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An interface is “a situation, way, or place where two things come together and affect each other.”(Vale, 1996) The interface in the digital world connects humans and machines. However, throughout the development of the technology, the interface became an invisible tool that people hardly noticed.

How was the interface designed? What is the relationship between physical and digital in the interface history? What is the digital infrastructure behind the digital screen?

With an interest in the existing interface we use on daily bases, this research started with explorations of computer folders.

-Open, group, move, delete...

A computer folder is one of the more common methods of storing documents and data. Moving the files into this virtual space allows us to store vast amounts of content without taking many "physical"(renewable) areas. The mutual influence between the physical and digital worlds, as per this example, was constantly repeated throughout the invention and evolution of the computer interface.

To explore the relationship and transformation between real-life activities and digital interfaces, I use the folder as a site for examining objects and activities from the physical world (in this case, the browsing of a refrigerator). Utilizing the limited functions of the folder, I dissect and arrange things, just like how people do cleaning and organizing in real life, and change the visual layout to augment the detail of the folder's visual qualities. Therefore, the step-by-step process-led exploration reveals the parallel between the digital interface and the actual physical world and, at the same time, utilizes exclusive digital functions to show their dissimilarities.

REFRIGERATOR OVERVIEW

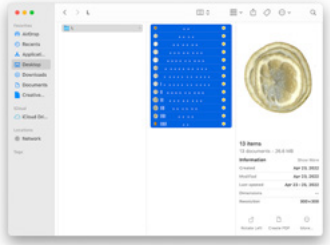
1. The Medium is the Massage - Marshall McLuhan

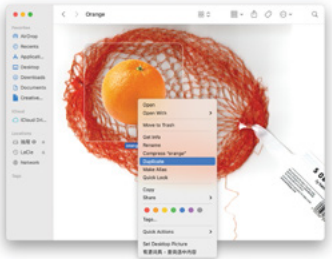
"All media are extension of some human faculty—psychic or physical (1967, p.26)."

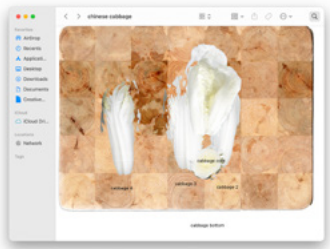
In The Medium is the Massage, Marshall McLuhan raised this discussion about media and humans. Although McLuhan wrote this essay far before the prevalence of personal electronic devices such as computers, his discourse on media could also explain the relationship between the user and computer interfaces. Nothing can be created from nothing, especially interfaces designed for communication and interaction. Giving specific examples of extensions, Mcluhan illustrated the links of media. When considering how we create and shape things based on our needs and how a slight change in the perception of media can influence us inversely, I become more sensitive to the process of manipulating the "familiar" functions in my computer folders. Concentrate on the invisible or the details that I ignored because of familiarity.

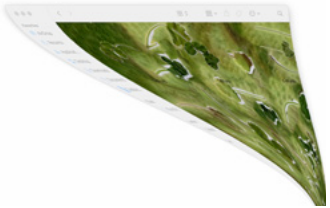
*2. 'I-N-T-E-R-F-A-C-E', A *New* Program for Graphic Design - David Reinfurt*

In this digital age, many consumers long to purchase better and more up-to-date digital products, just like other commodities. The very early designs of interfaces were born from the beautiful wonder even before the public knew what a digital screen should look like. In this book chapter, David Reinfurt brought the story of interface designers Muriel Cooper and Susan Kare. He addressed that it is helpful to look at "things that are out of date, that do not register in the current moment," and we can get to see "what the present is supposed to be like" and further reveal the "desires for how we would like our computer to behave (2020, p.234)." I make this folder iterations with interest in the computer interface. Therefore, the evolving interface provides a rich story of humans and interfaces. The first interface visual design showed the need for detailed explanations with the icons derived from real-life activities (such as hands, trashcans, and files)—we shape the media. However, the interface visuals have become much more simplified and abstract nowadays because our perception is also shaped by the media conversely.





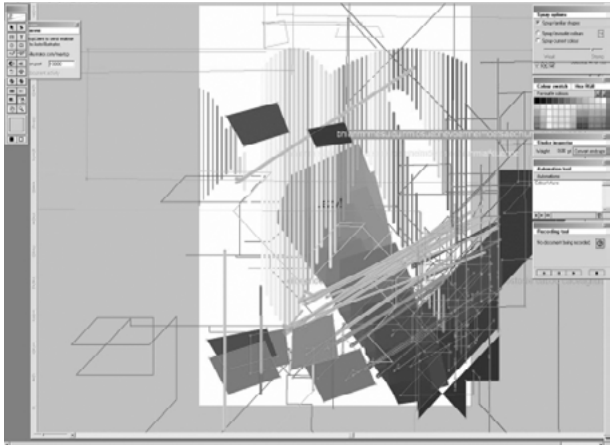




100 ITERATIONS

3. Interface Realisms: The Interface as Aesthetic Form - Søren Pold

From a post-digital perspective, Søren Pold's argument challenged the idea that "an interface is an obstacle" that stands between a person and the system being used (2005, para.5). In the view of the fact that interface does not "stem from an aesthetic tradition," but from "engineering tradition that has paradoxically tried to get rid of it. (ibid., para.4)" The cultural influence of digital aesthetics has not been widely discussed, not to mention the interface aesthetic form. From his writing and projects example, I get to reconsider the interface context and how the digital age motivates people's perception of aesthetics. Therefore, when exploring the folder's function, I also investigate the folder as a creative site for generating non-functional visual compositions.



ADRIAN WARD
SIGNWAVE AUTO-ILLUSTRATOR

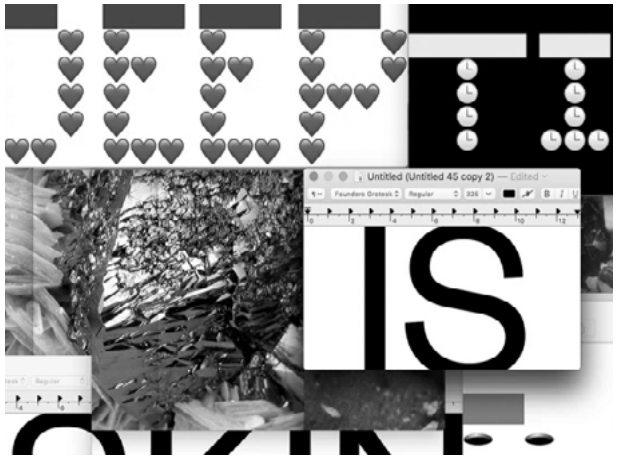
4. *'Understanding Human Users: Extensions of Their Digital Media' - Robert K. Logan*

"The user's information becomes the content of the digital medium. (2019, p.5)."Robert Logan's essay further discussed Marshall McLuhan's human extension concept focusing on digital media, and brought in other scholars' ideas. The argument that "we become the extension of our digital media" is inspiring. The change from real-life visuals to digital data is the fundamental transformation in my experiment of the folder interface. The manipulation within my personal computer seems protected and free (is it truly safe?). However, considering the vast virtual network built with a tremendous amount of data information, Logan stated that there might be danger behind the media. When our private or public life transforms into fragmented contents and numbers on digital sites, are our existence in the physical world change? Are these worries about uncertain power just delusions of persecution, or should we be more careful while behaving in the virtual scope? non-functional visual compositions.

100+ ITERATIONS
FOLDER BOOK DISPLAY

5. Graphical User Interference - David Caterini

Designer David Caterini explored the sensory design and narrative of software. The research project includes short animation and low motion screen recording to reveal the sensory visuals of the computer interface and Google Maps. His use of desktop, folders name, and text edit tool was mainly for the narrative and layout purposes. From my point of view, his research and way of representation amplified the visual transformation that is hard to notice. However, the content and subject he used in the desktop manipulation seem a little ambiguous, which also led me to consider and pay more attention to the future subject I should choose in research about the interface.



DAVID CATERINI
DEEP TIME IS SKIN DEEP

METAHAVEN
ISLANDS IN THE CLOUD

6. Islands in the Cloud - Metahaven

Metahaven studio's project about cloud computing is a valuable example of how we can use design to discuss an extensive topic. They created a set of works that explored different aspects of the cloud, including installation, essays, and identity design. Their practice shows that it is helpful to touch on specific questions when researching a broad concept. That encourages me to feel comfortable narrowing down the scope of my direction and take the possibility of creating a group of works. In this case, instead of focusing on the overall computer interface design, I start with a focus on one single familiar interface—the folder on a personal desktop.

What is behind the visual display of interface and digital files?

In the first experiment, I explored the visual of the computer interface “folder “to highlight the interface’s existence. To further research the topic and figure out the themes of interest, the second exploration is about the back-end infrastructure of digital files. Reversing the process from digital to physical reveals the digital display’s fragmented data and hidden content.

PHYSICAL TRANSLATION OF *HARD COPY*

7. Uncreative writing : Managing language in the digital age - Kenneth Goldsmith

In the book Uncreative Writing, Kenneth Goldsmith discusses how writing meets digital and its relationship to digital media. Goldsmith started the conversation with an image of an airplane screen displaying white code texts. The sudden transformation from images, sounds, and graphics to running readers of complex code reveal the visuals' hidden backend. Goldsmith further questioned and explored the code's literary value. He brought a new perspective on viewing the code as an aesthetic form by giving examples of writers' and poets' works with code-like qualities that challenged the writing language's character. When working with the website's backend, I experienced a similar moment as Goldsmith; the sudden unfolding of thousand lines of source codes opened up a complex but confusing world for me. Of course, I tried to read and interpret those languages, although it is almost impossible to understand all the functions. However, Goldsmith's writing provides a new way of reading and experiencing language in this digital world. He showed how simply changing the file format and twisting the texts can cause the change of an image visual or a sound file. The fascinating "ability of language to alter all media (2011, p.24)."

