

TECH 1711 - Mixed Reality Studio



New Class
(Be Ready for Changes)

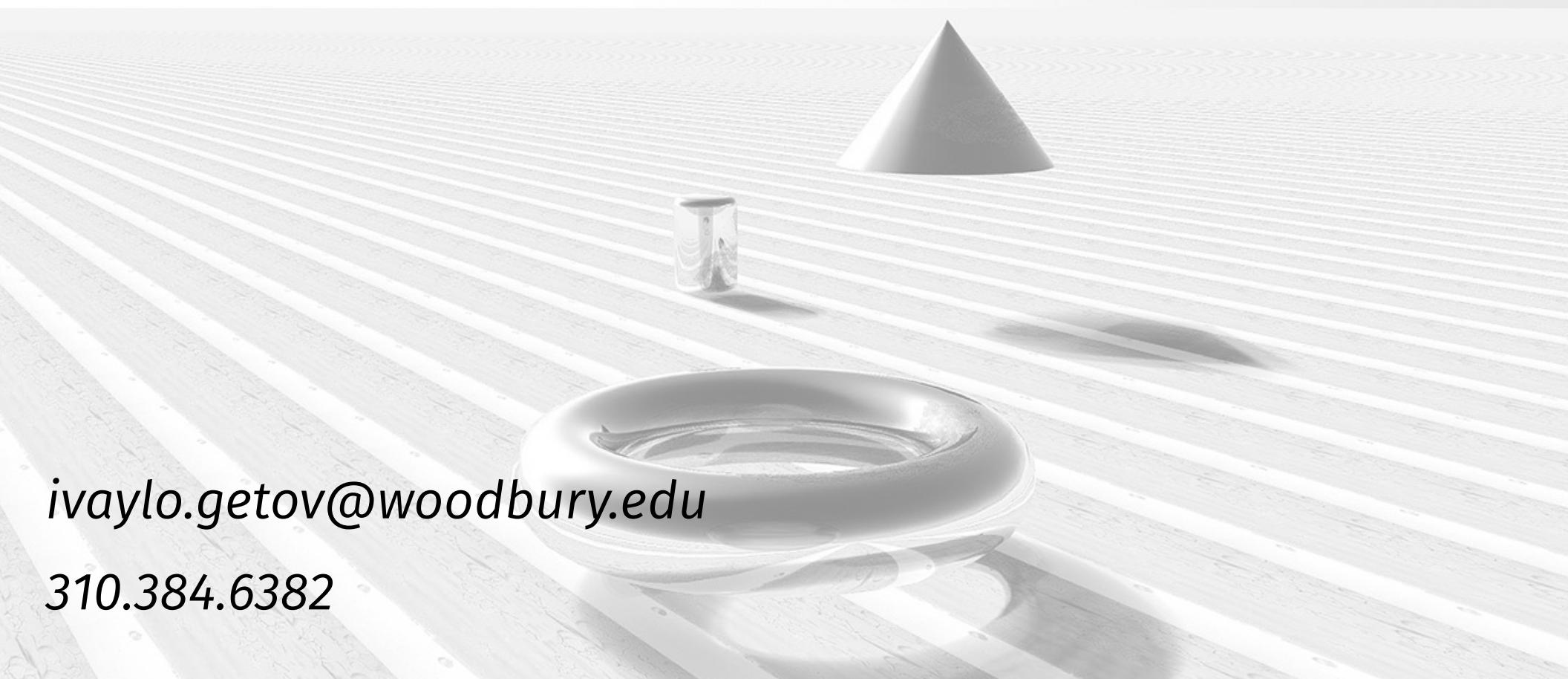
Most Up-to-date Syllabus:

