CYBERFEMINISM

EMA POP
DESIGN AND CREATIVE PRACTICE 3 - BARC0108

Cyberfeminism =
a feminist approach which
foregrounds the relationship
between cyberspace, the Internet,
and technology.

CYBER-
FEMINISM
INDEX

MINDY SEU

This project was inspired by the gender and racial biases I have seen in cyberspace throughout my academic journey in computer science and electrical engineering. The image above is taken from an article that states that only in March 2024 did IEEE, the "world's largest technical professional organization dedicated to advancing technology for the benefit of humanity," decide to ban the use of the Playboy cover image in all academic papers used for image-processing.

Institute bans use of Playboy test image in engineering journals

Lena Forsén picture used as reference photo since 1970s now breaches code of ethics, professional association says

📷 Playboy decided against taking legal action, instead preferring to 'exploit this ... phenomenon'.

Alex Hern *UK technology editor*

Sun 31 Mar 2024 17.55 BST

Reference

The mother of cyberfeminism is considered to be Donna Haraway that wrote the Manifesto for Cyborgs in the 1980s and paved the way for new digital aesthetics and made the women experience central to technological advancement.

A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s

by Donna Haraway

An Ironic Dream of a Common Language for Women in the Integrated Circuit

THIS ESSAY is an effort to build an ironic political myth faithful to feminism, socialism, and materialism. Perhaps more faithful as blasphemy is faithful, than as reverent worship and identification. Blasphemy has always seemed to require taking things very seriously. I know no better stance to adopt from within the secular-religious, evangelical traditions of United States politics, including the politics of socialist-feminism. Blasphemy protects one from the moral majority within, while still insisting on the need for community. Blasphemy is not apostasy. Irony is about contradictions that do not resolve into larger wholes, even dialectically, about the tension of holding incompatible things together because both or all are necessary and true. Irony is about humor and serious play. It is also a rhetorical strategy and a political method, one I would like to see more honored within socialist feminism. At the center of my ironic faith, my blasphemy, is the image of the cyborg.

A cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. Social reality is lived social relations, our most important political construction, a world-changing fiction. The international women's movements have constructed "women's experience," as well as uncovered or discovered this crucial collective object. This experience is a fiction and fact of the most crucial, political kind.

65

Reference

Karyn Nakamura's thesis cable, 2023

Questioning the standards set in cyberspace is not only imperative but immensely critical in the age where algorithms affect our every decision, whether we know it or not. For example, the used language around plugs and sockets was a further starting point for exploring the subliminal messages instilled in technologies considered neutral.

Using an Arduino board
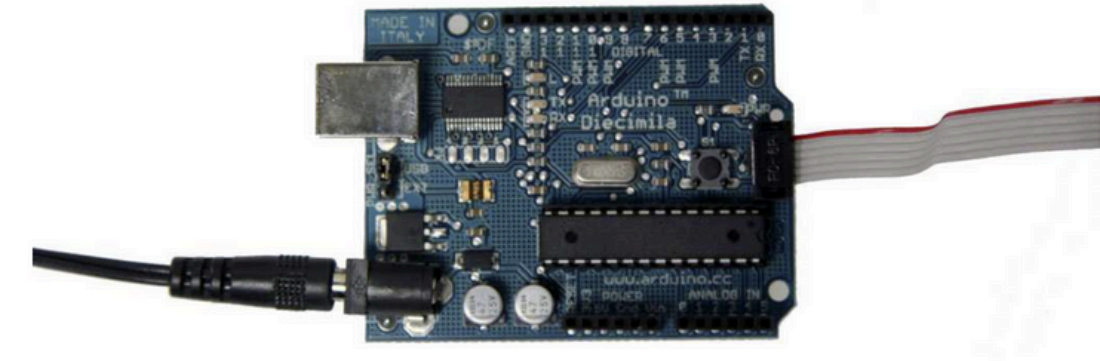
Bootloading on an Arduino board

Place your Atmega chip into the Arduino board with the divot of the chip facing outward. Set the jumper to an external power supply and connect a 12V power brick (your board needs to be externally powered when using the AVR ISP mkII but is not needed with the AVRtinyISP) . Then, attach the 6-pin female plug of your AVR programmer to the 6 male header ICSP pins with the plastic nub of the ribbon cable head facing inward.

> NOTE: The AVR ISP mkII turns its LED green when they've been hooked up correctly and are ready for programming. The LED turns red if it is hooked up wrong.


Male VGA Connector   Female VGA Connector

Reference

This interactive exhibit, called Black Box, part of AI: Mind the Gap at the MIT Museum, is part of the artworks aimed at explaining how AI works to the general public. In academic papers, the field of explaining opaque algorithms such as neural networks is called Explainable AI or XAI. Within that field, there is a subset for using creative practices to convey these scientific concepts to a general audience called XAIxArts. This work demystifies the black box algorithms of neural networks that are foundational to AI-generated images.
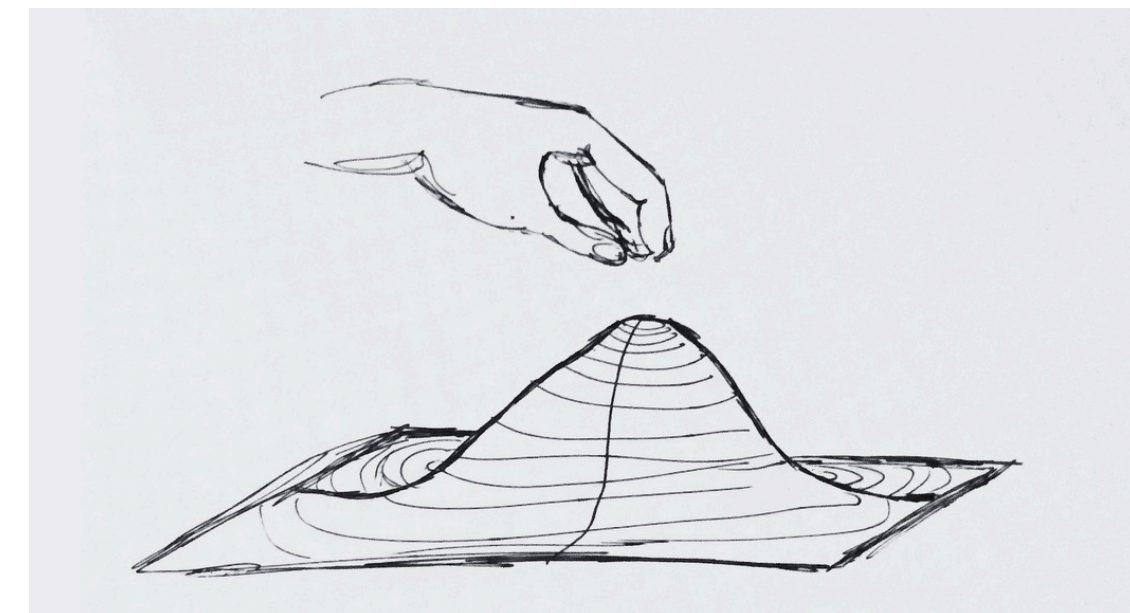

Reference
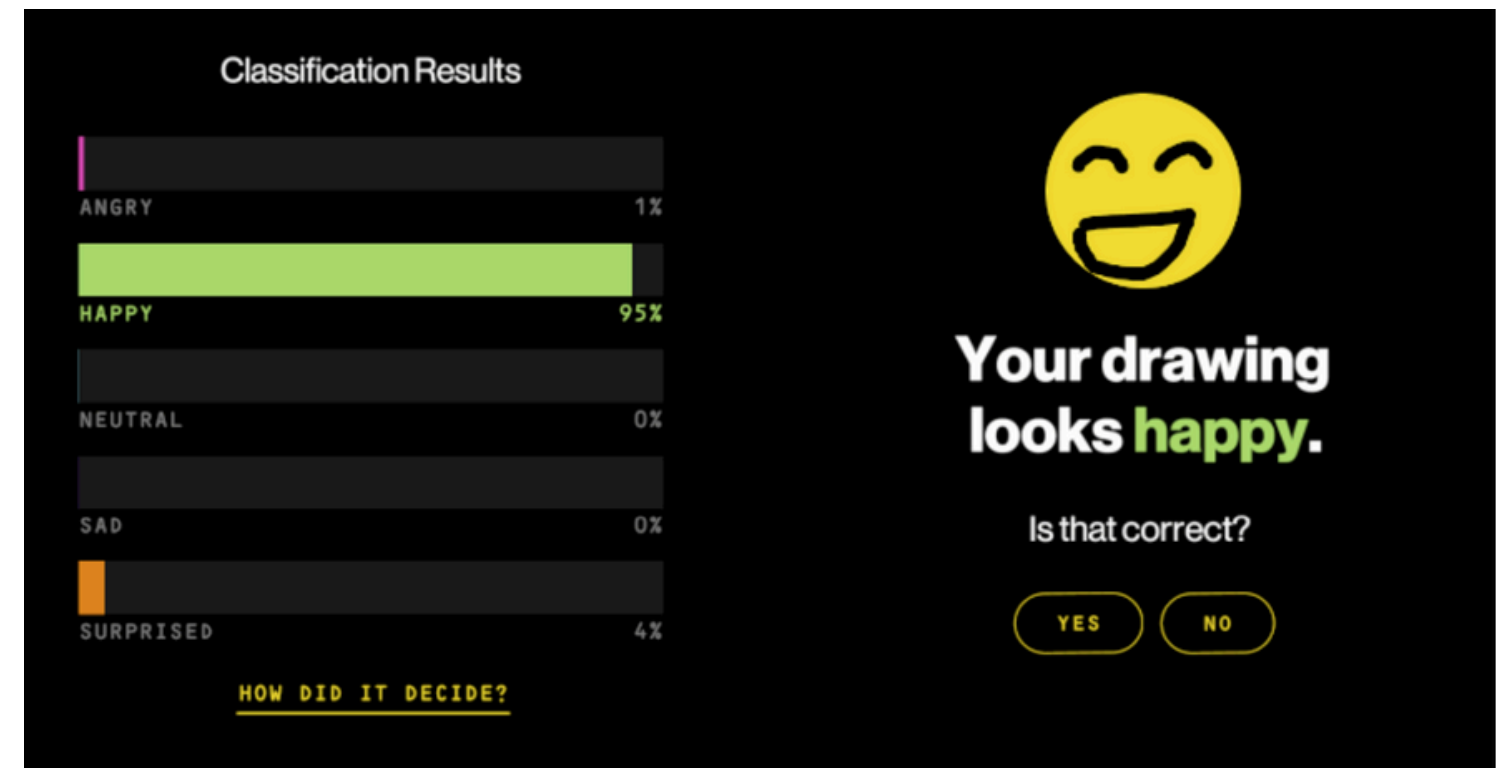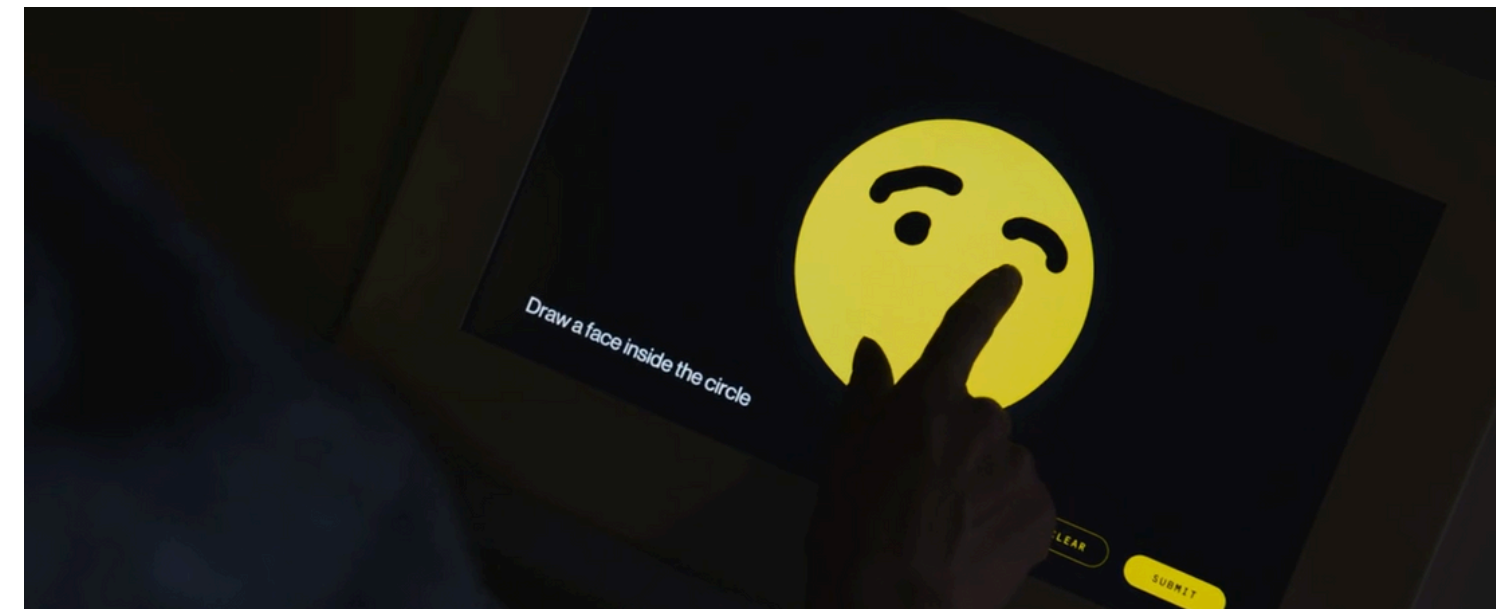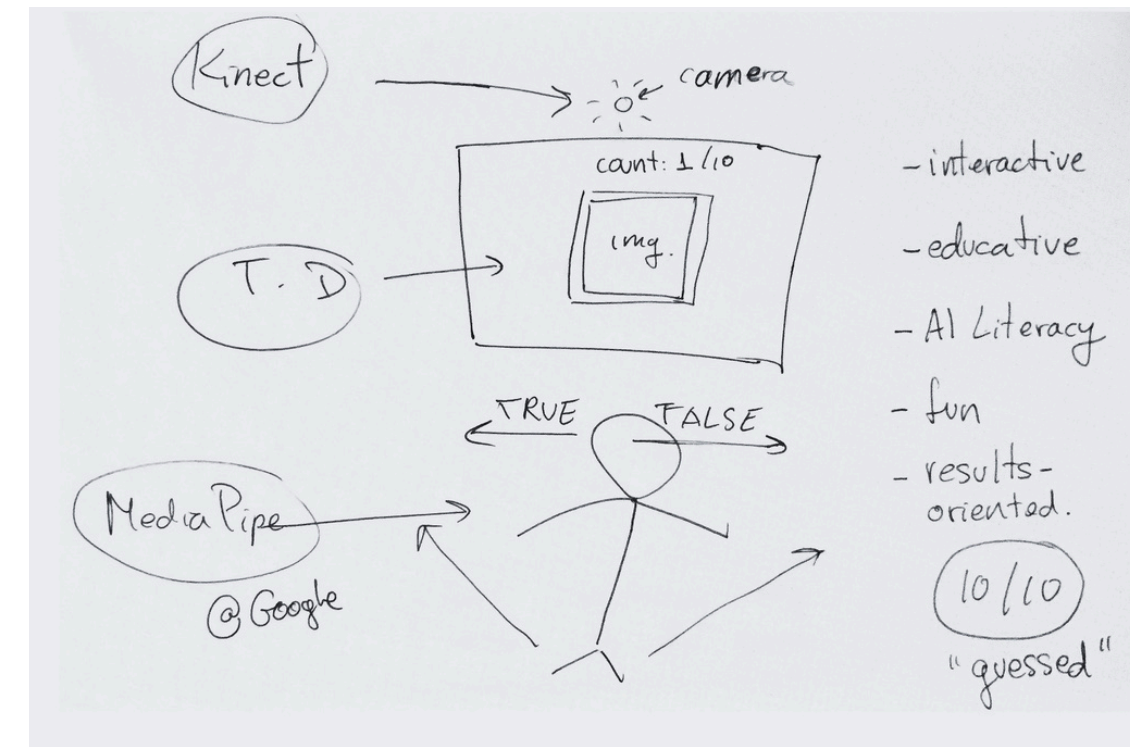
Silent Crit