8. 'Smartphone: The Networking of the Self' - Adam Greenfield

Adam Greenfield digs into this vital artifact in-depth in this chapter about the smartphone. He discusses how it gradually replaced a lot of everyday objects in the pre-smartphone time. Step by step, "most of the artifacts we once used to convey identity (2017, p.12)" are no longer needed anymore, and the smartphone upgrades with more and more functions that used to be in other devices. Default functions, apps, the vast data network, and the hidden problems behind them were very complex. In my project, I'm not working specifically on the smartphone; however, this increasing public reliance on digital devices is an important topic. The relationship between people and machines kept changing throughout history, including data storage methods. People's life and information become data floating in the networks, and the devices become the extension of themselves. Thus, I want to explore the interaction between users and devices and reveal the invisible, intangible details behind it.

9. 'Modernity and Contemporaneity: Mechanical vs. Digital Reproduction' - Boris Groys

Boris Groys's writing explores the difference between the modern and contemporary ages by contrasting two reproduction modes. The first mode is mechanical reproduction, in which Groys further discussed Walter Benjamin's idea within and out of the historical context. Moreover, he examined the digital reproduction mode of our time and raised that the visual people see on the screen is only a performance of the invisible digital data. His concept inspired me to reveal the hidden backend of the digital file, in this case, the source code behind the webpage. Throughout my exploration of how changing formats causes loss of content quality and quantity, Groys's writing led me to question the visual changes between soft and hard copy and the structure and essence of digital format content.

10. Print Punch: Artefacts from the Punch Card Computing Era - Patrick Fry

Nowadays, computing devices are becoming more compressed, and the process has become more invisible. However, back in the nineteenth century, this process needs much more human labor, and most importantly, the data is tangible. In Print Punch, the two writings bring out a relatively long history of the punch card format data and the discussion about the relationship between people and machines. I am constantly comparing the punch card with the current storage methods. The transformation of devices affects our utilization of digital data and the need for visual design. Just as people in the past needed visuals on blank punchcards (first designed blank for only machines to decode), we need a practical design of computer interface visuals to communicate function. Thus, this transformation from physical hard copy to more and more intangible data interests me to explore the changing between tangible and intangible formats.

11. HARD COPY - Julia Christensen

Julia Christensen's project is a photograph series of old hard copies, such as VHS tapes from her friends and neighbors. Through these photos, she discussed the obsolescence due to the upgrade culture. It displays how people keep using new methods to store personal data and how increasing digital storage capacity causes more loss and inaccessible recordings. The transformation to digital format needs continual renewals, or they will no longer be retrievable and become obsolete media. I'm intrigued by Christensen's research around upgrade culture and especially look more into the history of storage and how that influences people's relationship with the machine. In the 100 iterating projects, I explored how I could use the existing computer interface folder as a site for examining objects and activities from the physical world. The changing and loss of the objects' quality were augmented throughout the process. While reading more references about data storage, including Christensen's writing, I'm able to unfold a broader story of obsolescence.

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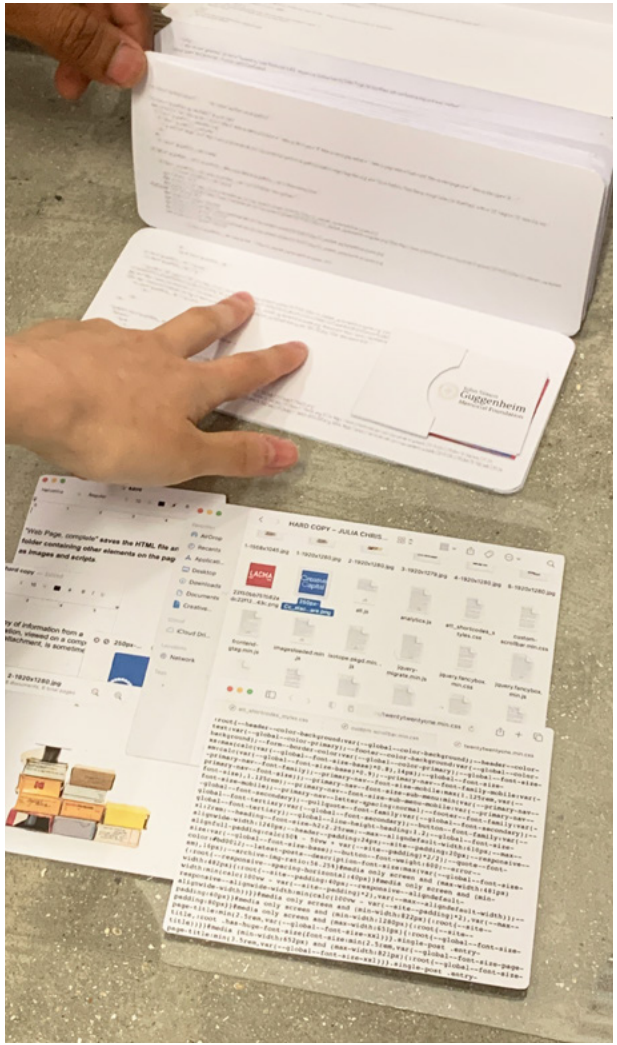

100+ ITERATIONS
FOLDER BOOK DISPLAY

12. Max Dovey / Your Homepage - Max Dovey

Max Dovey's Your Homepage is a video documentary project that uses a web map interface that discusses "memory and locality." Participants shared their stories about a specific site in front of the google street view page. This process explores how personal stories can parallel network data. The contrast between distorted computer visuals and people's heart-warming narratives questions the reality of a virtual site. While researching content storage in digital space, I was mainly focused on personal computing devices. In comparison, Dovey's use of google map street view is like a blend of public and private content. The widespread cameras capture the random moment of site, time, and people. This dislocation of time and space is a good representation of online data gathered from the real world, and Dovey's video project built gripping narratives that further address the discussion.

EXTENDED ANALYSIS 1 --> 'MODERNITY AND CONTEMPORANEITY: MECHANICAL VS. DIGITAL REPRODUCTION'

A digital computer screen consists of tiny pixel components that need a backlight to create images, which require processing through machine system operation to make it work. Therefore, seeing an appearance on the screen differs from seeing a paper photograph. Consider a photo as the sudden capture of the light of the original object, a copy of the original. Then the same picture transforms into digital format through the data language translation to encode and save in electronic devices. Is the digital photo the same as the analog photo? How about its relationship to the original? The reproduction process can be very complex in today's age, and so do the perception of visuals.

In 1935, Walter Benjamin discussed mechanical reproduction and the relationship between the original and copied in his essay "The Work of Art in the Age of Mechanical Reproduction." Philosopher and media theorist Boris Groys started writing Modernity and Contemporaneity with Benjamin's argument and historical context. Groys stated that Benjamin's concept of originality is "rooted in nature." Moreover, he explained the artist's avant-garde response to this discussion of nature and originality. His writing shows that the cultural context and technological development impact reproduction methods, which further influence people's perception of media.

However, the cultural context in our age is very different. Groys points out the complexity of nowadays reproduction mode—digital reproduction. He explains that the image file is not an image but "an effect of the visualization of the invisible image file, of the invisible

data (2021, p.75)." It functions like the relationship between music scores and the music, they are not the same, but the music is a performance of the score. Hence, each time we trigger the contents to show on the screen is like a new copy that we cannot compare to the original since it is invisible. So, "digitalization turns visual arts into performing arts. (p.76)" Groys's idea inspires me to explore the essence of digital data, not merely challenging the visual aspect of the computer interface but also revealing its hidden side. Therefore, I tried to deconstruct and displace the data of the webpage interface in physical form to show the invisible "score."

Finally, digital reproduction changed our perception of content as well as our relationship with data. Unlike mechanical reproduction, digital methods, especially electronic devices and networks, make the viewer visible to the hidden observer. Whenever a viewer browses the internet and triggers content, their action also becomes data that feeds back to the net and becomes a reproduction of themselves and their "off-line behavior (p.78)." However, this bidirectional reproduction cannot be fully controlled by the viewer. The danger of big data and the loss of private data are always radical topics; however, Groys explains it as a return to the "supernatural," intriguingly suggesting his argument about this unstable and uncontrollable reproduction age. Transforming the digital backend into a physical display allows audiences access to the invisible content without feeding their data back to the internet, creating a safer read and communicate environment.

The relationship between humans and machines constantly changes and alters the way we live in this unstable world. One small act, such as uploading images to social media, can be associated with an expansive network universe; or purchasing a newly released smartphone could open up the whole hidden world of e-product commerce and e-waste issues. The Ohio-based artist and writer Julia Christensen's projects mainly focused on the upgrade culture and the hidden e-waste issues. In an interview with Apollo art magazine, Christensen explains the upgrade culture concept as "a sort of relentless notion that we constantly have to upgrade our electronics and media to remain relevant (2020, para. 3)." Her interest emerged because of a visit to India's e-waste processing center. Afterward, she created a series of photographs and writing exploring different obsolescence aspects.

Hard Copy is one of the photograph series that explicitly explores the private collection of recordable data media such as films and disks. Christensen took six photos of her friends' and neighbors' old physical recordings that are no longer accessible due to obsolescence. Compared to another photo series Technology Time which shows the devices' components in e-waste processing, this series provides another context of obsolescence. Christensen mentioned that viewers get to see and question how these contexts "change the [object's] economic and cultural value (para.7)." She kept the angle and focal point solid in all photo series rather than changing too much on photographic effects, which elevated their changing of contexts. This juxtaposition works effectively in the exhibition

setting. In September 2020, the ArtCenter Exhibitions presented Julia Christensen's works. In the gallery, audiences got to view all of her projects and see the relationship and contrast. The discussion about e-waste slowly branched out to private data storage and further opened up the overall argument about obsolescence.

Even though Christensen's works mainly use photographs and installations as a medium, her approach to discussing big topics with specific perspectives is very influential. Her research on upgrade culture gradually moves from big concepts to everyday objects since she goes through this process from the beginning, from the use of electronic devices in people's lives to the various endpoints of obsolete media. Thus, her research process inspired me to explore other aspects branches from my initial interest in computer interfaces and changing of digital format.

