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Digital Starlight Memorial:
An Online Memorial System with Tangible Interactive Interface

By

Wei Wu

Bachelor of Architecture, Guangdong University of Technology, 2019

Submitted in partial fulfillment of the requirements for the degree of

Master in Design Studies
Art, Design, and the Public Domain

At the Harvard University Graduate School of Design

May, 2022

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Wei Wu
Harvard University Graduate School of Design

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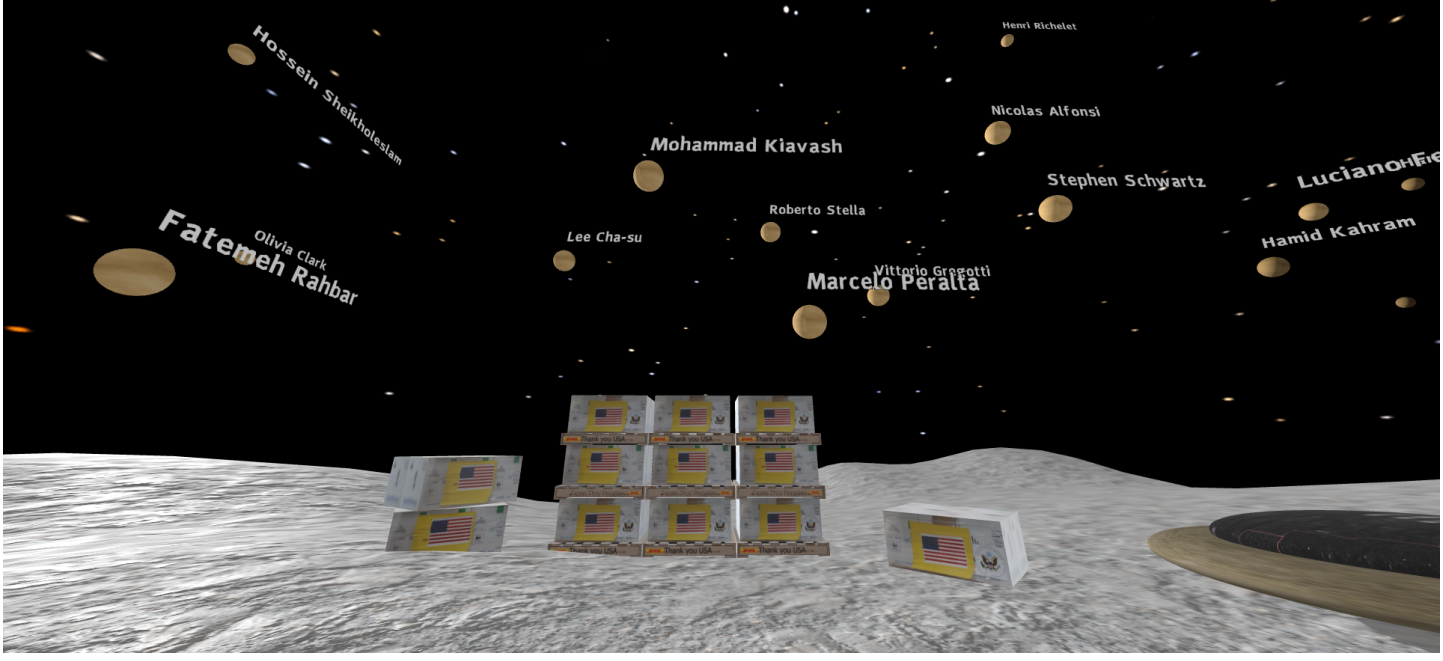
Krzysztof Wodiczko
Professor in Residence of Art, Design and the Public Domain
Harvard University Graduate School of Design

Digital Starlight Memorial:

An online memorial system with tangible interactive interface

Wei Wu
GSD MDes
Art, Design and the Public Domain
Spring 2022



Abstract

The Internet has created countless possibilities for commemorations dedicated to tragic or catastrophic events and for exercising collective memory, which has not only gradually hidden our physical bodies but is also changing the way we experience the death of those around us. People who died in some extreme events could not be buried well. Meanwhile, their relatives shared collective memories and trauma. Thus, I want to create a digital cemetery that collects the digital "soul". Besides, the digital cemetery could gather the people who have relatives who died in the same event and experienced the same trauma, forming a place that not only communicates but can heal each other.

I will create a website as the main digital platform for the community where people can bury their loved ones in a virtual Constellations system and build them a monument. Along with an Augmented Reality mobile application mobile application, people can see the exact location of their relatives or friends buried in the constellation and resonate in the community. What's more, they can have an additional physical interaction device. When someone visits a buried person, the interactive device will produce haptic feedback, and people can experience tangible visualizations from the device and comfort from those who have shared trauma. To join the community or merely to experience it, both strains and reinforces the mutuality of the “Collective memory” said to be in this together.

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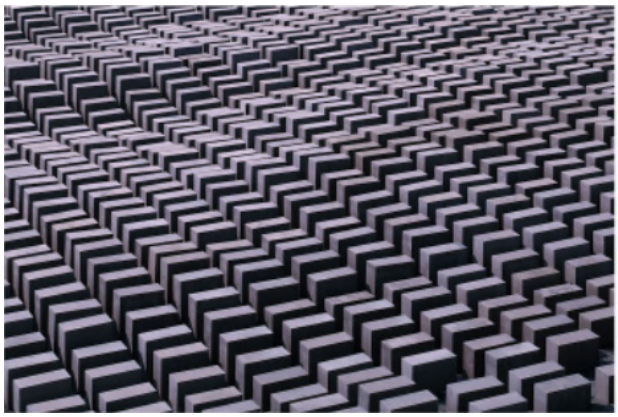
Acknowledgment

Thanks to Ya'an Wei, Xiaoxia Zhang, and Shufang Tan as my first teammates for putting up the original idea of the Flowever project; Tianwei Li and Masumi Ito for helping me with the storytelling and UI design during the Metaverse Hackathons; Harvard Innovation Lab for bringing this project into the community; and every critic from SJTU FourC Challenge Charrette Contest, MIT Reality Hack, and Harvard Metaverse Hackathon that helps with the project, especially Athena Demos, who has supported me from the very beginning.

Thanks to Feiyue Chen and Yalun Li for the inspiring peer critics; Hanpu Yao for the technical support; Yujin Cao, Xiaoji Zhou, Zhifei Xu and Tairan An for taking care of me during the final review. You all have pushed my project forward at some moments.

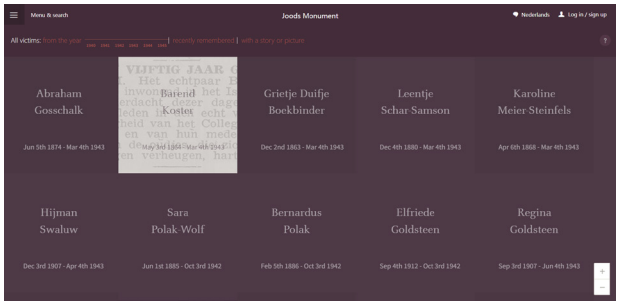
Thanks to Krzysztof Wodiczko and Malkit Shoshan, for your amazing advice, sharp critics, and the avant-garde vision; for your generous love, and for giving me the chance to start this fabulous journey and explore this environment; for allowing me to freely express my voice and imagination over the past three years, and for telling me to devote myself to the life-long fearless speech. Thank you, for everything.