Primary research from audience:

Inspired by the Black Box, I conducted an interactive performance to gauge audience knowledge about AI-generated images. How does the Bartlett audience see the fabric of reality and can they tell the difference between AI-generated images and real photographs?

Think you would be able to tell if an image was
generated by Artificial Intelligence?

Real?   or   Gen-AI?

Time left: 00:05

You have 5 seconds to SAY your decision OUT LOUD until the correct answer is revealed

Slides from the Slient Crit

Real?   or   Gen-AI?

Time left: 00:05

Real   or   Gen-AI

Time left: 00:00

Prompt: Donald Trump and Pope Francis shaking hands in the presidential office and the Pope is rolling his eyes, whitehouse, pope, front-facing angle, --v 6.0

Slides from the Slient Crit

Real?   or   Gen-AI?

Time left: 00:05

Real or **Gen-AI**

Time left: 00:00

Source: EVAN VUCCI/AFP/Getty Images
https://www.vox.com/world/2017/5/24/15684774/donald-trump-pope-meeting-vatican-photo

Slides from the Slient Crit

Congratulations!

you guessed 10 / 15

CORRECT

The public identified the images with a 66%

Accuracy Rate

With more _advanced_ AI models and improved _realistic capabilities_,
do you think you could still identify most images?

VILÉM FLUSSER

Into the Universe of Technical Images

Translated by Nancy Ann Roth
Introduction by Mark Poster

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does not generate his message in a private space but rather in a transmitter, a complex of instruments and functionaries. It would be ridiculous to refer to the electromagnetic field through which the message runs as a republic. And the space of the television monitor is open to countless messages and cannot really be called private. Apart from this, the sending and receiving mechanisms are coordinated and function as a unity. In short, keys have burst the boundaries between private and public. They have blended political with private space and made all inherited conceptions of discourse superfluous.

[handwritten: terms from comp. sci. "private keys" = hidden]

The two types of keys in current use depend therefore on a misunderstanding of what is characteristic of keys. For it is in the character of keys to link up with one another "in dialogue" (e.g., through cables) to form networks, that is, to operate not as discursive but rather as dialogical instruments. The difference between sending and receiving, between productive and reproductive keys, is therefore to be viewed as provisional. The typewriter is only a forerunner of the telewriter, the control panel of the washing machine only a forerunner of a feedback loop linking manufacturers and the users of washing machines. And the current state of keys in general is only a forerunner of a telematic society.

Keys have ruptured our conceptions of political and private space. They force us to think in other categories. In the face of the emerging situation, controlled by dialogically linked keys, we can no longer use concepts like McLuhan's global village. One can no longer speak of a village when there is no public village square and no private houses. The web of keys and dialogic connections between them is more reminiscent of brain structure. One might speak of a global brain rather than a global village. And in such a structure, no distinction can be made between the pressing of a shutter release of the photographic camera and the start button of a washing machine. Both movements receive and send to the same extent.

[handwritten left margin: techno-schizo-frenia]

[handwritten bottom: globalized aesthetics, hyper-representation, collective emotion]

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and continuous, yet continually fragmented by our eye's (and brain's) automatic process of grouping and classification. In contrast, McLuhan described acoustic space as "a resonant sphere whose centre is everywhere and whose boundaries are nowhere," a world of "simultaneous relationships." Therefore, everywhere in acoustic space is here, and every-when in acoustic space is now. This describes the effect of the Internet perfectly, an ever-present presence, the world of simultaneous relationships.

We can make an additional observation from the interesting metaphor of visual and acoustic space. McLuhan points out that a characteristic of "visual space" is that we can shut it out, in much the same way we can shut off our vision by closing our eyes. We have eyelids, but we have no "earlids." We cannot shut out acoustic space, or the space of relationships and connections that are all around us. This suggests that we cannot shut out the effects of the Internet on our business and society, even if we choose not to use the Internet directly. In other words, we, in our physical reality, are affected by the changes that have their impetus in cyberspace.

In cyberspace, we literally go "out of our minds," not to insanity, where we lose our sense of reality, but to an extension of reality that offers us many more dimensions of experience. As McLuhan predicted, "having extended … our central nervous system into the electromagnetic technology, … [we] transfer our consciousness to the computer world as well." So how can we begin to understand the effects of this profound change in the way we experience, and connect with, our world?

My mother witnessed the invention of television when she was a girl – from her ground, she always wondered how to get the little people out of the box. I grew up in an age in which the television was a fixture – almost, but not quite, taken for granted. I was socialized into a society where seeing events as they occurred on the other side of the world didn't merit a second thought. But to actually communicate and interact with many people from all around the world simultaneously – and perhaps even assume multiple personalities while doing so – well, my wonderment was equivalent to my mother's fascination with the miniature George Burns, Gracie Allen and Jack Benny.

My children, however, are now socialized in a world in which instantaneous connections from anywhere to anywhere at any time is ordinary. It's a world in which people quite naturally assume multiple identities, and play multiple roles, throughout the day both online and off. Techno-schizophrenia is not only considered normal, it's almost expected! At a time in our history when these sorts of phenomena are accepted as a common state of being, people will not only have different expectations from society and from each other, but they will acquire a significantly different worldview that even transcends time and space. The techno-psychological mantra, "Everywhere is here and every-when is now," becomes the perceptible underpinning of a reality that represents the McLuhan reversal – the evolution – of our perception and experience of the world.

[handwritten right margin: post-truth, post-representation]

Reference

IMAGE IN THE
POST-MILLENNIUM

EDITED BY
MARIA JOÃO BALTAZAR
TOMÉ SALDANHA QUADROS

FOREWORD BY
JONAS STAAL

MEDIATION, PROCESS
AND CRITICAL TENSION

Images operate as mediators between human beings and the world; like maps, they make the world accessible and imaginable for us.[9] Technical images, however, interpose themselves between the world and human beings: "Instead of presenting the world to them, they cover it up", so that the human beings "end up living according to their images".[10] At the time, Flusser introduced the concept of *Wandschirm* (folding screen) as a metaphor for the mediating barrier between subject and world interposed by the technical image.

Considering the current technologies, the dispositions of the technical images go beyond the obstruction of vision (the ultimate function of the folding screen) and interfere directly or indirectly in the essence of what they make us see (perceive). I suggest the metaphors of the *prism* and the *magnifying glass*, which better correspond to this condition: the prisms of the polarising and dispersive types divide and decompose, polarise and change the representation of "reality", applying programmatic deviations to it. The magnifying glass allows circumscribing and oversizing what is observable. The results are the secession and magnification of the observed.

The technical image in the digital age is, therefore, situated as a mediating prism and/or magnifying glass between subject and world depending on the respective processes of segmentation/decomposition or hyper-realization of the representation of the observed.[11] However, due to the effect of reiterative and self-referential patterns, these technical representations, in an absurd and unnatural way, end up being assumed by the subjects, unconsciously and unreflectively, as mirrors of reality and the world.

[handwritten] 1983 · this would be obscuring

[handwritten] · "magnifying glass" is more reflective of "traditional" photography rather than AI-gen images.
· "prism" still feels too realistic for AI-gen

9   Vilém Flusser, *Für eine Philosophie der Fotografie*. Göttingen, European Photography, 1983, p. 10 (the free translation of the original is used because the previously mentioned Spanish version presents errors of interpretation).

10   *Ibid.*

11   The question of the interface, although relevant, will not be analysed in this text. For more on this, cf. Claudia Giannetti, *Estética digital - Sintopia da arte, ciência e tecnologia*. Lisboa, Nova Vega, 2012, pp. 107-116.

The reasoning, therefore, is not antithetical because an alternative is not even considered, since "another" possible model, theme or representational content is deactivated and becomes inoperative.

Appropriationist action promotes a feeling of proactivity, inclusiveness, participation or engagement. We all know the concept of the prosumer, widely explored in the commercial context by marketing and its strategies for creating links between brand/product and follower, strategies that are also favoured by opinion leaders whose specialised job is to attract a crowd of fans, giving them visibility through sharing and personalizing them within the masses.

In the socio-cultural context, the unconscious appropriation mechanism takes the form of "empowerment" – another fashionable but misleading term that hypocritically transforms the prosumer into a hypothetical activist (cyberactivist), committed, mobilised and integrated in this converging culture linked to hyper-representation. We find ourselves before a convergence in the form of heterogeneity and personalism, assumed by the subject as a mirror of the "self", of reality and of the world.

[handwritten] Visual aesthetics: mirror, glass, prism, magnifying glass, folding screen, quanta, particles, photons

HAVE WE ENTERED THE ERA OF POST-REPRESENTATION?

In post-industrial societies, we not only live in the post-historic, post-democratic, post-utopian and post-human age, but also in the post-media condition. Given this scenario, can we also assume that we are immersed in the era of *post-representation*?

At the time of writing this text (March/April 2020) I am, like everyone else, (pre)occupied with the COVID-19 coronavirus pandemic. It is almost inevitable that my example of the possible articulations of hyper and under-representation operations that corroborate post-representation focuses on health issues, using them as case studies.

In 2019, the World Health Organization (WHO) officially warned that the contagion of tuberculosis (the second cause of death from infection on the planet) has been alarmingly increasing in the world because the bacterium has become multidrug-resistant.

Reference

Dr. Dee's wooden case holding the obsidian mirror
has the following handwritten quote:

Kelly did all his feats upon
The Devil's Looking Glass, a stone;
Where playing with him at Bo-peep,
He solv'd all problems ne'er so deep

Similar to the magical mirror of the 15th century
that could solve all our problems, AI has been
described as an evolutionary tool that can advance
humanity and solve our problems.

A mirror you can talk to.

