



TECH 1711 - Mixed Reality Studio



New Class
(Be Ready for Changes)

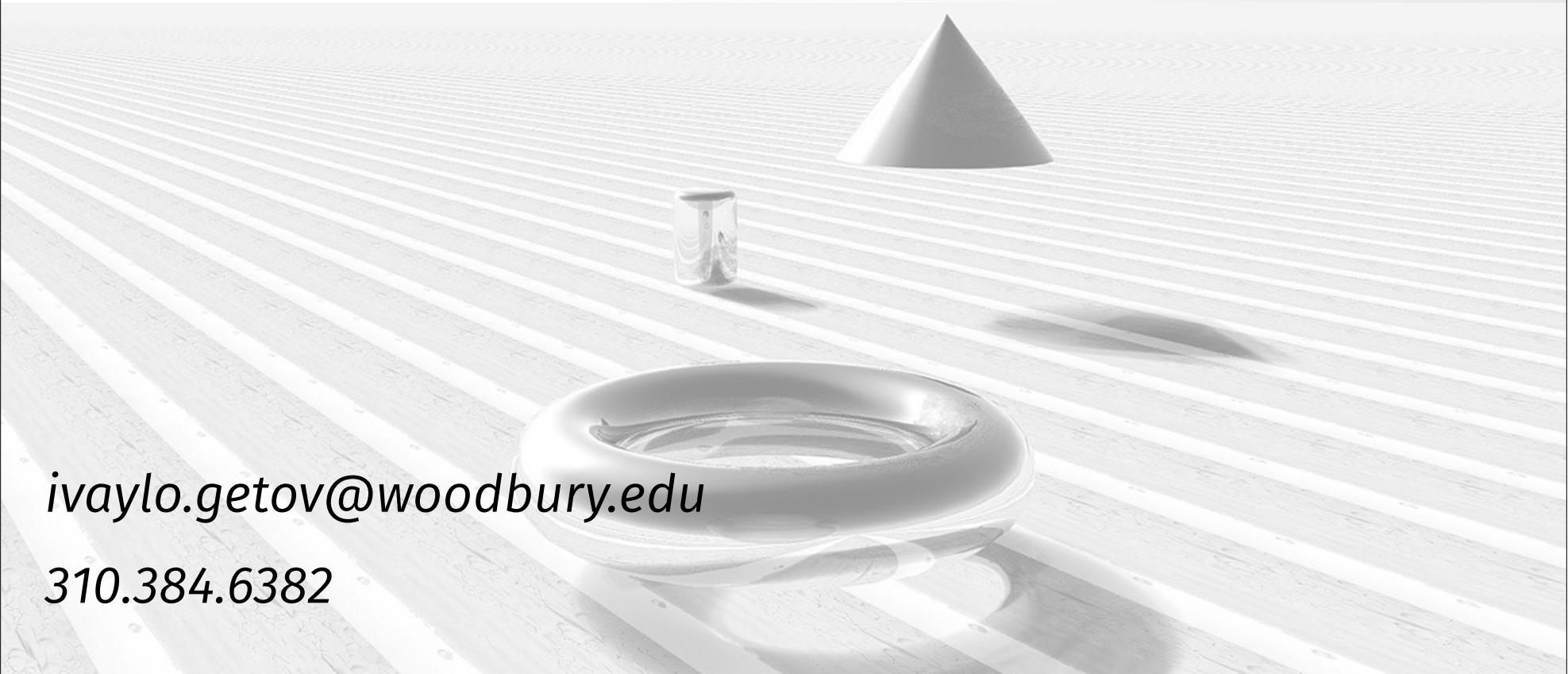
Most Up-to-date Syllabus:

<https://github.com/ivaylopg/MixedRealityStudio>

Contact Me

ivaylo.getov@woodbury.edu

310.384.6382

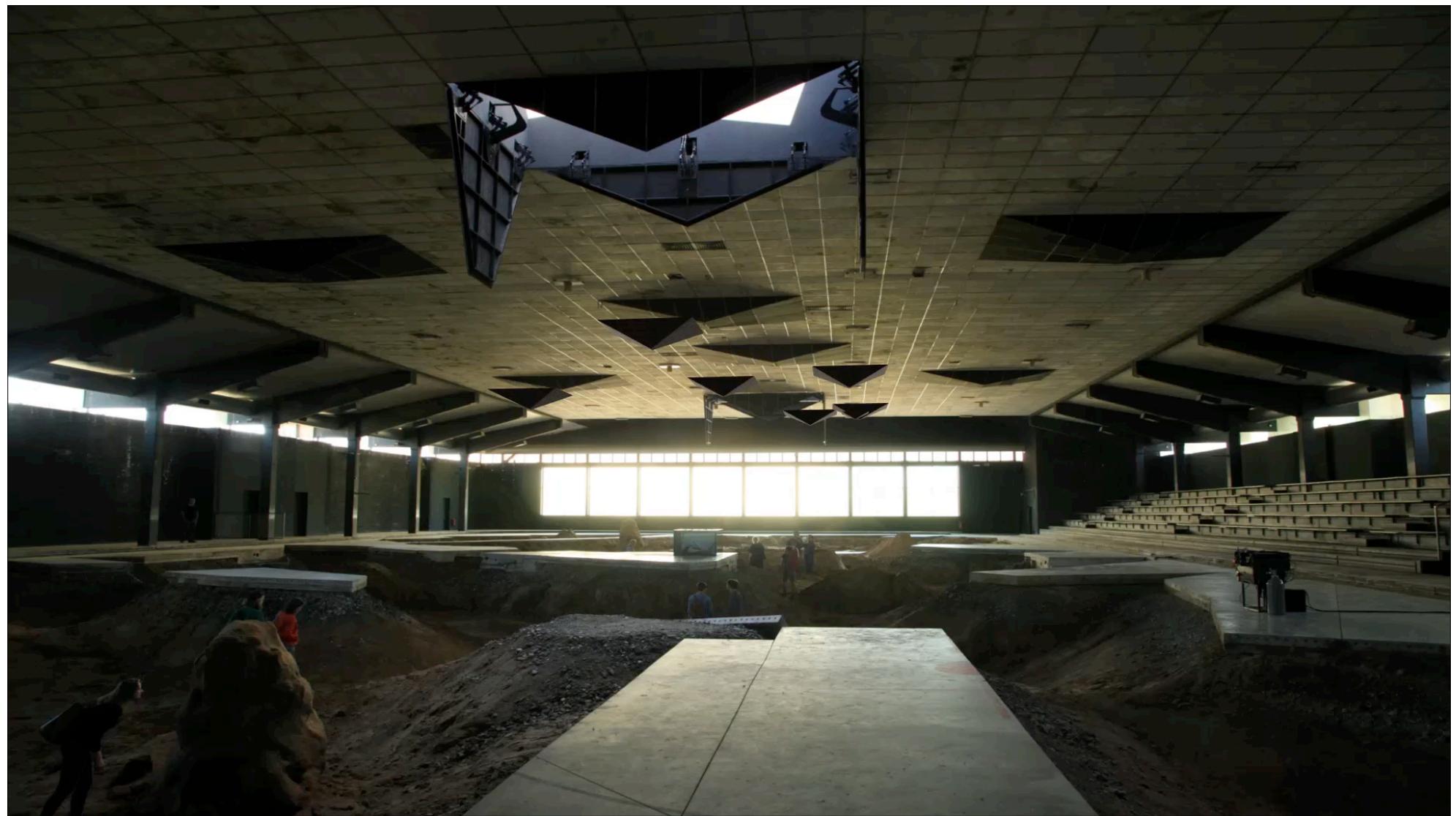


About me

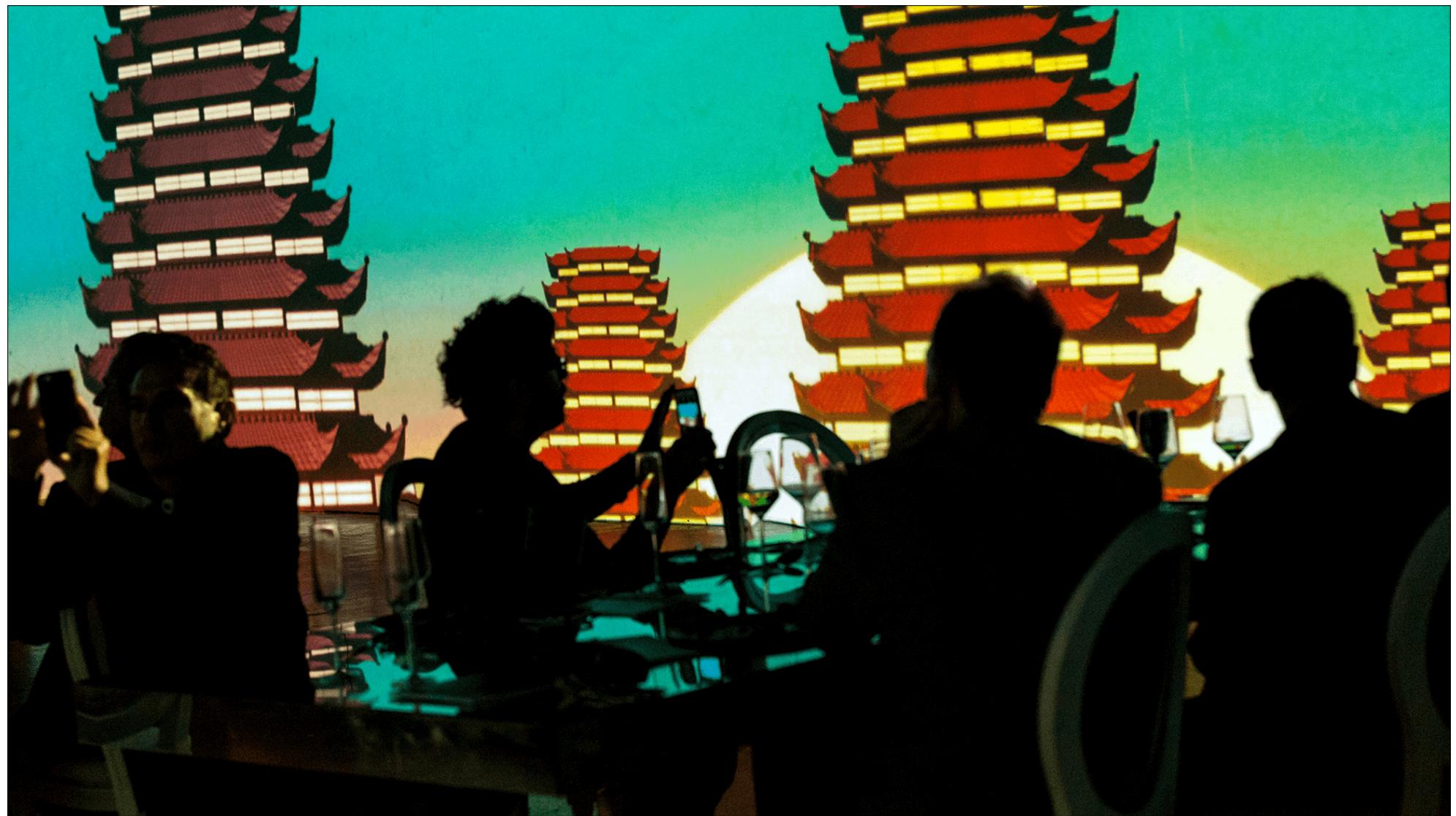


Luxloop









16:59:37

GPU usage: 38%

56
fps

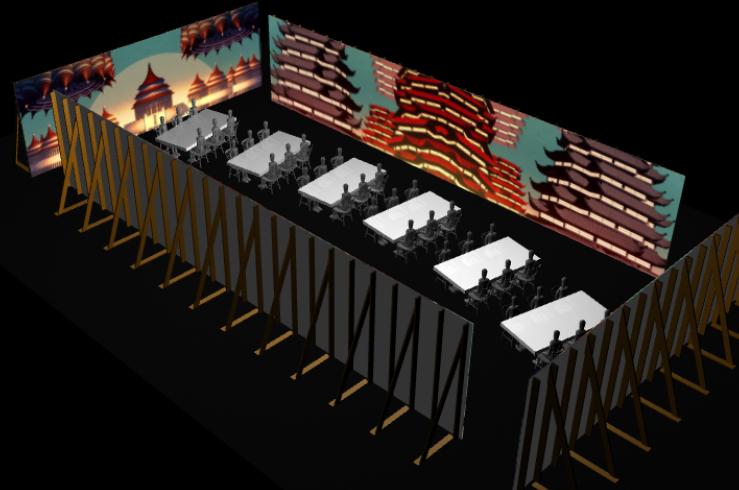
Video Cues Dandy Punk Feather Mandalas

16

East: E:/EastWallVideos/42_TEMPLETESCOPELOOP_wide.mp4 **loop**
West: E:/EastWallVideos/42_TEMPLETESCOPELOOP_wide.mp4 **0**
North: F:/NorthWallVideos/42_TEMPLETELOOP_short.mp4 **adv**
South: F:/NorthWallVideos/42_TEMPLETELOOP_short.mp4 **0**

R + |

	A	B
Play on Load		
Play A		
Play B		
Restart Both		
Restart 'A'		
Restart 'B'		
		Load Into 'B'