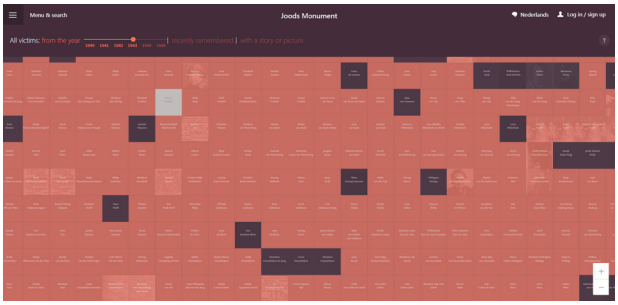
Monument / Memorial / Cemetery

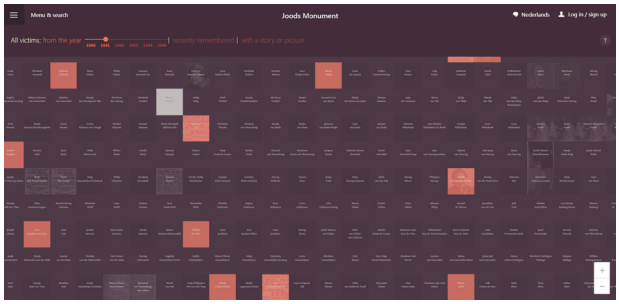


Memorial to the Murdered Jews of Europe
Berlin, Germany
Peter Eisenman

Digital
Monument / Memorial / Cemetery





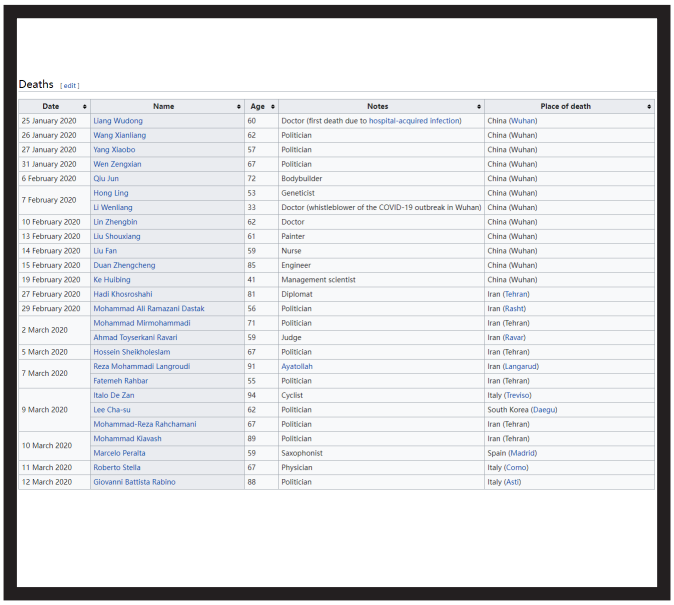


Information within Memorials

Physical

Digital

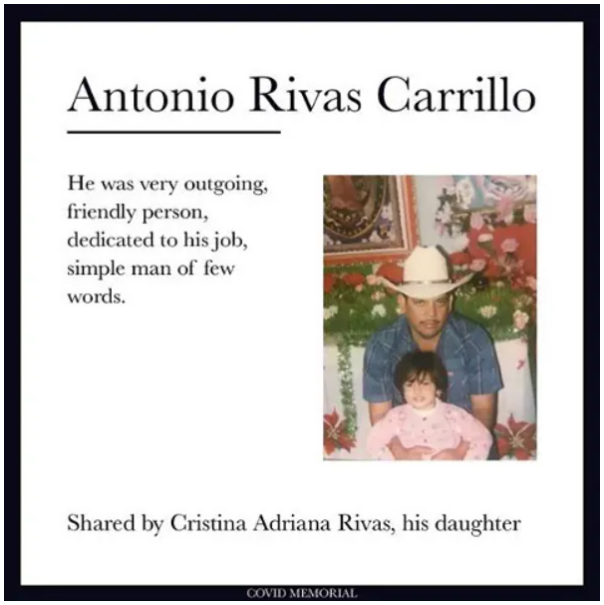
Memorial of Caroline G. "Carol" Buck, daughter of author Pearl S. Buck, in Vineland, New Jersey, U.S.



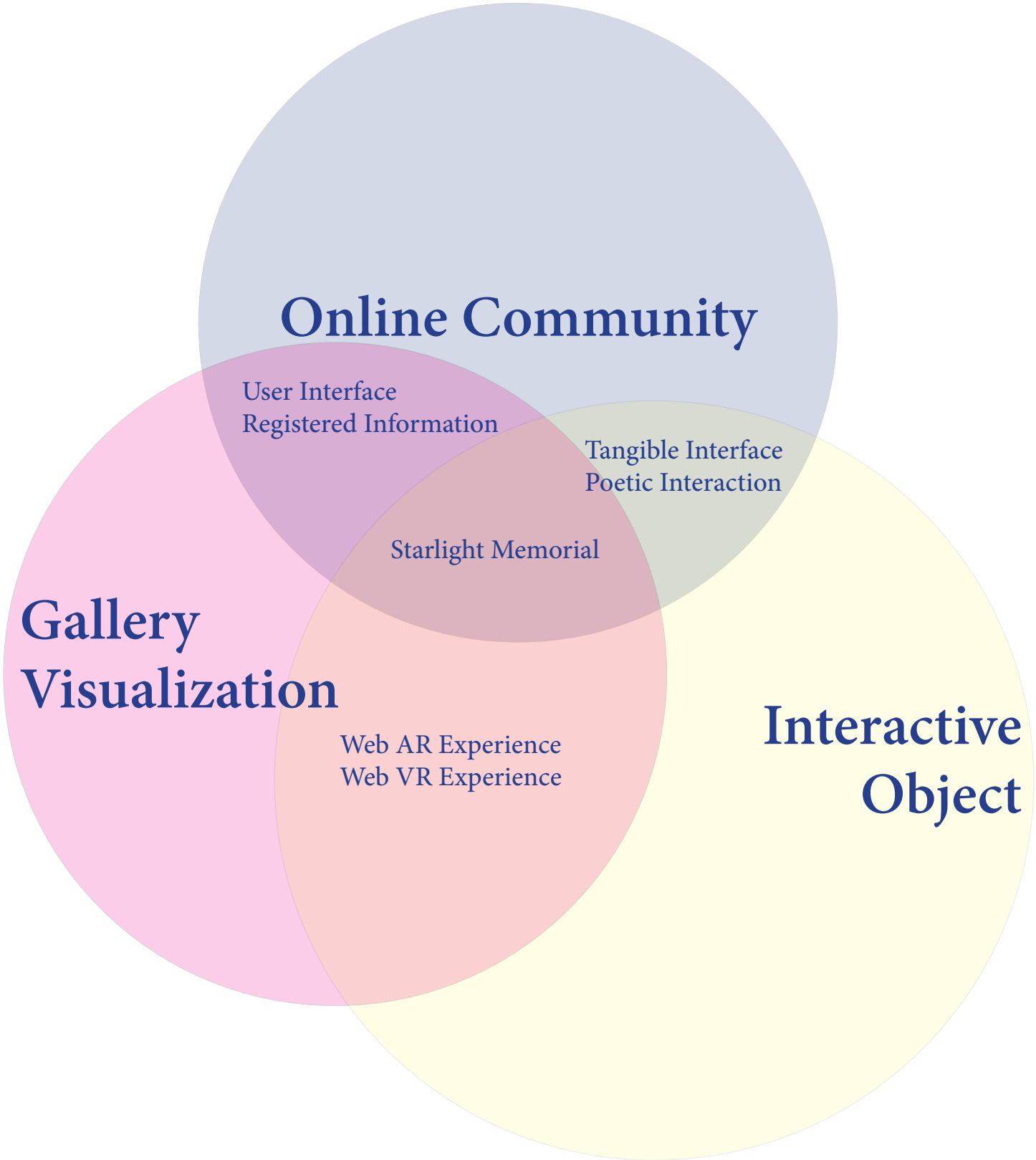
Deaths [edit]

Date	Name	Age	Notes	Place of death
25 January 2020	Liang Wudong	60	Doctor (first death due to hospital-acquired infection)	China (Wuhan)
26 January 2020	Wang Xianliang	62	Politician	China (Wuhan)
27 January 2020	Yang Xiaobo	57	Politician	China (Wuhan)
31 January 2020	Wen Zengxian	67	Politician	China (Wuhan)
6 February 2020	Qiu Jun	72	Bodybuilder	China (Wuhan)
7 February 2020	Hong Ling	53	Geneticist	China (Wuhan)
	Li Wenliang	33	Doctor (whistleblower of the COVID-19 outbreak in Wuhan)	China (Wuhan)
10 February 2020	Lin Zhengbin	62	Doctor	China (Wuhan)
13 February 2020	Liu Shouxiang	61	Painter	China (Wuhan)
14 February 2020	Liu Fan	59	Nurse	China (Wuhan)
15 February 2020	Duan Zhengcheng	85	Engineer	China (Wuhan)
19 February 2020	Ke Huibing	41	Management scientist	China (Wuhan)
27 February 2020	Hadi Khosroshahi	81	Diplomat	Iran (Tehran)
29 February 2020	Mohammad Ali Ramazani Dastak	56	Politician	Iran (Rasht)
2 March 2020	Mohammad Mirmohammadi	71	Politician	Iran (Tehran)
	Ahmad Toyserkani Ravari	59	Judge	Iran (Ravar)
5 March 2020	Hossein Sheikholeslam	67	Politician	Iran (Tehran)
7 March 2020	Reza Mohammadi Langroudi	91	Ayatollah	Iran (Langarud)
	Fatemeh Rahbar	55	Politician	Iran (Tehran)
9 March 2020	Italo De Zan	94	Cyclist	Italy (Treviso)
	Lee Cha-su	62	Politician	South Korea (Daegu)
	Mohammad-Reza Rahchamani	67	Politician	Iran (Tehran)
10 March 2020	Mohammad Kiavash	89	Politician	Iran (Tehran)
	Marcelo Peralta	59	Saxophonist	Spain (Madrid)
11 March 2020	Roberto Stella	67	Physician	Italy (Como)
12 March 2020	Giovanni Battista Rabino	88	Politician	Italy (Asti)