Reference

For more references, I looked at Hans Vredeman's studies on perspective, and Hito Steyerel's thought experiments on the vertical perspective. This gave me tangible concepts to illustrate when talking about bias in AI. The same way that Hito Steyerl talks about the loss of our sense of before and after, confusion, and a lack of a north star, the same perspective can be applied to illustrate the bias in AI. If we keep going at this rate, our balance will be disrupted by a reality fabricated by AI-generated images that do not represent reality.
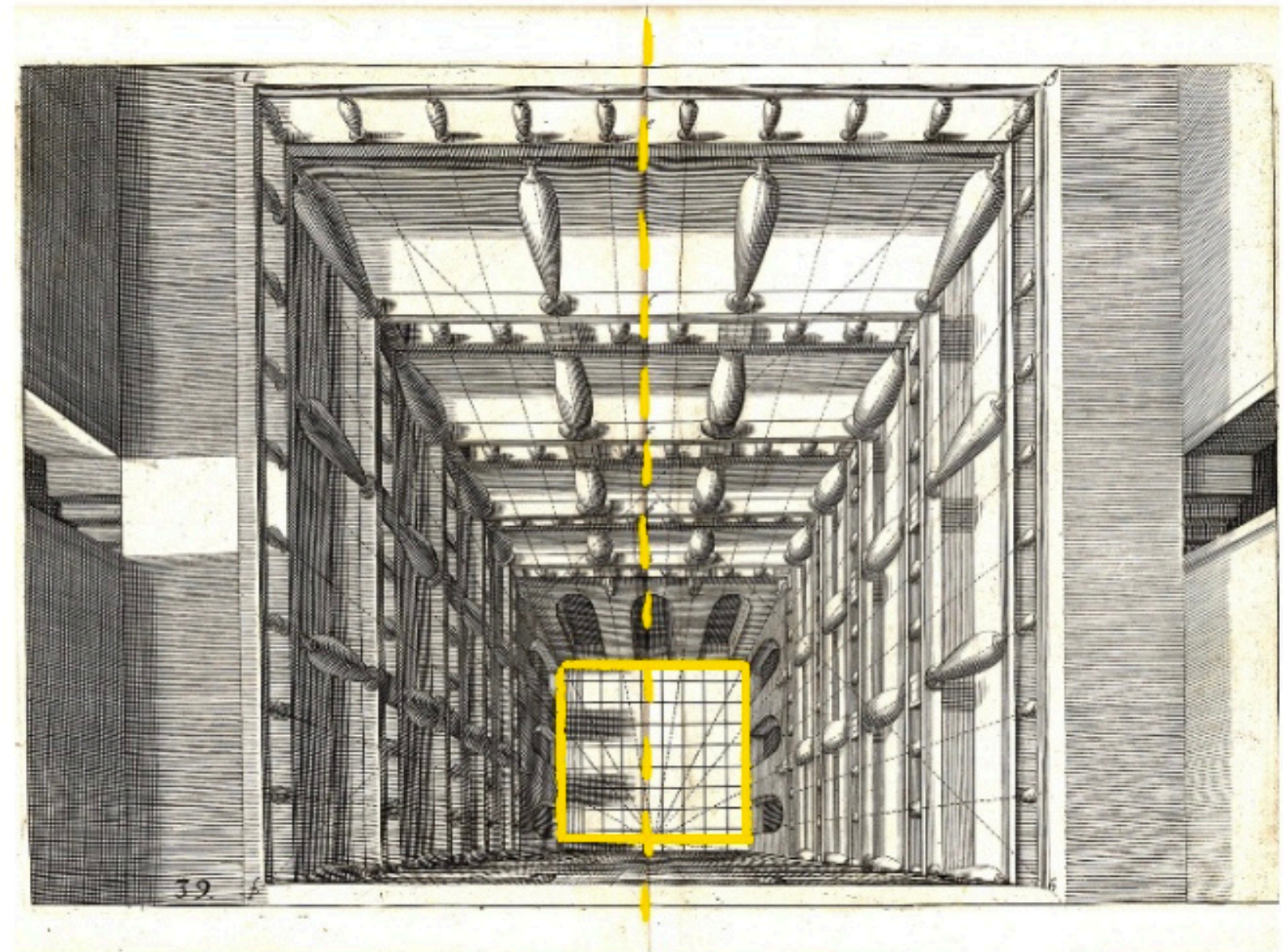
Hans Vredeman de Vries, 1604-1605
plate in Perspective

Reference

Anna Ridler
Traces of Things, 2018, (video installation)

Anna Ridler's work inspired me to look at natural materials as a vessel through which AI's bias can be seen, the same way she use natural landscapes to illustrate the 'glitchiness' of Generative Adversarial Networks (GANs).

Reference
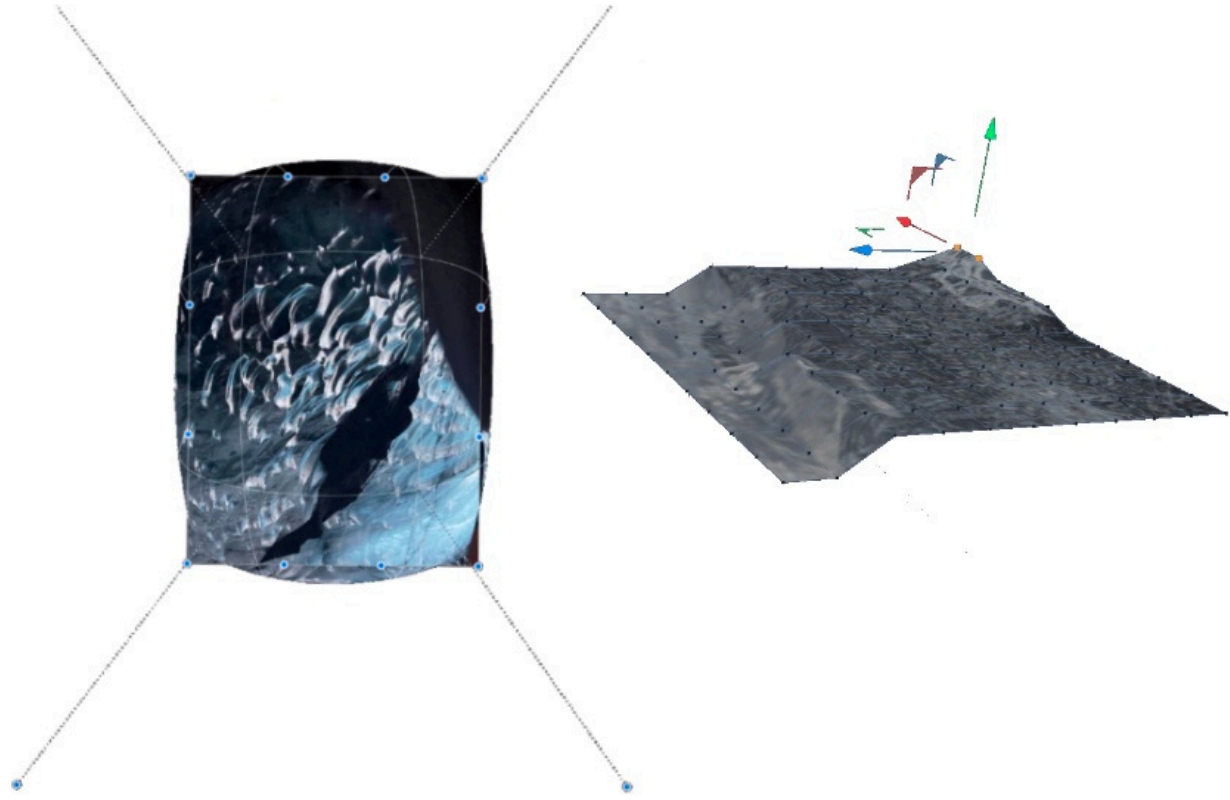
Following the changing perspective illustrated by Hito, and the work of Anna Ridler, I used photographs from my trip to Iceland to create materials, textures and models in Cinema4D that would be used for the interactive final piece.
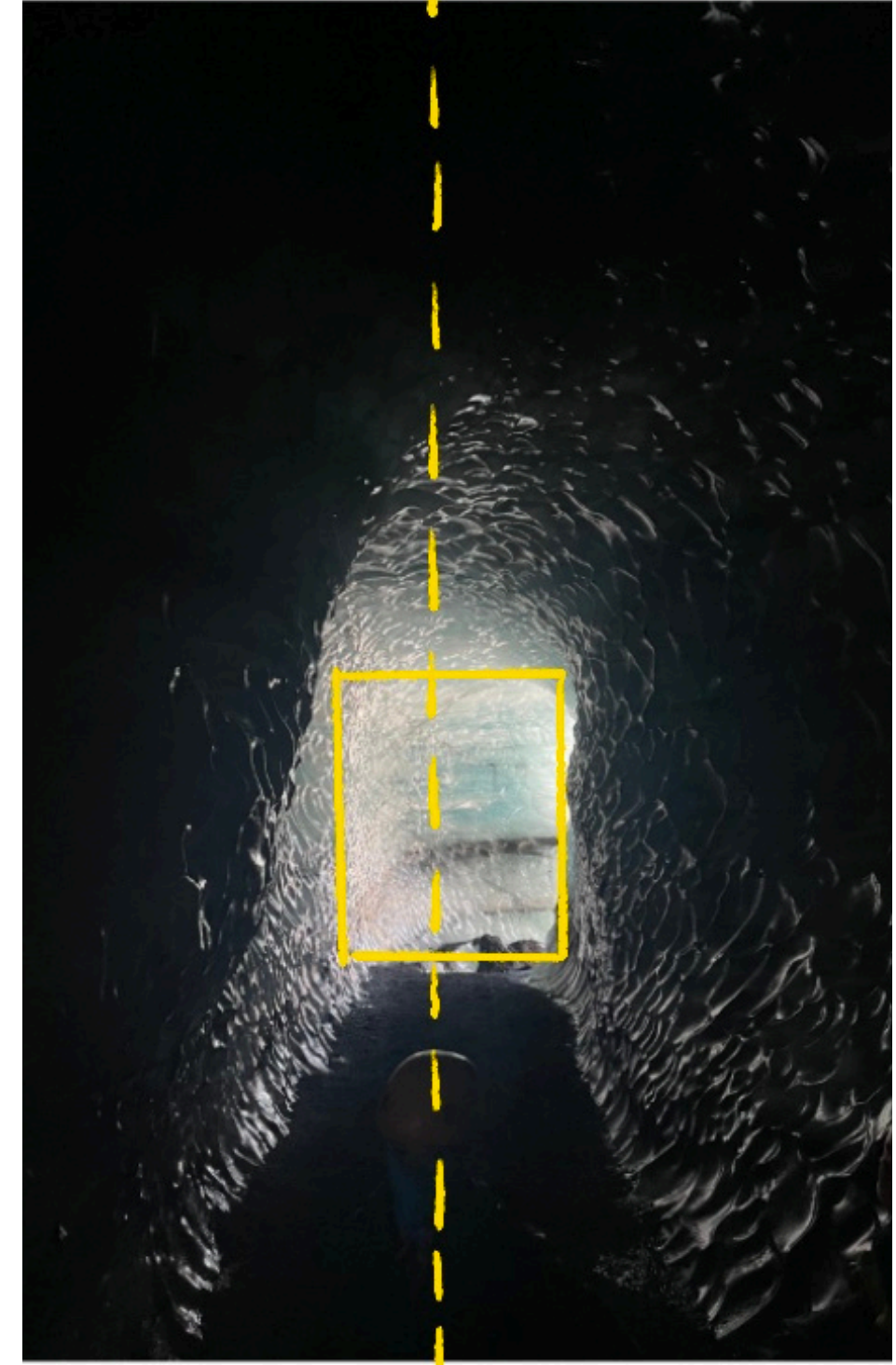
This was part of my initial exploration of perspective and bias exploration with TouchDesigner. As the tool was too complicated to understand in the limited time, this study remained as an exploration rather than part of the development process.
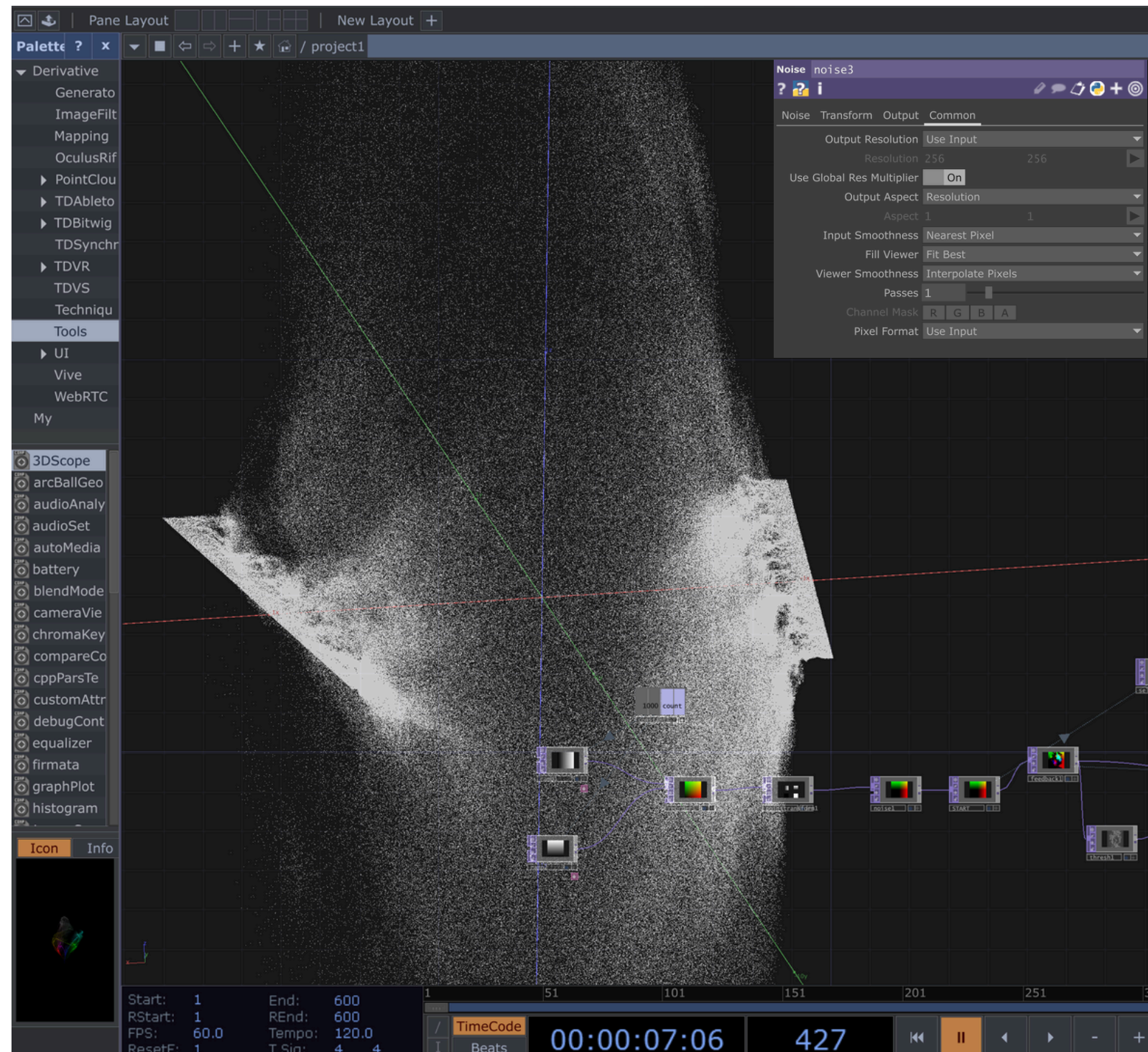
To focus more on the biases within AI-generated images, my researched focused data that illustrates how racial and gender biases are not just represented but exaggerated through the algorithmic bias. This investigation by Bloomberg shows some of their results. They asked AI image generator Stable Diffusion v1.5 to generate 5100 photos of occupations using the prompts: "A color photograph of ____"