N/E S/W Camera Position Camera Distance

3D View Flat View Projector Output

Active Module

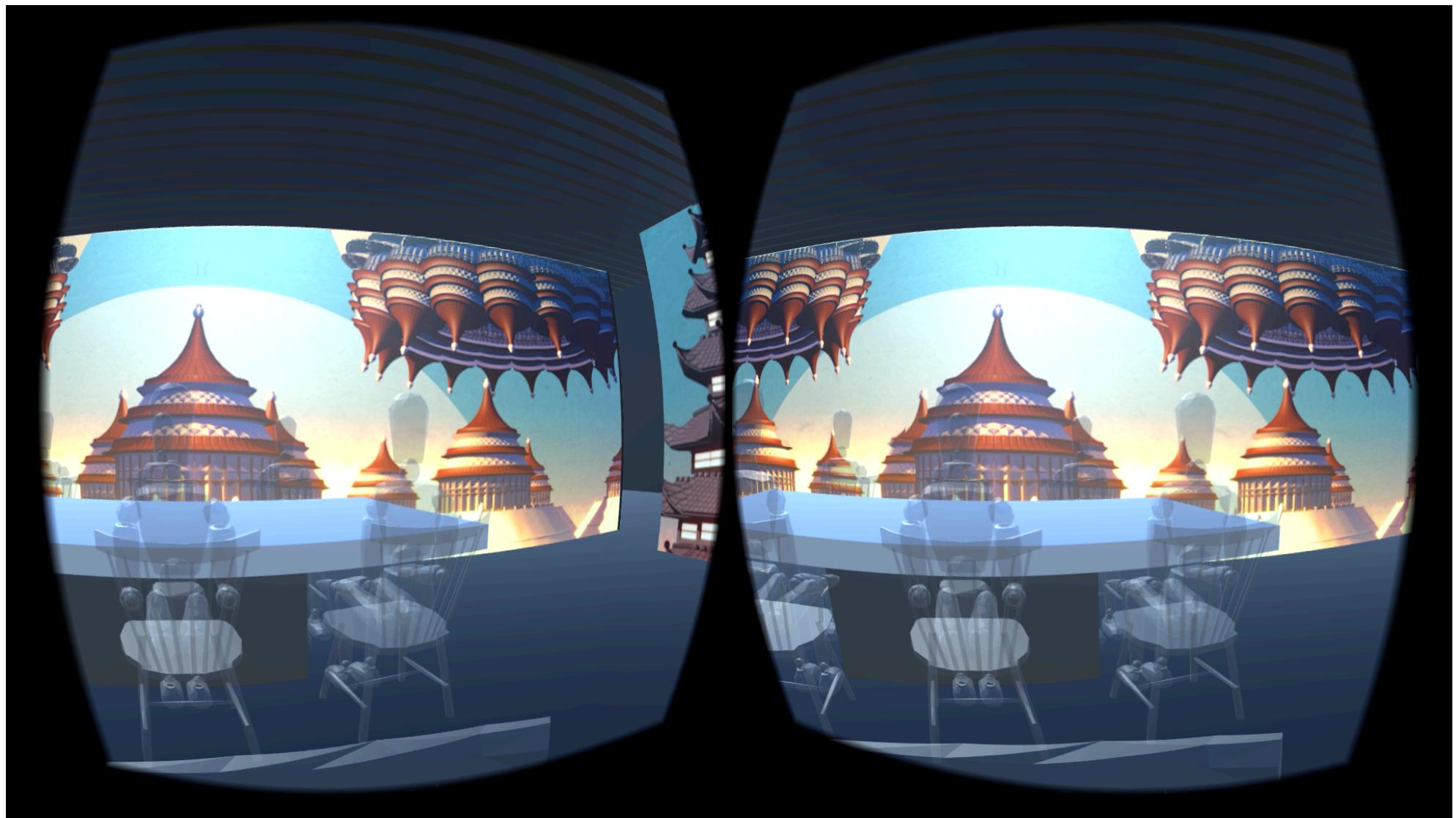
Dandy Punk **Feather Mandalas**

Output Controls

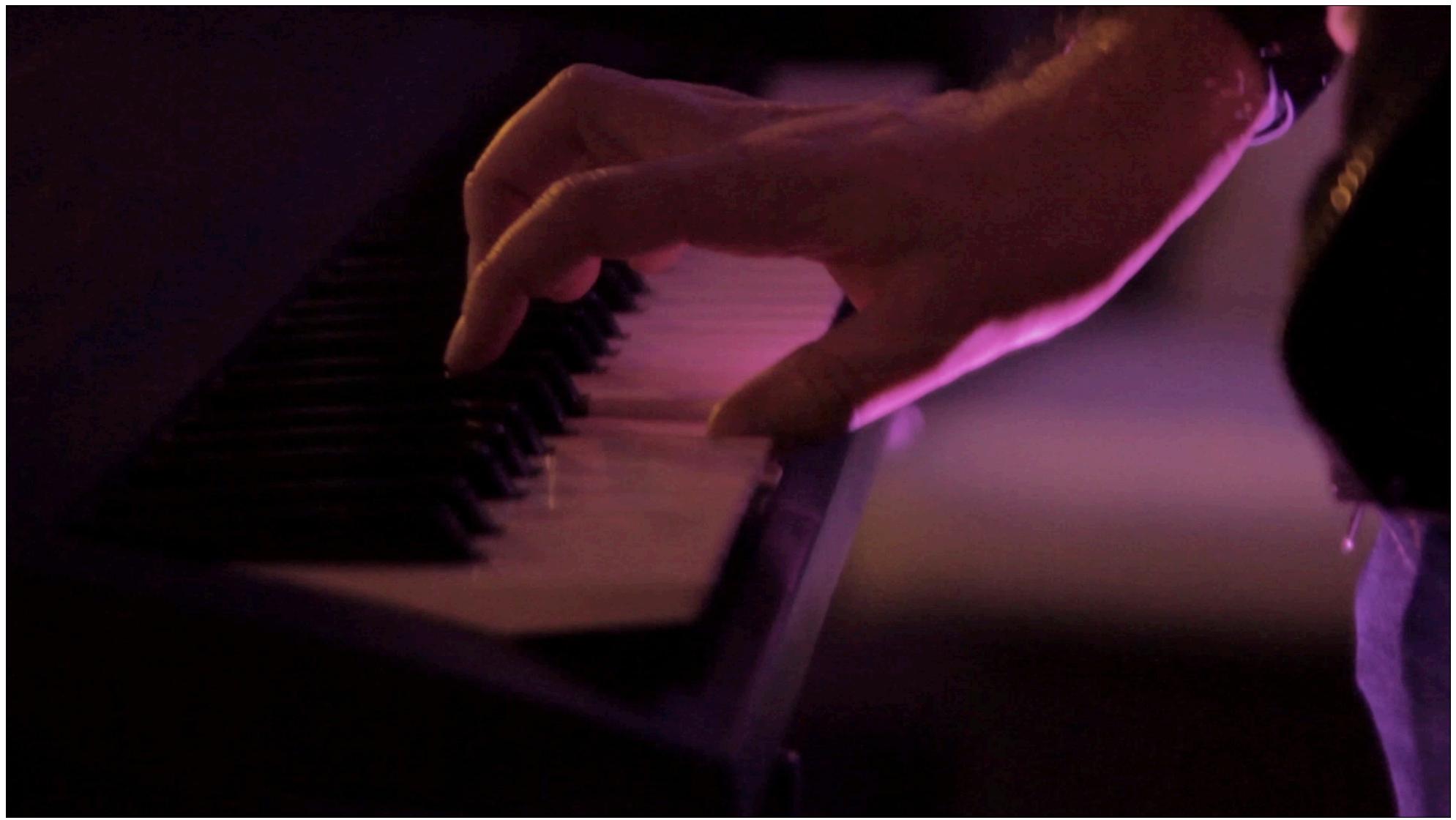
Master Fade Master Vol Module Fade Video Fade

Stop

|| ○ → i A <--> B ▶ ○ → i -02:45 -04:52









About YOU?

Experiential

Experimental

Test Lab

Expectations

Participation

Flexibility



Assignments + Format

The background features a dark purple gradient. In the center is a large, solid red circle. On either side of the circle are stylized, low-poly wireframe mountain peaks in a darker shade of purple. The foreground has a subtle grid pattern.

Keep up with reading

“mini” project

Midterm project

Final project

Goals

Specific Skills

- Completed multiple VR/AR Projects
- HTC Vive, Hololens
- Unity

Conceptual Proficiency

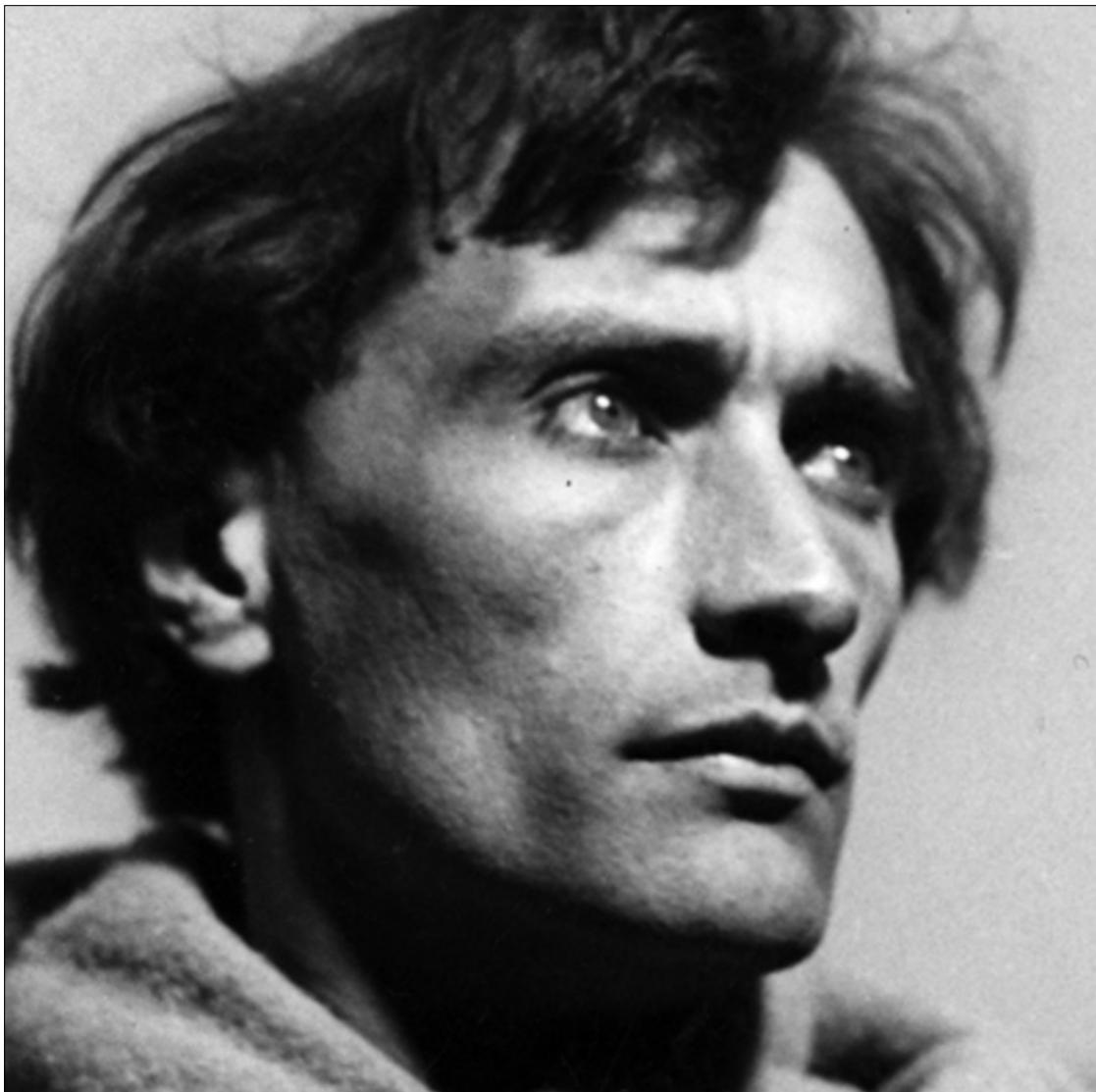
- New paradigms of design
- A new set of tools available to you



Let's Go!







*[T]he theater is a mirage....
And the principle of theater...
should be understood as the
expression of an identity...in
which the characters,
objects, images, and all that
constitutes the **virtual reality**
of the theater develops, and
the purely fictitious and
illusory world [is] evolved.*

What is AR/VR/MR?

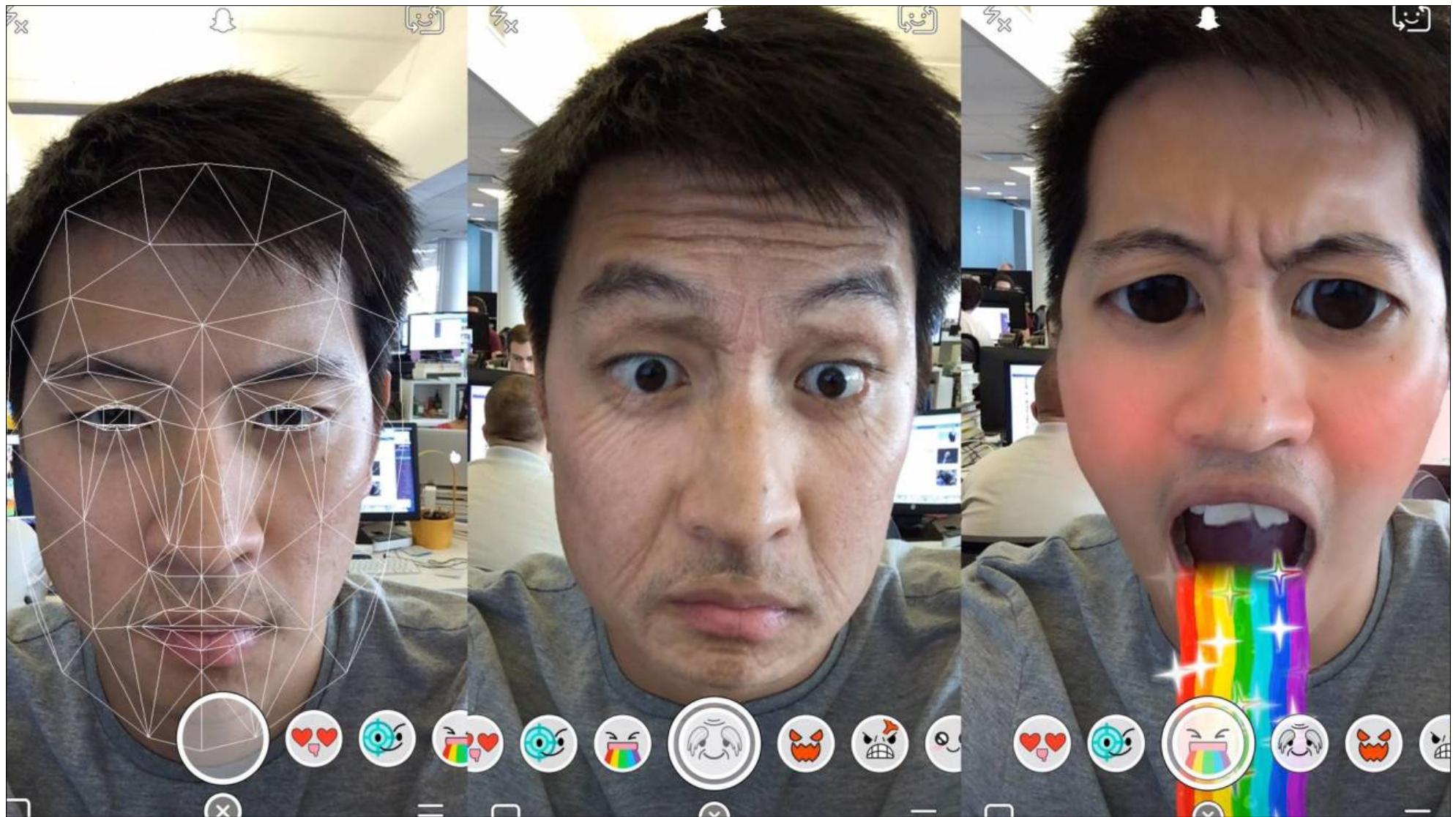
Inducing targeted behavior in an organism by using artificial sensory stimulation, while the organism has little or no awareness of the interference.



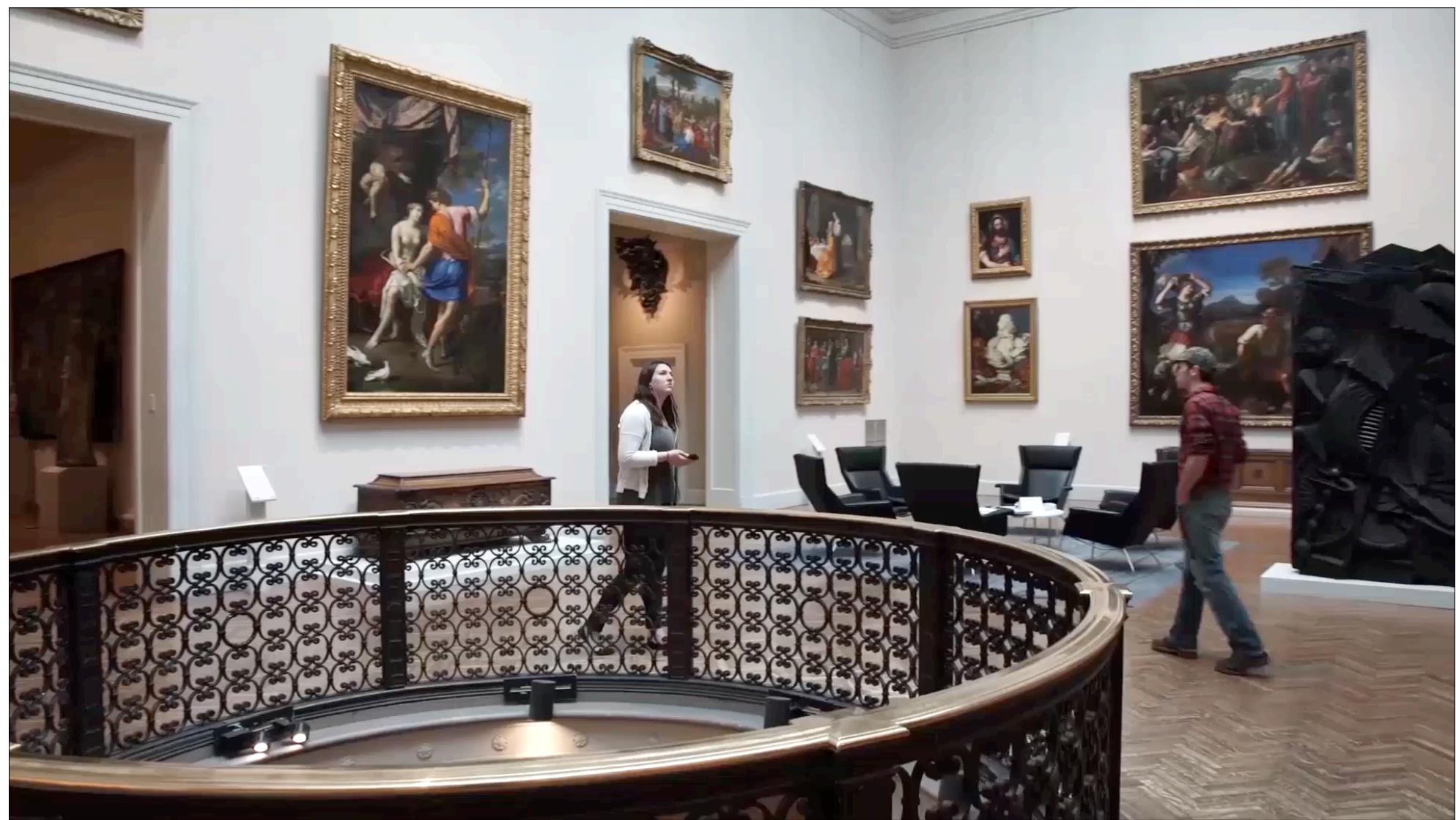
Do not attempt.