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

Contact Me

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310.384.6382

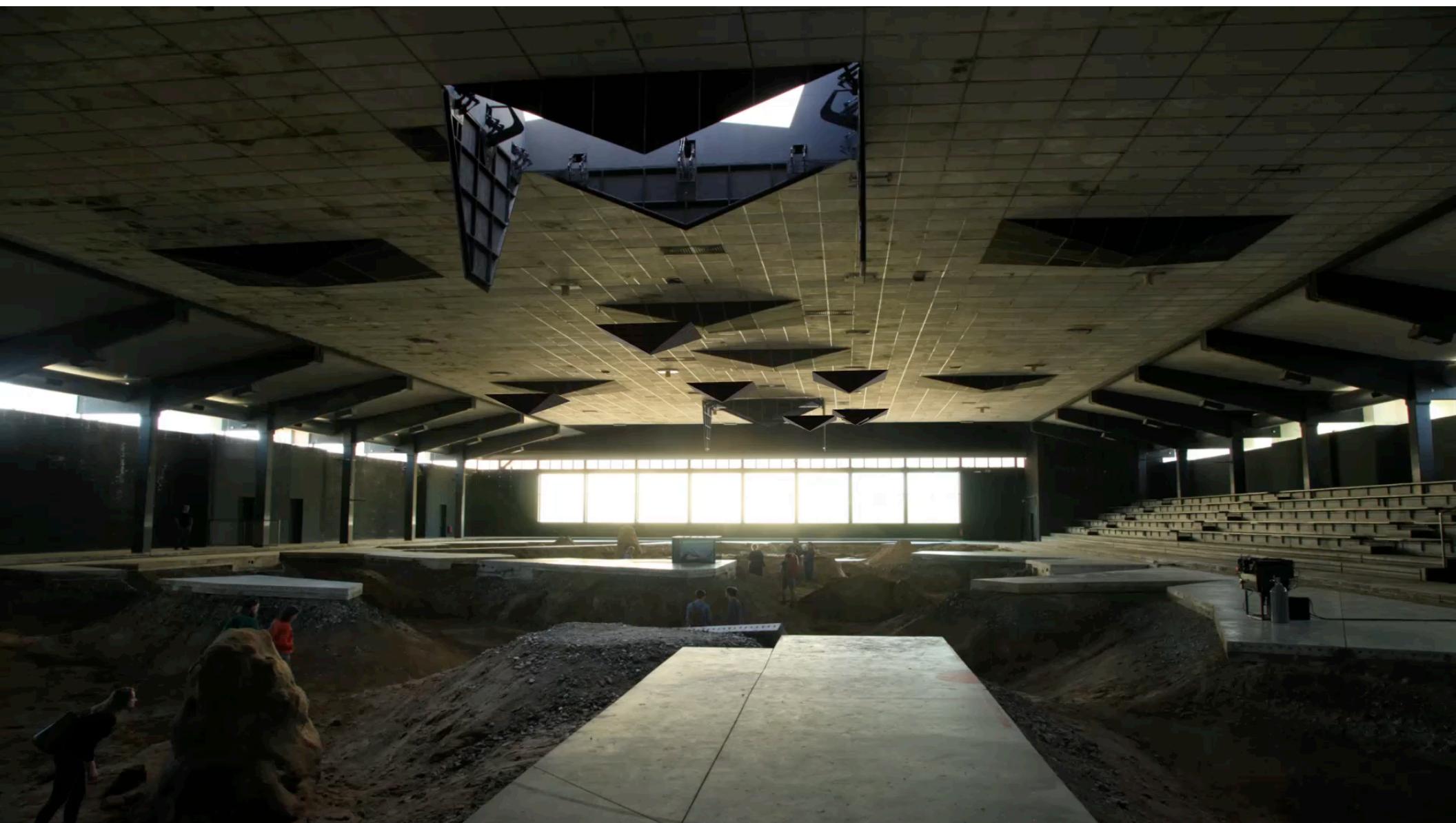


About me

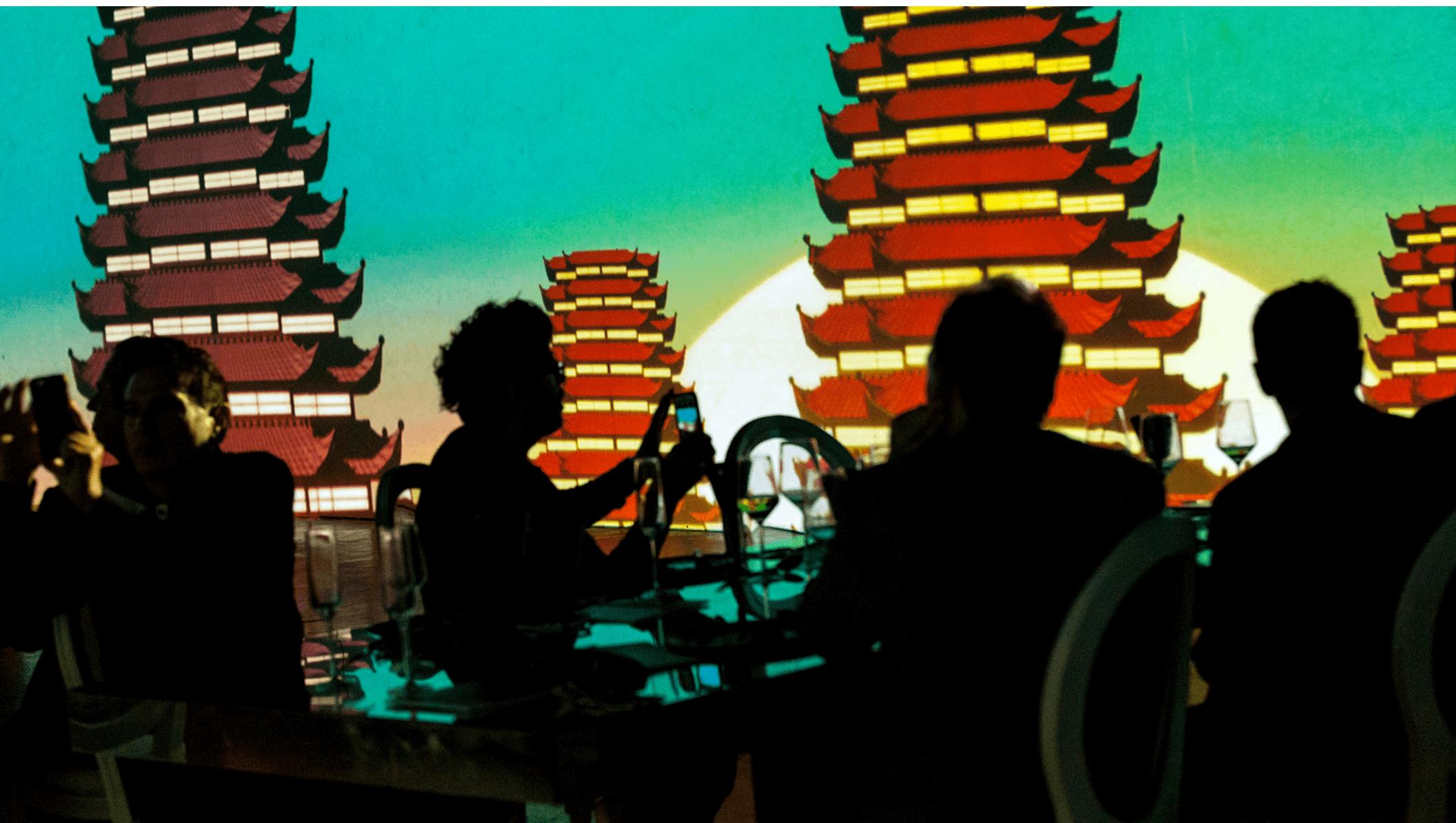


Luxloop









16:59:37

GPU usage: 38%

56
fps

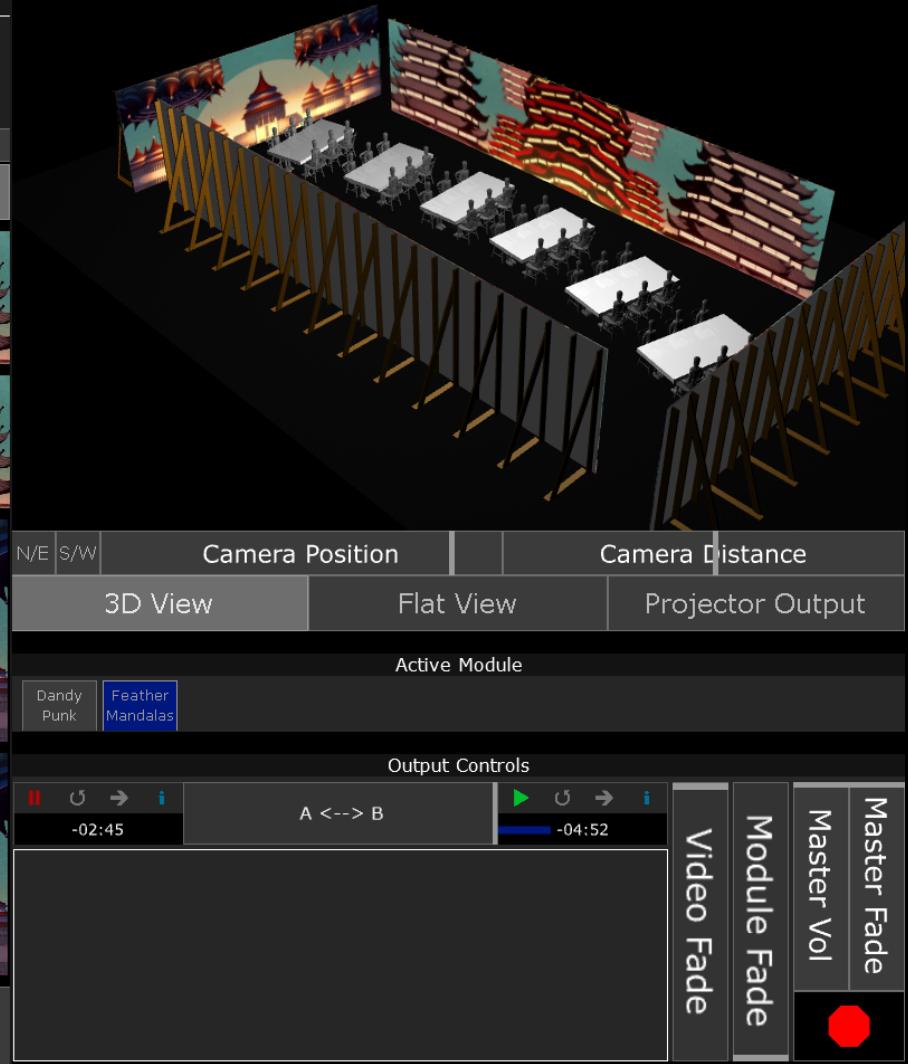
16

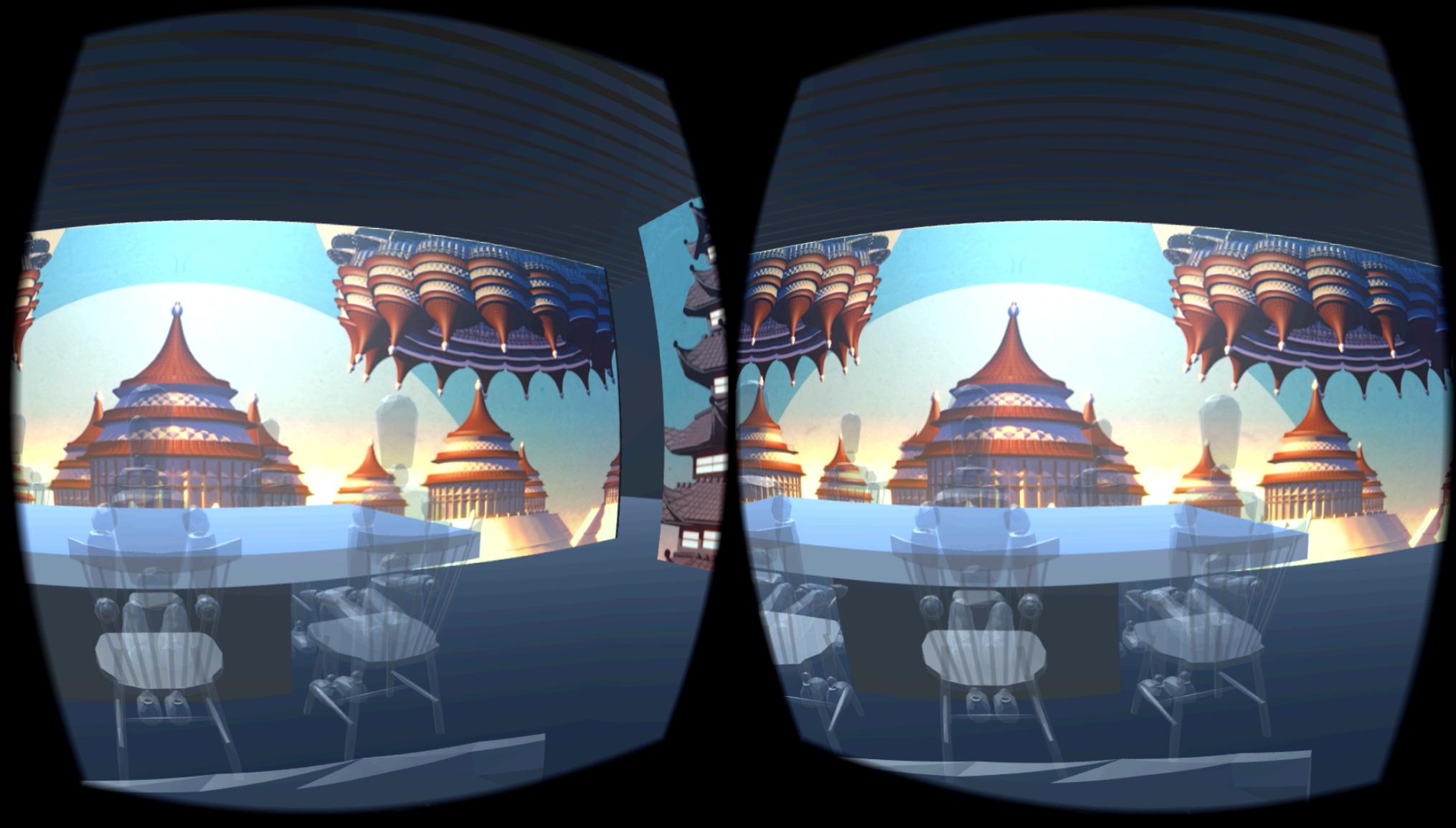
Video Cues	Dandy Punk	Feather Mandalas
------------	------------	------------------