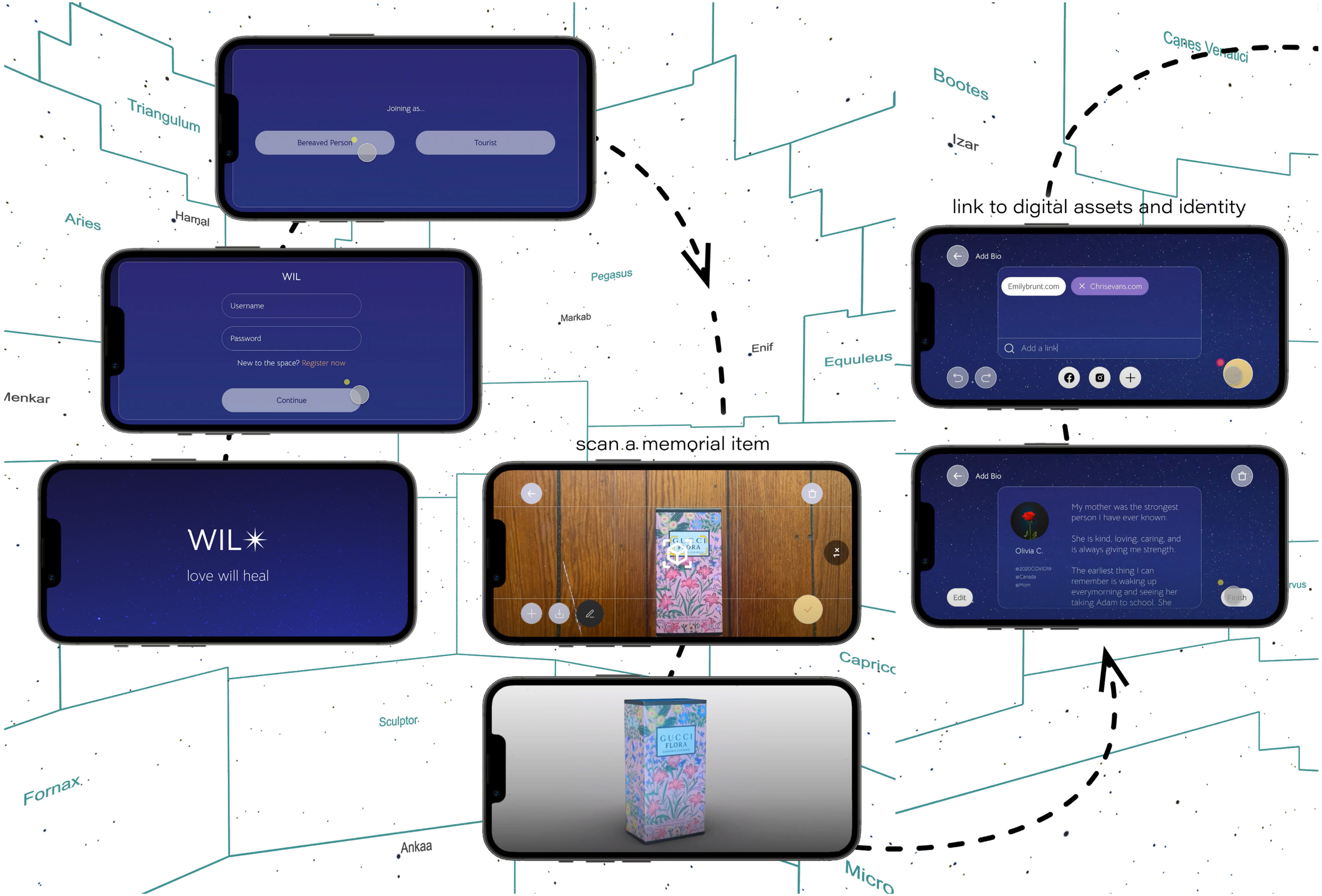
List of deaths due to COVID-19
Wikipedia
en.wikipedia.org/wiki/List_of_deaths_due_to_COVID-19



Memorial of Antonio Rivas Carrillo
COVID Memorial
www.covidmemorial.online

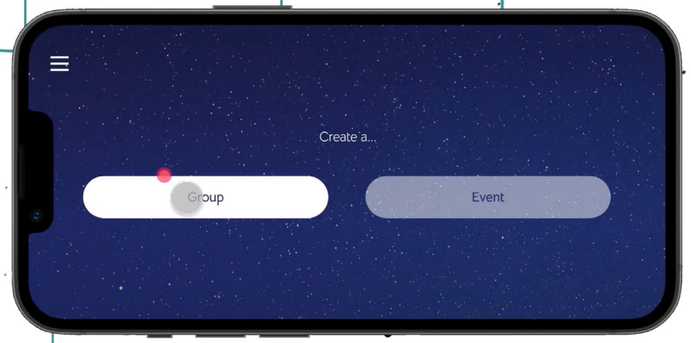

Online Community
User Interface
Registered Information
Tangible Interface
Poetic Interaction
Starlight Memorial
Gallery
Visualization
Web AR Experience
Web VR Experience
Interactive
Object

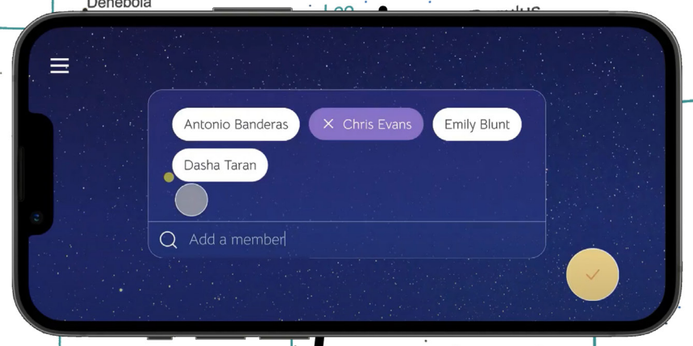
WIL
love will heal

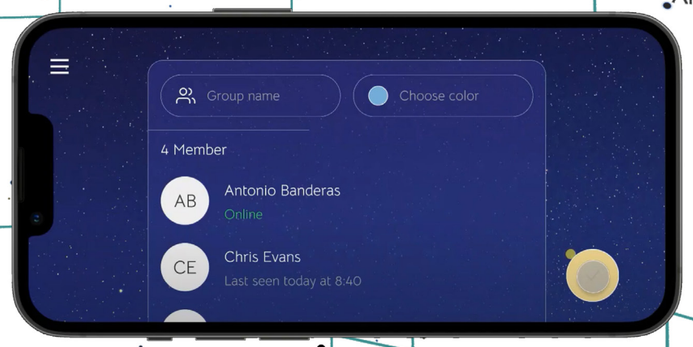


Joining as...
Bereaved Person
Tourist
WIL
Username
Password
New to the space? Register now
Continue
WIL
love will heal
link to digital assets and identity
Add Bio
Emilybrunt.com
Chrisevans.com
Add a link
scan a memorial item
Add Bio
My mother was the strongest person I have ever known.
She is kind, loving, caring, and is always giving me strength.
The earliest thing I can remember is waking up everymorning and seeing her taking Adam to school. She
Olivia C.
Edit
Finish
Triangulum
Aries
Hamal
Pegasus
Markab
Enif
Equuleus
Bootes
Izar
Canes Venatici
Sculptor
Fornax
Ankaa
Micro