I decided to reversely explore the loss in changing the format in response to Christensen's work since data storage development is a gradual transformation from tangible to more intangible and compressed form. Add on my first 100 iterating projects, which transform real-life activity to digital data; the contextualizing project unfolds the digital media back to physical hard copy to reveal the hidden complexity of computer data and the losing function and content of the interface. Just like Christensen shows people's old obsolete media in Hard Copy, I want to discuss how people slowly get rid of physical storage without knowing the hidden complexity behind a simple computer interface and explore the interface more by analyzing them in other formats.

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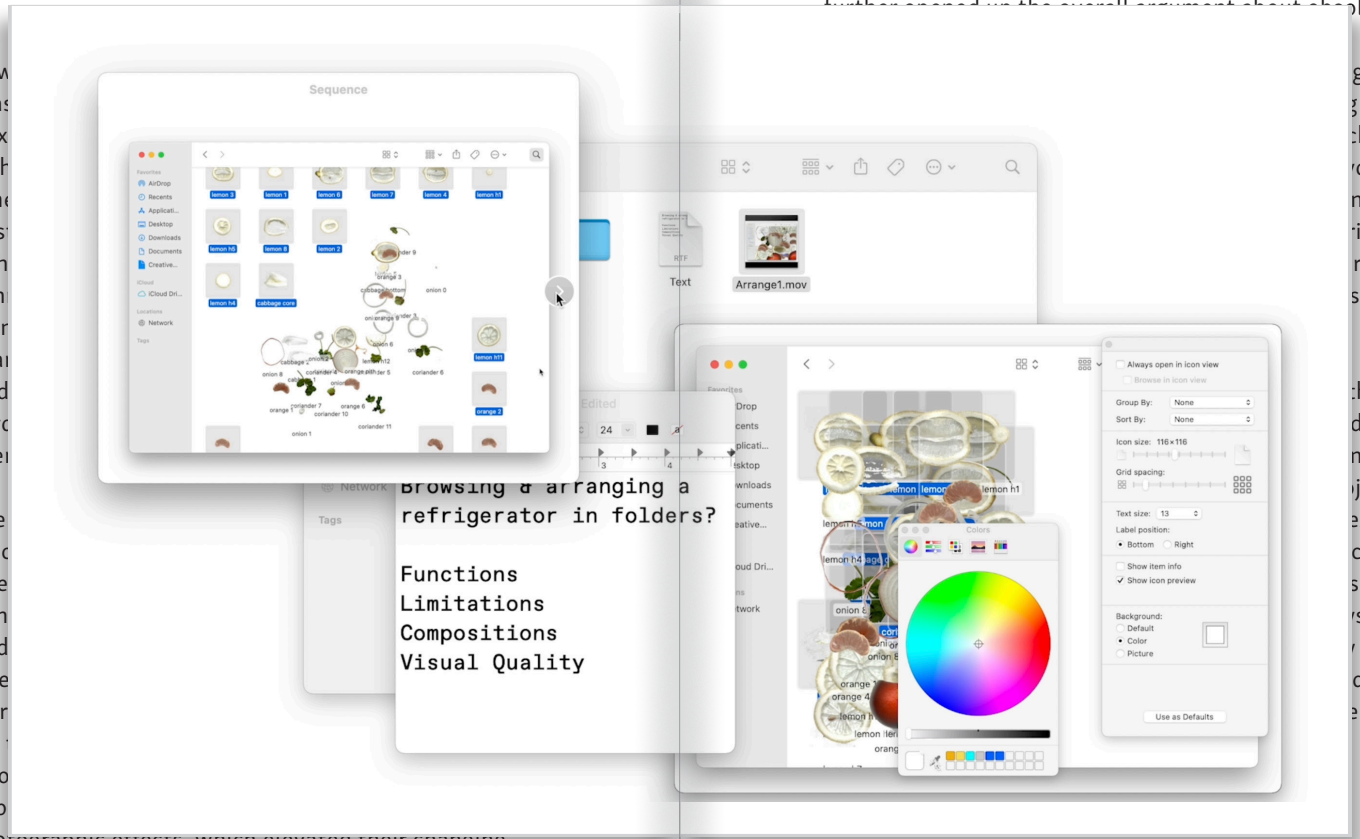

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- This is a folder. By naming it, it becomes a folder for the video essay. Now, I'm creating more folders, naming them, sorting them, and duplicating them. Finally, I'm able to categorize/ build up a digital archive for the materials.

- The existing computer interface folder is the starting point of my experiment.

- The design of the interfaces keeps evolving. Back to the first Macintosh graphical user interface OS system 1.0, we can see the similarities and differences.

- In The New Program for Graphic Design, David Reinfurt discusses that "Interface design is an explicitly speculative exercise. When looking at interfaces from the past, we see what the present was supposed to look like."

- Skeuomorphism: "Skeuomorphism is a design concept used to take advantage of these affordances, creating digital imitations of the things users interact with daily. Individual items that mimic the real world are called skeuomorphs. For example, the entire desktop metaphor was a skeuomorphism. By using skeuomorphs like "files," "folders," "windows," and even "buttons," we create helpful metaphors that people can relate to."

- To explore the relationship and transformation between real-life activities and digital interfaces, I use the folder as a creative site for examining objects and activities from the physical world (in this case, the browsing of a refrigerator). Utilizing the limited functions* of the folder, I dissect and arrange things, just like how people do cleaning and organizing in real life, and change the visual layout to augment the details of the interface's visual qualities.

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- But what is a digital file? Is it the visual display we see on the screen? In Boris Groys's essay Modernity and contemporaneity: Mechanical vs. Digital Reproduction, he mentions, "The image file is not an image-the image file is invisible. The digital image is an effect of the visualization of the invisible image file, of the invisible digital data."

- A simple twist in the code can distort the performance of a digital image. And these are the actual intangible data, like the score behind the performance of music.

- In the history of data storage, we can see the constant development from physical methods to more and more compressed and Intangible methods.

- A one-page website is built up with thousands of lines of source code. That also contains a lot more content and scripts. They are all the invisible scores behind the visual display.

- In order to explore the essence of digital data, I reversely unfold the webpage to the physical hard copy. Therefore, the displacement of functions and content deconstruction reveals the hidden complexity.

- These two explorations of graphical user interface(and digital data)lead me to question the familiar digital screen we see all the time—how it presents a specific appearance of data. Furthermore, what can I do with it concerning the hidden information architecture?

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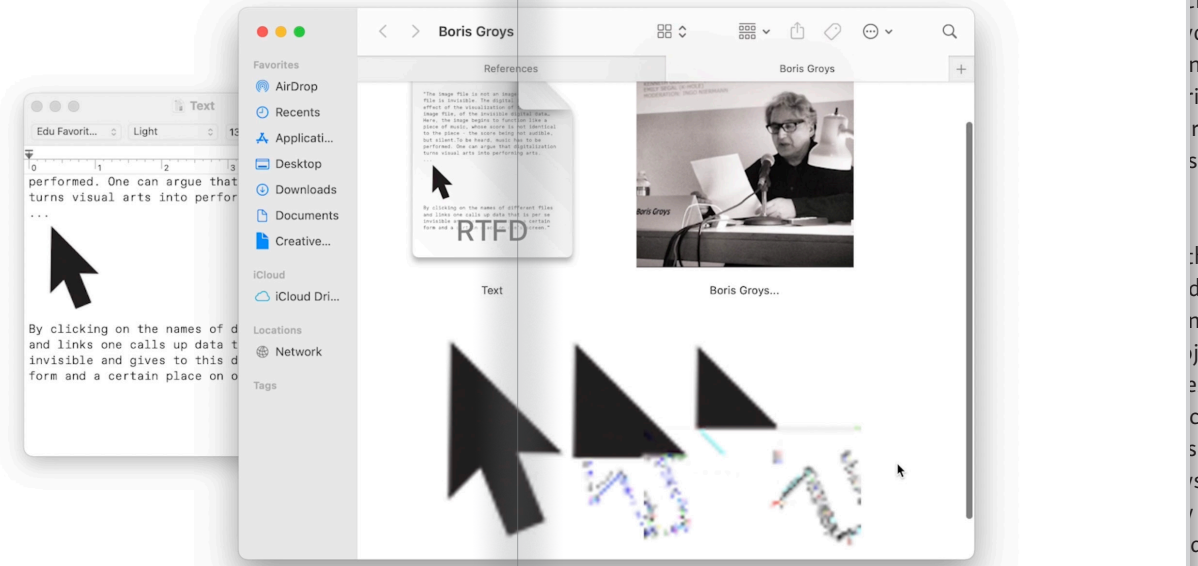

