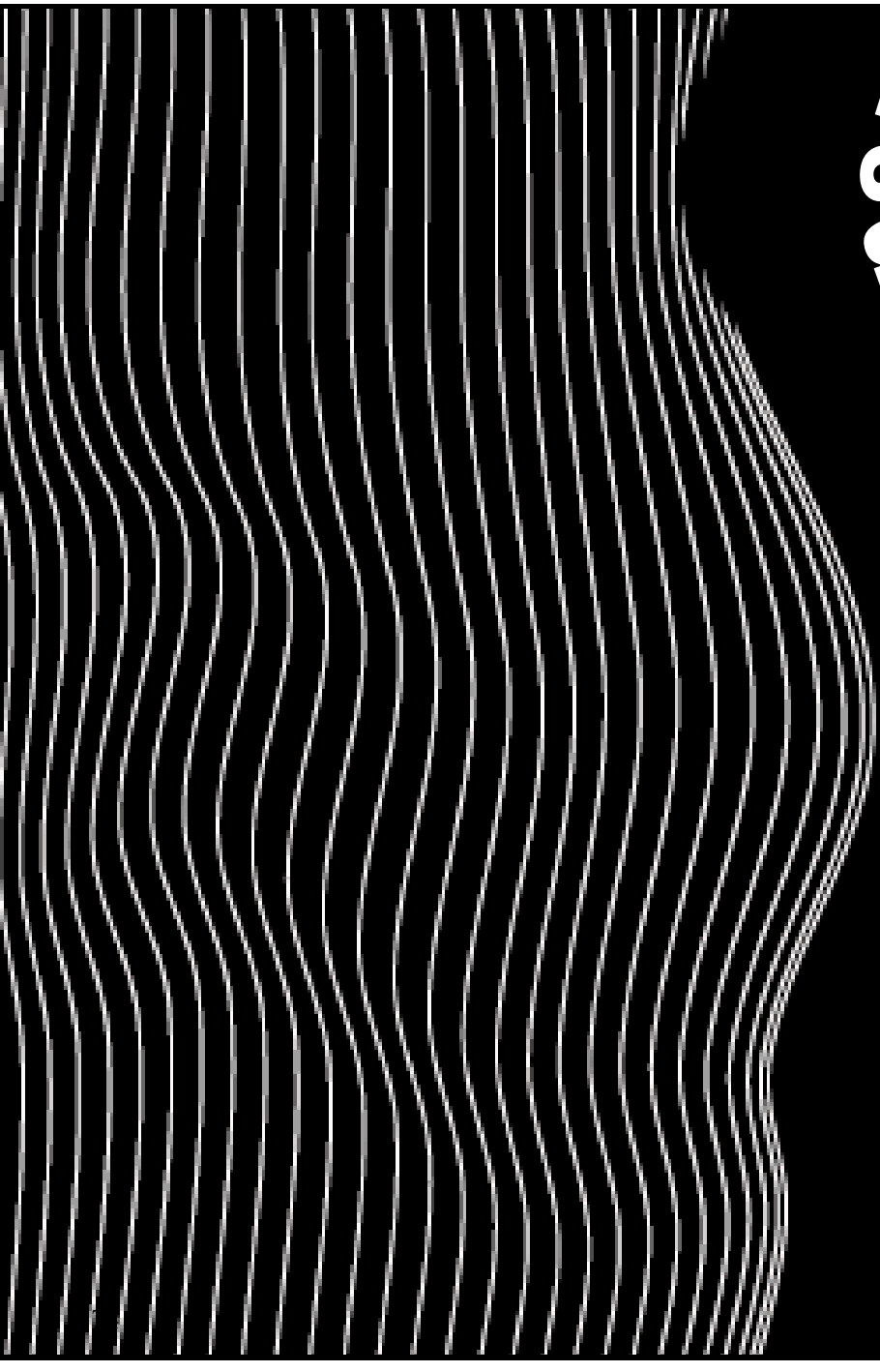
TWK Lausanne 300

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VWXYZ,.
abcdefghijklmnopqrstu
vwxyz*