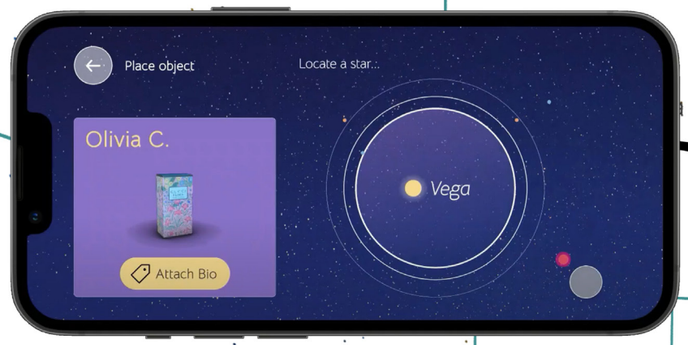
find the group with collective memory

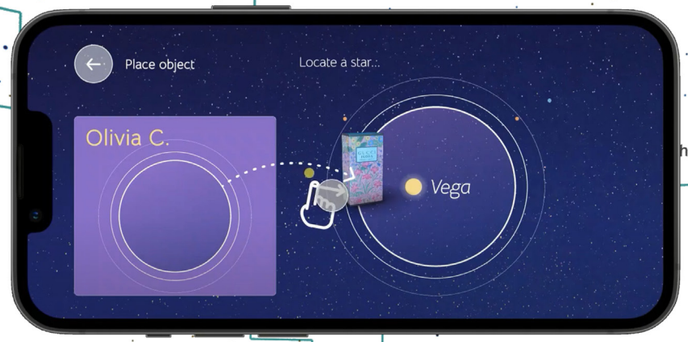




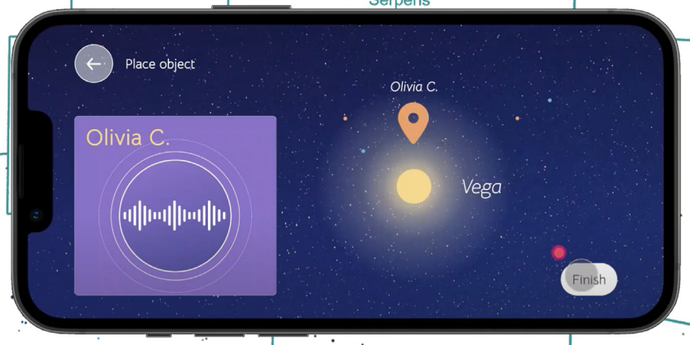


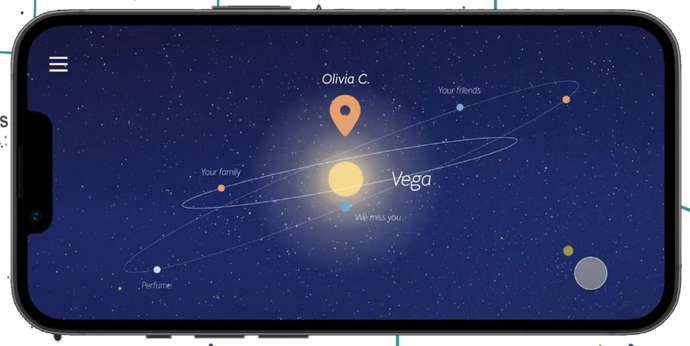
benefit from the community



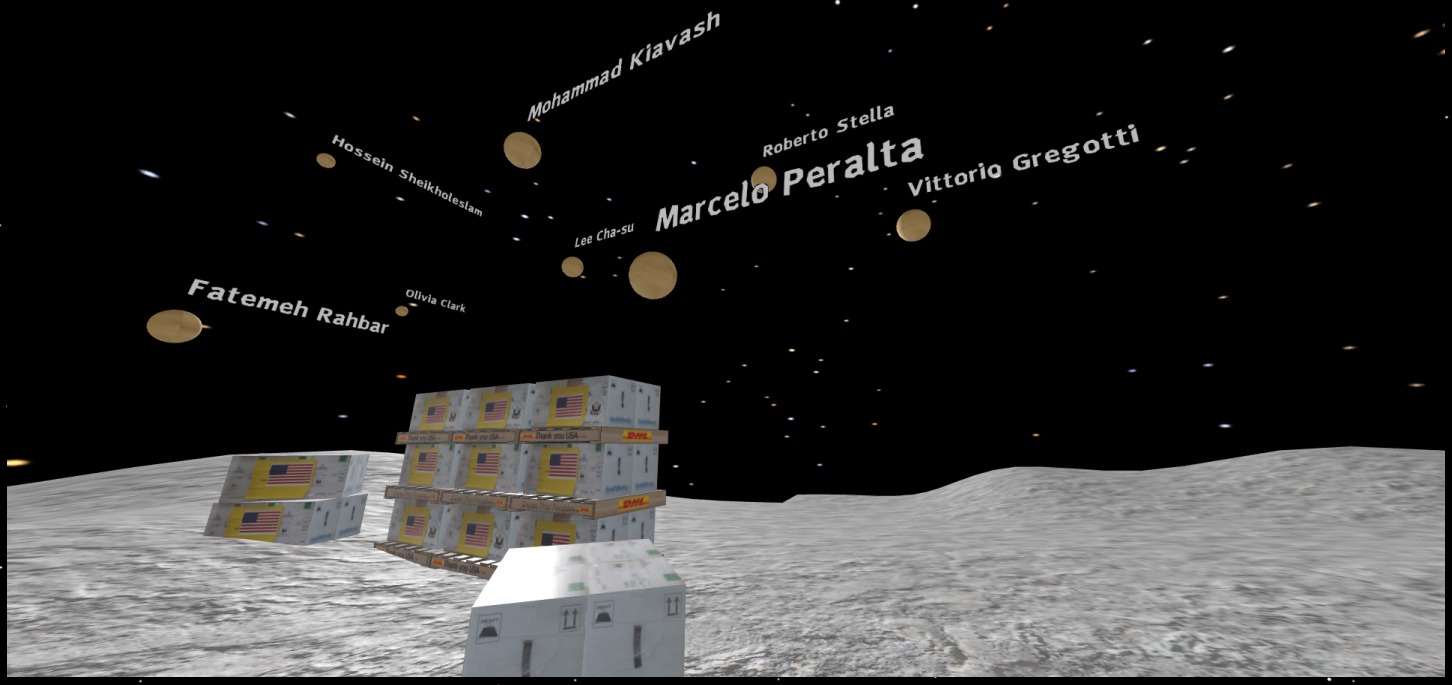