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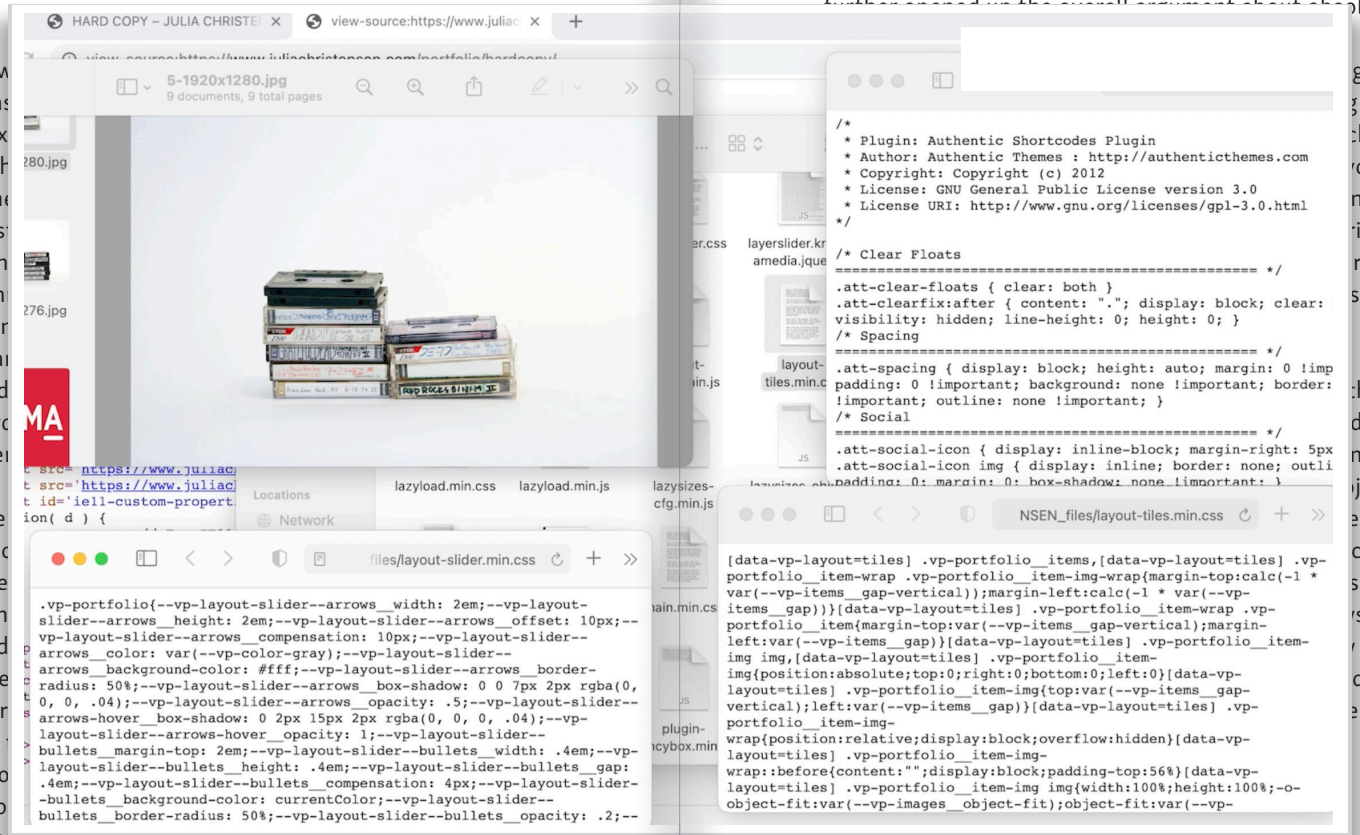

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The Museum of Modern Art. (2013). Metahaven: Islands in the Cloud | MoMA. [online] Available at: <https://www.moma.org/calendar/exhibitions/3739?> [Accessed 6 May 2022].

In the earlier experiments, the research of interface started by exploring the visual aspects and functions of the existing computer interface (in this case, the apple interface) and further branches to the hidden back end of digital files and electronic memory. These small projects are my natural process of exploring and answering new questions about the interface, which opens up many more dimensions such as historical context, politics of design, and physical & digital materials. At this stage, they are still investigations for myself, which I consider as the understructure of the following approaches.

Is reveal enough?

During the conversation with Francisco Laranjo, he raised the question, "Is reveal and inform enough?" Which pushes me to think more about the purpose and possible goal. In the first 100 iterations project, I want to use the familiar computer interface differently. Such as changing the layout composition and arrangement with the essential functions of the folder to augment and emphasize the existence of the interface. In Søren Pold's writing Interface Realism: The Interface as Aesthetic Form, he challenges the constant desire to eliminate the interface that makes them more transparent and brings the discussion of the digital aesthetic concerning the interface as an important cultural form. Thus, inspired by the discourses, my experiment aims to draw the audience's attention to the familiar interface. And the following experiments reveal specific contents I discovered about the digital code behind

visuals. However, the outputs are technically informing my ideas. Inform viewers need an explicit consideration of who the audience is and how to get ideas across to them effectively.

Who is the audience? How to get across ideas?

In the dialogue with Nick Briz, we discussed different ways to get ideas across to the audiences and the importance of context. Nick's projects cover various topics, such as upgrade culture, glitch art, and hidden network geography. He mentioned that there are artists that open their works for interpretation. Personally, he has very "specific ideas that he wants to get across, which is vital that not being misinterpreted." Therefore, different formats and contexts can provide different experiences for audiences. And sometimes, the "same project has various manifestations so he can meet different audiences." Such as the project, WiFi Data Safari uses the butterfly as a wireless network data metaphor; the approaches include software, installation, and workshop.

In comparison, the installation in a gallery setting might intimidate viewers and affect their mindset toward an art piece; the workshop can be more welcoming and allow people to have conversations that hit on the topics. This leads me to consider the audiences and different approaches to invite engagement in the next step. Besides directly bringing the answer to the viewer, Nick gave an example of artist Ingrid Burrington's work Networks of New York, discussing her method of creating situations where audiences can discover the answer themselves.

What is the position? How to join the conversation?

In the scope of digital media, so many good artworks and research

have already been made by artists. Francisco said it could be helpful to understand what has been done before and what my research/ project can add to it. The topic I'm working with now has plenty of historical content and current issues that I should investigate; hence I should consider myself one of the people in the extensive conversation and bring my responses out of it. Possible Directions: Dark Pattern, digital memory, the system, and historical context of existing interfaces.

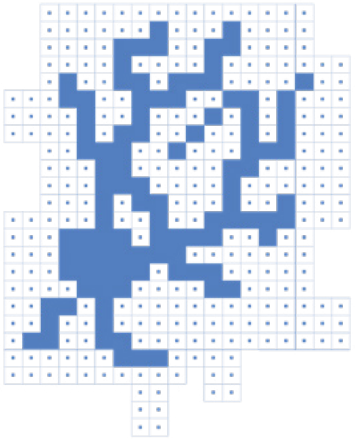
Burrington, I. (2014-2016). Networks of New York. [online] Ingrid Burrington. Available at: http://lifewinning.com/projects/networks-of-new-york/

Francisco Laranjo, guest tutorial meeting, 14 June 2022.

Nick Briz, Nick & Marie's Conversation, 23 September 2022.

Pold, S. (2005). Interface Realisms: The Interface as Aesthetic Form. [online] Pmc. iath.virginia.edu. Available at: <http://pmc.iath.virginia.edu/issue.105/15.2pold.html> [Accessed 25 September 2022].

The first set of projects explored various perspectives on digital interfaces, including interface aesthetics, digital infrastructure, and memory media. These experiments answered my own questions about the subject and provided a wide range of possibilities to explore further. Moving forward, I narrowed the research to a specific topic —Dark Patterns. Which are the interface design features that are “crafted to trick users into doing things they might not want to do.”(Brignull, 2010) As a designer, we have the ability to create deceptive designs that harm users but also have the strength to reveal hidden issues. Thus, in the following exploration, I define my position as a revealer and explore methods to carry the research to audiences effectively.



In the late 1970s, the personal computer revolution started and brought people a new experience of interacting with the machine. Since then, digital devices have swiftly spread in everyone's daily life. However, in the early stage of development, when working with a device that still requires a lot of clumsy physical hardware and lagging operation systems, it is reasonable that people are constantly pursuing more changes. Other than big technology companies in Silicon Valley, informal groups of electronic enthusiasts such as Homebrew Computer Club played a significant role in the rise of computer culture and designed the Apple computer. (Wozniak, 2015) The interface was a considerable part of this microcomputer revolution. It is the bridge, translator, and space between humans and machines. So that people can achieve a specific goal with the interface instead of manipulating the highly complex machine backend.

In the project The Dark Pattern, I focus on a current issue in the scope of digital interface—the dark pattern designs, which are the interface design features that are "crafted to trick users into doing things they might not want to do"(Brignull, 2010). This kind of deceptive design has been used for years in the digital world, but its seriousness has not been fully emphasized until recent years with new laws and policies, including General Data Protection Regulation (GDPR) in UK and Federal Trade Commission (FTC) in the US. Thus, I revisit the early articles about interface design histories to learn more about the transformation of digital interfaces, exploring how to approach the topic.

Don Norman is a design researcher and writer who was the User Experience Architect at Apple Computer from 1993 to 1998. (Lialina, 2015) In Donald Norman's article "Why Interfaces Don't Work," he criticized the Macintosh computer interface and raised the discussion of interface design concerning user experiences. The article was written in 1990 when personal computers became affordable for wider customers, and most importantly, this was in between the rapid upgrading of technologies. At that time, Norman claims that the interface is the tool, and the good tool should not "get in the way" and attract attention. It should be invisible. (Norman, 1990, p210) However, nowadays, we already get to a point where machines and systems have become highly compact and invisible. Moreover, due to the invisibility of technology, there are designs like dark patterns that use people's existing cognition to harm users. Thus, I would argue that the discussion of interface design should maintain a certain amount of visibility rather than carrying over the emphasis on extreme transparency, especially with the deceptive interface that matters to users' rights and safety.

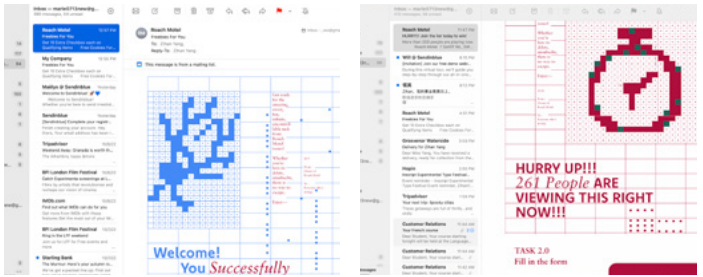
Seamless and blending?

* *Is it feasible to unearth dark patterns within the original context*
* *Create an interactive digital trap instead of direct reveal*
* *Outcome easily became invisible again*

Norman argues that the interface should be "subservient to the task" the user attempts to accomplish, when in fact the deceptive design does not. (Norman, 1990, p217) Therefore, to unearth the dark pattern, we should eliminate its invisibility and not just analyze them as tools. My research started with locating the deceptive designs in our commonly used digital media. Where dark patterns

are used extensively, users hardly pay attention to them. People already get used to being inundated by digital noises, and the dark pattern design was like an undercurrent quietly flowing below the surface. We can easily find them by opening a shopping webpage or email advertisement. Hence, my first exploration was curated digital traps in their major digital contexts and further highlighted the existence of dark patterns.