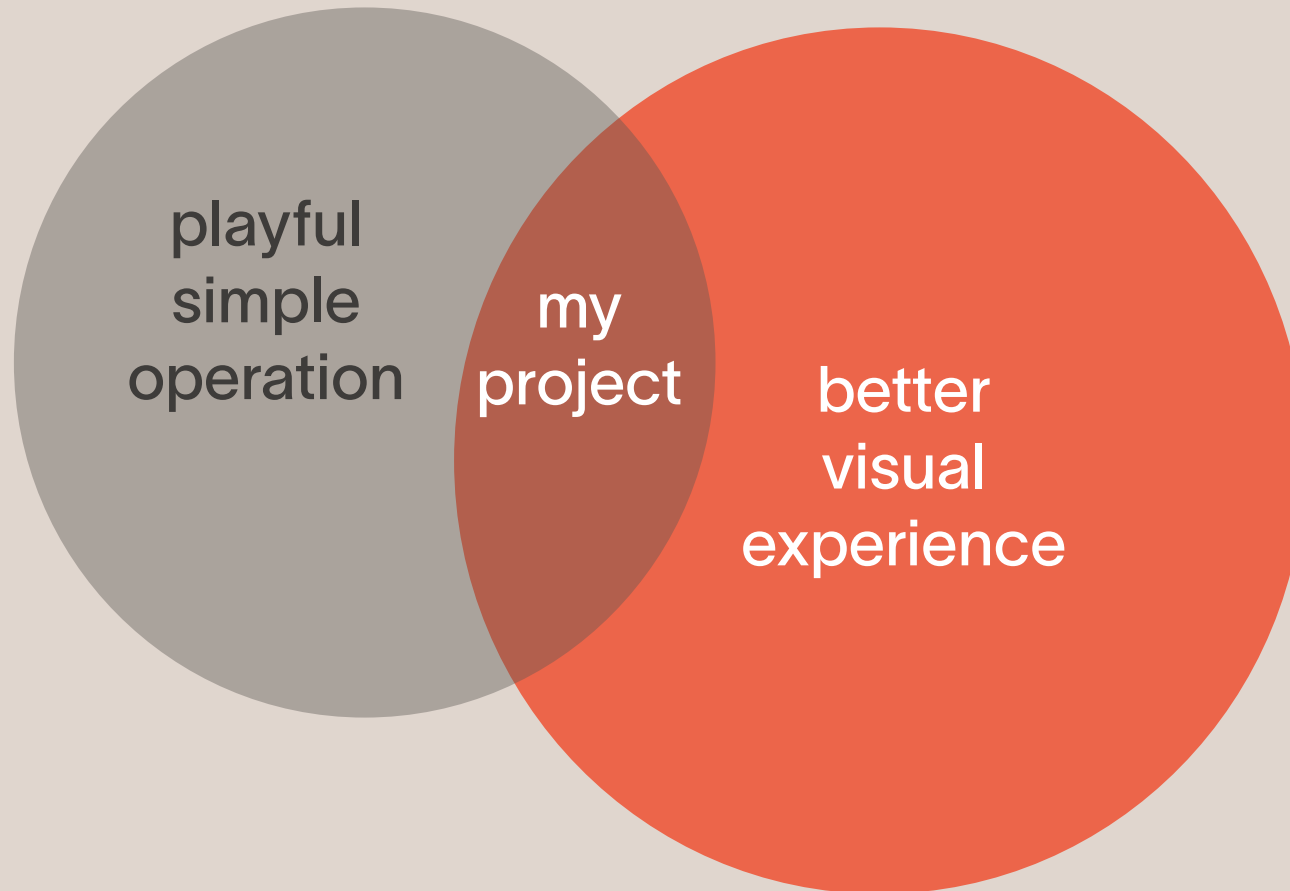
Visual experience



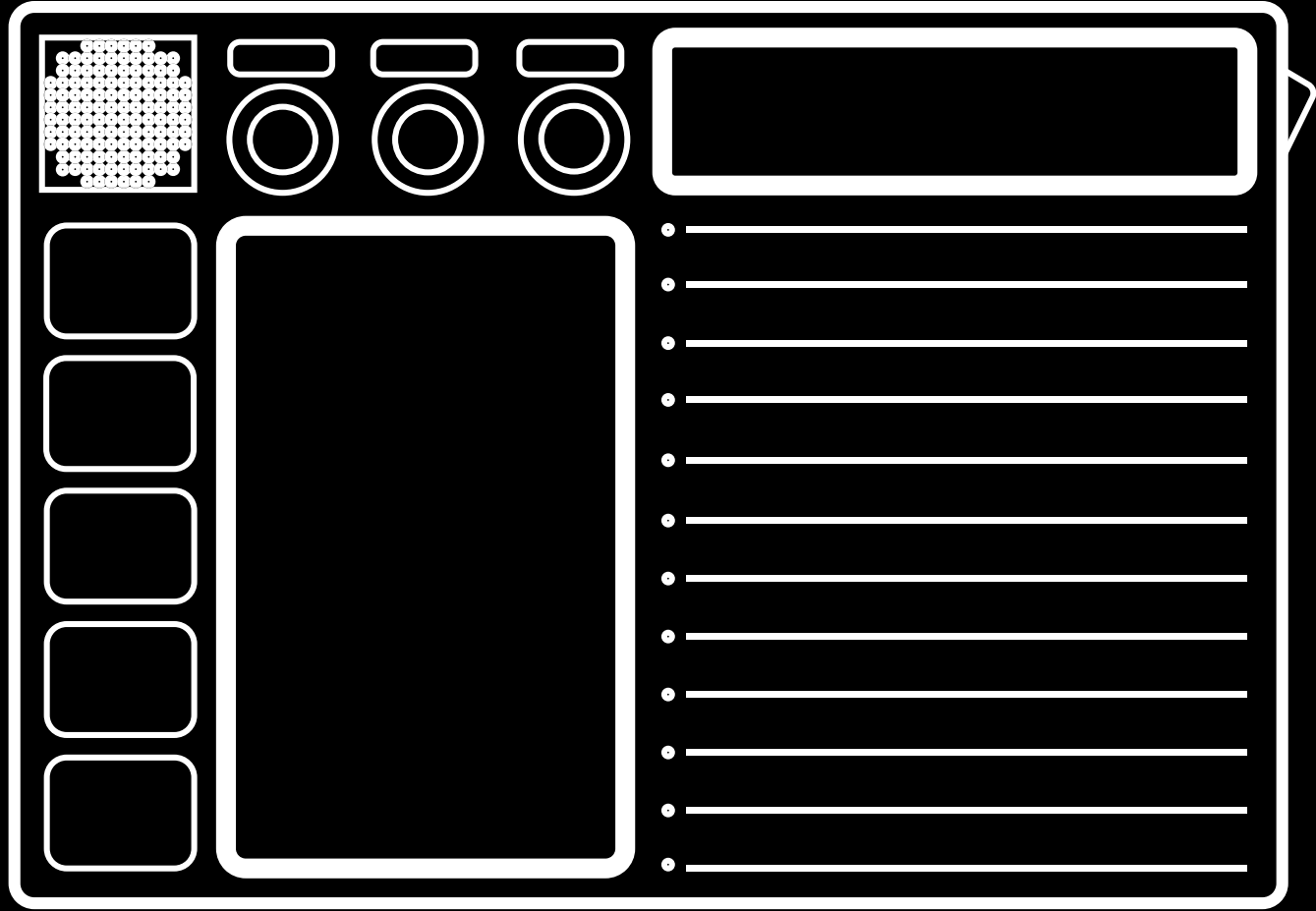
visual experience

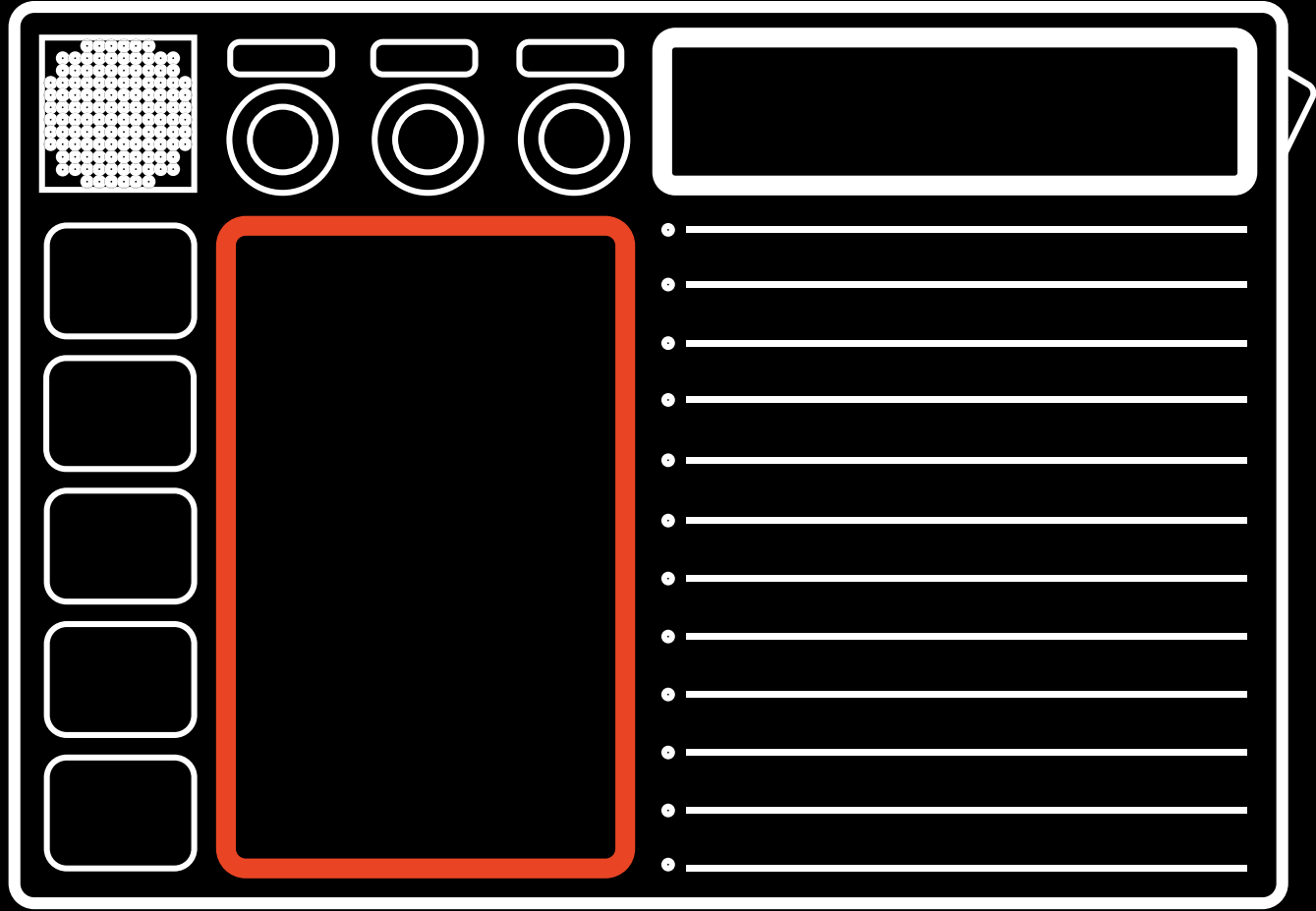
- sound visualization
- HMW
- sketch
- moodboard
- tool
- process
- tryouts