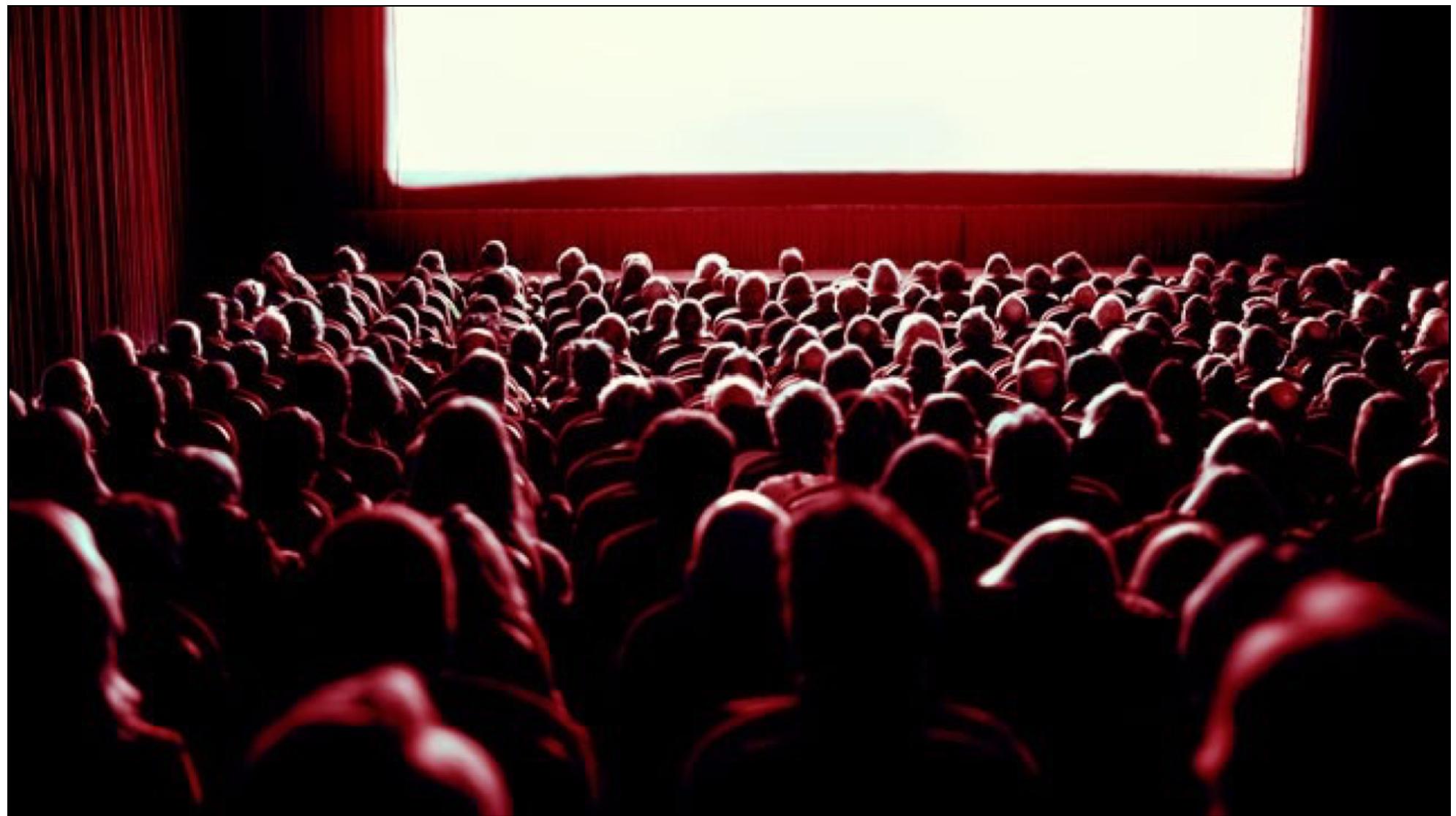


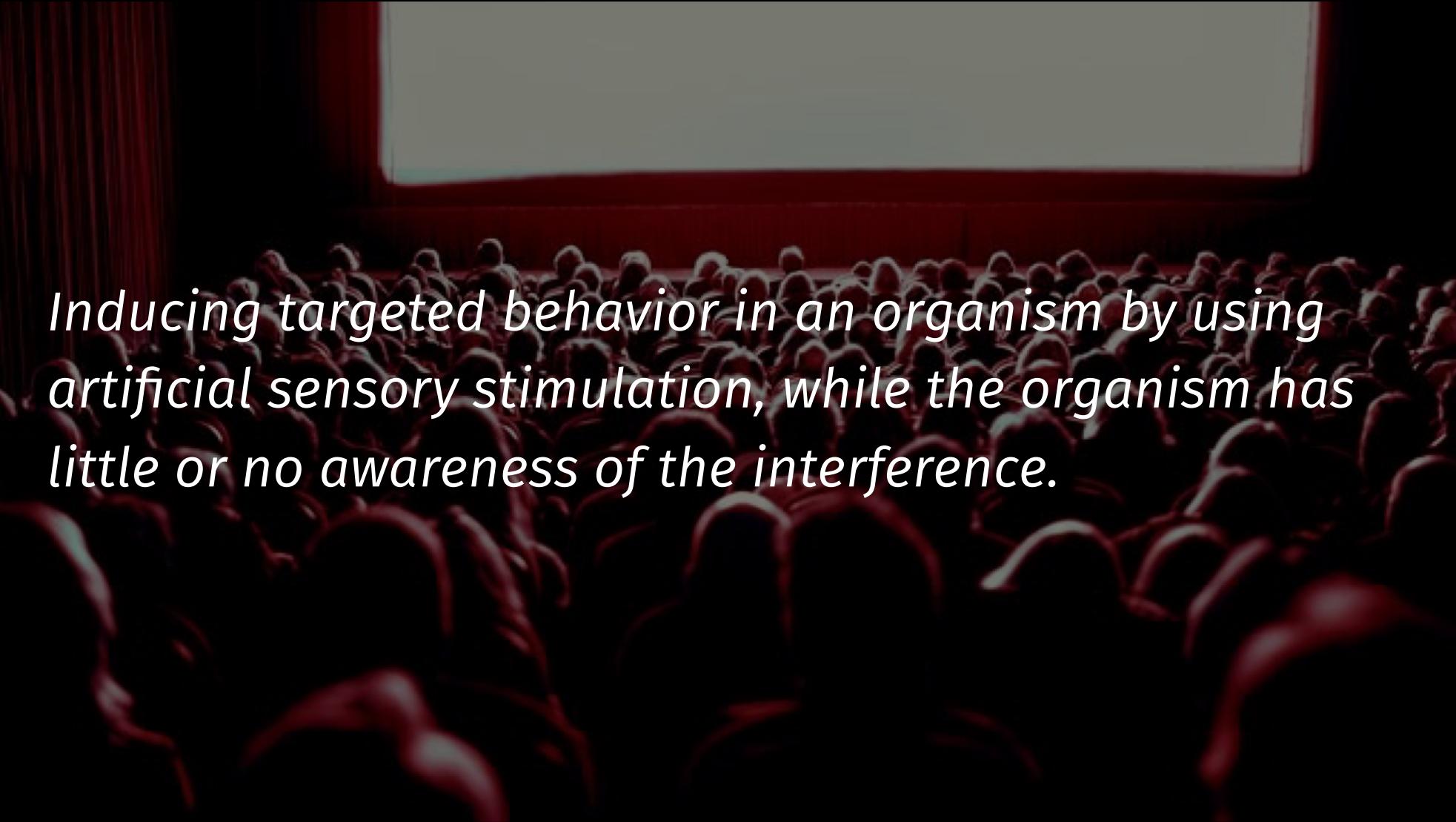








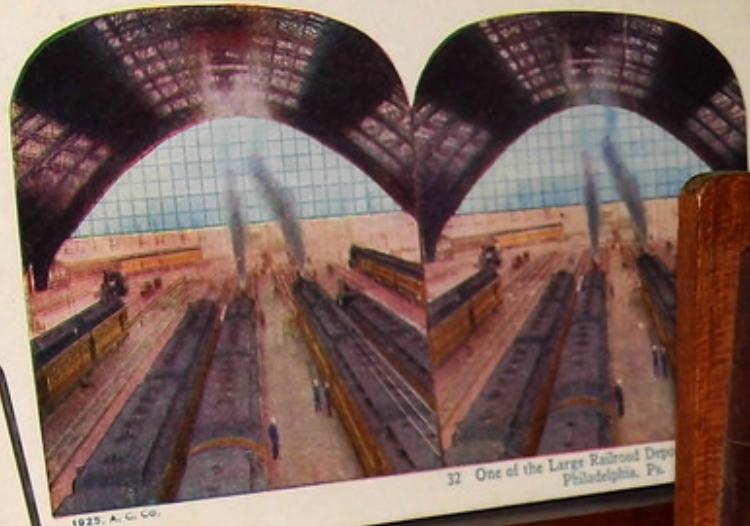




Inducing targeted behavior in an organism by using artificial sensory stimulation, while the organism has little or no awareness of the interference.

A (Brief) History of VR/AR

sensorama

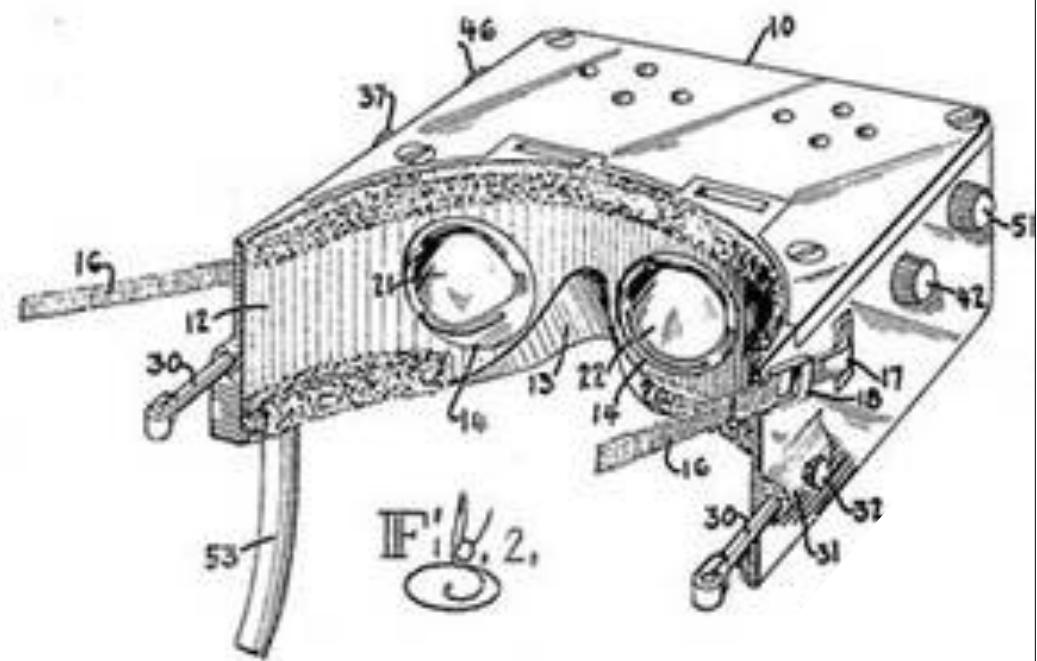


32 One of the Large Railroad Depo
Philadelphia, Pa.

1925. A. C. Co.

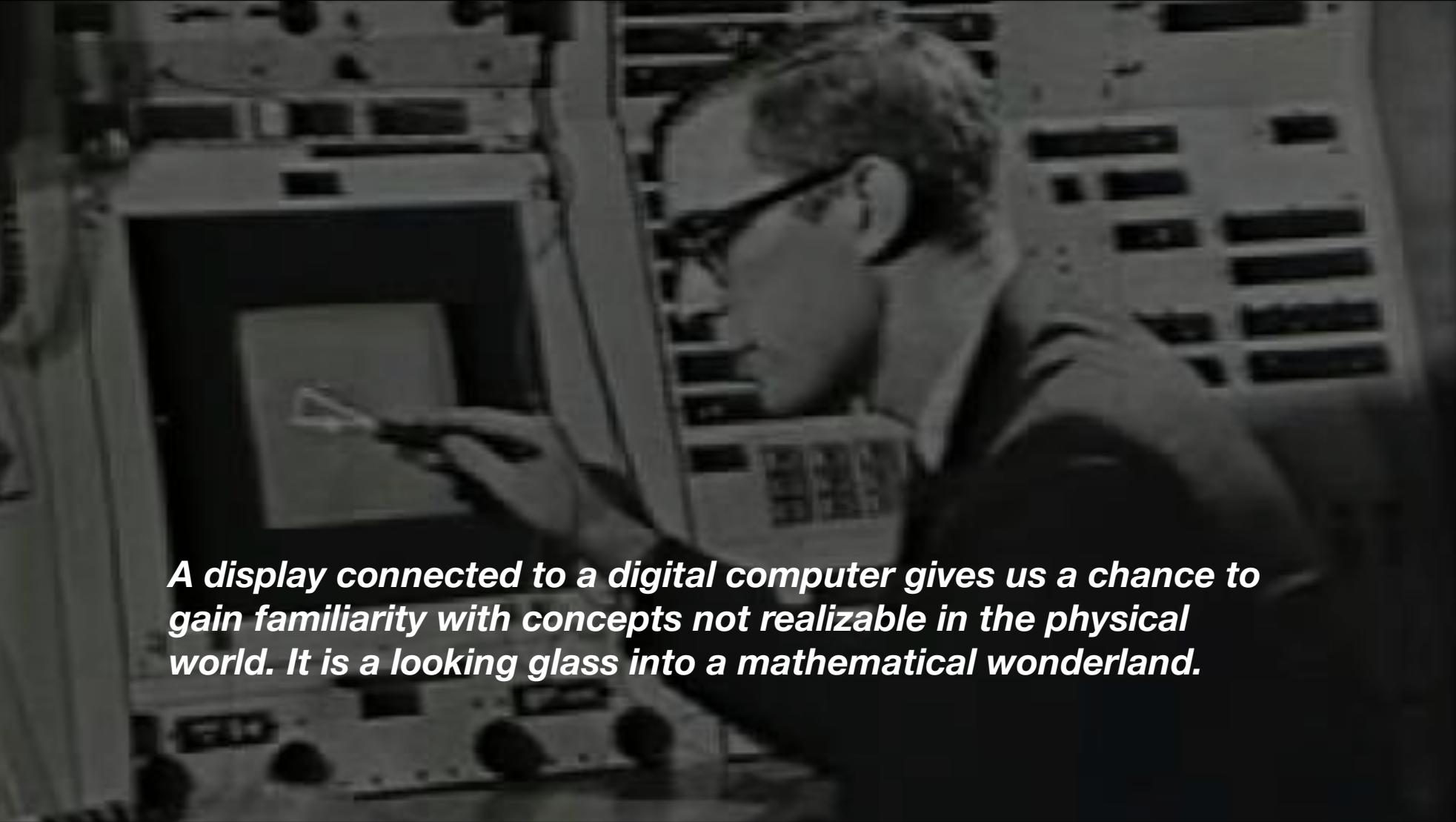








Philco HMD



A display connected to a digital computer gives us a chance to gain familiarity with concepts not realizable in the physical world. It is a looking glass into a mathematical wonderland.

