Reshape Memories

Exploring more playful ways to rediscover digital photos in the age of AI

Shengwen Lin
Xiaoyun Wang

Abstract

This is nothing new: we take a lot of photos every day, many of which we never look at again and just forget in our phones' storage. So what is the point of having these photos? How should we use them? In this interaction design diploma project, we have explored possible solutions so that forgotten photos can be seen again, and may even bring people surprises and new value.

In terms of the title, "Reshape Memories", the word "memories" has a double meaning. On one hand, memories are not absolutely accurate; they can be reinterpreted and given new meanings. When we look back at a photo, we are constantly making associations in our brains to reinterpret a memory. (Lee, 2015) On the other hand, our final concept is inspired by the *Memories* feature of today's smartphone albums, which brings photos that may be important back to users through AI technology.

Our outcome "Colagic" takes *Memories* further by making photos into collages through AI technology. This provides users with a more playful way to revisit and rediscover their potentially important photos. More importantly, they can edit, create and share their creations, extending the memory and the story contained in the photos.

We hope this project could add new value to digital photos and inspire people in how to deal with the ever-changing information and technology in the age of AI.

Contents

Introduction

In this chapter, we will briefly describe our motive and design process.
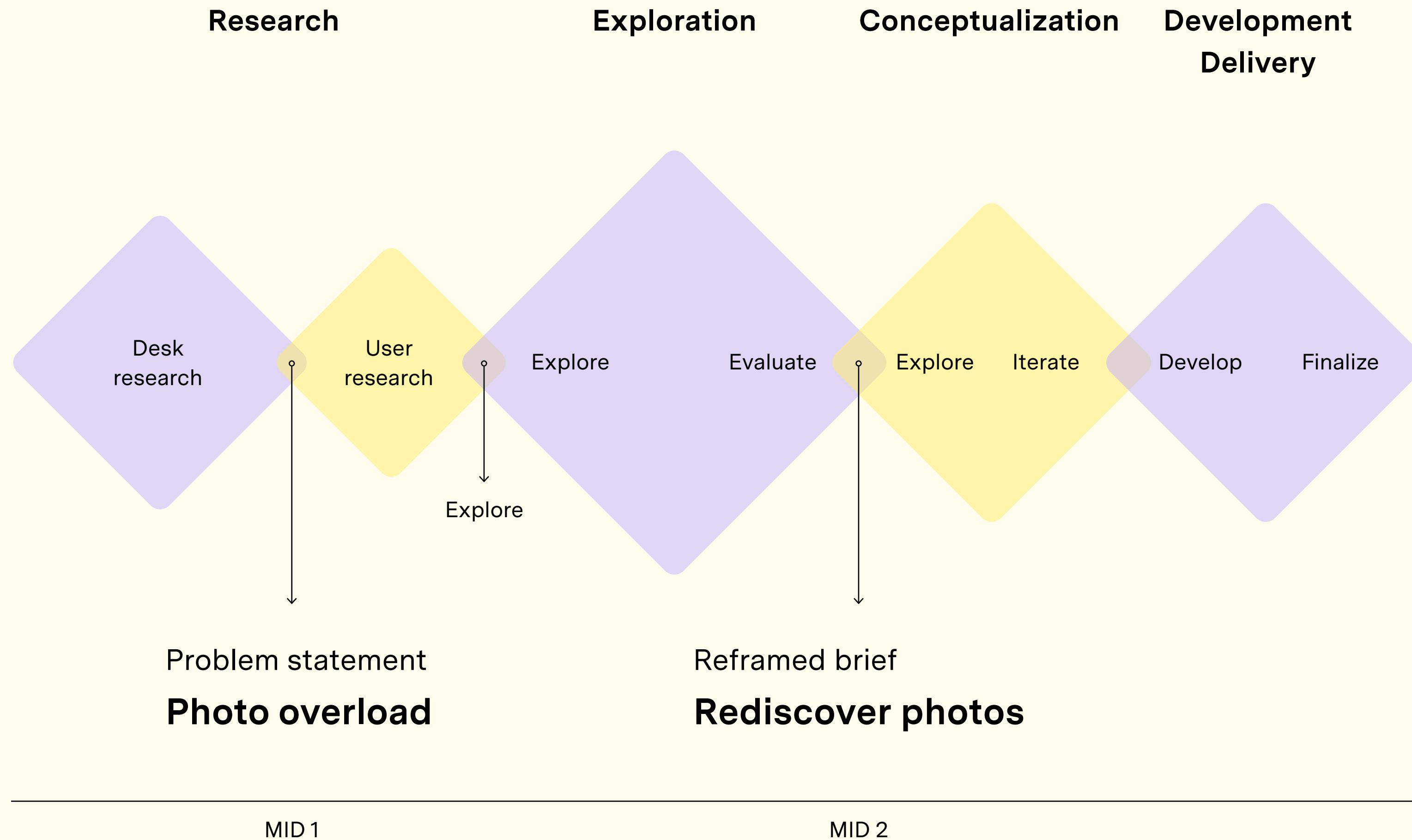
Our Motive

Choice of topic

The project started with a phenomenon we saw on a trip to Italy last summer: everyone around us was taking pictures constantly, no one seemed to be in the moment - this sparked our interest. As John Culkin says: "We shape our tools and, thereafter, our tools shape us." (Culkin, 1967) The development of photographic technology is inevitably changing the way we interact with the world.

Like everyone else, we also like to take pictures with our smartphones, but sometimes we look at the thousands of pictures on our phones and wonder: What is the point of having so many pictures? Has the advancement of technology devalued photos as a medium for carrying memories? We would like to take this diploma as the opportunity to answer these questions. In addition, and more importantly, we wanted to know how to deal with ever-changing information and technology as designers.

Explorative and fun

Compared to our previous interaction design projects at AHO, each of them only has a short period of time. In this diploma project, which requires a full semester of work, we also hoped that this topic is not only something we are interested in, but also something we can have fun with. At the same time, we also hope that we can fully exercise our skills as interaction designers, through skills such as visualizing and prototyping.

Process

Research   **Exploration**   **Conceptualization**   **Development Delivery**

Desk research

User research

Explore

Explore

Evaluate

Explore

Iterate

Develop

Finalize

Problem statement
Photo overload

Reframed brief
Rediscover photos

MID 1   MID 2

We wanted to keep the questions as open as possible at the beginning so that we could have enough room to explore. Of course, this also meant that at the beginning we did not know what our final result would be. Therefore, during the subsequent research and design process, just like the 'multiple diamonds model' you can see above, we spent a lot of time on trials and errors to find the right entry point.

This process was challenging, but it also led us to identify the direction that we were really interested in and that would be most valuable to others. During the design process, we used prototypes of different fidelities for rapid user testing and constantly iterated and reflected on our design directions. In addition, talking with design experts pushed us to optimize the results even further.
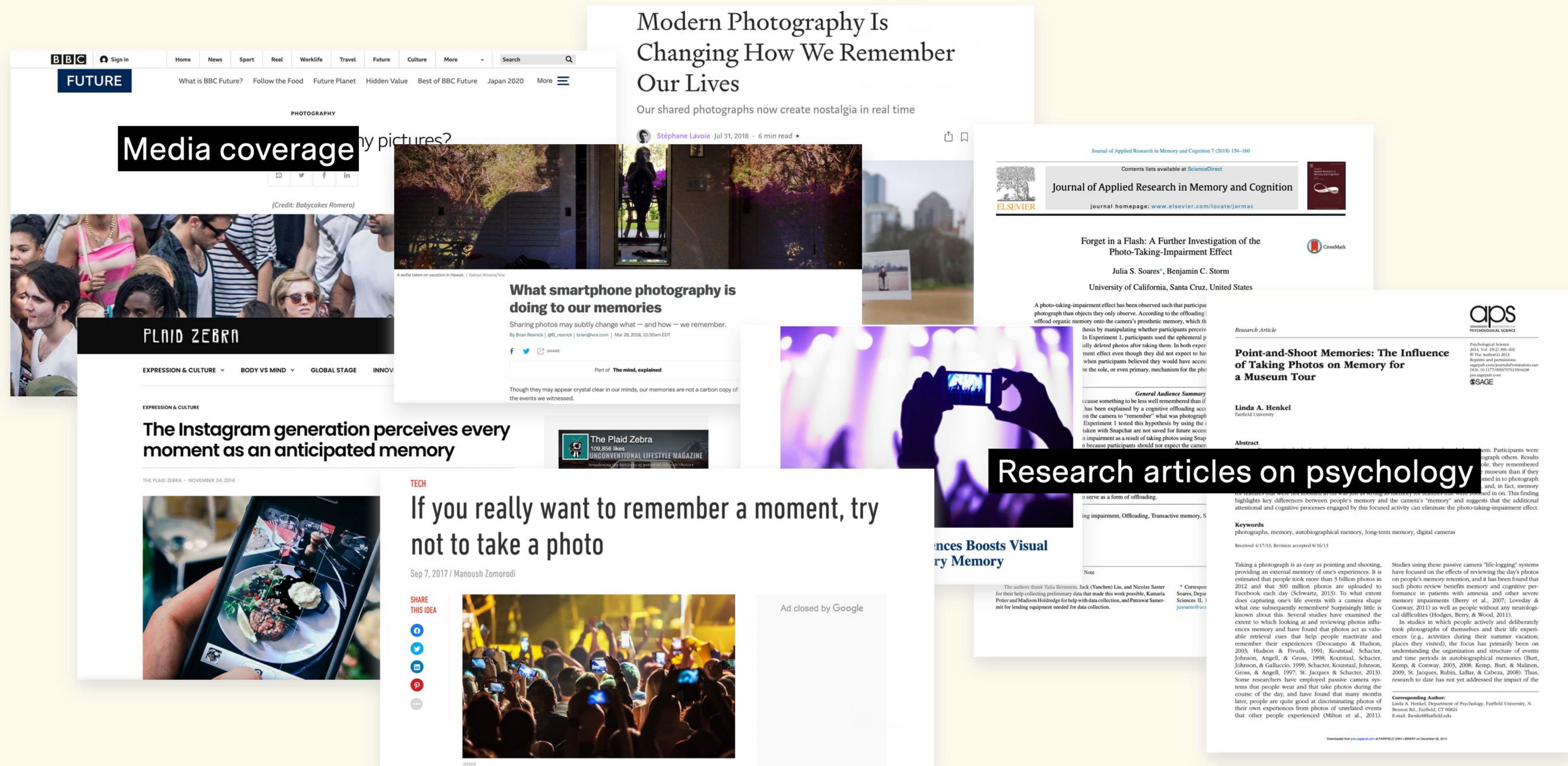
The Teaser
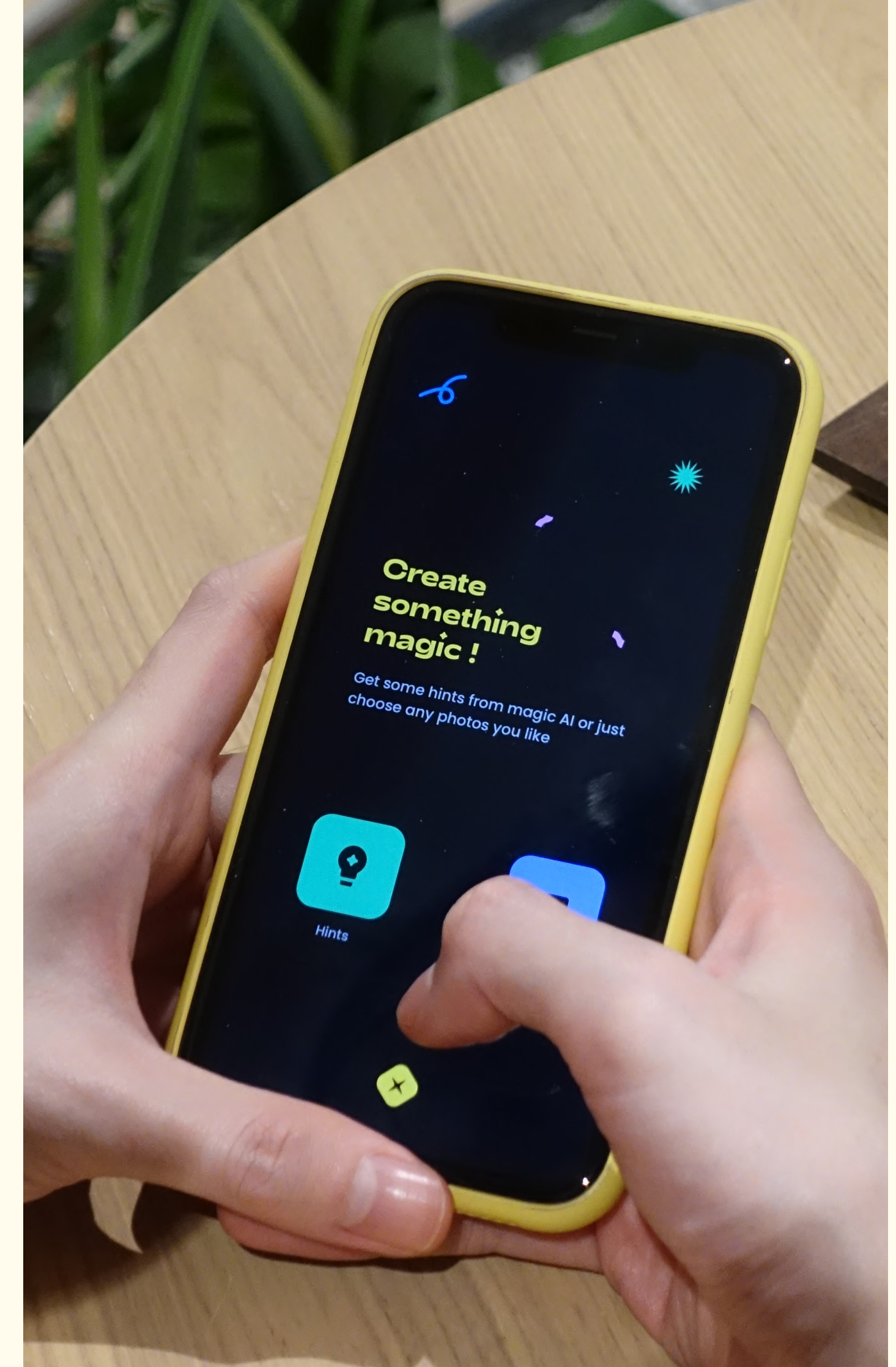
Background

In this chapter, through desktop research, we gained a deeper understanding of how the development of smartphone cameras has changed the nature of photographs and the impact it has had on people's lives. By the end of the chapter, we arrive at a question that we would like to explore further.

First, we would like to share some of the articles we have read.
Keywords: mobile photography, memory, experience

Media coverage

Research articles on psychology

We will present our main findings in the following.

Mobile photography explosion

" Today everything exists to end in a photograph."

Susan Sontag, On Photography

Technological advances have taken cameras from expensive and bulky analog cameras to smartphones that everyone can carry in their pockets, and now everyone can take pictures anywhere, anytime. In fact, ubiquitous smartphones with their built-in cameras have, for the past decade, helped us produce more photographs than ever before. Statistics (Carrington, 2020) shows that people took 1.4 trillion photos in 2019 alone, and eighty-five percent of them were taken with smartphones.

1.4 trillion photos were taken in 2019

Iphone, 2007

The number of analog photos
The number of digital photos

Photo by Uffizi Museum, data from InfoTrends via Bitkom

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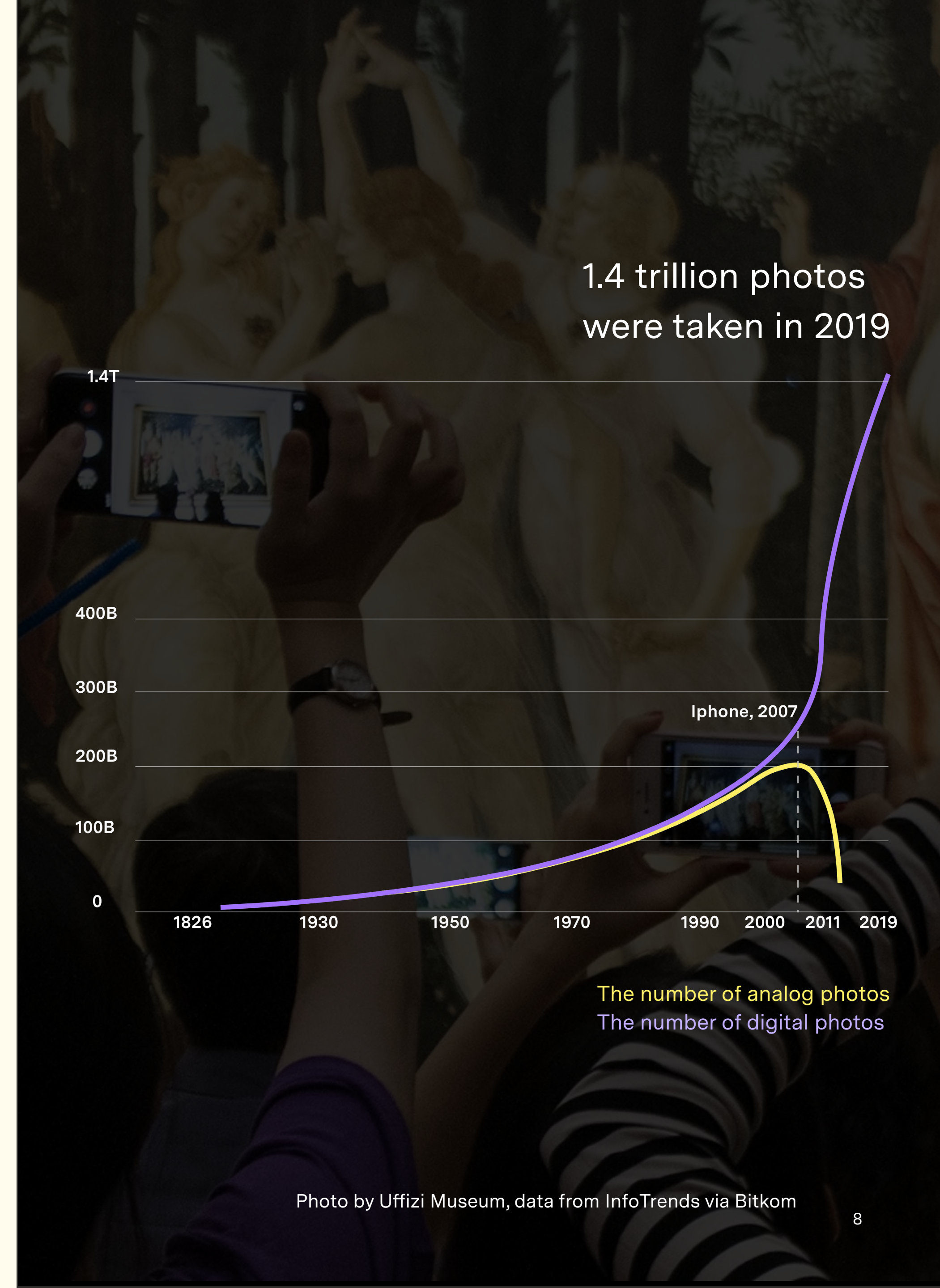
You can have both

You may have had a similar experience as we did, where your friends or people around you were taking pictures of whatever was going on at dinner or while traveling, and you felt like they weren't fully engaged in the moment. These situations have led us to a sort of conflict, where we are in the position of weighting: "the picture or the moment?" To explore this situation, we investigated online media coverage and research articles about related topics.

Contrary to what we might have thought, a study has found that the act of photographing something can actually "enhance the enjoyment of a positive experience, by focusing attention on and heightening engagement with the thing being photographed." (Diehl, Zauberman and Barasch, 2016) Thus, the researchers believed that "while many people lament that others take too many pictures and are not enjoying the present, those who take the photos may not feel that way."

Photo by Priscilla Du Preez on Unsplash

You can have both

"Find a balance with technology that feels right for you."
Google Digital Wellbeing

However, this study also found that if the person took the photo solely with the intention of sharing it, there was no increase in enjoyment, because they didn't do it for themselves. Erin Sullivan, a travel photographer, therefore concluded in a TED talk that photography can enhance one's experience if it's done intentionally. (Sullivan, 2020) It is wiser to put the smartphone away sometimes to have a moment only for oneself.

As Susan Sontag puts it, although taking photographs is "a way of certifying experience, taking photographs is also a way of refusing it-by limiting experience to a search for the photogenic, by converting experience into an image, a souvenir." (Sontag, 1977) Jonas Larsen, a professor of mobility at Roskilde University, also believed that carefully studying an environment between snaps can open one up to a more sustained kind of experience. (Mallonee, 2020)

All of these different points have underpinned our understanding that at a time when our phones have become an extension of our eyes and brains, it's unrealistic to focus entirely on the present experience without taking pictures. It's more important to strike a balance between taking pictures and enjoying the moment.

The new role

So, why do people take so many pictures today? What has changed in the nature of photos in the digital age?

As José Van Dijck, a media studies professor, explains in his book "Mediated Memories in the Digital Age"(Dijck, 2007), taking a picture is no longer just for commemorating special events and remembering family life, but also for documenting all kinds of trivial moments in life." Thanks to the development of social media, we can now share photos with friends from thousands of miles away, anytime, anywhere. It is not surprising that Dijck(Dijck, 2007) believes that among the younger generation, photos have become "an instrument for interaction and peer bonding." People also often re-create photographs to enrich the meaning of a photo or solely for more clear communication by adding texts and adding filters to it, and so on.

All in all, photos are no longer just "slicing out this moment and freezing it," as Sontag(Sontag, 1977) puts it. Although photographs retain their original use as memory aids, they are now more casual and less serious. People can also interact more with photos, such as re-creating and sharing them.
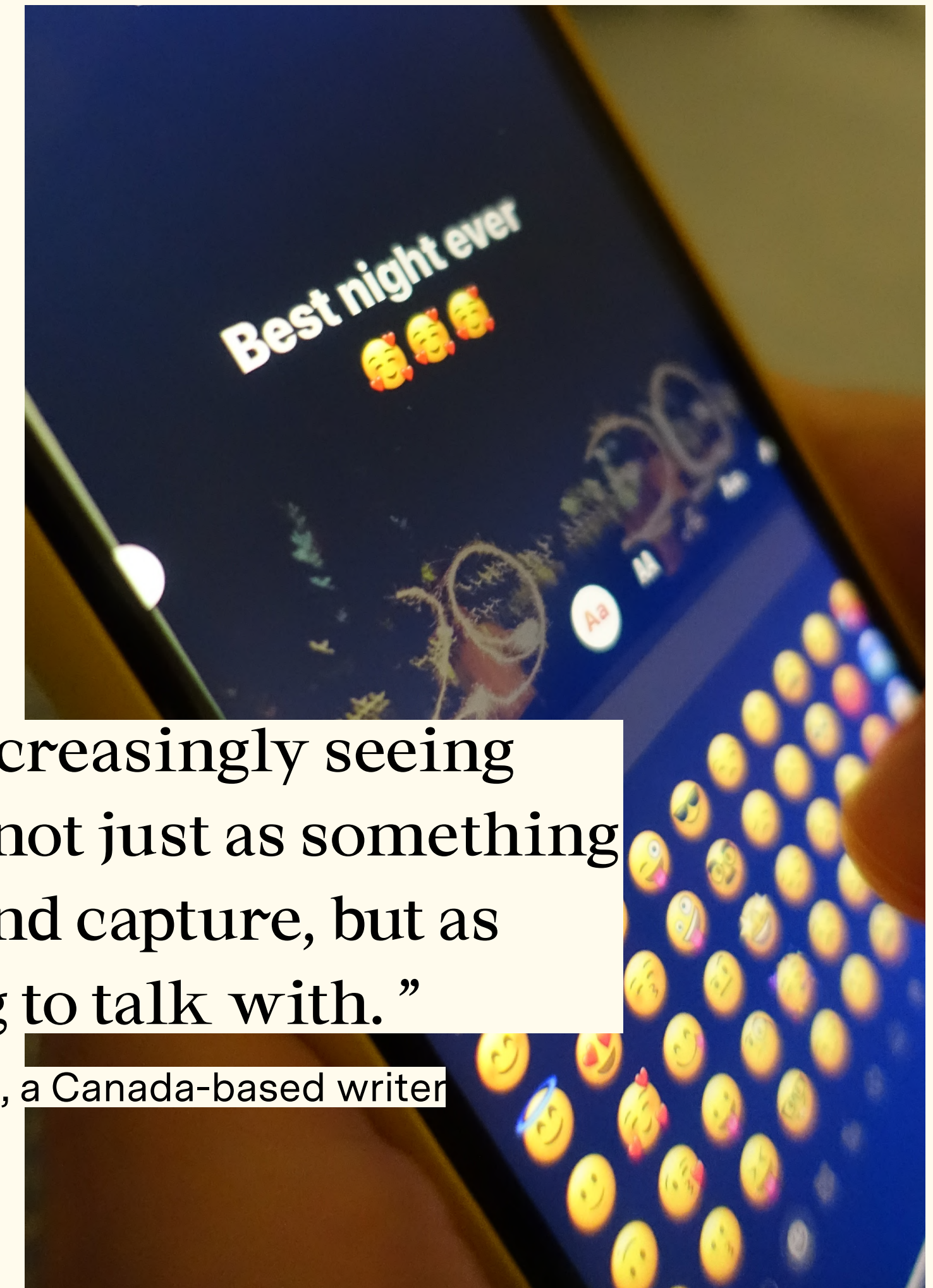
"We are increasingly seeing the world not just as something to freeze and capture, but as something to talk with. "

Stephane Lavoie, a Canada-based writer

The downside of image abundance

So, what's the result of producing, owning and seeing a large amount of photos?

Less valued

This is probably the feeling of everyone who has used a film camera: digital photos do not seem to be as precious as film photos. Martin Hand, a sociologist at the University of York, agreed that people often find it hard to know how to view a digital photo in a meaningful way. (Hand, 2012) While helping us remember our experiences, the volume of photographs and the platforms on which we see them also make it easy to forget them. Snap, share, scroll, repeat — pictures have become ephemeral, sliding down an endless stream, mostly unnoticed and rarely to be encountered again. (Lavoie, 2018)

"When images are easy to make and easy to share, they come to be less about permanence."

Nathan Jurgenson, Social Photo

Penelope Umbrico, '541,795 Suns from Sunsets from Flickr (Partial) 01/23/06'

The downside of image abundance

Stress and disorganization

A 2015 report (Roettgers, 2015) states that there were 630 photos on the world's cell phones per capita, and although the most recent data is not available, with the rapid growth of social media, it's easy to assume that the number is much larger now. The rapid production of photos and almost unlimited storage capacity have inevitably resulted in some problems.

Research has shown that people perceive their 'self' as becoming extended to their digital possessions and also becoming increasingly 'attached' to them (Cushing, 2011, 2013). The accumulation of digital files can also eventually result in stress and disorganization (van Bennekom, Blom, Vulink, & Denys, 2015). Martin Hand (Hand, 2012) made a similar point, that people are afraid of accidentally deleting important photos and do not know how to manage and categorize the large number of pictures they have.

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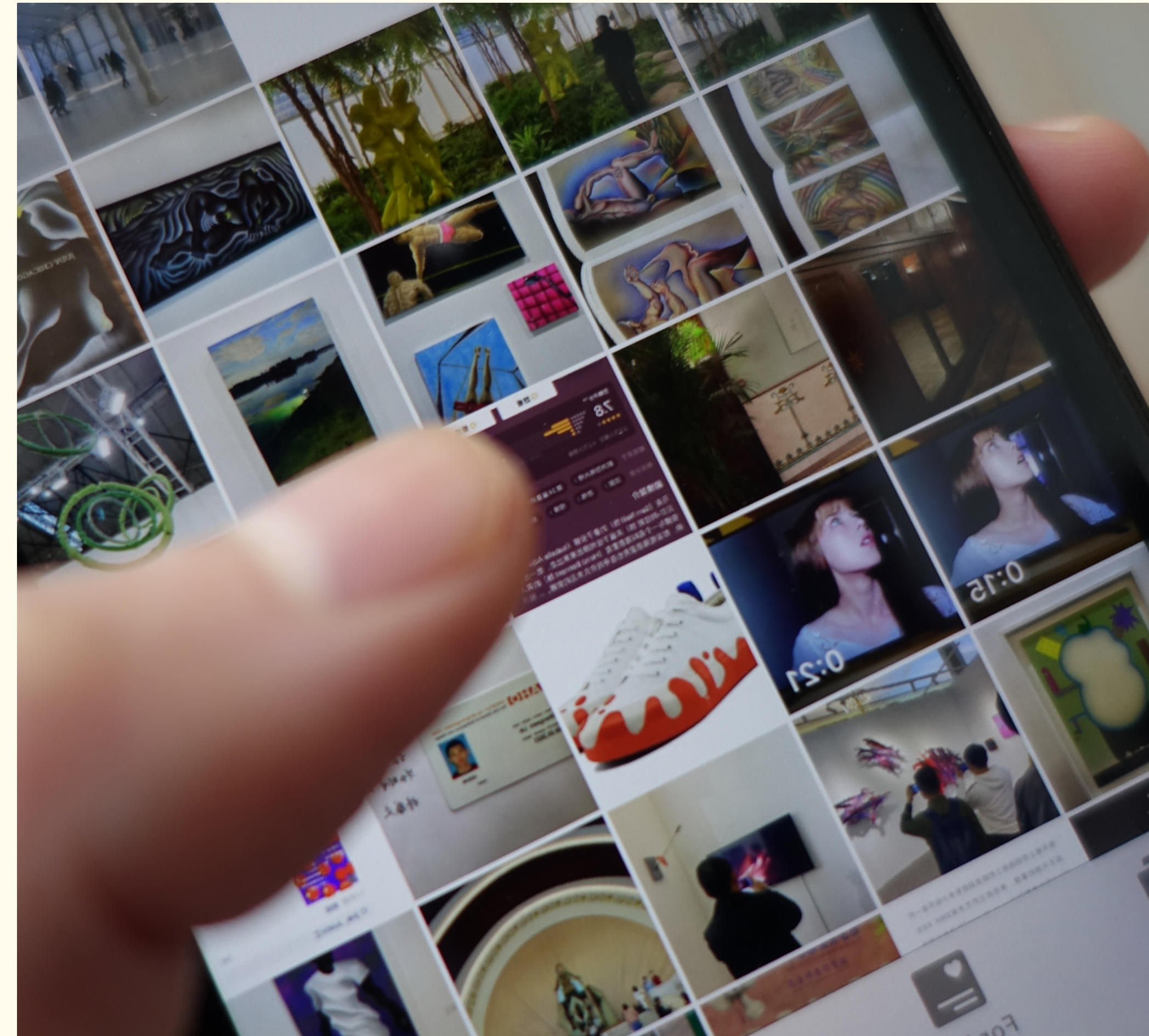
Problem Statement

The findings of this research body suggest that in the age of rapid photo production and consumption, digital photos are slowly becoming less valuable when compared to film photos. People are slowly becoming aware of the psychological effects of photo abundance, including feeling visually saturated, worrying about accidental deletion, and feeling stressed while organizing photos.

How then, might we help people deal with the downside of photo abundance?

User Research

In this chapter, since our previous findings are still general, we used questionnaires and user interviews to learn more about people's behaviors or problems in the process of taking and organizing photos and reviewing them. In the end, we translated these findings into three directions for subsequent exploration.

Scope

Photos that matter

Although a large number of photos on the web also contribute to image abundance, such as the ones on social media, research finds that shared photos somehow involve self-representational concerns (Barasch, Zauberman and Diehl, 2018). An example of this could be only selecting positive aspects of one's experience. However, these carefully curated photos tend to be less 'authentic' or misrepresent the true experience and even cause false memories - be it a photo of a birthday party or just a fallen leaf on the window sill.

Therefore, we were more concerned about the large number of photos on people's smartphones that have been forgotten but still hold some precious memories.

Young people

Although the effects of photo abundance are felt by almost everyone, we decided to focus our research on young people (aged 18-35). On one hand, we wanted to study the behaviors and thoughts of our peers. On the other, young people are more accessible to us, which makes it easier for us to conduct subsequent research.

Methods
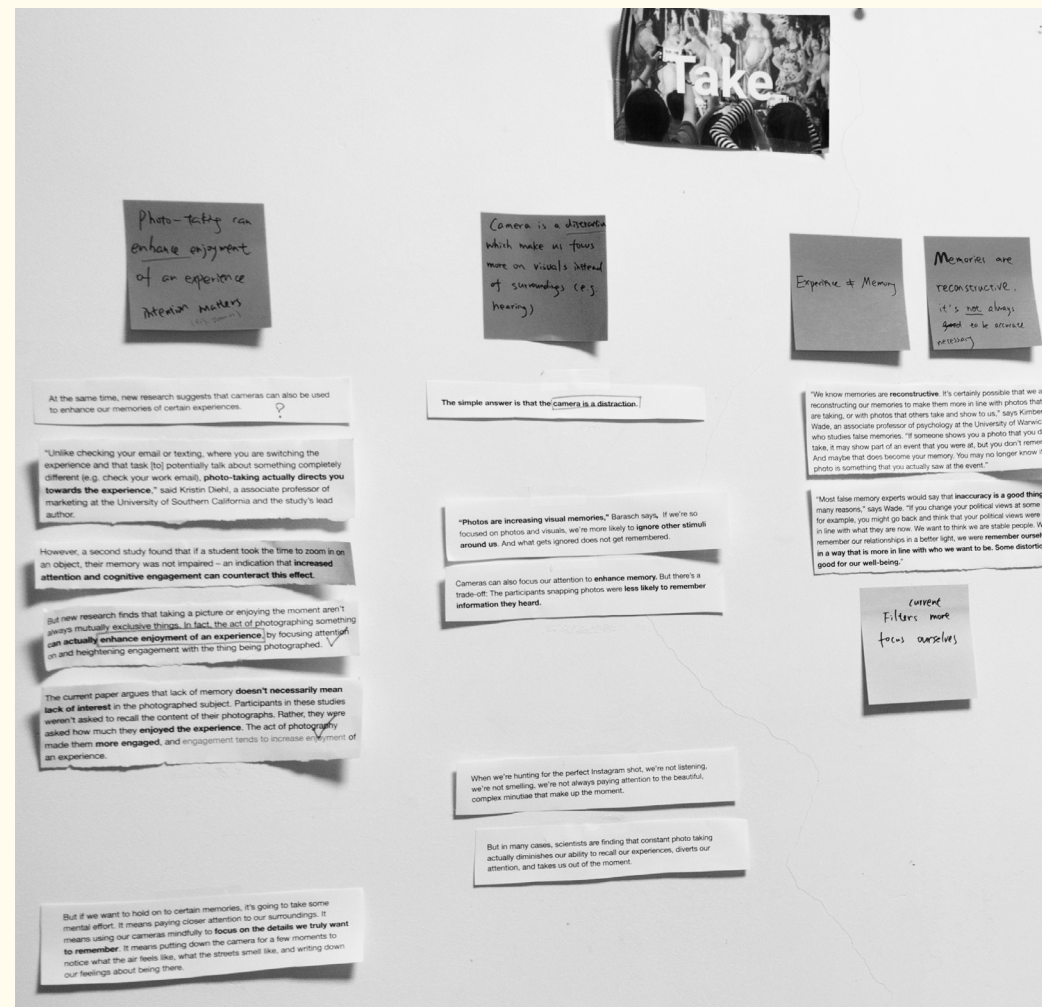
Literature mapping

We did some mappings to better understand the changes of photography in the analog to digital shift and found some initial findings.

Observation

We observe how people take photos in some tourist sites like the West Lake in Hangzhou, China.

Methods

Online survey   150 respodents (aged 18-35)

To better understand people's behaviors of taking, organizing and reviewing photos, we conducted an online survey.

Online interview   13 ppl (aged 18-35)

To deeply understand how people deal with their photo collections, we interviewed 13 people remotely.

Methods

Album analysis 100+ screen shots from 13ppl

In order to have a direct feeling of people's photo collection, beside doing interviews, we also collected over 100 screenshot of their albums to find patterns.
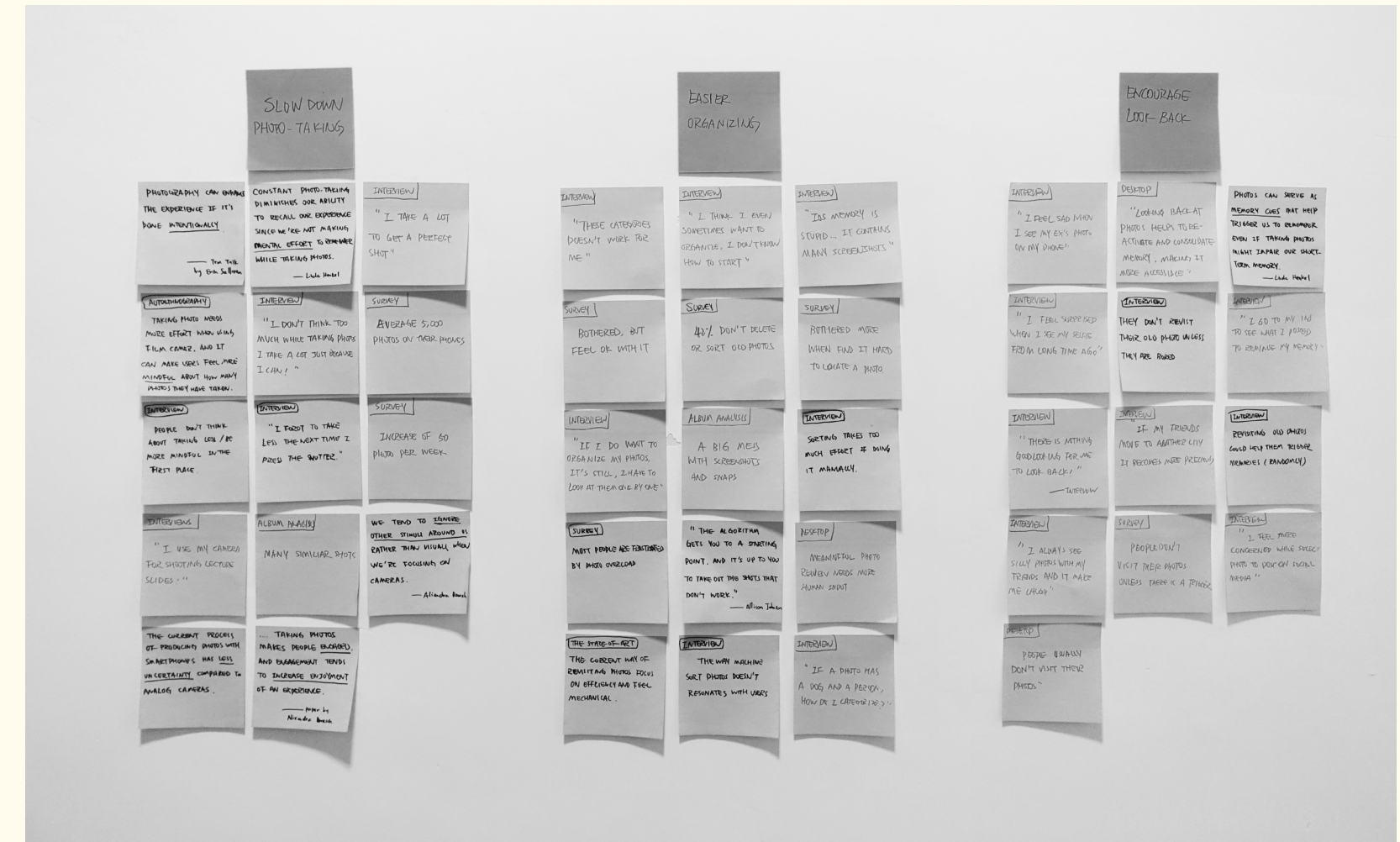
Synthesis

We mapped out all the findings and tried to identify patterns to find design opportunities.

Findings

What you will see are our three findings in the process of taking, organizing and reviewing photos.

Taking   Organizing   Reviewing

↓   ↓   ↓

Finding 1   **Finding 2**   **Finding 3**
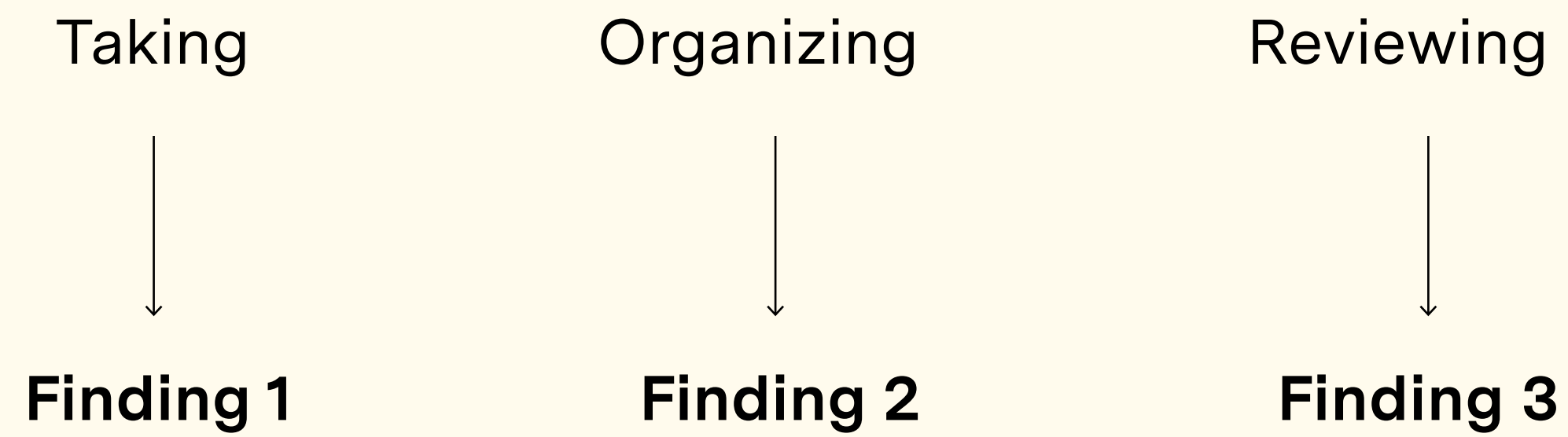
Findings ^{Taking}

Compared to analog cameras, which require manual focus and have a limited number of shots, now anyone can take a photo with a simple press of the shutter button. This easy operation facilitates the quick captures of life moments and accelerates the accumulation of mobile photos. More than half of our questionnaire respondents (52%) have **more than 5,000 photos on their phones**, with an increase of about 50 photos per week. It is worth noting that these photos also contain a large number of **screenshots**.