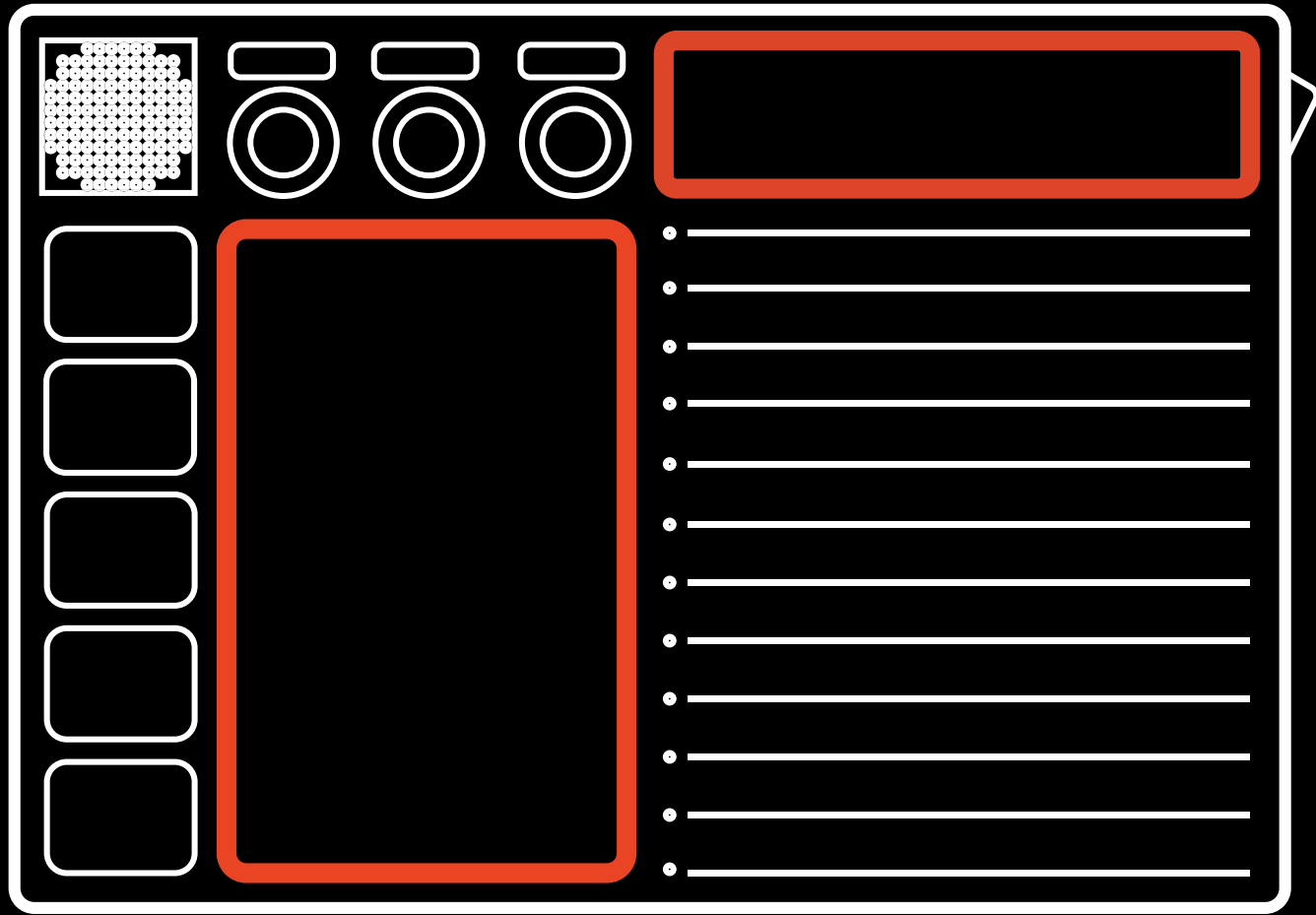
what I will focus on

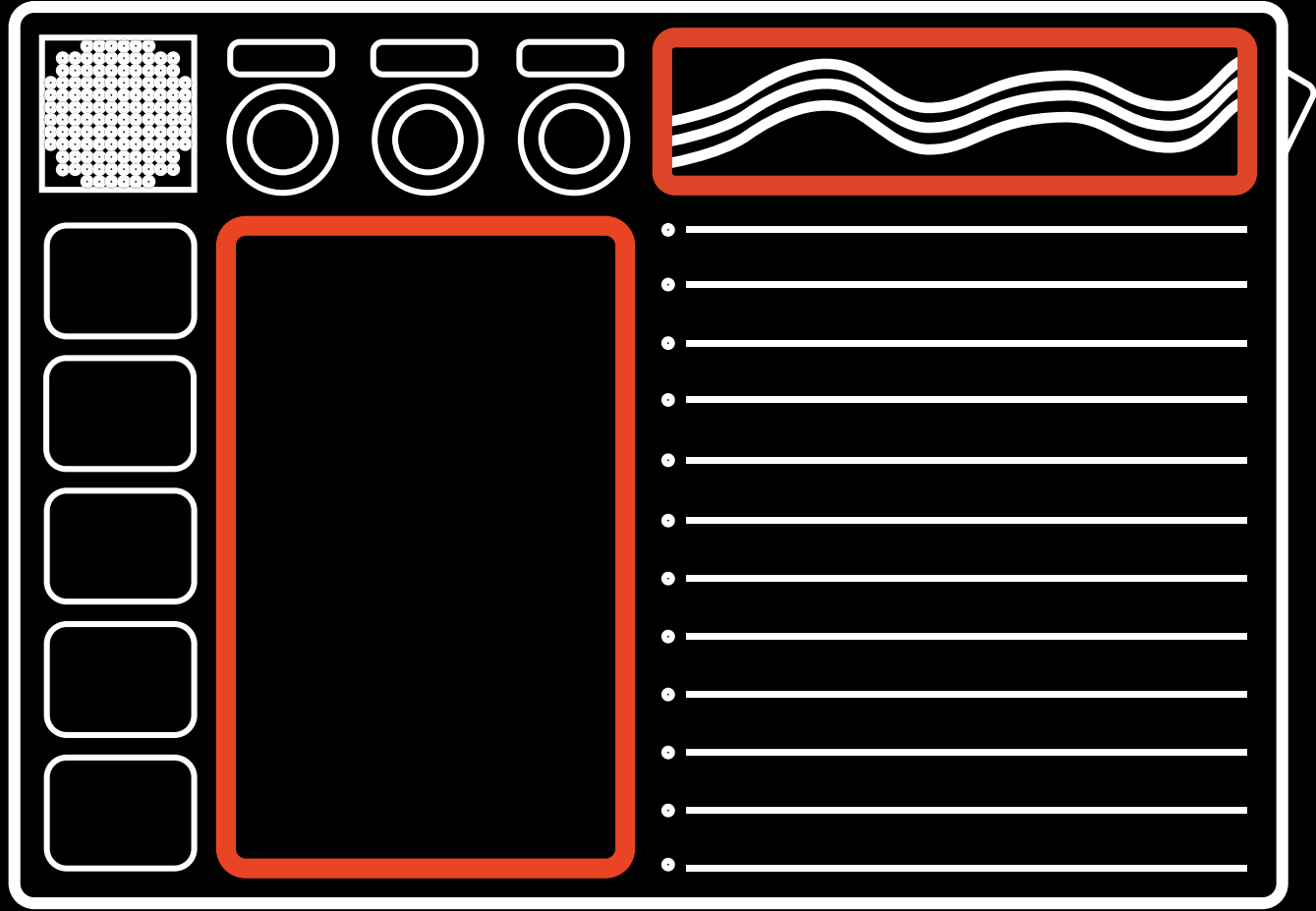


better
visual
experience

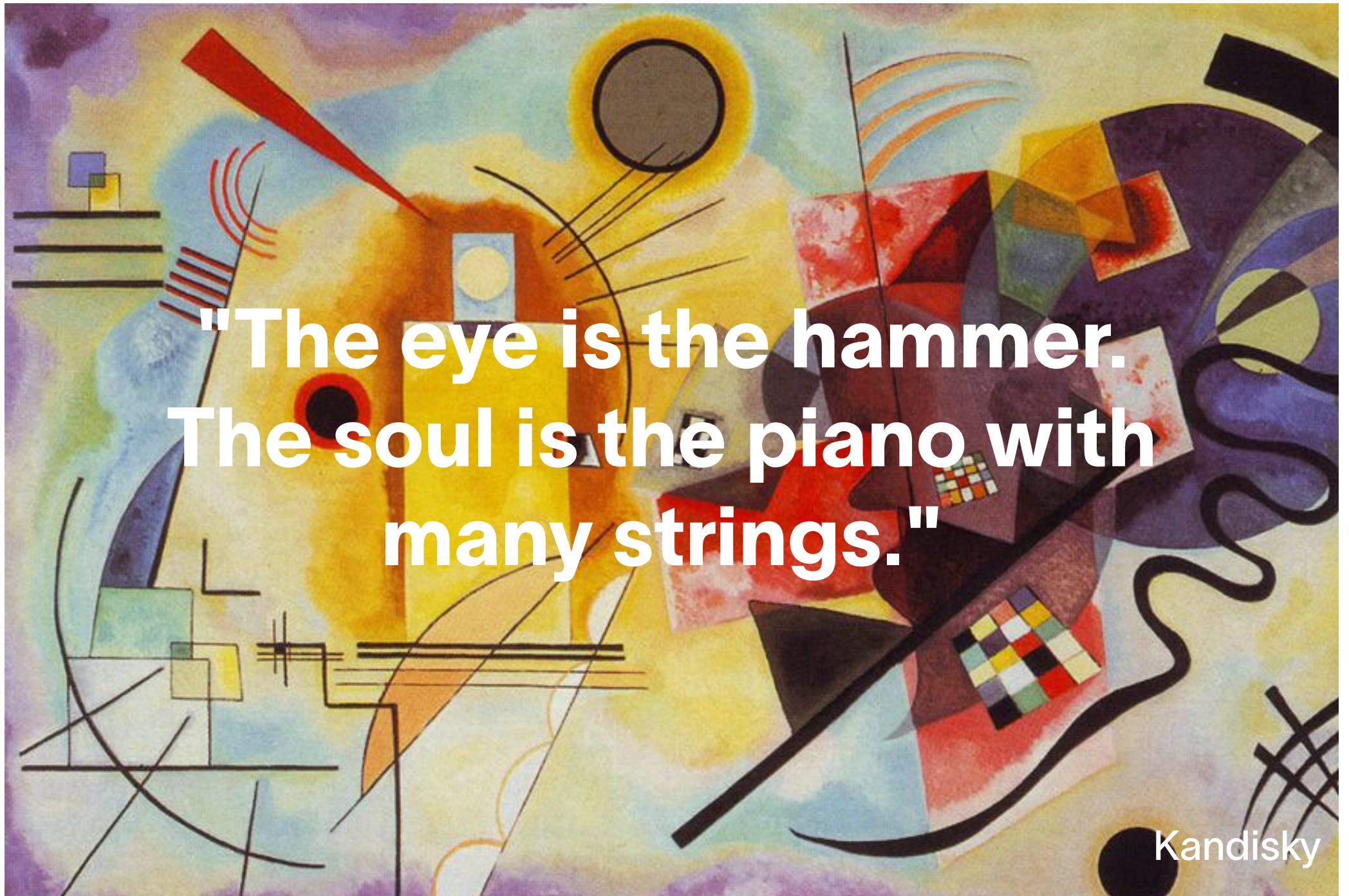








HMW see the music /notes



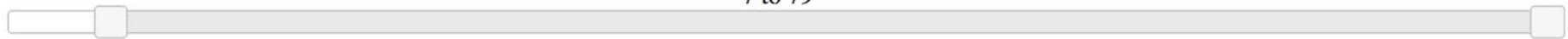
**"The eye is the hammer.
The soul is the piano with
many strings."**

Kandinsky



- Part 0
- Part 1

7 to 79



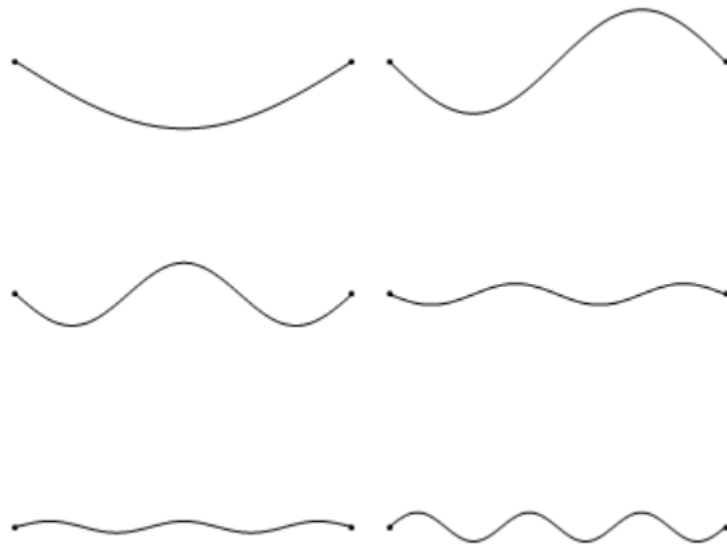
An abstract music visualization by John Cage. The image features a grey background with a grid of small black dots scattered across it. A solid black line runs diagonally from the upper left to the lower right. A rectangular area in the lower half of the image is filled with a fine grid pattern. Overlaid on these elements are several complex, overlapping lines: some are solid and wavy, while others are dotted and more irregular. The overall composition is non-representational and abstract, typical of Cage's experimental work.