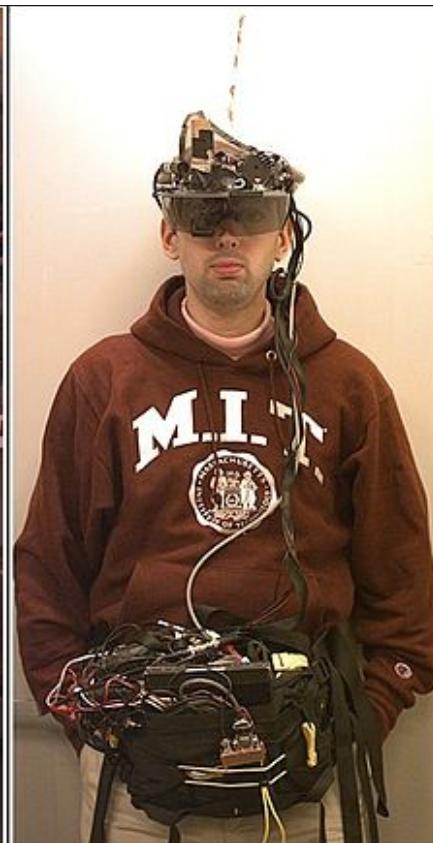




(a)
1980



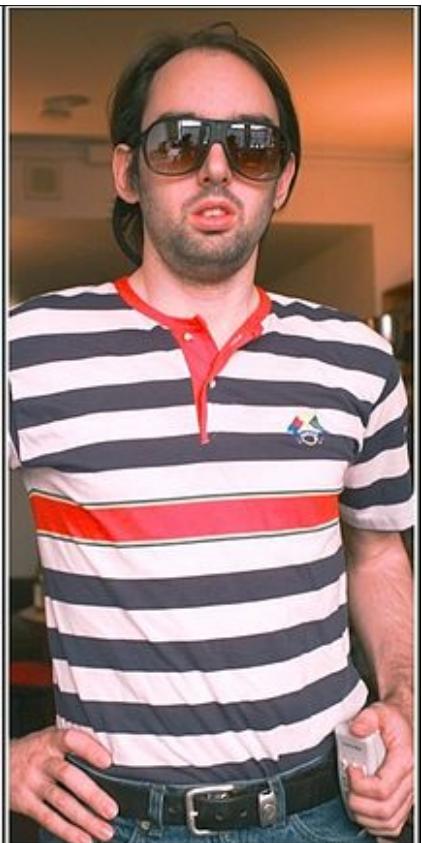
(b)
Mid 1980s



(c)
Early 1990s

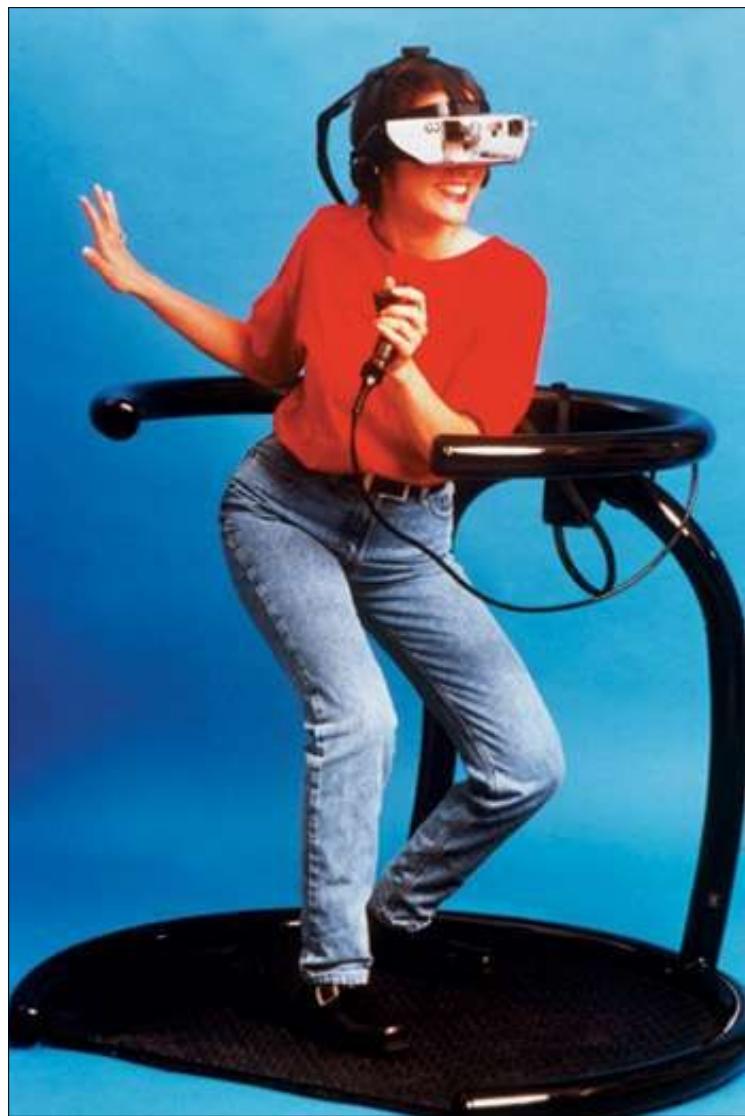


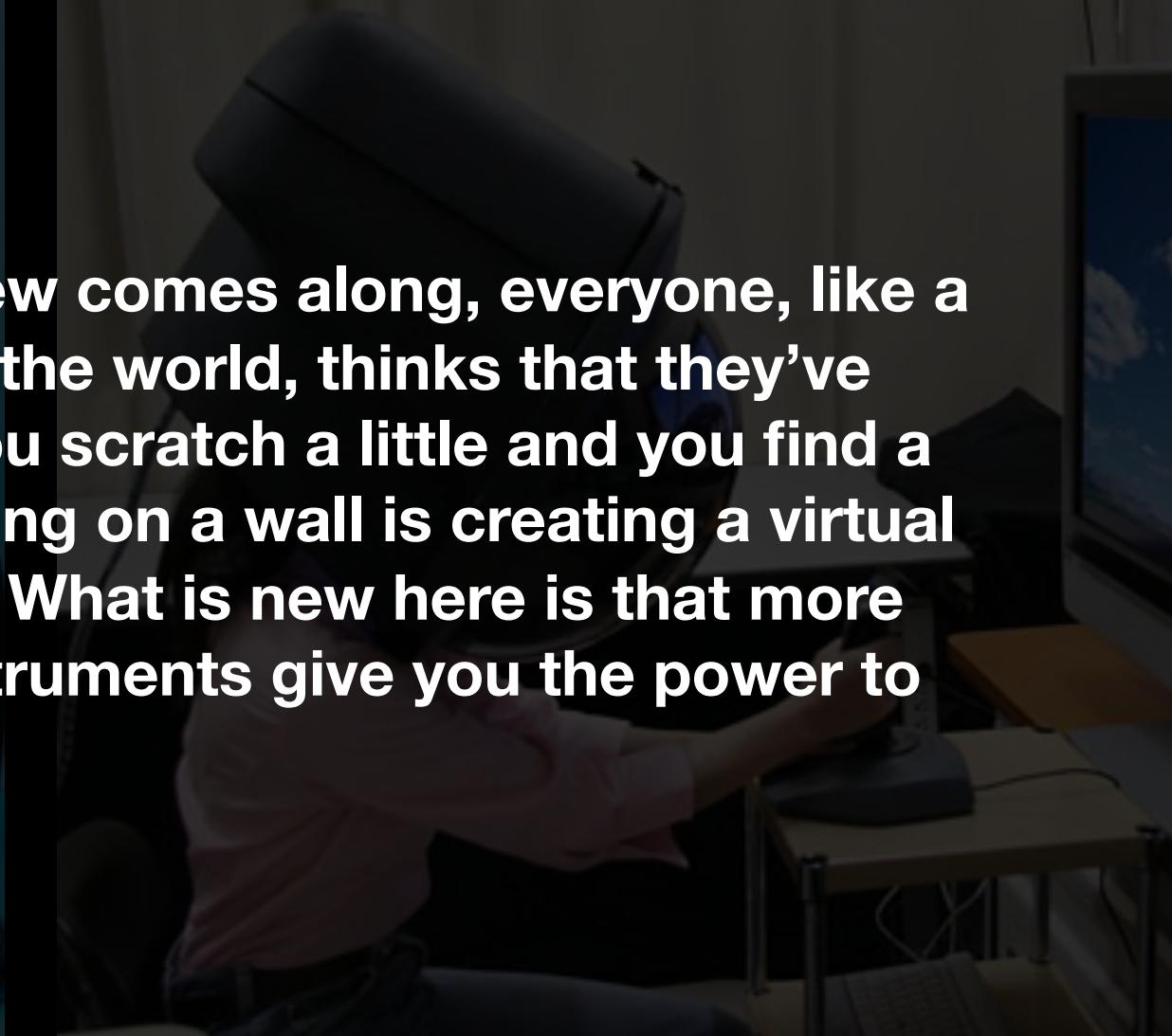
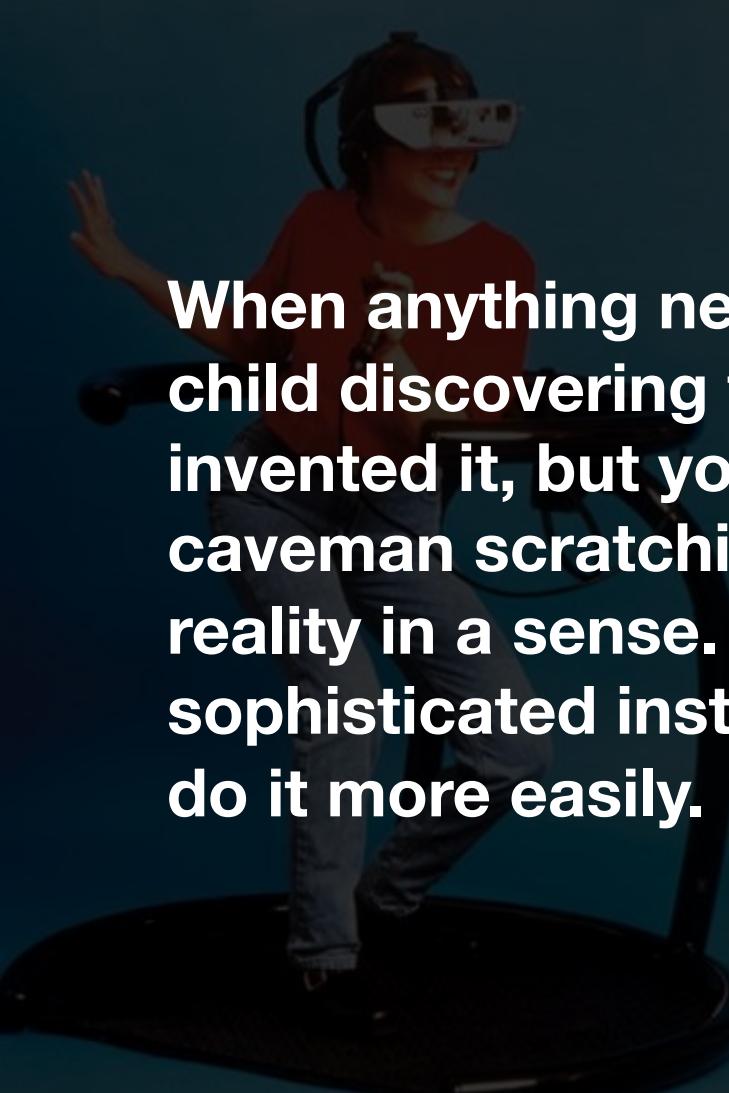
(d)
Mid 1990s



(e)
Late 1990s

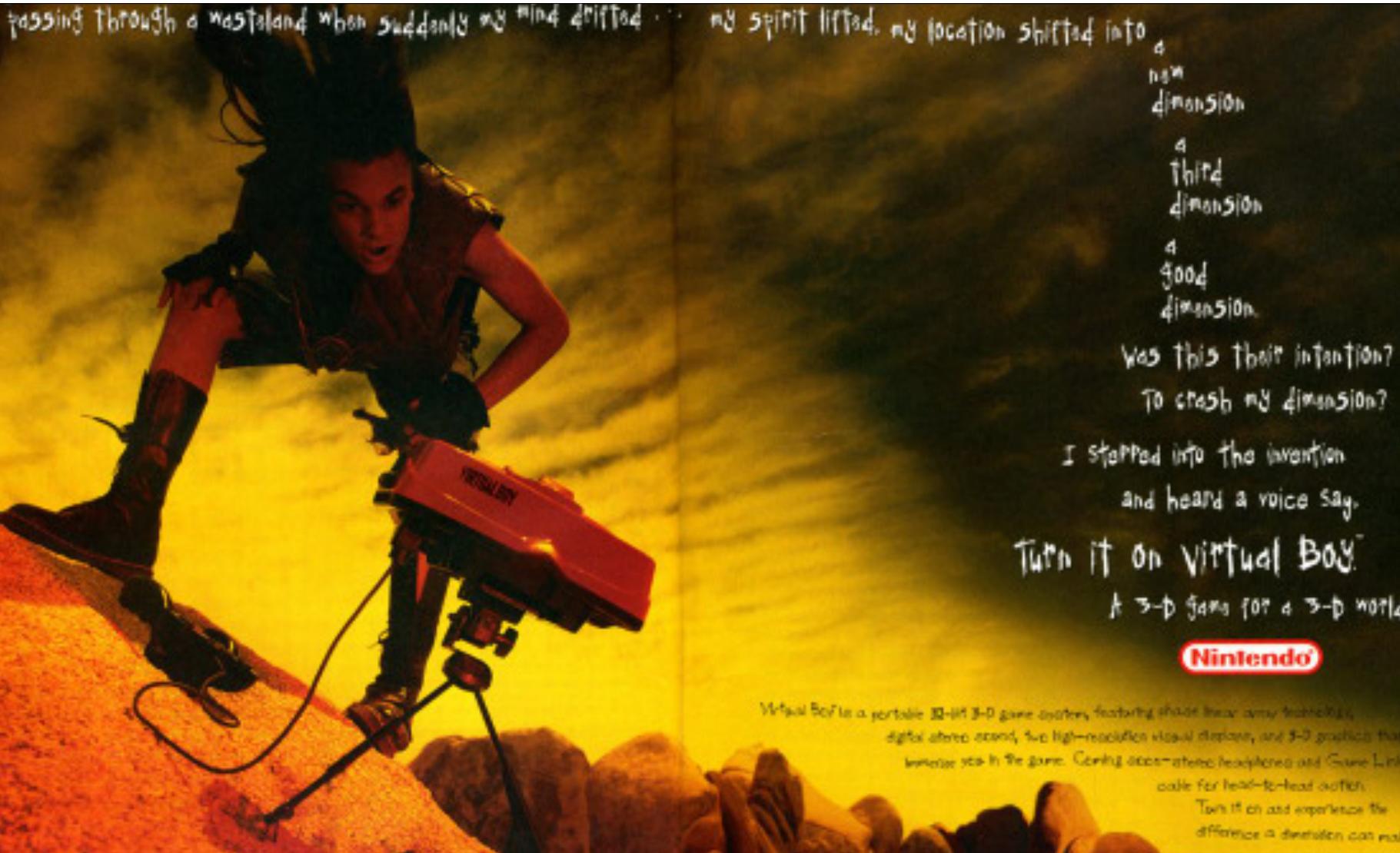






When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating a virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do it more easily.





4
height
dimension

4
Third
dimension

4
good
dimension.

Was this their intention?
To crash my dimension?

I stepped into the invention
and heard a voice say,

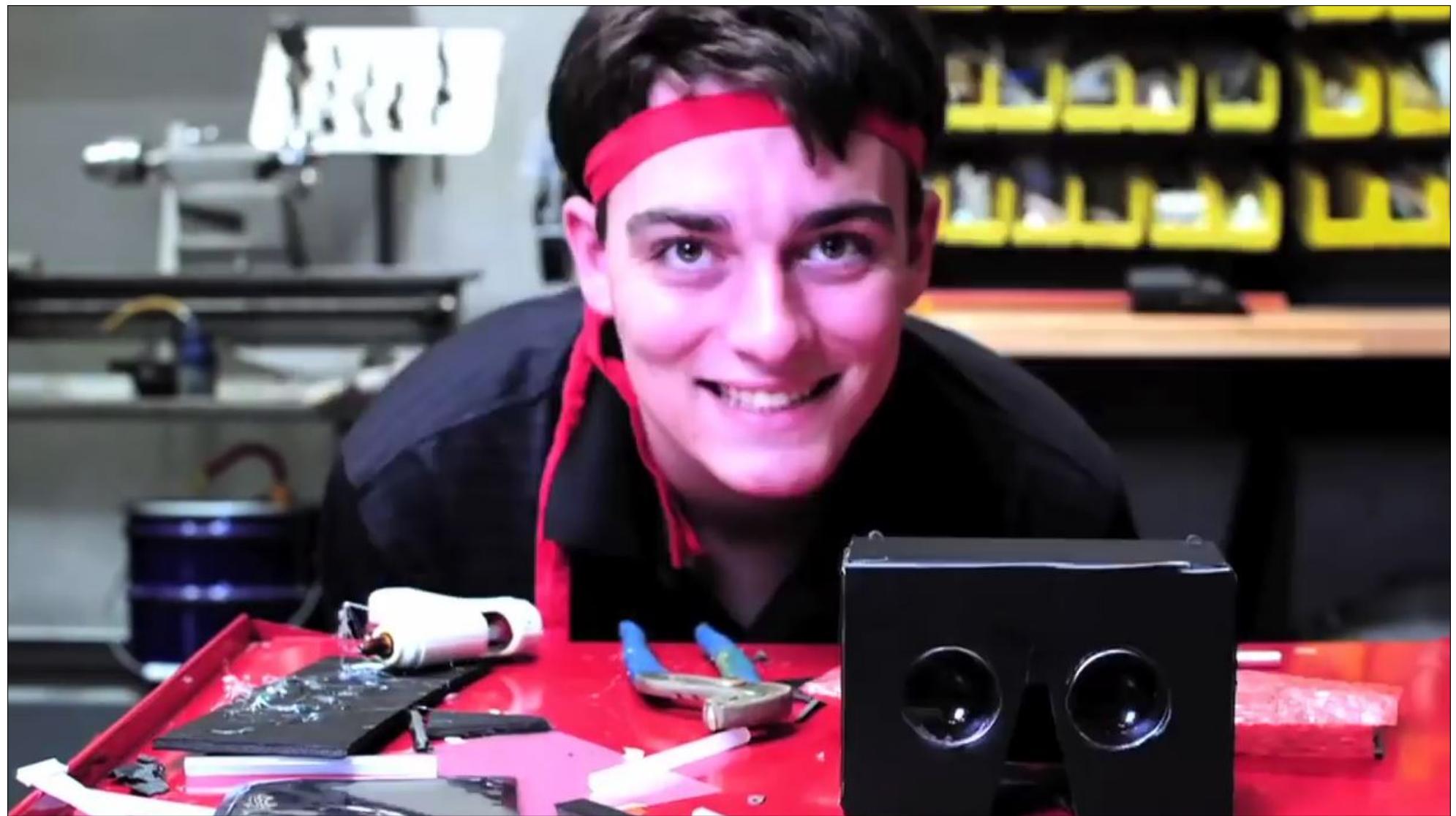
Turn it on Virtual Boy.
A 3-D game for a 3-D world.