East: E:/EastWallVideos/42_TEMPULKALIEDSCOPELOOP_wide.mp4 loop 0
West: E:/EastWallVideos/42_TEMPULKALIEDSCOPELOOP_wide.mp4 0
North: F:/NorthWallVideos/42_TEMPLETE_LOOP_short.mp4 adv 0
South: F:/NorthWallVideos/42_TEMPLETE_LOOP_short.mp4 0

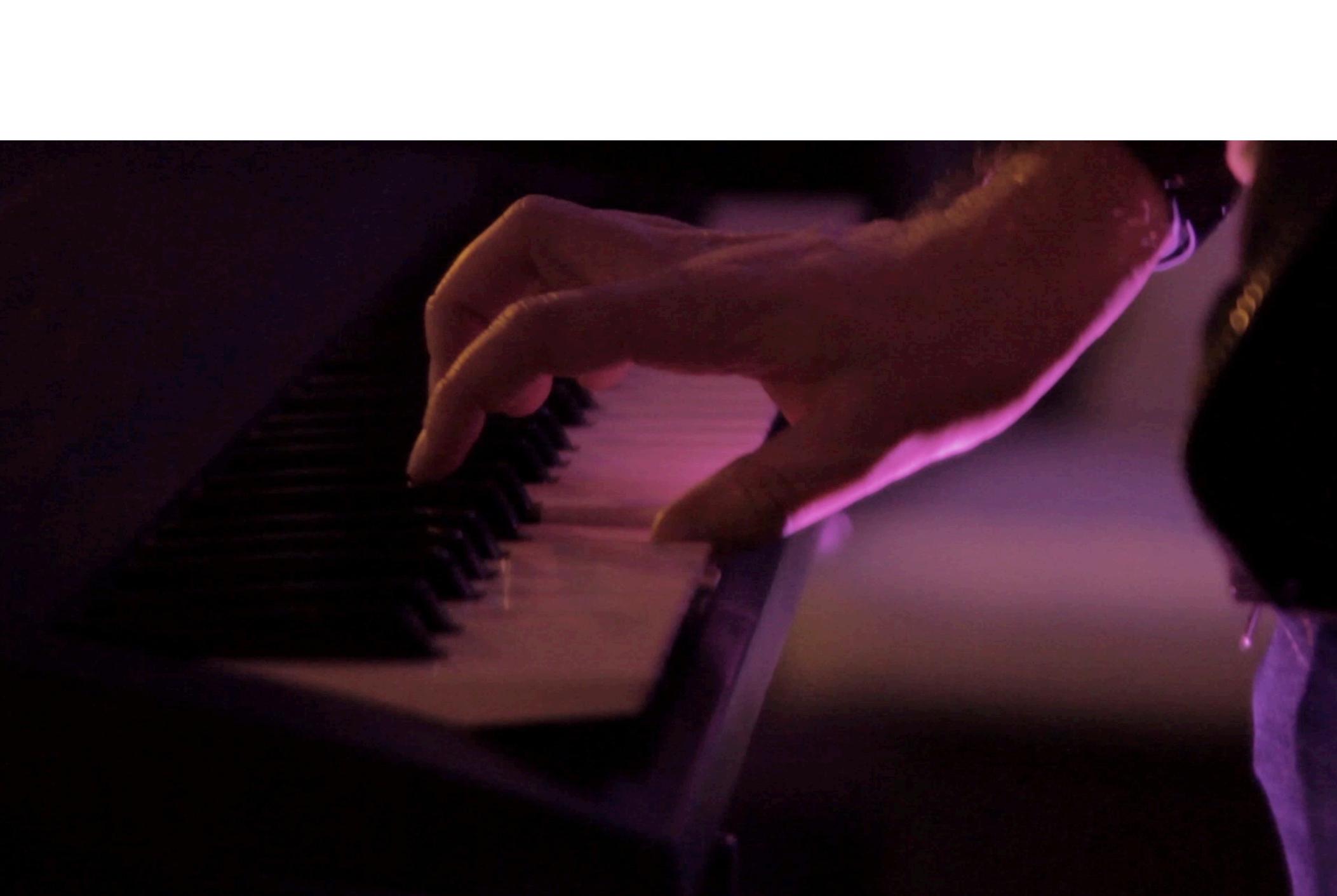
R + |

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











About YOU?

Experiential

Experimental

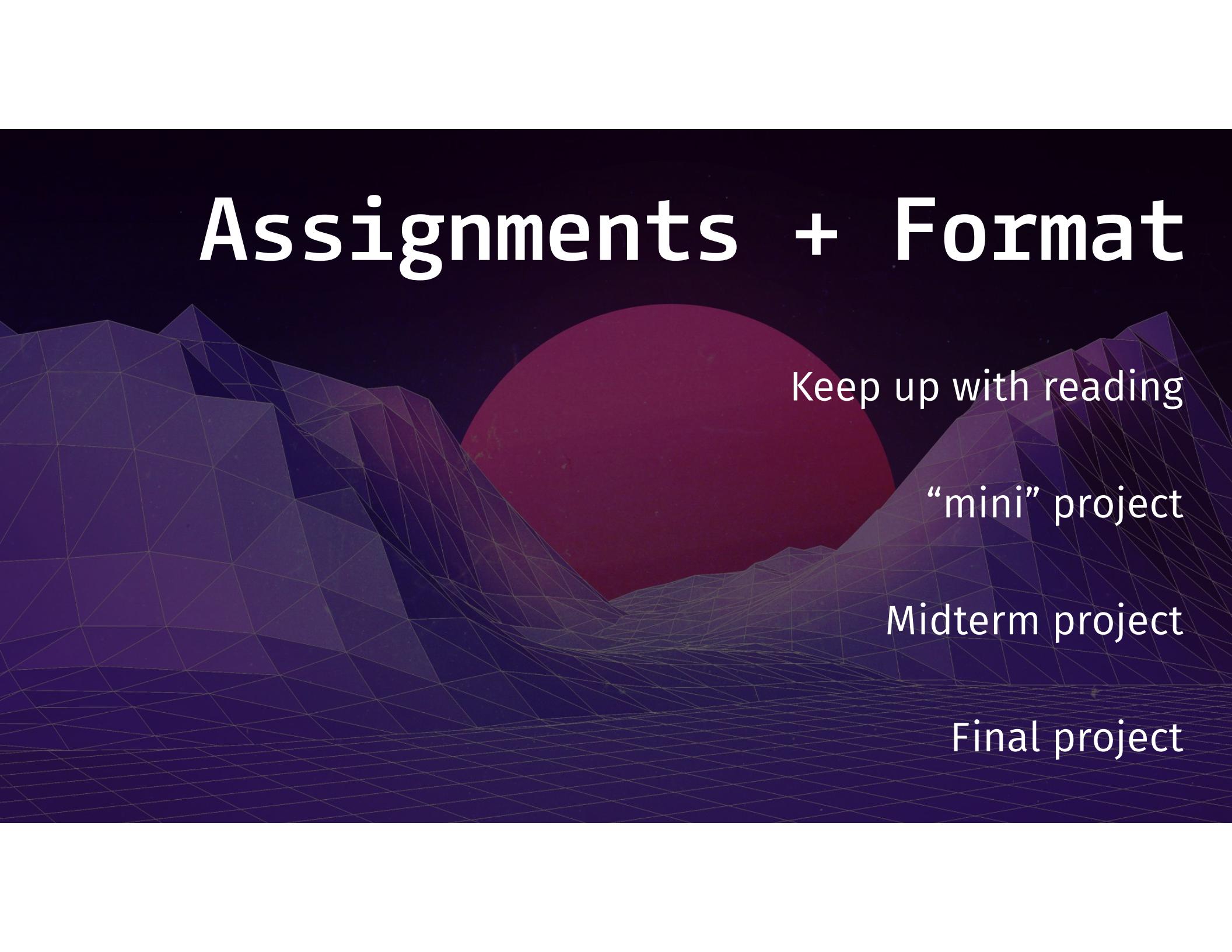
Test Lab

Expectations

Participation

Flexibility

Assignments + Format

The background features a stylized landscape with two large, dark purple mountain peaks on either side of a bright red circular sun or moon. The ground is a light purple grid.