Music visualization

John Cage

My main inspiration is the painter Kandinsky. I never understood his art, but I do like his saying that he believes that the different shades of colours combined create "visual chords". He said " colour is the keyboard. The eye is the hammer. The soul is the piano with its many strings."

The music composer john cage has done a lot with visualizing music, and with imagination, his scores are unusual.



SHAPE INVENTORY FOR ILLUSTRATION



CLOUDS/MOUNTAINS



MOON



PERSON-ESQUE



VEGETATION



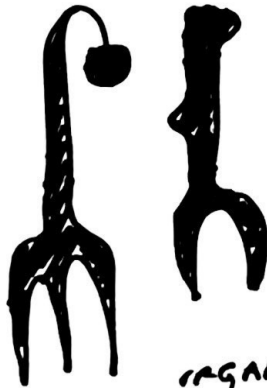
CAN BE WATER



EYELASH



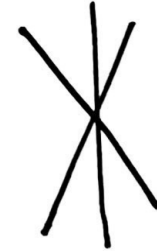
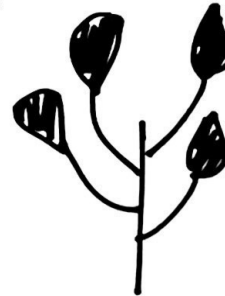
MORE VEGETATION