In addition to a large number of screenshots, we found that almost every interviewee had more or less **similar photos**, such as photos taken from different angles, and photos that were used only for **practical purposes** like shooting lecture slides. But there were so many that were rarely deleted, as long as their phones had enough memory.

"I don't think too much while taking photos. I take a lot (of photos) just because I can."

Interviewee, 25

Findings _{**Organize**}

Our questionnaire results showed that nearly half of the respondents (42%) **do not delete or sort old photos**. Paradoxically, although the majority of respondents (72%) felt that the large number of pictures on their phones caused them problems, such as difficulty in finding important photos, they also **did not think that this is an urgent** problem to be solved. This suggests that people are desensitized to the distress caused by the large number of photos, but a better solution could help alleviate this distress.

In our user interviews, we also found that people now **rely on their phones to help them manage** photos automatically, such as sorting albums by people, places, and things. However, the interviewees also said that this is just easier to find and that if they were to sort their own photos, **they would not do it in such a mechanical way**. At the same time, the smart categories are often **not accurate enough**, such as travel photos mixed with unrelated screenshots, which is one of the complaints from our interviewees.

"Apple suggested me this photo of a fever a few days ago."

Interviewee, 23

Findings <small>Review</small>

One of the main reasons we found that most of our interviewees do not review their old photos is that, as we mentioned, they **find it difficult to find the important ones** in their cluttered mobile albums. Reviewing photos is not a behavior that needs to be done very often, but it is often **triggered by something** internal or external, such as a sudden memory of a trip or a conversation with a friend that needs a photo for additional explanation.

Looking back at some of the old photos can give users **some emotional touch**. Some interviewees (6/13) look back at old photos to gain some comfort when they are feeling down, while those (10/13) who have received old photo suggestions from their smartphones sometimes find new details or meanings in them, which gives them surprises. This is in line with the findings of a study that suggests that **the meanings** contained in photos are highly subjective and **change over time**. (Lee, 2015) For example, a snapshot containing a friend will become more meaningful when the friend moves away. Linda Henkel, a professor of psychology at Fairfield University, also believes that looking back at photos frequently can **strengthen our memory** of the stories they contain. (Henkel, 2014)
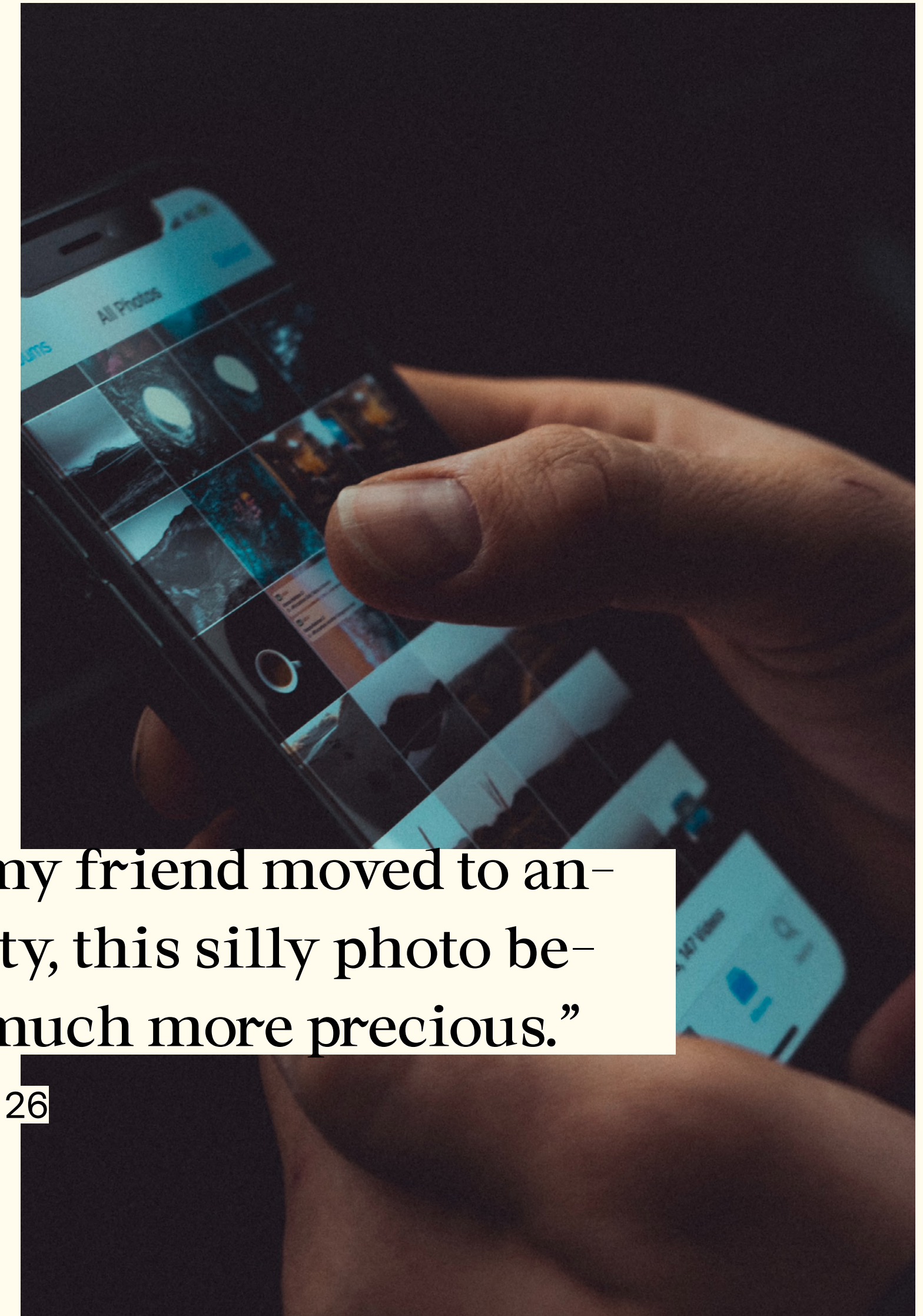
"After my friend moved to another city, this silly photo becomes much more precious."
Interviewee, 26

Photo by Chris Coe on Unsplash

Directions

We identified design opportunities from the findings of our research and came up with 3 design directions.

Slow down photo-taking

Since a lot of photos are taken and never looked back on, how might we slow people down while taking photos, in order to reduce the accumulation of trivial ones, leaving space for those that matter?

Easier organizing

Since most people find it troublesome or unnecessary to classify photos manually, how might we have more human control in organizing photos in an easier way?

Encourage looking back

Since people have difficulty finding important photos and rarely look back at them voluntarily, and since looking back at photos can potentially strengthen their memory and emotional connection, how might we encourage people to look back at their (important) photos?

Exploration

In this chapter, we explore the three directions synthesized from user research. We spent most of our time in the last direction, exploring how to provide users with a better experience of reviewing photos. During the process, we recognized the potential of AI to help users look back on (important) photos as well as people's desire to create and share photos. In the end, we reframed our design brief.

Methods
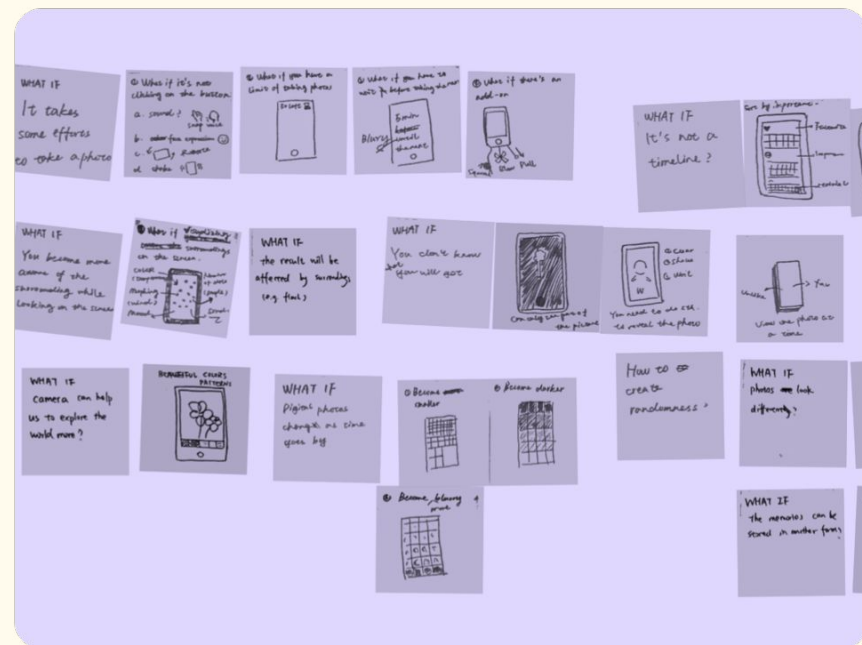
Brainstorming
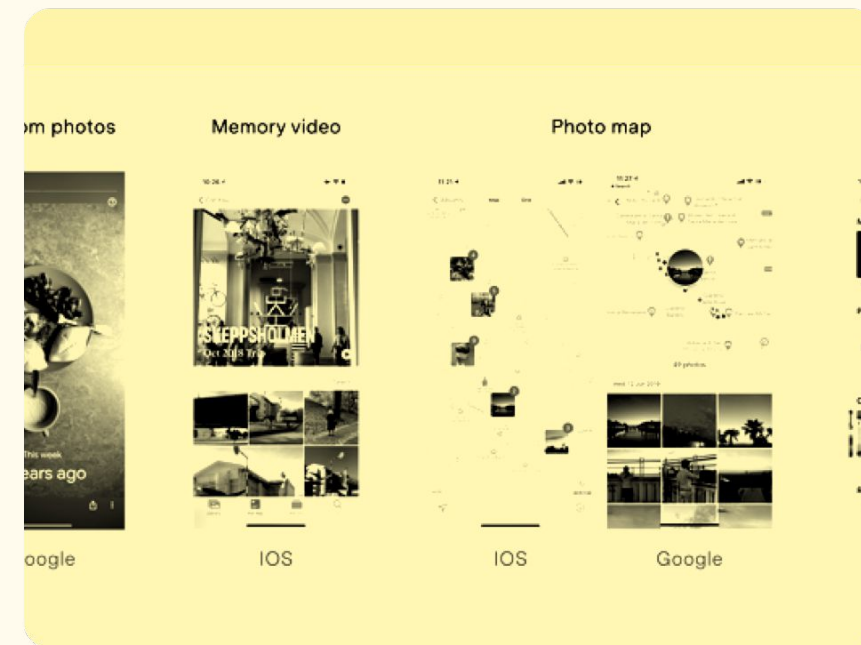
Benchmark researching

Paper skeching
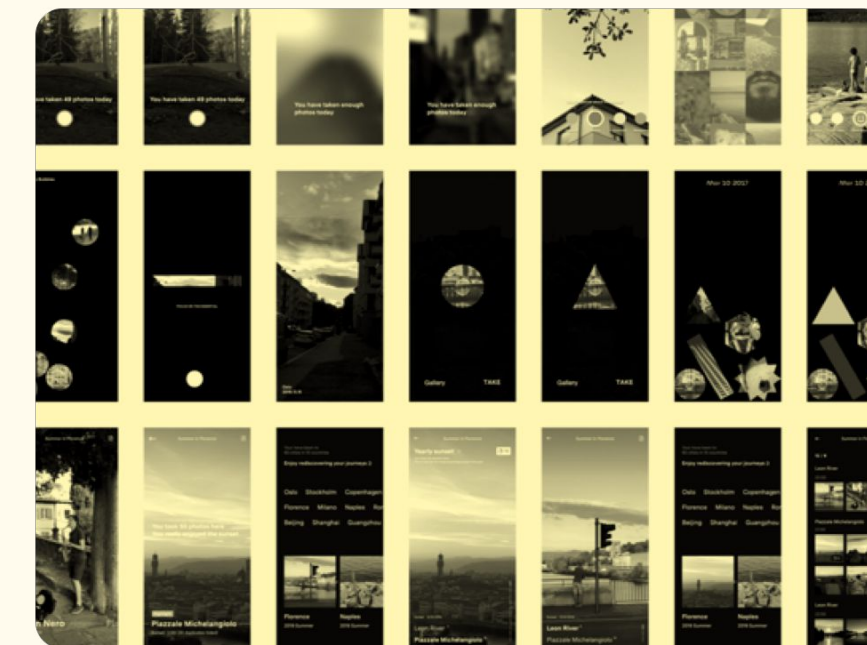
Digital skeching

Co-creation / 6 ppl

Idea mapping
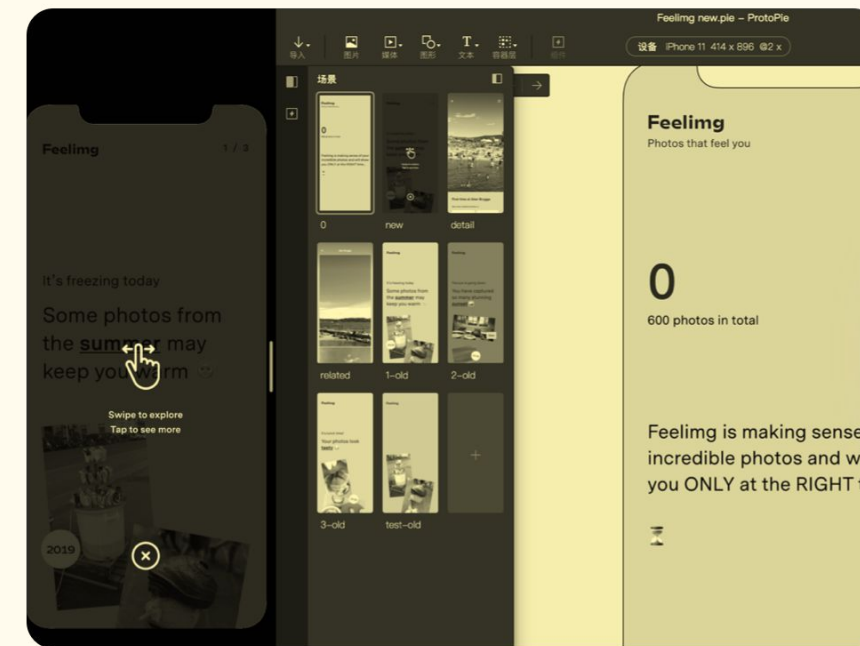
Prototyping
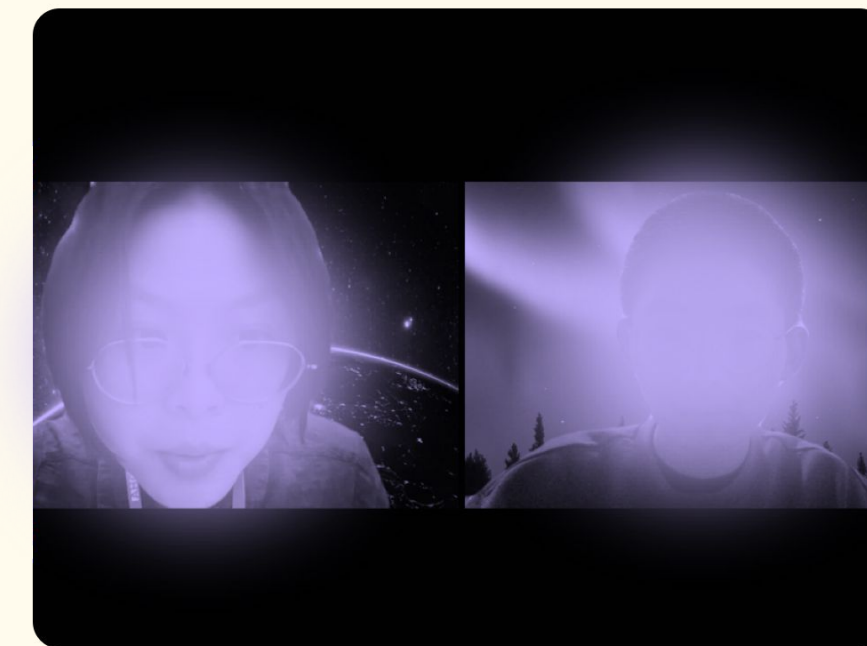
Zoom testing / 12 ppl

Throughout the process, we used a variety of design tools, such as sketches and interactive prototypes. At the same time, we quickly tested ideas with users to verify their feasibility and potential.

We put all potential ideas into an idea pool, constantly looking back and optimizing them, and picking out different ones to build more concrete concepts.

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Overview

What you will see are our three directions of exploration, and we finally explored the last one in depth.

Direction 1

Slow down photo-taking

Direction 2

Easier organizing

Direction 3

Encourage looking back

Direction 1

Slow down photo-taking

Since a lot of photos are taken and never looked back on, how might we slow people down while taking photos, in order to reduce the accumulation of trivial ones, leaving space for those that matter?

Research

Design frictions

After reading some articles related to slow technology and design limitations, we were fascinated by the concept "design frictions". This concept refers to "intentionally added points of difficulty encountered during users' interaction with technology"(Cox, Gould, Cecchinato, Iacovides, & Renfree, 2016).

Indeed, today most applications are designed to have as little friction as possible. People can just press the shutter button to take a photo effortlessly, which we assumed was the main cause for the accumulation of trivial and similar photos. By adding some small frictions in the process of taking photos, we hoped to encourage users to have a second thought before pressing the shutter button.
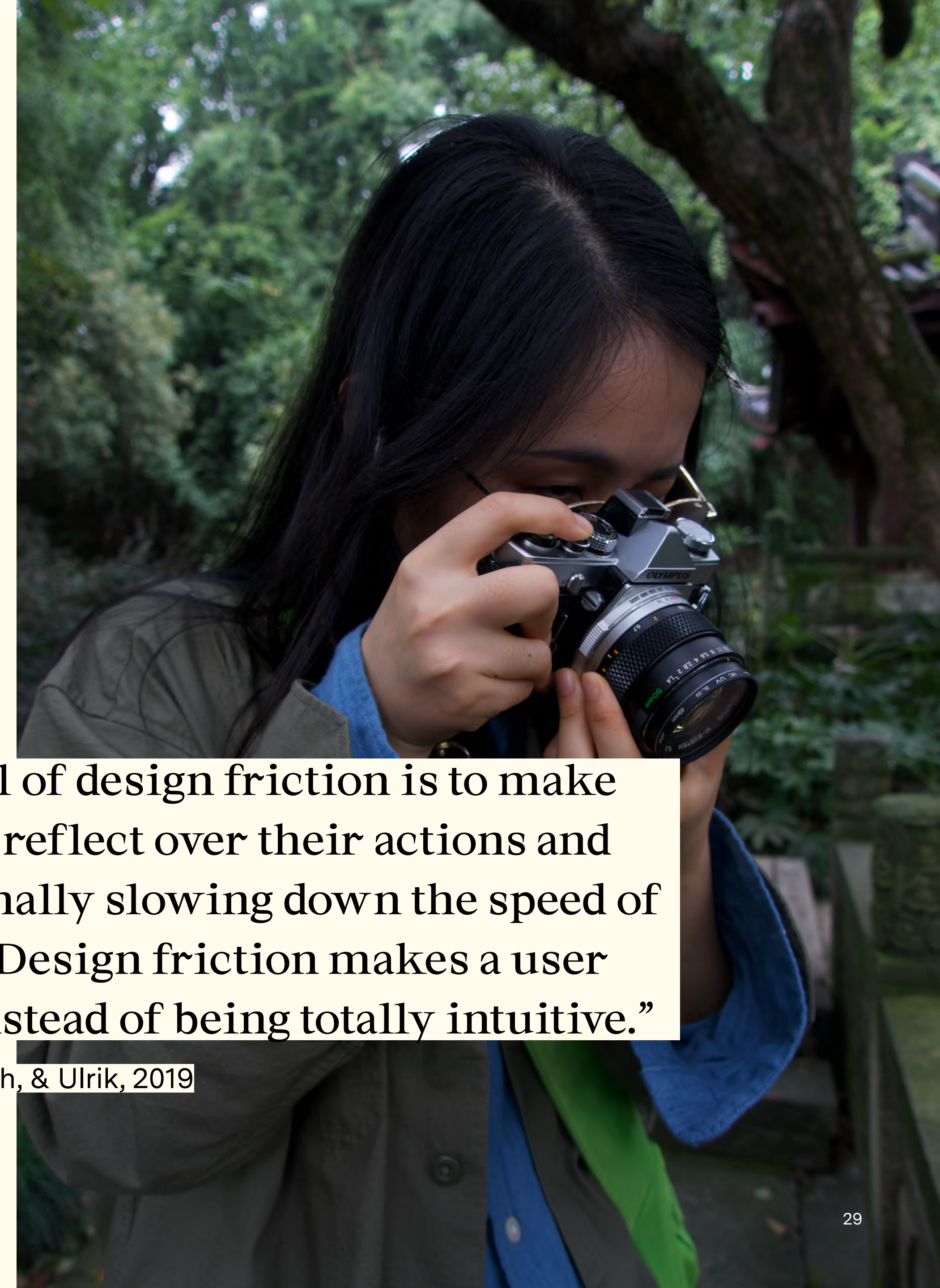
"The goal of design friction is to make the user reflect over their actions and intentionally slowing down the speed of actions. Design friction makes a user work, instead of being totally intuitive."

Thomas, Sarah, & Ulrik, 2019

Research

The State of Art

After researching current concepts related to slowing down pho-to-taking, we found that there are few projects related to the topic, and most of them take a speculative design approach.

Among these projects, we were most interested in a project called Camera Restrica (Schmitt, 2018). It is a speculative design of a new kind of camera. It locates itself via GPS and searches online for photos that have been geotagged nearby. If the camera decides that too many photos have been taken at your location, it retracts the shutter and blocks the viewfinder.

Camera Restricta by Philipp Schmitt
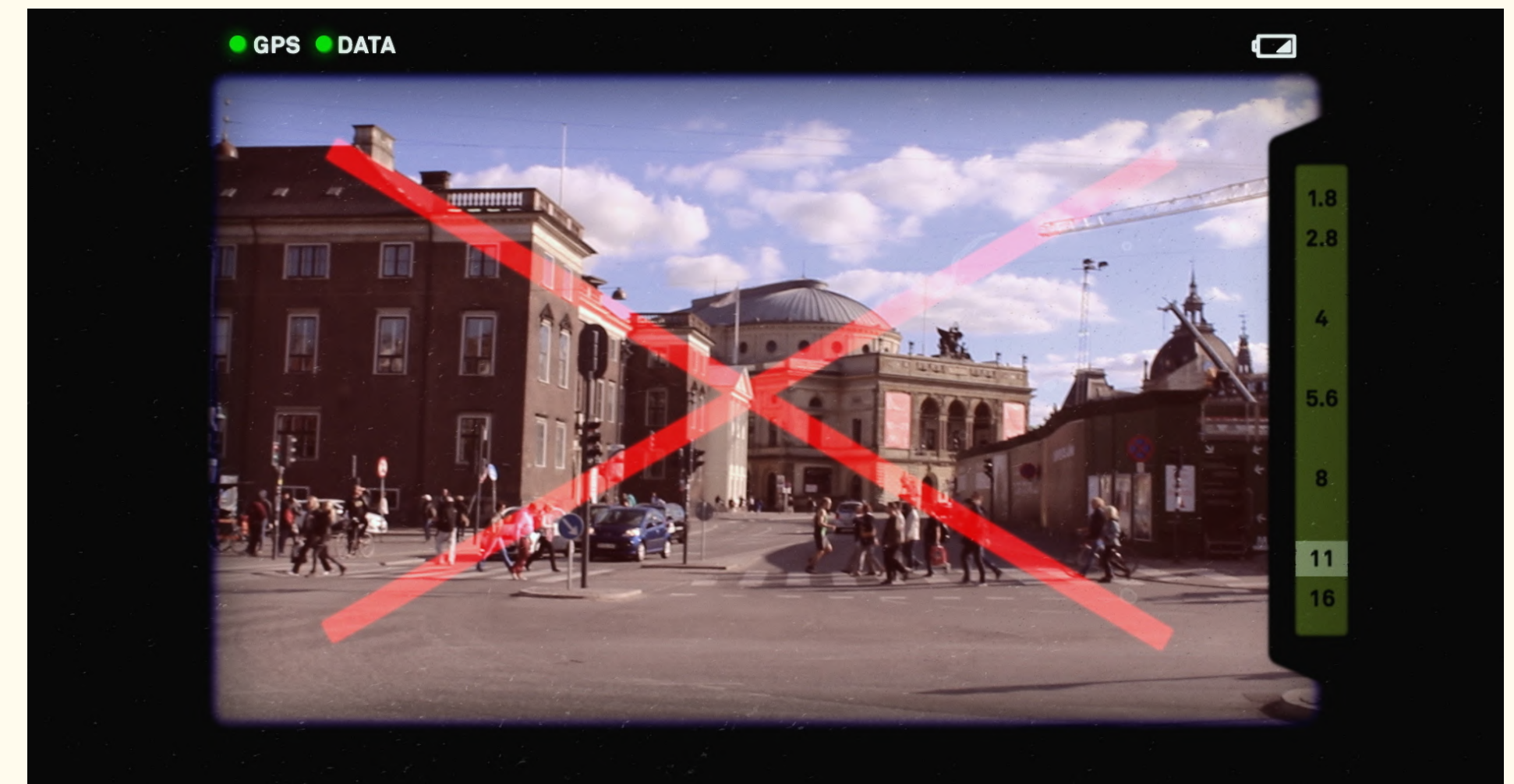
Opportunity

Framemory

A mask that enhances impressive seeing with eyes.
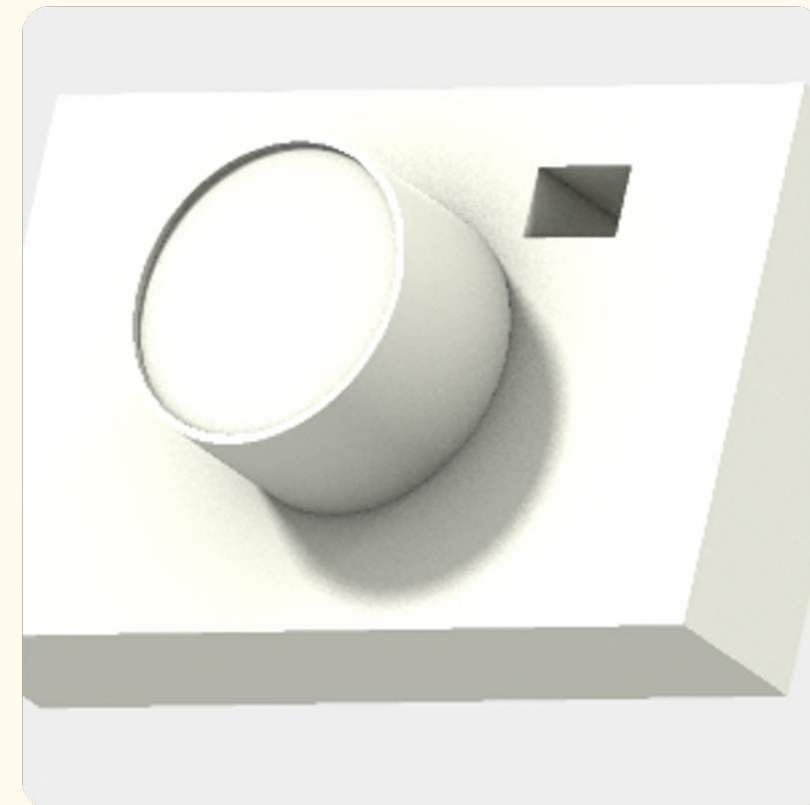
Memory Camera

A simple object that creates a single memory by using one's senses - each Memory Camera can only be used once.

Camera Restrica

A disobedient tool for taking unique photographs.

Photo Memories

A small device to roughly sort photos into categories while taking them.
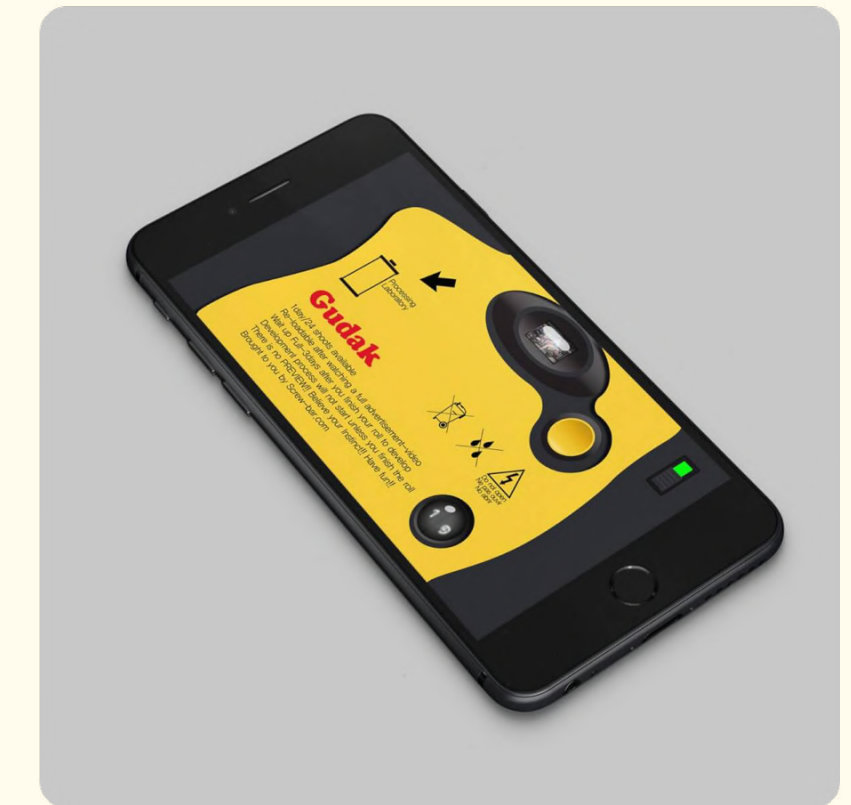
Gudak

An app mimicking disposable camera.

Most current projects we found take on a speculative design approach, and the design results are physical products that are detached from the phone screen, with the aim of provoking people to reflect on the meaning of taking photos.

Instead, we wanted to take a more problem-solving approach and focus on the screen, exploring whether the addition of frictions on the phone camera could effectively help users be more selective when taking photos, thus reducing the accumulation of unnecessary photos.

Left to right: Zhou, J. (2018). Framemory. / Stedman, D. (2019). Memory Camera / Schmitt, P. (2018). Camera Restricta / Vries, L. D. (n.d.). Photo Memories/ Lee, D. (2017). Gudak

Exploration

Show the number

Sleepy camera
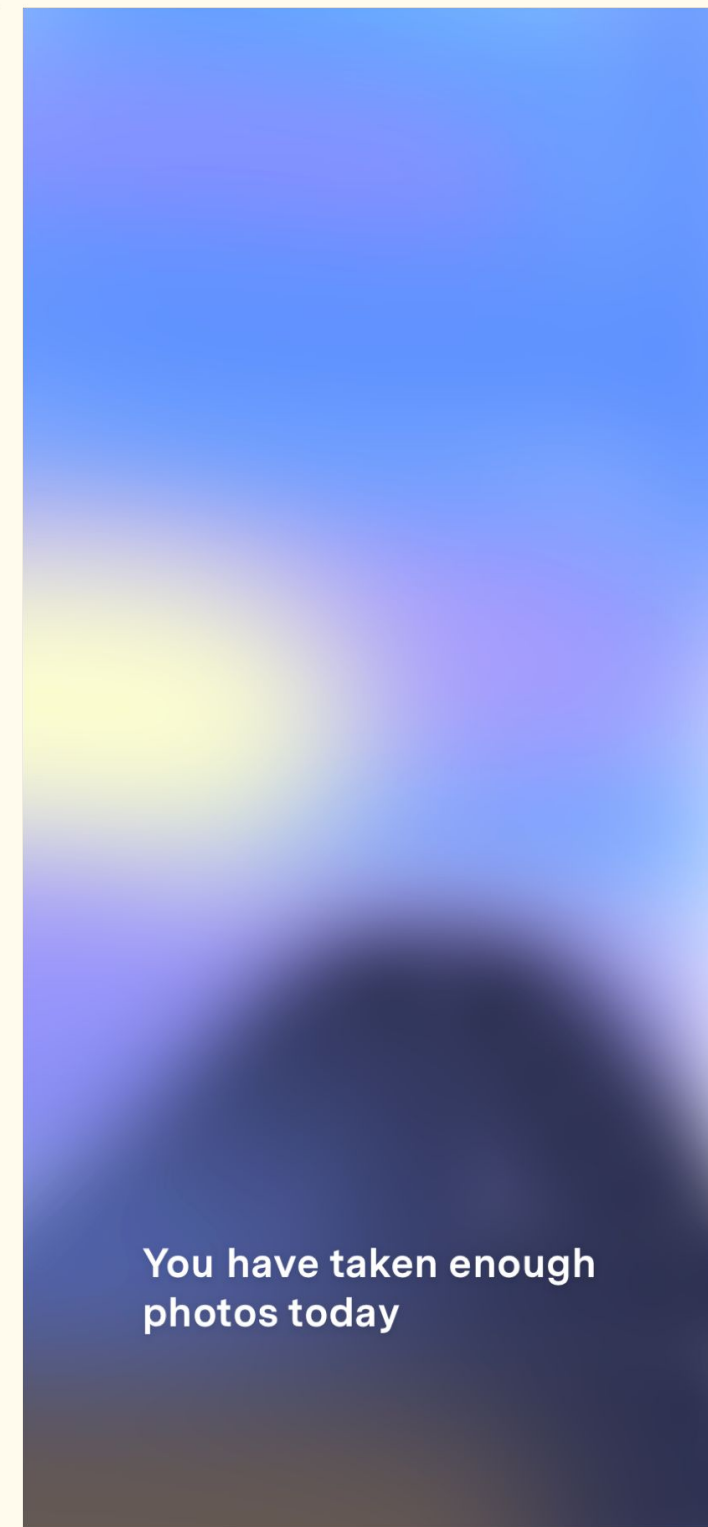
Blur lock
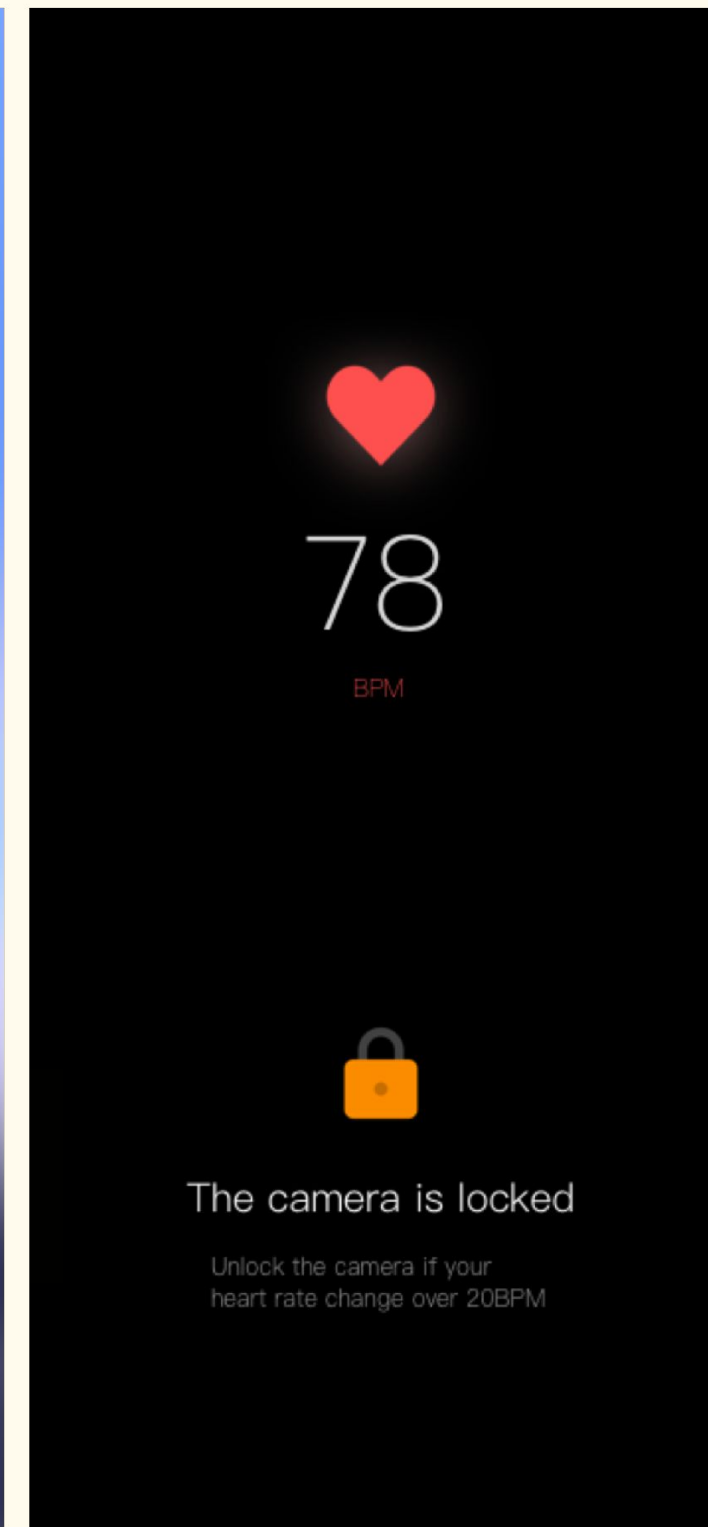
Heart lock

More frictions

Adding frictions

Show the number: This idea only shows the number of photos that the users have taken during a period, like a day, as a reminder for them.

Sleepy camera: By making the restriction more human and playful, and having the camera express 'tiredness', this idea tries to offset users' frustration by preventing them from taking photos in time blocks.

Blur lock: This idea is similar to ' Sleepy Camera', trying to offset users' frustration by making the result of the re-striction more appealing.

Heart lock: This idea is the most forceful, limiting users from accessing the camera unless their heart rates reach a certain level.

Feedback

"I don't see the point of hav-
ing this limitation, I take a lot
(of pictures) because I want
to make the perfect shot."
Tester, 23

You have taken enough
photos today

The camera is tired
Get back in 10 mins

"Yeah It's fun but I won't use
it for the long term."
Tester, 23

After testing these ideas with 6 users, we realized that frictions on the shutter button is disliked by most people (5/6). Users also told us that they took a lot of photos each time because they want to get the perfect shot. Although few of them (2/6) thought the playful aspect of 'Sleepy camera' is fun, they did not want to have them for the long term.

Halfway Reflection

At the beginning of this exploration, we were influenced heavily by the current projects related to slowing down photo-taking, which are mostly in tangible forms. After we borrowed some of the ideas from them directly into the smartphone-like adding limitations, we realized the results felt too moralized. This is mainly because people treat smartphones as obedient

tools, which should allow people to do whatever they want.

Although it may be interesting to speculate our relationships with smartphones and technology in general, we were more interested in solving problems and bringing value to the users.

Thus, we decided to further explore how adding limitations might bring value to users.

Co-creation

Restrictions with immediate benefits

To know what restrictions users would like to have, we conducted a co-creation workshop to gain more fresh ideas. We found that participants liked the idea of being restricted only with the benefit of taking a better picture. For example, one participant thought about rating a scene compared to photos on Instagram to decide if this is worth being captured.

IDEA CARD

Idea title: AI ASSISTANT

Context / Scenario Imagine when or where this concept makes sense
Snap! Snap! Snap! In order to get a good one

User Imagine who might like this idea
Amateurs.

Description Describe your idea in one sentence
AI could help was to take a good photo.

Sketch Draw down your idea!

IDEA CARD

Idea title: SCORING MOMENT

Context / Scenario Imagine when or where this concept makes sense
Take many photos.

User Imagine who might like this idea
People who want to improve their photography skill.

Description Describe your idea in one sentence
Score photo while taking photos to slow down

Sketch Draw down your idea!

Reflection

Through testing with users, we acquired a valuable lesson when it comes to designing frictions: moralized frictions are not welcomed by most people, and frictions should come with immediate benefits and at good timing.as obedient tools, which should allow people to do whatever they want.

Although assisting people in choosing a better angle and composition could avoid taking too many similar photos in some way, it was not our main aim to help people take a better picture.

Therefore, we decided to keep these ideas in the archive for further reference but not go any further in this direction.

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Direction 2

Easier organizing

Since most people find it troublesome or unnecessary to classify photos manually, how might we have more human control in organizing photos in an easier way?

Research

Market research

After researching some of the popular photo organizing apps on the market, we found that there are two main categories: one is sorting photos into albums by Artificial Intelligence (AI), and the other provides a more interactive and easy way to manually sort photos.

As we found in our previous research, organizing photos by AI saves time and effort, but it is not accurate enough; although photo organizing software provides an easier way to sort photos than the default album, users still have little motivation to organize them manually.

Whether it is AI or manual sorting, existing products classify the pictures after they have been taken. Therefore, we wanted to take the process of organizing upfront.