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

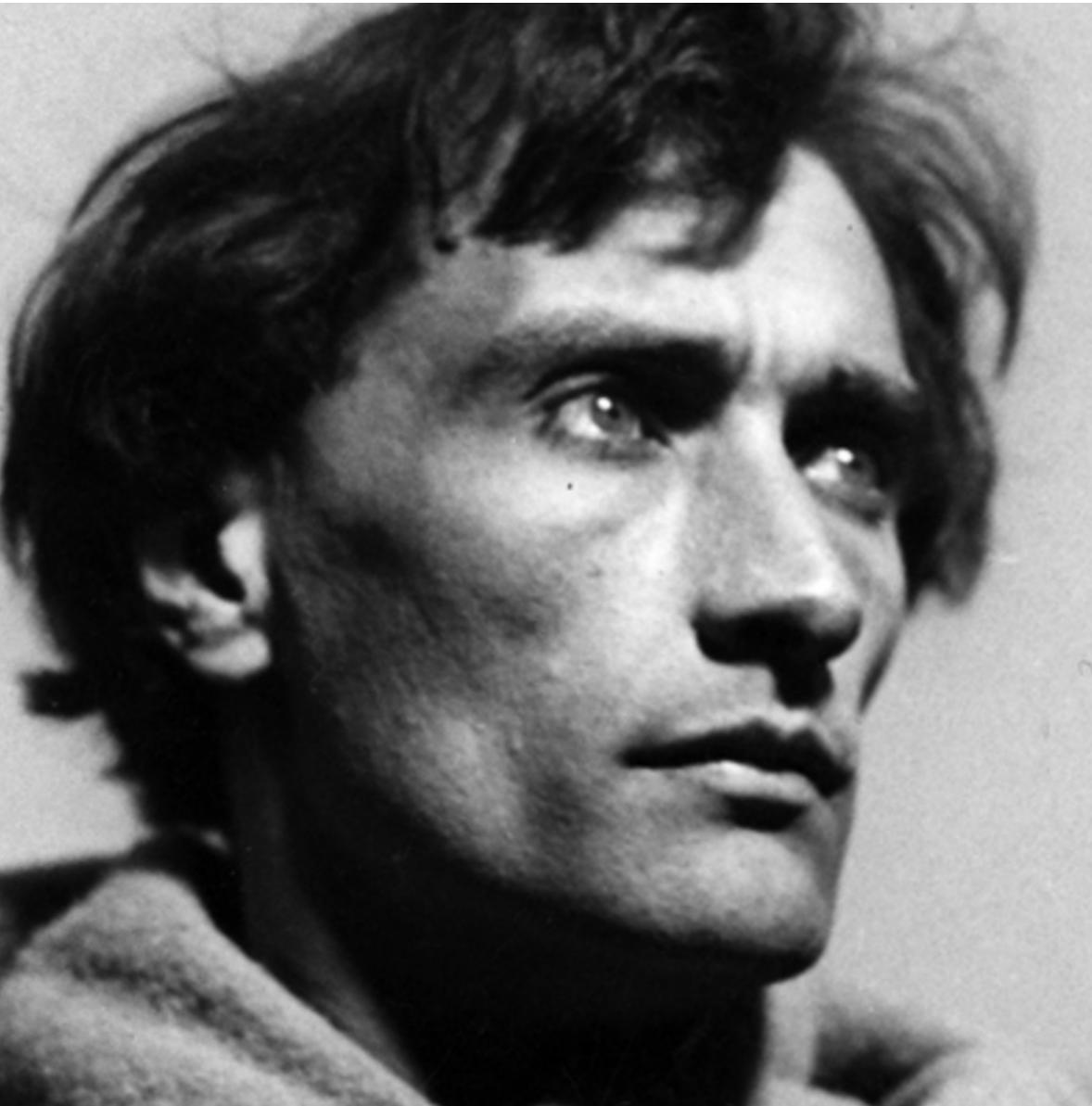


Let's Go!









*[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.

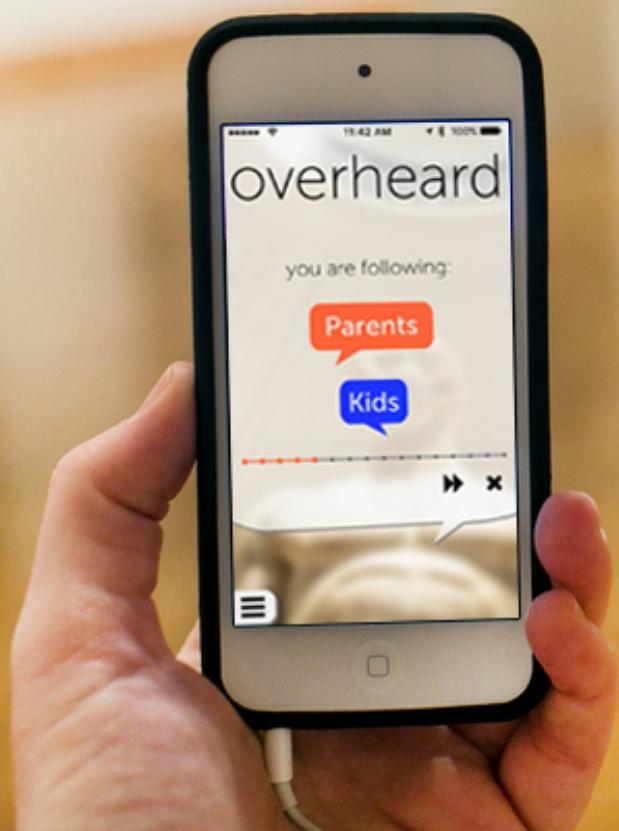


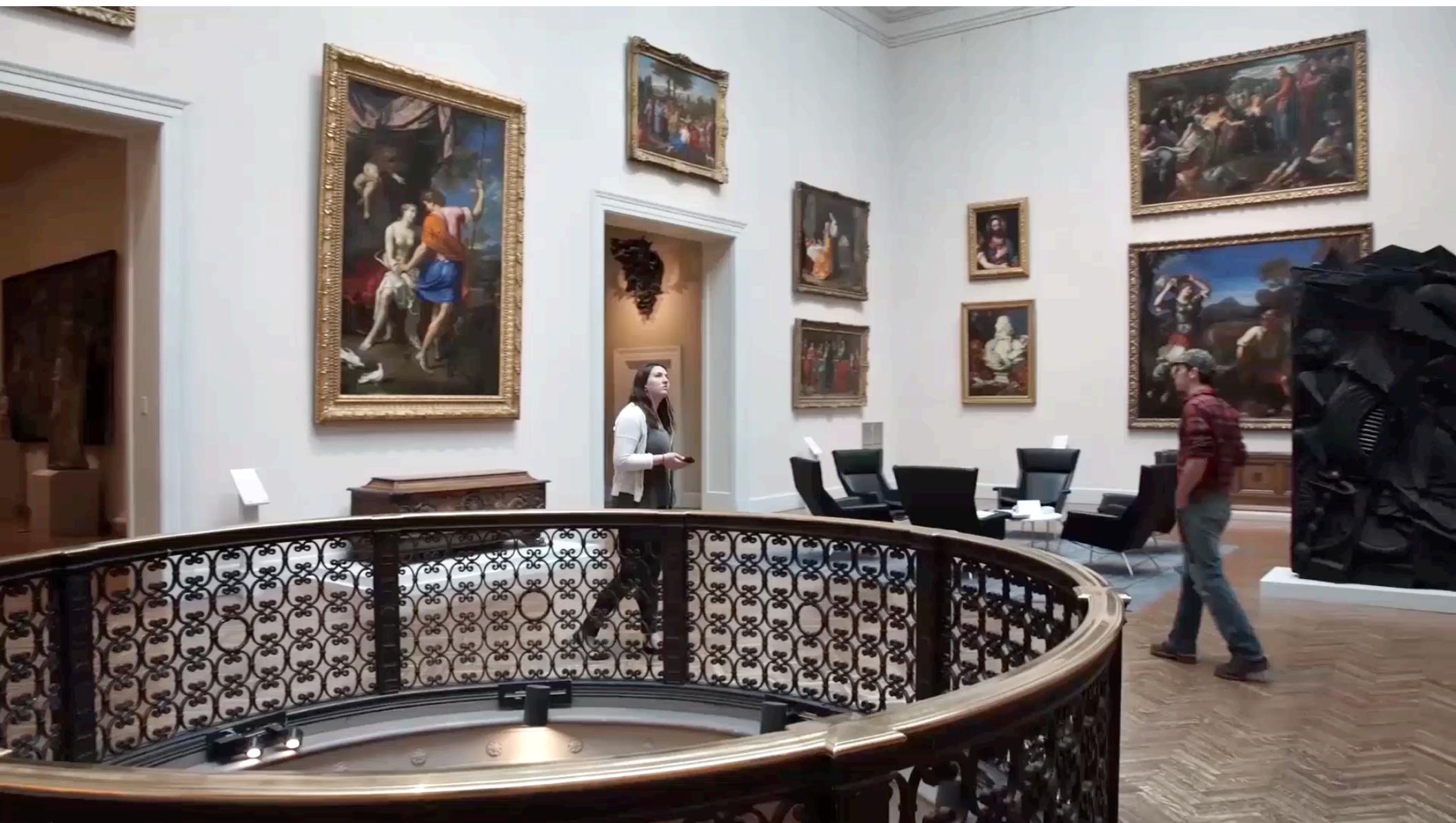
Do not attempt.