The experiments include interactive software design and fake junk email sets. By mimicking design elements, I wished to provide an interactive experience for audiences inside the original context. At the same time, these approaches could adapt to other dark pattern designs in the context and subtly surprise viewers, such as the spam approach that merges into the inbox list. These explorations pushed me to pay more attention to the functions and visuals of dark patterns. However, the assembled translation of visuals and retained functionality makes the interface seamless again, which retreated to an invisible condition. While testing the email approach, some testers naturally ignored the emails or feared clicking on anything due to chronic hesitancy, noticing that it is more difficult now to make things visible than invisible given these nonviable explorations. Therefore, finding a form that people can perceive clearly but does not get overwhelming is essential.



EMAIL EXPERIMENTS
TEST SENDING

Brings back things that are out of sight:

** Reverse the transition from digital to physical manifestation.*
** Remove the functionality of dark patterns.*
** Extract design elements from deceptive design*

Visuals on a digital screen are like the surface appearance of the performance for the backend infrastructure. In the section "keep the technologies out of sight," Norman discusses that complex technologies like physical hardware should get out of sight for users to focus more on the tasks. (Norman, 1990, p217)Because computing still needs more analog materials and human labor in the late 90s. In order to emphasize the crafty dark patterns, I reverse the transformation from digital back to analog. The final approach of this project takes the publication format to create a physical manifestation of the research—using the paper-based medium as a tangible container to reveal and relocate contents with new values.

This publication set unfolds and extracts the visual elements used in the deceptive design to augment the interface. It contains four sections that display the research of visual components, including checkboxes, buttons, and countdown timers, frequently used in the deceptive interface. Take the checkbox as an example; this graphical widget could mean different choices depending on the content text. For example, in a context such as website subscription page, it could mean yes or no, select or delete. The small publication edited different text with the checkbox, demonstrating how the content twist could mislead users to make unwanted choices.

Moreover, translating the digital interface into physical form deactivates the interface functions, further providing the reader with a sense of control. Compared to the digital site that could

contain infinite pieces of information, the publication brings the reader a fixed amount of content. As a result, the audience could access the dark pattern without hesitation or uncertainty. On the other hand, the correlation between the publication and deceptive design could create a contrast in value. For instance, the accordion fold in the junk email section gives a continuing viewing experience that mimics the infinite scrolling of email and overflowing dark patterns in spam. When seeing a well-printed publication, people tend to expect more valuable info, whereas it is actually loaded with unwanted letters that people normally ignore.

Brignull, H. (2010) Deceptive design - user interfaces crafted to trick you, Deceptive Design – formerly darkpatterns.org. Harry Brignull. Available at: https://www.deceptive.design/ (Accessed: October 31, 2022).

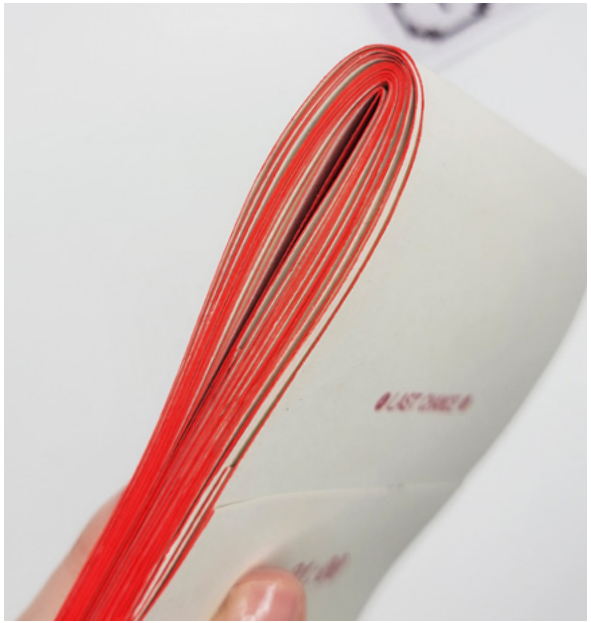
Lialina, O. (2015) Rich User Experience, UX and Desktopization of War, Rich user experience, UX and desktopization of war. Available at: http://contemporary-home-computing.org/RUE/ (Accessed: November 1, 2022).

Norman, D.A. (1990) "Why Interfaces Don't Work," in B. Laurel (ed.) The art of human-computer interface design. Boston, MA: Addison-Wesley, pp. 209–220.

Wozniak, S. (2015) "Homebrew And How The Apple Came To Be". atariarchives.org. Available at: https://www.atariarchives.org/deli/homebrew_and_how_the_apple.php (Accessed: November 4, 2022).

DARK PATTERNS
PHYSICAL APPROACH

DARK PATTERN
PUBLICATION-TIMER



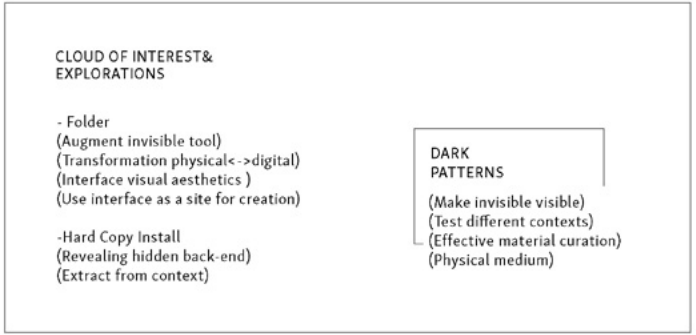
DARK PATTERN
PUBLICATION-CHECKBOX

DARK PATTERN
PUBLICATION-EMAIL

DARK PATTERN
PUBLICATION-COOKIES

From the computer folder to the dark pattern interface, this research project goes through processes of expanding and narrowing down discussions and explorations. The first set of experiments provided different dimensions of the digital interface, which gave me an overview of the subject and further picked out specific topics from my cloud of interest that I could push forward. Also, it allowed me to test and improve my working system, where I got to try various methods and mediums in these small projects that benefitted my following directions. For instance, the use of the tangible medium in the Hard Copy project made me notice the experience and value differences between digital and physical mediums, which inspired the publication approach for the dark pattern project. Furthermore, my position as a designer and “revealer” became more defined. Instead of researching only to answer my own question, I decided to demystify the hidden complexity and get across the discourse to audiences using my curated system and visual languages.

DIAGRAM OF PROJECTS KEY POINTS



Moving forward from Dark Pattern, the research lands on the discussion of “control.” We, humans, believe that we can fully control the interface, when in fact the interfaces are also invisibly controlling us and influencing our behavior.

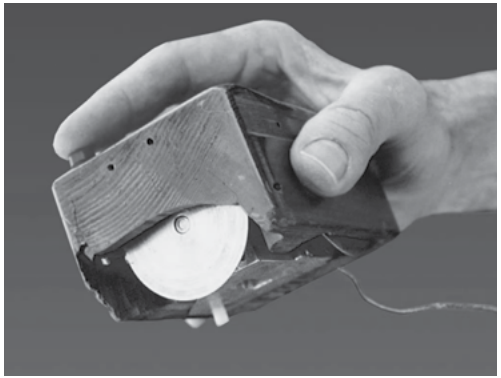
How to discuss this mutual control?

The project took the cursor as a starting point, a critical visual element in the first computer interface design to represent the individual’s movement on a digital screen.

"Eyes, brains, capacities also mutate; we adapt, altered by interface."(Drucker, 2013, p218)

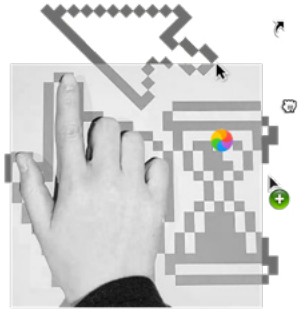
From the 1940s to 1968, the computer shifted from room-size systems that needed a group of people to control to desktop size, which encouraged personal ownership of devices. Moreover, the control of the interface also developed from command system computer to mouse control and, nowadays, direct touch-triggered systems. As a result, users become increasingly "close to the metal." (Norton, 2019). With the need to master the new technologies in this "upgrade culture," the public is pushed to learn more, always gaining familiarity with new features. As the further discussion of Marshall McLuhan's thesis "media as an extension of man" in the digital era, Robert K. Logan raised, users also become "the extensions of their digital media," ((Logan, 2019)) it is not a one-way control, but mutual. We shape the digital tools, and at the same time, it feeds back to us and shapes our behavior.

These projects are part of ongoing research on digital interfaces. For the purpose of analysis and to provide new ways of observing

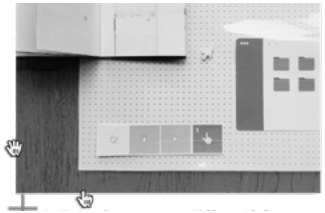


FIRST COMPUTER MOUSE

INITIAL EXPERIMENTS



How the graphical interface relates to real-life objects and activities?



How individual use cursor differently?(A physical version of 5 mins cursor movement.)

Digital publication of the research on arrow → cursor

the mutual control between humans and the interface, the experiment used the cursor as the starting point. Douglas Engelbart invented the computer mouse as part of his "oN-Line System" (NLS), where people are first able to see the little icon move on the screen as a representation of their hand movement, which plays a crucial role in providing interactive elements based on individual manipulation. Emma R. Norton raised that in Engelbart's system, "the human body was not reaching for the computer; the computer became an extension of the body." The beginning of our distance from the interface moving closer. (Norton, 2019)

After several experiments with the cursor and the use of the cursor, the exploration comes to removing the cursor icon altogether, where suddenly, the screen and hand gestures become the only clue of interaction. In that situation, the importance of visual feedback and the limitation of gestures was obvious. Everyone uses the same hand gestures for the touchpad and keyboard that are determined by the devices, like a unified interface language. It seems to bring users closer to the interface; however, the researcher Ali Na argues that the more direct the interface appears to users, "the more likely they are to take it for granted and ignore how their experience is being mediated." (Na, 2010) Thus, in order to highlight the familiar gestures we hardly notice, the video experiment "The cursor: Fish in Tank" uses metaphoric representation to create mismatched visuals to disturb the viewer's acquired knowledge and intends to provide a pause moment for pondering. Raise that question: what kinds of movements do we usually do? How does the interface respond to us in return? How do these gestures become our muscle memory?