Google Photo   Yile Photo   Hashphotos   Slidebox

Tencent album   Apple Photos   Mypics   Scene

Exploration

"I sort photos into different albums regularly so this will be very convenient for me."
Tester, 23
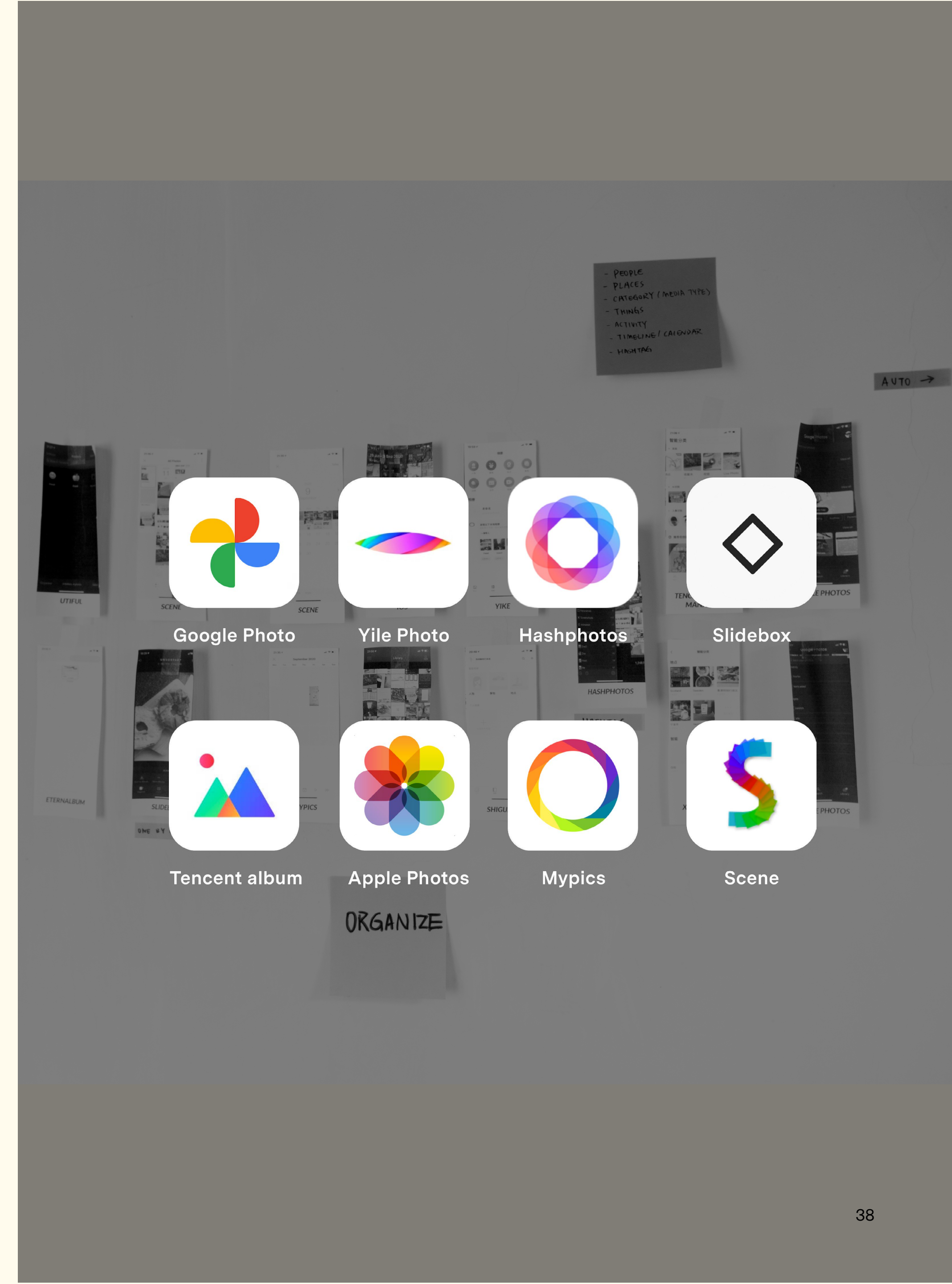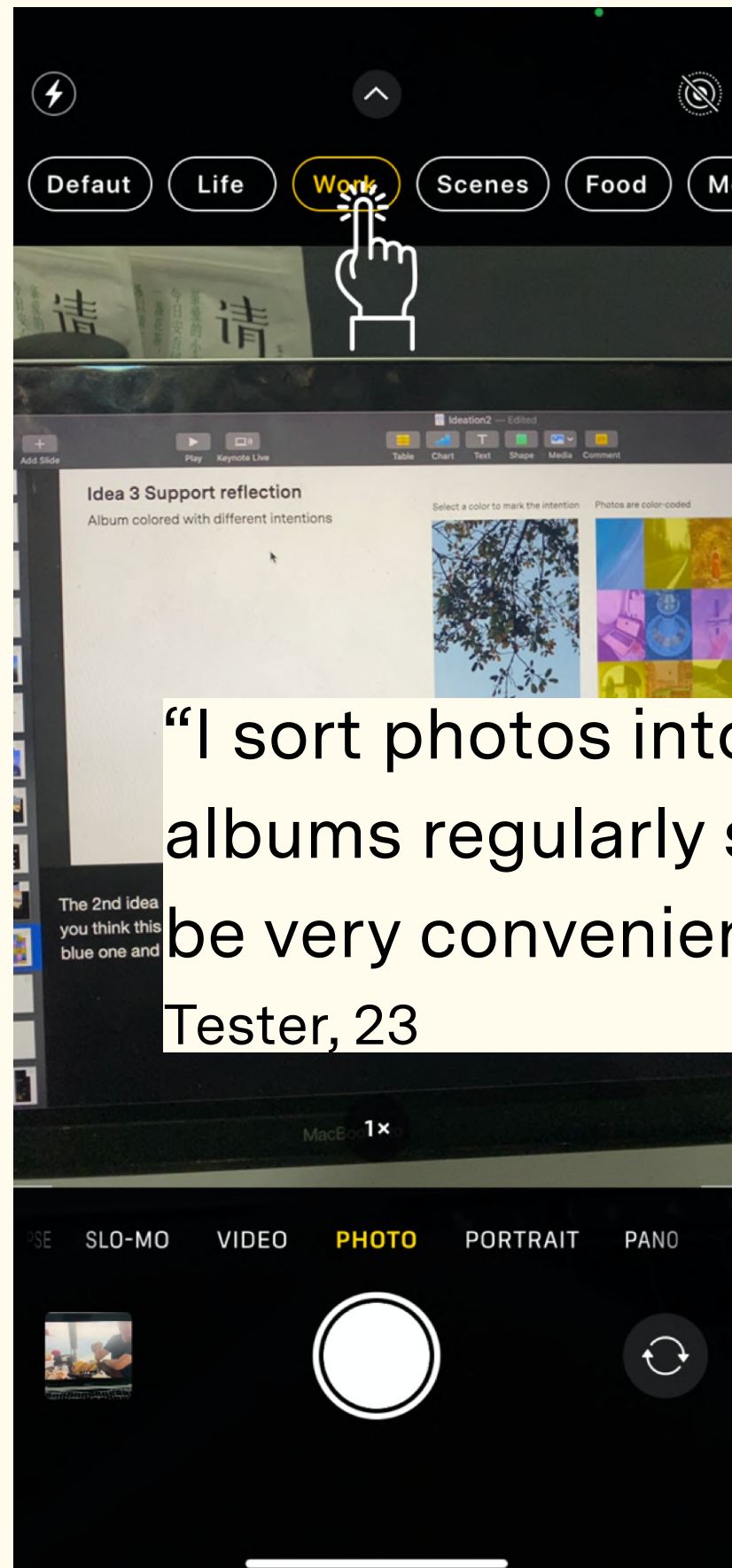
By album
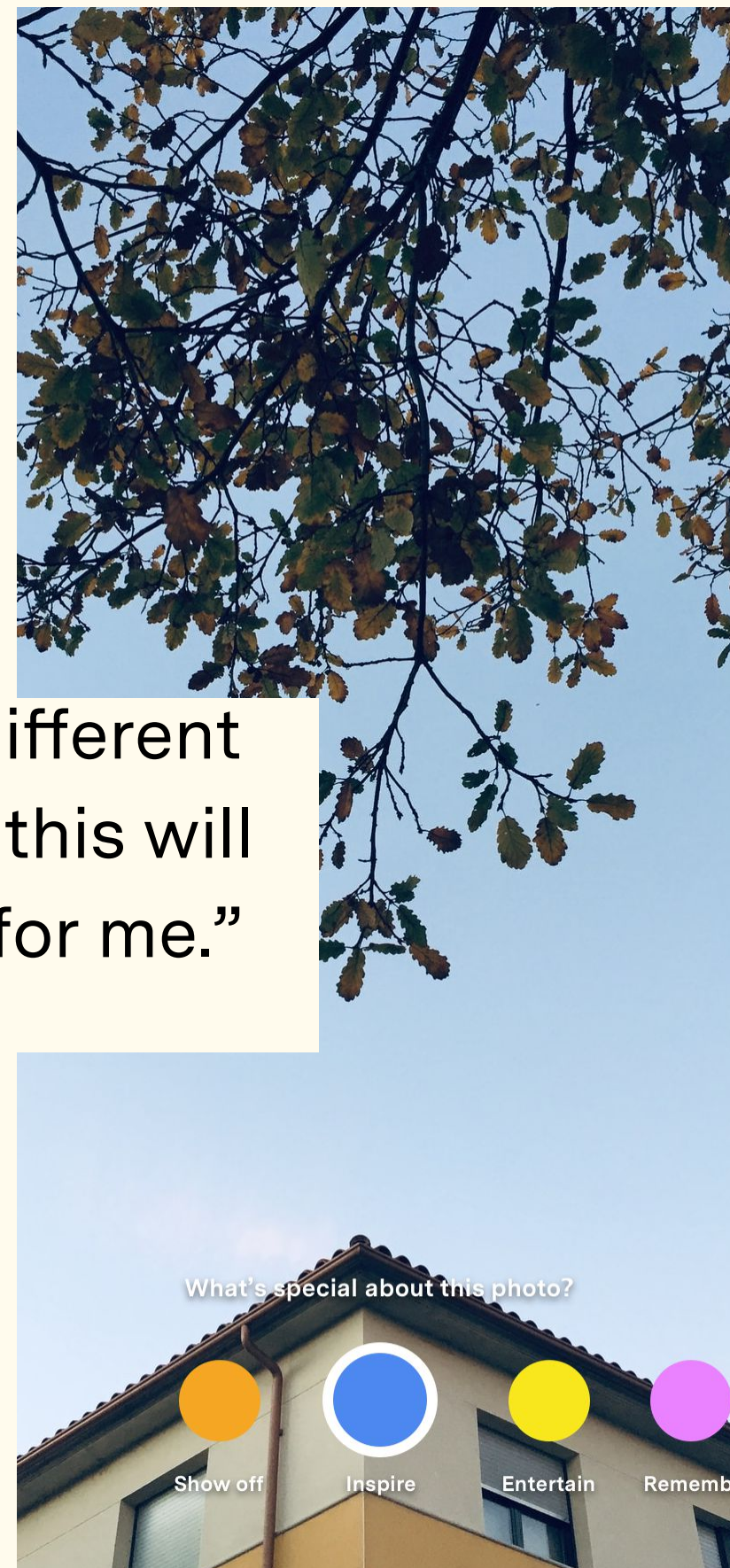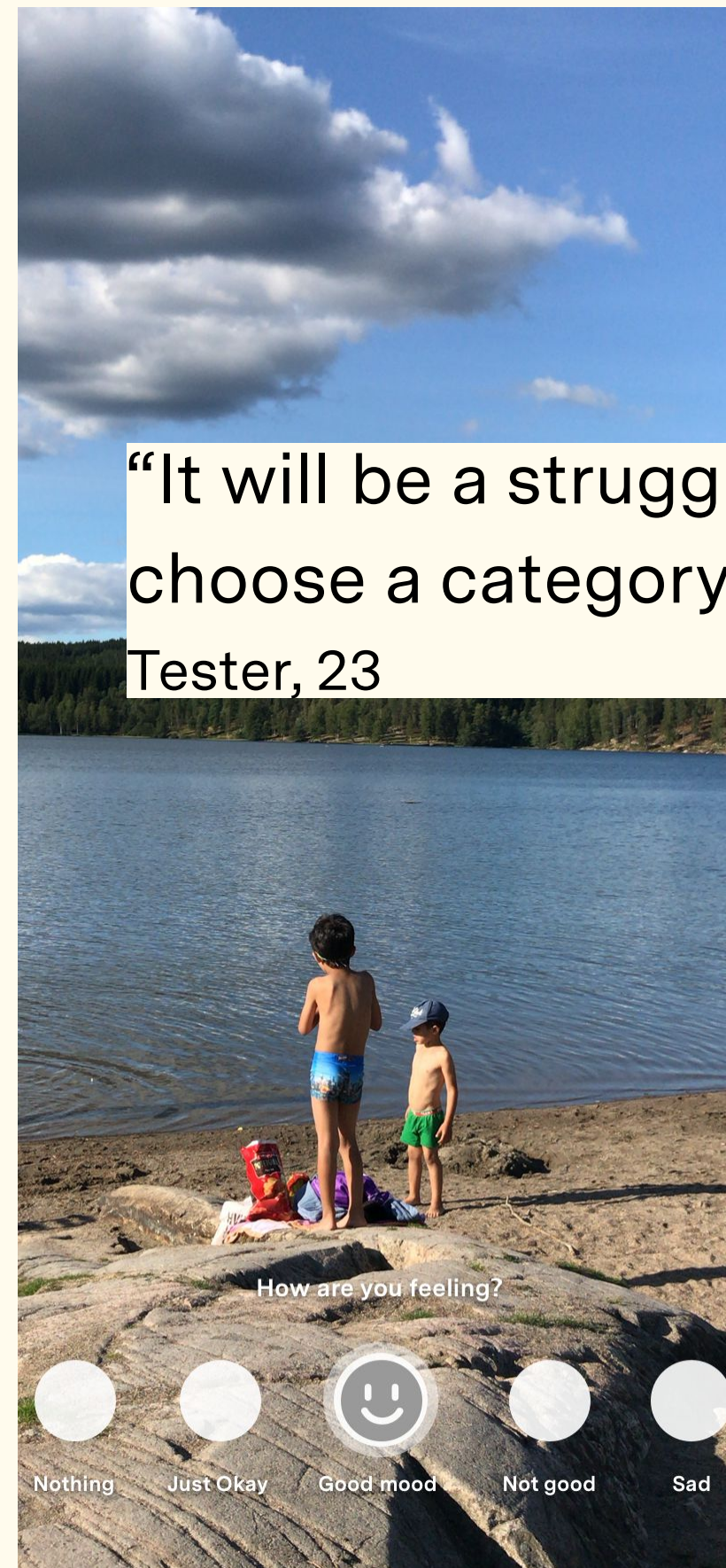
"It will be a struggle for me to choose a category."
Tester, 23

By intention

By mood

Real-time classification

By sorting photos in real time as they are taken, the user does not have to sort through a large number of photos later, and at the same time, it is more accurate and more in line with the user's review habits than the current AI classification. We designed several small features added to the camera to explore the possibility of real-time classification in different dimensions (album/ mood/ intention).

After testing these explorations with 6 users, we got some feedback. While some users (2/6) felt this tool would be very convenient for them to use, most (4/6) found it hard to choose a category.

Co-creation

AI suggestions & building habits

From the co-creation workshop, we got some ideas of better organizing photos through AI, for example, AI suggesting which photo to delete. Some participants also thought it would be helpful to remind users to organize photos regularly so that they would not have too many photos to deal with at once.

While these ideas were close to the functionality of commercially available apps, they demonstrated once again that users wanted the machine to help them organize their cluttered photo albums.

Reflection

During user testing, we found that even users with the habit of organizing photo albums regularly still feel overwhelmed by the large number of photos. This suggested that the problem of photo abundance cannot be solved by making the albums tidier.

In this era of information overload, not only photos, but also other kinds of information can no longer be handled manually by people alone, so we need the power of AI to help us process and manage information. In addition, there are already many apps on the market that organize photo albums by using AI, so we did not think we should go in this direction.

We recognized the potential of AI to assist humans in managing information, and this gain would be applied in the next direction.

Direction 3

Encourage looking back

Since people have difficulty finding important photos and rarely look back at them voluntarily, and since looking back at photos not only strengthens their memory and emotional connection, how might we encourage people to look back at their (important) photos?

Research

Google Photo - Memories
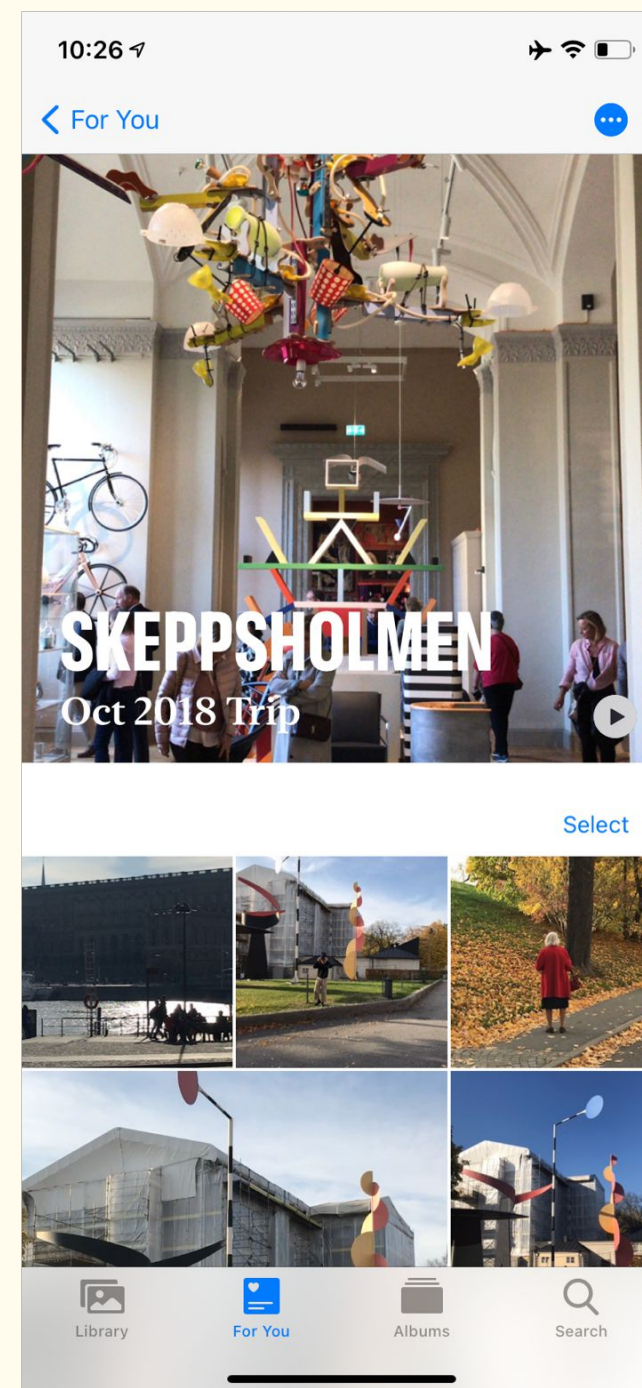
Apple Photo - Memories
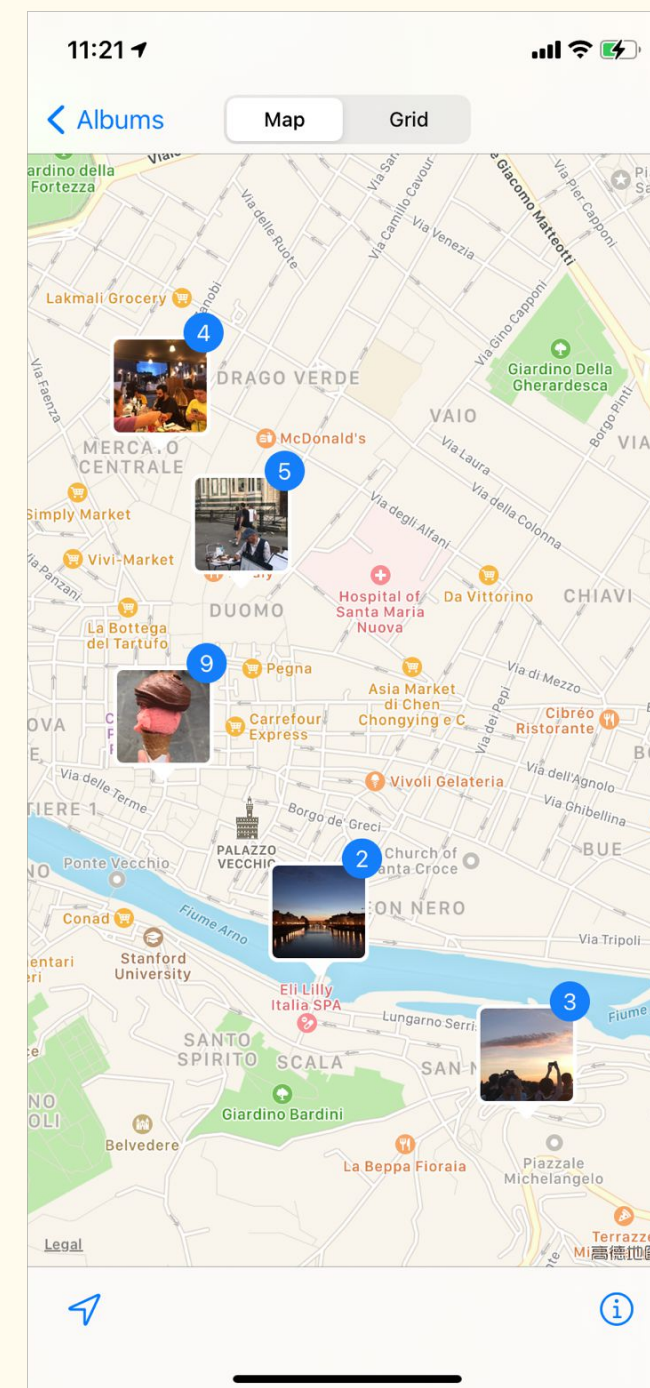
Apple Photo - Map view
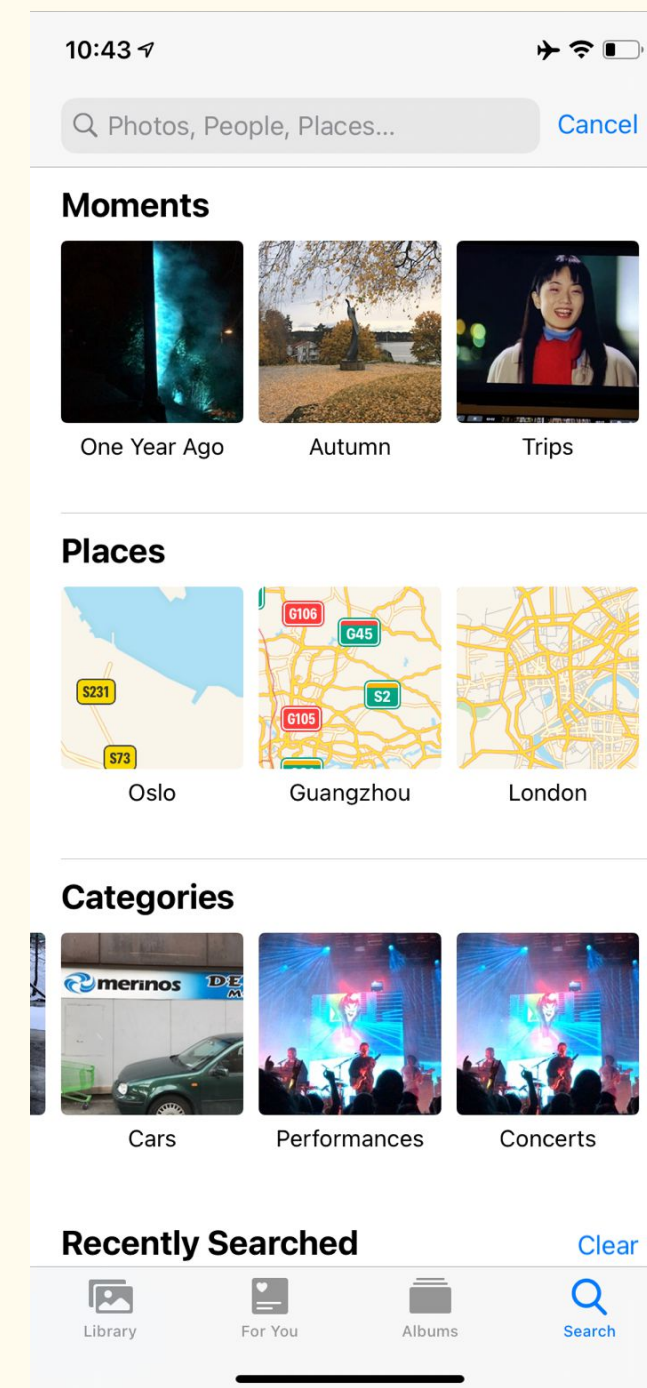
Apple Photo - Search

Google Photo - Search

Random browsing

Specific searching
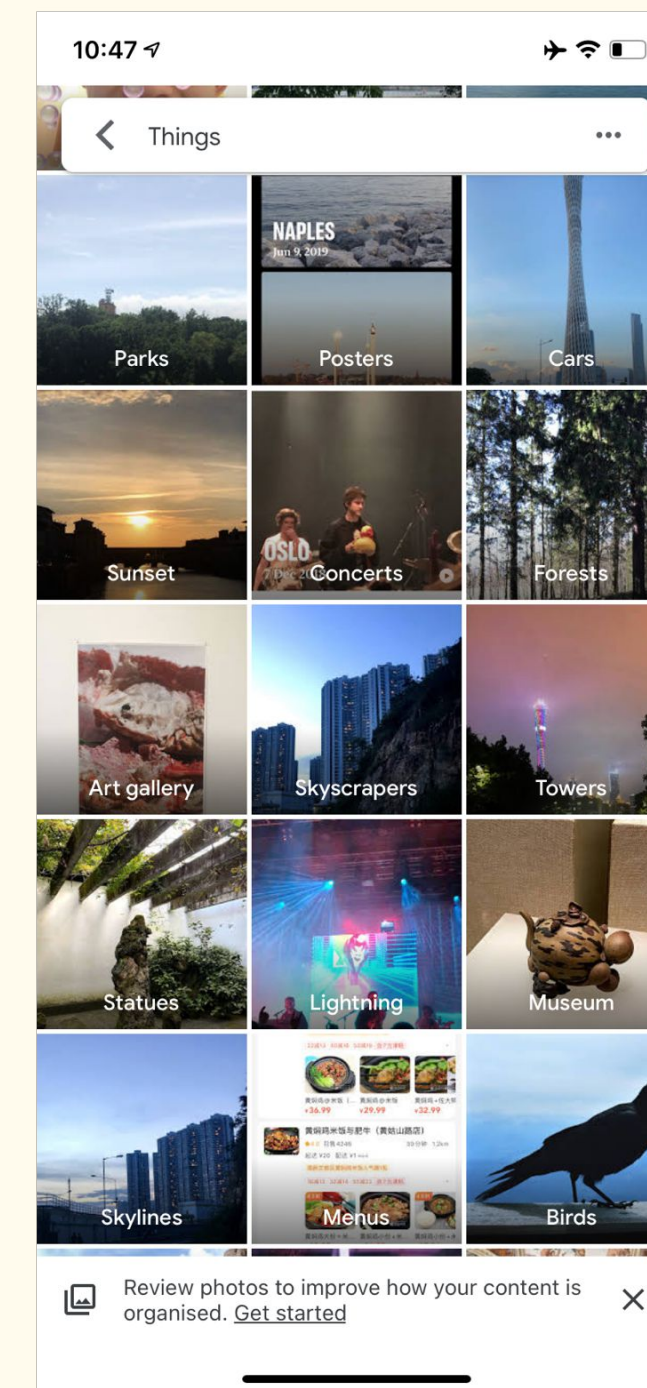
The state of the art

By mapping the state the art, we found that big tech companies like Apple and Google have already supported users with different features in reviewing a large number of photos.

These features range from showing a photo from the past randomly, generating a short video automatically from related photos, showing photos in a map view, categorizing photos by objects, and searching a photo precisely.

These functions are based on the raw data of the photo, such as the time and place where it was taken. In addition, some features make use of more advanced algorithmic techniques, such as image recognition to extract keywords from objects in a photo.

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Research

Apple Memories

Among these features, we are most interested in Apple Memories, where the machine selects important photos and presents them to the user. During the user research, some people thought that the machine sometimes picked out irrelevant photos like screenshots, but in general, people thought it was a good way to help them reminisce. There was also a sense of surprise when they saw photos they hadn't seen in a while.

Hence, we went further to investigate the mechanism behind Apple Memories.

Research

Single dimension

Multiple dimensions

By places

BATTERSEA PARK
Jun 14, 2020

BEIJING
Oct 23, 2017

伦敦
2019 年 6 月 25 日

By things

BON APPÉTIT
Over the Years

FOUR-LEGGED
FRIENDS
Over the Years

By people

DOUDOU
2018 – 2019

RICH CHIGGA
2017

By date

OCTOBER 23
2020

9 月 30 日
2019 年

过去的今天
2018 年 6 月 23 日

往年今日
2018 年 6 月 7 日

BEST OF LAST
3 WEEKS
2019

By season

SUMMER
2020

By festival

中秋节
2020 年

By year

年度回顾
2019 年

By activity

登山徒步
2020 年 8 月 23 日

拥抱大自然
2019 年

By food + places

LUNCH IN
LONDON
Jul 1, 2019

TASTE OF
LONDON
2019

DINNERS IN
LONDON
Over the Years

伦敦午餐
2019 年 4 月 16 日

GOOD EATS IN
OSLO
2019

By activity + places

TRIPS TO
BEIJING
Over the Years

BEACH DAY
KLAMPENBORG & HUMLEBÆK
Mar 17, 2019

AT THE SHOW
OSLO
Dec 7, 2018

AT THE SHOW
GÖTEBORG
25 Nov 2018

The mechanism behind

By collecting phone screenshots from six users, we found that Apple Memories has a wide variety of suggestions. The push mechanism is based on two approaches: one is to suggest related photos based on a single dimension, such as photos taken from the same place and photos containing the same object (eg. Summer) the other is to organize related photos based on two dimensions, such as things and places (eg. Lunch in London). It is worth mentioning that some albums have fun captions that users will find amusing when they see them (eg. Four-legend Friends).

To sum up, the core of this mechanism is to link related photos that the machine thinks important for users to help users recall those precious moments.

Screenshots collected from 10 persons

45

Opportunity

We saw the possibility of using AI technology to help people recall important moments and forgotten details.

So based on the same technology, we wanted to explored how to review photos in new ways.

Photo by Owen Beard from Unsplash
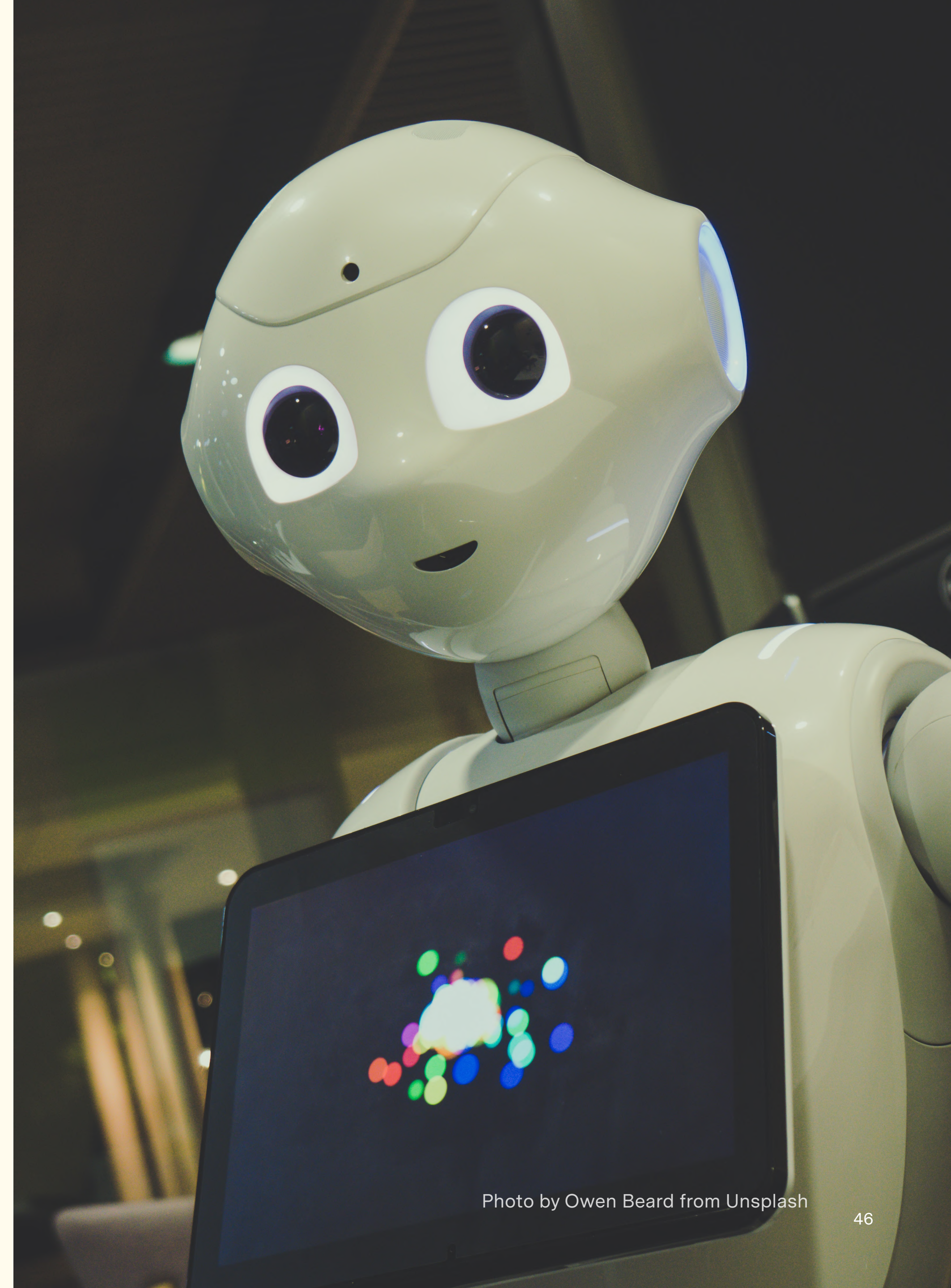
Exploration

Suggested by AI

Controlled by human

More control

Less user input

More user input

Less control

Good Bites in Oslo 🍽
Walk Along the River
Autumn Inspiration

Random suggestion

What you like to recall about Oslo

Summer	Autumn	Winter
AHO	Aker Brygge	Bjolsen
Food	Tree	Dog	Friends

Oslo   Summer

Seleted keywords

Memory.

It was a freezing winter, I was walking in Sognsvann

Type words

Feelimg

It's freezing today

Some photos from the **summer** may keep you warm ☺

2019

Contextual suggestion

2018/12/7
Oslo

It was just a few days before **Christmas** and it was really cold. I went to see **MGMT** live with **Mellisa** and I got home quite late that day.

Generating stories

Based on similar principles as Apple Memories, we explored different ways of reviewing photos. These ideas include searching by keywords and receiving suggestions from AI. We created a coordinate axis to map the ideas in two dimensions; the degree of user input and the degree of user control over the results.

In order to give users a clear idea of what we were thinking, we created several interactive prototypes and tested them remotely with seven users.