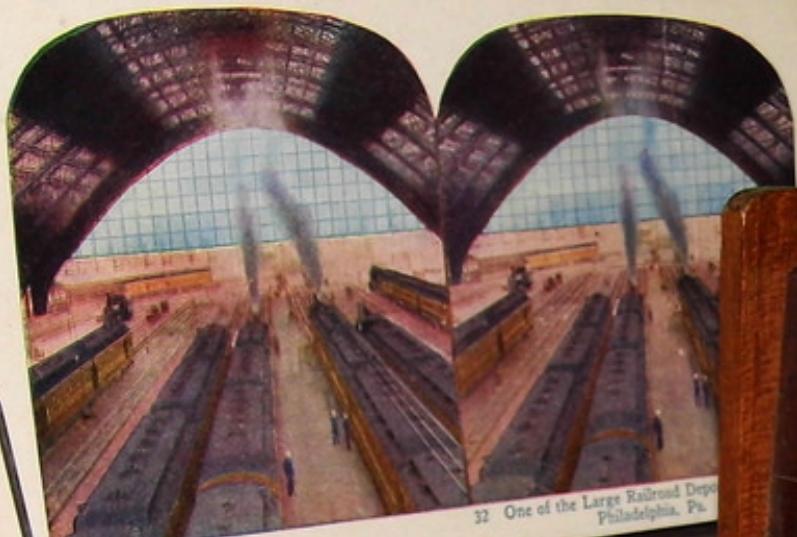


A dark auditorium with rows of red theater seats facing a brightly lit screen at the front. The screen displays a large, faint white text definition of hypnosis.

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

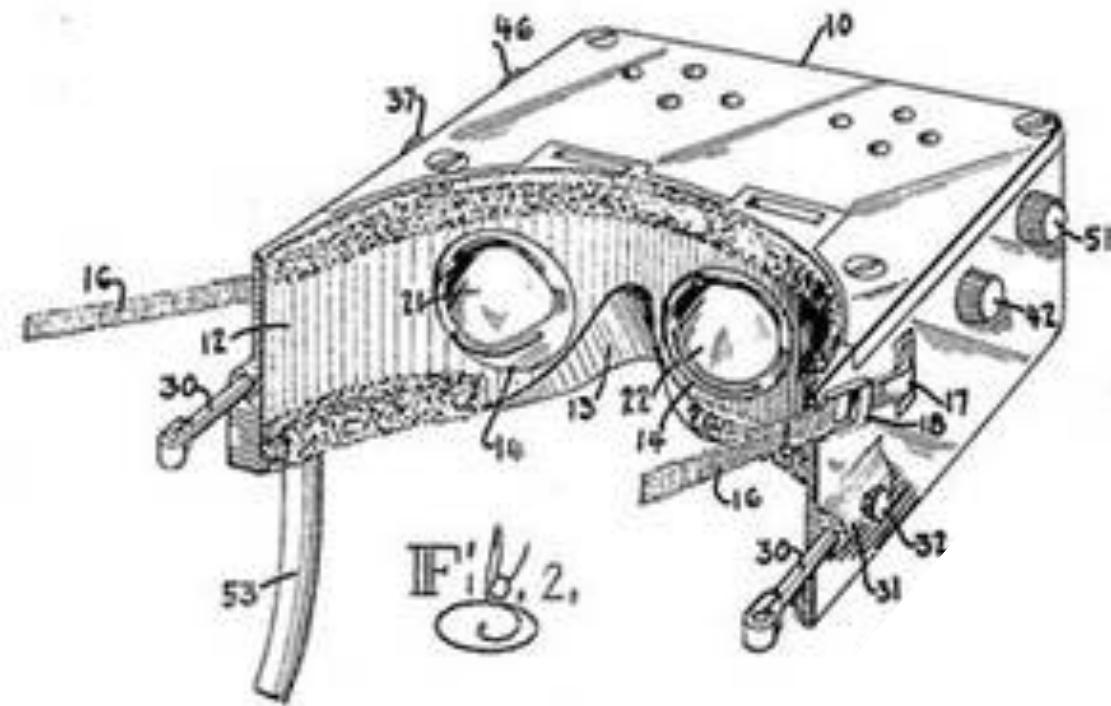


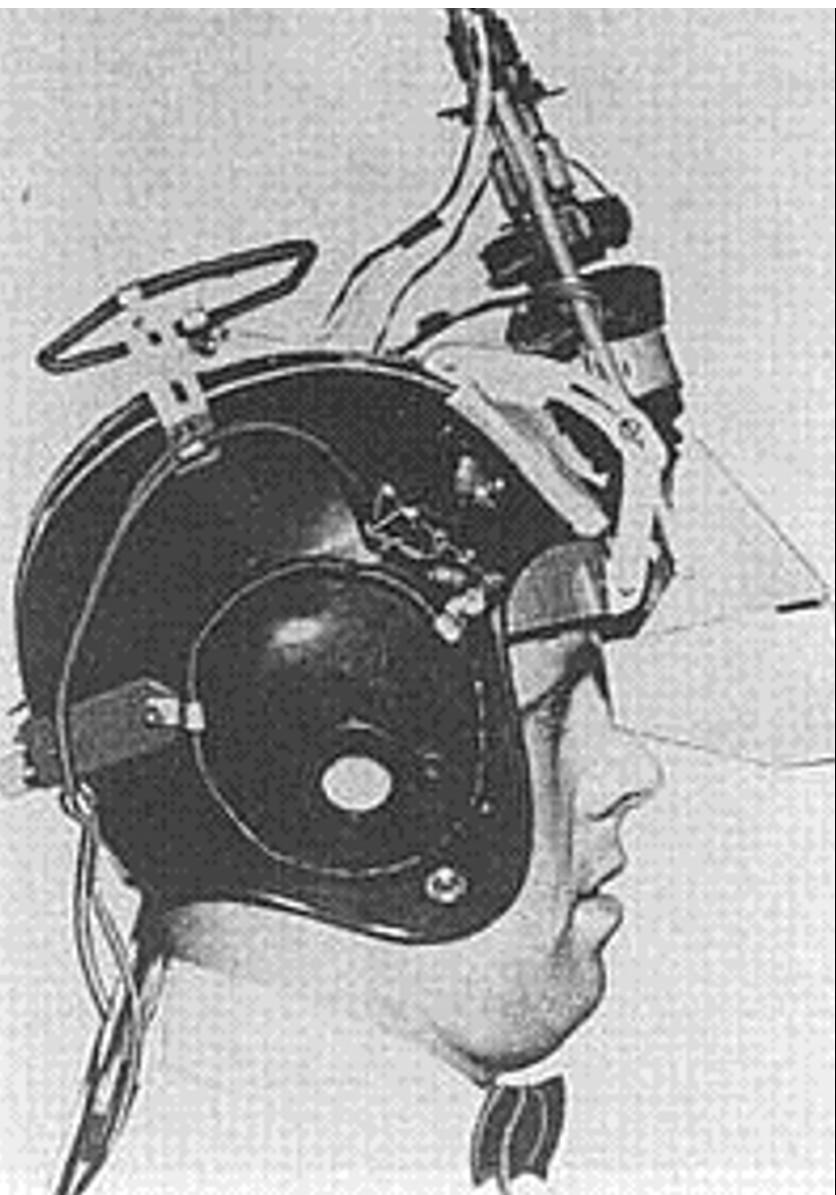
32 One of the Large Railroad Depo
Philadelphia, Pa.