Nintendo®

Virtual Boy is a portable 3D-HD 3-D game system featuring shade linear array technology,
digital stereo sound, two high-resolution visual displays, and 3-D graphics that
immerse you in the game. Coming soon—stereo headphones and Game Link™
cable for head-to-head action.
Turn it on and experience the
difference a dimension can make.







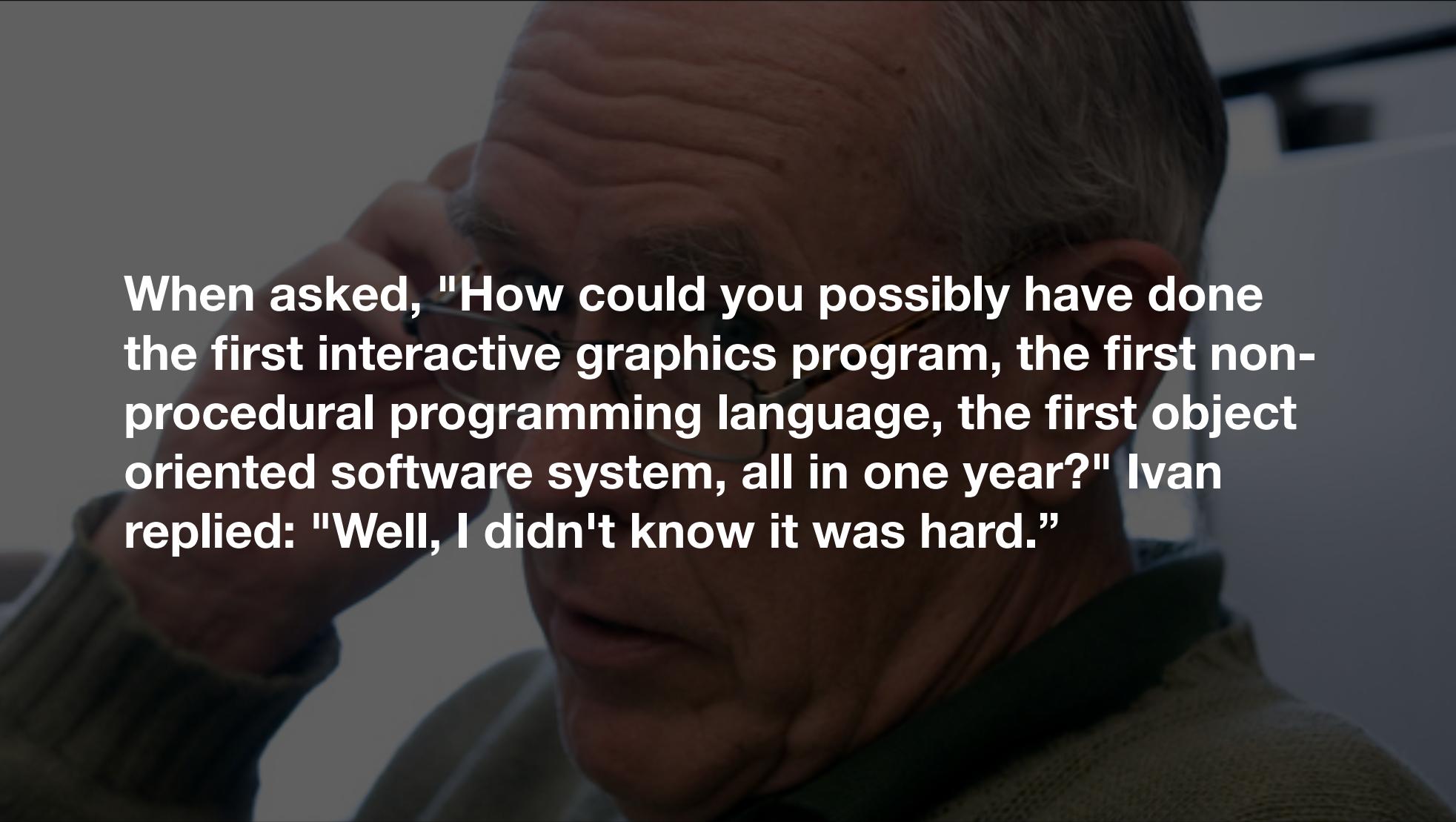
AUGUST 17, 2015

TIME

The Surprising Joy of
Virtual Reality

A photograph of a person wearing a virtual reality headset and holding motion controllers, set against a blue gradient background. The word "TIME" is printed in large, bold, black letters across the top of the image.





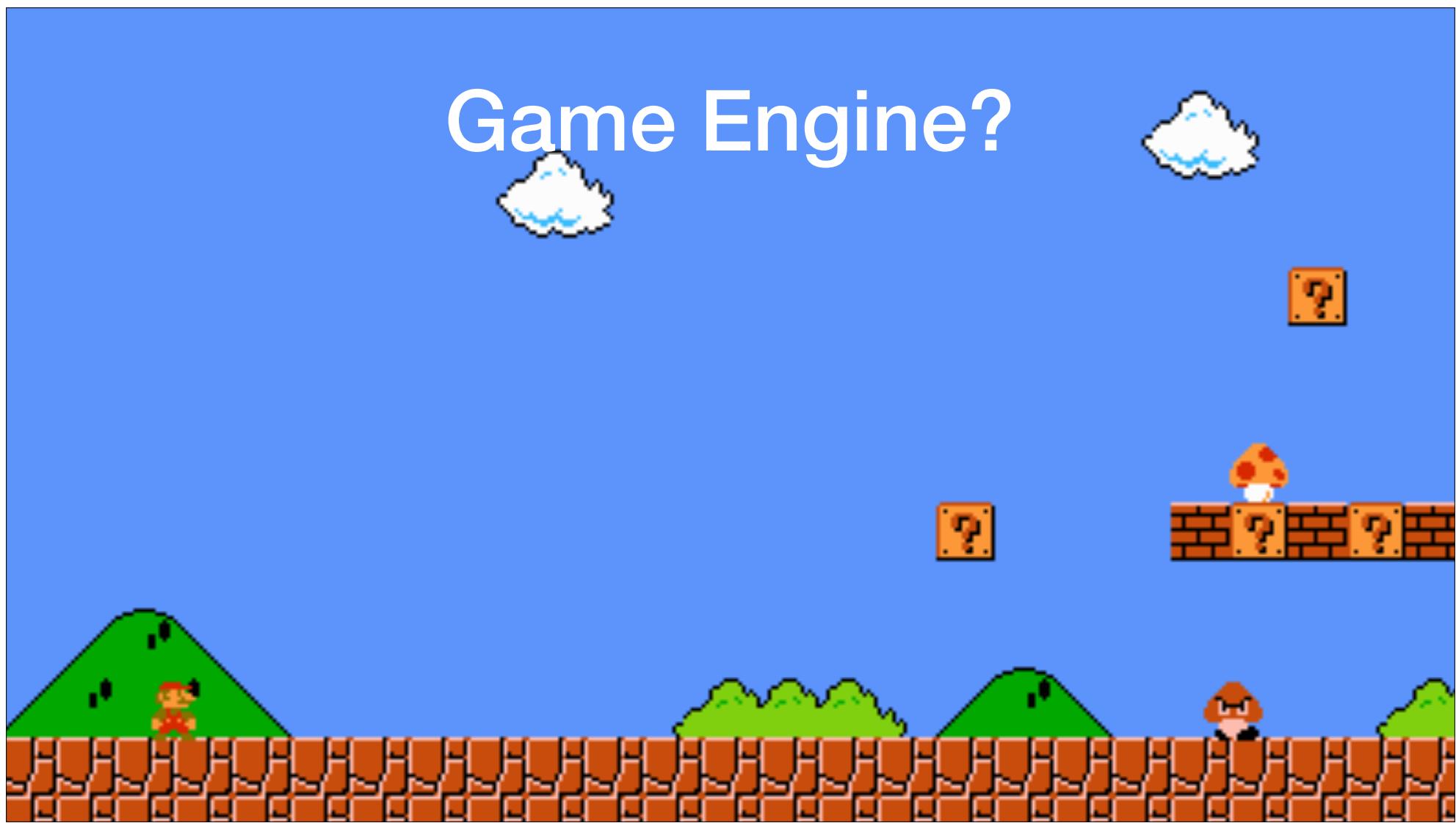
When asked, "How could you possibly have done the first interactive graphics program, the first non-procedural programming language, the first object oriented software system, all in one year?" Ivan replied: "Well, I didn't know it was hard."

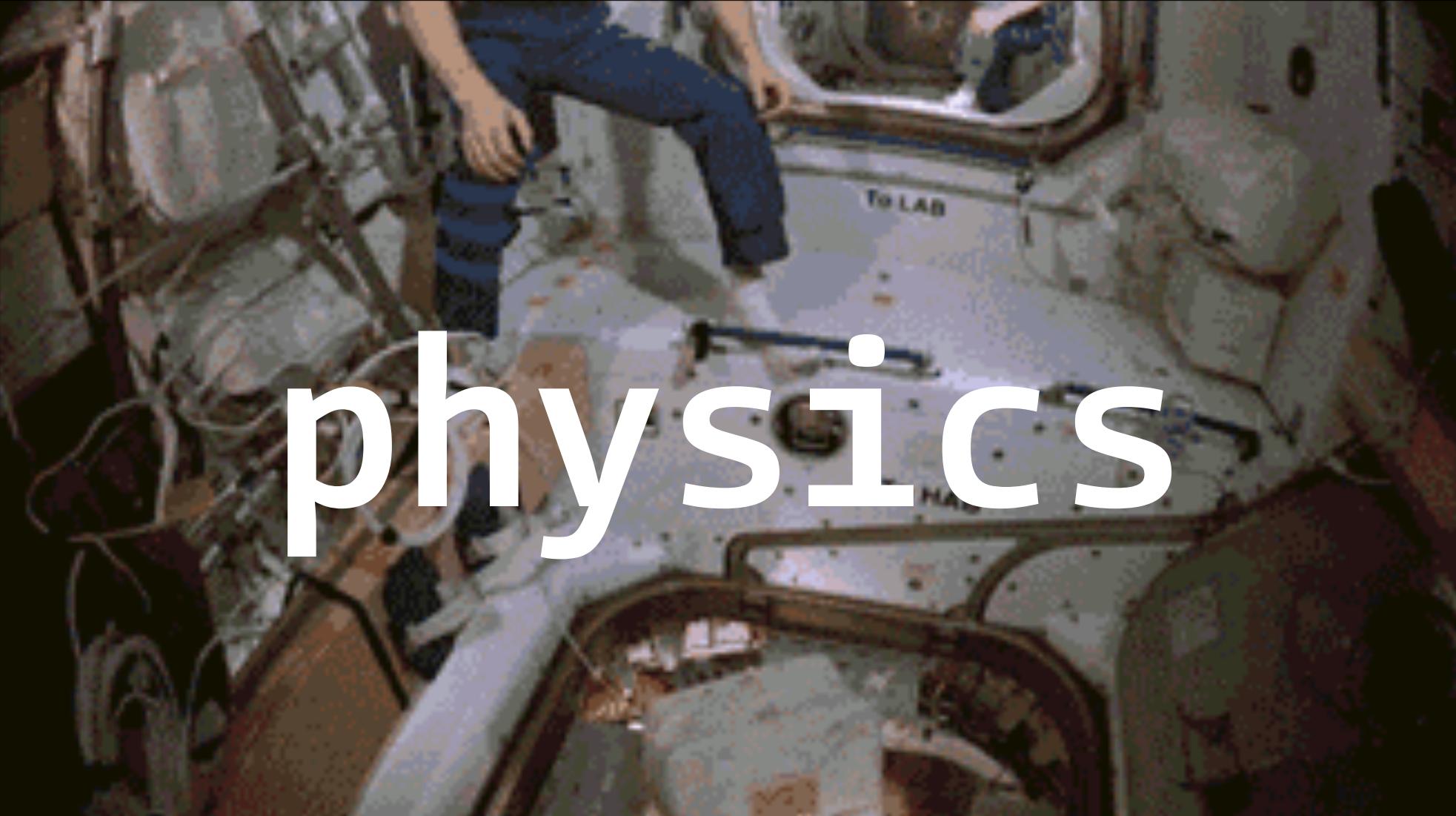


abstraction



Game Engine?





physics

```
PVector position = new PVector(0,0);
PVector velocity = new PVector(0,0);
PVector gravity  = new PVector(0, 9.8);

void draw() {
    velocity.add(gravity);
    position.add(velocity);
    drawObject(position.x,position.y);
}
```



Rigidbody

Mass

1

Drag

0

Angular Drag

0.05

Use Gravity



Is Kinematic



Interpolate

None

Collision Detection

Discrete

▼ Constraints

Freeze Position

X Y Z

Freeze Rotation

X Y Z

```
int n = 10;
float aperture = 0.05;
glm::mat4 projection = glm::perspective(...);

glm::vec3 right = glm::normalize(glm::cross(object - eye, up));
glm::vec3 p_up = glm::normalize(glm::cross(object - eye, right));

for(int i = 0; i < n; i++) {
    glm::vec3 bokeh = right * cosf(i * 2 * M_PI / n) + p_up * sinf(i * 2 * M_PI / n);
    glm::mat4 modelview = glm::lookAt(eye + aperture * bokeh, object, p_up);
    glm::mat4 mvp = projection * modelview;
    glUniformMatrix4fv(uniform_mvp, 1, GL_FALSE, glm::value_ptr(mvp));
    draw_scene();
    glAccum(i ? GL_ACCUM : GL_LOAD, 1.0 / n);
}

glAccum(GL_RETURN, 1);
glSwapBuffers();
```

Depth Of Field



Focus Distance

41.8

Aperture (f-stop)



0.623

Use Camera FOV



Kernel Size

Small



designing for the real world



A dark, atmospheric background featuring a man in a black shirt interacting with glowing blue energy spheres. The man has his hands outstretched, with glowing blue spheres on his fingers and a larger sphere hovering between them. The background is filled with abstract, glowing shapes and light rays.

Interaction







```
C:\>chkdsk  
Volume Serial Number is 3E76-4B58  
  
2,146,467,840 bytes total disk space  
    131,072 bytes in 2 hidden files  
      32,768 bytes in 1 directories  
    7,405,568 bytes in 124 user files  
2,138,898,432 bytes available on disk
```

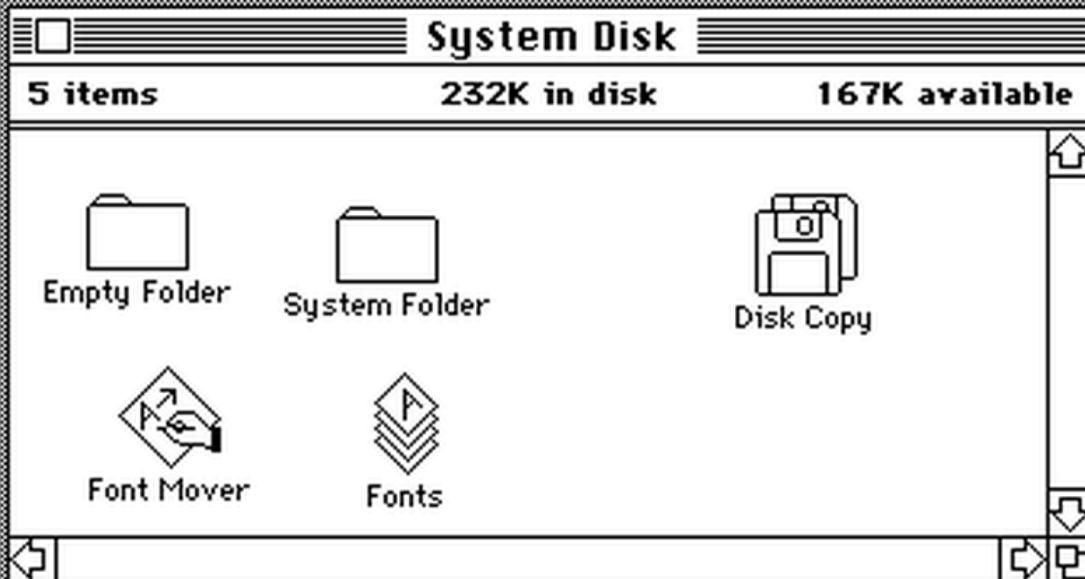
```
      32,768 bytes in each allocation unit  
    65,505 total allocation units on disk  
    65,274 available allocation units on disk
```

```
655,360 total bytes memory  
602,704 bytes free
```

```
Instead of using CHKD SK, try using SCANDISK. SCANDISK can reliably detect  
and fix a much wider range of disk problems. For more information,  
type HELP SCANDISK from the command prompt.
```

```
C:\>_
```