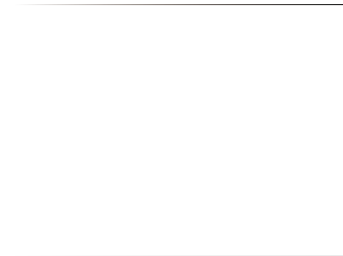
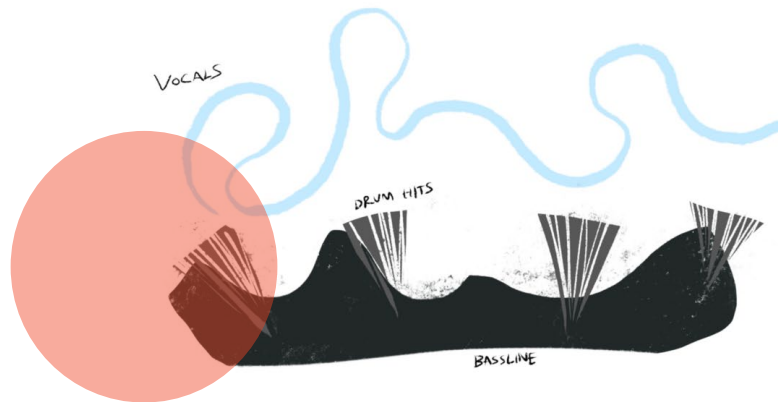
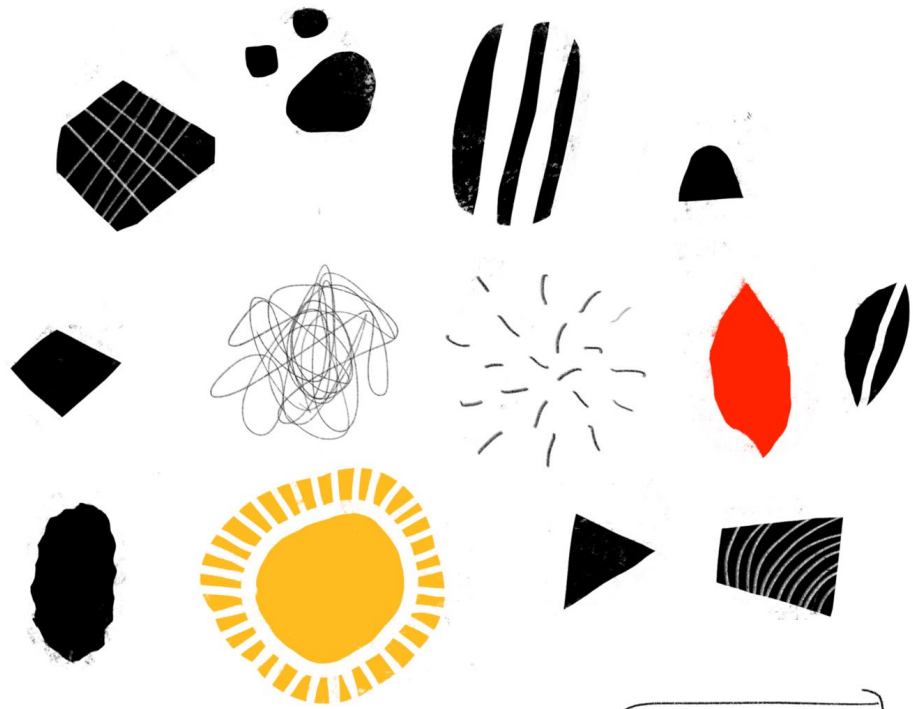


ORGANISM/
LIFE FORMS



RELATIONSHIP





abstract
image



dissolve texture



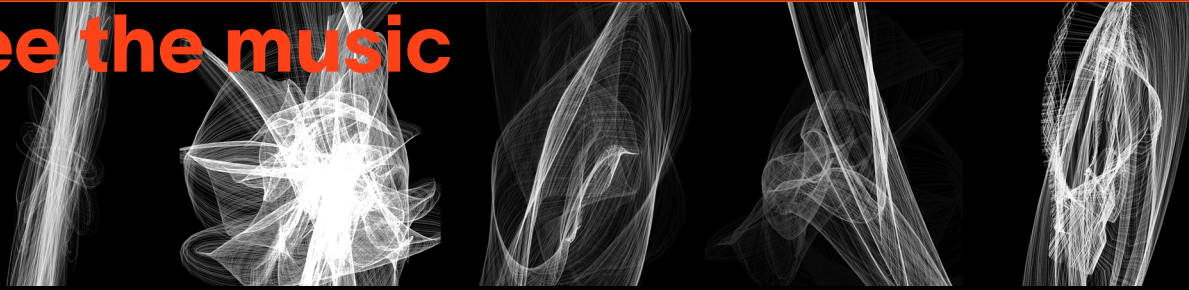
mountain

audio-visual
transformation.

moodboard

I want to use some abstract images to realize the audio-visual transformation. And I use the symbol of the mountain to express the ups and downs in the music.