VICTORIA FU
BELLE CAPTIVE 1

"We shape our tools and thereafter they shape us,"

In the 'Screenic (Re)orientations' of Screen Space Reconfigured, De Rosa and Strauven discussed the reference to interface gestures. Taking Hirshhorn and Victoria's explorations as example, they raised that the fake and curated gesturality provide fake interactivity for spectators that sits on a "strong presence of the author and a consistent hypermediacy of the screenic interface." (De Rosa & Strauven, 2020) Hence, took the inspiration of the discourse, the next experiment simplified the elements, curated with only gestures and visual feedbacks without adopting too much from the existing interface like the past experiments. Moreover, the video piece takes place on a hand-size screen to create a life-size display of hand movements. Reproducing a "fake" interface experience, the video creates a subtle discomfort and confusion that augments spectators' awareness of "communal gesture" in interface design.

De Rosa, M. and Strauven, W. (2020) '9. Screenic (re)orientations: Desktop, tabletop, tablet, booklet, touchscreen, etc', Screen Space Reconfigured, pp. 231–262.

Drucker, J. (2013) 'Reading interface', PMLA/Publications of the Modern Language Association of America, 128(1), pp. 213–220.

Logan, R.K. (2019) 'Understanding humans: The extensions of Digital Media', Information, 10(10), p. 304.

Na, A. (2010) The fetish of the click: A small history of the computer mouse as vulva ..., Feminist Media Studies. Available at: https://www.tandfonline.com/doi/abs/10.1080/14680777.2017.1298143 (Accessed: 6 May 2023).

Norton, E.R. (2019) Close to the metal, Real Life. Available at: https://reallifemag.com/bad-metaphors-close-to-the-metal/ (Accessed: 6 May 2023).

1. (2020) Desktop films, alsolikelife - Kevin B. Lee.

In my first set of experiments around the digital interface, I utilized the computer interface folder space as a site to create visual layouts. People nowadays are familiar with interfaces and personal computer spaces; thus, I use the interface unfamiliarly and provide unique experiences in each audience's computer. Kevin B. Lee is a media artist and filmmaker who explores a film format called "desktop films," which incorporates the desktop interface and authentic materiality of the desktop to create narratives. His concept and way of working with the existing interface inspired me to reconsider the possibility of creating digital publications using the interface while highlighting its features and providing audiences possibility of interaction. How can I talk about the interface itself by using the interface? If it is a publication in the form of desktop reading, how to control and curate the experience?

KEVIN B. LEE
TRANSFORMERS: THE PREMAKE

2. Screen Space Reconfigured, Screenic (Re)orientations : Desktop, Tabletop, Tablet, Booklet, Touchscreen, Etc. - Miriam De Rosa, Wanda Strauven

In this digital age, many consumers long to purchase better and more up-to-date digital products, just like other commodities. The very early designs of interfaces were born from the beautiful wonder even before the public knew what a digital screen should look like. In this book chapter, David Reinfurt brought the story of interface designers Muriel Cooper and Susan Kare. He addressed that it is helpful to look at "things that are out of date, that do not register in the current moment," and we can get to see "what the present is supposed to be like" and further reveal the "desires for how we would like our computer to behave (2020, p.234)." I make this folder iterations with interest in the computer interface. Therefore, the evolving interface provides a rich story of humans and interfaces. The first interface visual design showed the need for detailed explanations with the icons derived from real-life activities (such as hands, trashcans, and files)—we shape the media. However, the interface visuals have become much more simplified and abstract nowadays because our perception is also shaped by the media conversely.

3. Reading Interface - Johanna Drucker

The relationship of control and be controlled between the user and interface is the starting point of the project research, exploring methods to read the interface that we usually take for granted. Johanna Drucker raises the discussion around the digital interface through the visual and semiotic aspects, the historical background, and different perspectives of the understanding interface. She explains how familiarity with metaphors influences our perception of interface visuals, such as the folder is not a tangible object but a behavior clue for action. Users adapt those visual clues to interact better with the machine, and at the same time, interfaces are developed and feedback new clues for learning. Drucker's writing allows me to analyze the digital interface from a different view and further consider how I can unstitch the story of the cursor from not only the visual design of the icon but other aspects, such as the physical gesture we use them.

4. (2018) Anatomy of an AI System - Kate Crawford, Vladan Joler

Anatomy of an AI System is a big, high-resolution infographic created by Kate Crawford and Vladan Joler. It explores the complex infrastructure behind the Amazon Echo device and its AI system. This project shows how a rich research process could be curated and put together, combining writing and graphic elements in both physical and digital formats. The digital publications and maps people can download and explore provide a more accessible interaction that effectively carries the complex content. I was taking the position of a revealer in my last interface research and now shifting to a reader who could offer different lenses to audiences. Crawford and Joler's project allows viewers to access a complex topic in different small sections, which inspired me to think about how I might approach the "cursor" interface from various experiments.

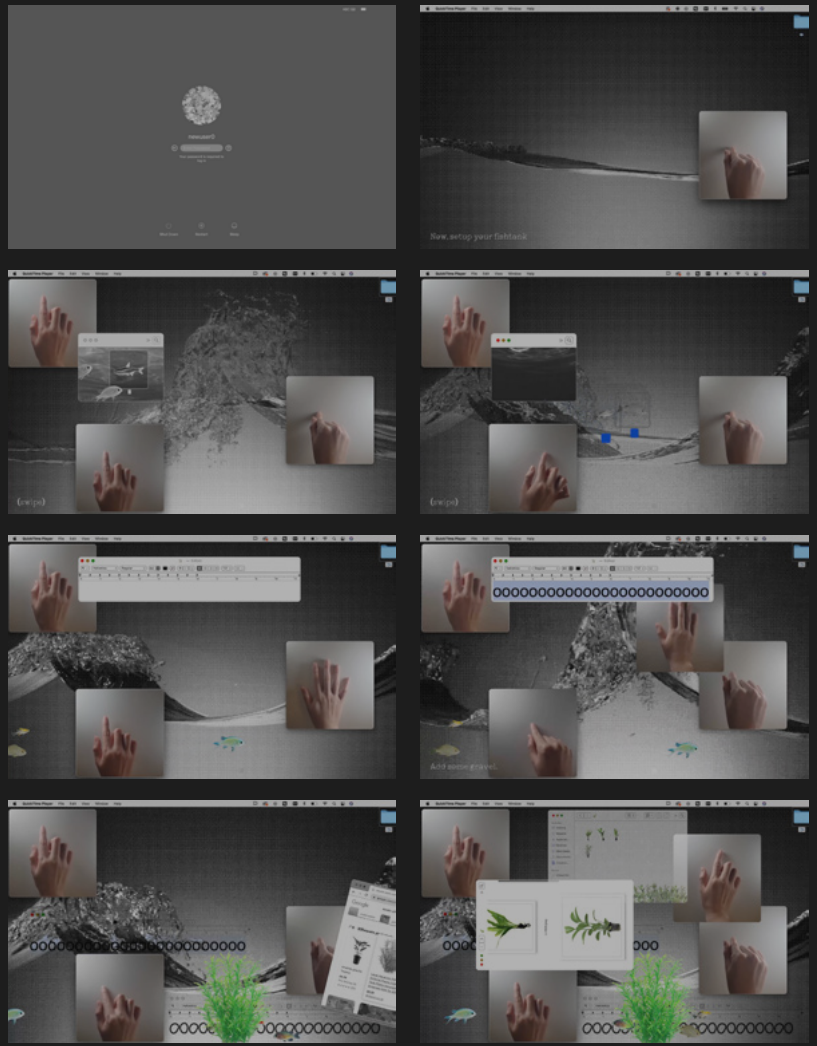
5 Metahaven's Facestate- Andrea Hyde

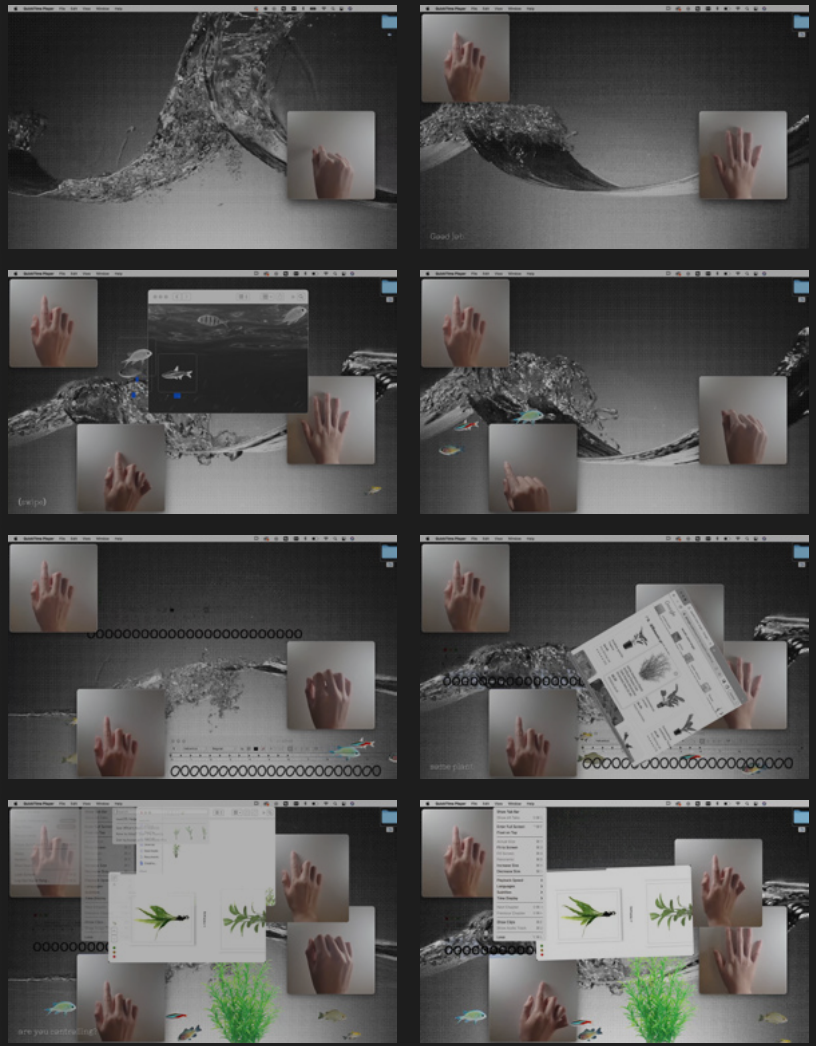
Facestate is a visual translation of Metahaven's research around Facebook and its parallel with the state. In this interview, Metahaven describes the concept and decision behind this installation. They describe this project as a starting point installment for a more significant, long-term project, and by exploring different formats, they could lead the topic to the next step. Their approach is very inspiring, where they address discussion through a set of visual and physical experiments. Although the starting point of a project is always tricky, from the Facestate installation, I learned possible methods to translate fragmented ideas into experiments in order to push forward.