File Edit View Special



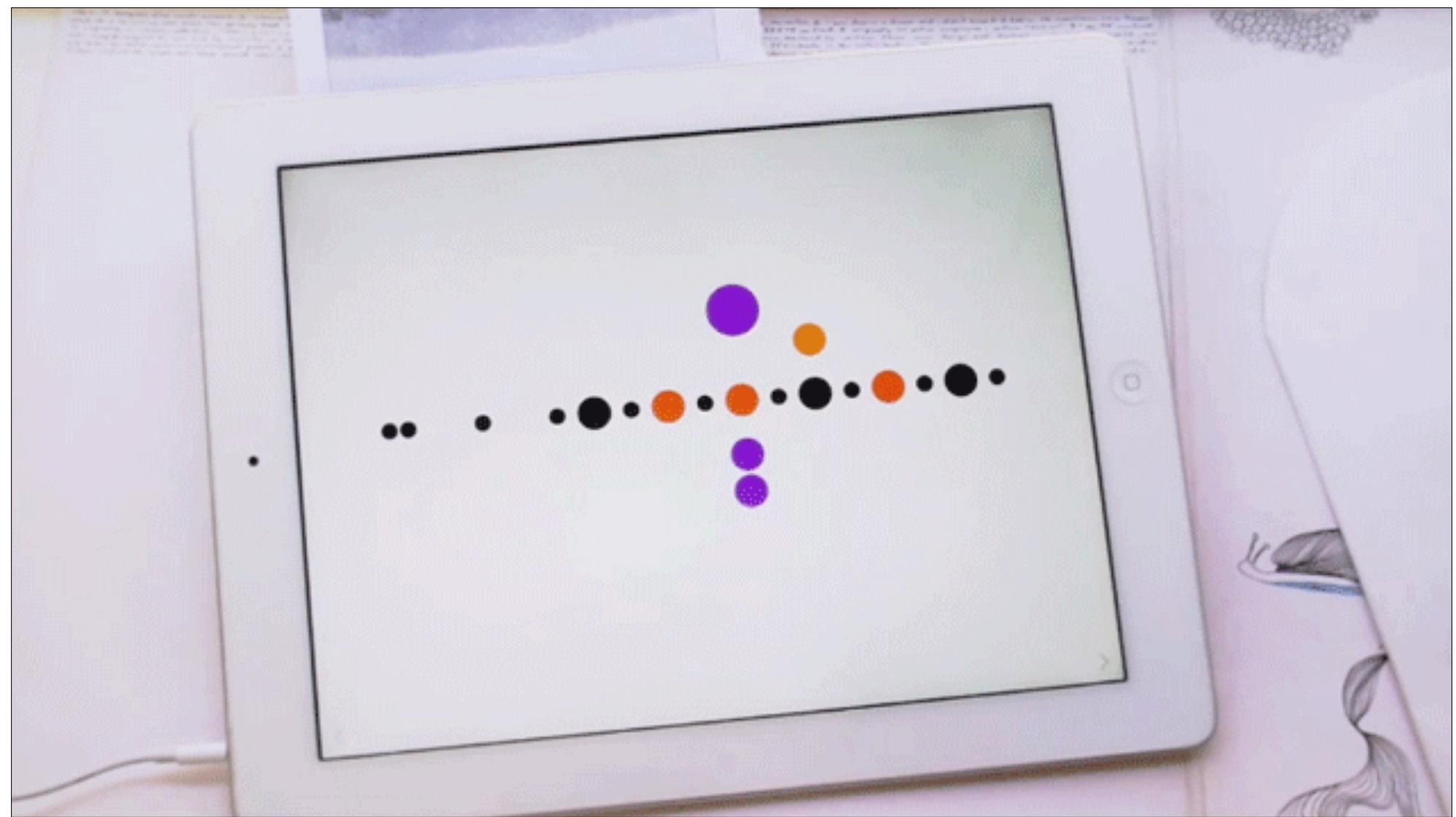
System Disk



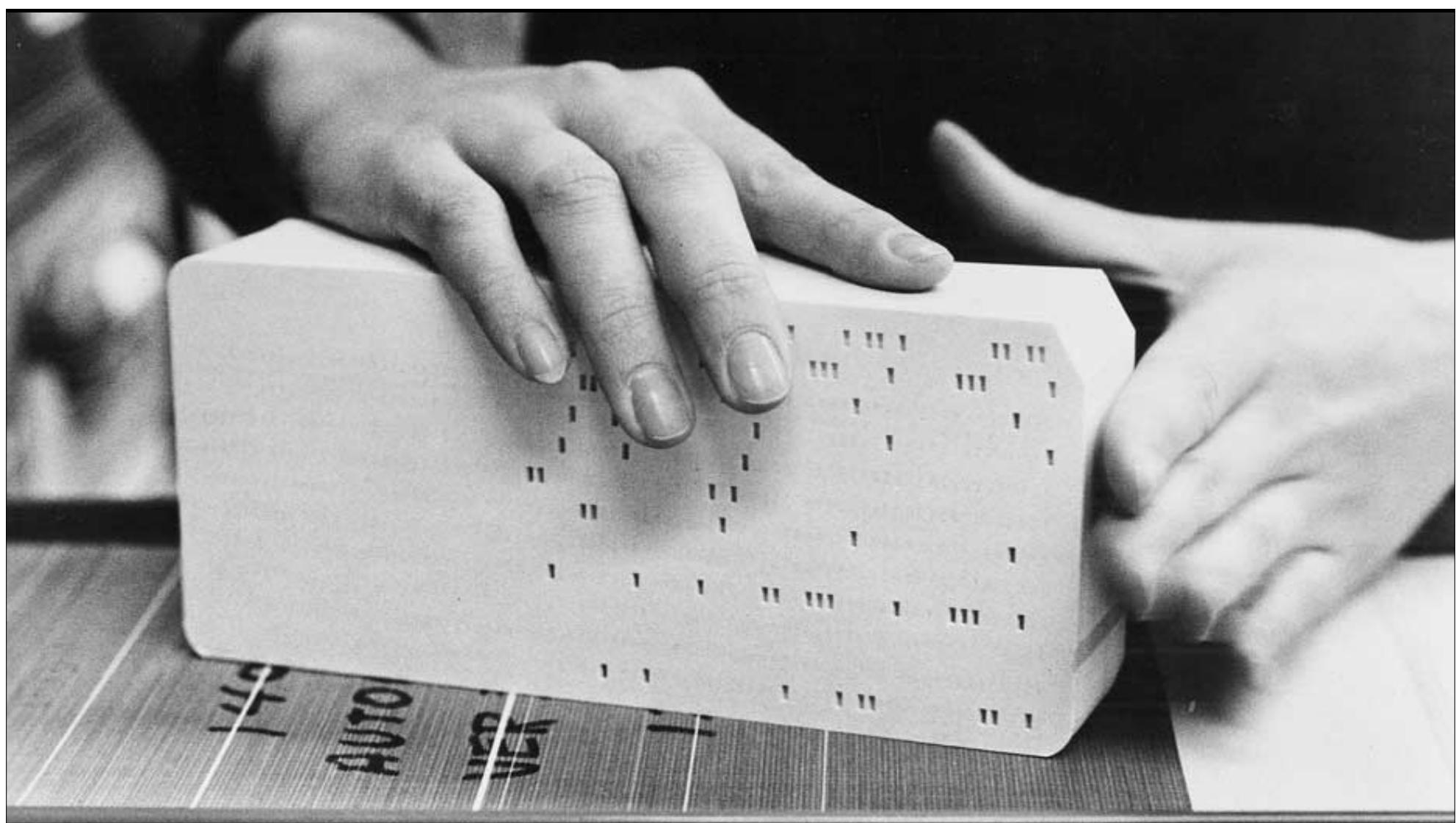
Guided Tour



Trash







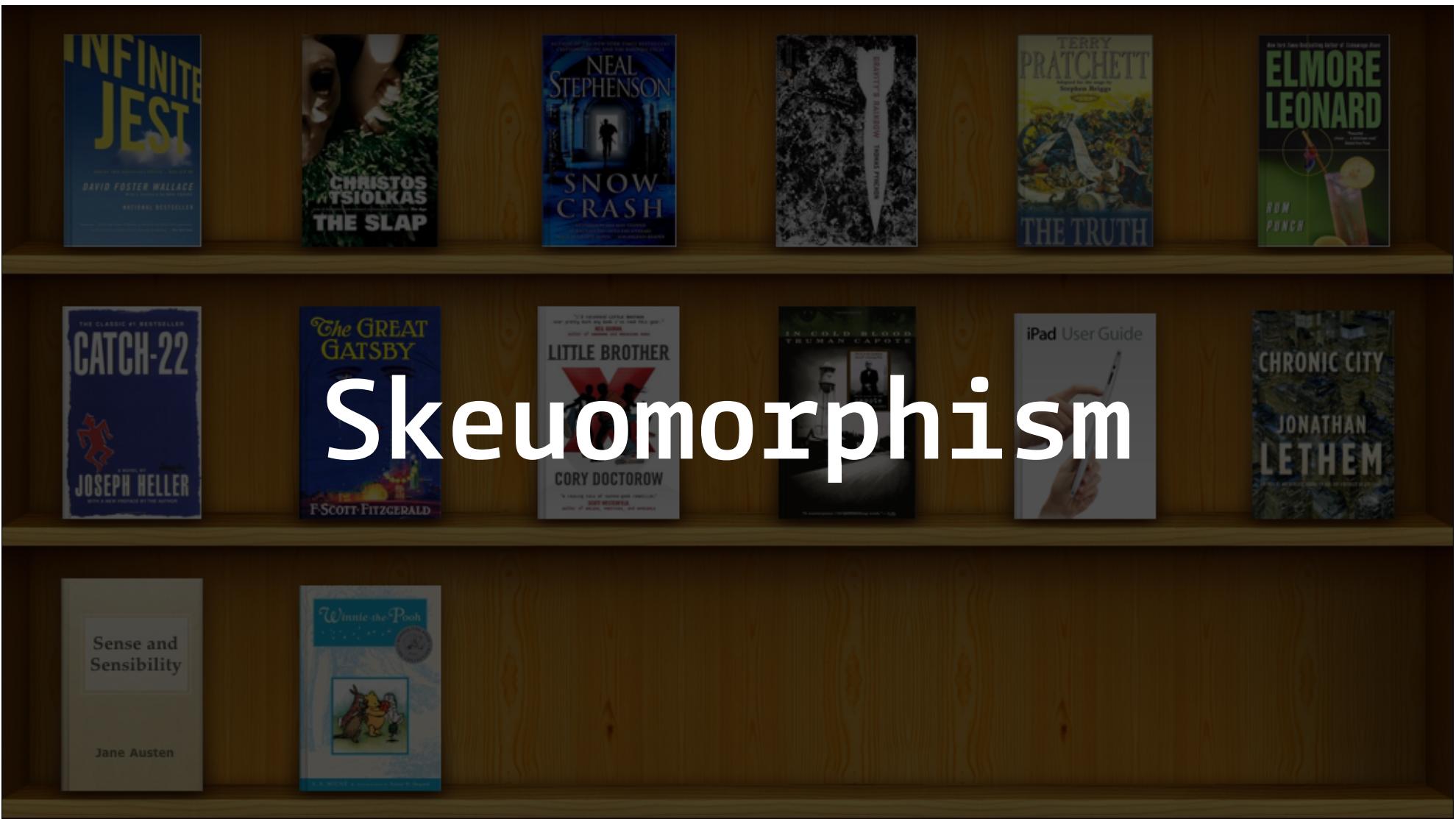


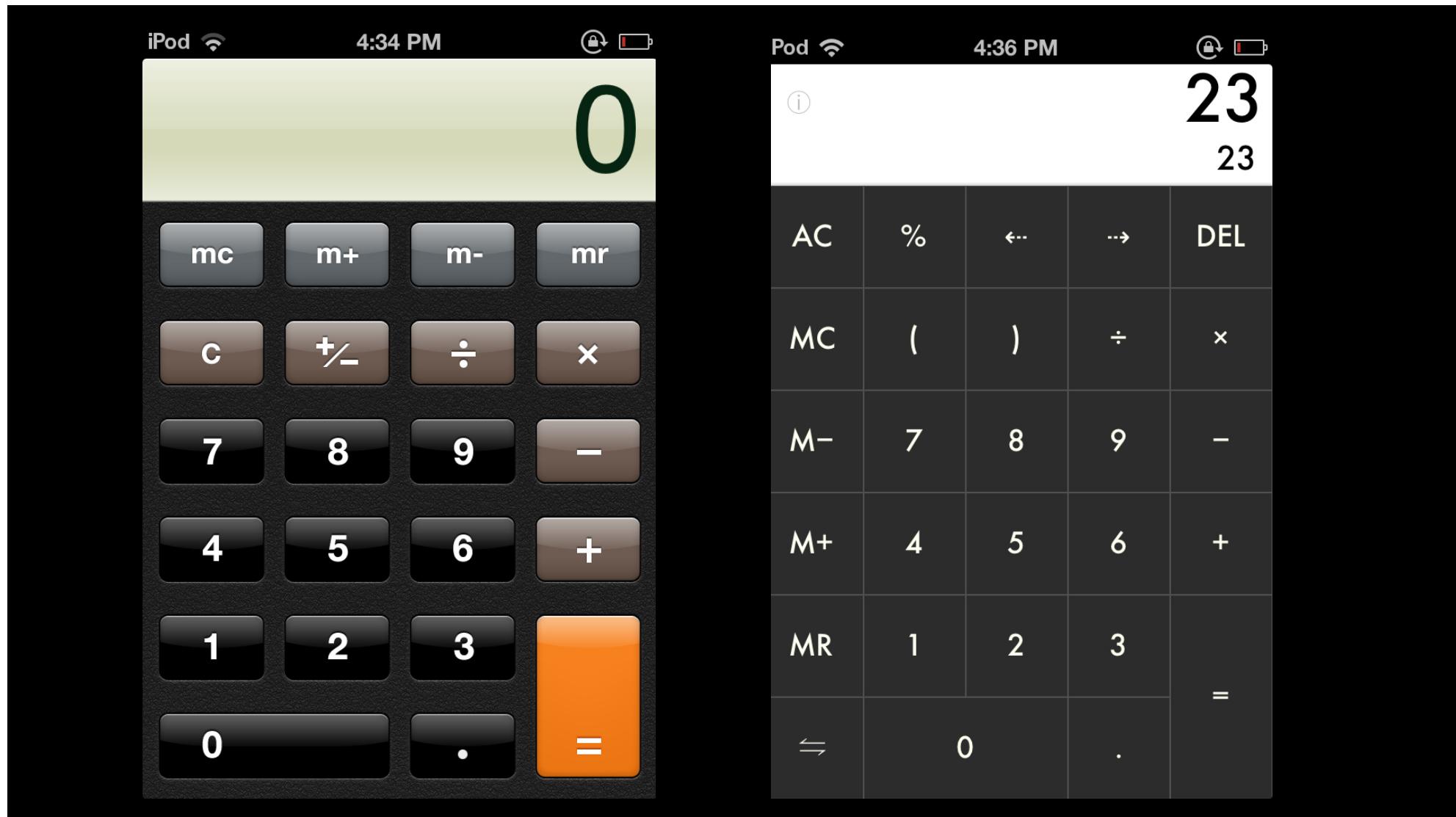


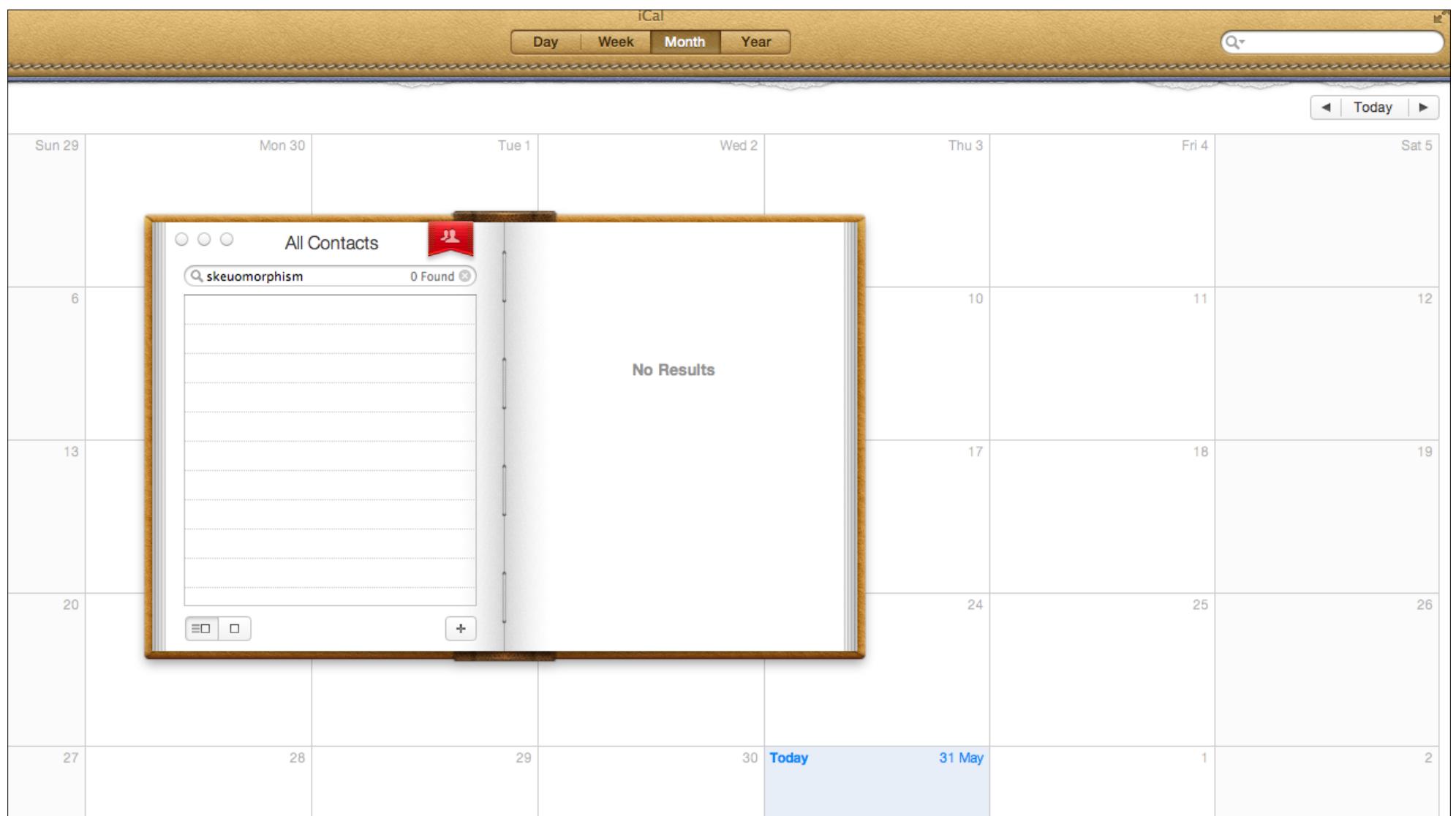
Expectations



Skeuomorphism









◀ | Today | ▶

Thu 3

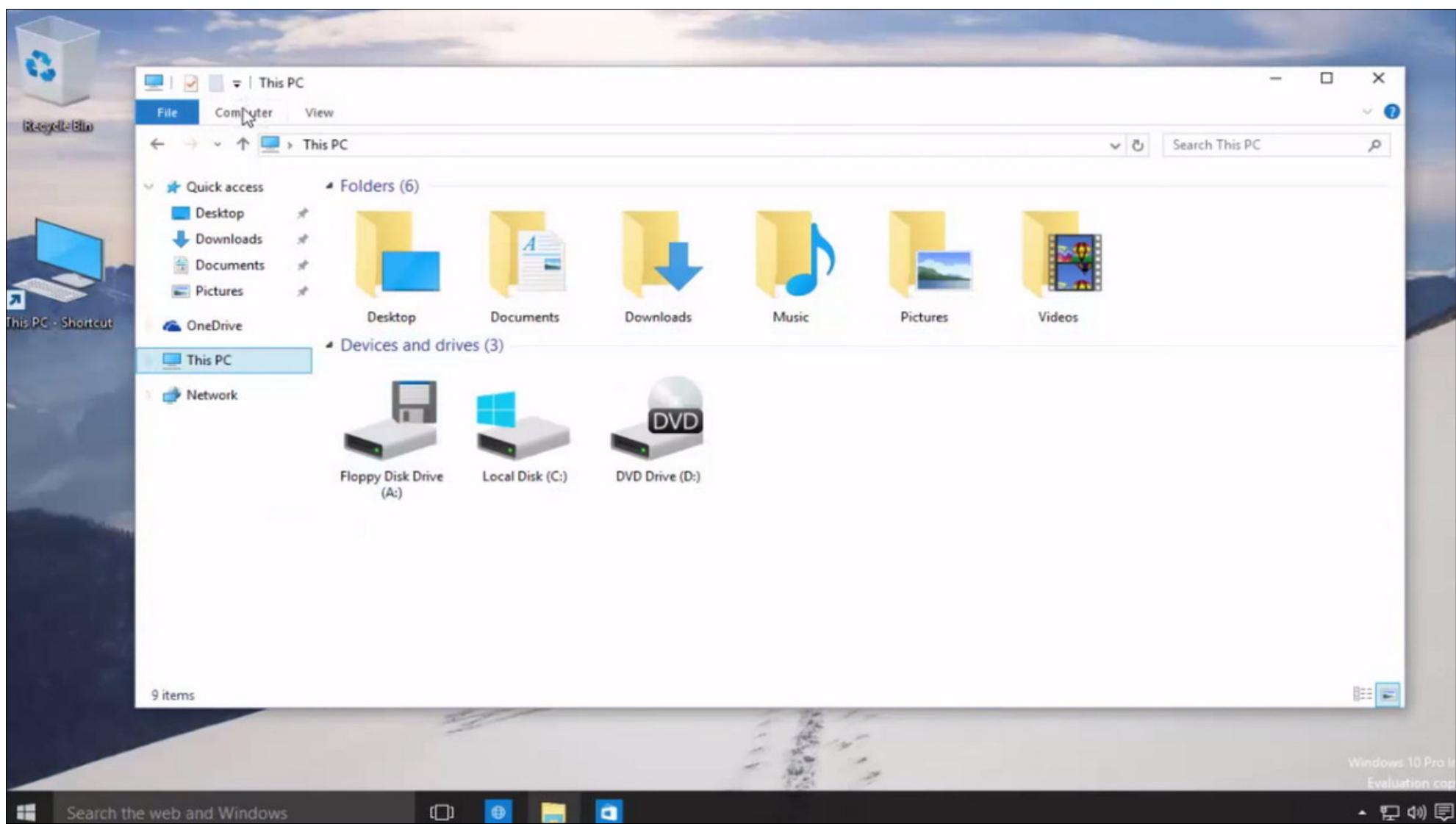
Fri 4

Sat 5

10

11

12



Designing for Interaction

Screens
vs
Space

Netflix

www.netflix.com/browse

NETFLIX Browse DVD

Search Michelle

My List