choose a location among the constellations to bury your loved ones

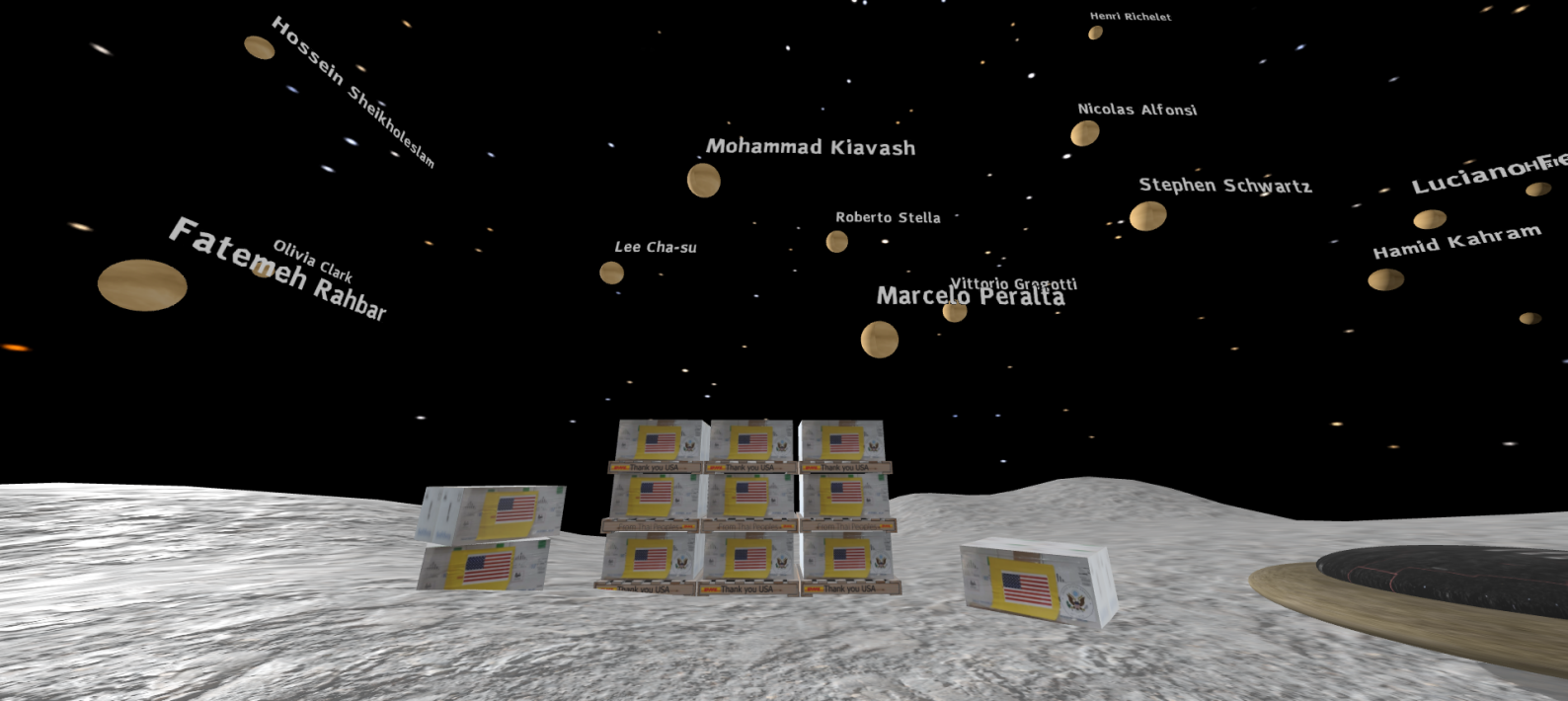


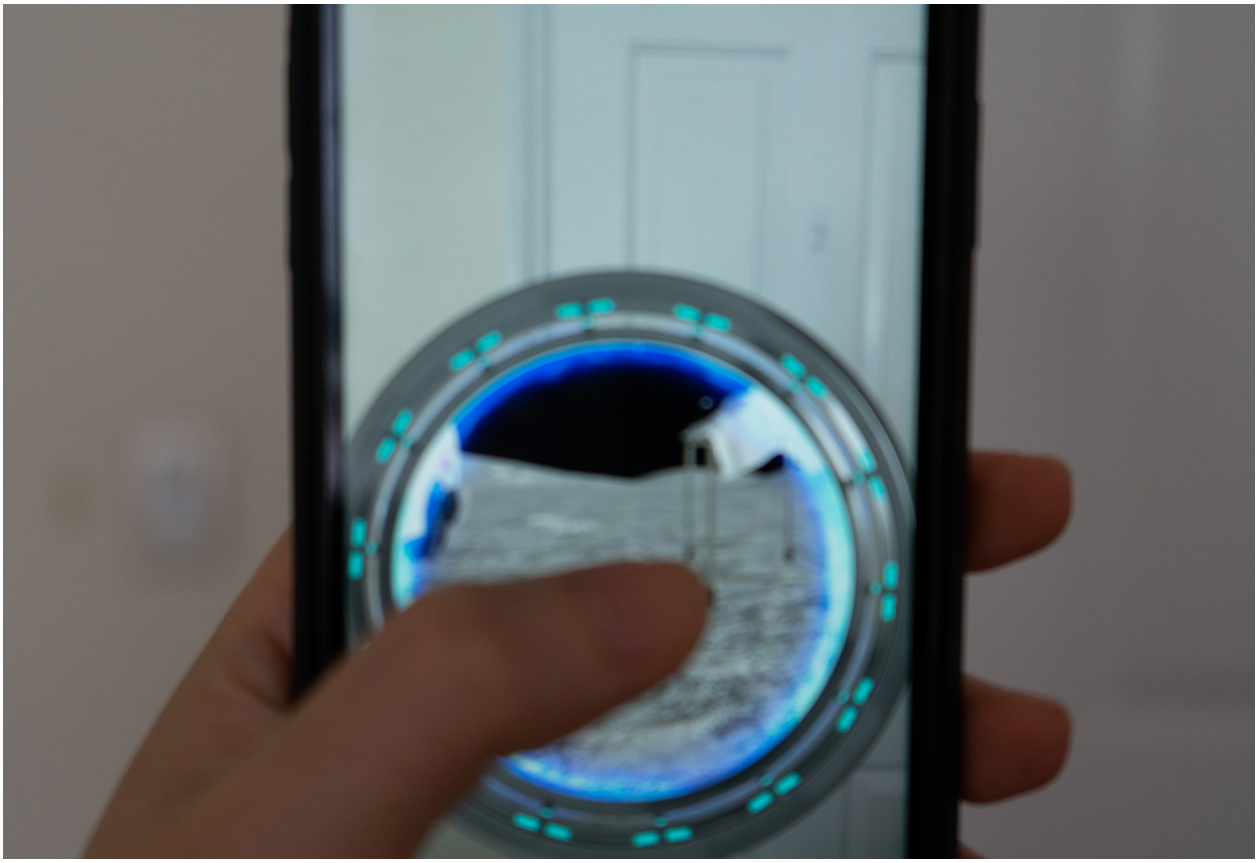


Starlight Memorial
access through WebAR portal



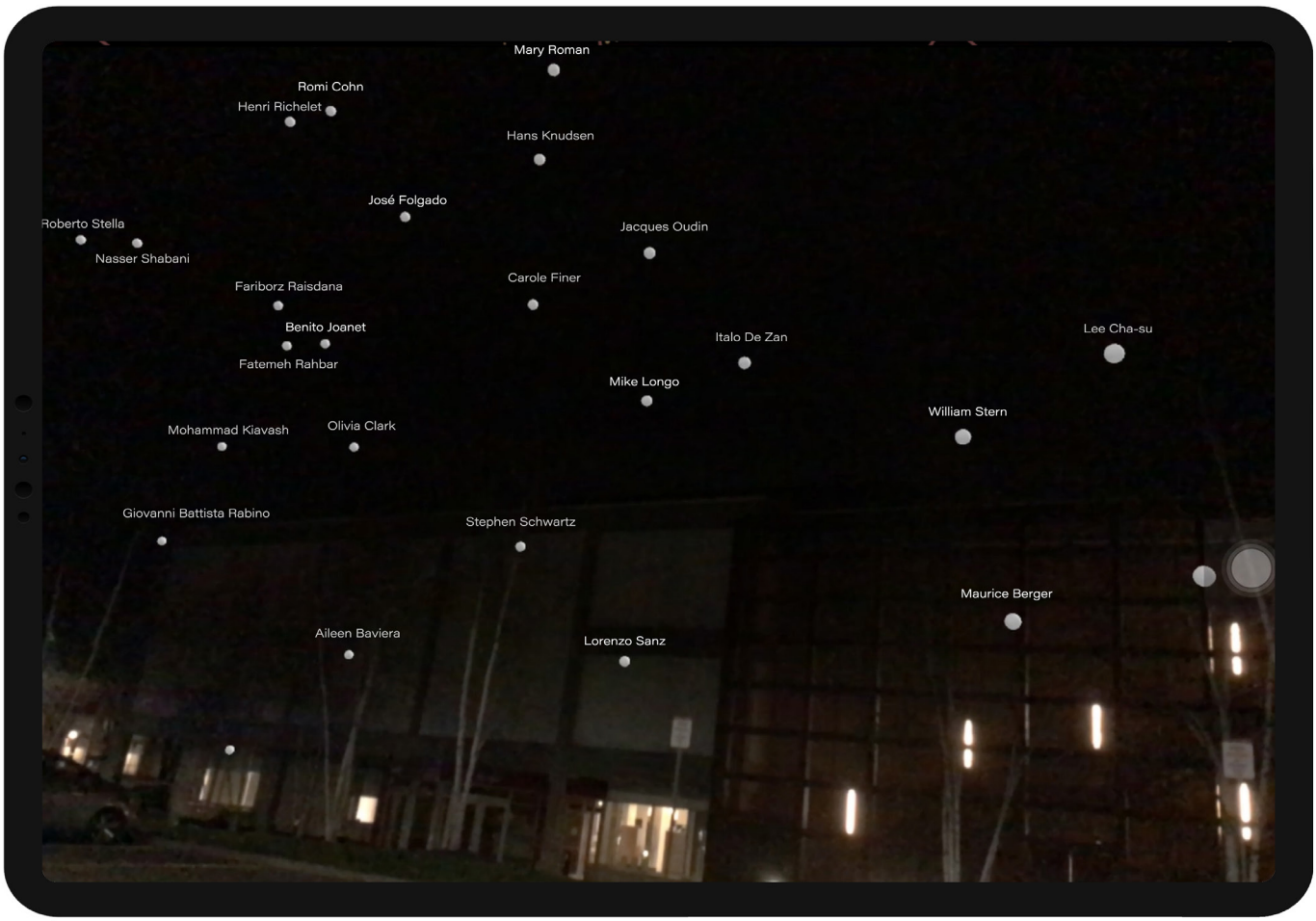
Starlight Memorial
view in Virtual Reality format