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.





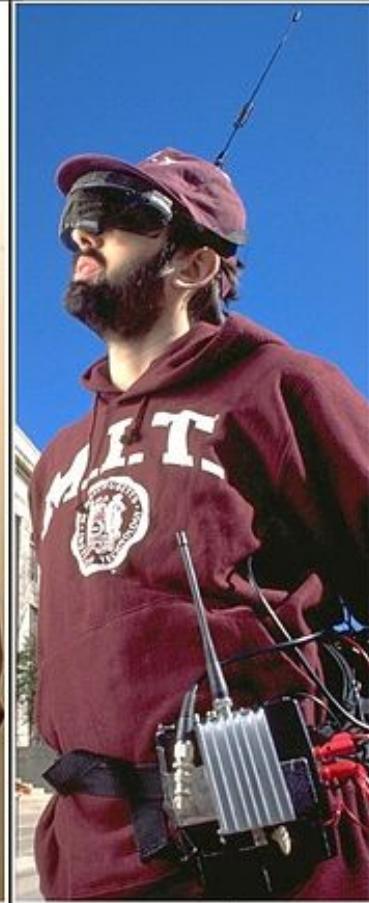
(a)
1980



(b)
Mid 1980s



(c)
Early 1990s



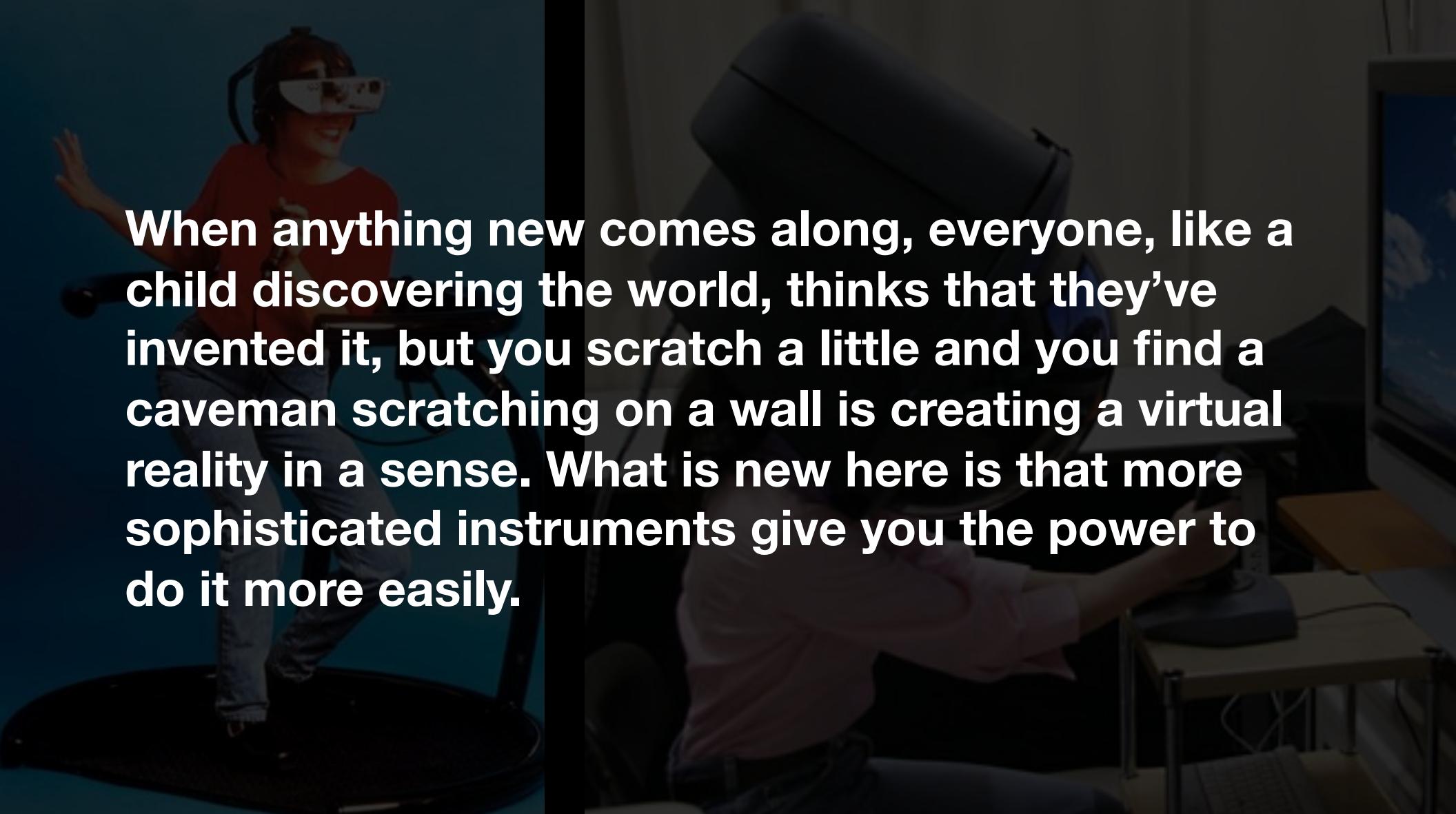
(d)
Mid 1990s



(e)
Late 1990s

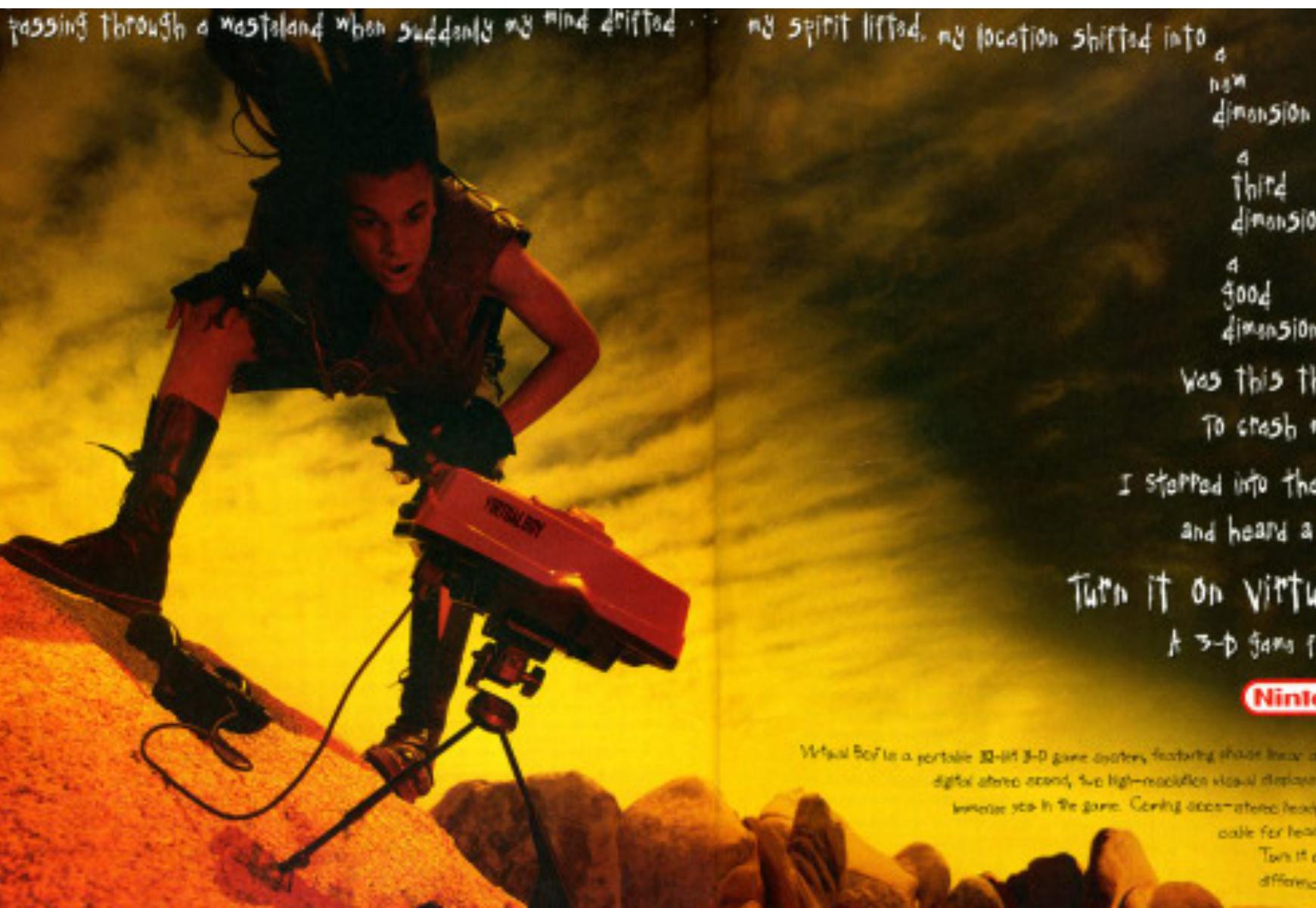






When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating a virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do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





was passing through a wasteland when suddenly my mind drifted . . .

my spirit lifted, my location shifted into

4
new
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.