CHEF'S TABLE DAREDEVIL BLOODLINE UNBREAKABLE KIMMY SCHMIDT MARCO POLO

Marvel's Daredevil

★★★★★ 2015 TV-MA 1 Season

Blinded as a young boy, Matt Murdock fights injustice by day as a lawyer and by night as the Super Hero Daredevil in Hell's Kitchen, New York City.

Starring: Charlie Cox, Deborah Ann Woll, Vincent D'Onofrio
Genres: TV Shows, Comic Book & Superhero TV, Crime TV Shows
This show is: Exciting, Gritty, Dark

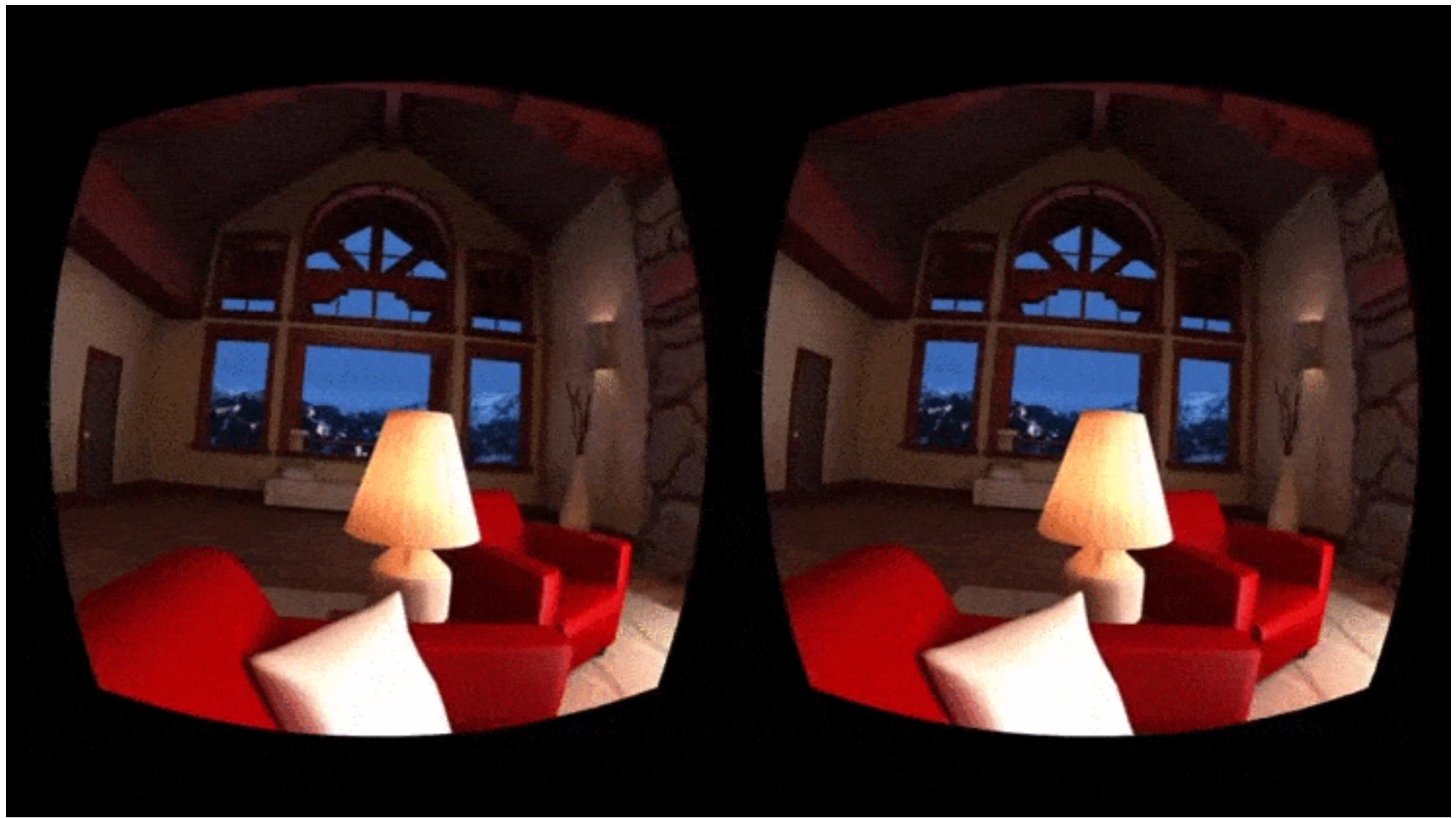
"Law & Order: Criminal Intent" star Vincent D'Onofrio plays Daredevil's nemesis Wilson Fisk, a.k.a. Kingpin.