Idea overview

For a better experience with the prototypes, please download the app **Protopie Player**.
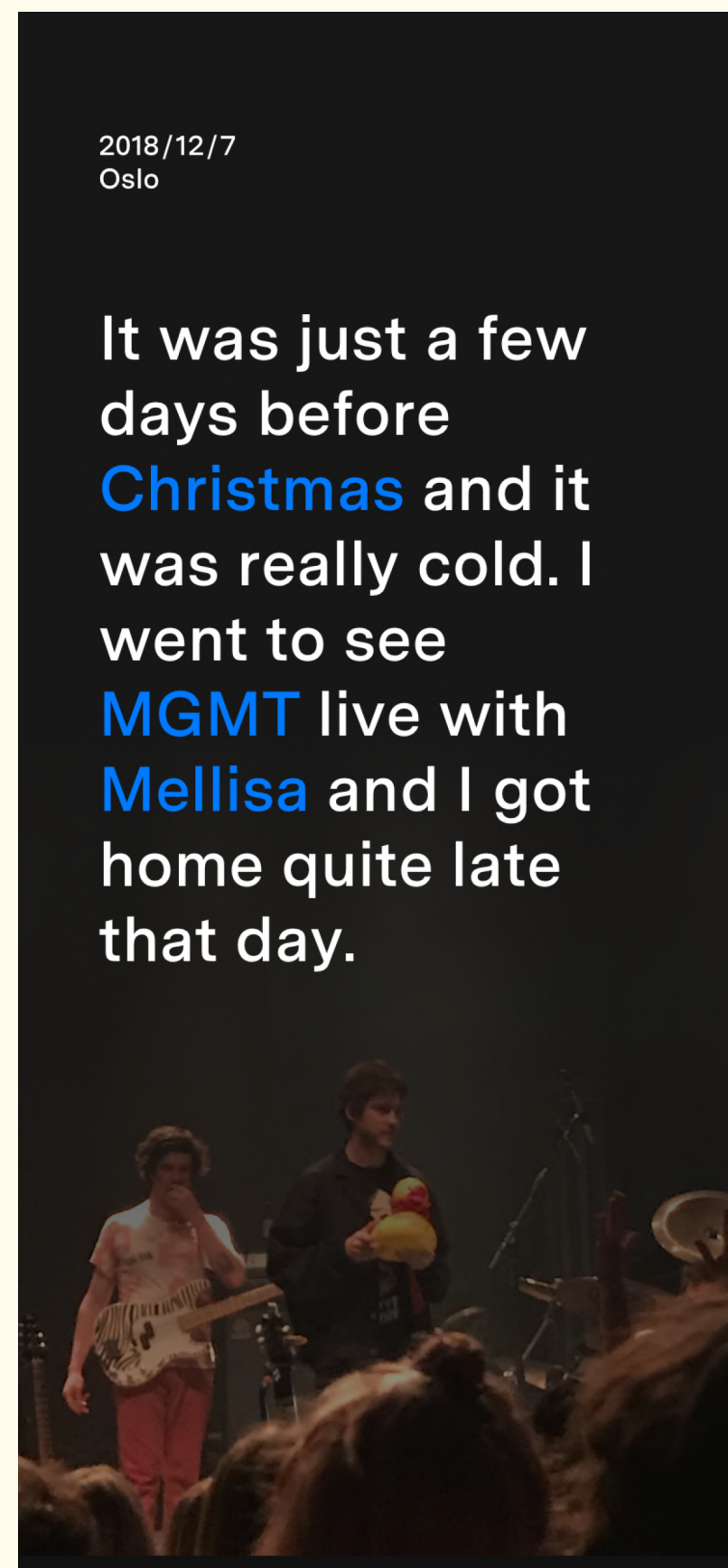
The AI extracts keywords from the photos and organizes them into a short story.
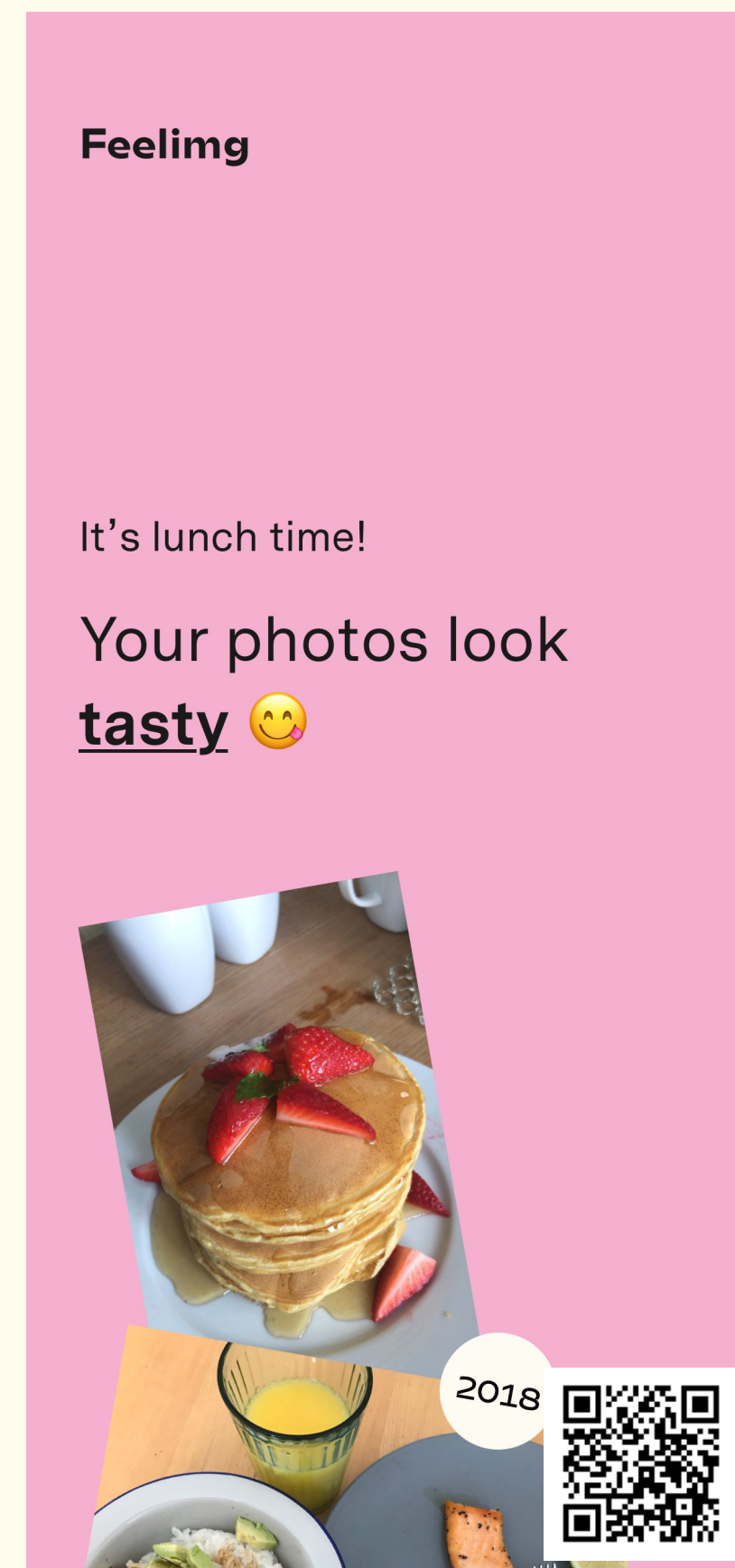
The AI recommends relevant photos to users based on the scenario they are in.
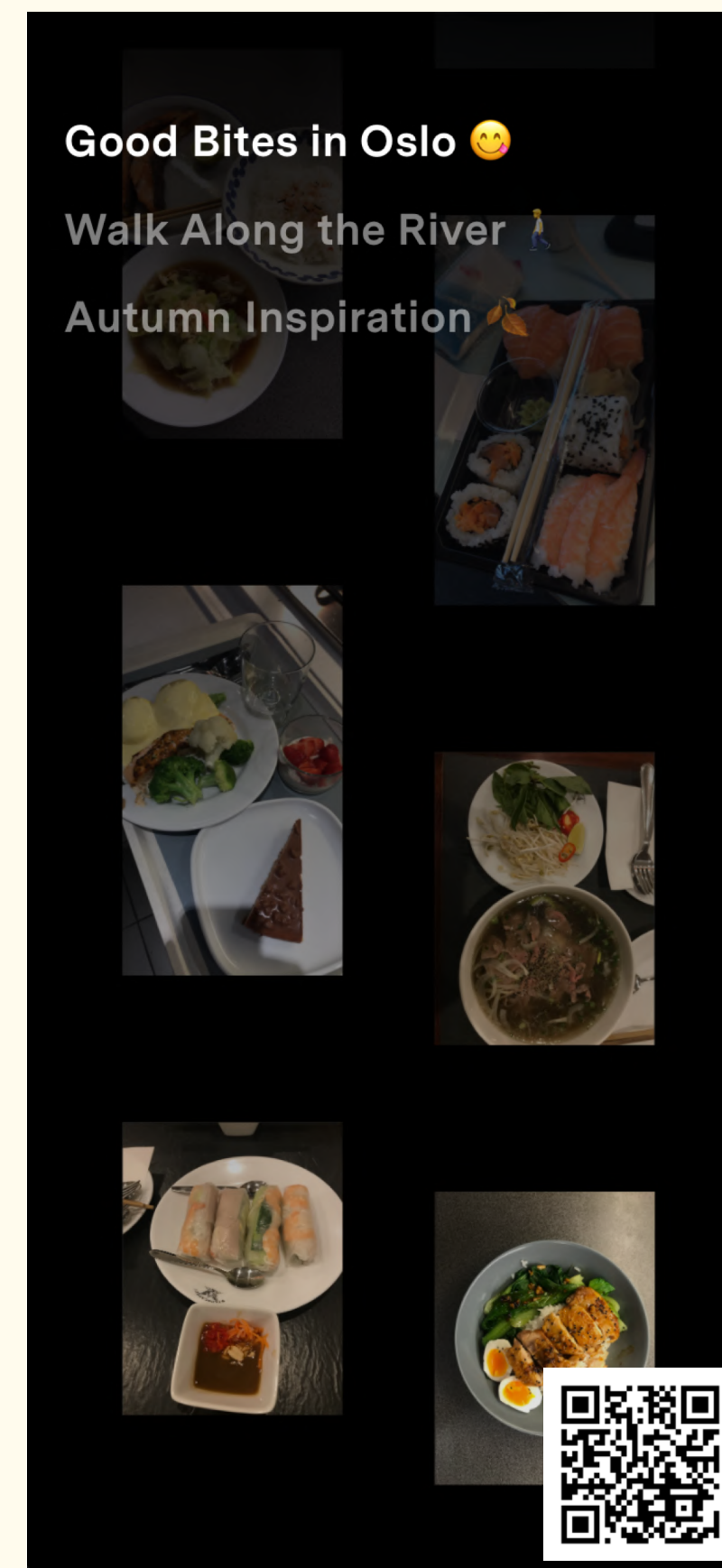
The keywords of photos are organized through interesting phrases.
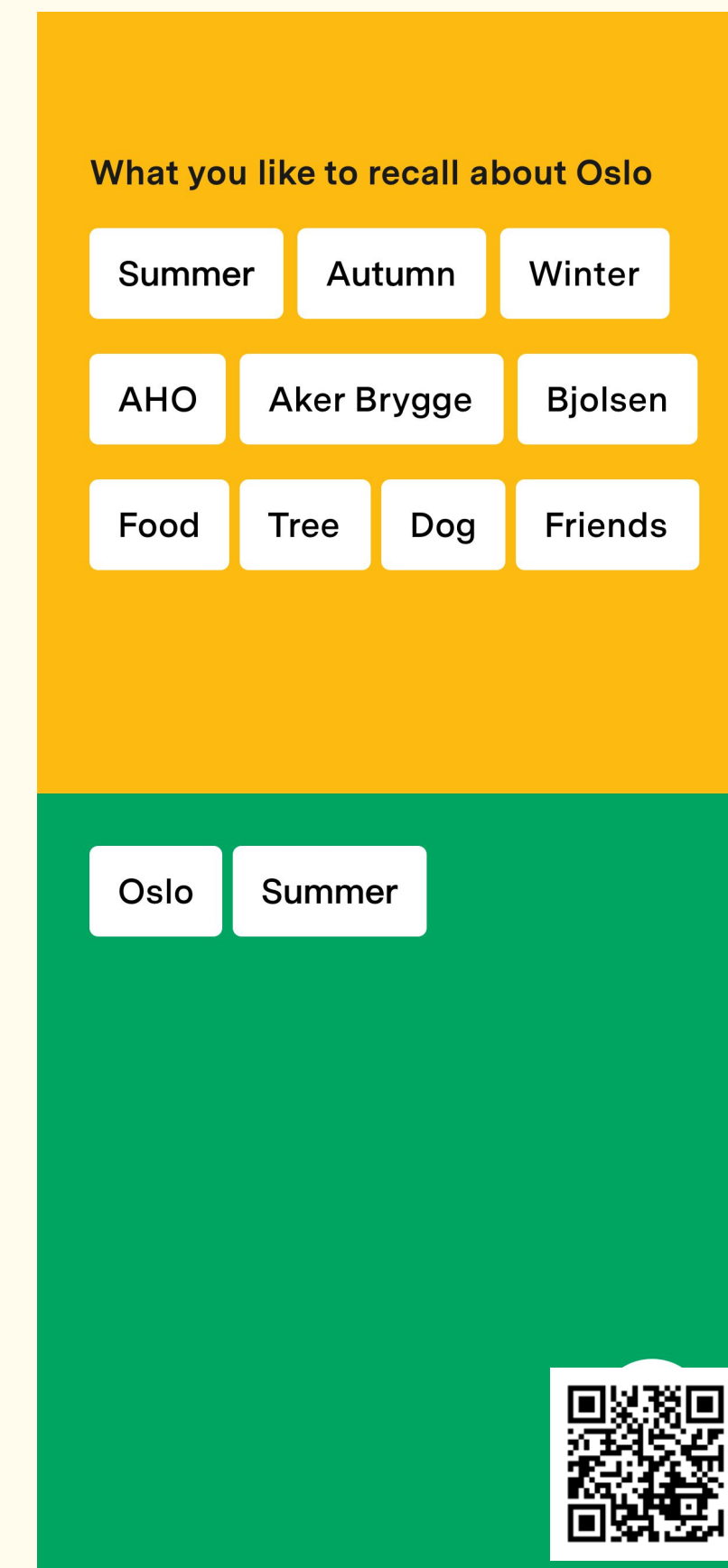
After users click the buttons to select keywords, they can get some recommendations by the AI.
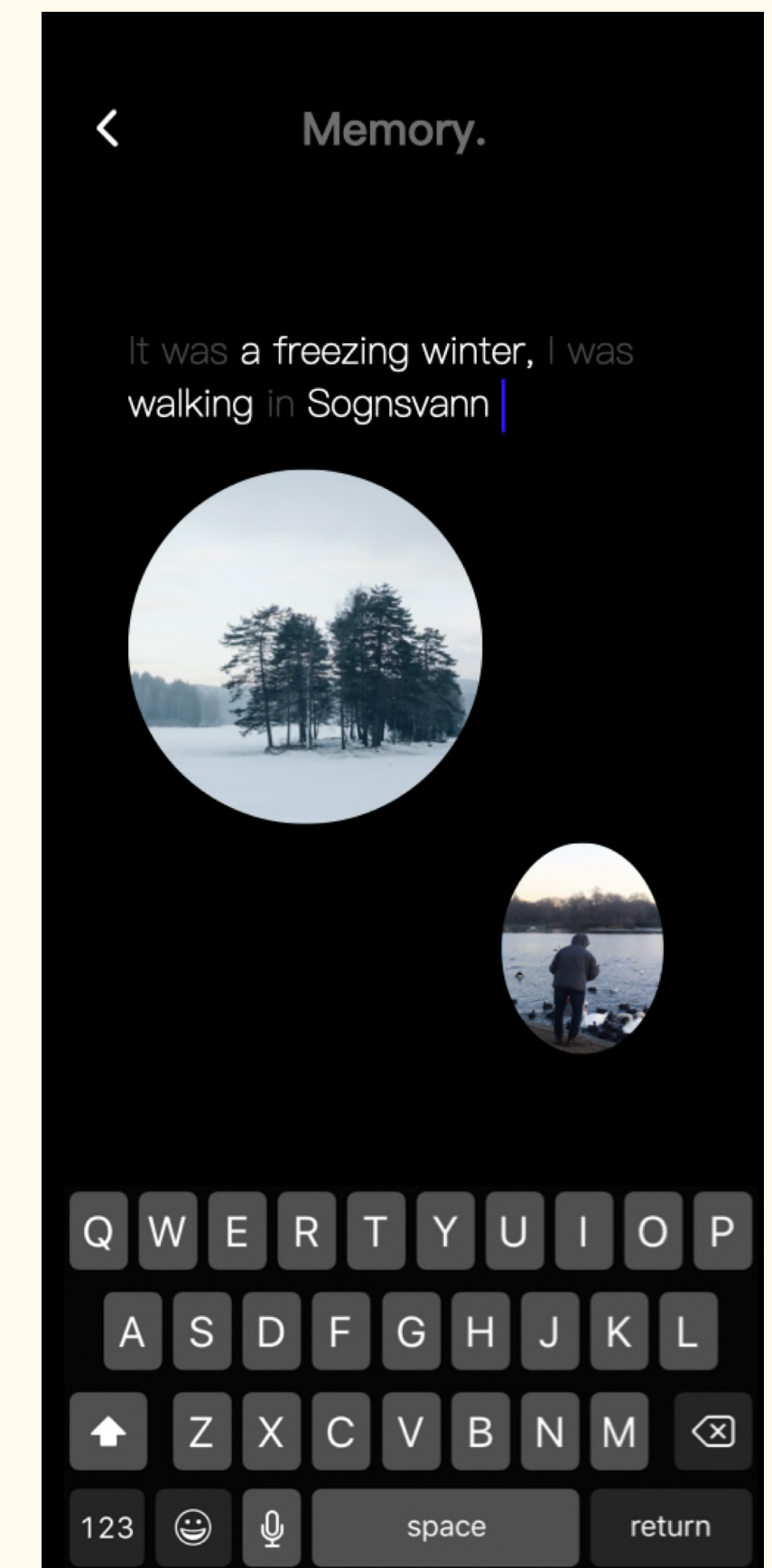
While the user enters the keyword, the related images will float up.

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Insights

After synthesizing the user feedback, we gained the following insights.

The balance of control

Although all users (7/7) felt more in control when they were allowed to choose content rather than to just passively accept recommendations, they reported that they needed more guidance. This was also the reason why they found it easier to choose keywords than to type on a blank page.
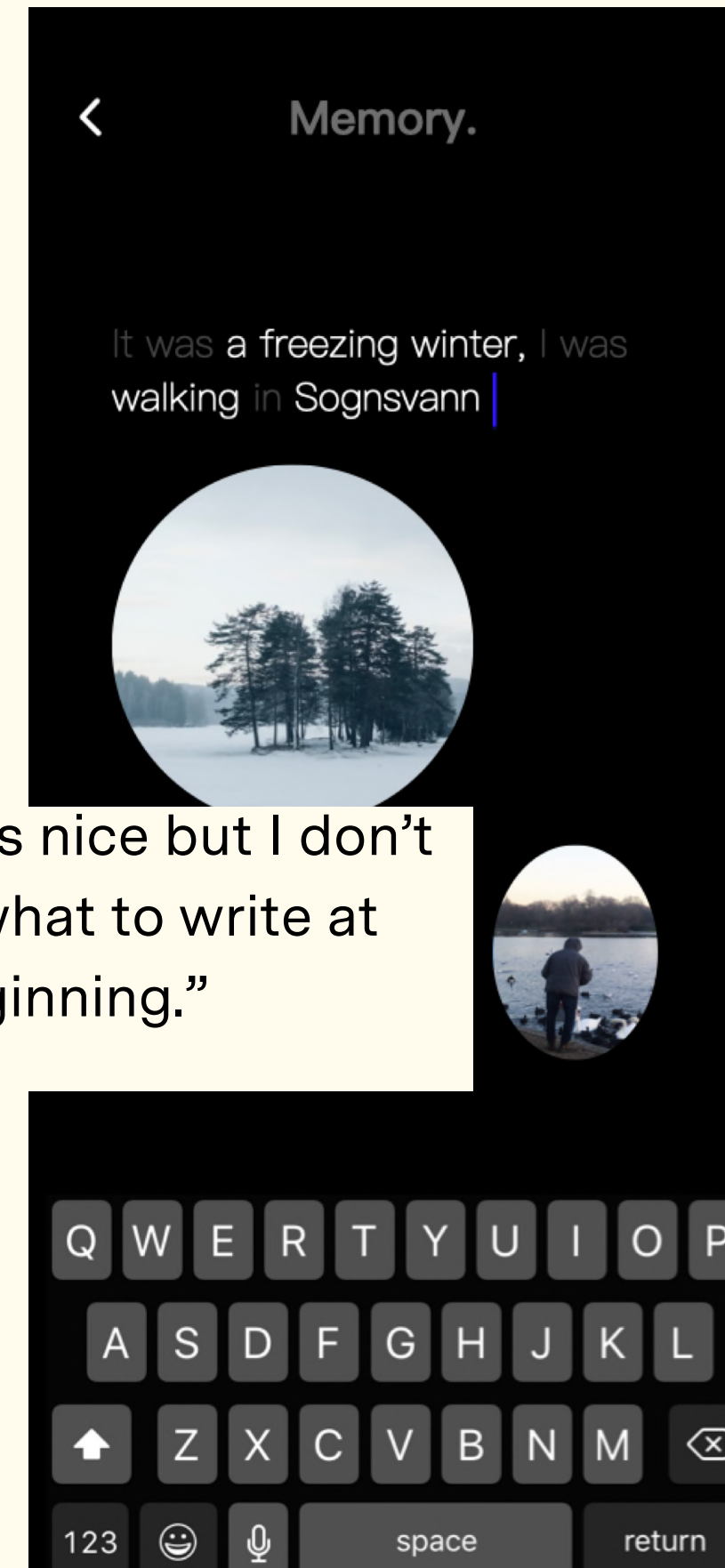
"It looks nice but I don't know what to write at the beginning."
Tester, 23
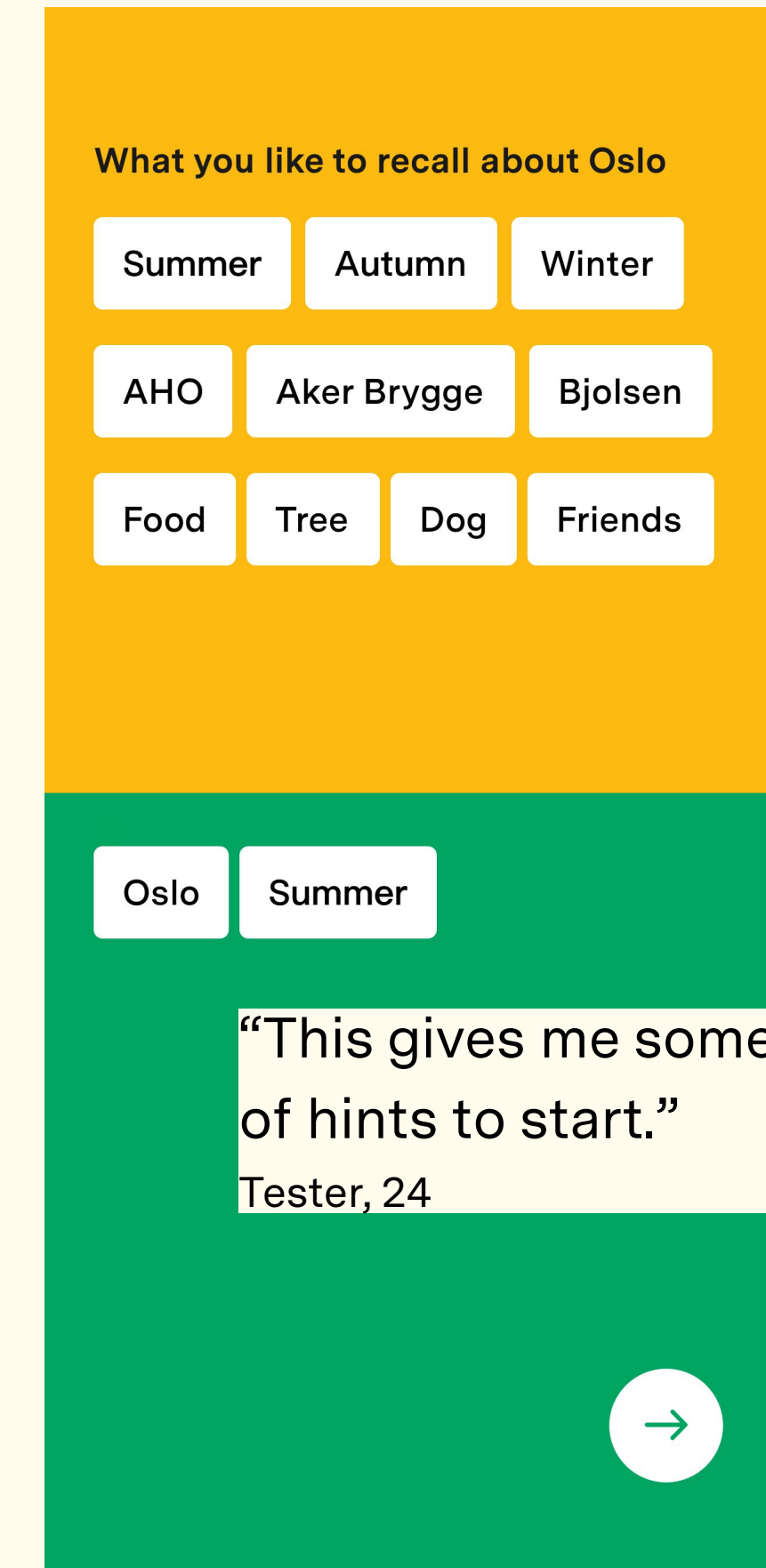
"This gives me some kind of hints to start."
Tester, 24

Insights

AI isn't smart enough

AI is not yet very accurate at figuring out the subtle meanings of photos. Thus, it may suggest completely irrelevant photos to the user. If AI can accurately recommend the photos that a user wants to see based on his or her situation or even mood, it will undoubtedly resonate with the user the most. However, at this stage, it is still difficult for AI recommendations to reach such a level, which may be the reason why big tech companies are not doing this.

2018/12/7
Oslo

It was just a few days before Christmas and it was really cold. I went to see MGMT live with Mellisa and I got

"I don't want a machine to analyze my private photos in such a creepy way."
Tester, 26

Feelimg

It's lunch time!

Your photos look **tasty** 😋

"Why showing me pictures of food when I am hungry?"
Tester, 26

2018
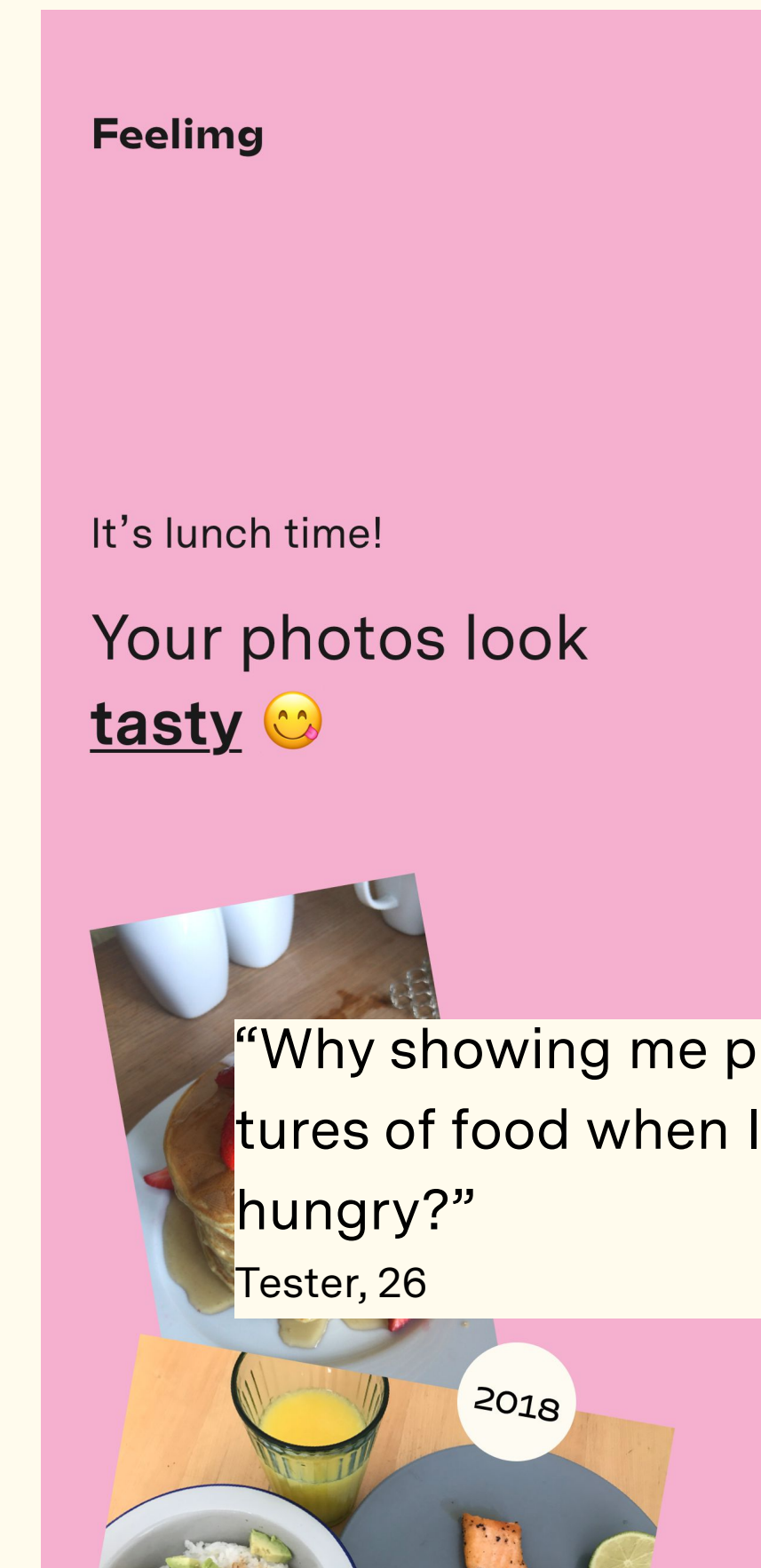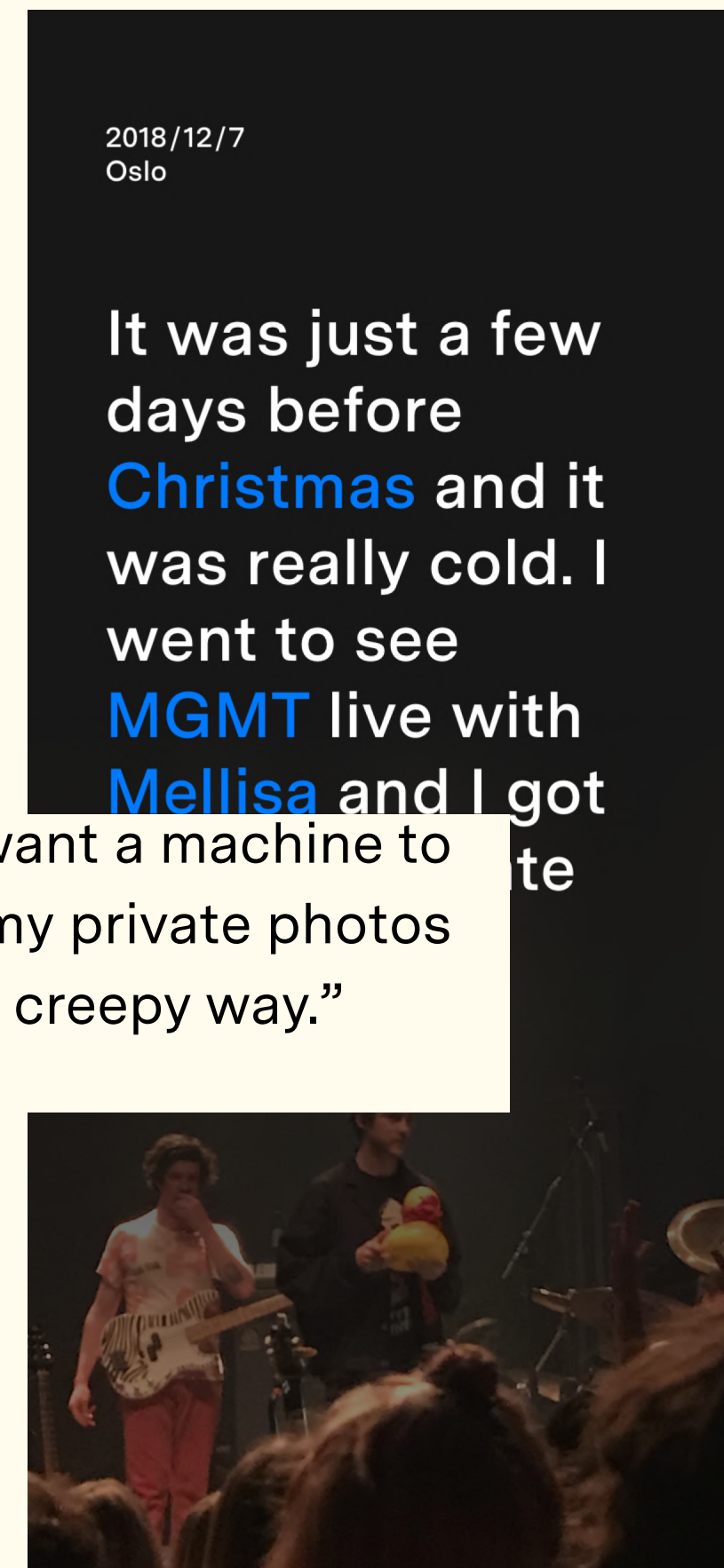
Insights

Small differences

Most users(5/7) said that if these ideas were just small features that came with their phone albums, they would use them because the visual feel was very different from the current albums, but they did not feel much different than the current features.

Good Bites in Oslo 😋

Walk Along the River 🚶

Autumn Inspiration 🍂

"This looks more interesting than Memories but I would expect for something more fun."
Tester, 26

Feelimg
"I like the look and feel and it talks like a humorous person."
Tester, 23

It's lunch time!

Your photos look **tasty** 😋

2018
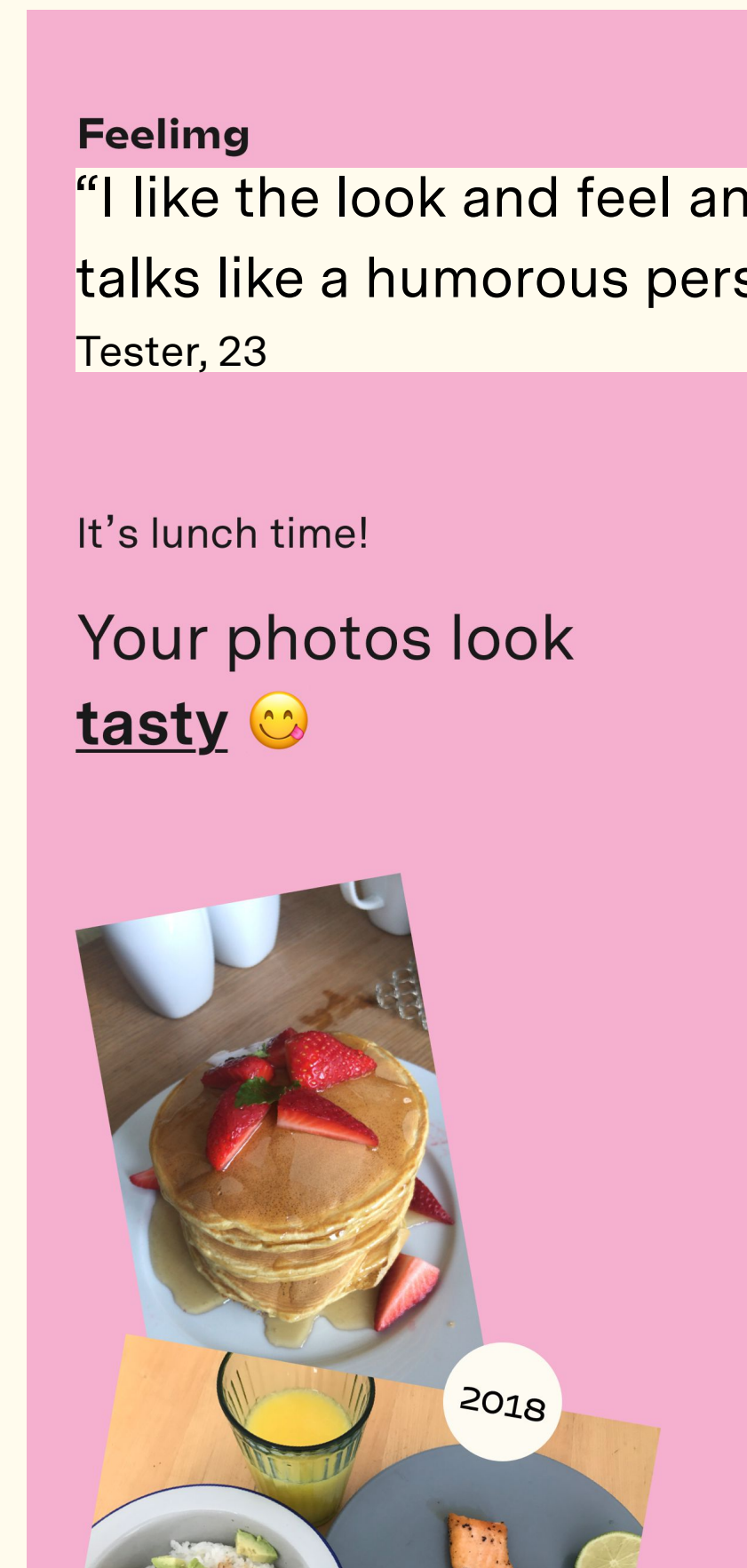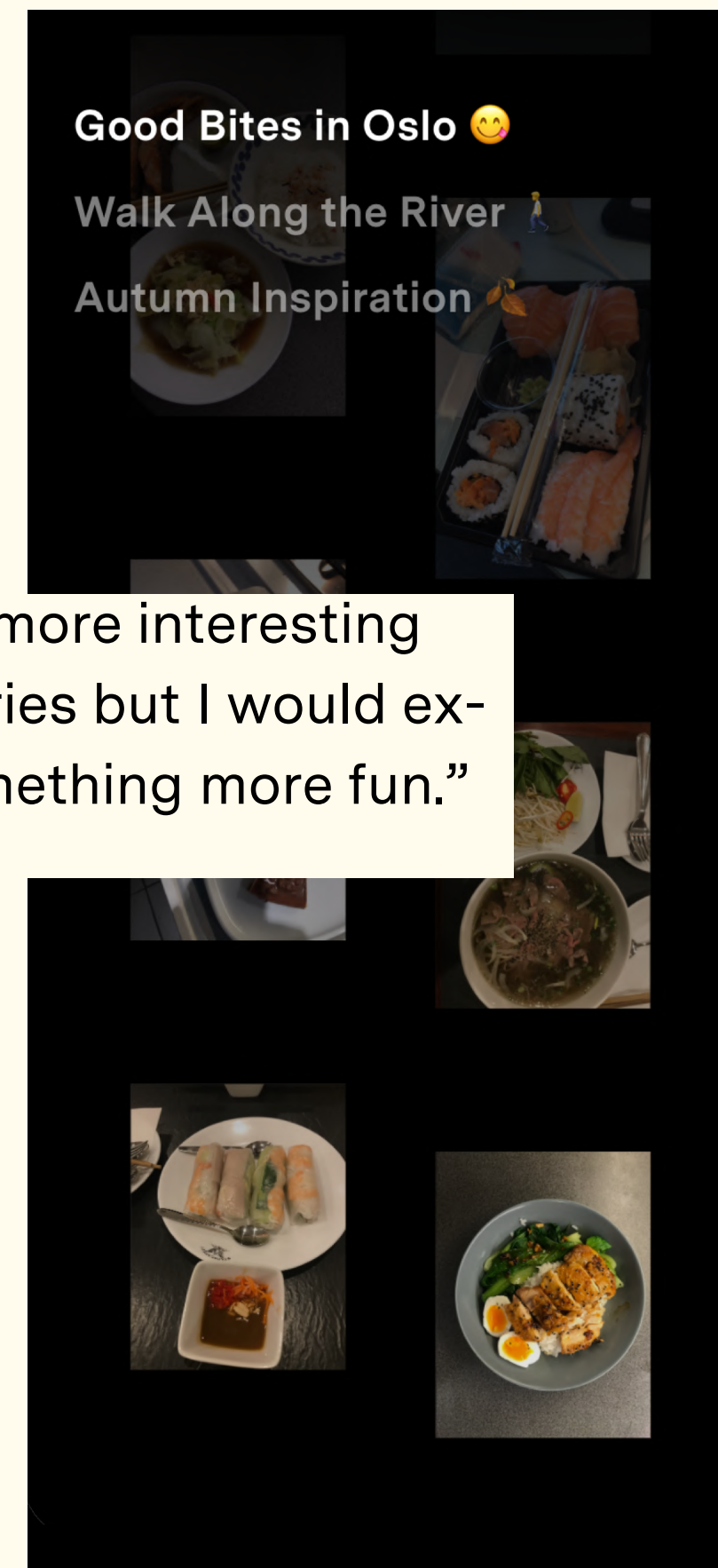
Reflection

Highlight the rediscovering aspect

Users we interviewed are often surprised when they look back at a photo because of details that they had forgotten about, did not notice at the time, or that have changed over time. Rediscovering the meaning of photos is potentially one of the most valuable parts of reviewing them.

Make it playful

Most of our testers (5/7) did not find much difference in the functionalities between our prototypes and today's mobile photo albums, mainly because these prototypes were only slightly different in visual form and still felt like quick photo-finding tools. However, they also mentioned that they liked some of the fun elements in the prototypes, such as the human tone of voice and bright colors, which they found more touching. So, by making the experience of reviewing photos more playful, we can both encourage them to review them and make it different from the current mobile albums.

Reframed Brief

Based on reflections, we decid-
ed to explore further. Here, we re-
framed our design brief.

**How might we leverage AI technol-
ogy to create a playful experience
for rediscovering photos?**

Conceptualization

In this chapter, we describe our process: from understanding the possibilities of AI technology and finding a design entry point, to translating it into our design concept. We refined the concept step by step through user testing and talking with design experts.

Research

	See from a photo		Extraction Information			Creat effets		Others
	Auto cut out	Pick colors	Describe a photo	Detect emotion	Blend photos	Apply filters		Words to poem
Technology			Write a description	Detect pets' emotion		Deep dream generator		Google's PoemPortraits
			Generate a story Generate a meme	Detect people's emotion		Auto coloring photos		
Potential	Making collage	Explore with color	Generate words / sentences	Generate words / emojis		Apply filter		Generate poems

most interesting

AI potential

In order to understand the possibilities, we first researched the existing AI technologies. The following are just some of the techniques that are relevant to photos, such as extracting information from images, adding filters, etc. We found that the possibilities of AI technology are endless.

Experiment
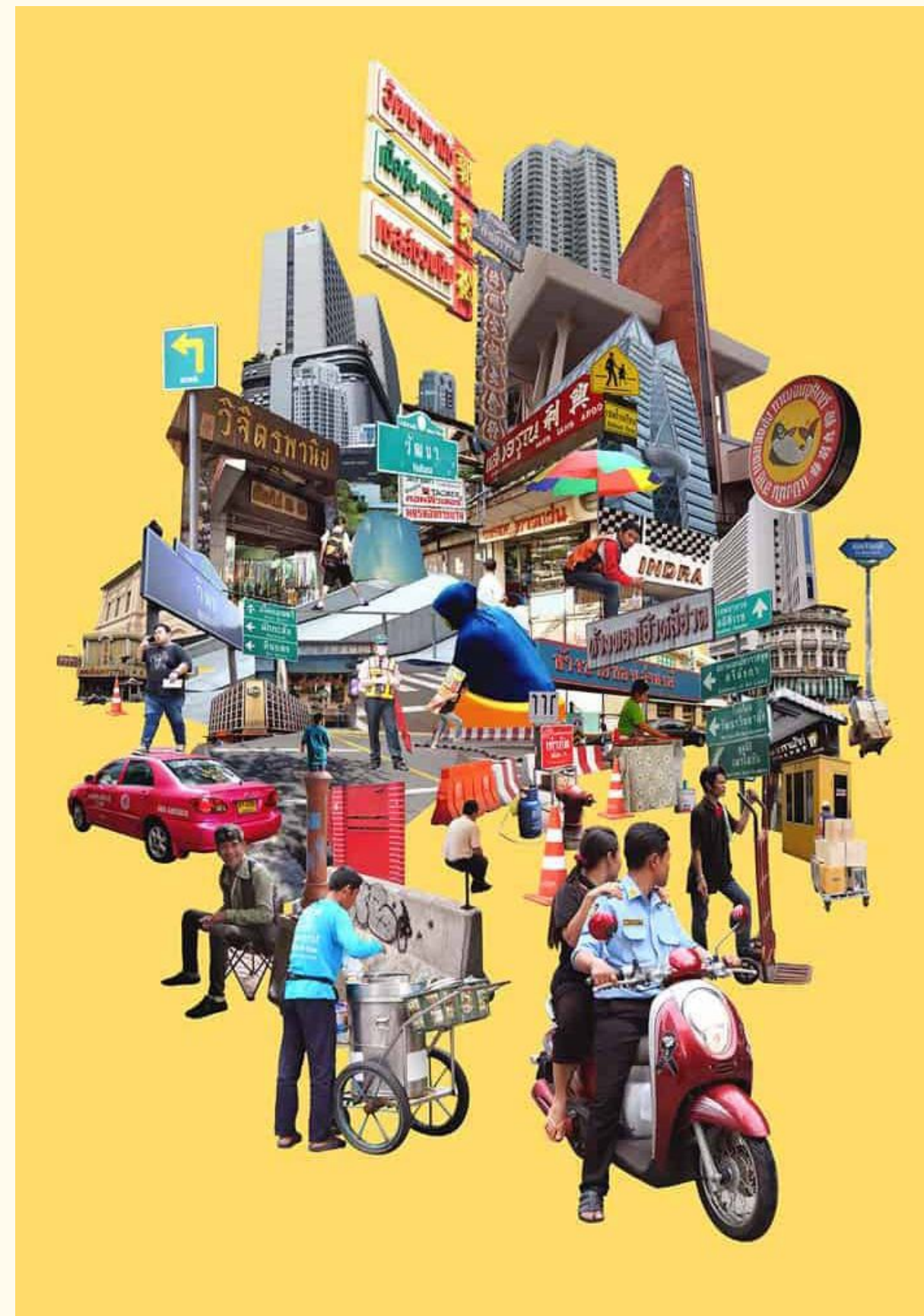
Inspiration by Pariwat
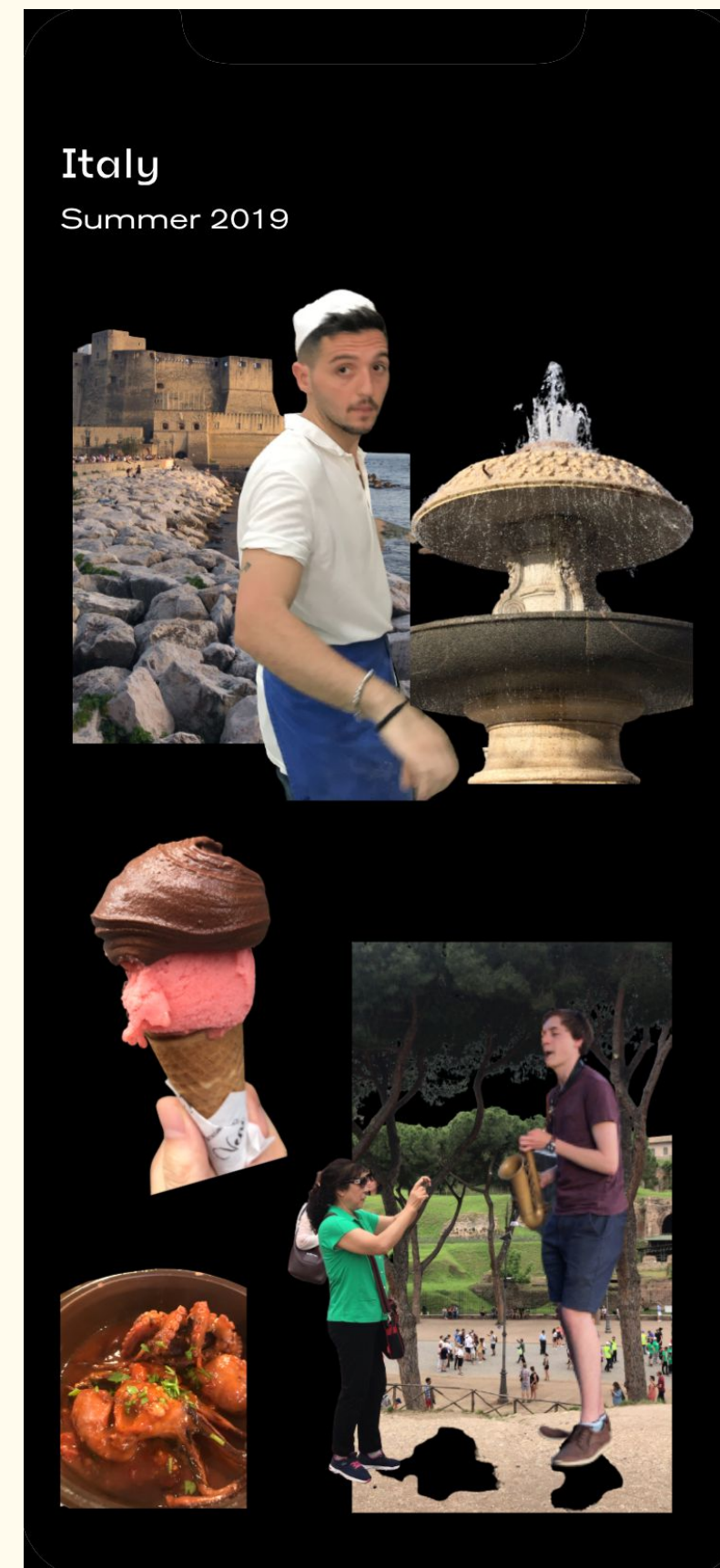
Our experiment

"Collage is a technique of art creation, by which art results from an assemblage of different forms, thus creating a new whole."

Wikipedia

We were most interested in auto cut-out because we thought that by cropping and combining different photos, we could produce a lot of different and fun results that would fit our goals of creating playfulness, and so we conducted our first experiment based on this technique.