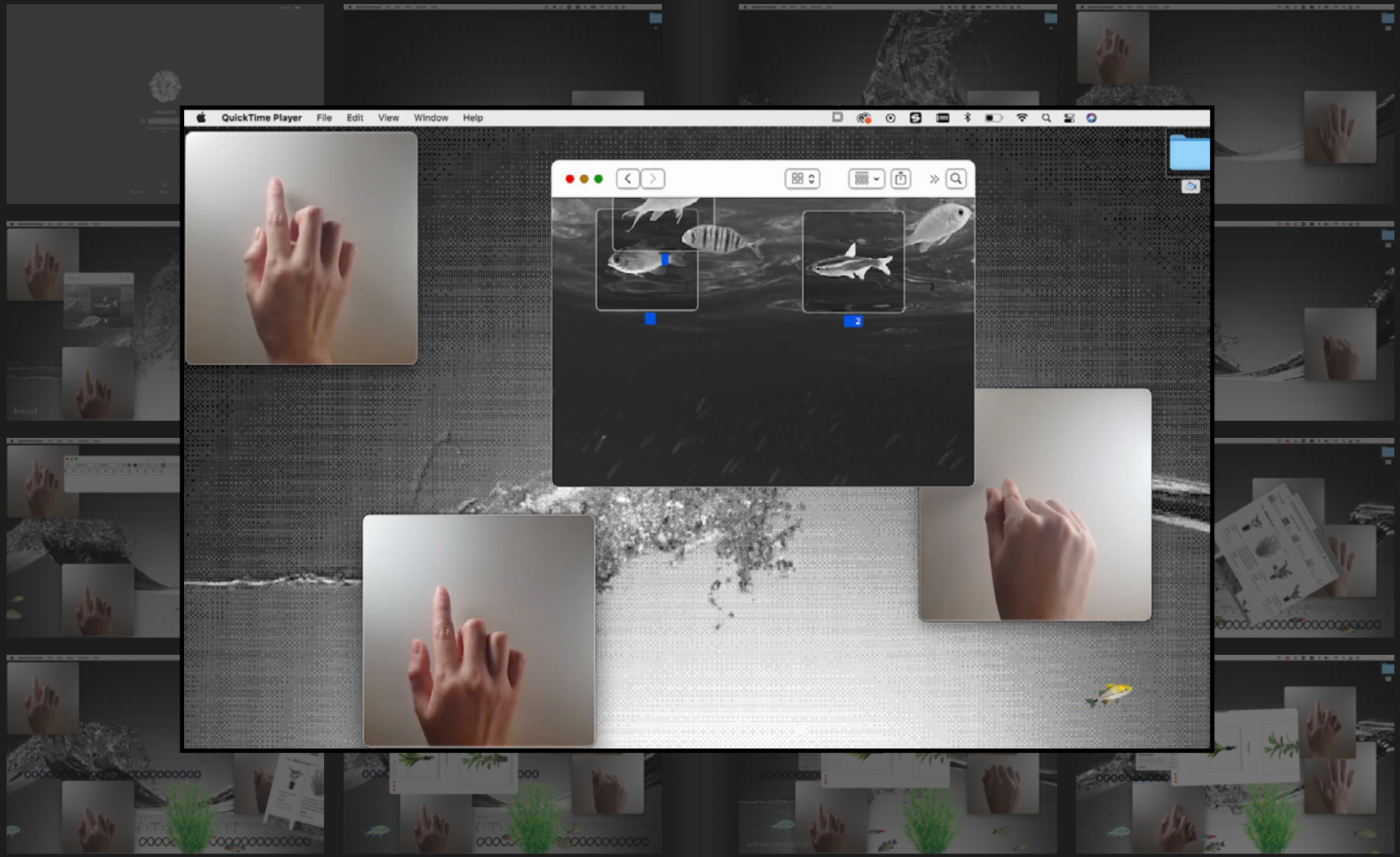
METAHAVEN
FACESTATE

As digital natives, most of our generation grew up “with the presence of digital technologies.” Yet, due to this familiarity, we hardly notice how we interact with our devices so fluently that they become our unconscious movements. This ongoing research project aims to unstitch the intimacy between users and the interface, providing different perspectives for viewers to pause, re-encounter, and reflect on the mutual control between humans and the interface.

“Fish in Tank” experiment used the existing computer desktop interface to recreate a mismatch of hand movement to visual feedback. Displayed on random devices in situ at a crowded Apple store, people are encouraged to interact and touch digital devices frequently, curating an accidental engagement for viewers, followed by further questions on who is “controlling.”



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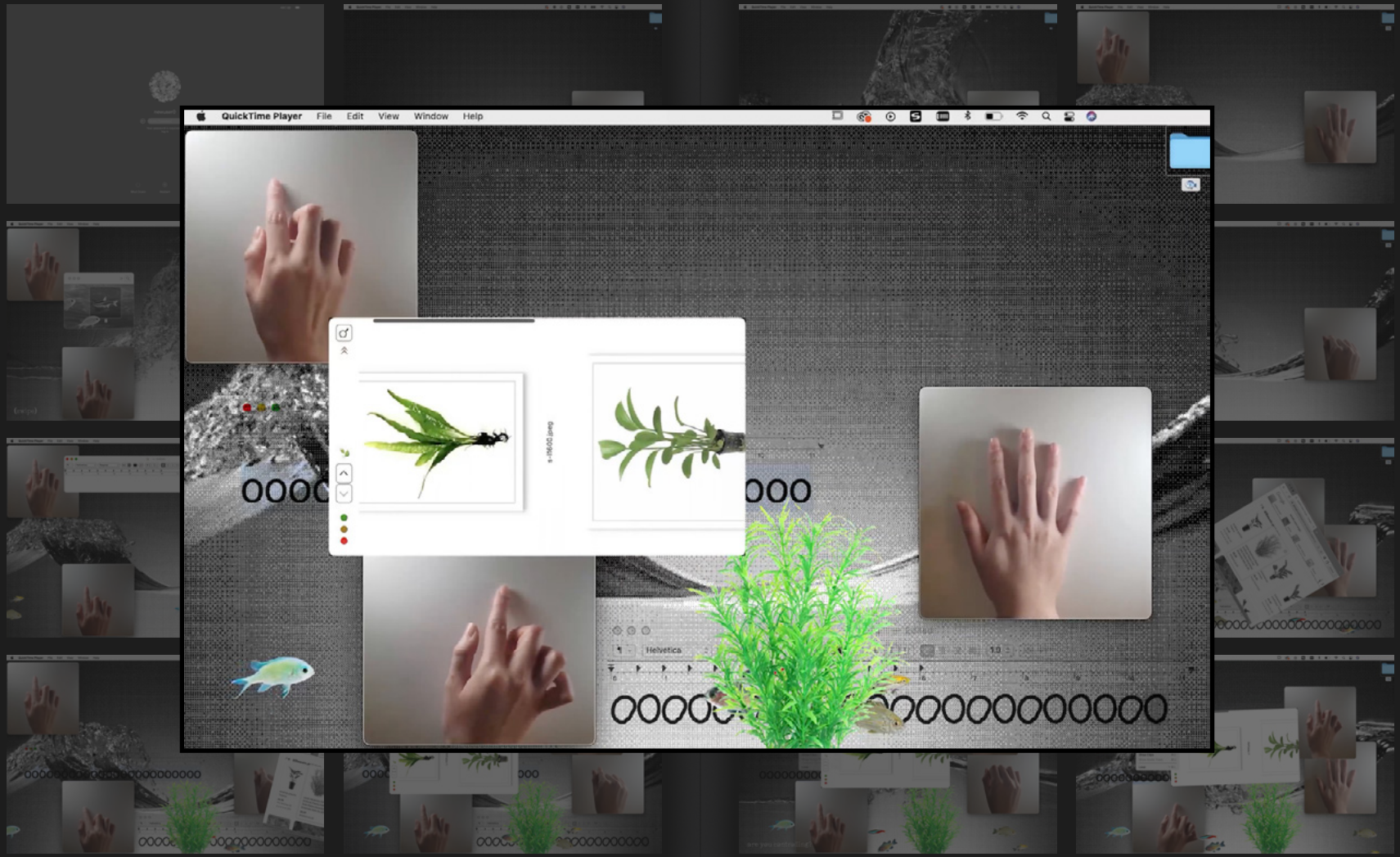
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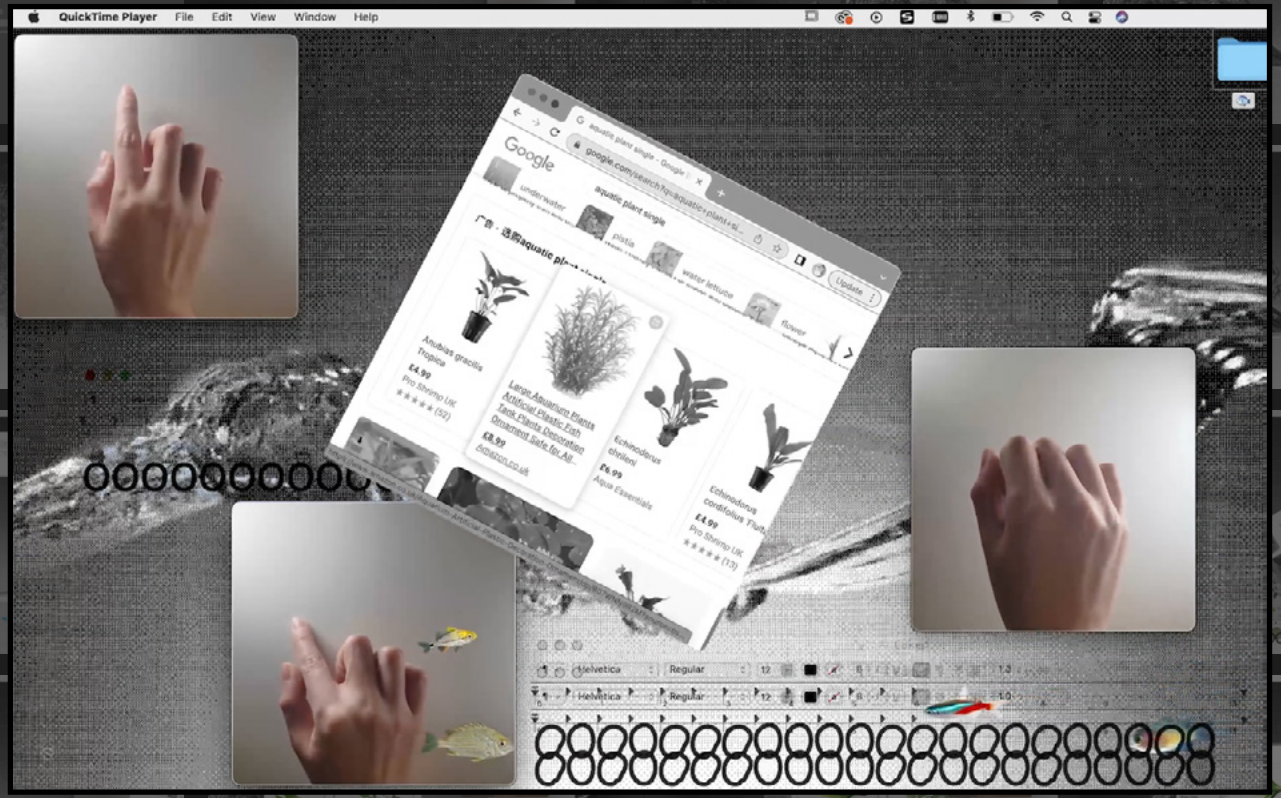
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This ongoing research project aims to investigate the mutual control between human and digital interfaces, taking the cursor as the starting point of the research. This small, tiny, unobvious visual indicator plays a vital role in interface use. While people get too familiar with digital interfaces, we pay less attention to them, not to say, question their use and the invisible mediated process behind them. One of the key concepts of the project direction is about the "touch" action in the interface, which in the development of interface and machine design leads to a lack of awareness and ignorance toward the hidden mediated experience. In the work-in-progress phase, I created a short