see the music



correspondence



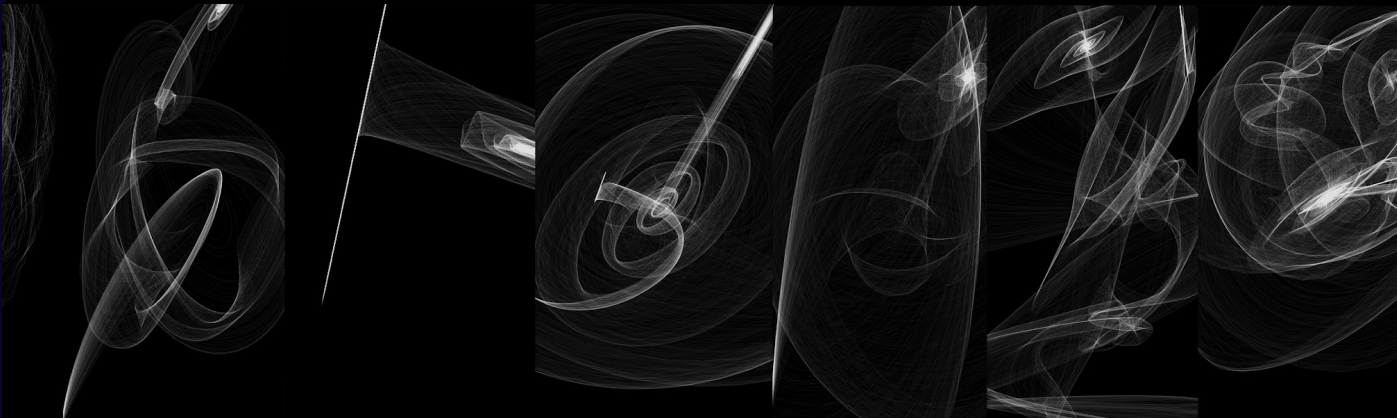
layers of sound
texture



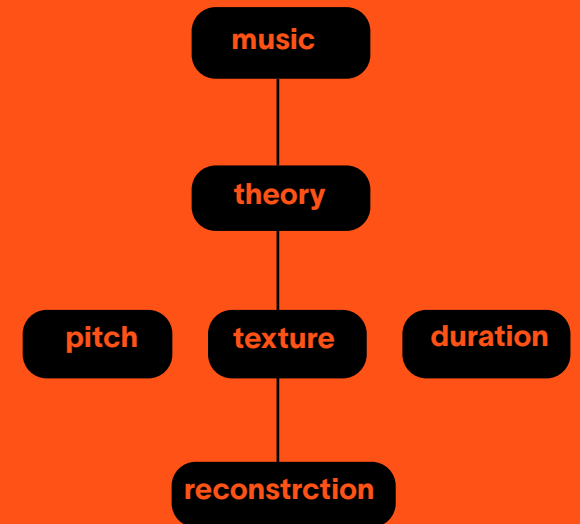
highs and lows
pitch



length of notes
duration



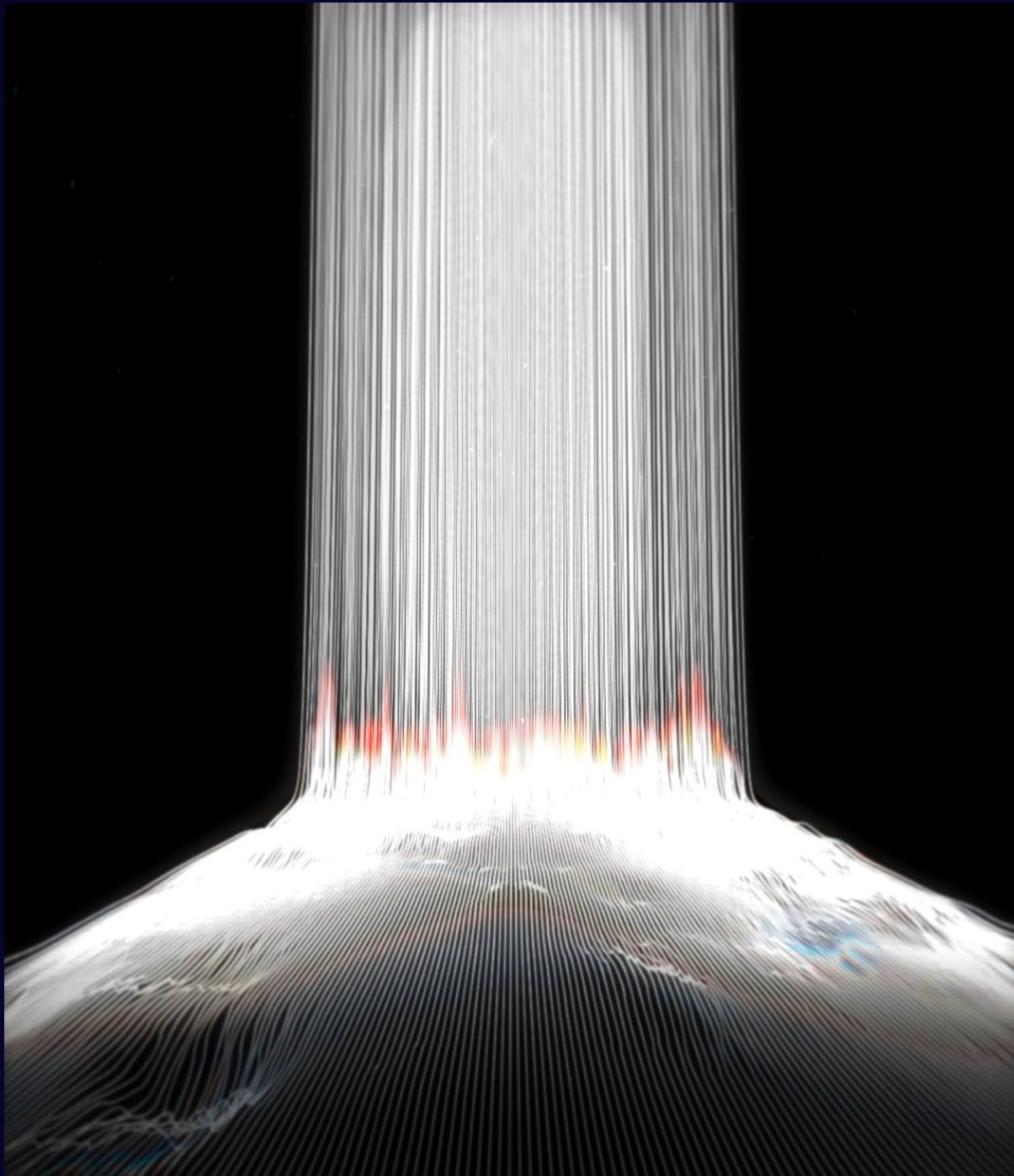
concept
extraction



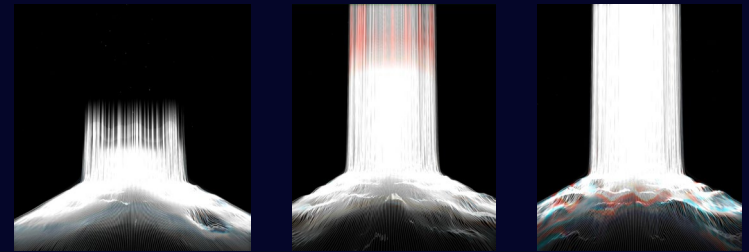
process



I use the form of lines to express the sound ebb and flow and rhythm in the music and use the algorithm of Touch designer to complete the sound interaction so that the user can feel the change of the music and get a better visual experience process of participation.

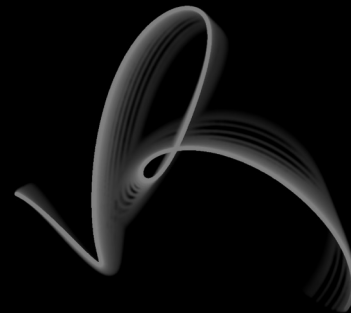
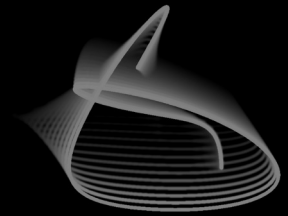
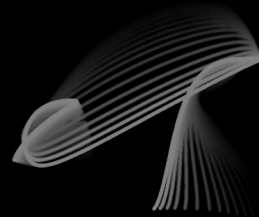
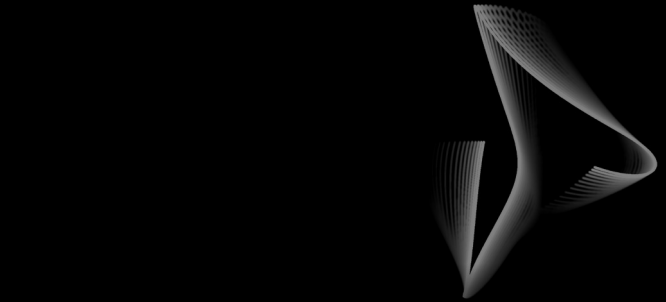
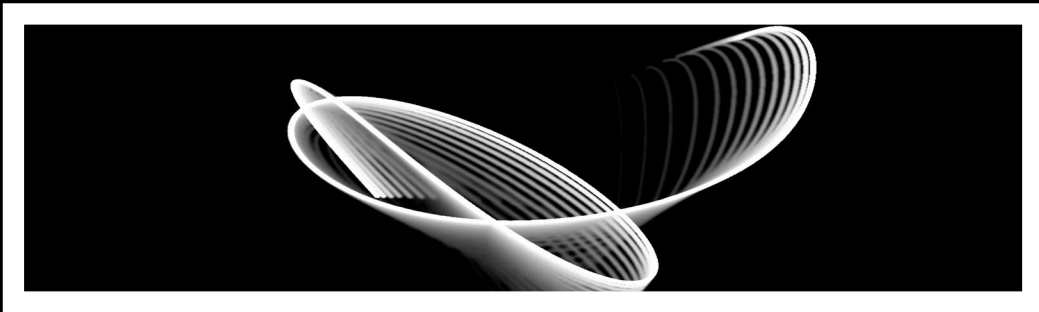
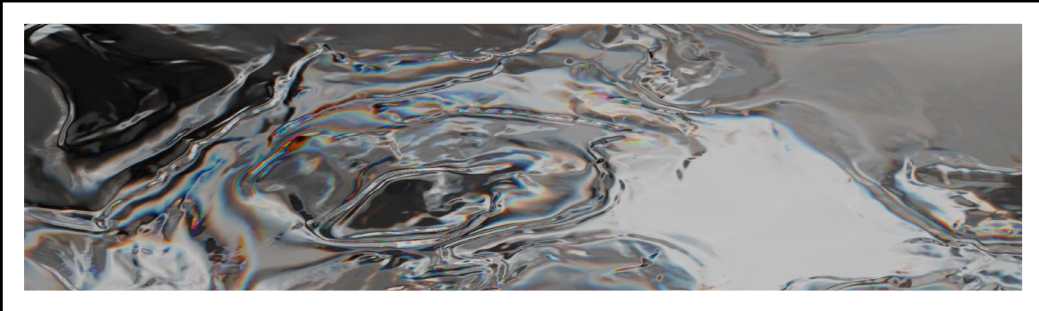
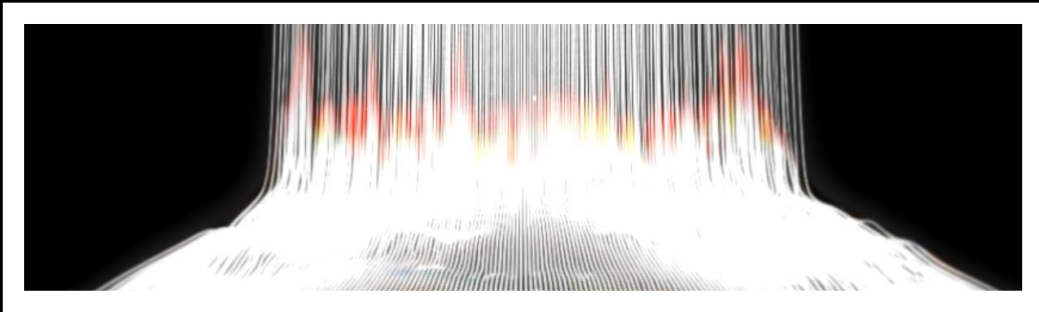