Prototype 1

"I like how you casually put stuff."
Tester, 24

Oct 2019
Oslo

Sep - Oct 2018

Homepage

When do you want to go back

2019 ∨

Jun ∨ ——— Jun ∨

Choose the places you want to go back

Oslo   Naples ✓

Florence ✓

"It's interesting to see what pictures the AI will select, but will be better to select pictures on my own."
Tester, 24

Select date & place

"It's like condensing different photos into just one interesting photo."
Tester, 26

"I want to remove some pieces and change background color!"
Tester, 23

Florence

Collage page

We quickly created an interactive prototype using our own photos, the AI randomly selected important photos for cropping, and the testers could move and scale any cutout to freely combine them.

Insights

After a quick test with six users, we got the following insights based on user feedback.

Playfulness & rich results

All testers (6/6) found it eye-catching, fun to try, and felt that the same photos can produce many different effects.

A fun link

All testers (6/6) found it eye-catching, fun to try, and felt that the same photos can produce many different effects.

More controls & adjustments

All testers (6/6) also wanted more control over the AI's random selection, such as being able to delete unwanted cutouts, uploading their own images, etc. This also shows that they want to be able to express uniqueness through their own creations.

High interest in sharing

Most users (5/6) wanted to be able to share the results, and few (2/6) felt that this is like a visual diary that they can review personally.

Prototype 2
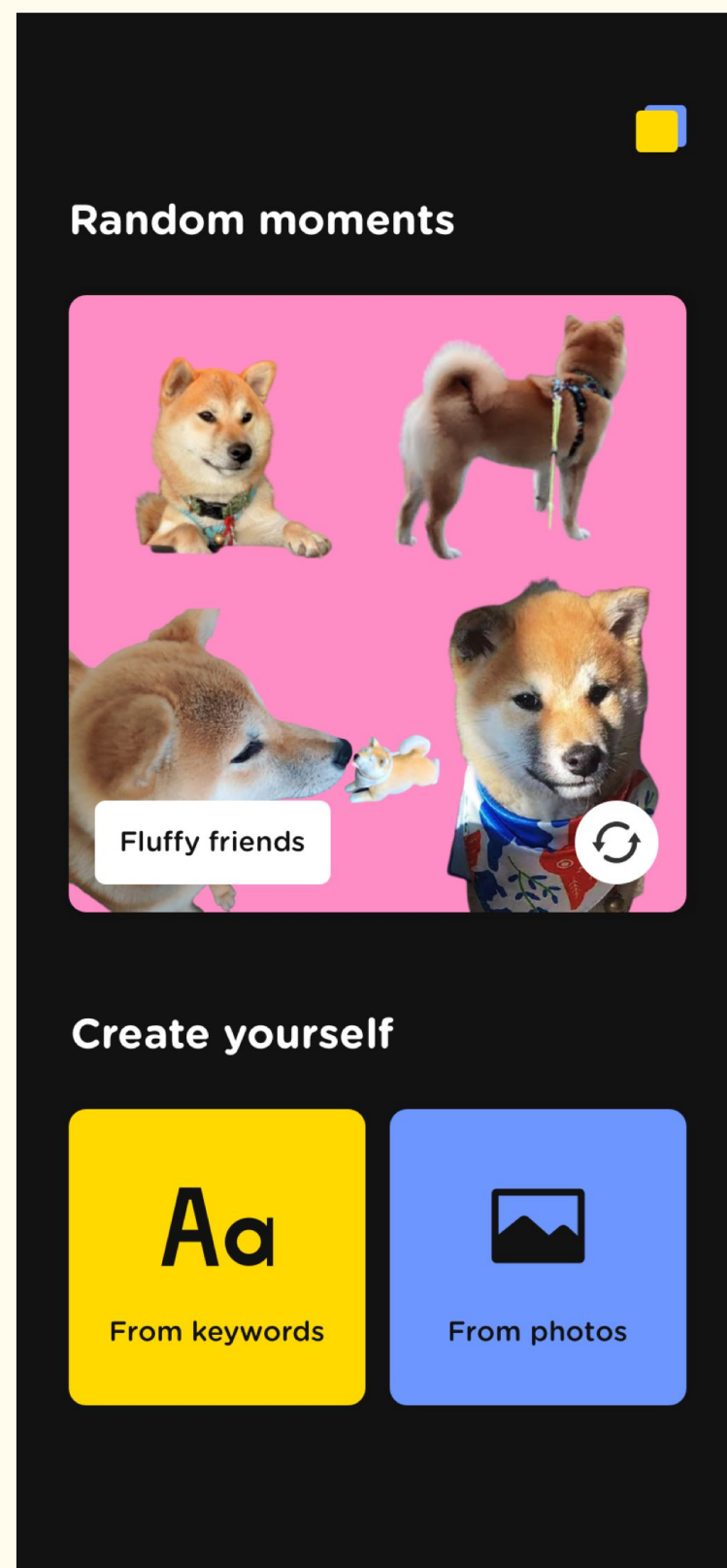
Homepage
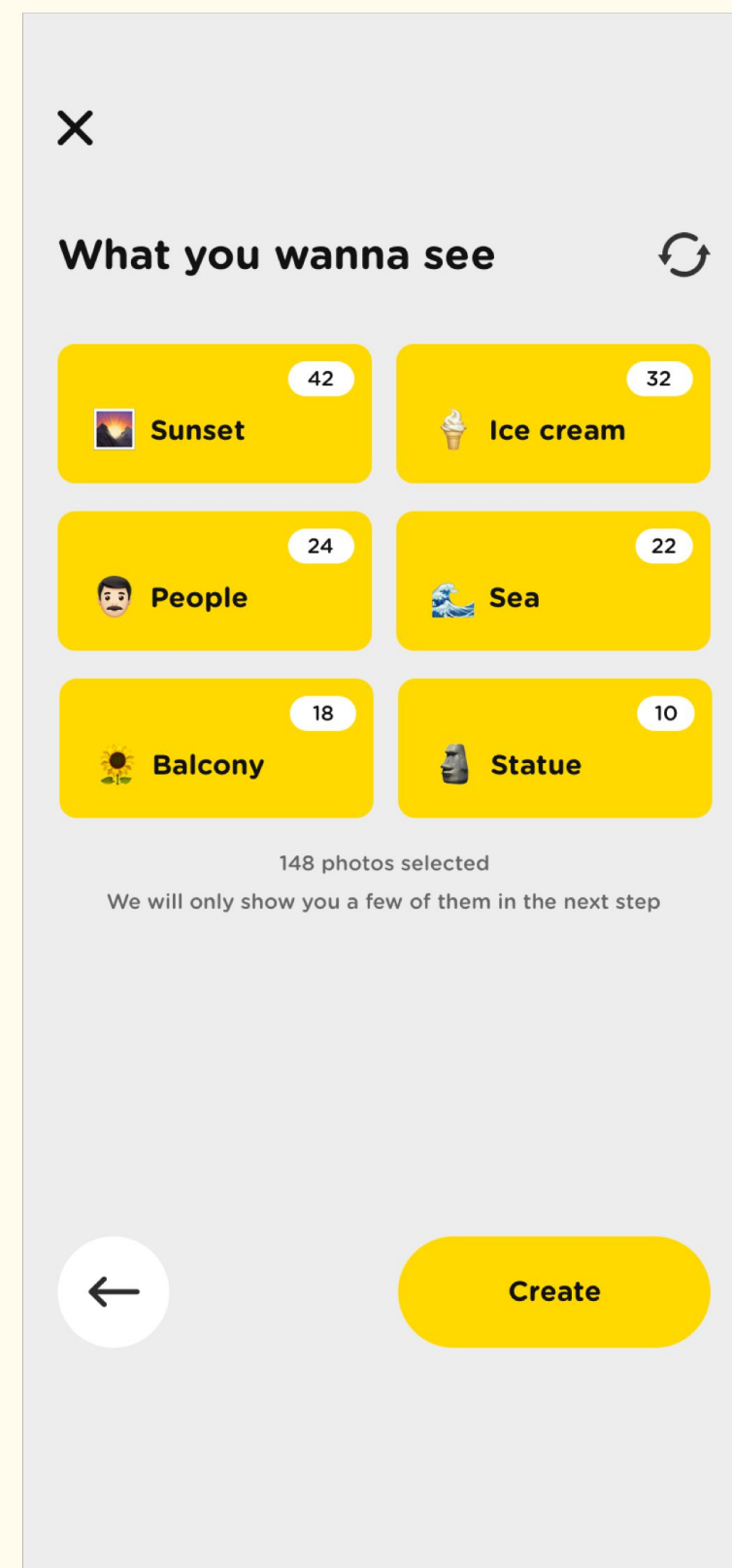
Select keywords
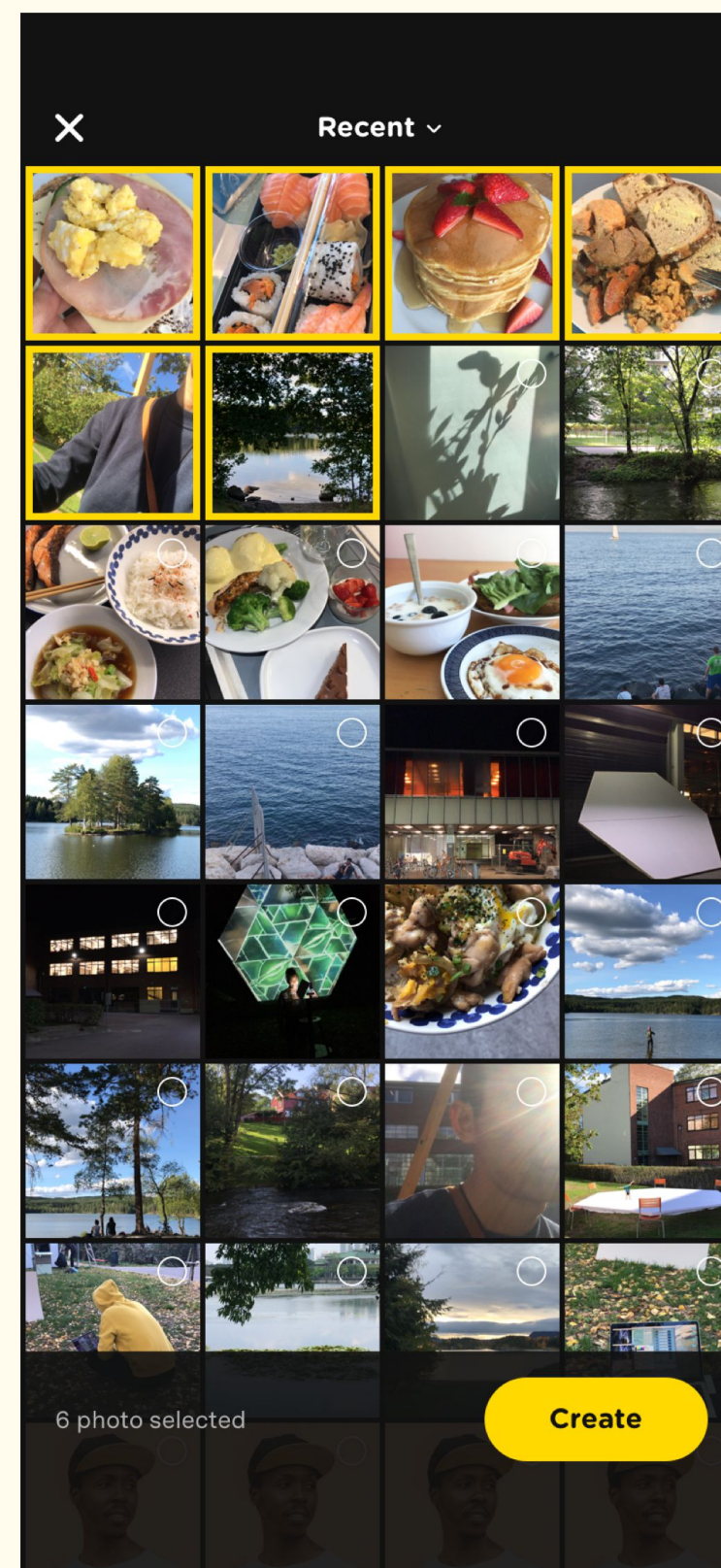
Upload photos

Creation page

The overall positive reactions made it clear to us that this was an idea we wanted to take further, and based on user feedback, we added more functionalities to the new prototype that allowed for user input, such as choosing key-words and uploading photos.

Expert Feedback

After talking with two senior UX designers (one at Designit and another at Ericsson), we got some valuable suggestions on the concept and interface details.

Go further

While the collage idea is interesting, other AI techniques could be explored further to enrich the results, for example, making photos into a gif.

Simplify the interface

Homepage still has a lot of things, and the structure is very conventional, you can strengthen the random recommendation section and weaken or hide others.

Further experiments

I think there must be
something wrong with me,
Linus. Christmas is coming,
but I'm not happy. I don't
feel the way I'm supposed to
feel.

Charile Brown

A GREEN SUMMER IN OSLO

Fluffy Friends

Some
happy
faces

Auto cut out
Image recognition
Generating quotes
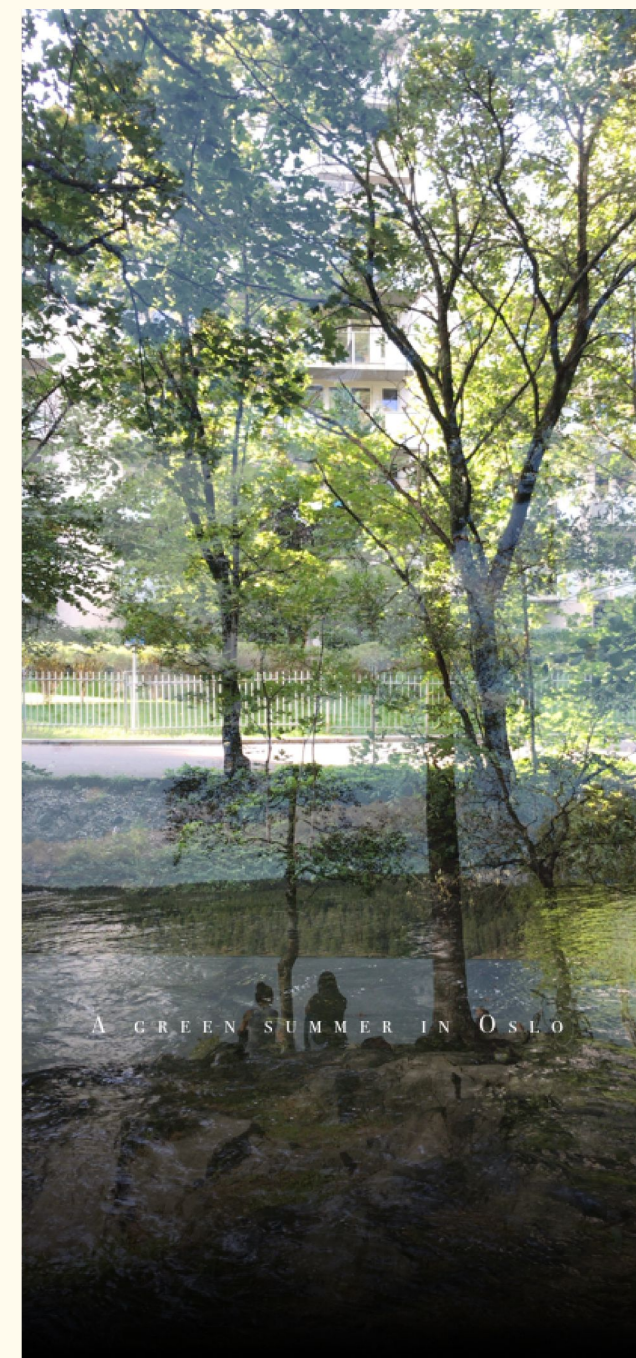
Photo blend
Image recognition
Generating caption

Auto cutout
Apply filter

Auto cutout
Image recognition
Generating caption
Picking a color

Auto cutout
Image recognition
Generating caption
Picking a color

sentimental

comical

Based on expert feedback, we conducted some new experiments based on other existing AI technology to enrich the result of the collage. We found that different colors, fonts, and typography could have very different visual effects and evoke different emotions, and we ranked several of the results from sentimental to comical. After talking with a senior UX designer at Ericsson, it also occurred to us that photos do not have to be static and that videos and moving pictures can bring a variety of feelings to the table.

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Reflection

Collage works

Most users (12/13) found the idea of the AI selecting important photos and reassembling them into a collage as being interesting - giving them a new visual experience, and they would like to create and share it. This idea accomplished the design goal very well.

AI+Human

Even if users thought AI saves them a lot of time and effort, they wanted more control, such as being able to upload their own pictures and make changes to the results selected by AI. AI should not completely replace humans, but rather assist them in finding what is meaningful for them within the large amount of photos.

Concept

With these reflections, we arrived to the concept of the product.

AI selects (important) photos and crops them to form a collage, which is an interesting way for users to see past photos. What's more, users can edit and create a collage as well as share it with others, extending the original value of the photos.

Collage

AI maigic
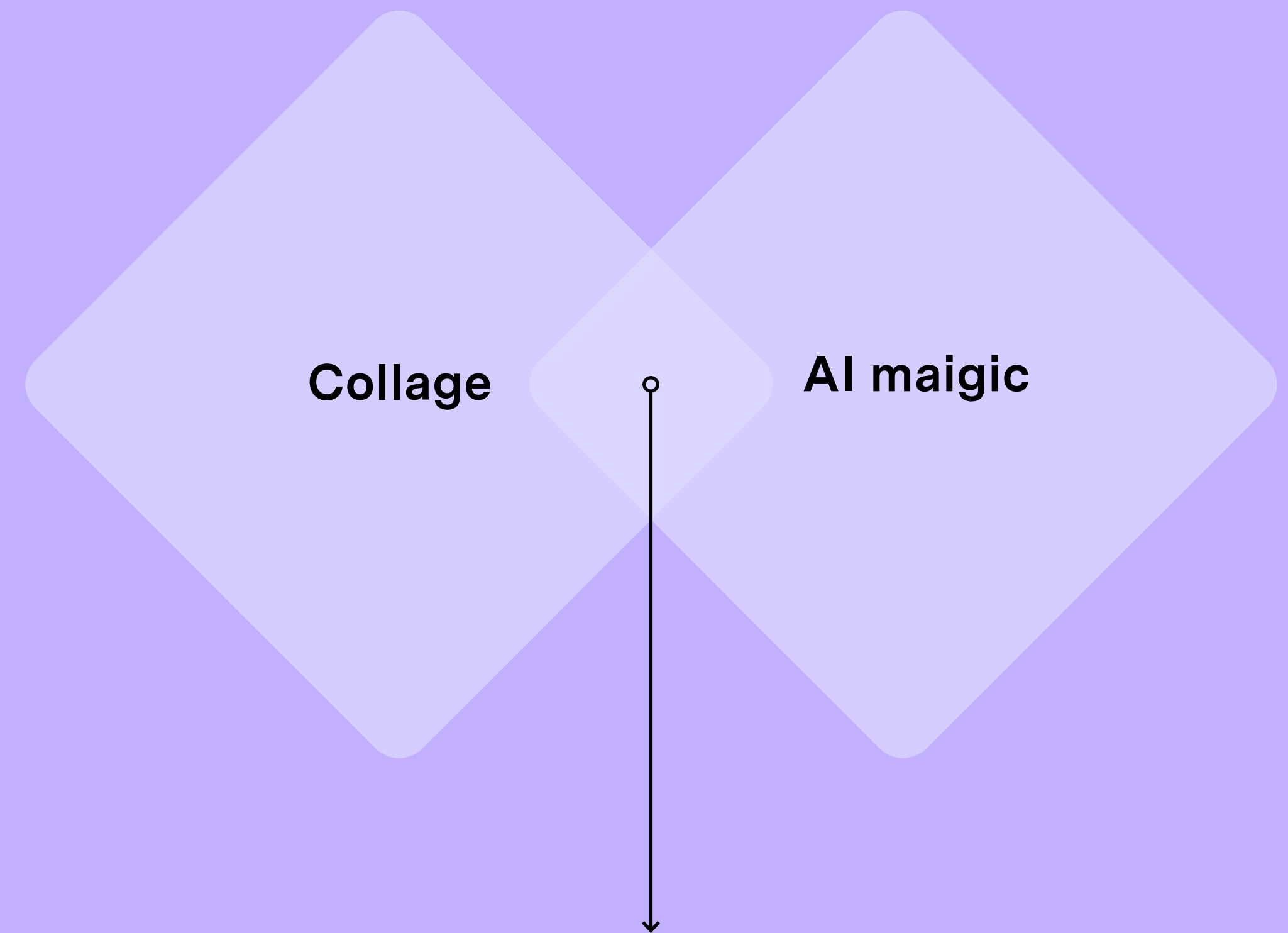
Colagic
Bring precious moments back to you with AI magic

Development

In this chapter, we will briefly describe how we further refined the concept from the previous chapter into a product, and show some of the most important iterations.

Design Principles

Before embarking on detailed designs, we translated some of the insights we gained earlier into product design principles that would be used to guide and evaluate our subsequent designs.

AI+Human

While receiving recommendations from AI, users can edit and delete them. Users can also see the original photos and select photos they prefer to generate a collage.
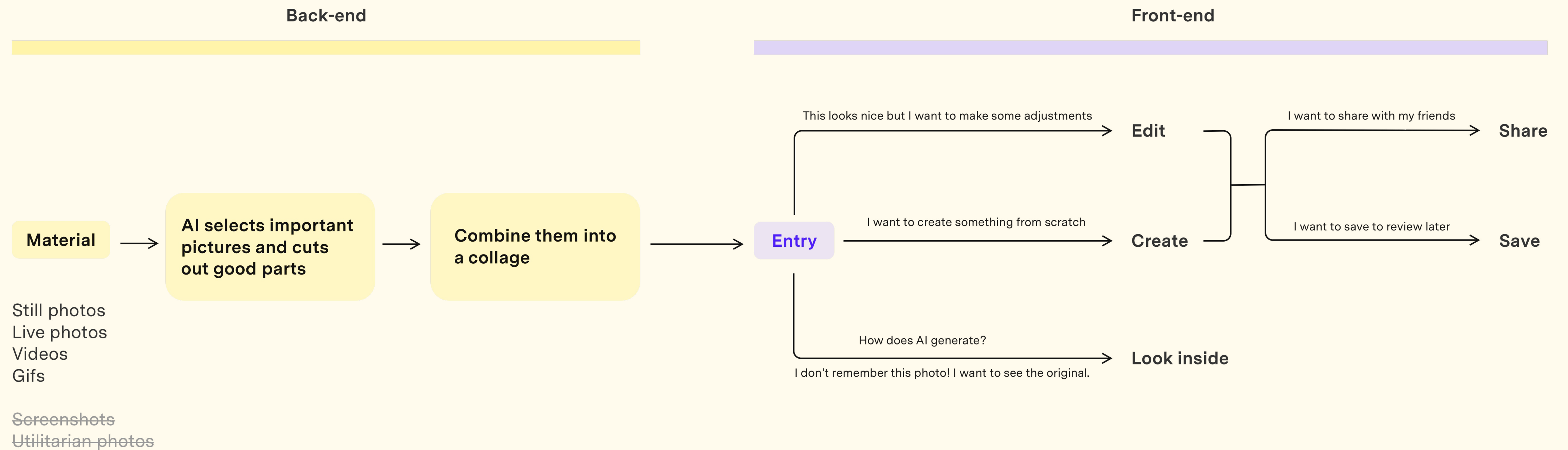
Playful

The app should convey the playfulness through a bold and fun visual style, a humorous tone of voice and some playful micro-interactions.

Straightforward

The app should have simple interface structures, let users get straight to creation, and give users concise guidance.

System flow

We translated the design principles and previous user requirements into the product's functionalities and mapped the back-end to front-end system flow of the product.

Back-end

Front-end

Material

Still photos
Live photos
Videos
Gifs

~~Screenshots~~
~~Utilitarian photos~~

AI selects important pictures and cuts out good parts

Combine them into a collage

Entry

This looks nice but I want to make some adjustments → **Edit**

I want to create something from scratch → **Create**

How does AI generate?

I don't remember this photo! I want to see the original. → **Look inside**

I want to share with my friends → **Share**

I want to save to review later → **Save**

Information Architecture

In order to further refine the sub-functions and to sort out the relationships between pages, we transformed the system flow into the information architecture diagram of the product.

Main features

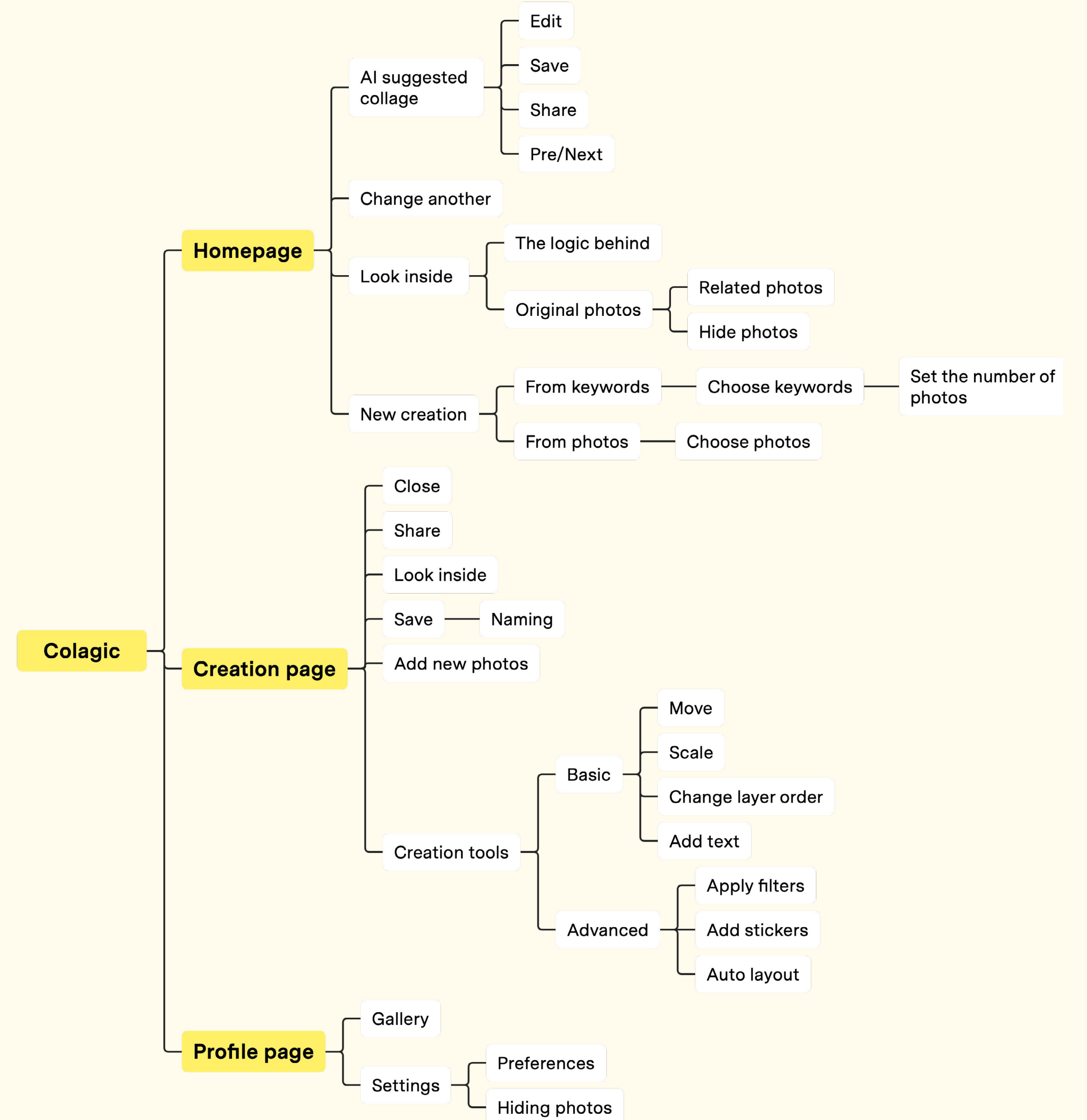**Entry**: AI picks out important photos and automatically generates a collage.

Edit: Users can edit the automatically generated collage.

Look inside: Users can see photos before they are cropped.

Create: Users can pick images they want to composite into a collage.

Save: Users can save their creations.

Share: The creations can be shared with others.

Colagic

- **Homepage**
  - AI suggested collage
    - Edit
    - Save
    - Share
    - Pre/Next
  - Change another
  - Look inside
    - The logic behind
    - Original photos
      - Related photos
      - Hide photos
  - New creation
    - From keywords — Choose keywords — Set the number of photos
    - From photos — Choose photos
- **Creation page**
  - Close
  - Share
  - Look inside
  - Save — Naming
  - Add new photos
  - Creation tools
    - Basic
      - Move
      - Scale
      - Change layer order
      - Add text
    - Advanced
      - Apply filters
      - Add stickers
      - Auto layout
- **Profile page**
  - Gallery
  - Settings
    - Preferences
    - Hiding photos

UI Iterations

Based on user feedback, we have made several iterations to the details of the interfaces. Here we showed the optimization of two interfaces that have been modified more than others. More interfaces will be shown in the next chapter.

It should be noted that we used high-fidelity prototypes with collage examples in our testing, but here we have removed intrusive visual elements like colors in order to more clearly demonstrate the changes in functional structure.
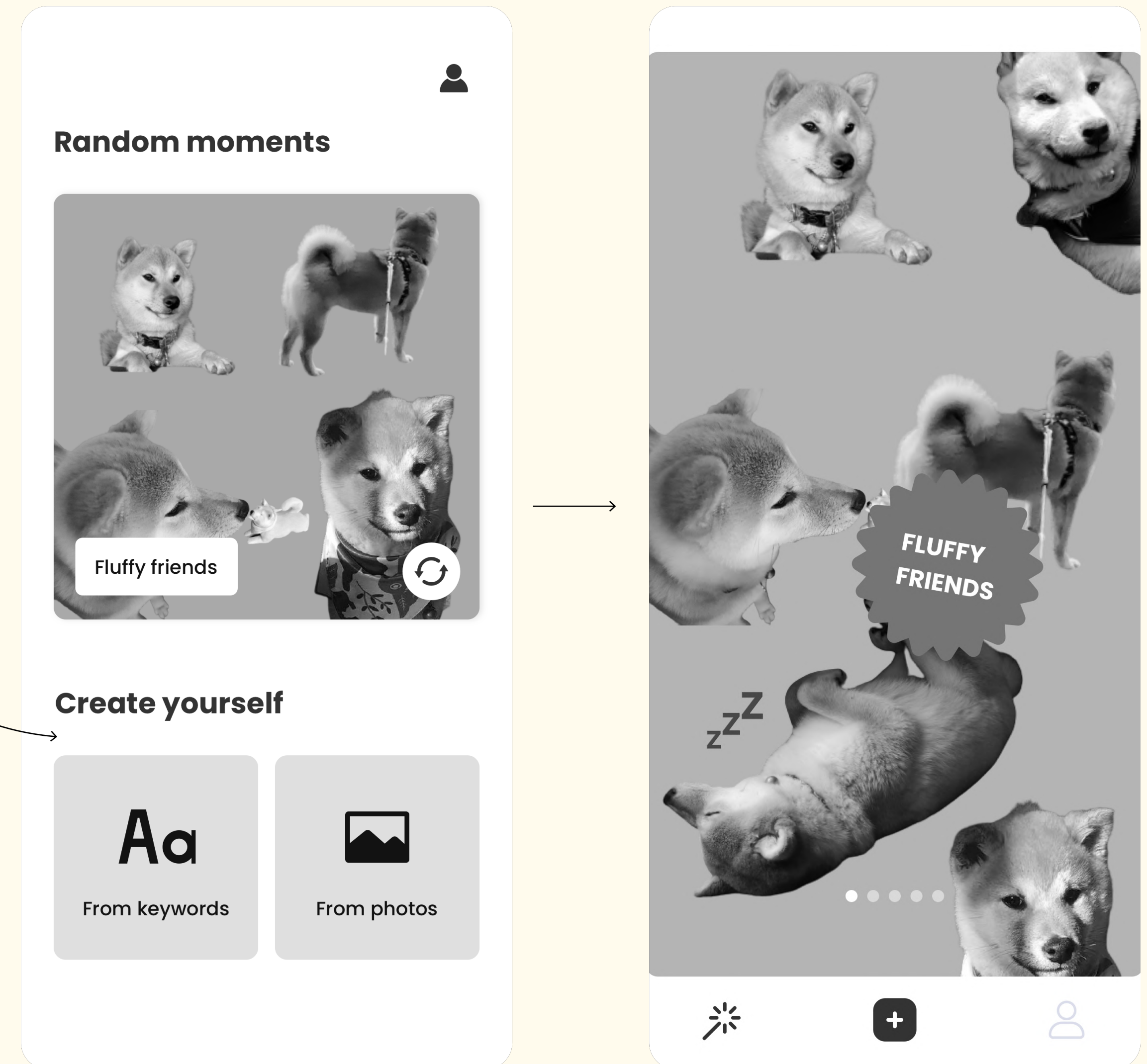
UI Iterations

Simplify the main structure

"You can highlight the AI-gener-
ated collages more and hide oth-
er features so that the user knows
what to do at once without even
thinking, just like Snapchat and Tik
Tok!"
Designer, Designit

Bigger collage

By talking with 3 designers (from Designit, Tencent, and
Accenture), we realized the importance of highlighting
the AI-generated collage. On one hand, it allows users to
quickly understand the main function of the product and
simplifies the interface structure. On the other hand, as our
supervisor suggested, a larger display space can enhance
the visual impact of the collage. So, during the iteration
process, we gradually made the AI-generated collage big-
ger and hid the user-created features in the "+" button.

Random moments

Fluffy friends

Create yourself

Aa
From keywords

From photos

FLUFFY
FRIENDS

UI Iterations

Simplify the main structure

"It's a bit cumbersome to press the 'surprise me' button every time to change collages. Maybe consider automatically generating several collages at once for users to quickly browse."
Designer, Tencent

Press to Swipe

A designer at Tencent suggested that we could replace the "surprise me" button with a more user-friendly swipe action. This would also give users more options to see multiple collages automatically generated by the AI. We adopted this suggestion by replacing the button to switch collages with a left-right swipe.

Surprise Me
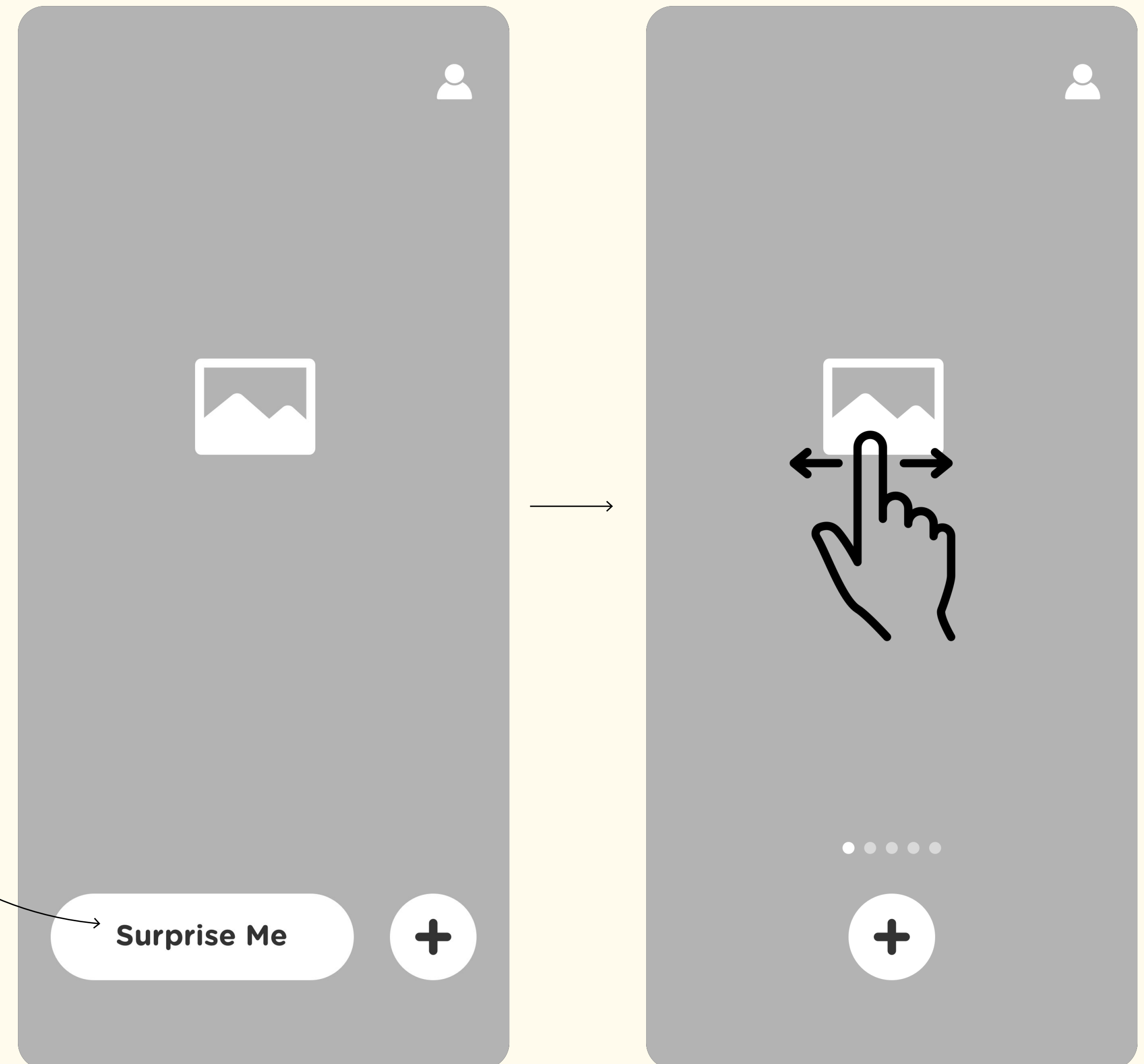
UI Iterations

Simplify the main structure

Add a tab bar

Considering that the 3 modules "homepage", "create" and "me" are side by side, and that putting "create" and "me" buttons on the homepage will make the relationship between them confusing, we aggregated the functions scattered on the homepage to the tab bar at the bottom to make the page structure more clear.
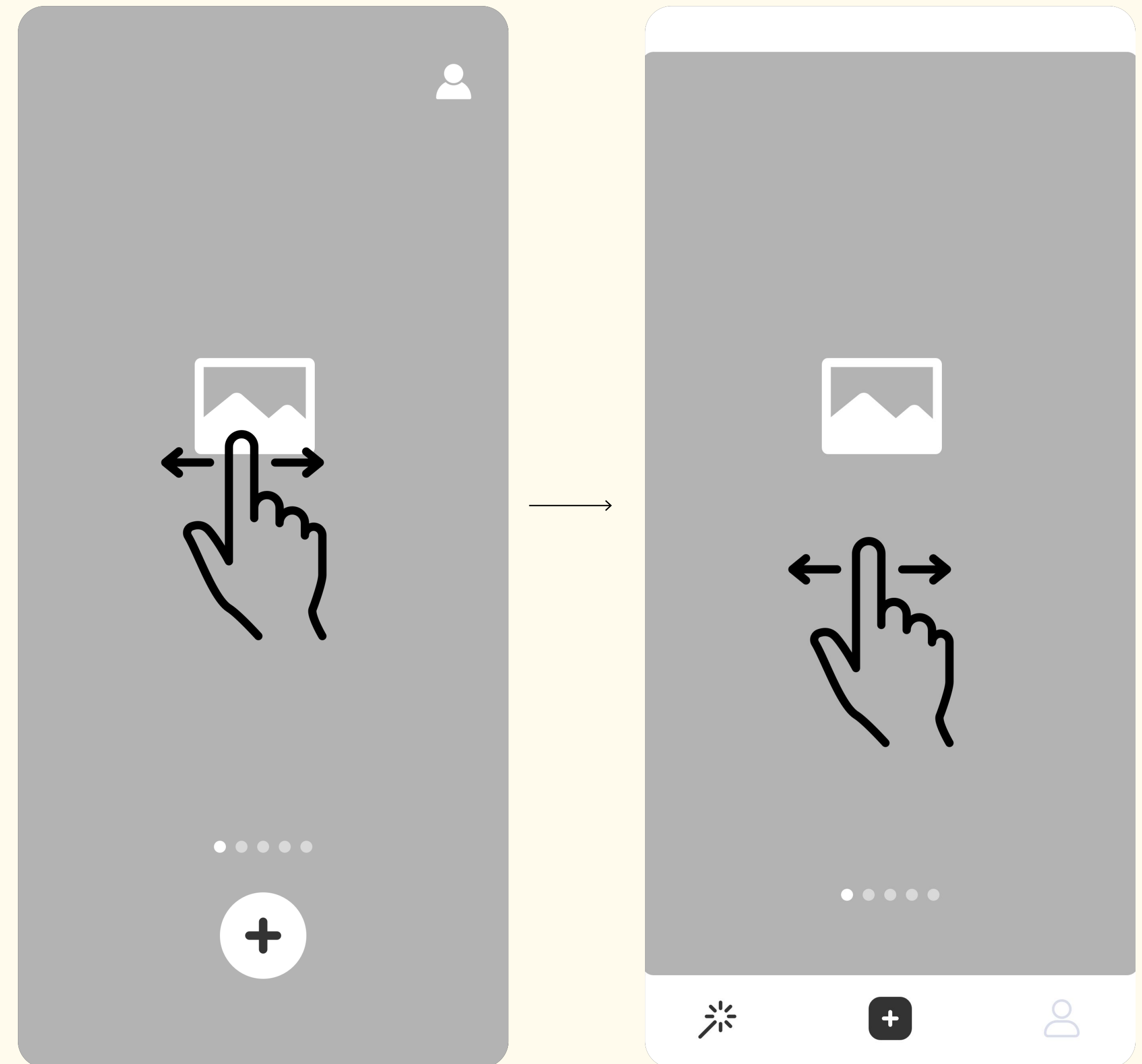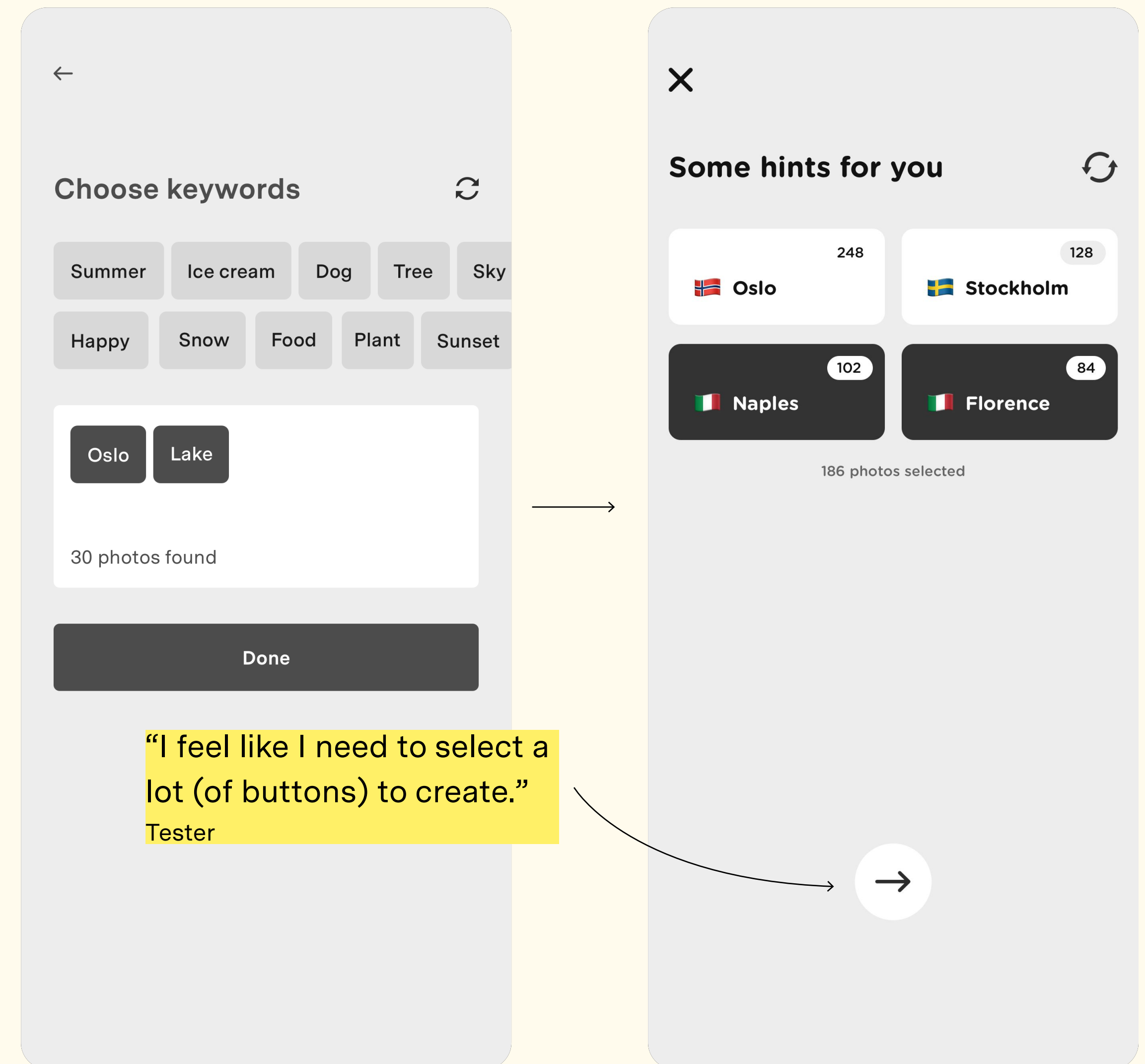
UI Iterations

Add fun to hints page

The "Hints" page is mainly to provide users who want to select their own images with some keywords so that they can complete the selection faster to generate the collage. The biggest design challenge here is to make the keyword selection - which is essentially focused on efficiency - more interesting.