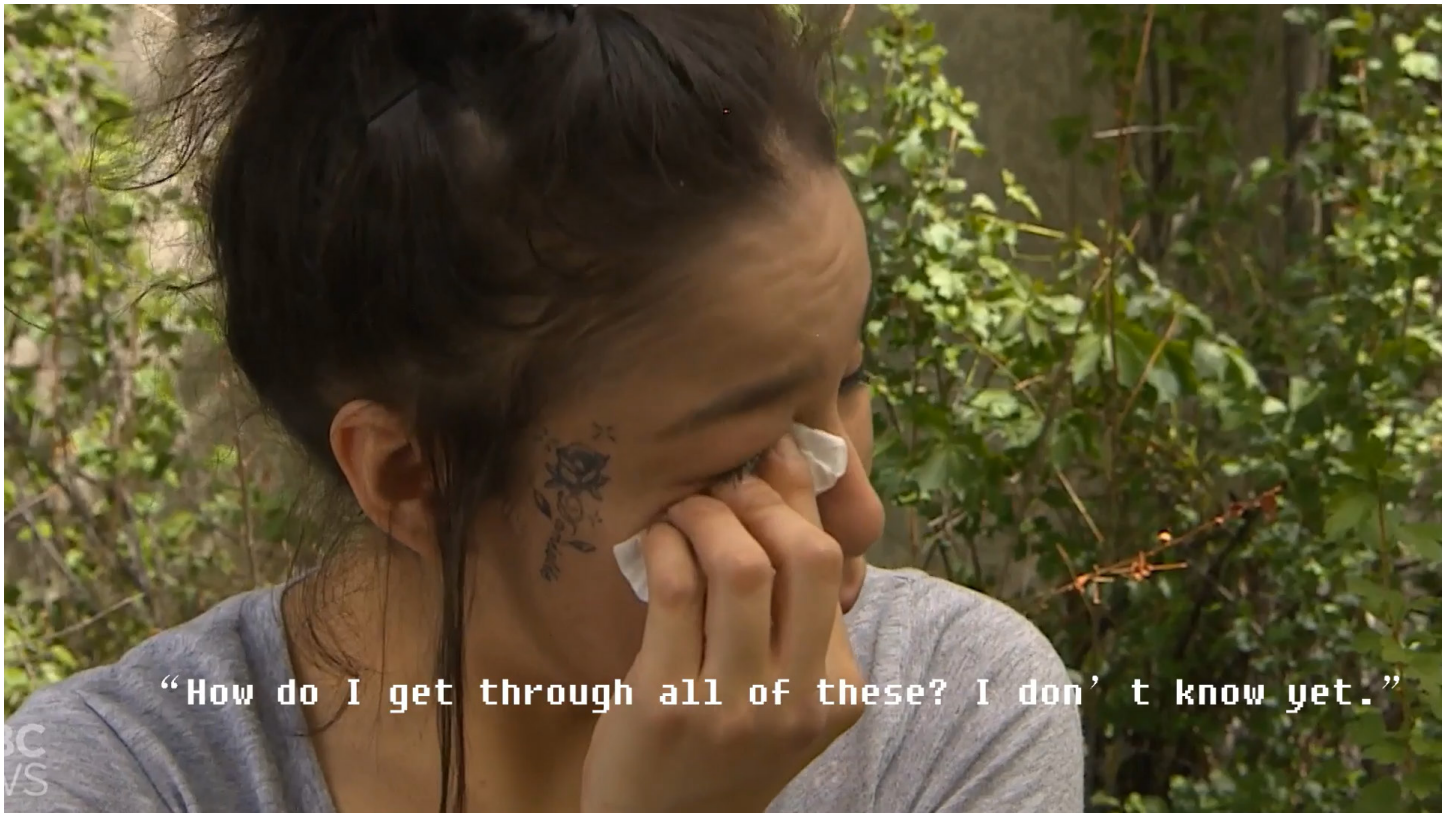
Starlight Memorial
access through WebAR portal

Starlight Memorial
view in Augmented Reality format



Starlight Memorial
view in Augmented Reality format

Physical Devices



Situation 1:

Laina Tuckanow, 21, lost her 39-year-old mother, Danielle Rose Poorbear, in April, 2020. Tuckanow had a rose tattooed on her face with the name 'Danielle' as the stem to honour her mother, who died of COVID-19. The Regina woman says the pandemic has forever changed her life.
Source: Matthew Howard/CBC News

Device 1: **Rose Media Player**

An Arduino board linked to a cramp, tied to the flower branch, dipped in the water.
The sensor could get the signal when the flowers are dipping in or without the water.

This device imitates the concept of tomb sweeping during funeral ceremony.
Usually, for flower caring, we change the water in the vase every two to three days.
When you lift up the flowers, the Arduino board can sense whether the flowers are out of the water and transmit the signal through WI-FI or Bluetooth that connects to the mobile application. Thus, specific sounds would be played based on your setting. It could be a voice message from people who visit your virtual memorial space, or just a song that reminds you of your loved ones.

Source: m.k366.com/rili/40027.html

Source: cultureguru.my/blog/life-hacks/

Situation 2:

The traditional funeral ceremony scripts usually contain a gesture of praying, either using joss sticks or praying with folded hands.

After observing the 911 Memorial, I noticed that nowadays people used to take a photo after their praying process, saving them as a shred of evidence that they had finished the memorial scripts.

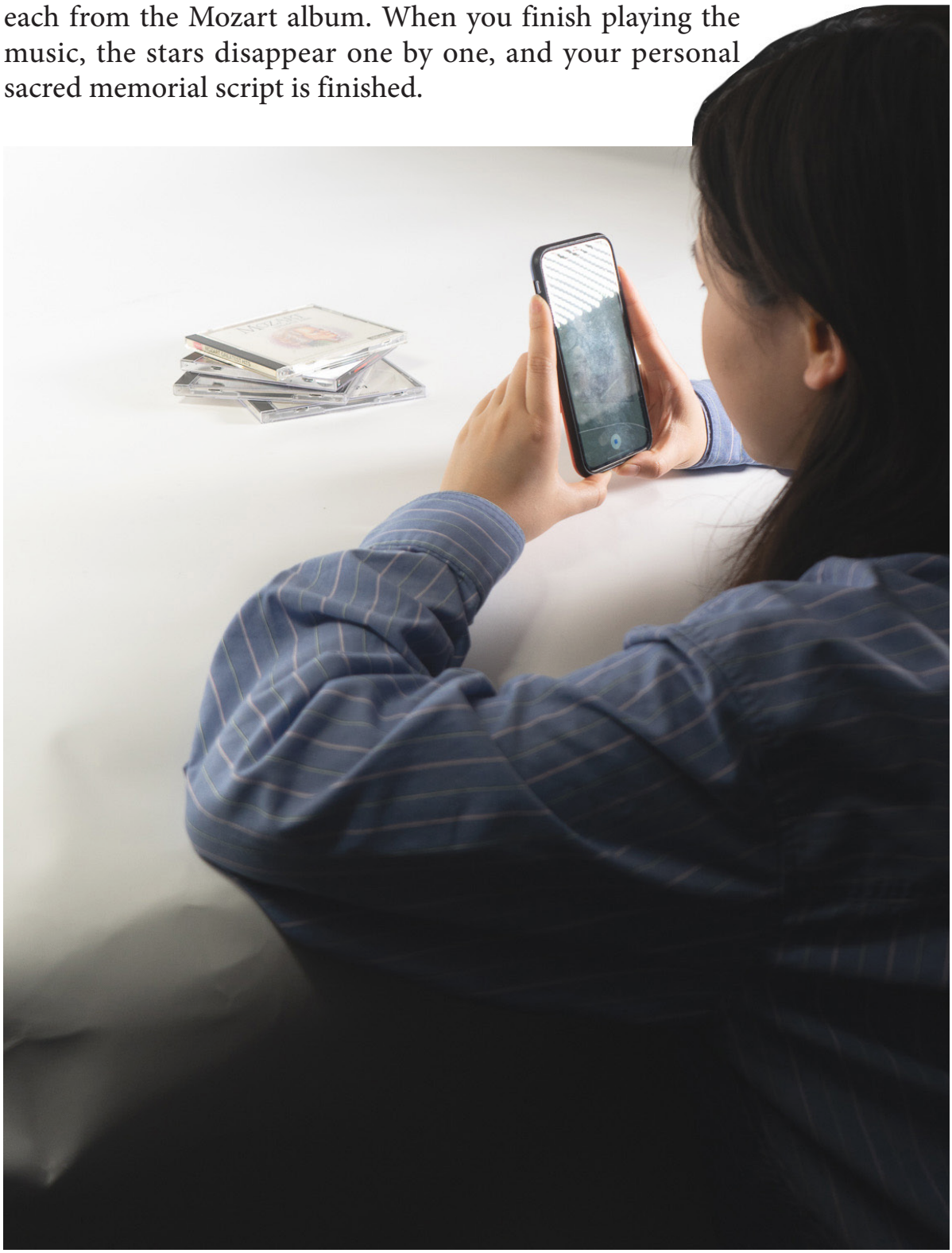
Based on this common pattern, I design a new funeral ceremony script in the digital world - using mobile phones and camera lenses to observe the environment as well as process the memorial ceremony. I use a Web AR application to describe these processes.