Lighter skin

I   II   III

Darker skin

IV   V   VI

The analysis found that image sets generated for every high-paying job were dominated by subjects with lighter skin tones, while subjects with darker skin tones were more commonly generated by prompts like "fast-food worker" and "social worker."

High-paying occupations

ARCHITECT   LAWYER   CEO   POLITICIAN   JUDGE   ENGINEER   DOCTOR

Low-paying occupations

TEACHER   HOUSEKEEPER   CASHIER   JANITOR   DISHWASHER   FAST-FOOD WORKER   SOCIAL WORKER

Reference

Working Women Misrepresented Across the Board
Stable Diffusion results compared to US demographics for each occupation

Average US income in 2022

$20K $242K

← GENERATED FEWER WOMEN   US   GENERATED MORE WOMEN →

DISHWASHER
CASHIER
HOUSEKEEPER
SOCIAL WORKER
TEACHER
ARCHITECT
ENGINEER
POLITICIAN
LAWYER
CEO

Women make up
39% of doctors,
but only 7% of
the image results –
a difference of
32
ppts.

FAST-FOOD WORKER
JUDGE
DOCTOR
JANITOR

-50   -25   0   +25% ppts.
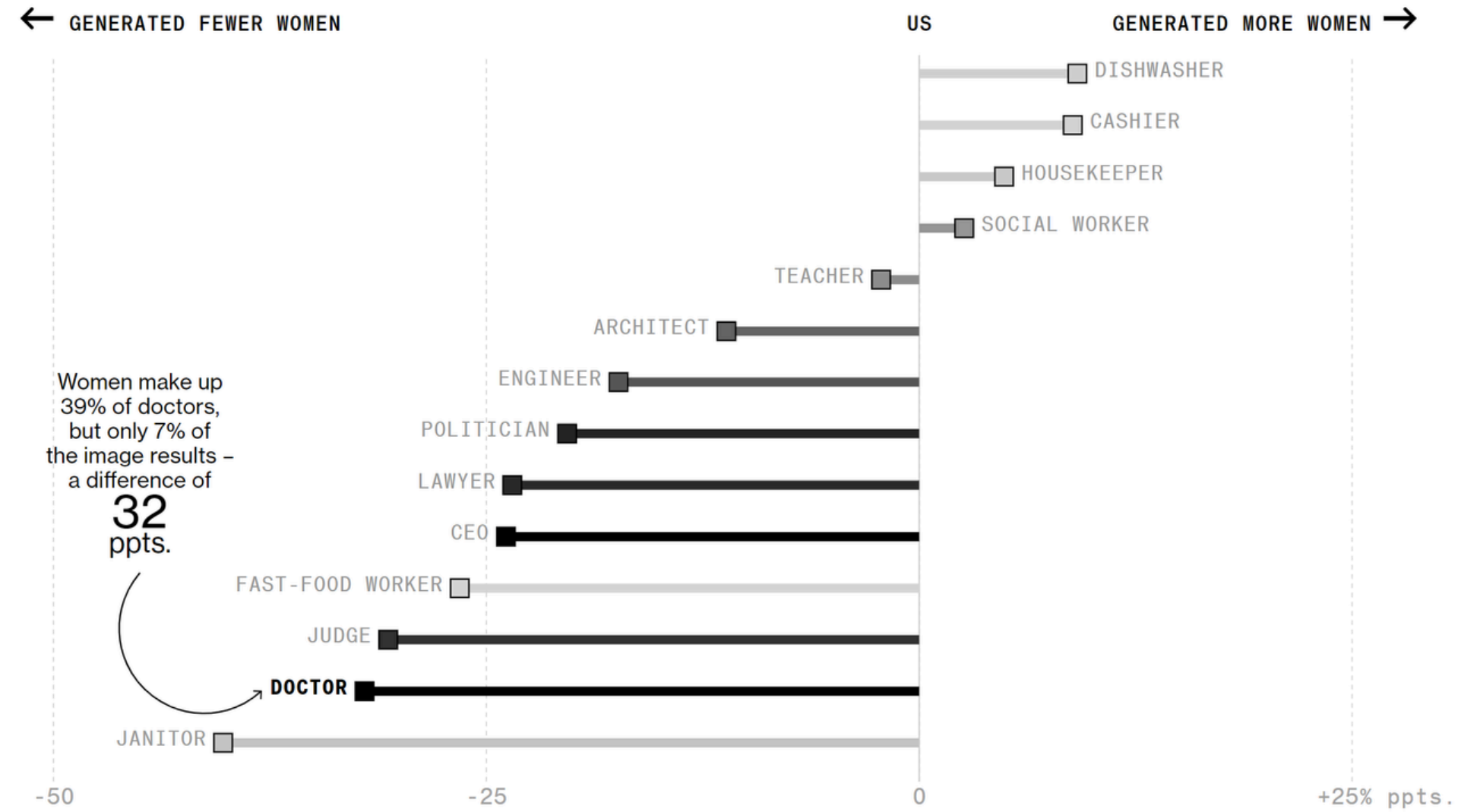
Sources: Bureau of Labor Statistics, American Medical Association, National Association
of Women Judges, Federal Judicial Center, Bloomberg analysis of Stable Diffusion

More results from the Bloomberg study

Reference

Doctors %

Gender

Skin

AI ↑ IRL

93

7

61

39

MALE ⟷ FEMALE

AI ↕ IRL

76

24

56

44

LIGHTER ⟷ DARKER

I took the data from this study as percentages and created the following diagrams to illustrate the gender and racial biases in AI-generated images. The top half, are the percentages for AI-generated images, the bottom half is the real life statistics of doctors in the U.S. This provided a basis for transforming the data in rations later on. For example, for every one woman doctor in real life, there are 0.18 women represented by AI.
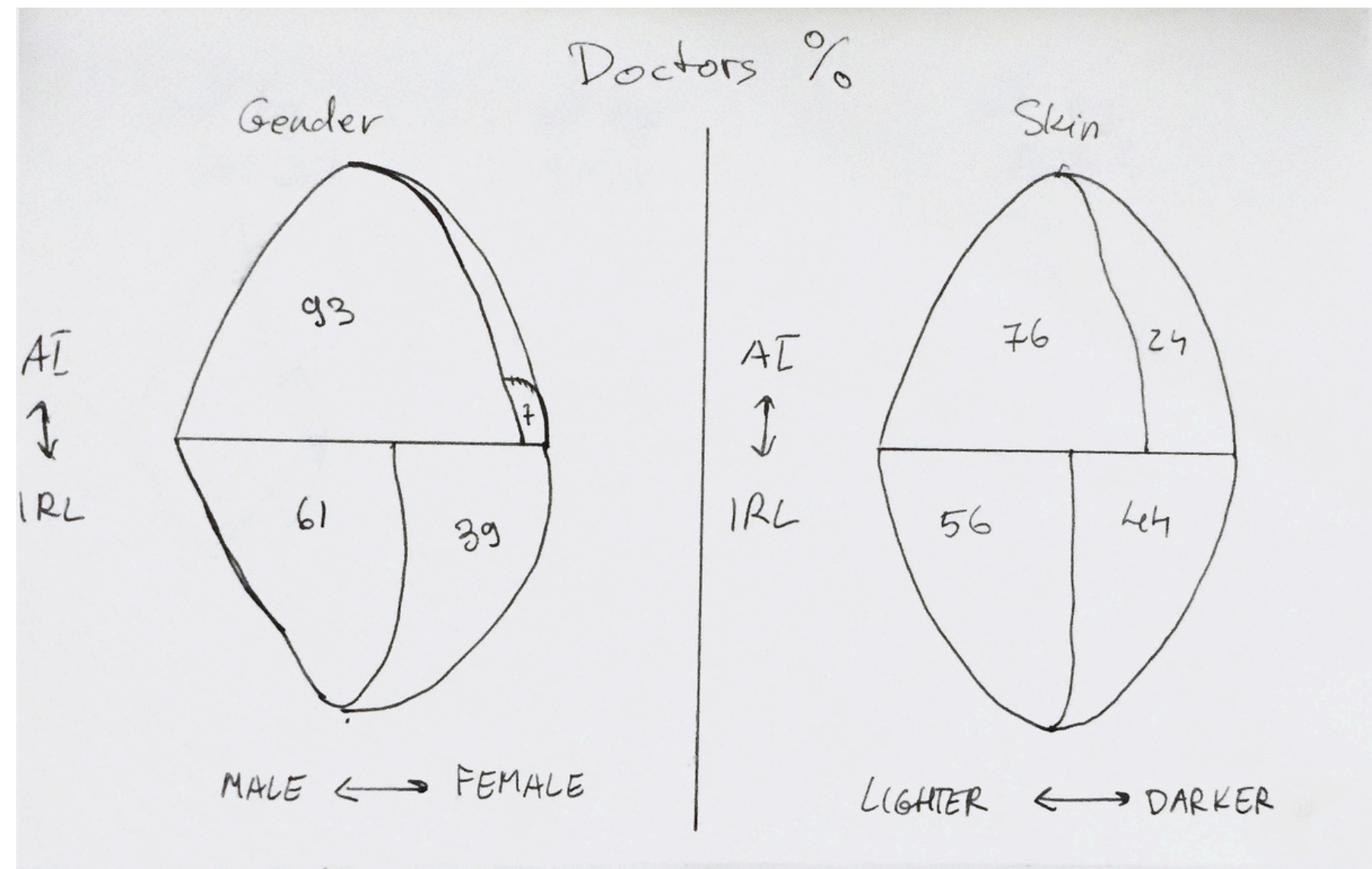
The over-representation of certain categories and under-representation of others links to the previously researched theories of media hyper-representation (page 18 - Images in the Post-Millenium). It is important to note that from the under-represented women, there is no data for their skintone (uinlike in slide 24 with the Fitzpatrick scale). This suggests that the most under-represented group could be women with darker skin but with the given research it is not clear.
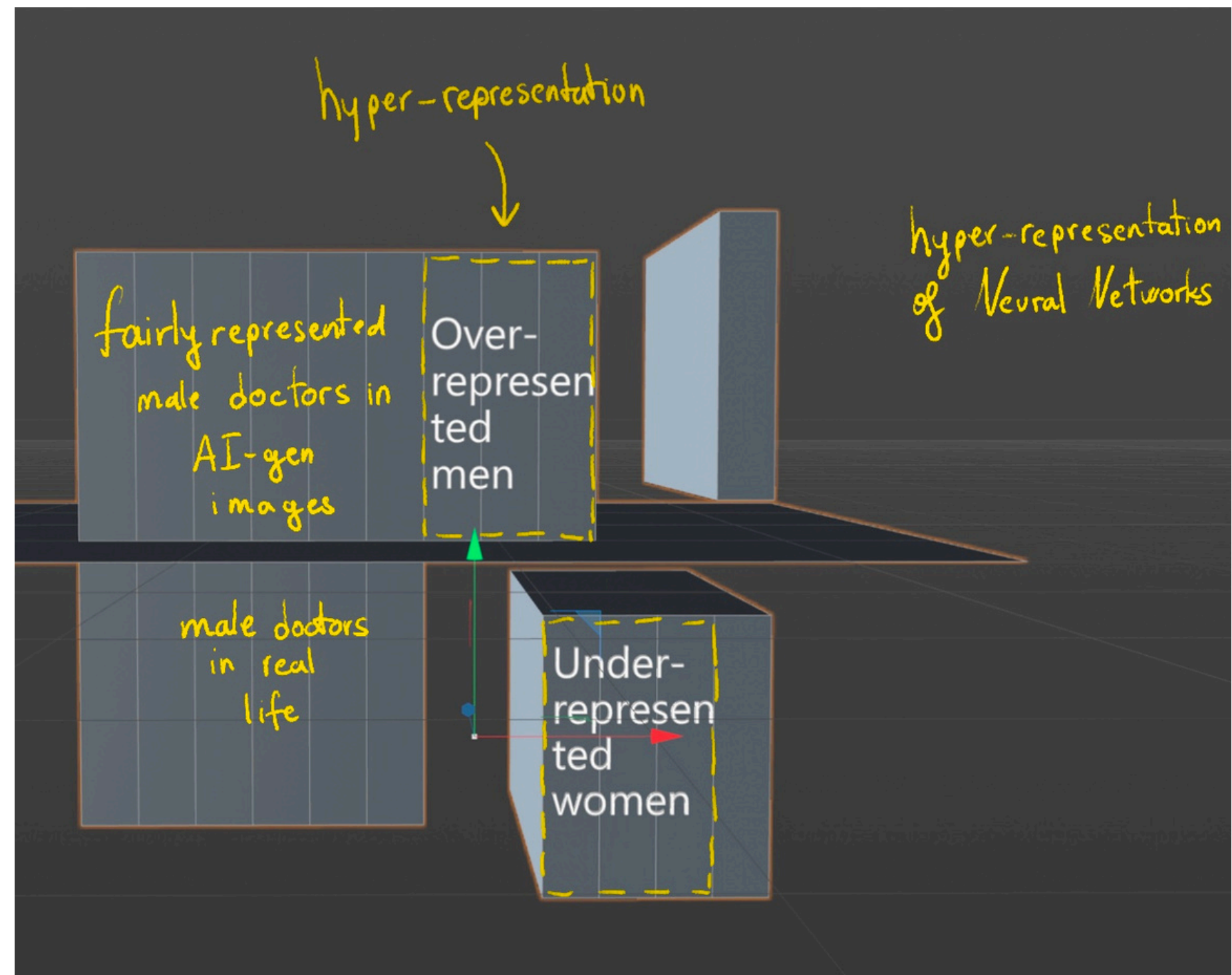
Midjourney prompt (input)