Early version

We changed the initial version from selecting keywords into an input box to a step-by-step selection. We also added some emojis to enhance the visual fun. After user testing, most users (3/4) thought the step-by-step selection process was too long, and our supervisors thought the number representing the amount of photos on the options was boring.
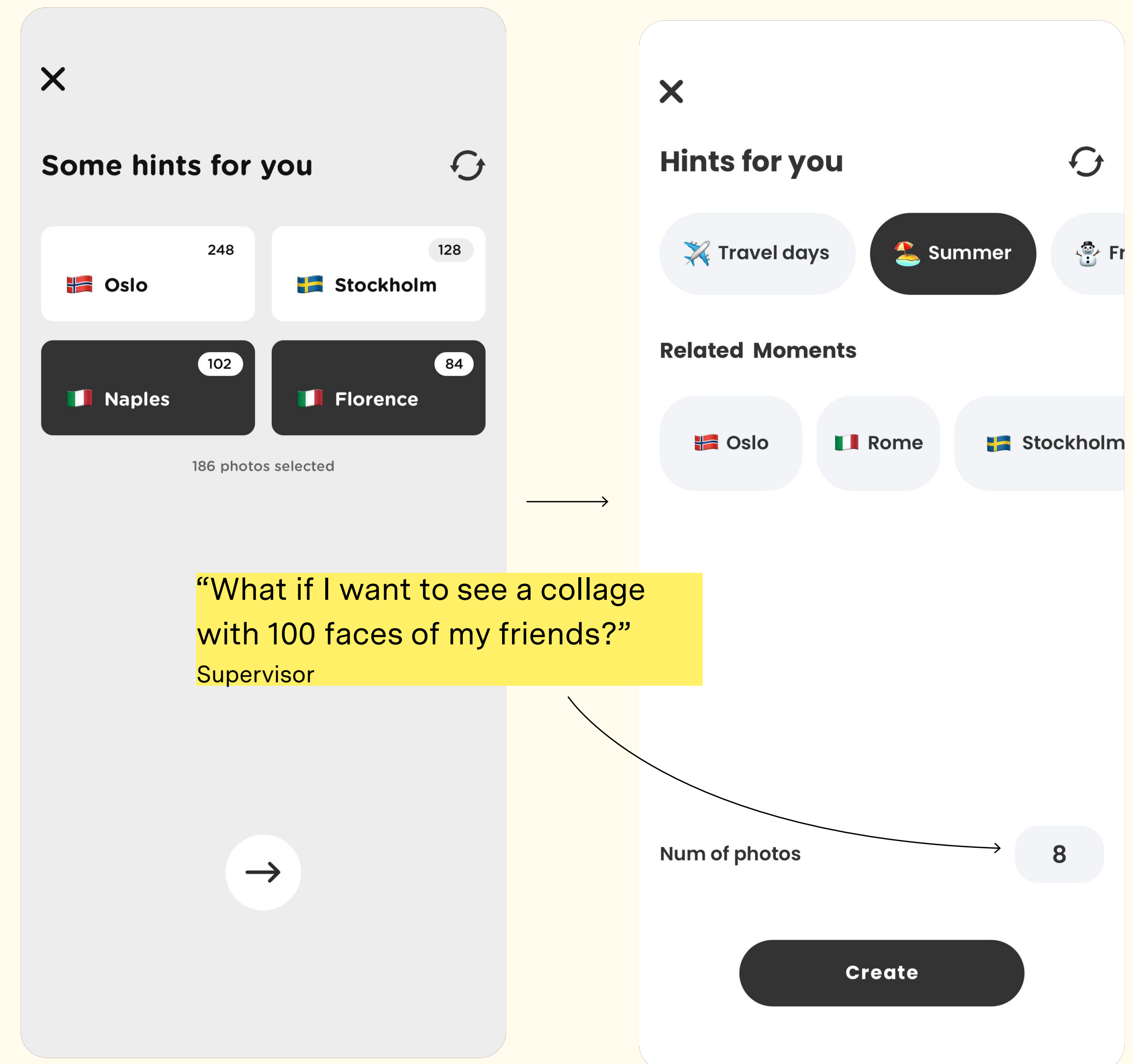
←

Choose keywords ⟳

| Summer | Ice cream | Dog | Tree | Sky |

| Happy | Snow | Food | Plant | Sunset |

| Oslo | Lake |

30 photos found

Done

"I feel like I need to select a lot (of buttons) to create."
Tester

✕

Some hints for you ⟳

| 248 | 128 |
| 🇳🇴 Oslo | 🇸🇪 Stockholm |

| 102 | 84 |
| 🇮🇹 Naples | 🇮🇹 Florence |

186 photos selected

→

72

UI Iterations

Add fun to hints page

Final version

In the final version, we kept the step-by-step selection, but more options would be triggered once an upper-level option was selected on the same page. Also, we used the size of the buttons to represent the number of photos, making the importance of the photos more intuitive. In addition, taking suggestions from one of our supervisors, we added the function to adjust the number of photos that will be selected by the AI, giving the user more control over their results.

Some hints for you

| 248 🇳🇴 Oslo | 128 🇸🇪 Stockholm |
| 102 🇮🇹 Naples | 84 🇮🇹 Florence |

186 photos selected

Hints for you

✈️ Travel days   🏖️ Summer   ☃️ Fr

Related Moments

🇳🇴 Oslo   🇮🇹 Rome   🇸🇪 Stockholm

"What if I want to see a collage with 100 faces of my friends?"
Supervisor

Num of photos   8

Create

73

Introduce...

Colagic

Bring precious moments back to you with AI magic

Branding

For the branding, we used bold and bright colors, bold fonts, and added some visual elements like confettis to enhance the playfulness.


BOLD + PLAYFUL + COLORFUL

Moodboard

Applied in the app visuals

Create something magic !

Get some hints from magic AI or just choose any photos you like

Hints

Photos
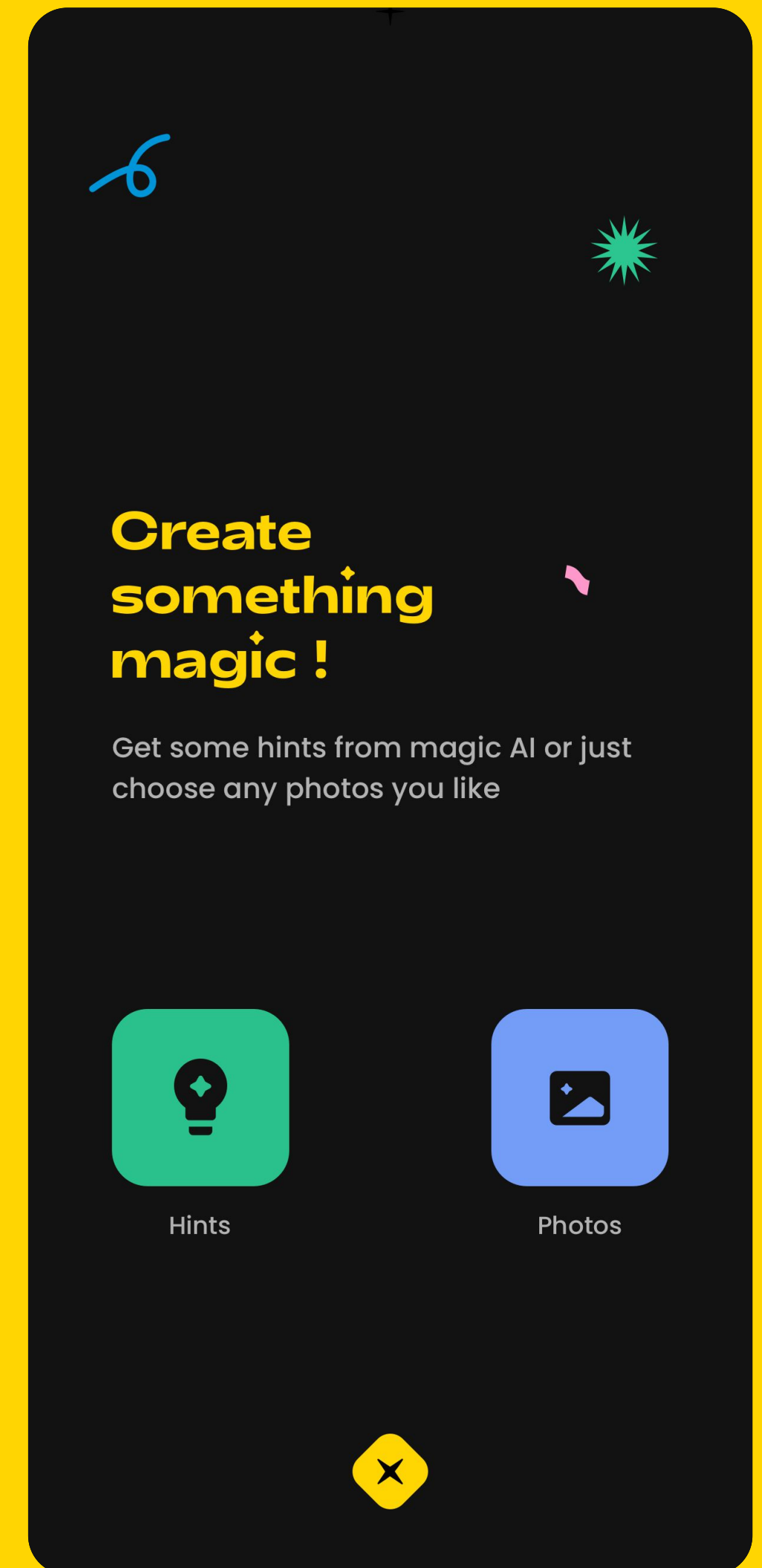
Design system

We built a design system for unifying the app's interface visuals. We also used the symbol of magic, the shining star, in the design of the icons to highlight the uniqueness of the product and to echo the concept of it.

Icons
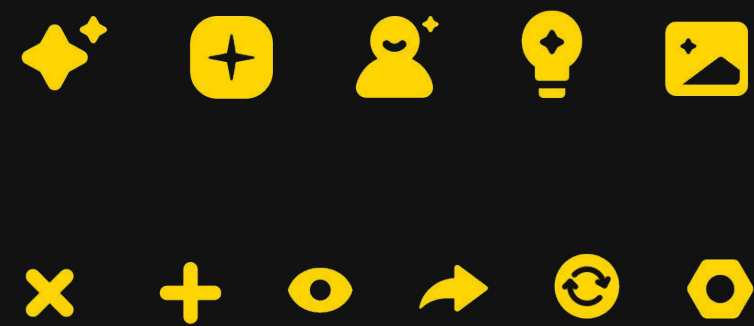
Typography

Title	**24**
Sub-Title	**20**
Body	16
Auxiliary text	14

Button

inactive

Create

56px

240px

active

radius: 20px

Create

Color
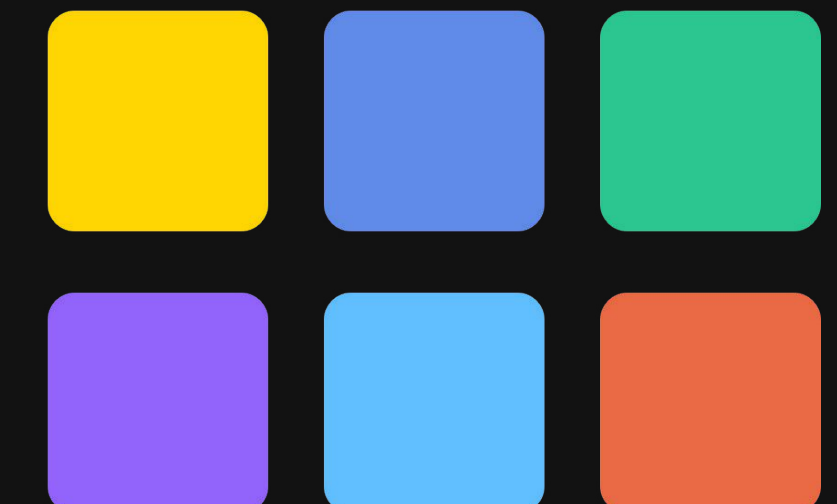
How to start (onboarding)
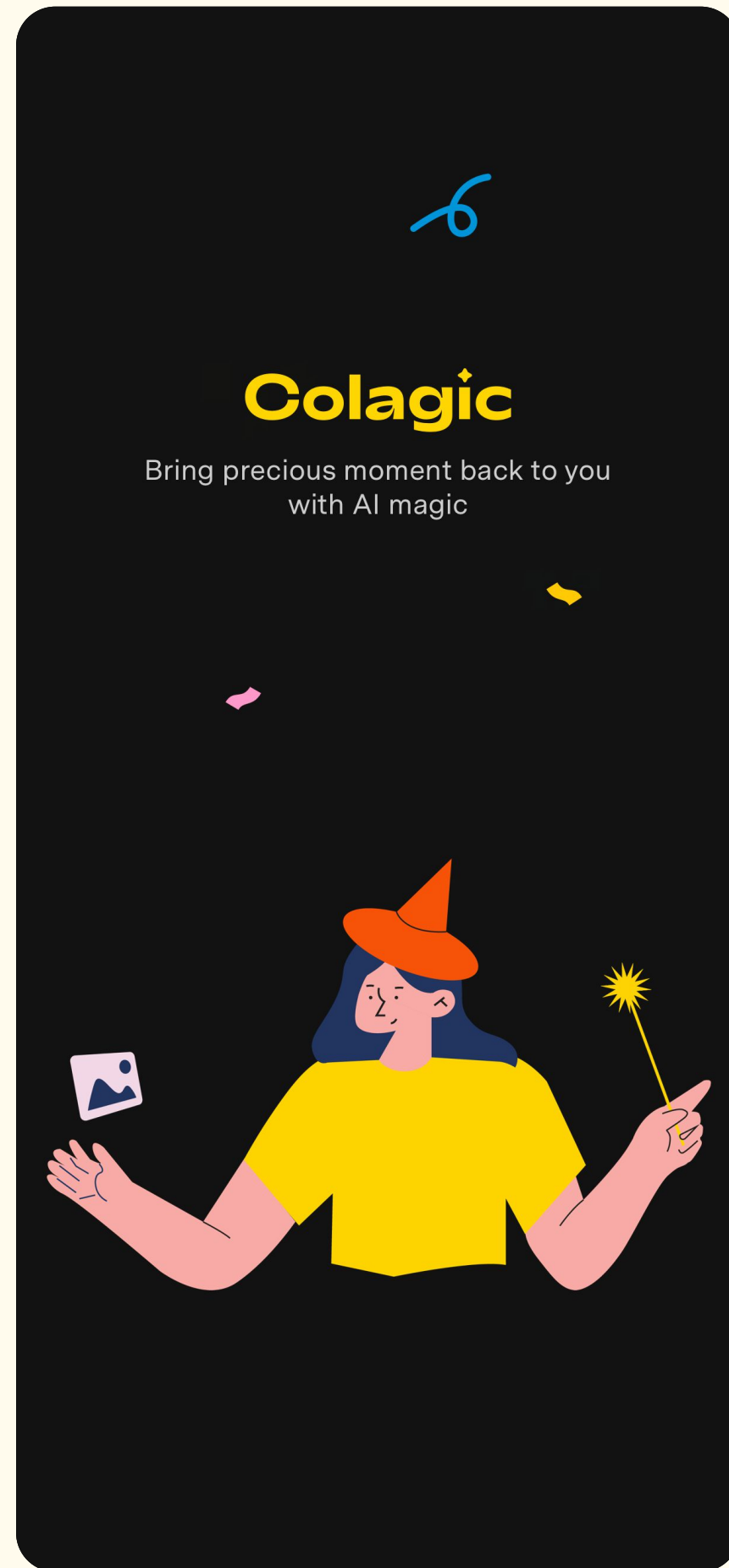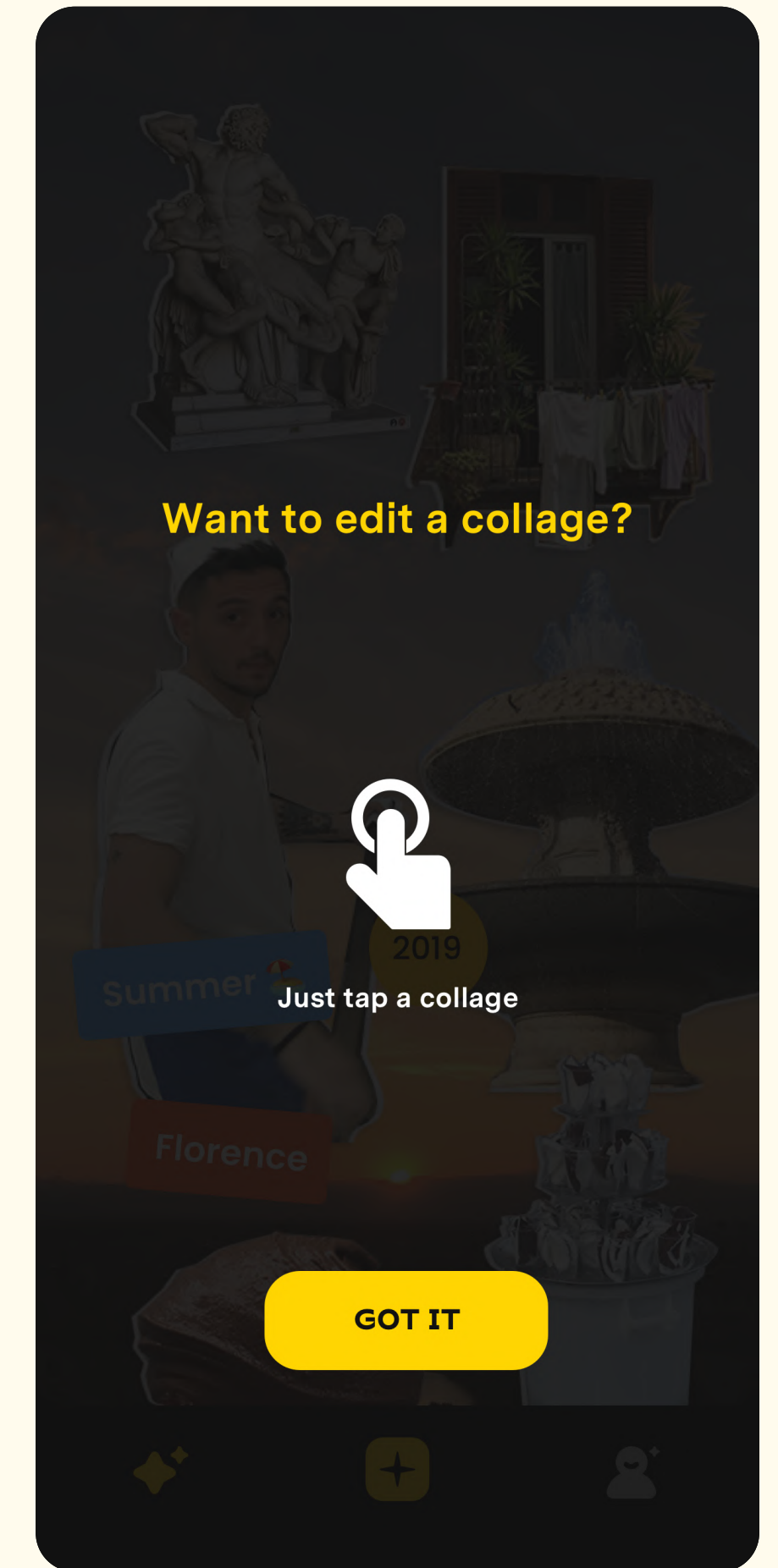

Onboarding page
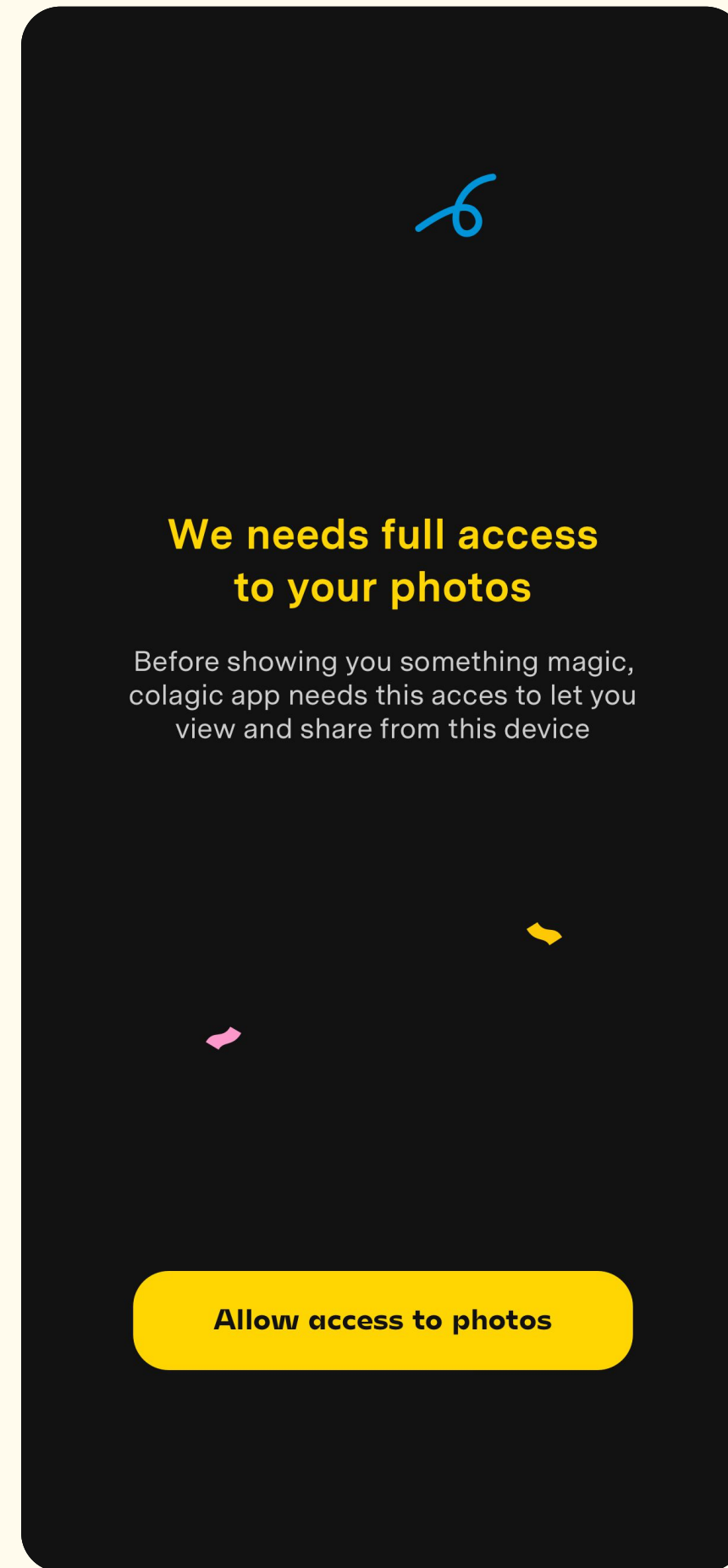
Ask for access
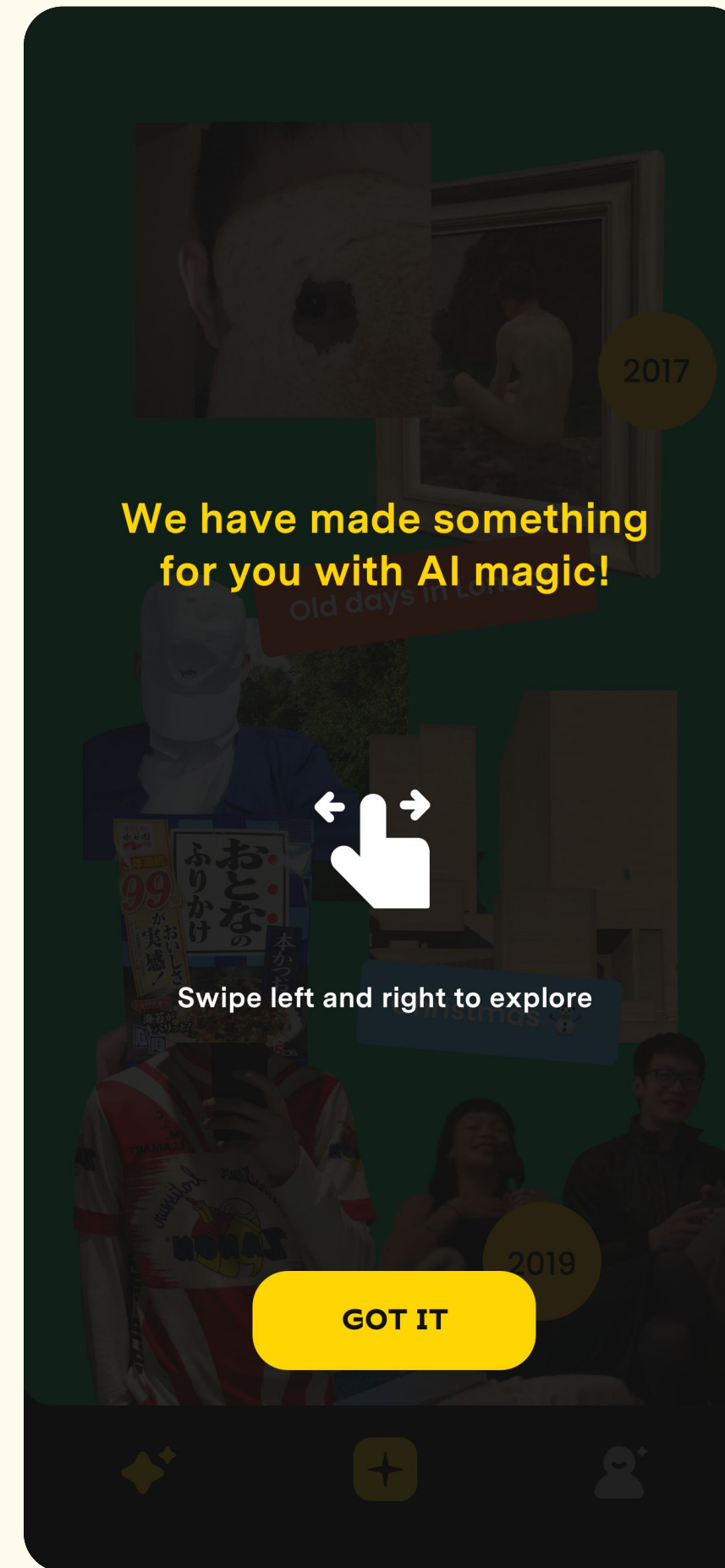
Instruction_browse
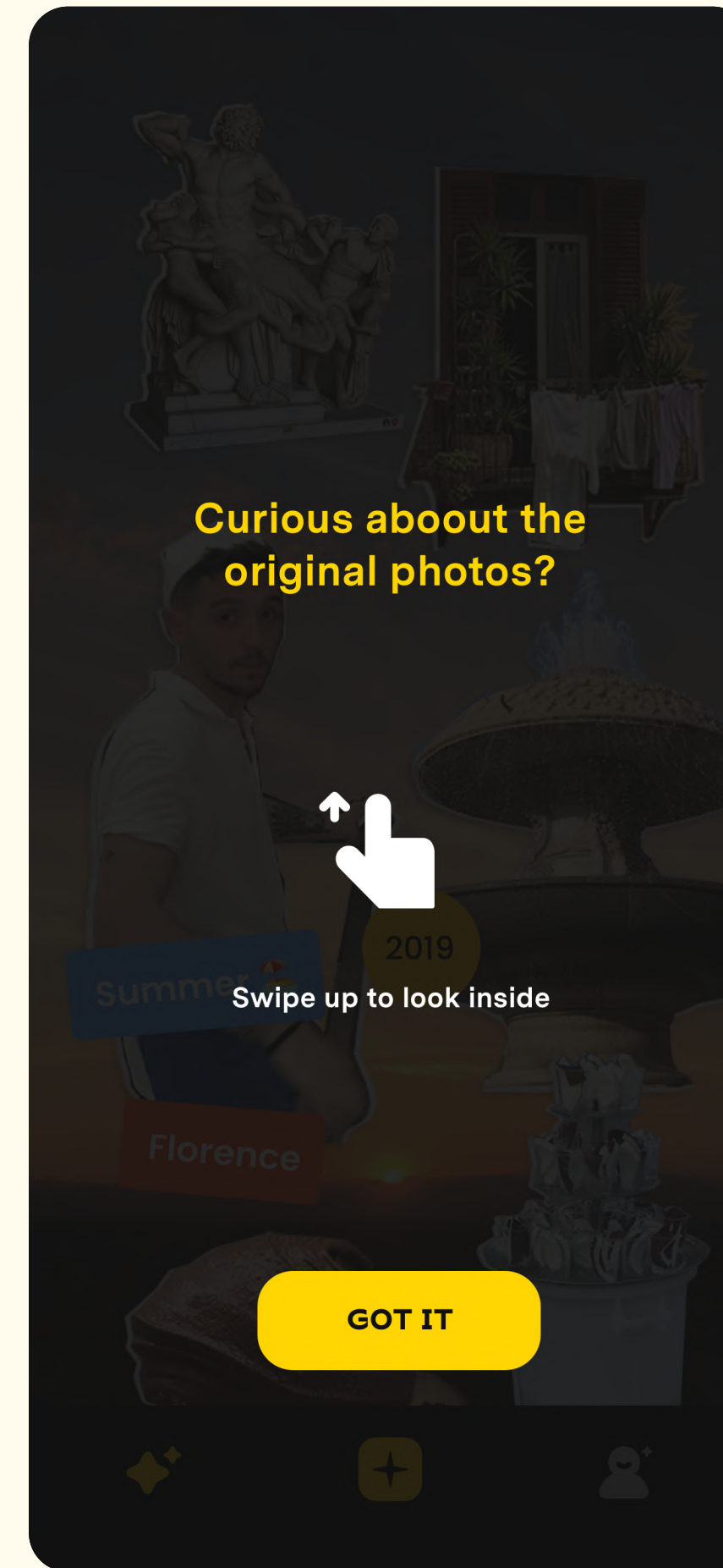
Instruction_look inside

Instruction_edit

How to see (exploring)

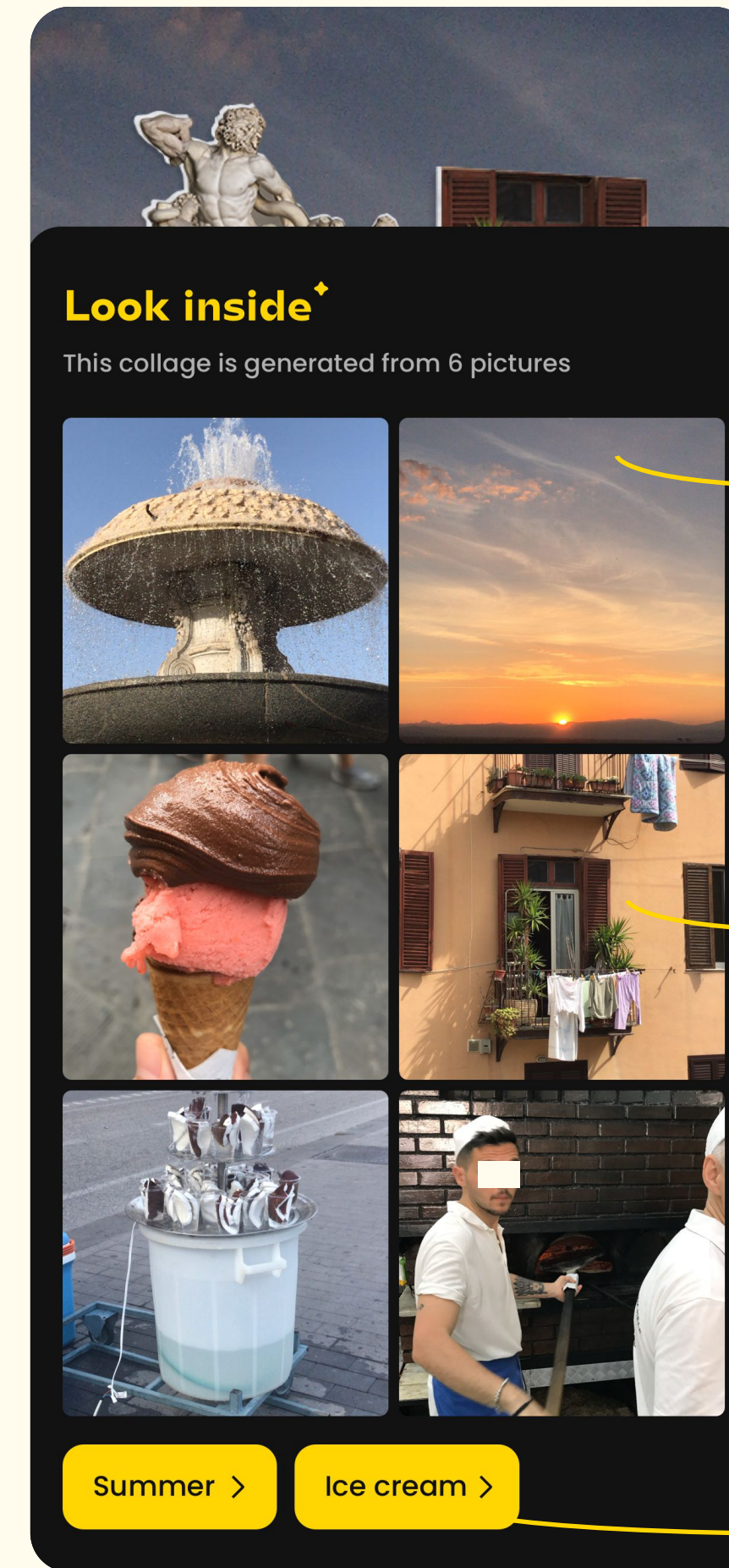**AI generated collages**
These change every time users open the app

Old days in London

2017

Christmas ☃️

Swipe to explore
Users swipe left and right to explore

2019

First collage

Summer 🏖️

Florence

2019

Swipe left to see others

Look inside⁺
This collage is generated from 6 pictures

Look inside
Users can swipe up on the homepage to open this popup when they want to see the original photos.

Tap for more
Users can tap to see the photo in a full-screen view and other related photos.

Tags
Users can tap to see related photos.