Source: Youtube - 911 Memorial and World Trade Center Tour

Device 2: **Personal Sacred**

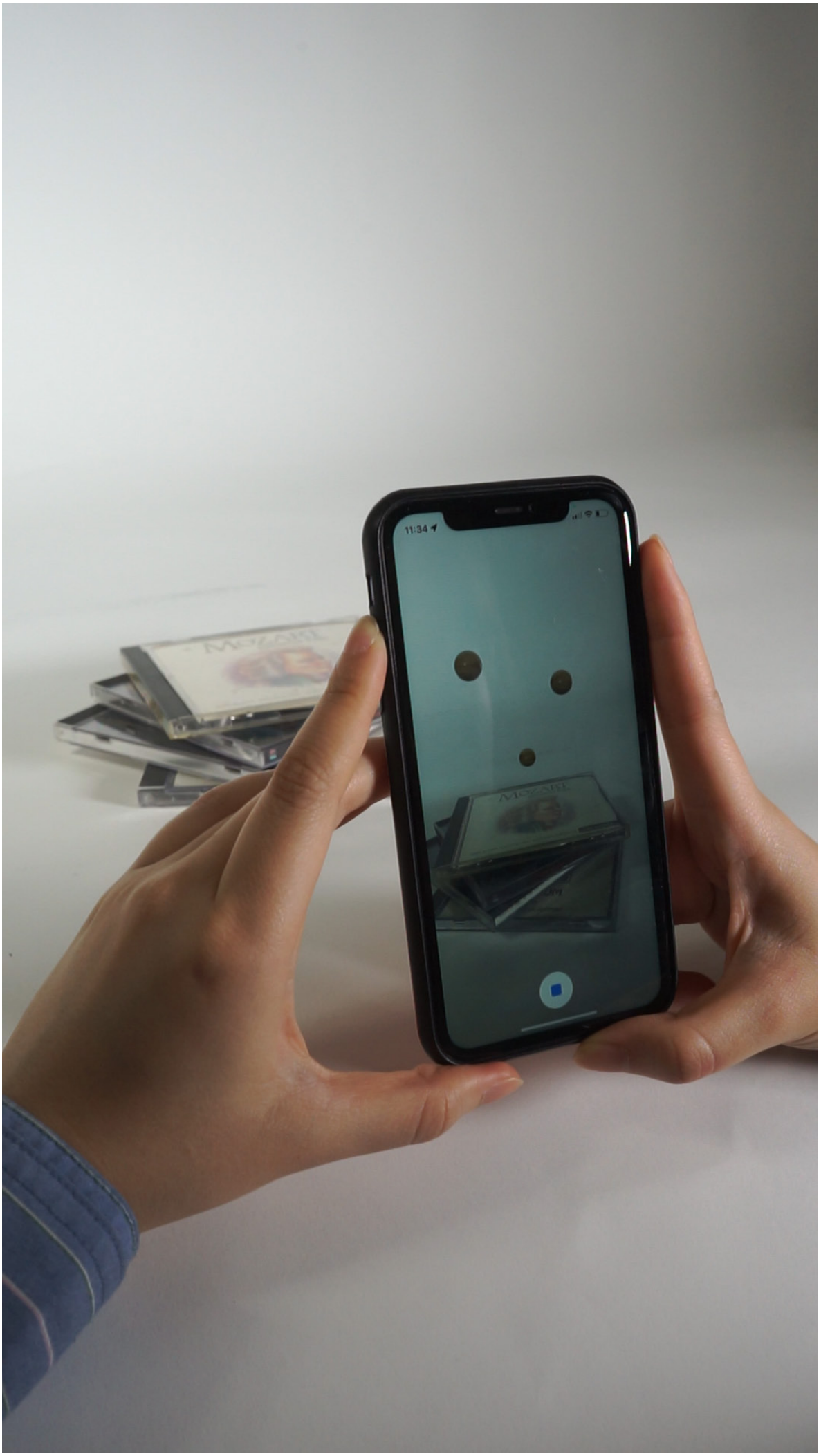
In this scene, the Mozart album is one's deceased grandfather's possessions. I create a web-based Augmented Reality application to represent the praying process.

In this new normal, you open the mobile phone camera and point it to the possessions, staring at the phone screen. After a while, more specifically, five minutes, based on your setting, some stars will appear on the screen. When you click on those stars, you can hear a 15 seconds music piece each from the Mozart album. When you finish playing the music, the stars disappear one by one, and your personal sacred memorial script is finished.



MAX-PLAY • 69 MINUTES OF MUSIC
MOZART
greatest hits
EINE KLEINE NACHTMUSIK • HAFFNER SERENADE
PRO ARTE

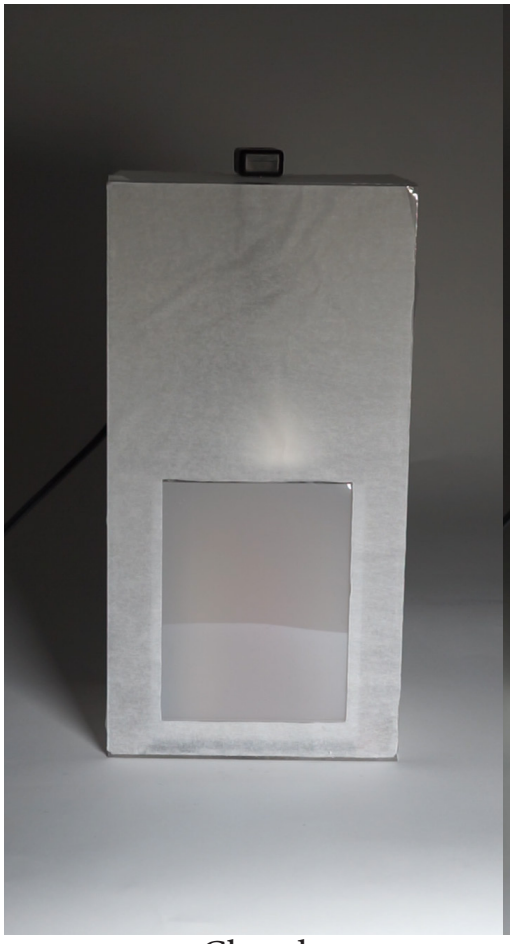
MOZART


11:34
MOZART
MOZART

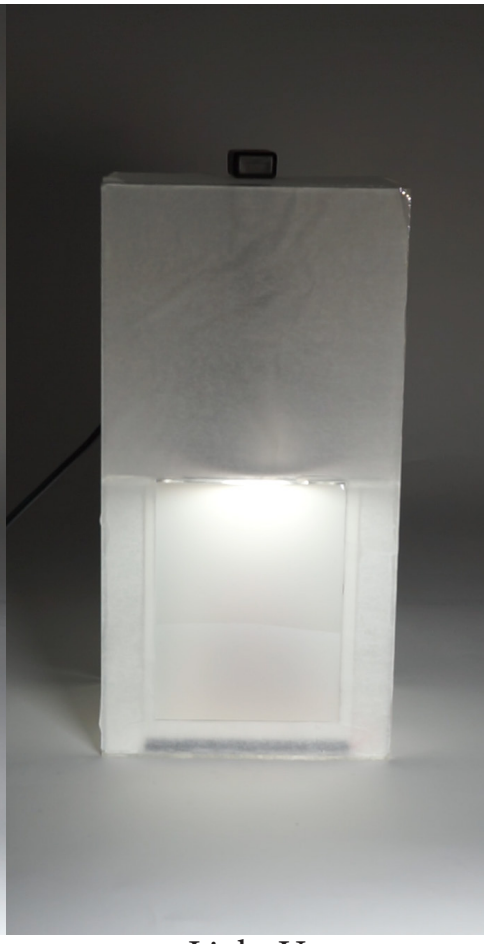
Situation 3:

Collective trauma during tragic or catastrophic events not only affects one or two people but has a huge impact on the community with shared memories. Not only the online digital cemetery should serve as a public monument that to remember the event, but also people should resonate in the community.

When someone visits a buried person, the interactive device will produce feedback, and people can experience tangible visualizations from the device and comfort from those who have shared trauma. To join the community or merely to experience it, both strains and reinforces the mutuality of the “Collective memory” said to be in this together.