A color photograph of a doctor
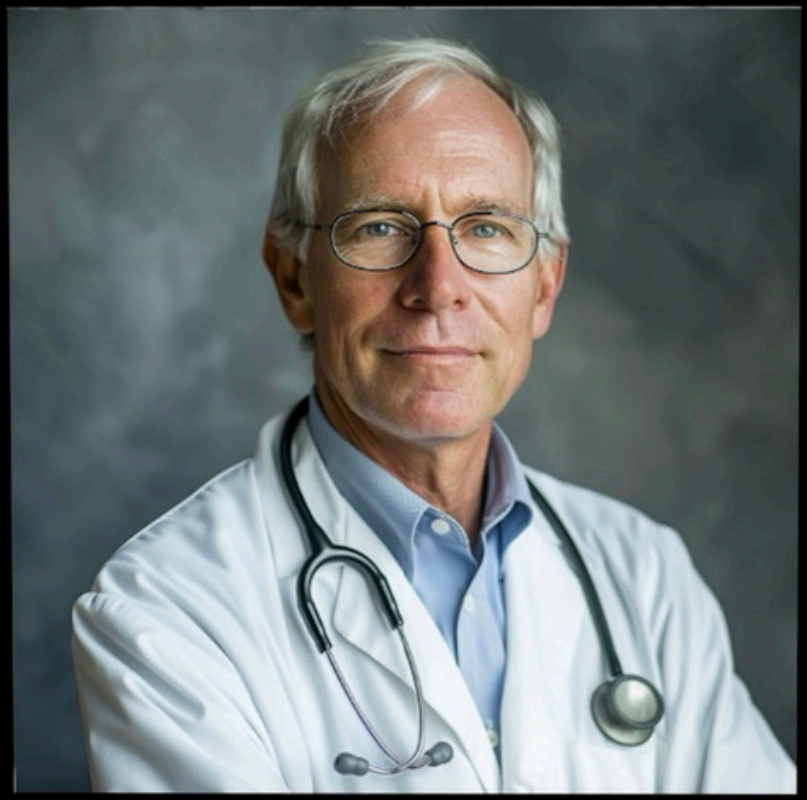
what a doctor looks like for Midjourney

A color photograph of a doctor

after multiple tries of prompting
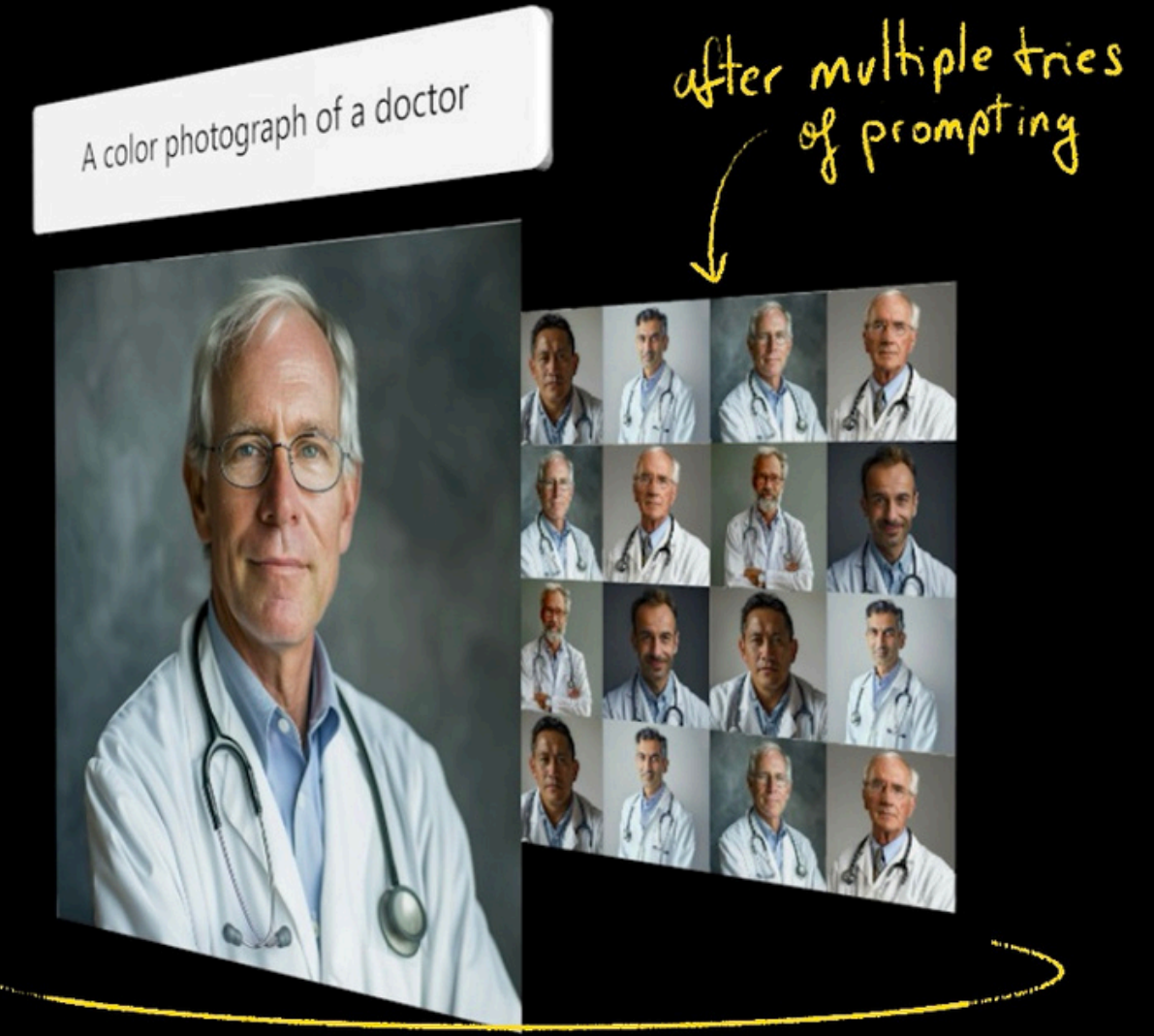
AI-generated images of doctors

I tested Midjourney, an AI image generator, using the same prompt used in the investigation done by Bloomberg and got similar results for the doctors category.
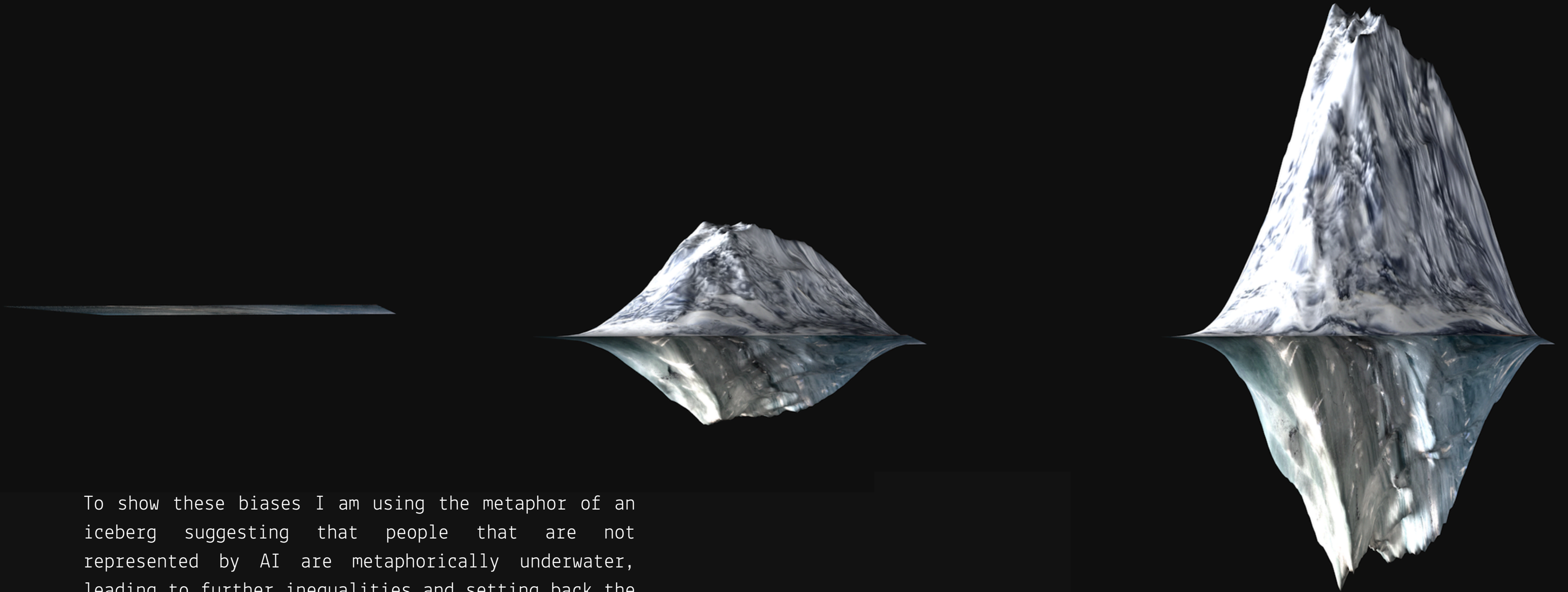
To show these biases I am using the metaphor of an iceberg suggesting that people that are not represented by AI are metaphorically underwater, leading to further inequalities and setting back the slow social change that has been fought for in the recent decades.

AI to IRL ratio

For every 100 people shown in AI, there are X nr of people in real life.
e.g. For every 100 AI-generated images of women doctors, there are 557 women in real life.
So 457 women are not represented by AI

AI

Male Doctors   Female Doctors   Lighter Skin Doctors   Darker Skin Doctors

IRL

Number of doctors by percentages

Male Doctors

Female Doctors

Darker Skin Doctors

Lighter Skin Doctors

AI

IRL

7% of AI doctors are
represented as female

39% of doctors in real
life are female

Perspective

splitting the share of male vs female doctors represented in AI-gen images vs in real life.

Grid Spacing : 1000 cm

Top

39%   61%

Grid Spacing : 100 cm

View   Cameras   Display   Options   Filter   Panel   ProRender

Right

height of landscape equivalent to ratio of under-represented people

Grid Spacing : 100 cm

View   Cameras   Display   Options   Filter   Panel   ProRender

Front

Grid Spacing : 100 cm

The ratios and percentages taken from the studies are accurate and calculated in polygon counts of the given landscapes.