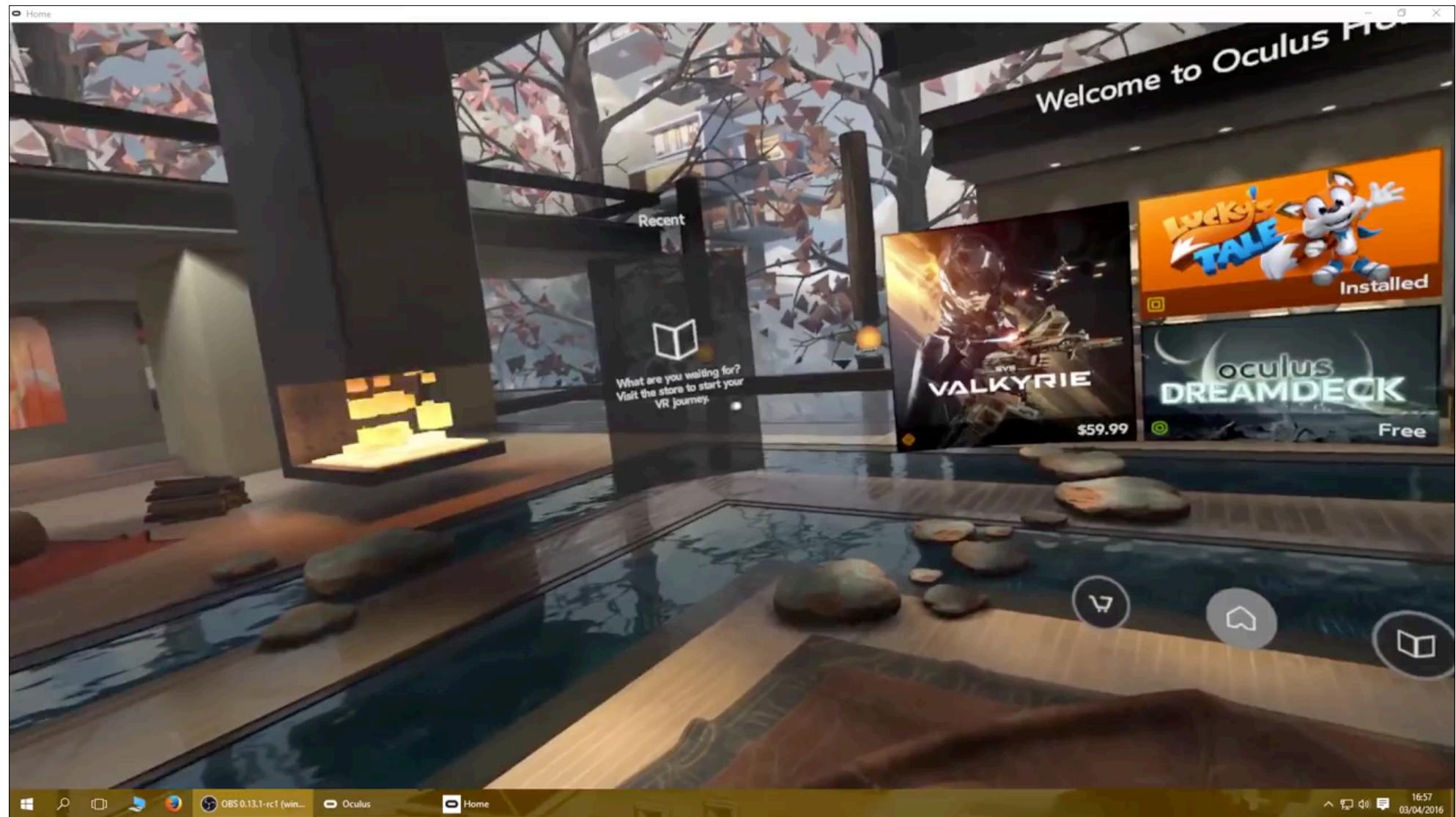
MY LIST

OVERVIEW EPISODES MORE LIKE THIS DETAILS

X







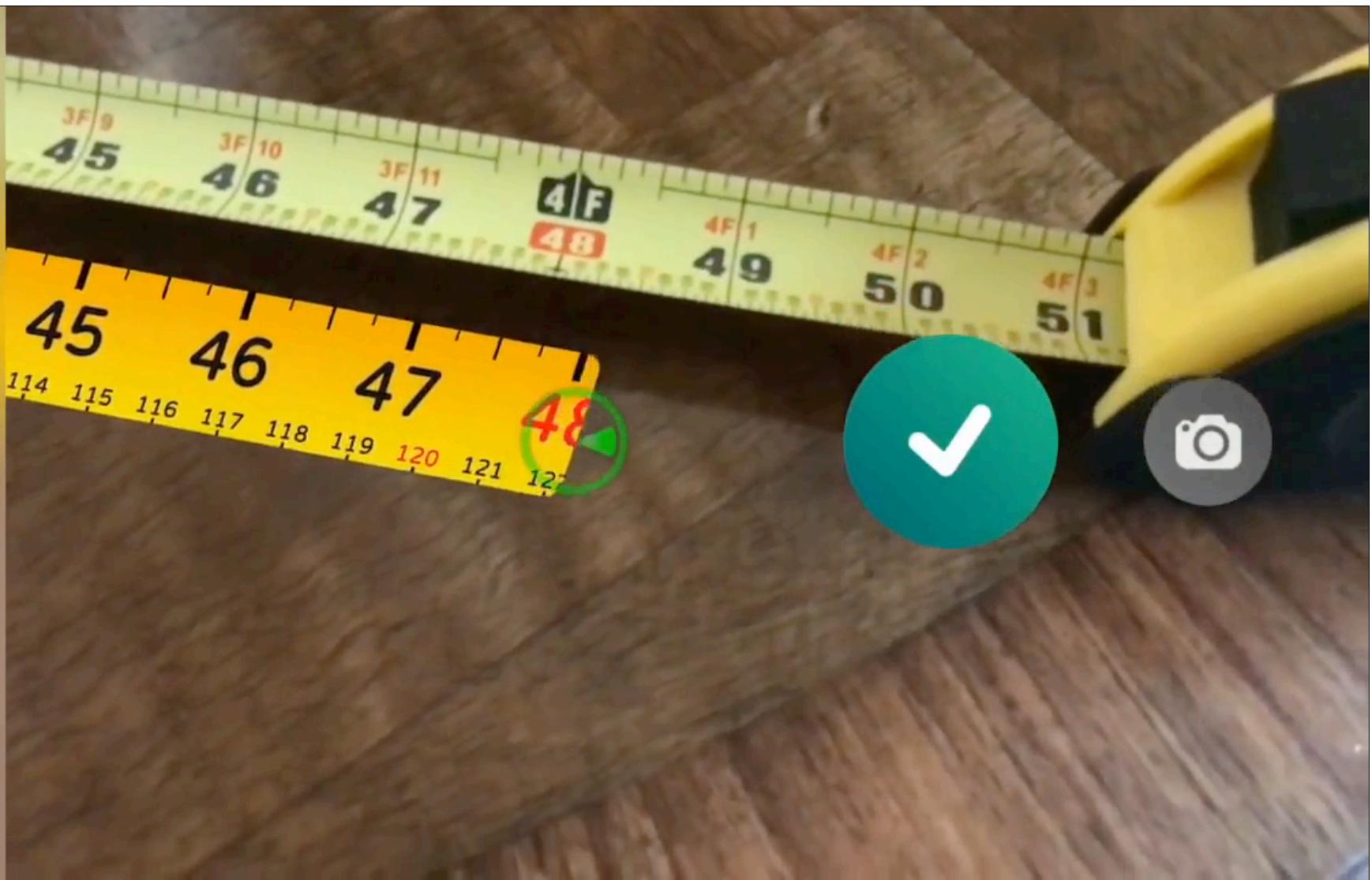
Screens
vs
Space

48.0 in

4.0ft

122 cm

METRIC



Manipulation

Exploration



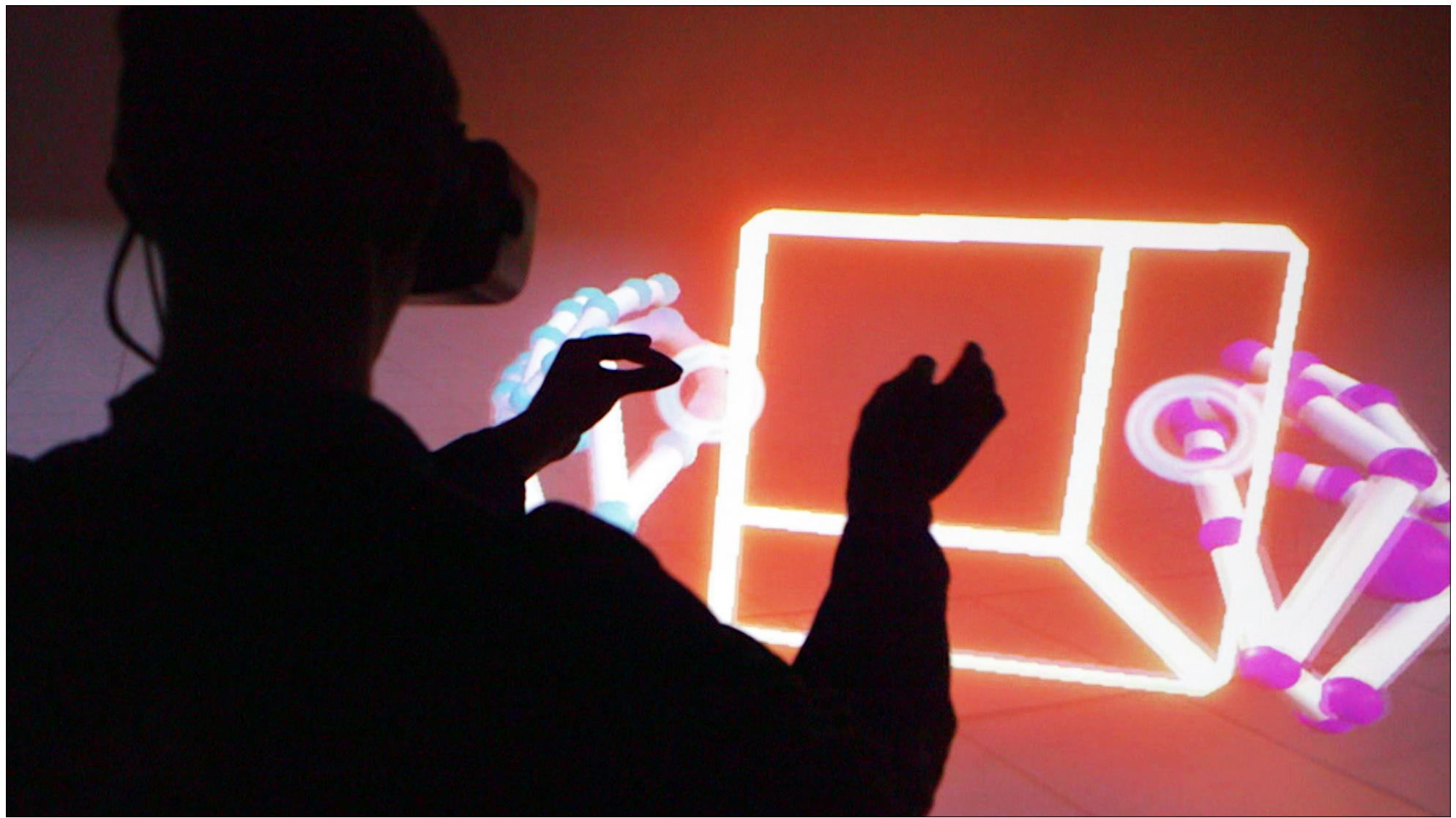
Manipulation

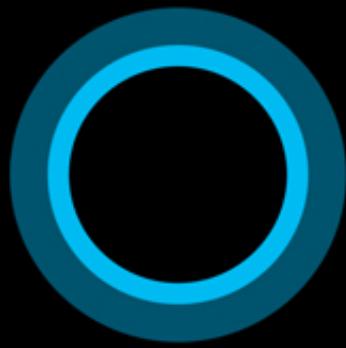












Hi, I'm Cortana.

Manipulation

Exploration

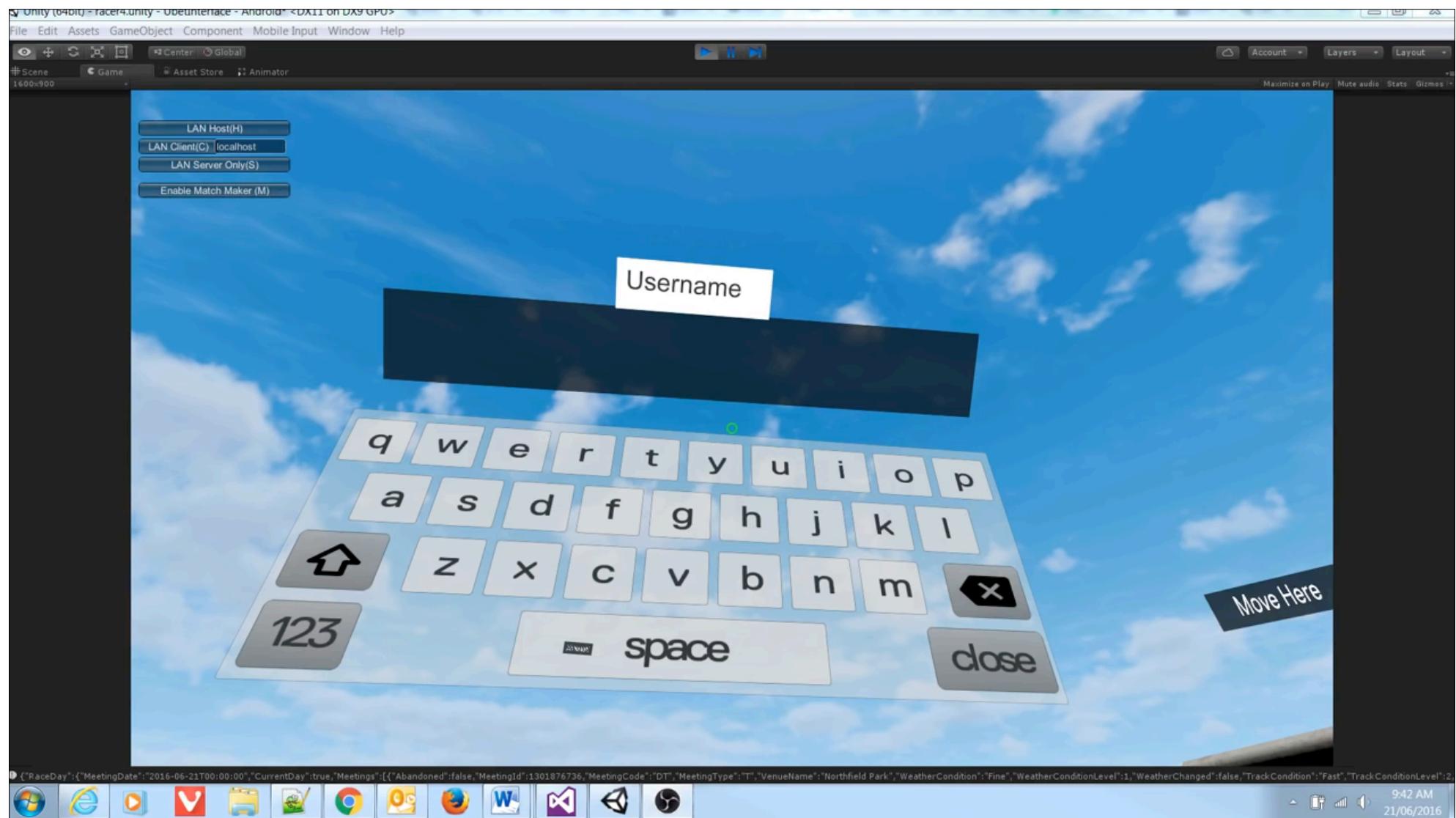


Exploration

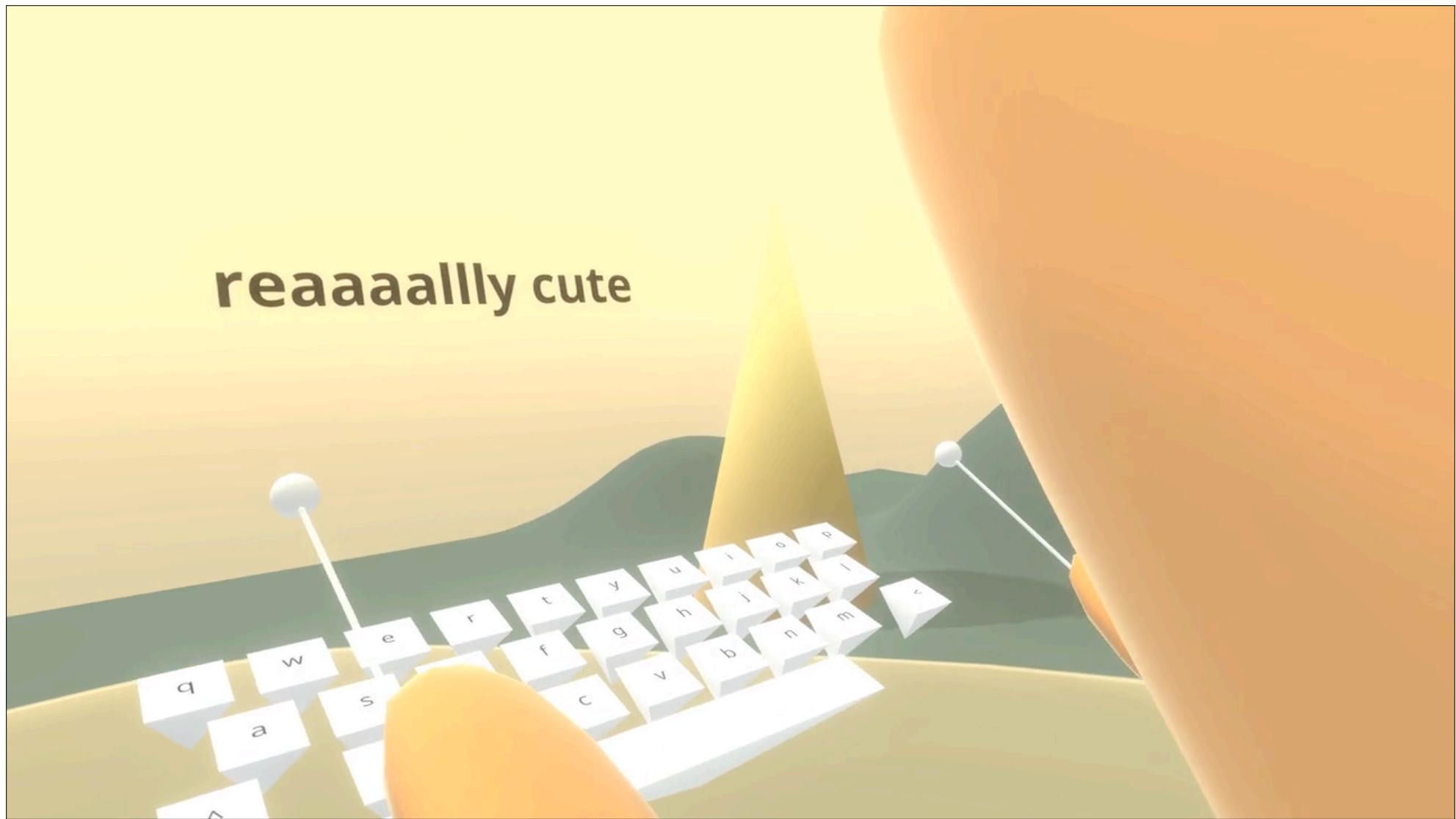




Designing for Interaction



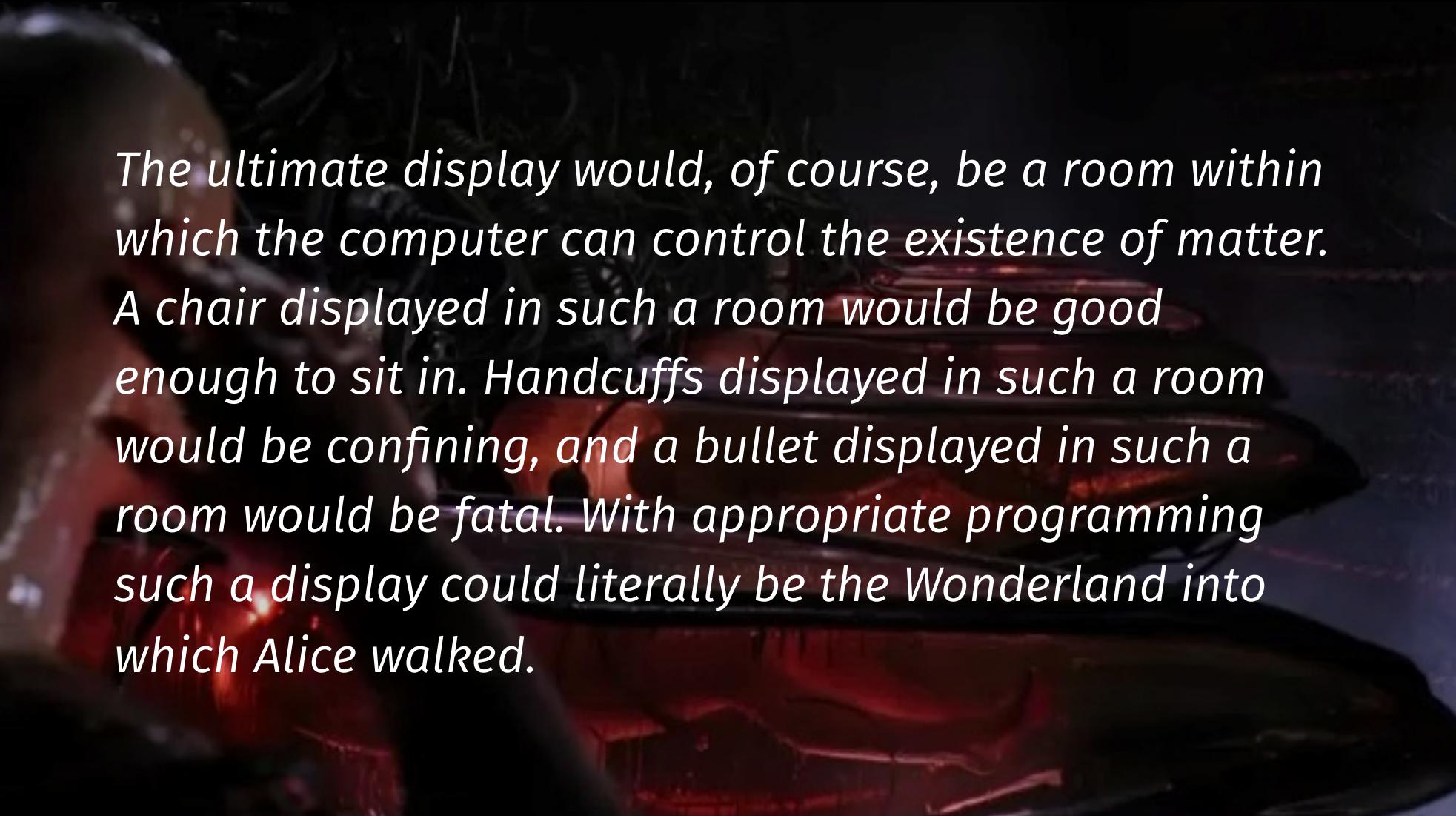
reaaaallly cute



Virtual Reality (LaValle) - Chapter 1

<http://vr.cs.uiuc.edu/>

Take a look at the Github



The ultimate display would, of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal. With appropriate programming such a display could literally be the Wonderland into which Alice walked.



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