The rhythm of each note is displayed on the screen, combining a tactile multi-sensory experience to bring the fun. The visualization of the music is inspired by the flow of water from the mountains, the lines pouring down from the top like a waterfall flowing with the music, and the ripples formed by the water falling from the sky and the impact of the lake surface also express the rhythm of the music.




the midi visualizer

some other tryouts



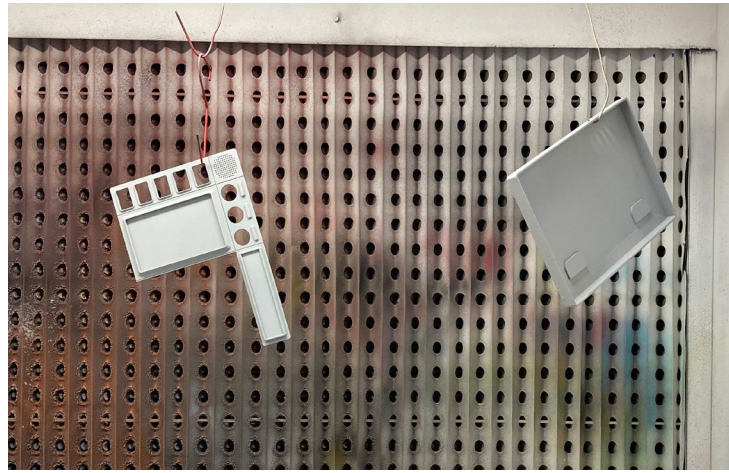


The image features a black background with a series of white, wavy, vertical lines on the left side. These lines are closely spaced and create a sense of depth and movement, resembling a stylized wave or a textured surface. The lines curve slightly towards the right, meeting a solid black area.

final result

final result

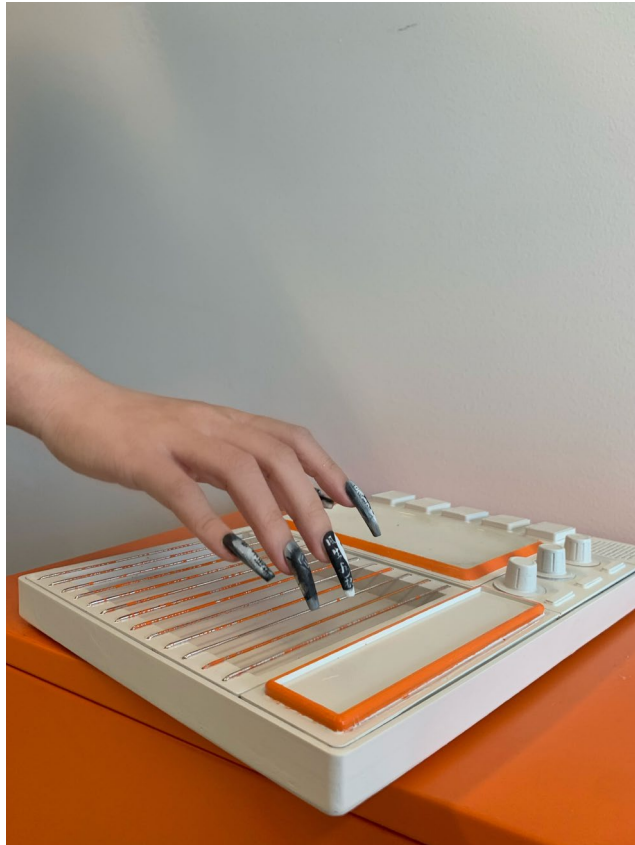
**process
details
using scenarios
photoshoot**

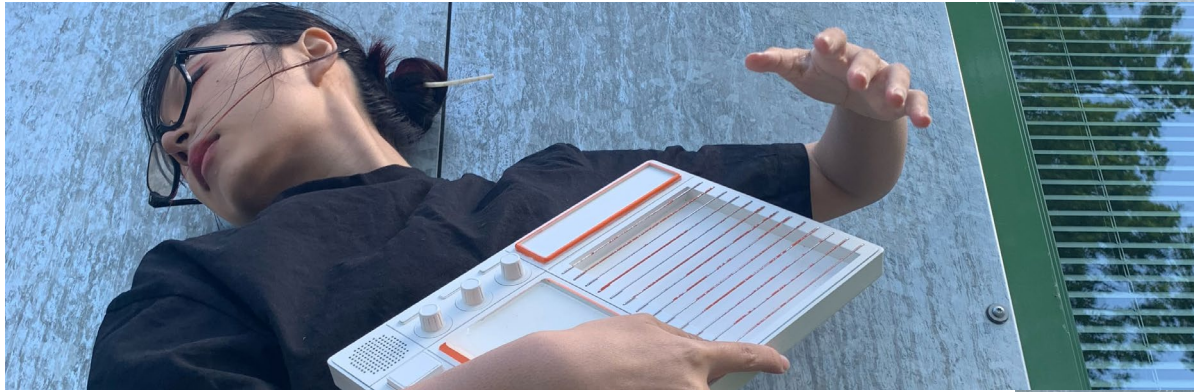












YIXIAO XU PRESENT 2022

GO WITH THE

FLO

YIXIAO XU PRESENT 2022

Designed and dedicated to create an intuitive music playing with tactile and sensory experience for advanced music producers as well as beginners even with minimal skills.

Designed and dedicated to create an intuitive music playing with tactile and sensory experience for advanced music producers as well as beginners even with minimal skills.