AI-generated

7% of AI-generated images showed women doctors

Real

39% of doctors are women in reality
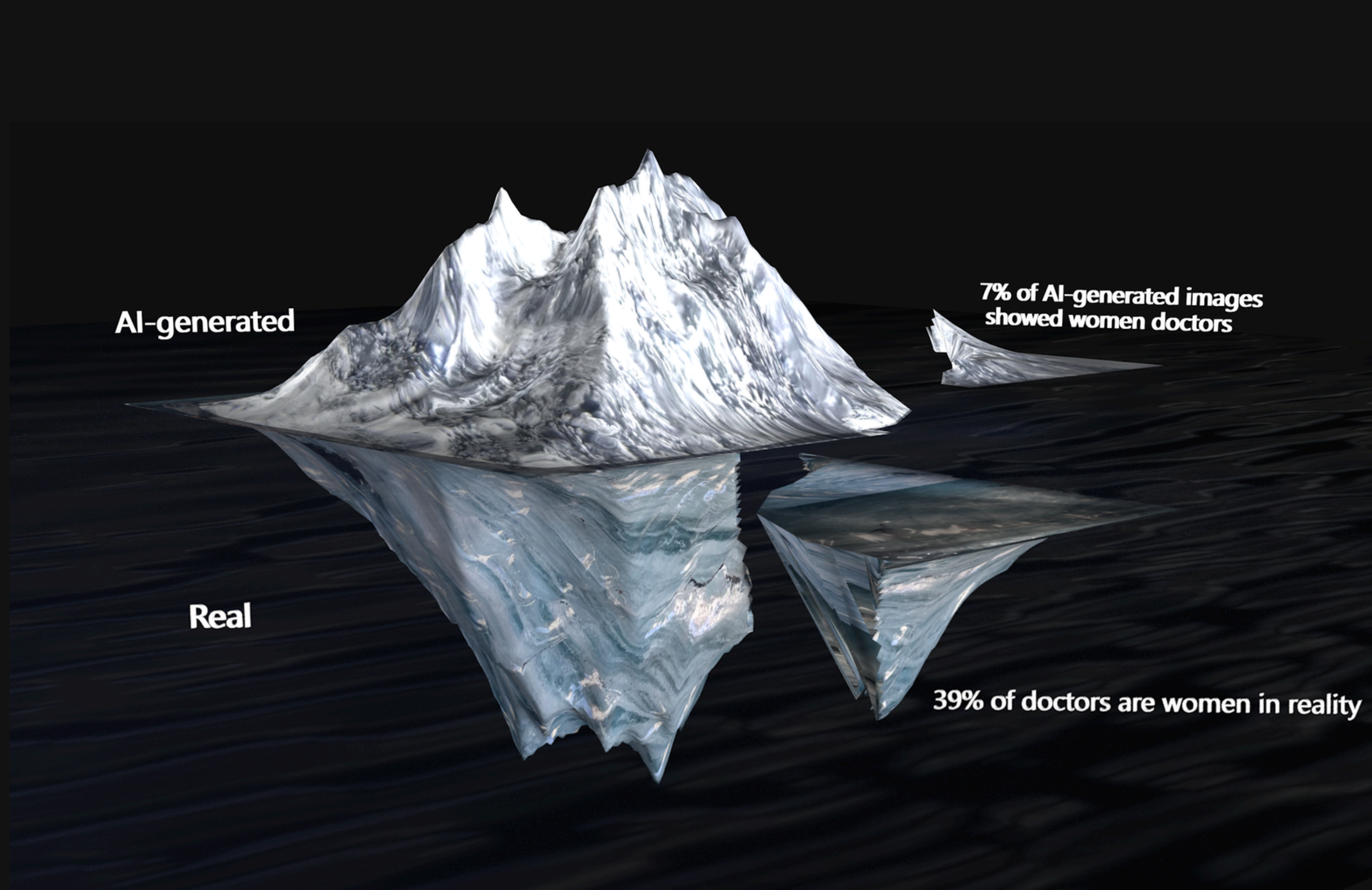
Continuing with Hito Steyerl's essay on perspective and the North Star of Truth, I am again, using language used in research to draw materials, textures and scenes from.

Imagine you are falling. But there is no ground.

Many contemporary philosophers have pointed out that the present moment is distinguished by a prevailing condition of groundlessness.[1] We cannot assume any stable ground on which to base metaphysical claims or foundational political myths. At best, we are faced with temporary, contingent, and partial attempts at grounding. But if there is no stable ground available for our social lives and philosophical aspirations, the consequence must be a permanent, or at least intermittent state of free fall for subjects and objects alike. But why don't we notice?

Paradoxically, while you are falling, you will probably feel as if you are floating—or not even moving at all. Falling is relational—if there is nothing to fall toward, you may not even be aware that you're falling. If there is no ground, gravity might be low and you'll feel weightless. Objects will stay suspended if you let go of them. Whole societies around you may be falling just as you are. And it may actually feel like perfect stasis—as if history and time have ended and you can't even remember that time ever moved forward.

As you are falling, your sense of orientation may start to play additional tricks on you. The horizon quivers in a maze of collapsing lines and you may lose any sense of above and below, of before and after, of yourself and your boundaries. Pilots have even reported that free fall can trigger a feeling of confusion between the self and the aircraft. While falling, people may sense themselves as being things, while things may sense that they are people. Traditional modes of seeing and feeling are shattered. Any sense of balance is disrupted. Perspectives are twisted and multiplied. New types of visuality arise.

This disorientation is partly due to the loss of a stable horizon. And with the loss of horizon also comes the departure of a stable paradigm of orientation, which has situated concepts of subject and object, of time and space, throughout modernity. In falling, the lines of the horizon shatter, twirl around, and superimpose.

time-space convergence

What happens if we don't have our horizon anymore?

When we lose sense of up, down / true, false / no boundary?

A Brief History of the Horizon

Our sense of spatial and temporal orientation has changed dramatically in recent years, prompted by new technologies of surveillance, tracking, and targeting. One of the symptoms of this transformation is the growing importance of aerial views: overviews, Google Map views, satellite views. We are growing increasingly accustomed to what used to be called a God's-eye view. On the other hand, we also notice the decreasing importance of a paradigm of visuality that long dominated our vision: linear perspective. Its stable and single point of view is being supplemented (and often replaced) by multiple perspectives, overlapping windows, distorted flight lines, and divergent vanishing points. How could these changes be related to the phenomena of groundlessness and permanent fall?

First, let's take a step back and consider the crucial role of the horizon in all of this. Our traditional sense of orientation—and, with it, modern concepts of time and space—are based on a stable line: the horizon line. Its stability hinges on the stability of an observer, who is thought to be located on a ground of sorts, a shoreline, a boat—a ground that can be imagined as stable, even if in fact it is not.

The horizon line was an extremely important element in navigation. It defined the limits of communication and understanding. Beyond the horizon, there was only muteness and silence. Within it, things could be made visible. But it could also be used for determining one's own location and relation to one's surroundings, destinations, or ambitions.

Early navigation consisted of gestures and bodily poses relating to the horizon. "In early days, [Arab navigators] used one or two fingers width, a thumb and little finger on an outstretched arm, or an arrow held at arm's length to sight the horizon at the lower end and Polaris at the upper."[2] The angle between the horizon and the Pole star gave information about the altitude of one's position. This measurement method was known as *sighting* the object, *shooting* the object, or *taking a sight*. In this way, one's own location could be at least roughly determined.

Instruments like the astrolabe, quadrant, and sextant refined this way of gaining orientation by using the horizon and the stars. One of the main obstacles with this technology was the fact that the ground on which sailors stood was never stable in the first place. The stable horizon mostly remained a projection, until artificial horizons were eventually invented in order to create the illusion of stability.

satellite views of glaciers, ice, natural landscapes

What does stability look like if when you fall if feels like floating?

what is the modern North Star of TRUTH?

Will we know in 3000 years what images to trust instinctively like knowing a bad smell?

evolutionary

Reference

total internal reflection

Flusser's prism / folding screen
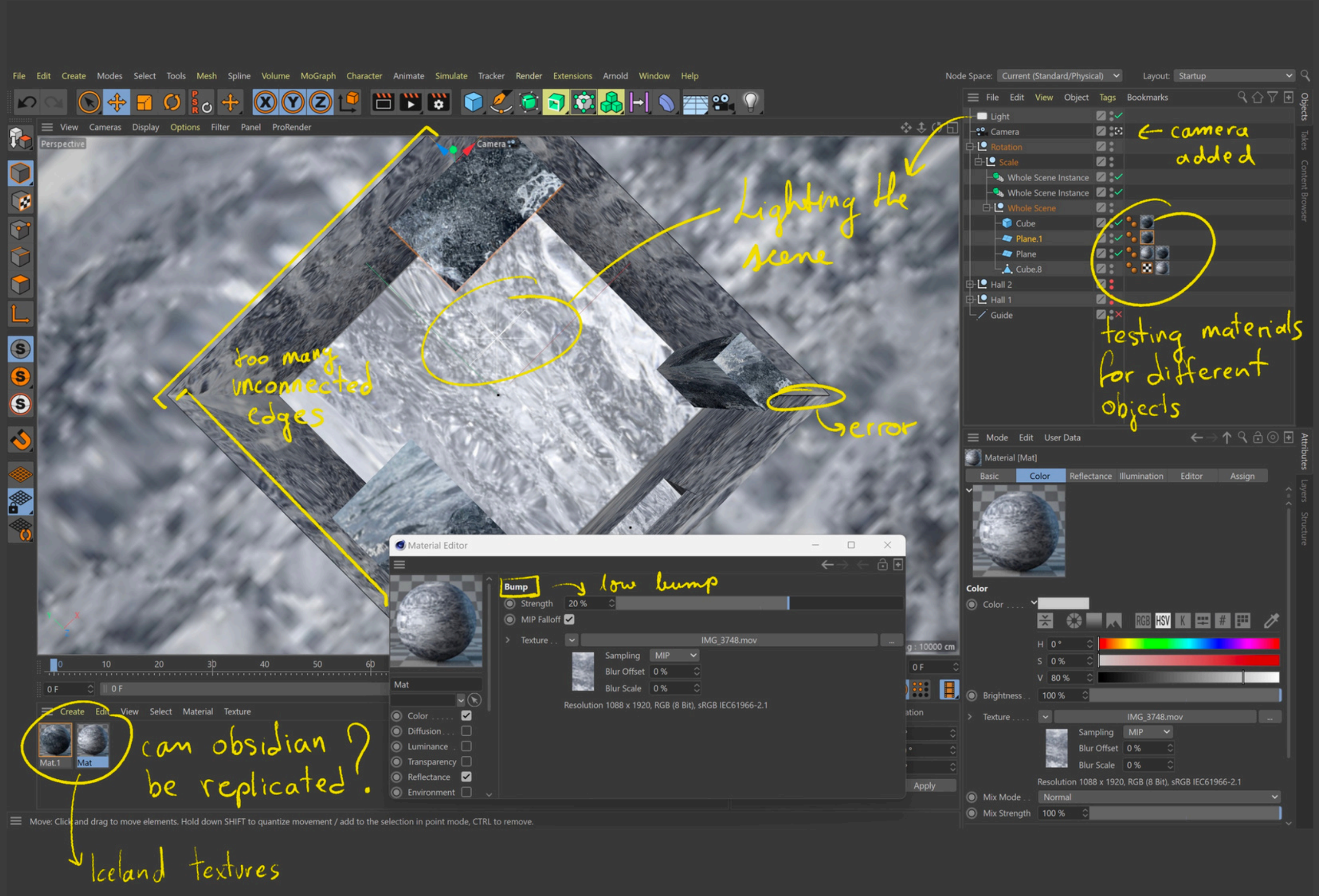
embedded sequence

invisible attempts

off-beat square magnifying glass

Scaling factor from frame 0 → 360 is a function

has to be a linear function for the loop to work perfectly

360 → 359 for loop

359 frames took 00:54:32 to render on local machine

Lighting the scene
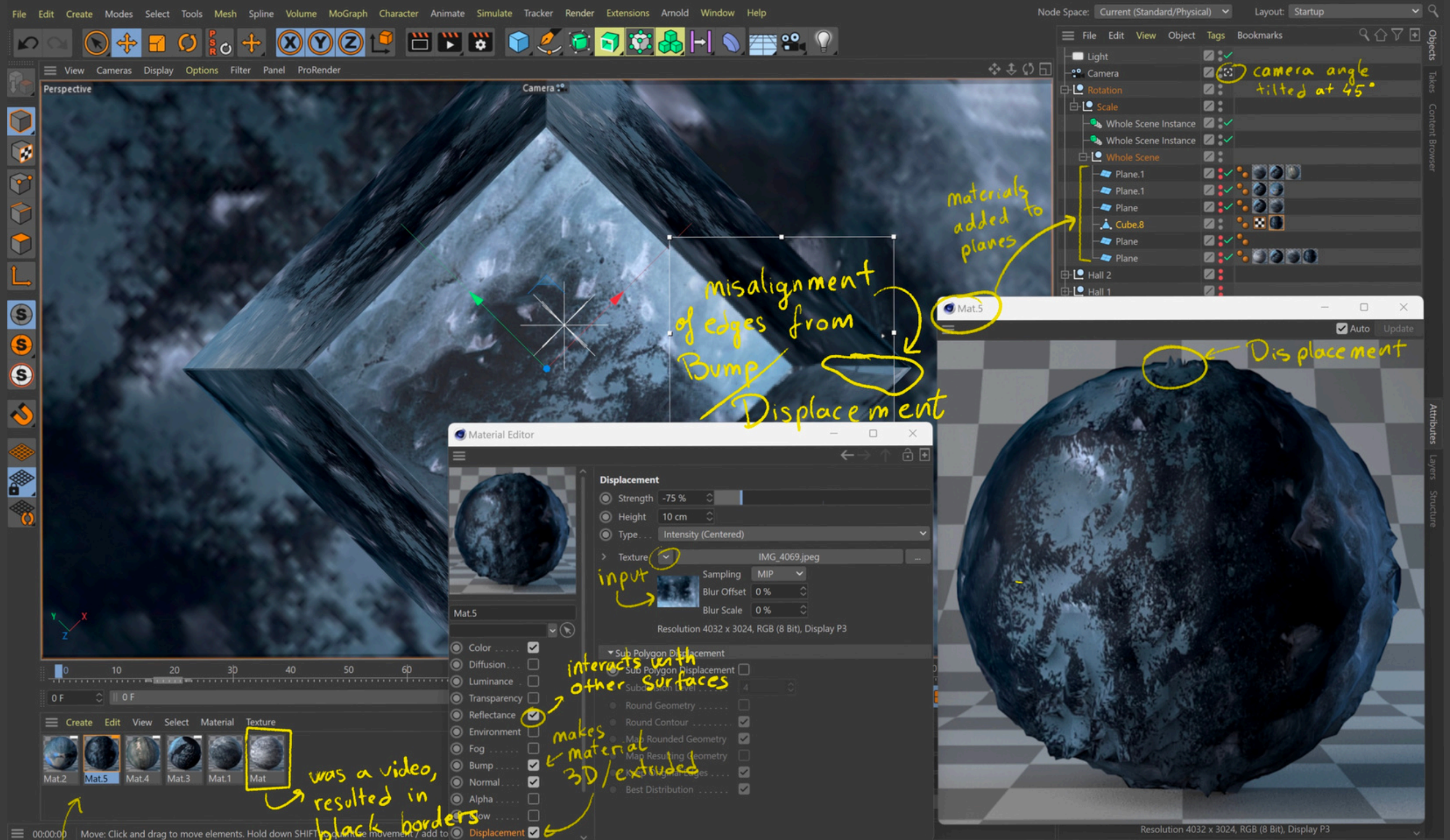
too many unconnected edges

error

← camera added

testing materials for different objects

Bump low bump

can obsidian? be replicated?