IN SITU TEST
ON RANDOM MACBOOKS

video on a standard desktop interface and explored using the "fish in the tank" metaphor to highlight and discuss the control of the cursor subtly.

Apple Developer Guideline describes the touch gesture design as "eliciting a close personal connection with the content and enhancing the sense of directly manipulating onscreen objects."

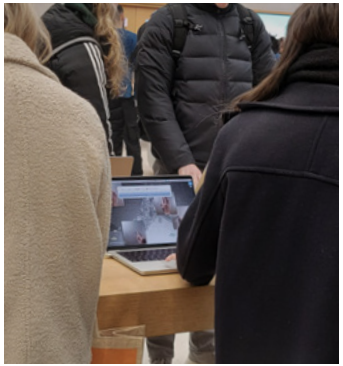
The audience test of this project took place at Apple Store Oxford Circus, the busiest Apple store in London, where everyone is wandering and testing the interface control on devices. For the first audience test, I choose the digital devices store as the context because this site is where people encounter interfaces with high consciousness. Moreover, as the project wants to raise awareness and discussion of the interface we use daily, setting it in situ provides a relative and familiar context. During the process, I used several random MacBooks at the Apple store to play the short video that manipulated visual elements on the desktop interface and observed viewers' reactions. While people

walk by and encounter the graphic, some stop by and watch it, and some keep touching and clicking to figure out what is happening. The most immediate reaction is direct touching and interacting with devices while watching.

In this direction, I took the video as a medium. The playing contexts could play a significant role for audiences because video has high flexibility for contextualizing, mainly on the digital screen. However, viewing videos on YouTube and in an exhibition context can bring very different experiences due to viewers' different expectations, mindsets, and accessibility. Since Apple store is designed to be a friendly "town" environment for people to experience devices freely, this project test used this context to discourse the interface under an active environment.

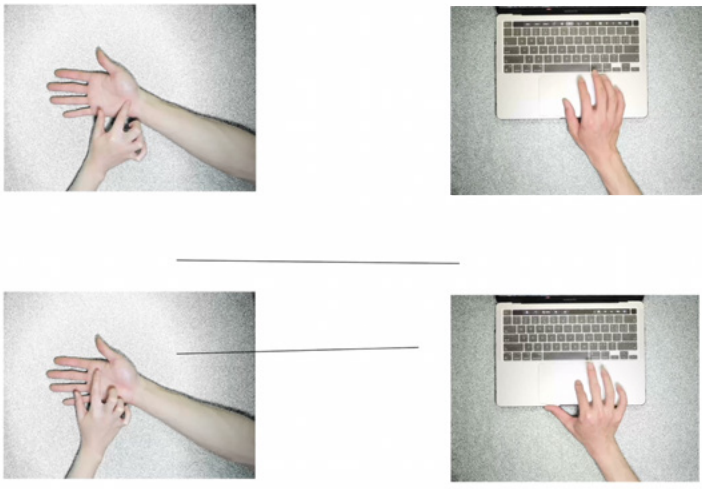
The test brings the project closer to the public, which is a necessary process for further development. It helps me scrutinize the communication performance and reveal what is effective and needs more clarification. Through observing the viewer's reaction, I noticed that due to the use of metaphor, and the small size of the original cursor, it could be challenging to get the concept at first sight. A better clarification and a more detailed narrative might help the audiences interpret the content better. Next step, I want to push the project further by exploring both digital and physical mediums and investigating a set of outputs that can package together to generate a better communication outcome.

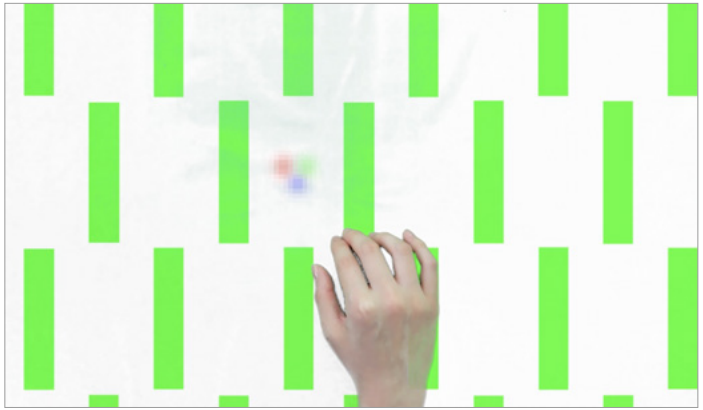
IN SITU TEST
VIEWERS' REACTION



The second set of exploration extends the reference to the unified hand gesture, in particular, the Apple system gesture. The experiment underwent different tests, including deconstructing elements, exploring touch & tactility, and analyzing the subtle “touch” as intimate gestures...

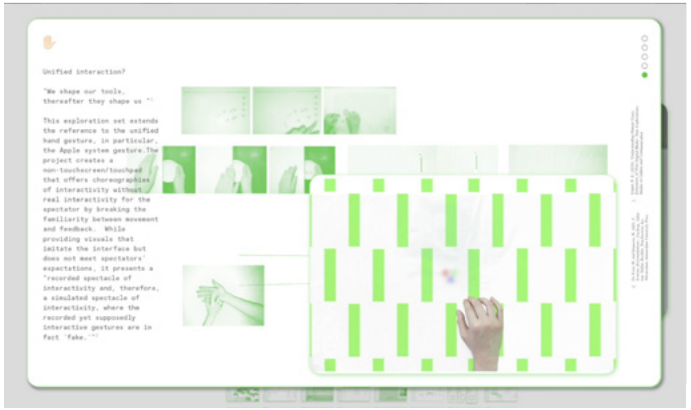
How to imitate the interface gesturality and break the understanding & familiarity of these gestures?





VIDEO
RIGHT DESTURALITY

*The Right Gesturality: matchs with visual experiments based on the first Macintosh Wallpaper pattern, the project creates a non-touchscreen/touchpad without real interactivity for the spectator by breaking the familiarity between movement and feedback.



E DOCUMENT
CTRL Z

* “Ctrl Z”: adopts the interface undo&redo feature to present a flashback narrative of the research processes.

EXHIBITION ON DISPLAY
RESEARCH SET

EXHIBITION ON DISPLAY
AUUDIENCE INTERACTION

Why do we need to pay attention to those details in the interface design? What is the discussion about ethics in the scope of digital interface? How to read them differently?

As graphic designers, we participate in interface development, despite limited power. Take the Dark Pattern(deceptive design) research as an example, where designers could play an essential role in creating visuals that trick users into doing things they don't want to do. This project starts with my questions about the familiar devices and unnoticed influences between us and interfaces. Throughout the process of experimentation, I've been constantly raising new questions and looking for ways to bring provocation and discussion to audiences. Instead of using didactic ways of explaining, this project aims to provide different perspectives on encountering familiar interfaces, focusing on the visual explorations of digital culture.

To push this project further, besides physical works and installation, I will keep the flexibility and accessibility by curating an editable research publication, using a website and data sharing device(such as USB) to package and organize the research materials and experiments. * In a past investigation, sharing content through USB for viewers to interact with their own devices could provide a more approachable experience which I hope could use as a container for this project.