Closed



Light Up

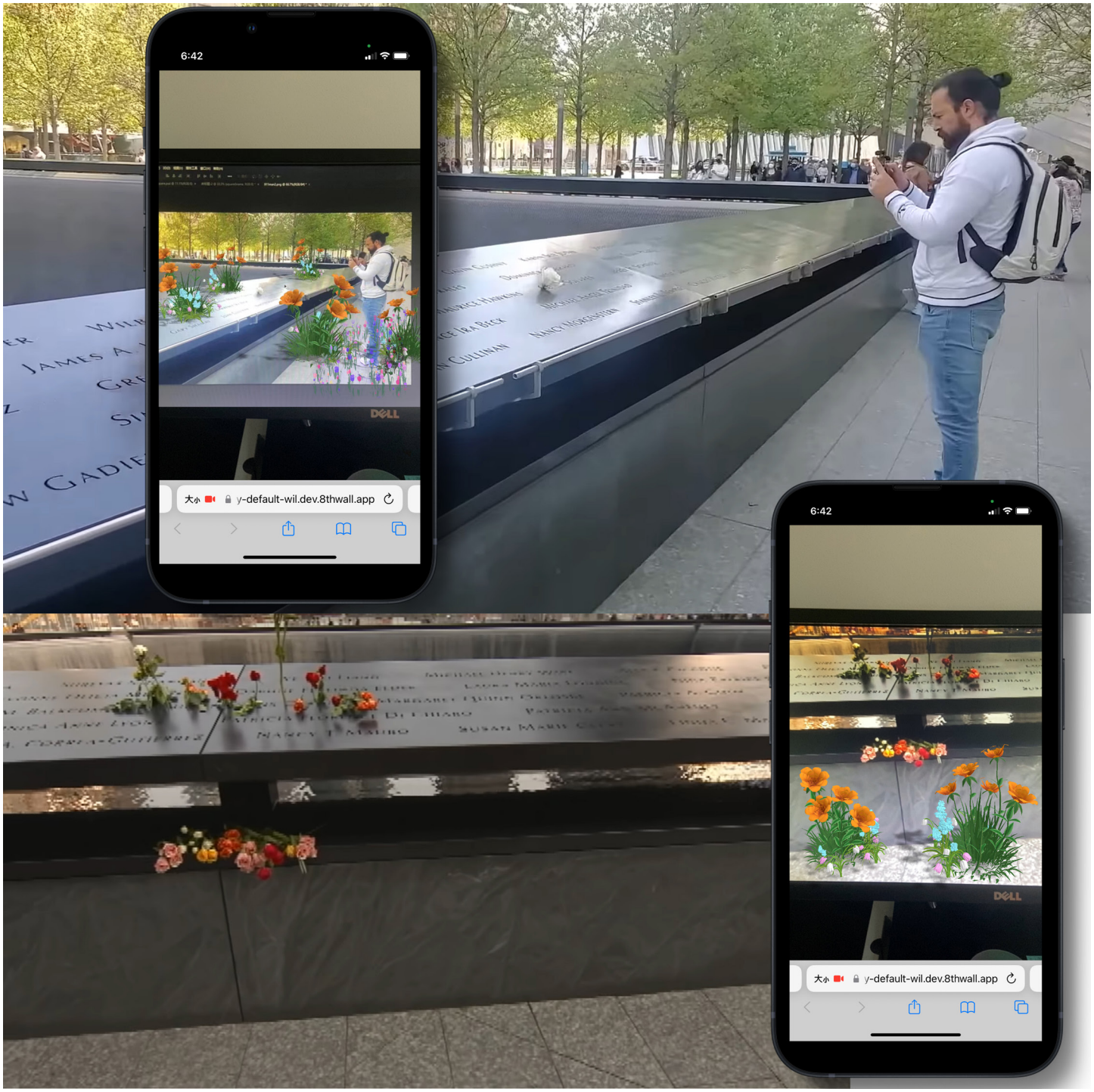
Device 3: Album Lantern

The album lantern is not only a drawer that stores your memorable object but emphasizes them and reminds you of your loved ones occasionally. Connected to Bluetooth or WI-FI, the lantern is normally served as a bedside lamp with an LED bulb. However, when someone visits your virtual memorial space on the mobile application, the LED bulb will change color to remind you, and the PDLC Switchable Electronic Adhesive Smart Glass will turn to clear mode and let you see through the lantern. Thus, your memorial item was revealed.

Change Light Color

Item Revealed

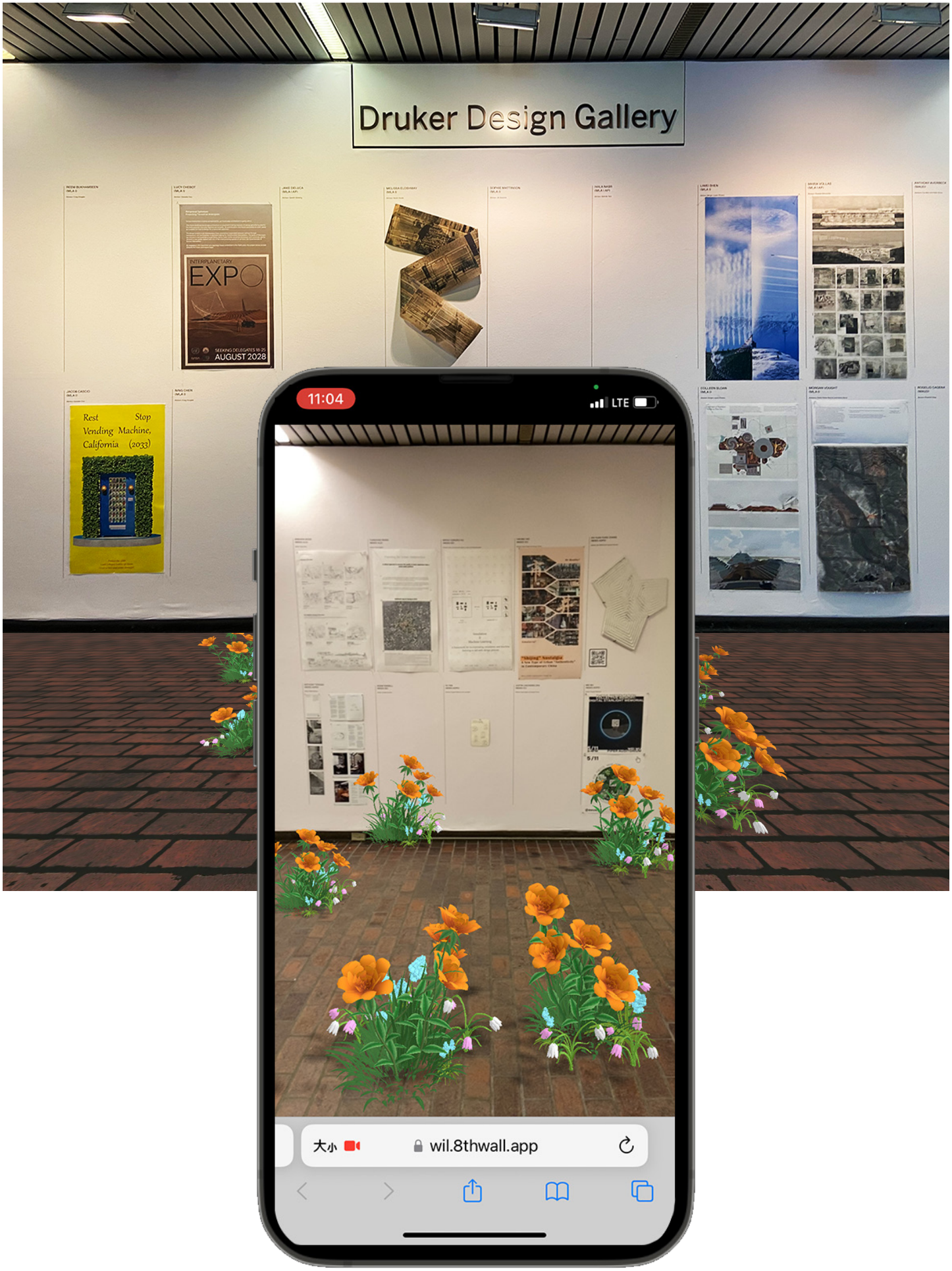
HARVARD



Memorial Day Event

For future development, we can imagine there are multiple ways of using the starlight memorial Web AR system as well as the physical devices. Users of the system are free to output their gestures and the culture of their own community.

1. For example, you can tap and plant the AR flower in any scene in the world base on maps and GPS location. You can put the physical flower on the 911 Memorial in central Manhattan, but also the virtual ones if you are not physically there.
2. On a memorial day, you can change the LED bulb color of your album lantern lighting devices at a specific time inside your community, as a memorial event.
3. You can also rearrange the location of your planet in the starlight memorial, to form a specific pattern or letter based on the culture of your community.



Tap and plant the AR flower in any scene