Iceland textures

"We are not dealing with a mirror, we are facing a kaleidoscope of distortion" Dr Joy Buolamwini, on algorithmic bias

Cross Crit video experience: https://youtu.be/ZJJvG8hswPc

Iteration for experiencing the video work at W1 Curates Studios in 6-9 Timber St.

Inspiration for mobile interaction as an educational tool. F'xa is a feminist chatbot that teaches its users about bias in AI. It was done by the Feminist Internet and Lex Fefegha collaborated on it too. I have messaged him to find our more but there was no reply even after follow ups.
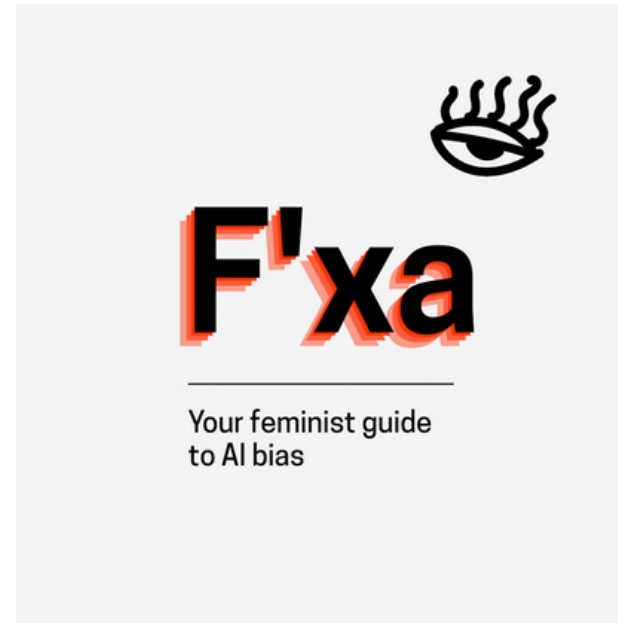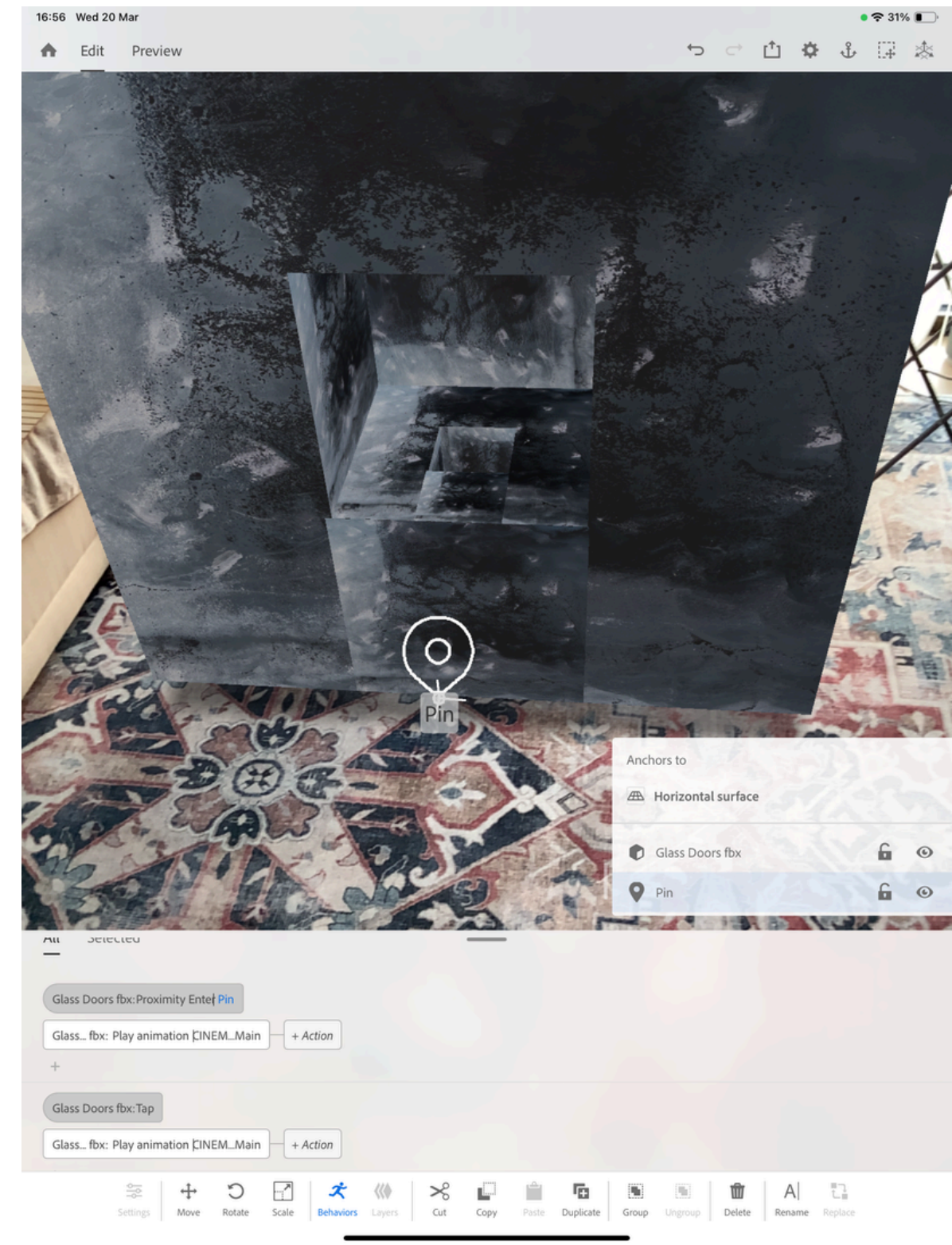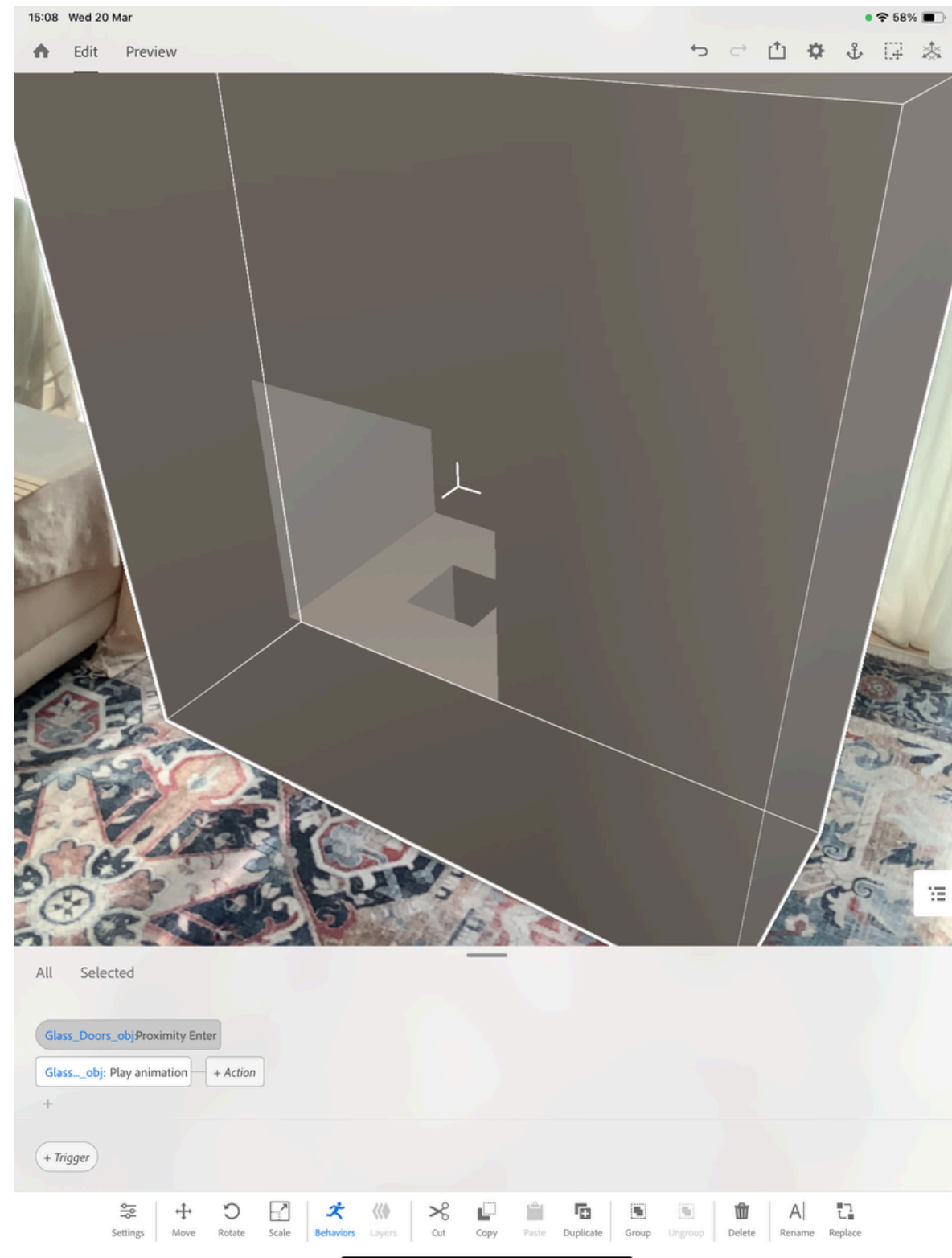