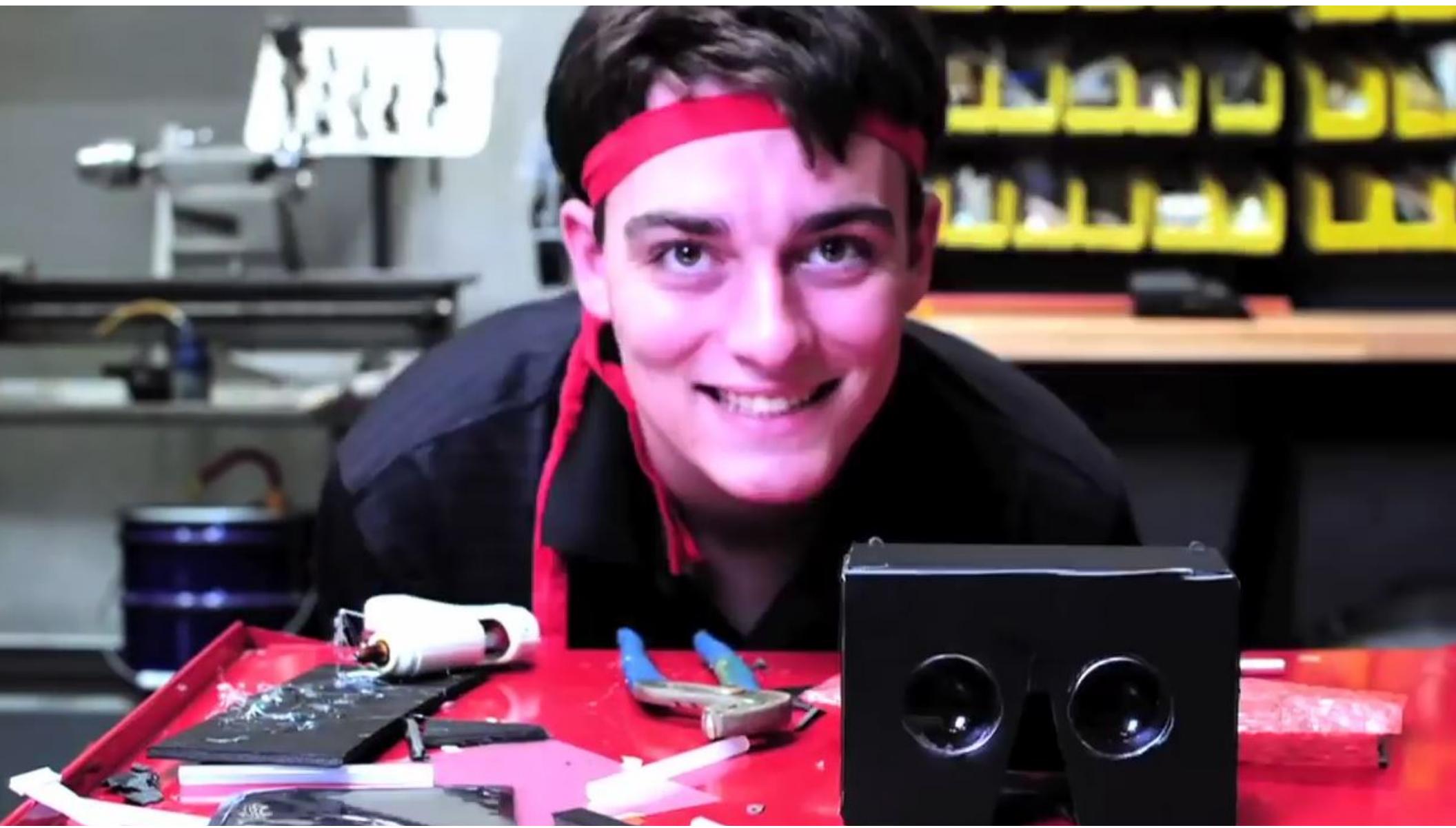
A 3-D game for a 3-D world.

Nintendo

Virtual Boy is a portable 32-bit 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.







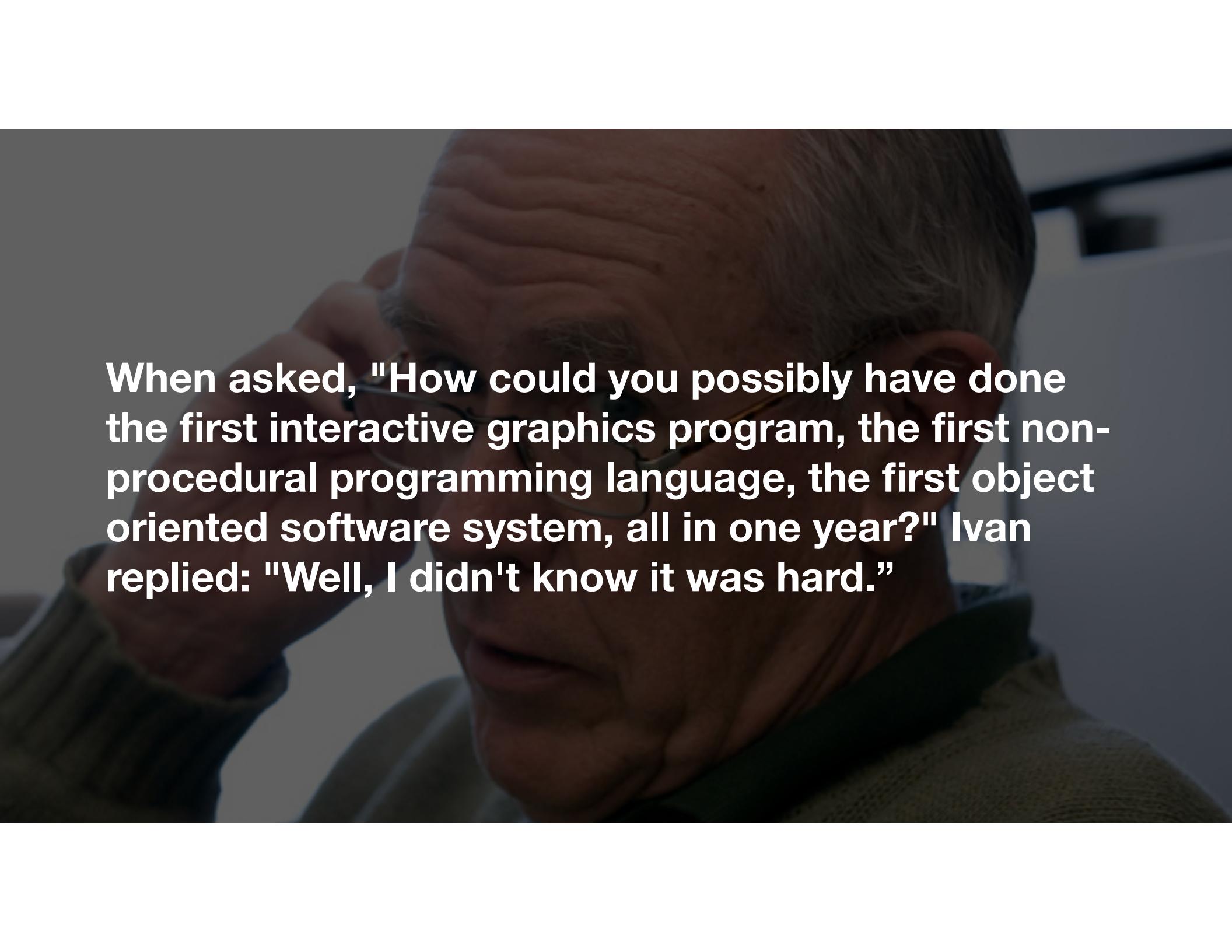
AUGUST 17, 2015

TIME

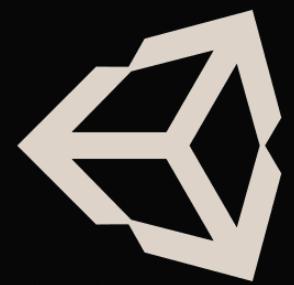
The
Surprising
Joy of
**Virtual
Reality**





A close-up, slightly blurred portrait of Ivan Sutherland. He is wearing dark-rimmed glasses and a green button-down shirt. His gaze is directed downwards and to his right, with a thoughtful expression.