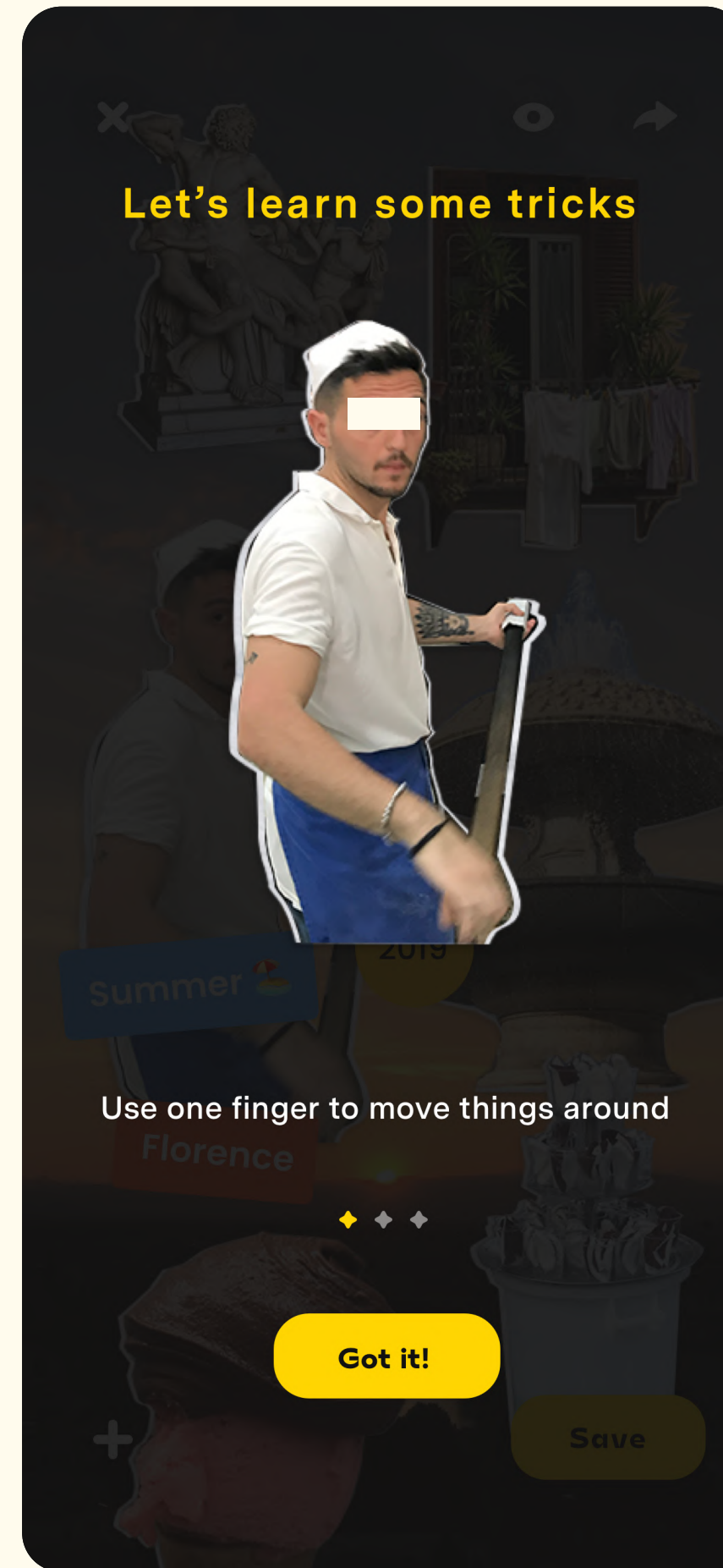Summer ›   Ice cream ›

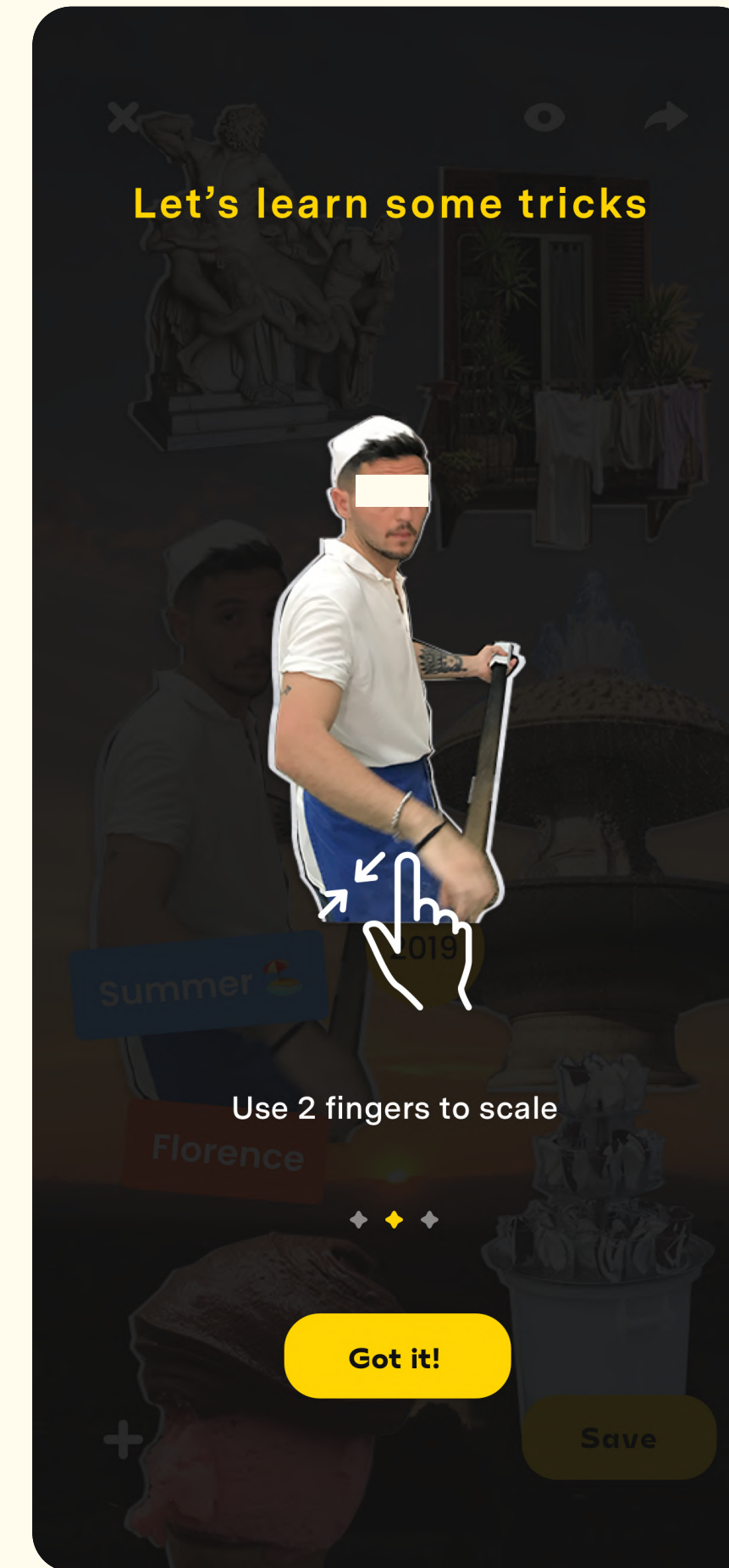Look inside popup
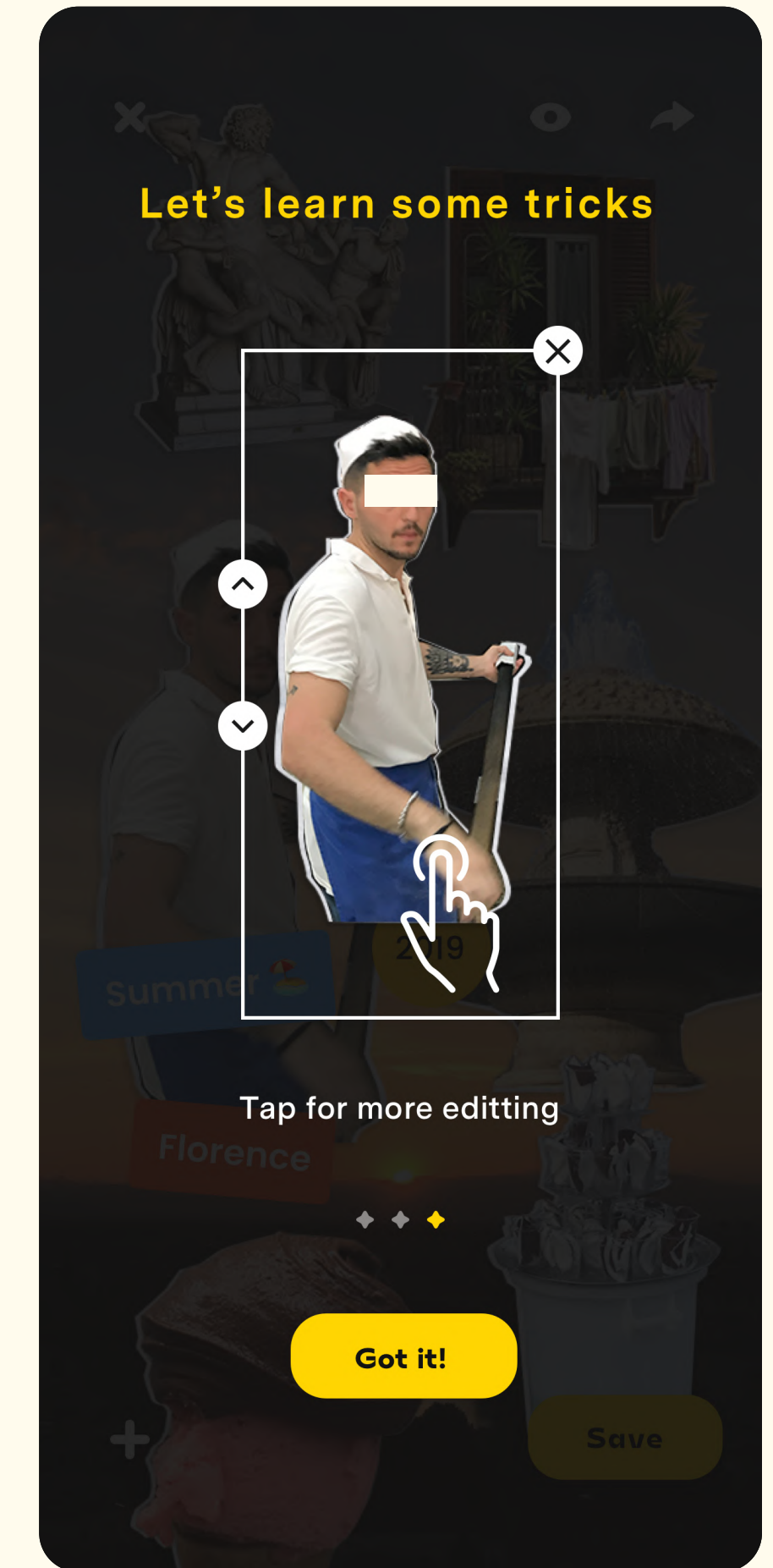
78

How to edit a collage

Tap a collage

Creation page

First time instruction_1

First time instruction_2

First time instruction_3

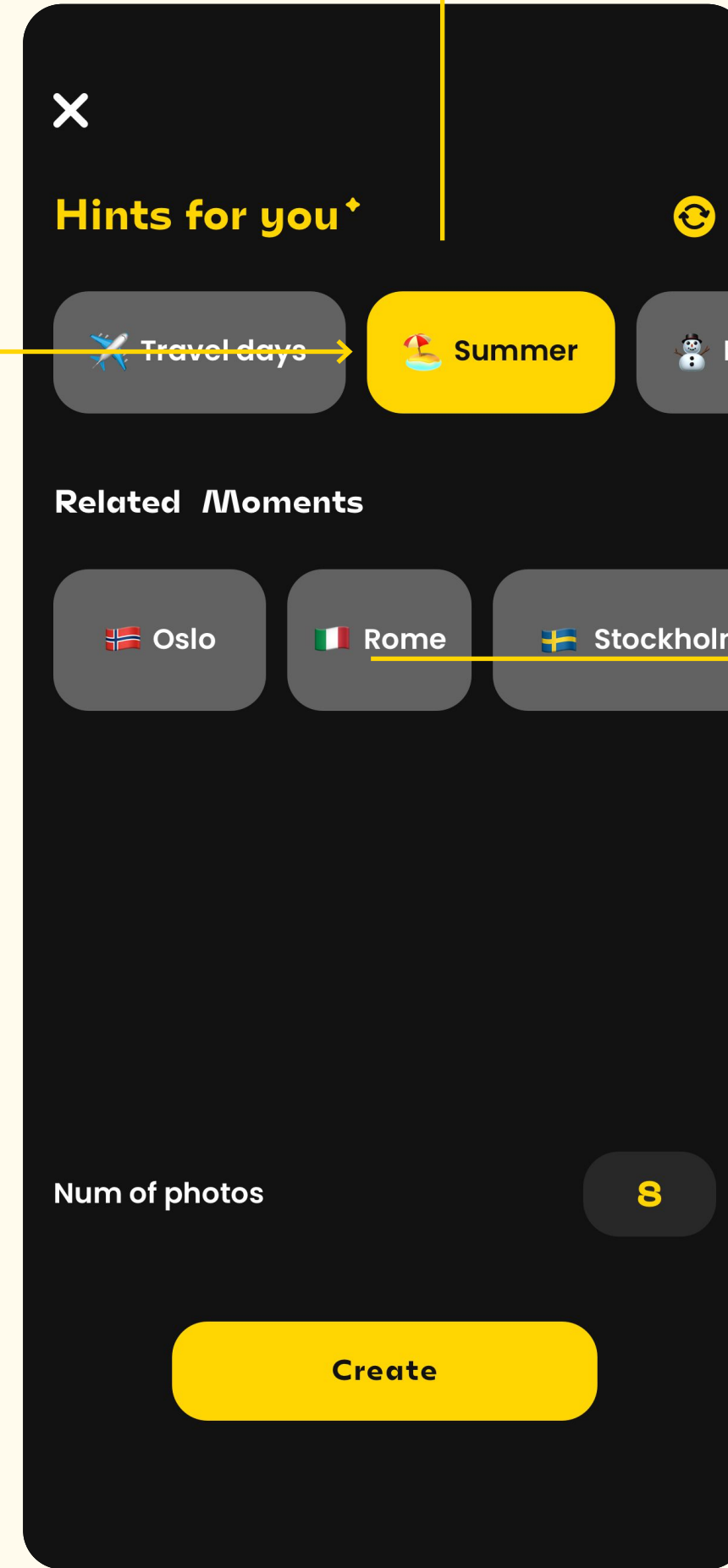# How to create by hints

Smart hints
Suggested based on location /
season / festivals and so on

Tap the add button
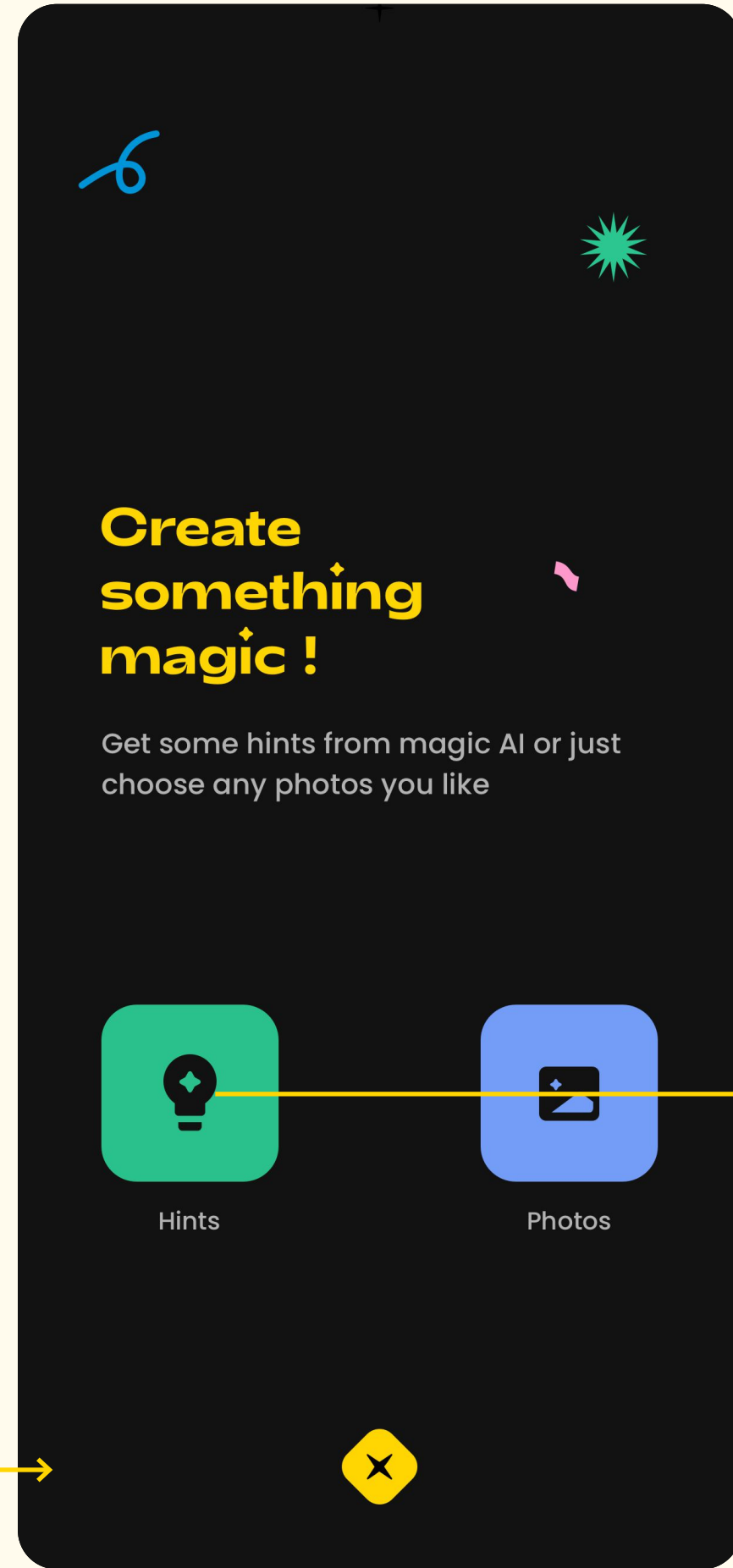
Create by yourself

Select hints_1
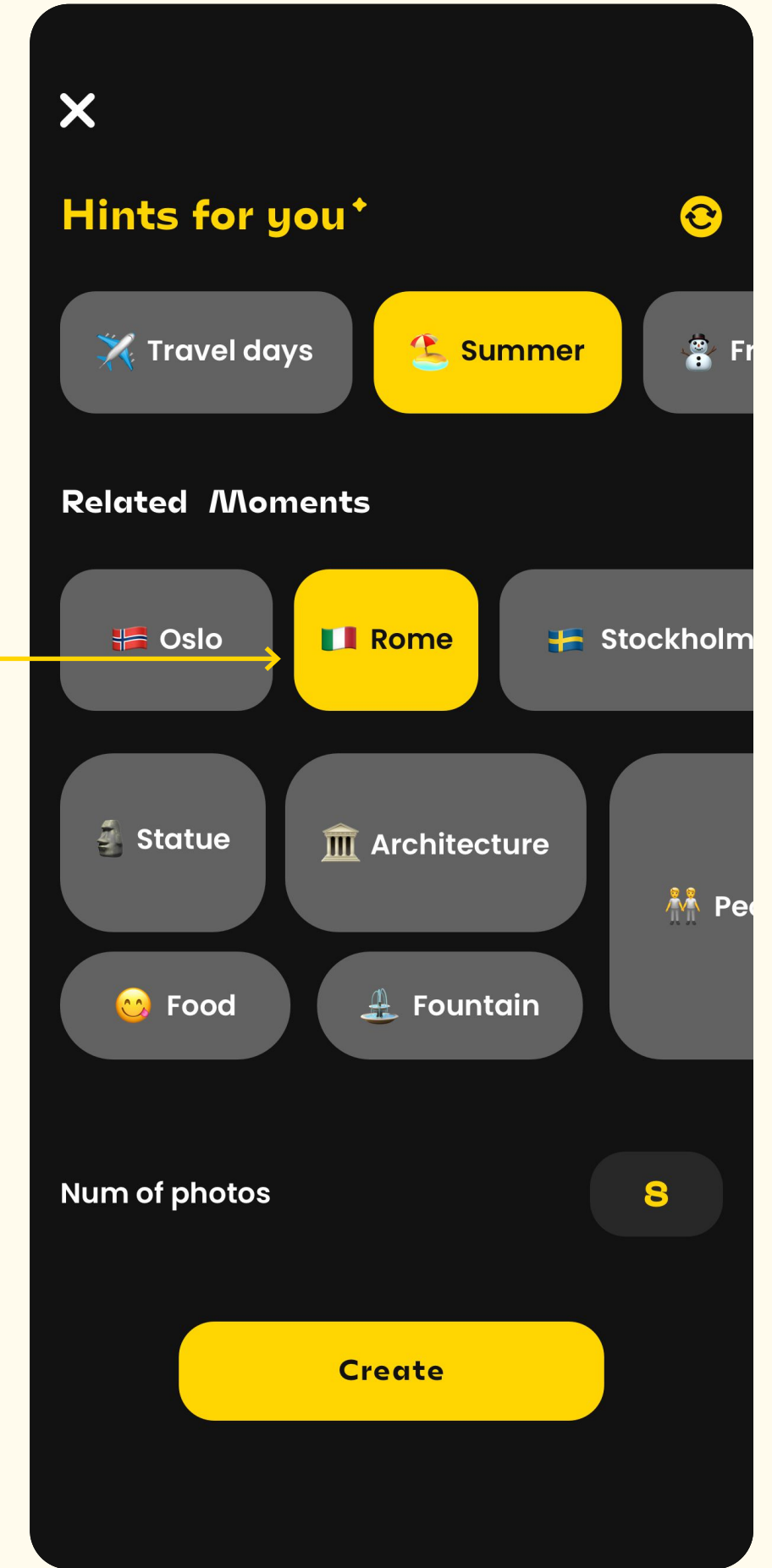
Select hints_2

Select hints_3

How to create

Move / rotate / scale
Remove the piece you don't like
Add new images
Change the background color
...

Create and share!

Check it out
(with old visuals)

Add new images

Creation page

Share your great work
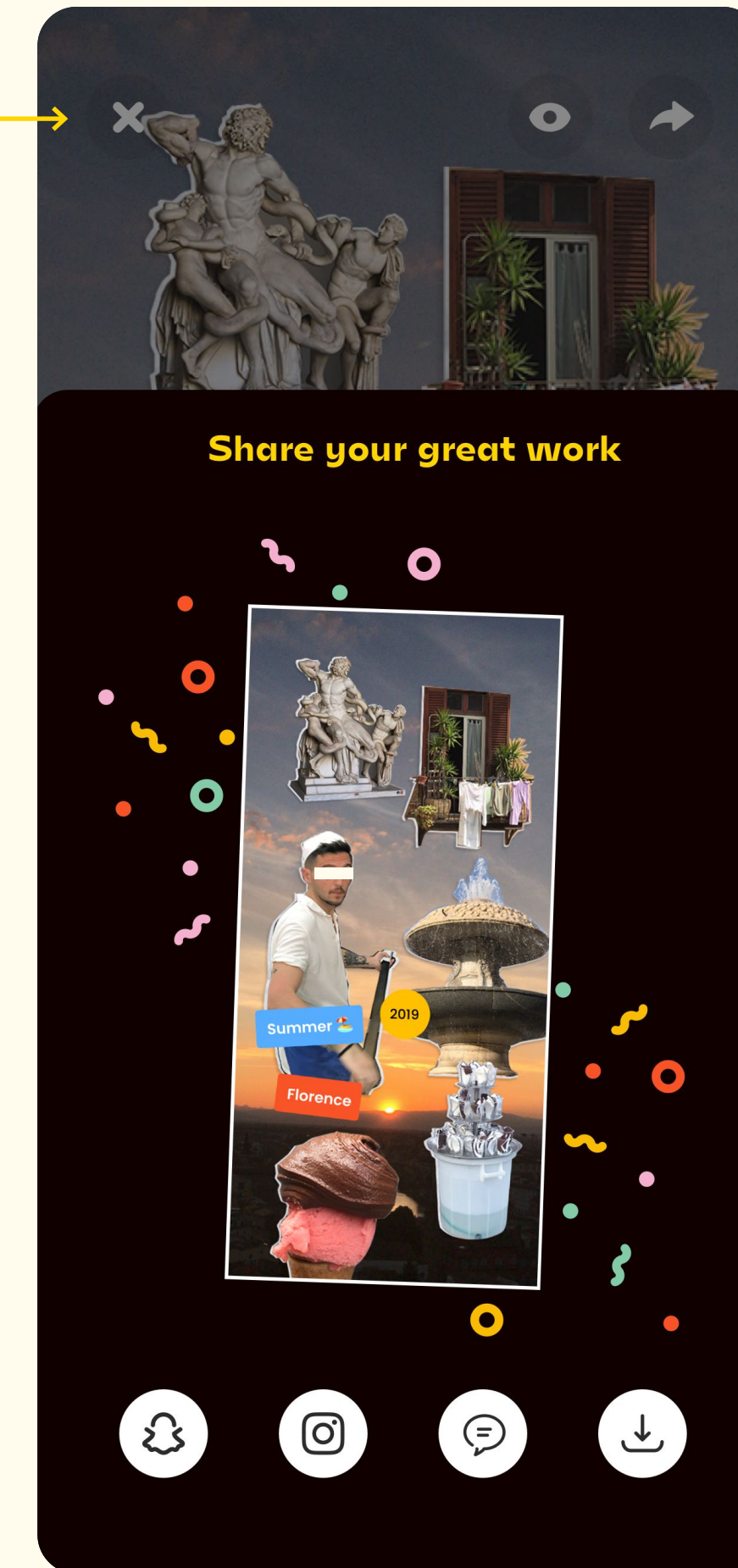
Share popup

Other good stuff

Gallery
All the works are here
Tap to edit

Profile page

Settings page

Look and feel setting
This will change the look and feel of the generated results

Privacy setting
This will hide photos that users rather not see again

User Scenarios

During the user testing, we discovered that the app can be used in many different ways, such as using as a visual diary or to create memes. We will show the potential of the app in three user scenarios.
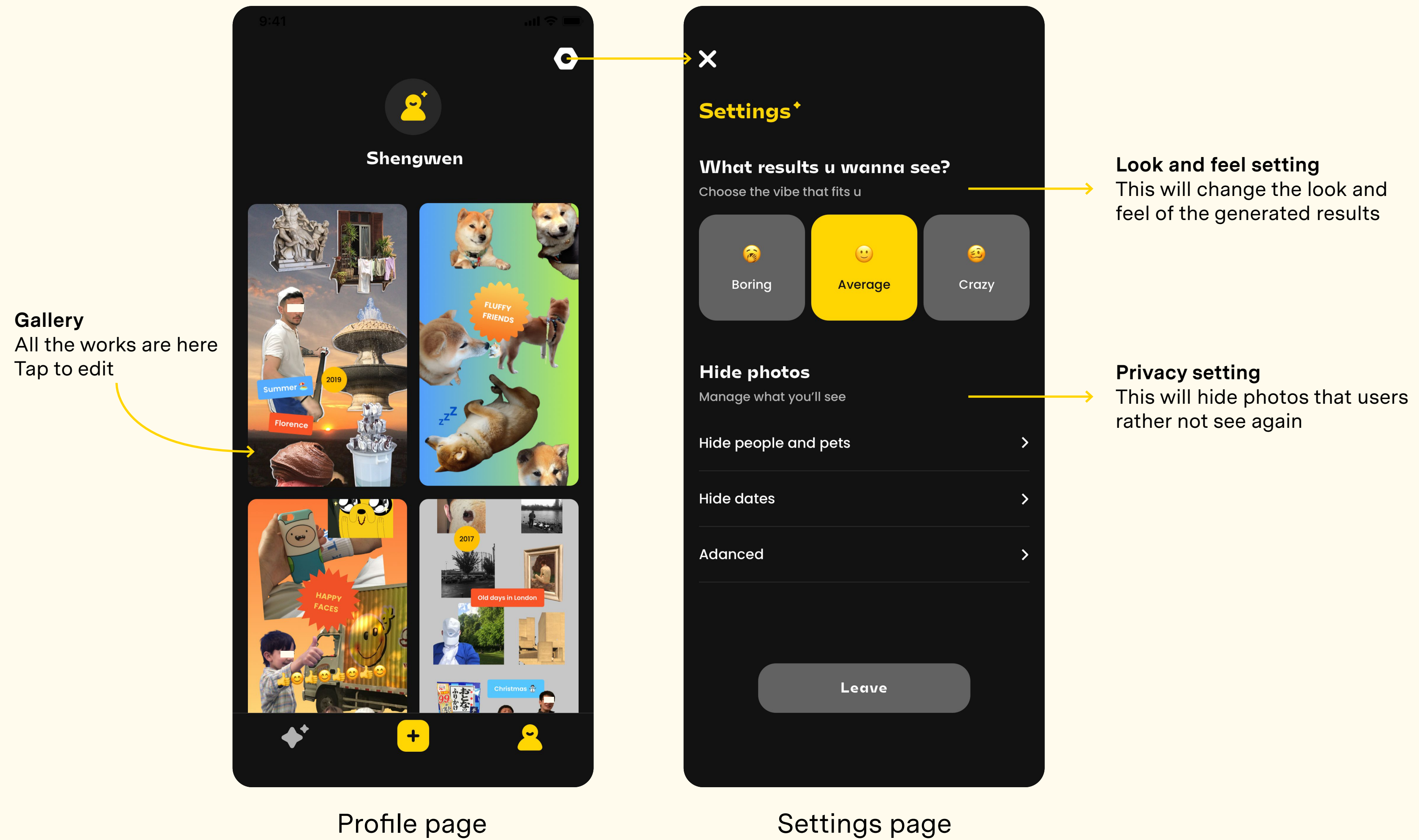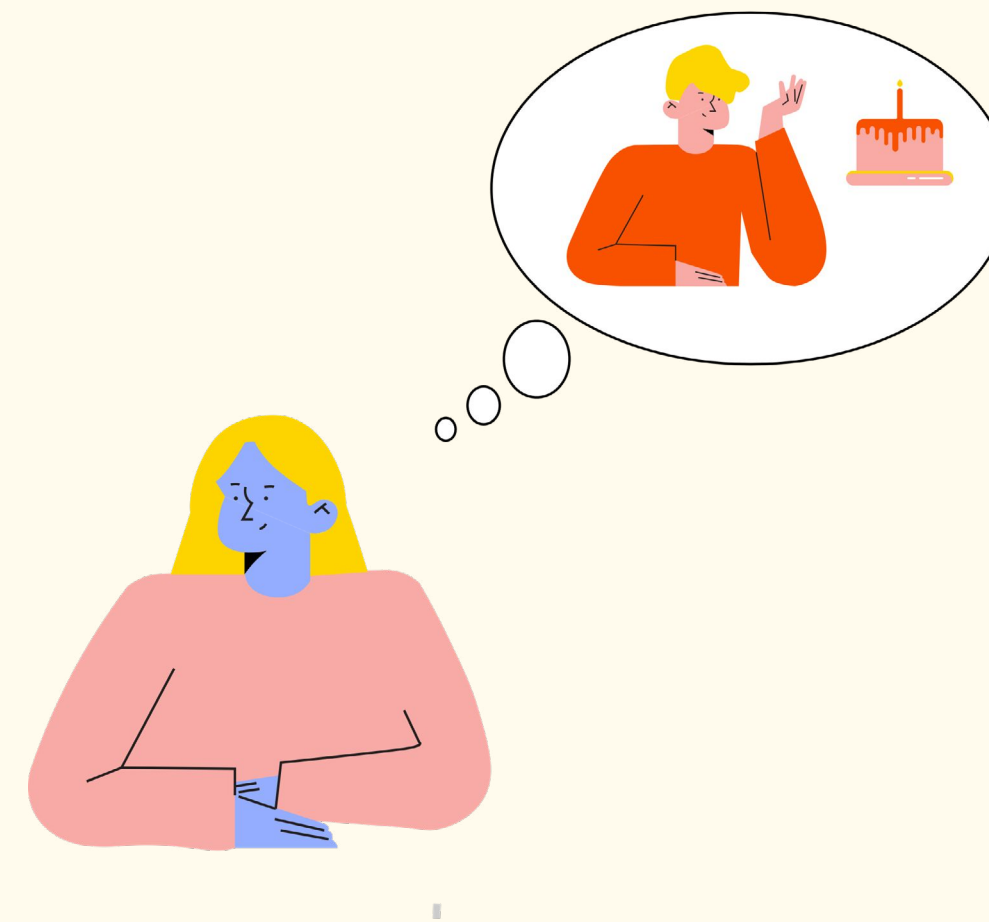
Emotional travel diary

Special birthday card

Surprising annual review

Potential user scenario 1
Emotional travel diary

4. She finds some interesting collages already made with some photos from her trip

2. A few days later, while sitting on the sofa, she starts to recall her great trip...

Ahh.. the nice food there...

1. Anna just came back from a trip.
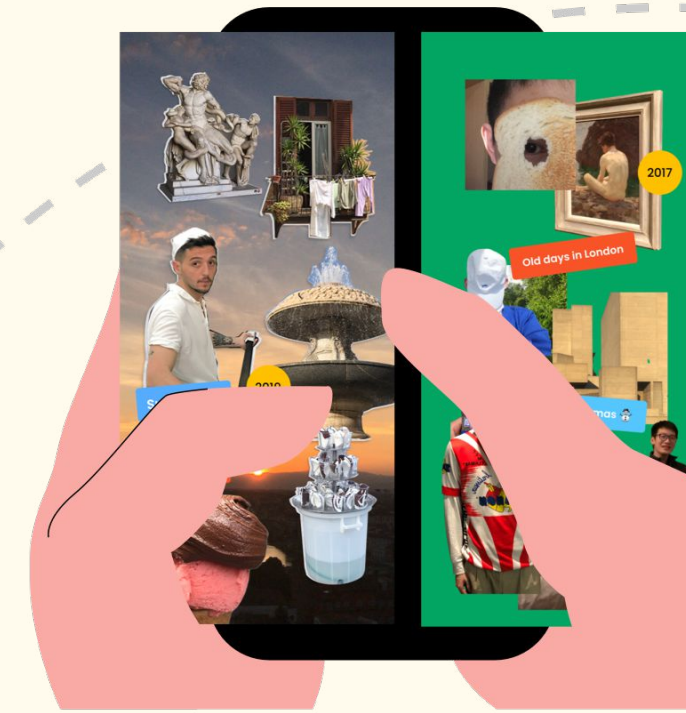
5. She's inspired by one of them, and starts to edit the collage. She also writes down some of her thoughts about this trip.

What photos for today?

3. She opens the app.
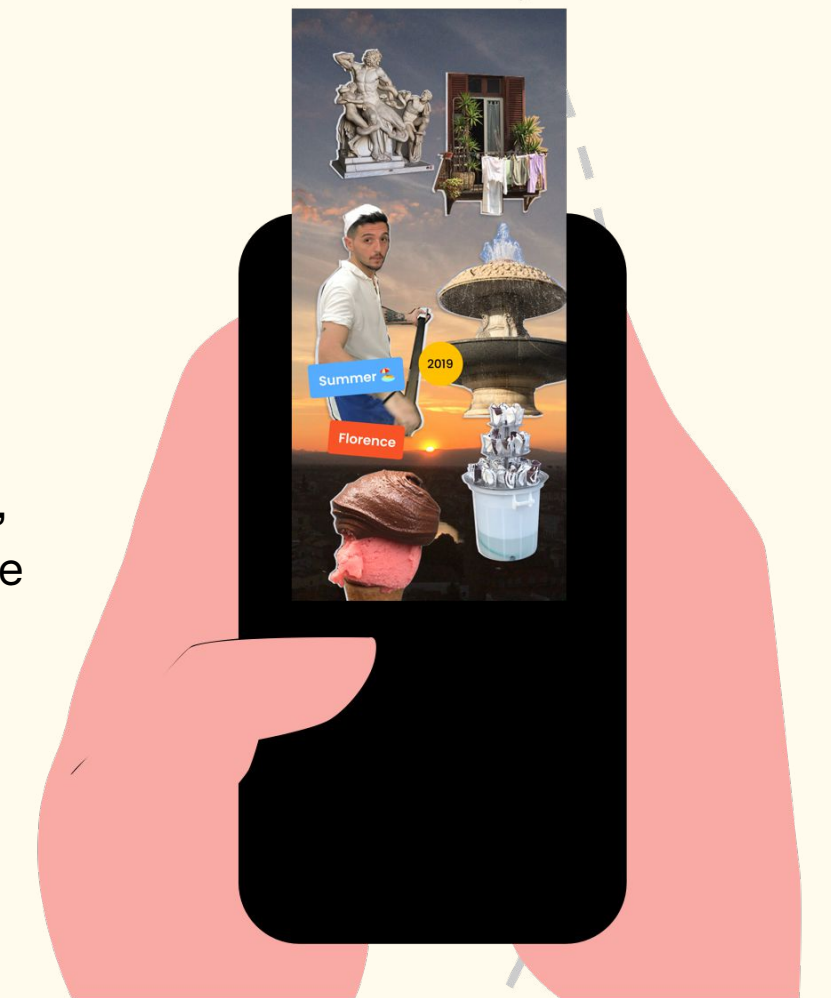
6. She saves her creation, thinking she may show it to her friends someday.

84

Potential user scenario 2
Special birthday card

1. Andrea realizes that her friend Timo's birthday is coming soon.

5. Timo receives the post-card on his birthday, and he feels very touched.

2. She opens the app and selects some photos related to her and Timo.

Dear xxx

3. She writes down some wishes to him and thank him for being such a good friend in her life.

4. The photos she selected are made into an interesting collage and it is sent to Timo as a digital postcard.

85

Potential user scenario 3
Suprising annual review

5. She clicks the selfie and realizes this's a random snap she took long time ago, but now it gives her a totally different feeling....

2. She starts to think about her whole year after she came home.
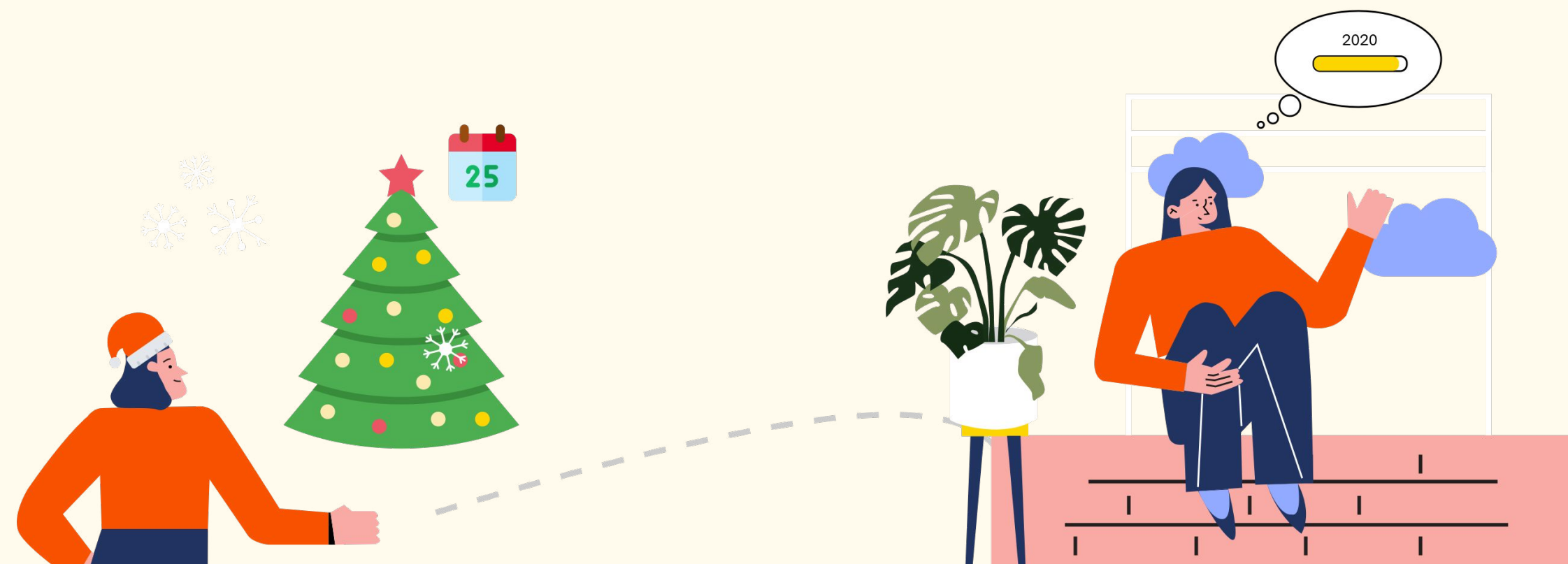
1. It's Christmas again! Lee feels very happy about the coming new year and everything.

3. She opens the app and finds one hint saying "Best of 2020". She clicks the hints that she's interested in.

4. She gets a surprising result: many fun photos that she almost forgets, and one selfie that she has no clue.

???

Technical feasibilty

We had already tested with multiple users and designers during the previous iterations to verify the validity of the concept, so we talked to an AI engineer (from Microsoft) to get feedback on the technical aspects in the end.
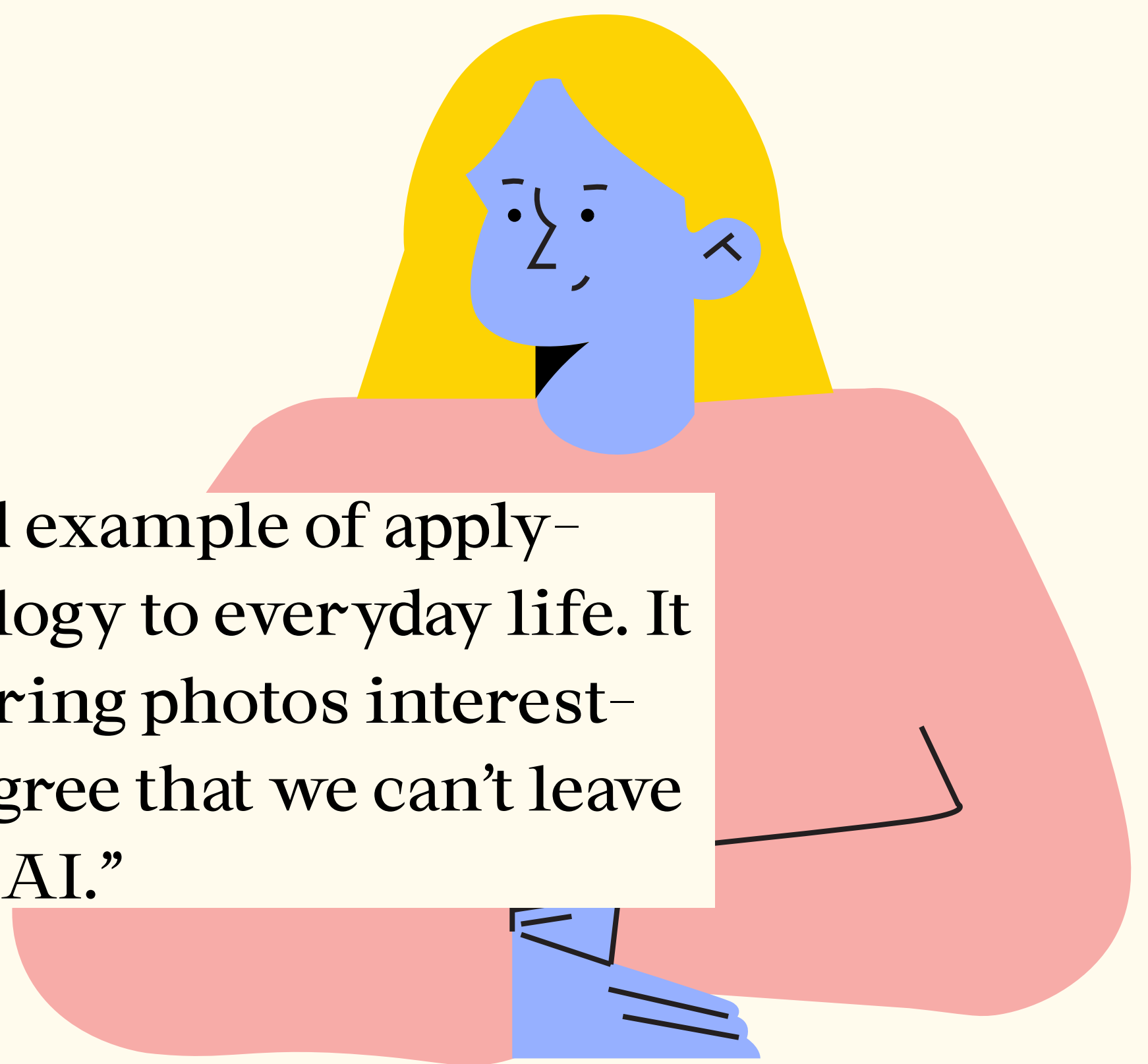
We found that the concept works in theory, but requires complex algorithms and the results are definitely not perfect, such as AI picking out irrelevant photos and the auto-generated collage not looking nice. But it is right to offset these flaws by providing users with tools to create their own.

"This is a good example of applying AI technology to everyday life. It makes our boring photos interesting. I totally agree that we can't leave everything to AI."

AI engineer, Microsoft

Limitations & Next step

Because of technical limitations, we could only select photos ourselves to make collage examples, which is very different from how the AI selects photos. Whether the collage result is interesting also depends largely on the selected photos. Besides, although most users were interested in the app during the testing process, whether it continues to engage them requires a longer testing cycle via a fully functional prototype.

If we had more time, we would explore how to make the results more diverse and interesting, such as designing different stickers. We would also like to explore a playful sharing experience since sharing is a good way to encourage users to create.

Closing Thoughts

Reflection

Our role as designers

We were happy that after a tortuous and sometimes frustrating design process, we ended up with a conceptual product that both ourselves and others who tested it found fun and valuable.

Looking back on this project, we not only gained design doing and thinking skills but also realized the value of designers more deeply.

As Steve Jobs said, "Creativity is just connecting things", designers can often see overlooked issues from a different perspective and find the connections between things more acutely. (Jobs, 1996) Essentially, our final concept is not new, but rather a combination of long-standing col-

lage art with AI technology to create a new experience and inject more fun and possibilities into everyday life.

At the beginning of our diploma, we asked the question: how can we, as designers, handle the relationship with the ever-changing information and technology? Through the exploration of AI technology, we deeply realized that in this era of information explosion, we have to use technology to help us select and manage information. One of the designers' roles is to humanize technology, to enable ordinary people to enjoy the benefits that new technology brings to their lives.

Reflection

Extending the meaning of photos

At the end of the day, we can not answer the question of whether the advancement of technology has devalued photos. But after this project, we have realized that the popularity of smartphones has allowed us to record fleeting moments at any time for us to look back on at some point in the future. At the same time, the memories and meanings carried by photos become more dynamic and richer as people communicate and interact with each other by re-creating and sharing them.

The power of two

As a team, from the beginning to the end, the constant collision of ideas and questioning each other made this collaborative project more rich and solid.

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Thank You

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To Angel, for proofreading the entire report.

To each other, for peer learning and questing each other for overall improvement of this project.

To you, for spending your time to reading this report.