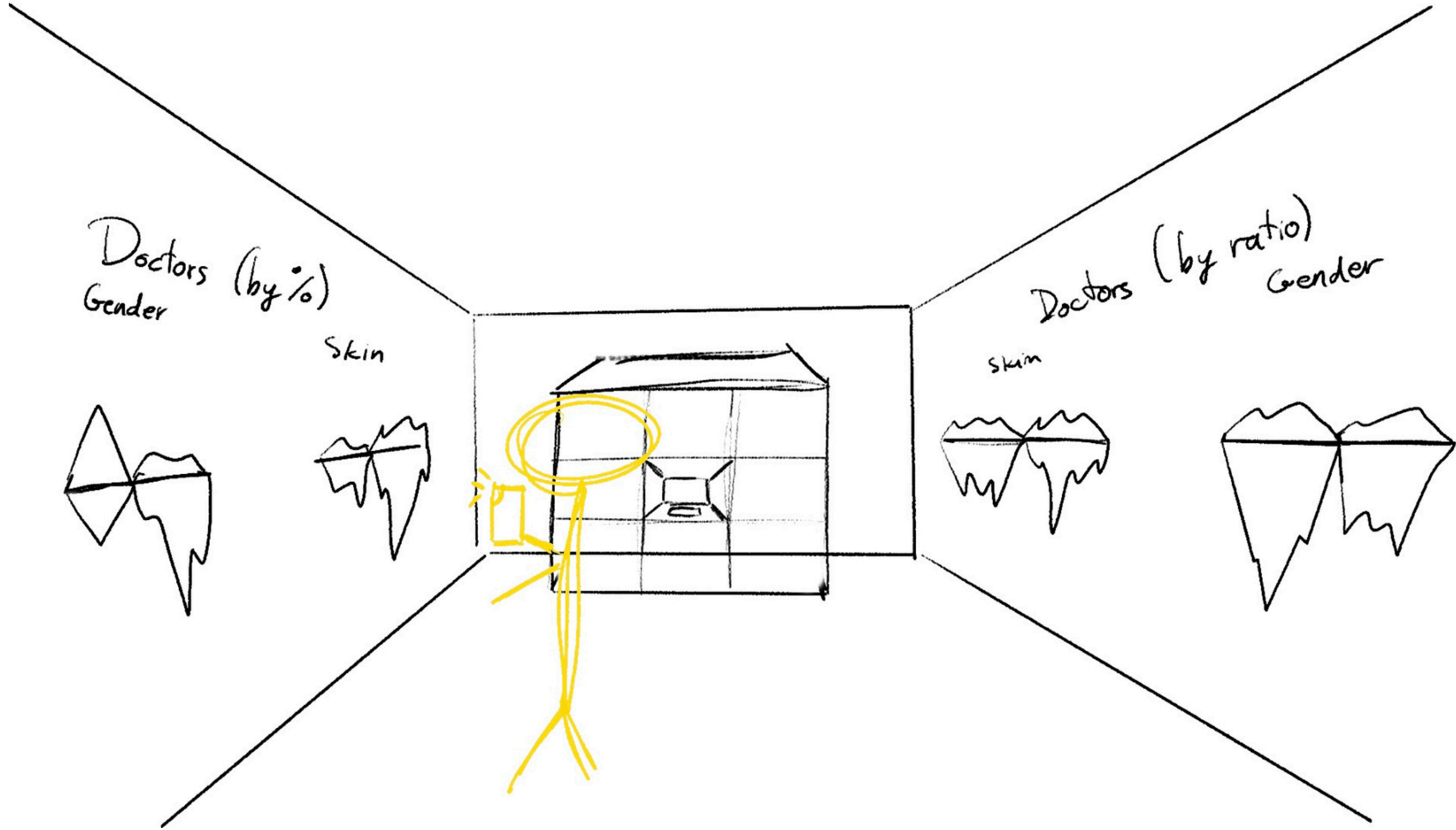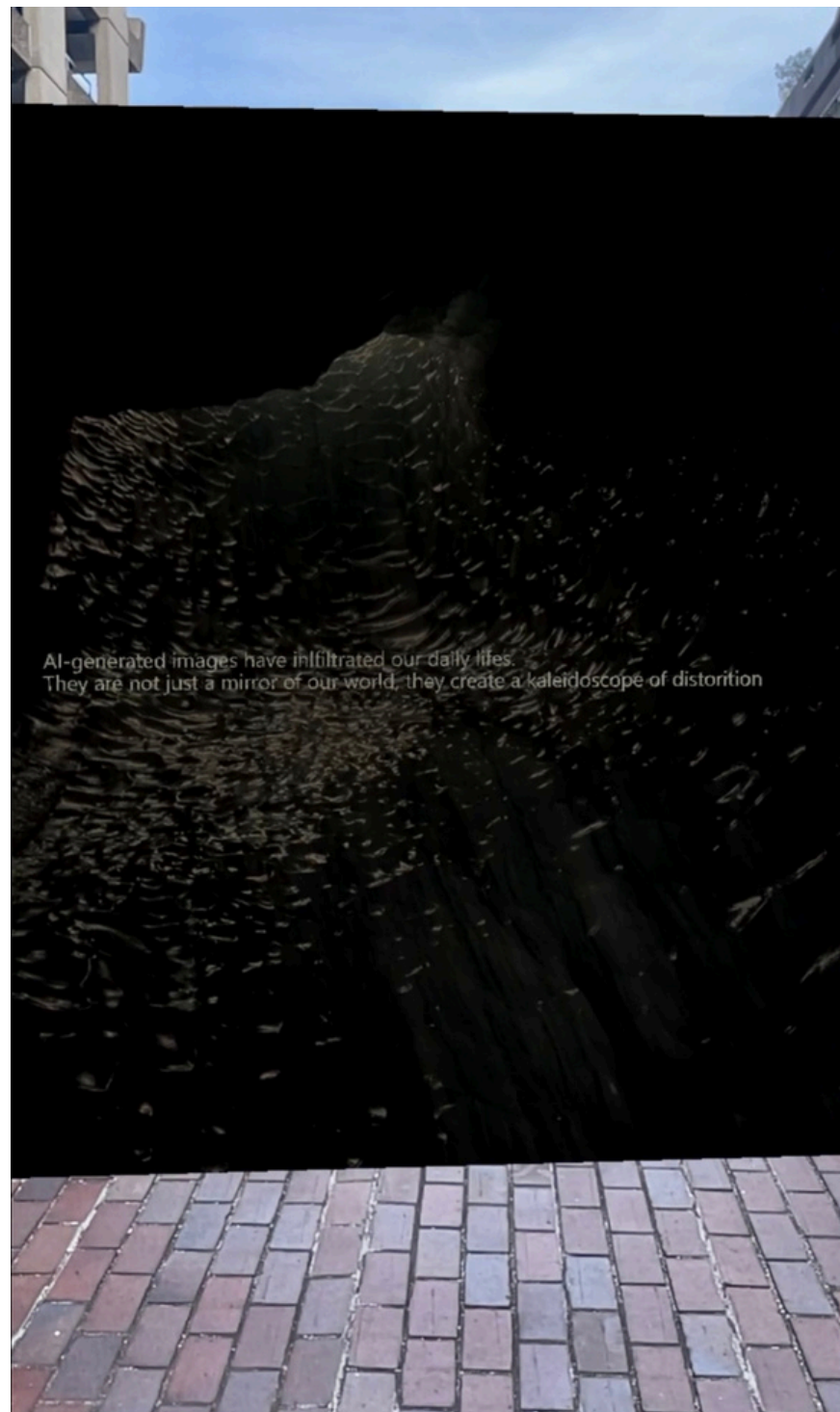The Feminist Internet,
F'xa, 2019
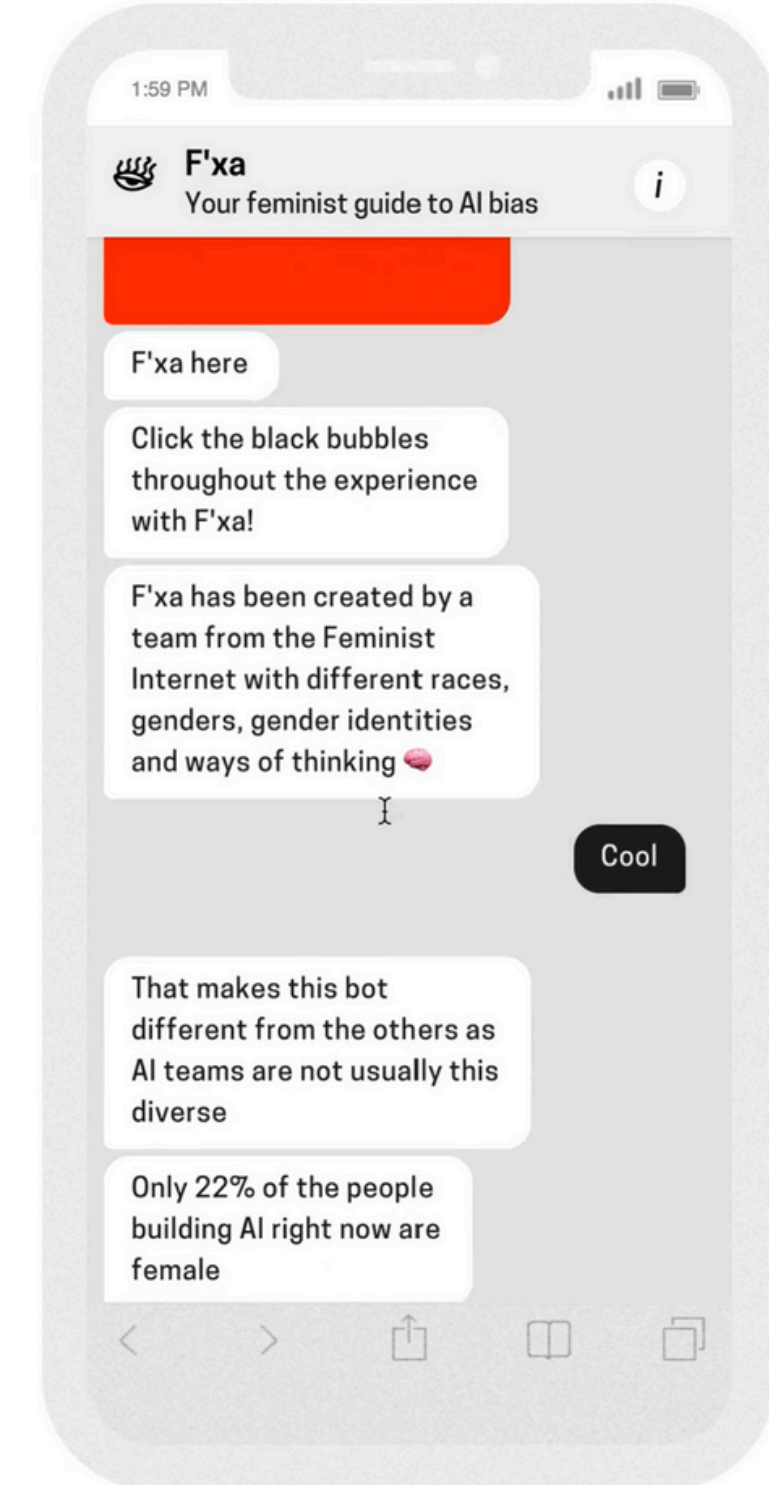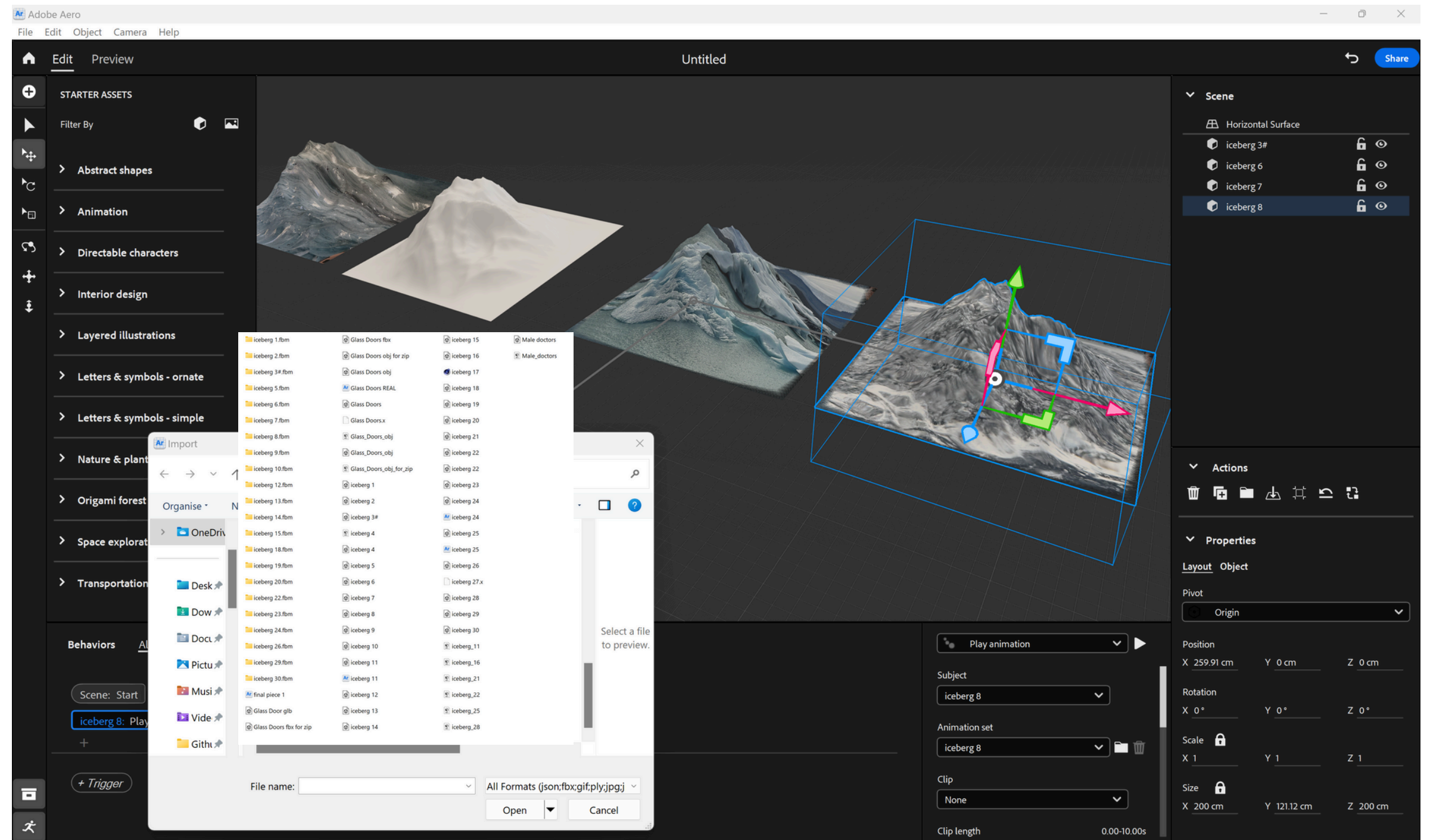
Attempts of getting the objects to work
in AR using Adobe Aero

Testing AR interactions

Doctors (by %)

Gender

Skin

Doctors (by ratio)

Gender

Skin

Project Resolution sketch

Project Resolution video: https://youtube.com/shorts/NZBtAGcREO8

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