YINIAOXU PRESENT 2022

FLO

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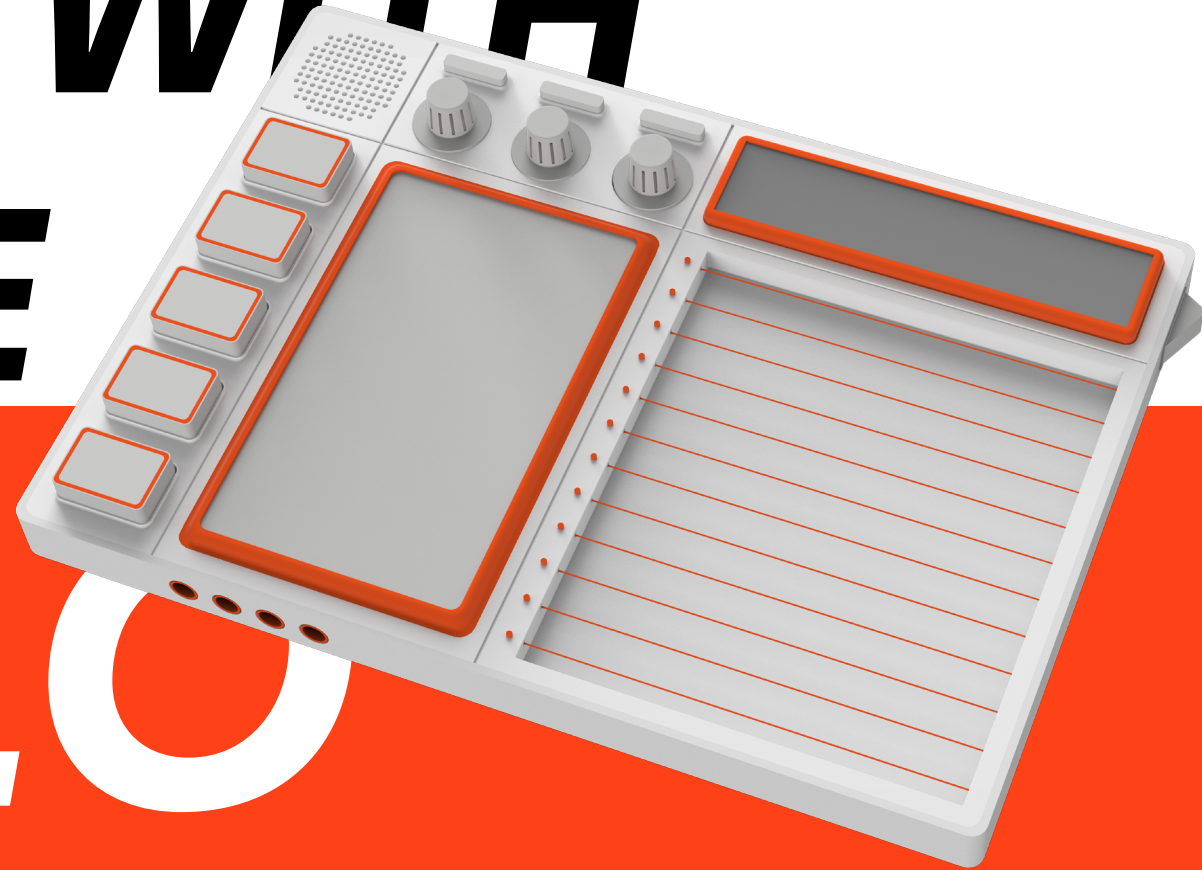
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FLO is designed and dedicated to create an intuitive music playing with tactile and sensory experience for advanced music production, as well as beginners with minimal skills.

YINAO XU PRESENT 2022

**GO WITH
THE**

FLO



FEEDBACK TARGET GROUP

" I love the design and the lovely color! It feels positive."

" I think the appearance is excellent. What is not clear to me is the exact functions it can do, and I am interested to know more."

" It does strike me as something familiar because it has the system of Guzheng or any string instrument. It is definitely a product I would buy!"

" It looks nice and has the basic functions as a synthesizer. I would

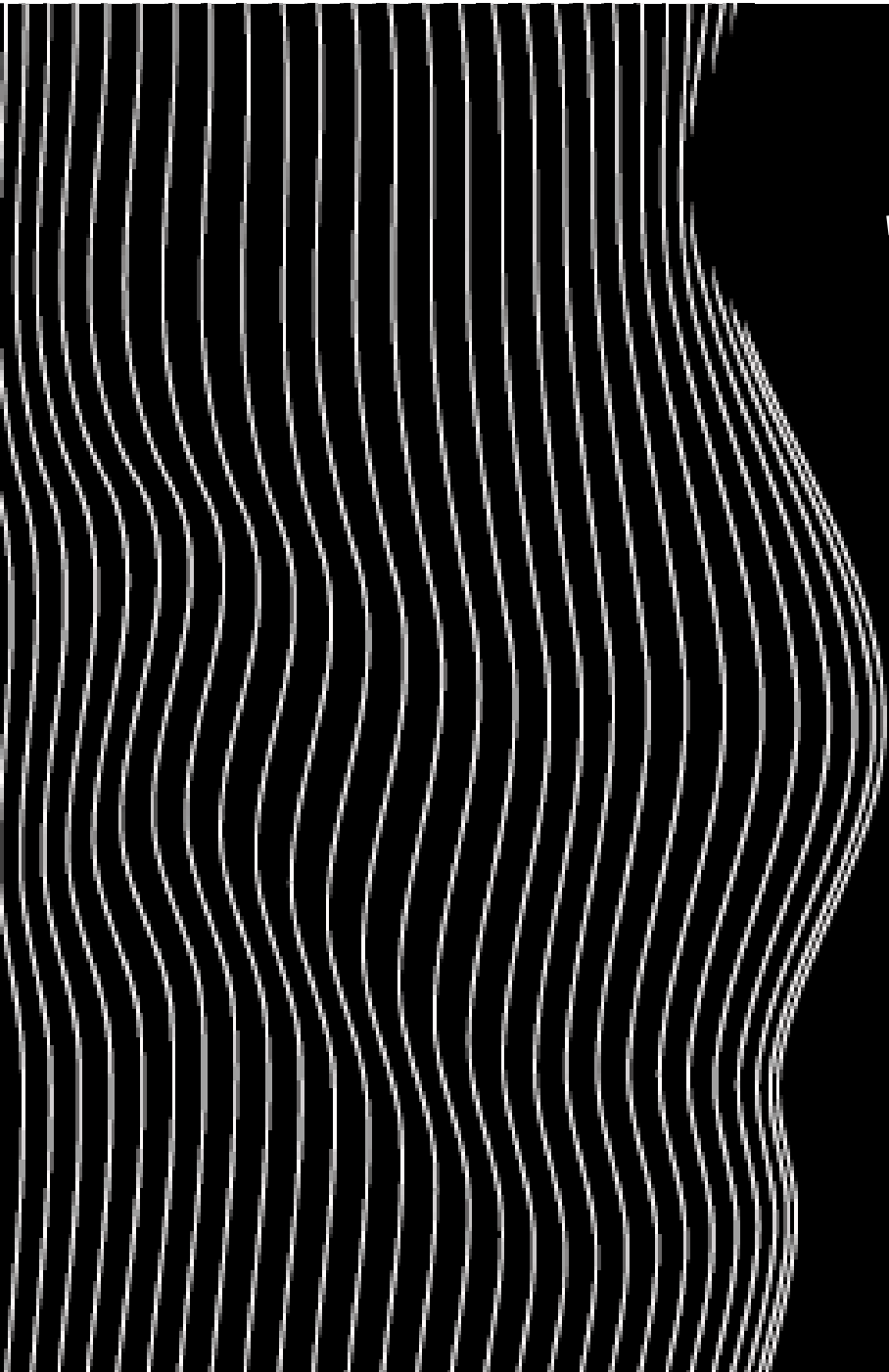
reflection

This project has taught me as much about music as about myself. It has been demanding in many ways. Firstly electronic devices were never my choice to design because I have zero knowledge of them. I have nevertheless enjoyed this project. The topic is interesting and extremely relevant to what I am passionate about. Working with my hands to create a 3-dimensional prototype is extremely good for me. It helps me understand the shape much better and is something I should do much earlier in the process. Actually, I had never been to the workshop in the whole 2-year-study until a couple of weeks ago. I missed the opportunity to receive feedback from my classmates but also lost access to the school's facilities. Luckily I can experience it at the end of the study journey in Lund.

When it comes to my end product, further development can inevitably be done to optimize the user experience. If I had the opportunity to continue with this project, I would definitely do it. This is merely the beginning.



acknowledgements



I want to thank Yin and Mo, who have supported me throughout this journey.

I'm also very grateful for the feedback from Andreas Hopf, Per Liljeqvist and all I have experienced these two years, which have made me the designer I am today.



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moogmusic.com

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