Appendix

Camera history mapping

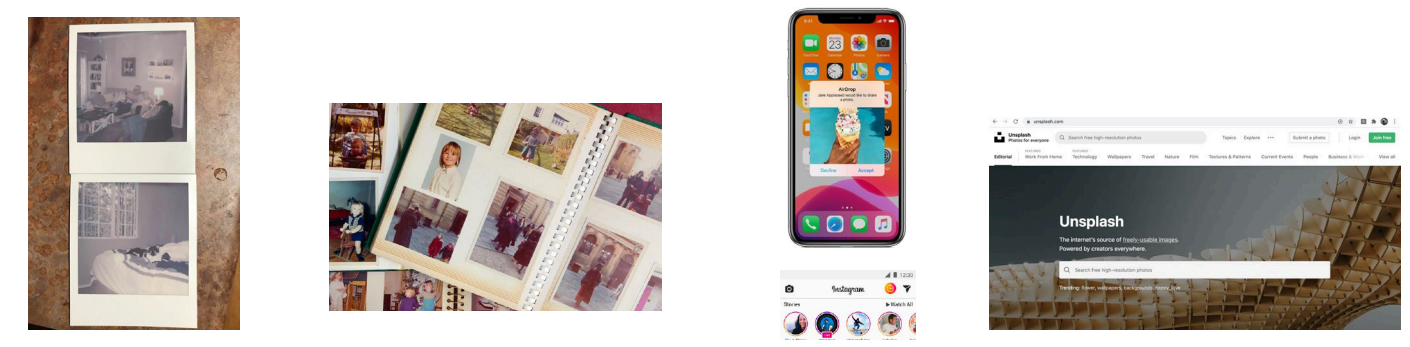| 1500
The Pinhole Camera | 1839
The Daguerreotype Camera | 1900
The Reise Camera | 1900
The Kodak brownie | 1925
The Leica I | 1947
Polaroid Model 95 | 1972
Polaroid SX-70 | 1975
Kodak Digital Camera | 1991
Kodak dcs slr | 2000
Sharp J-SH04 | 2007
Apple iPhone | Now ———— |

ave incessantly
graphic
ries and

Position

Result
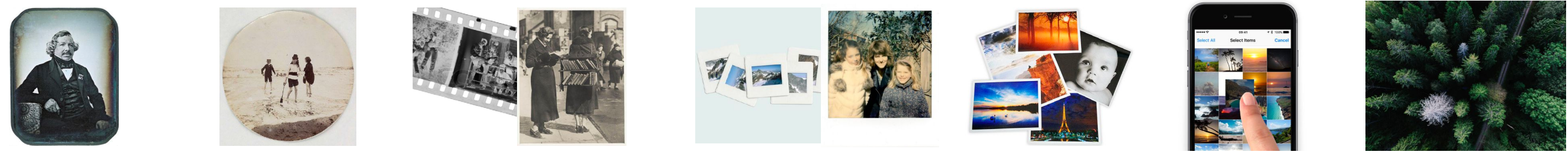
| Daguerreotype | Kodak "box" camera | black-white filmstrip | slide film   Polaroid | print-outs | digital albums |

Way of sharing

The rest of the procedure — exposing, developing, processing, and printing — all required a time-consuming process in the darkroom

Such an image connotated the camera to positive emotions related to the symbol of "children," such as youth, curiosity, and joy, constructing an enticing device that seems to guarantee the users' fun and happiness, specifically promising for family consumers.

Early ideas

Move to take a photo
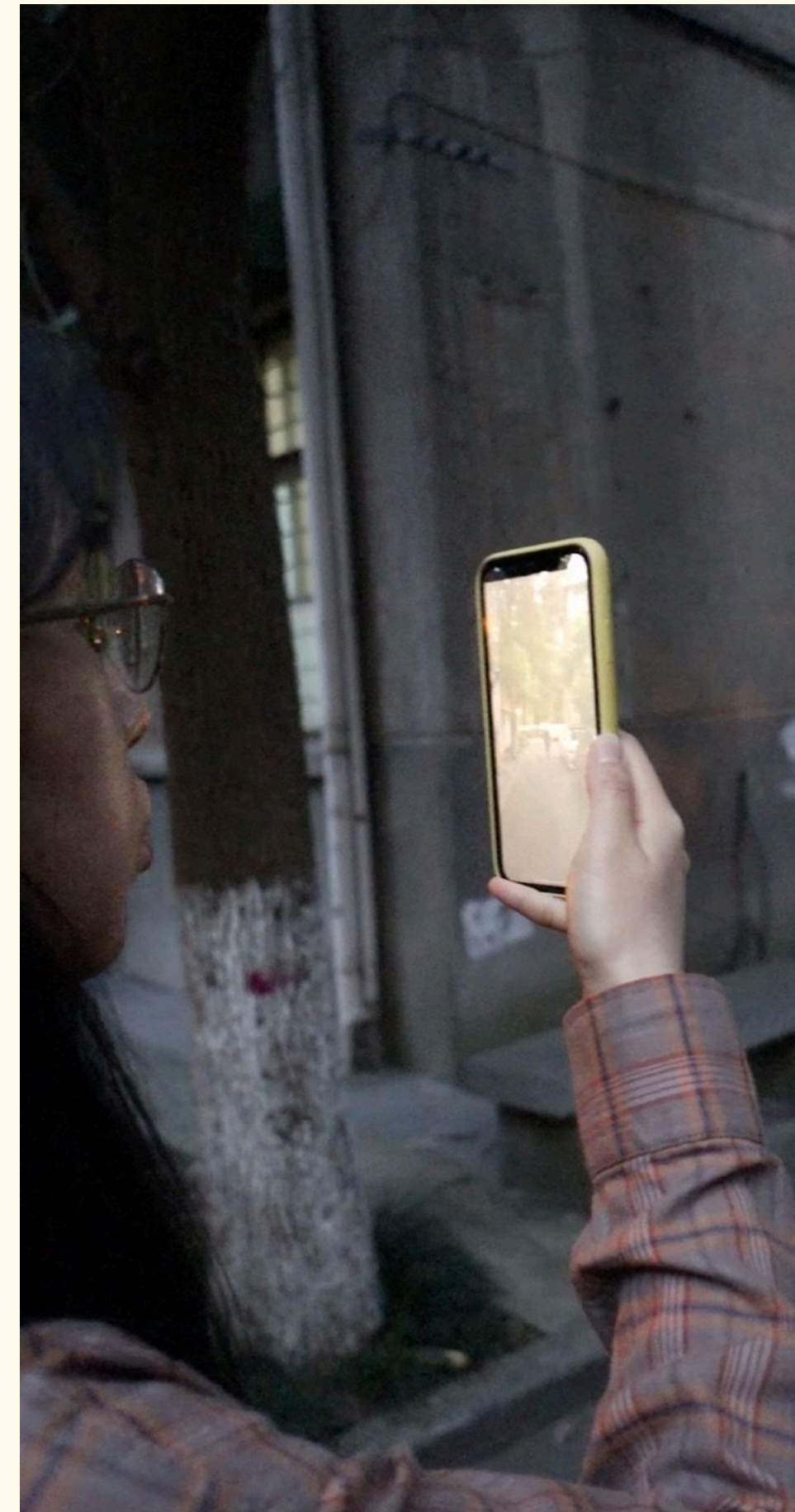
Blow to take a photo

New ways to trigger the shutter

We explored some fun way to take photos in the early stage of our process.
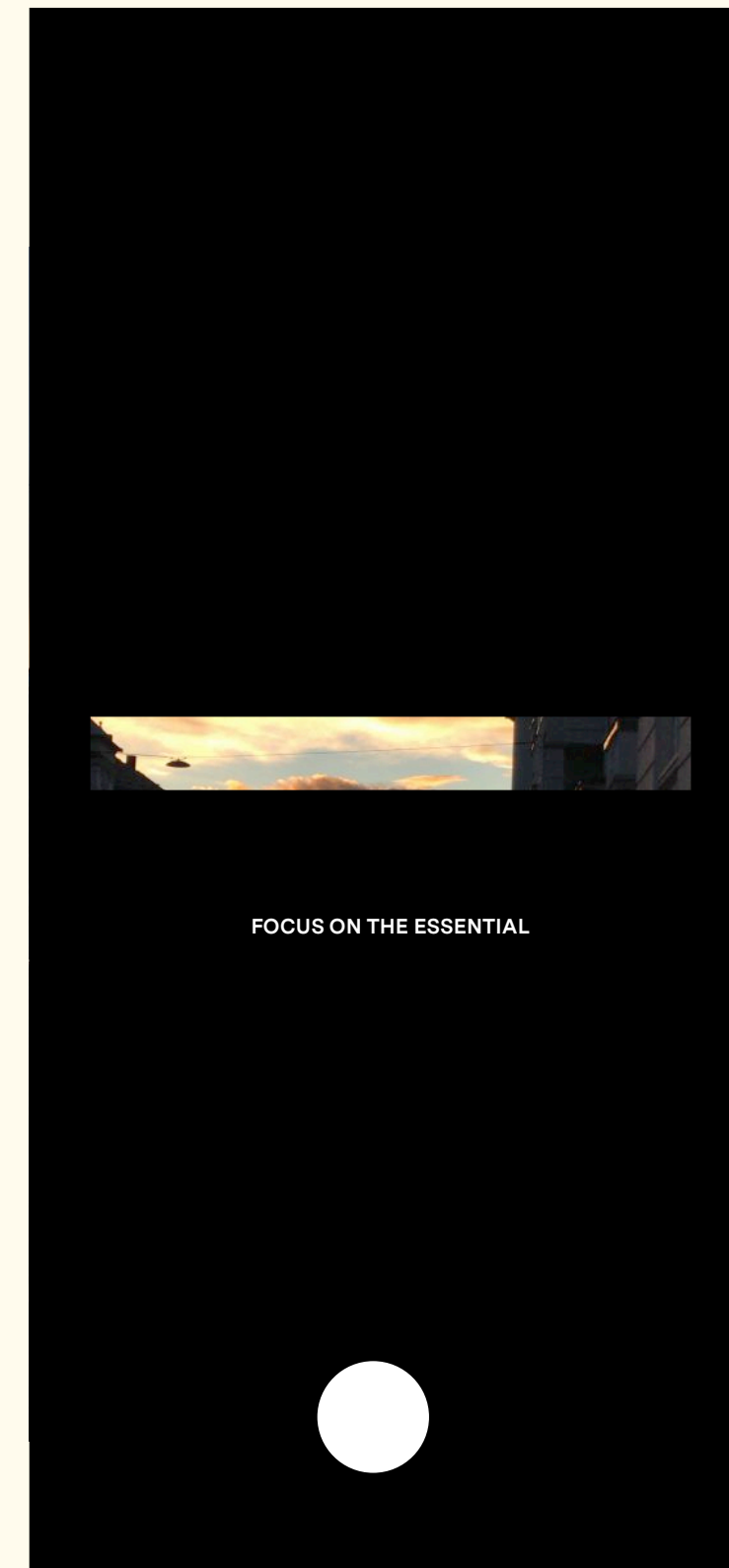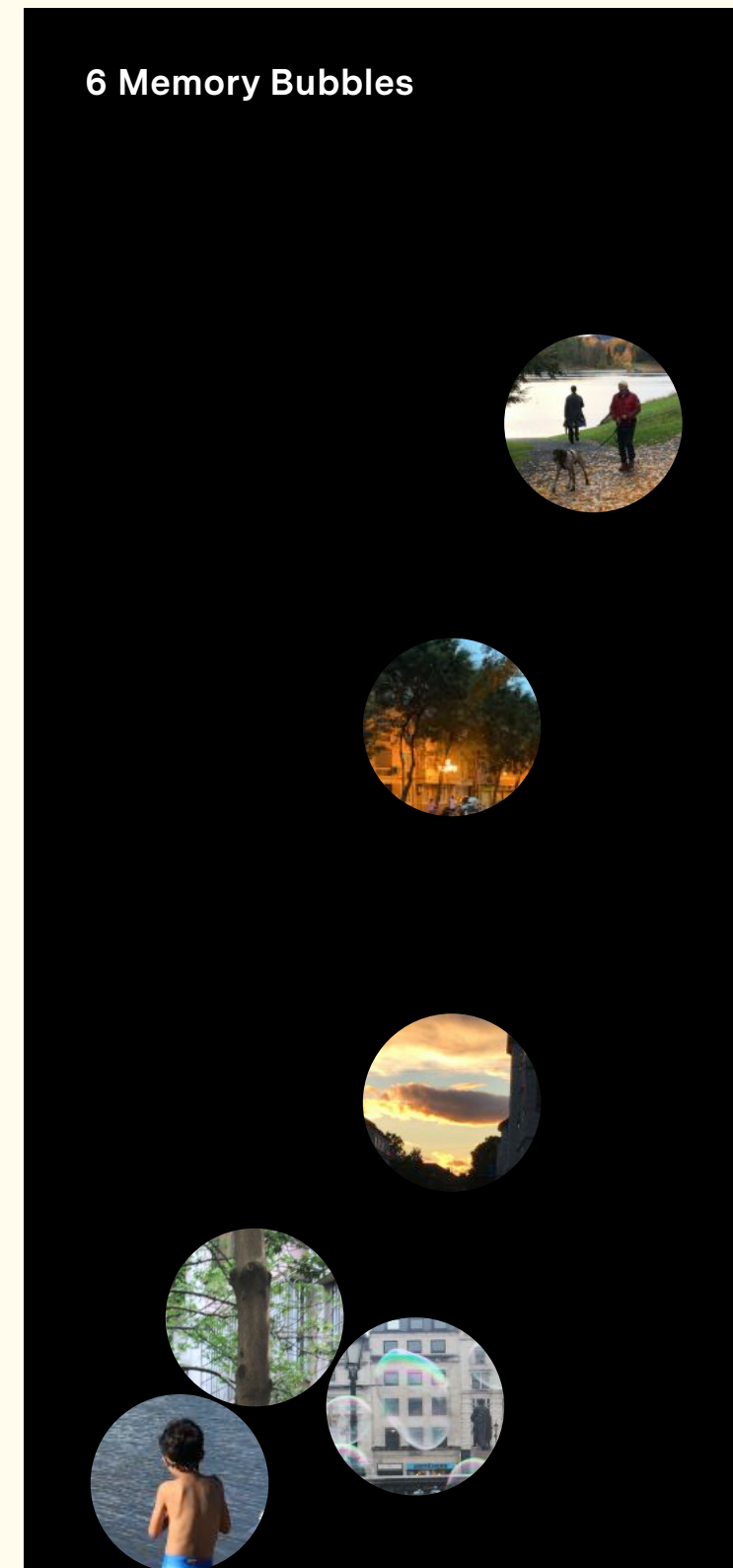
Early ideas
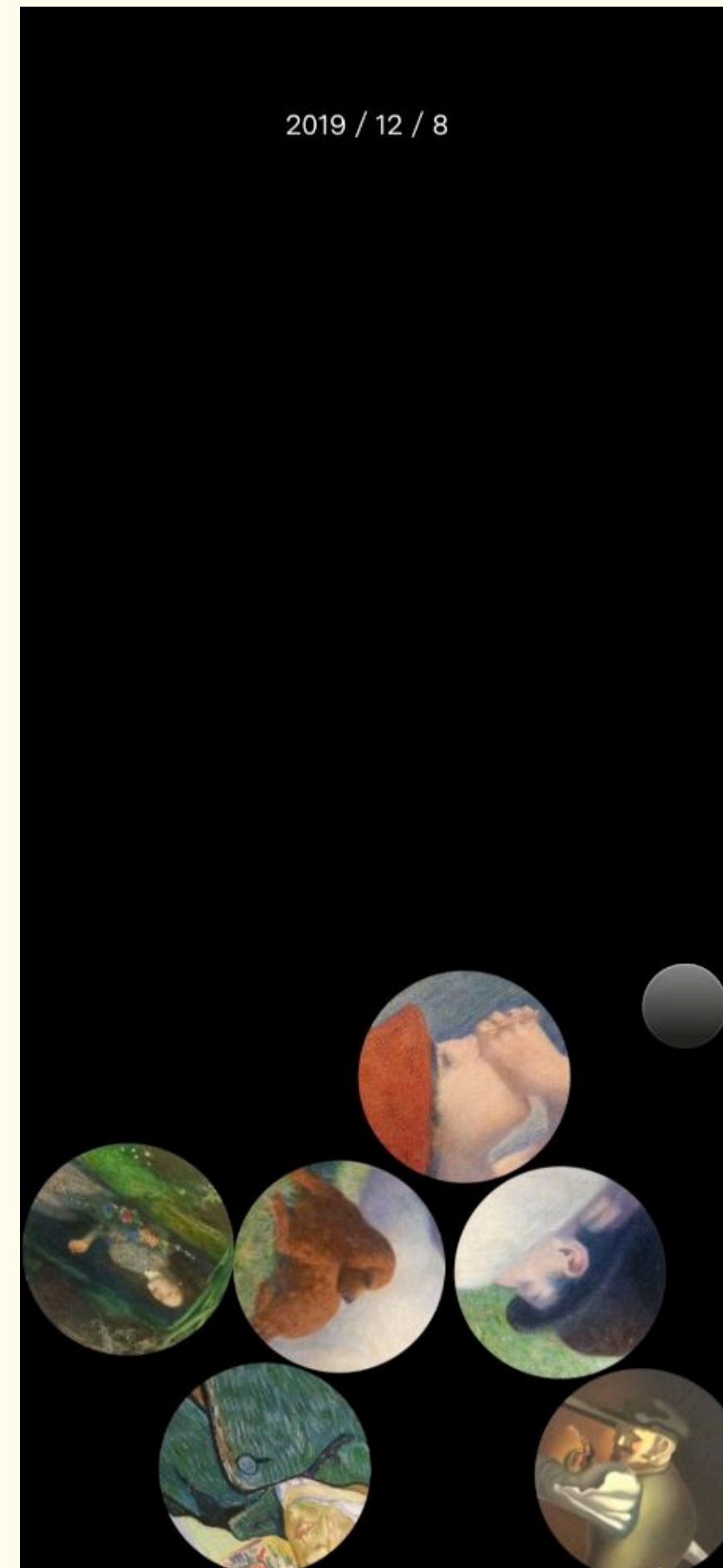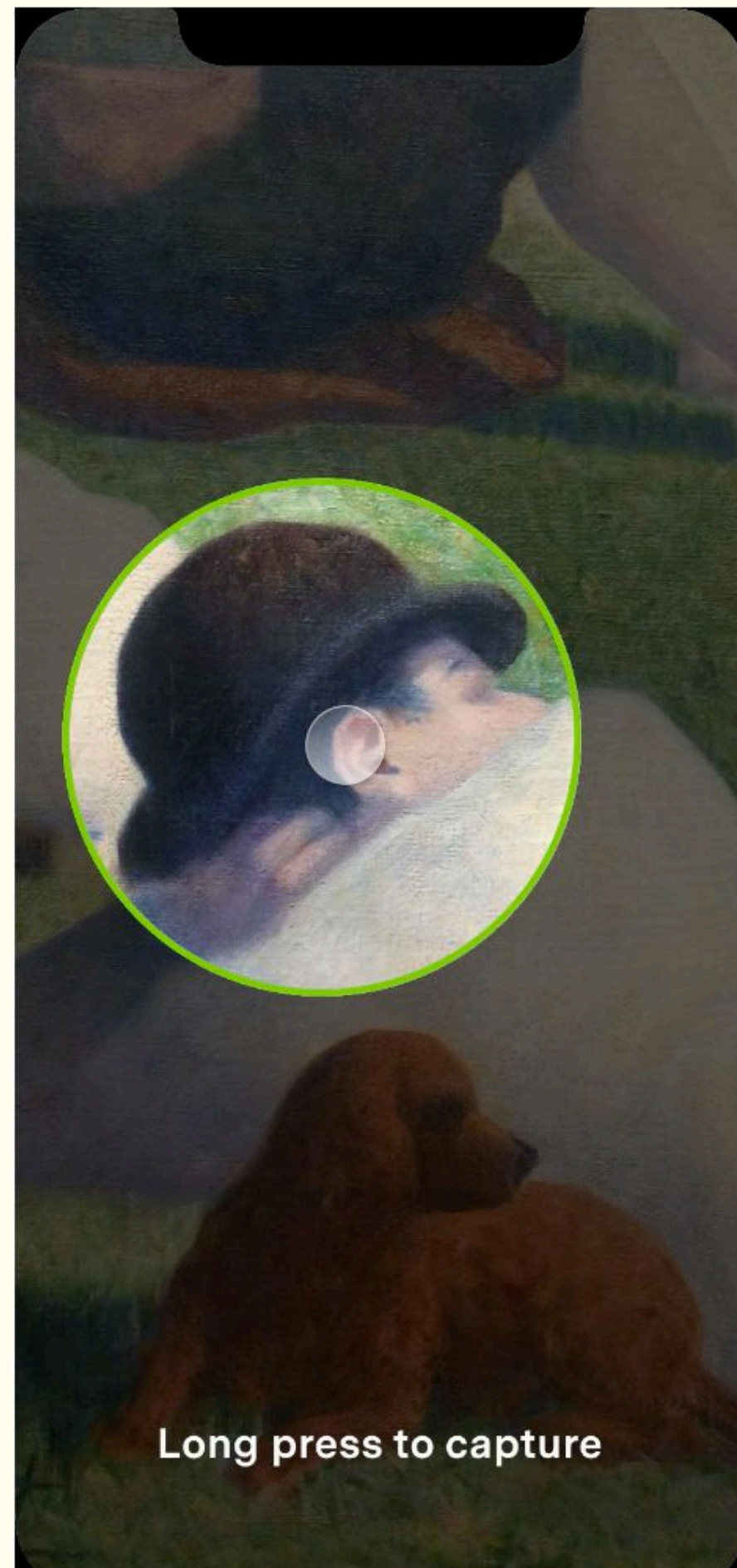
A gallery for inspiration

In our research we found that many people like to take photos for inspiration. This is the idea of capturing the most interesting piece of a moment into a circle, and automatically collecting them into a separate category.

Early ideas

Memory bubble

This idea to cover most part of camera's view-finder and led users to focus on the most inter-esting part of the photo.
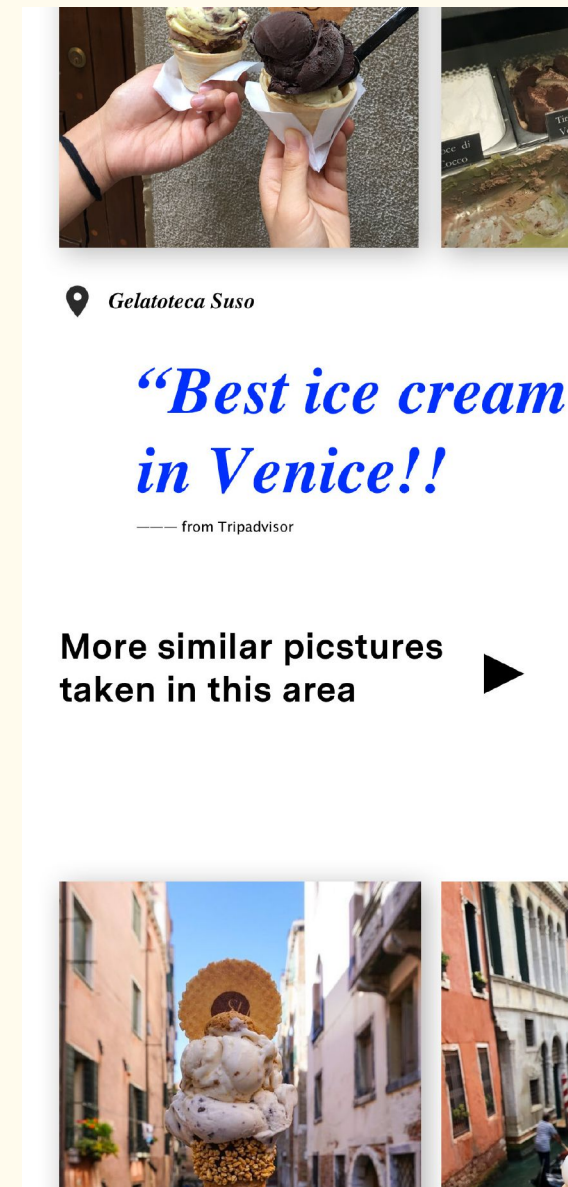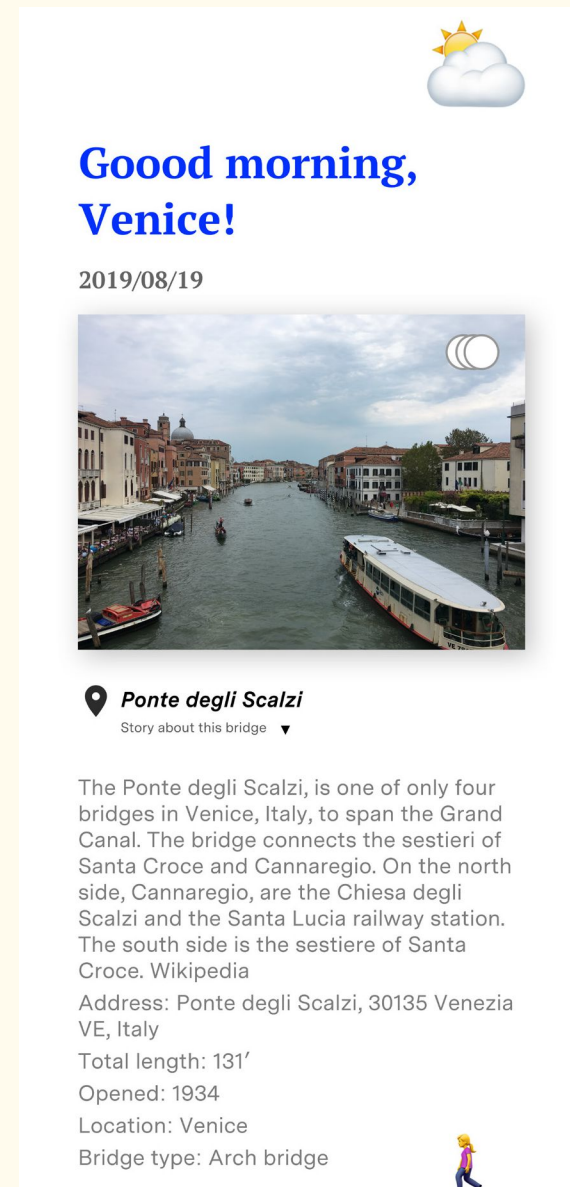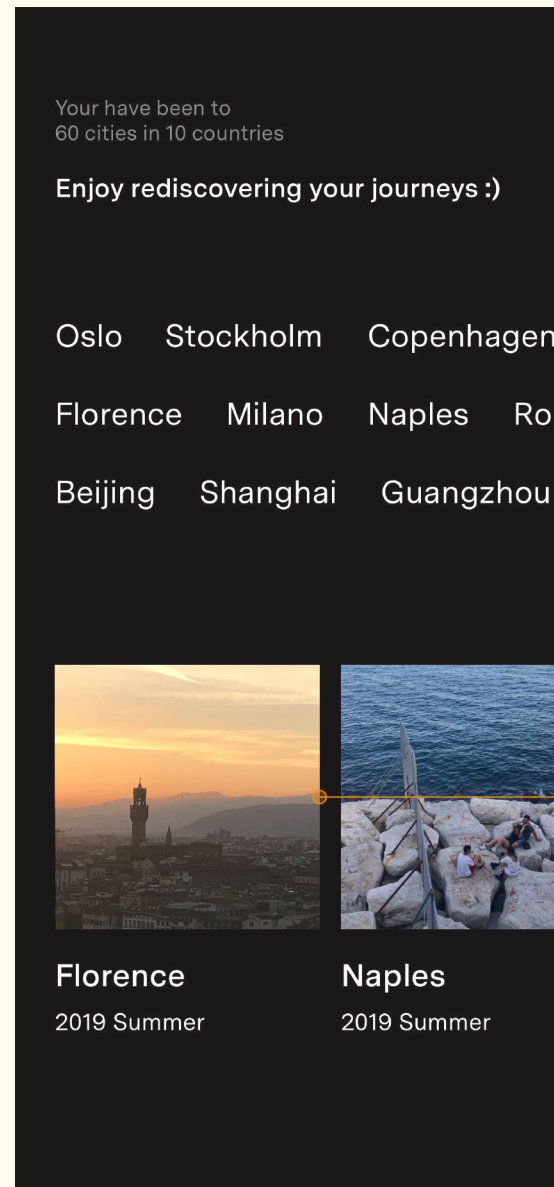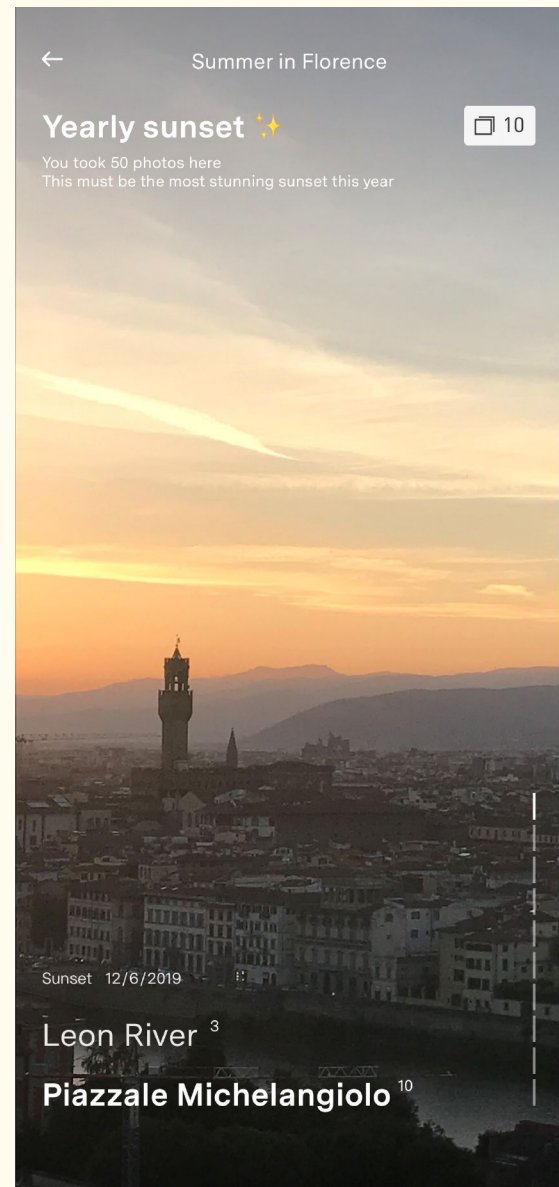
Design travel photos revisiting

Nowadays, it is possible to view photos taken at the same place via map view and browse photos chronologically via timeline view. But both the interaction and the visual presentation are very instrumental, and recalling a memory is supposed to be emotional. So we explored the possibility of curating photos into stories through more smooth interactions and more emotional visuals to help users recall better. Because we found that most people take a lot of photos when they travel, and travel memories are the ones they want to recall more often. So we tried to do something based on travel photos.

Metadata analysis

Summer in Florence
11/6/2019 - 12/6/2019

Day 1 30 ℃ / Sunny 11/6/2019

Florence Duomo
Seems you're not a big fan of historical stuff
19:44

Florence Cathedral
You're stunned by the delicacy
19:48

Duplicates

Trattoria Zaza
2 hours
19:57

You spent more than 2 hrs here 😊
Hope the food worth it!

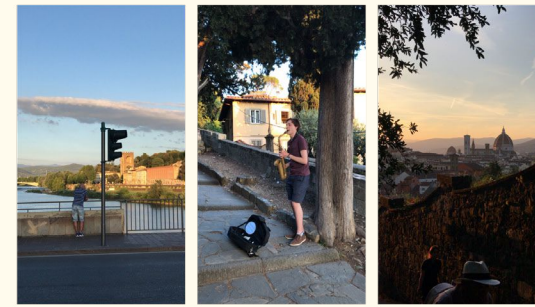

21:18

Day 2 32 ℃ / Sunny It was super hot!

Uffizi Gallery
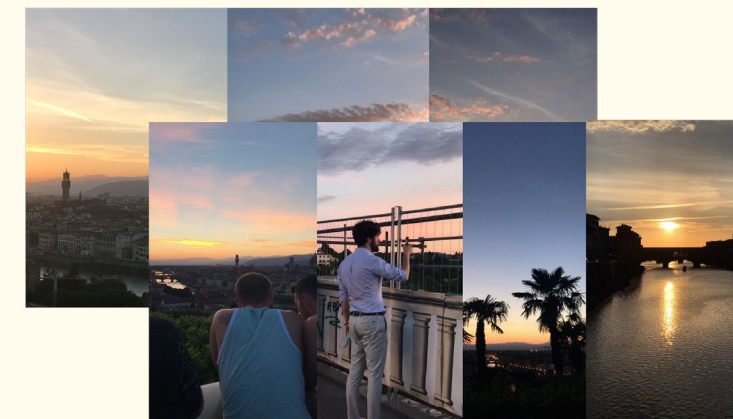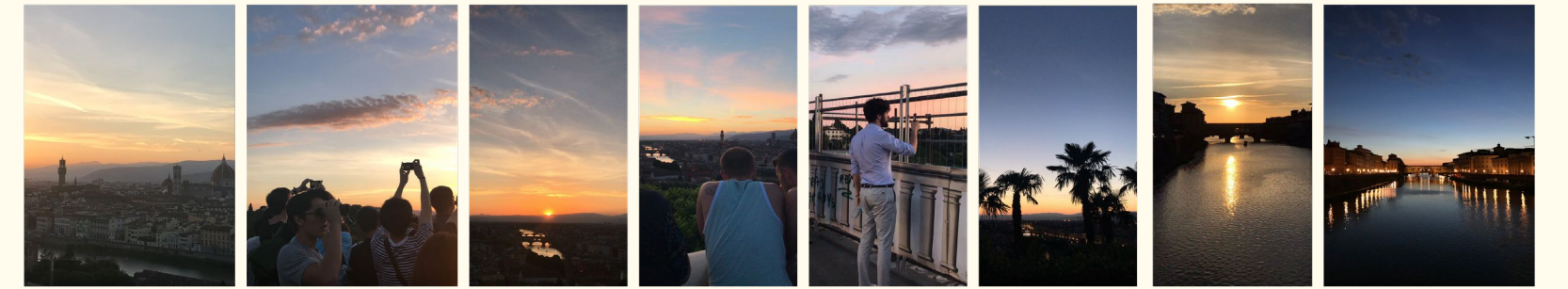13:43   14:53

Vipera 😊
15:25

Leon Nero
20:24   20:35   20:36

Piazzale Michelangiolo
20:46   20:47   20:48   21:08   21:09   21:19

You took 200 photos here
You must really enjoy the sunset

Highlights ✨

Leon Nero
21:30   21:39

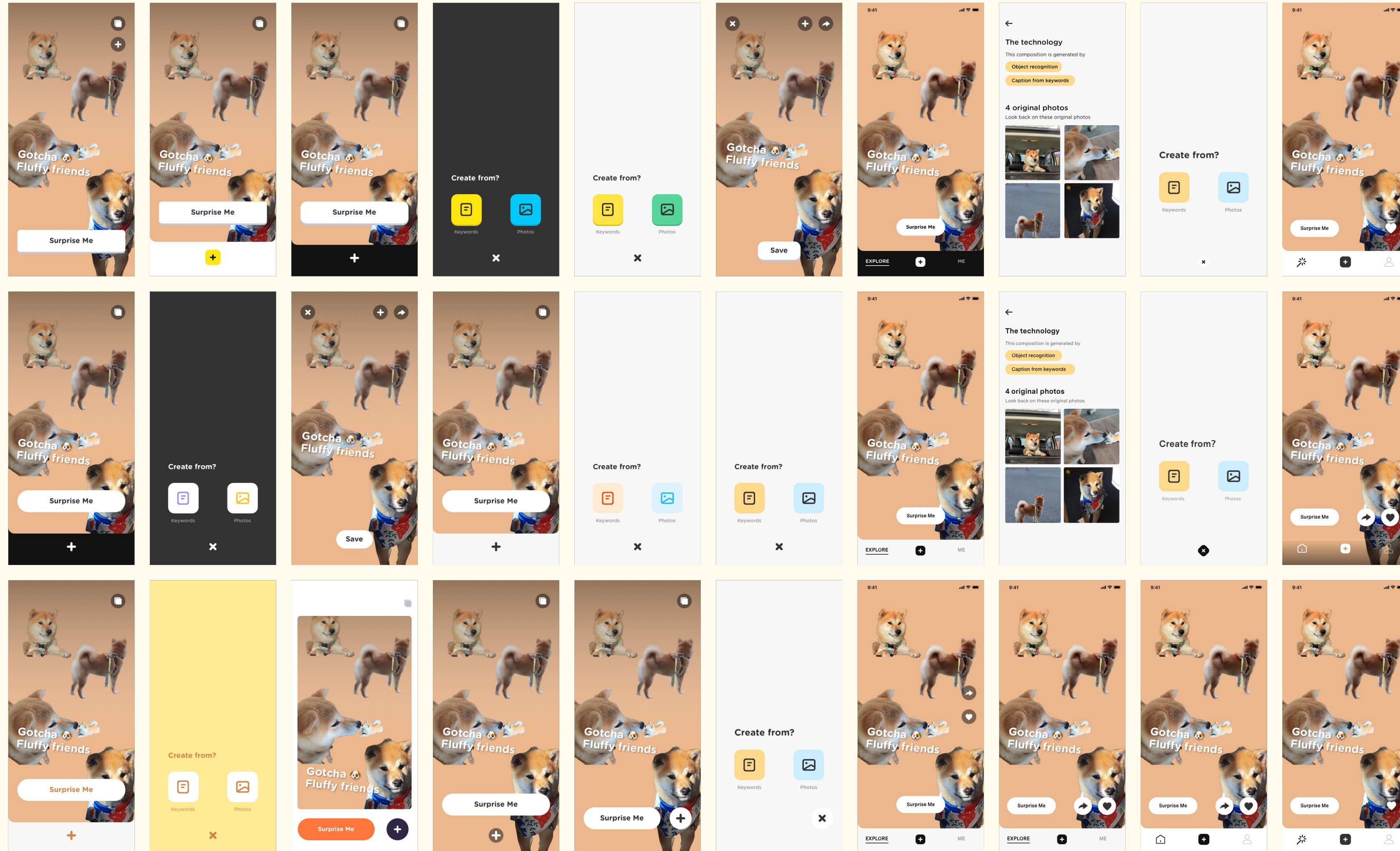## Data

Date

Time stamp

Weather

Location
Tourist attraction Restaurant Store Hotel

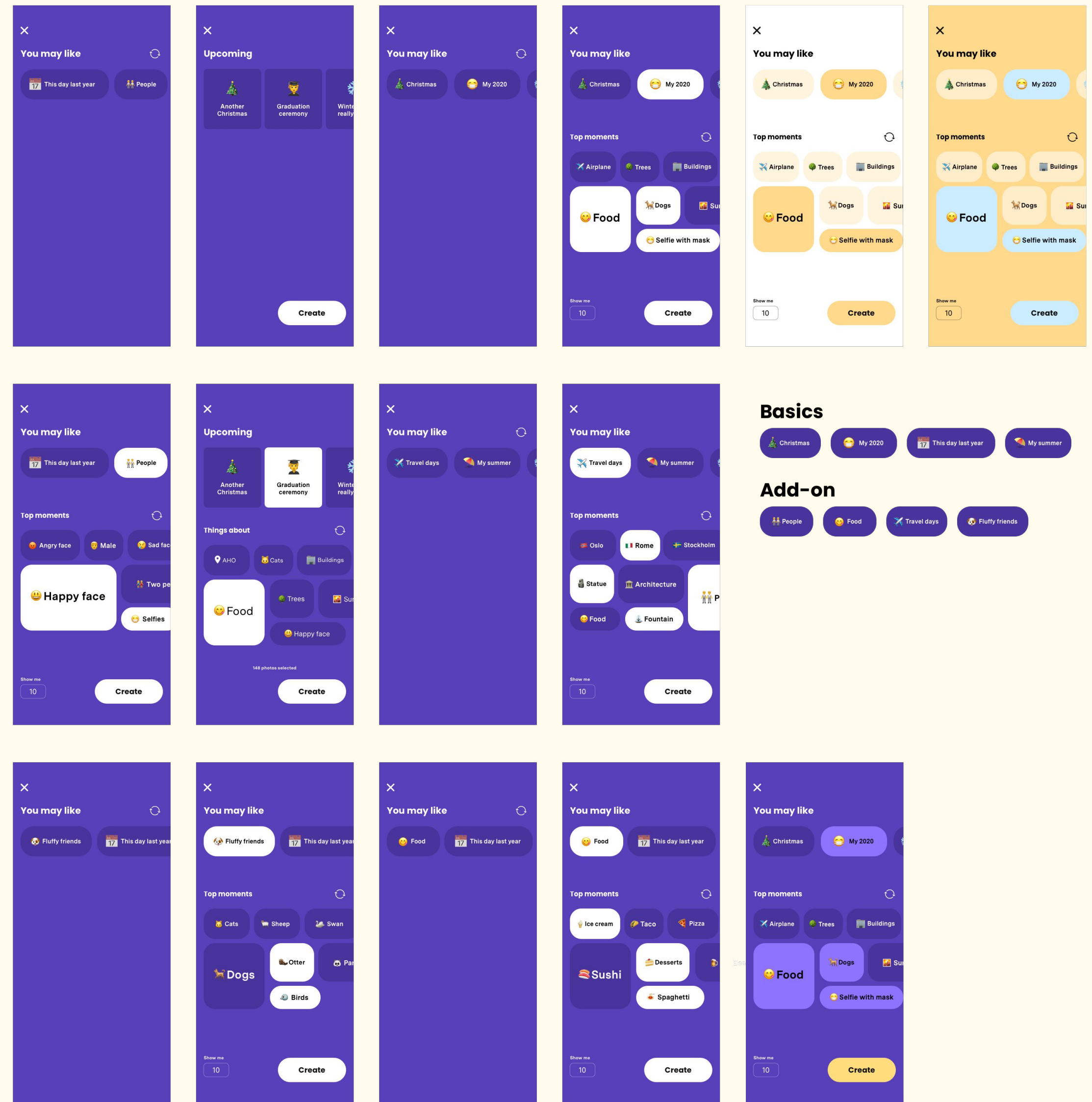Number of pics

Simlilarity of pics

Things recognized in pics

Output

Season

Morning / Afternoon / Night… & Duration

It was …

Location name / infos / features

Level of Interest (not interested - highlight)

Interestingness / Hiding duplicates

Story-telling

Extra

Add memo
Add mood
Share

UI Refinement

UI Refinement

Basics

Christmas | My 2020 | This day last year | My summer

Add-on

People | Food | Travel days | Fluffy friends

Thanks for reading :)