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."



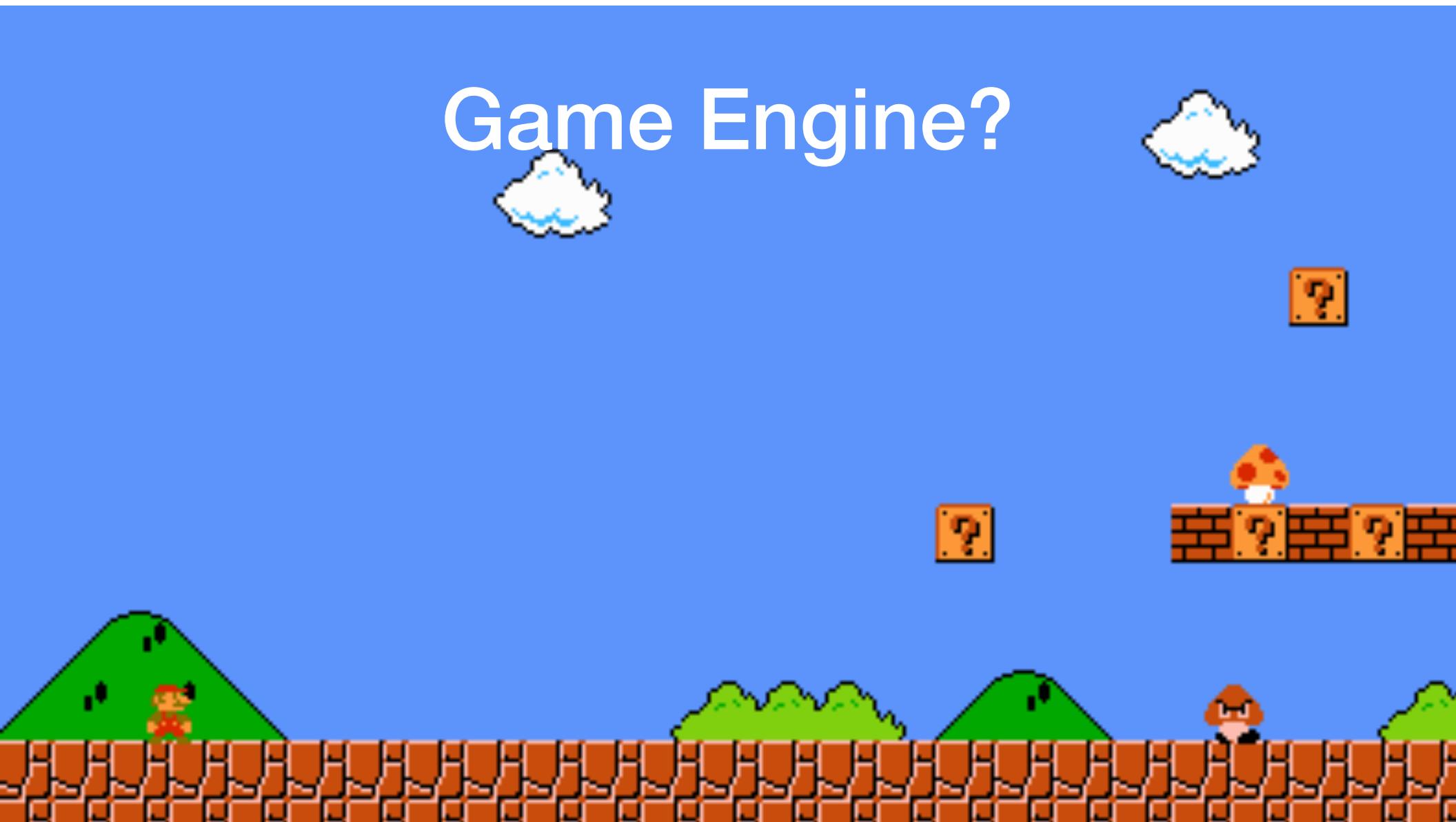
unity

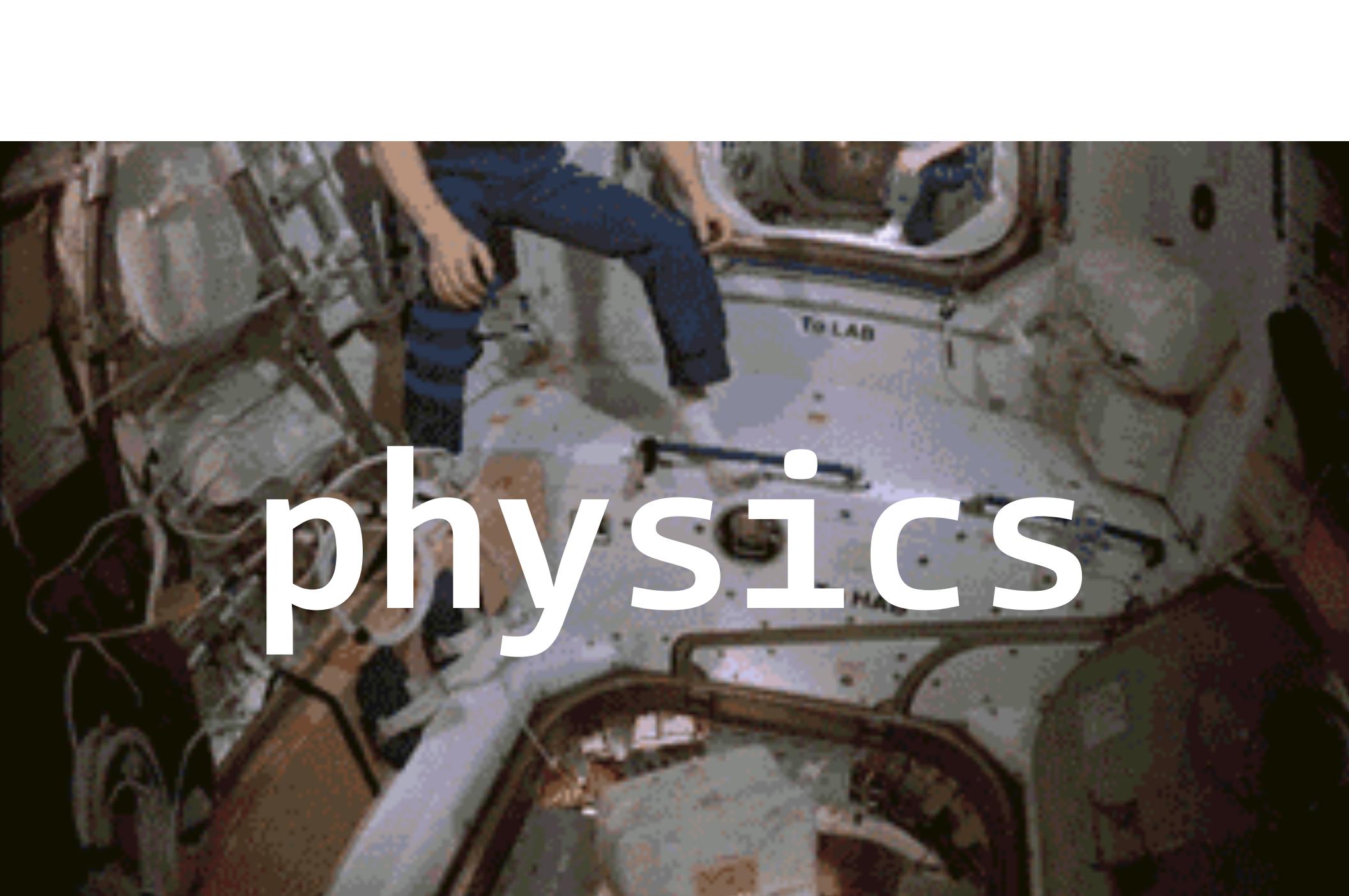


abstraction



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	<input type="checkbox"/>
Is Kinematic	<input checked="" type="checkbox"/>
Interpolate	None
Collision Detection	Discrete
Constraints	
Freeze Position	<input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> Z
Freeze Rotation	<input type="checkbox"/> X <input type="checkbox"/> Y <input type="checkbox"/> 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);
}

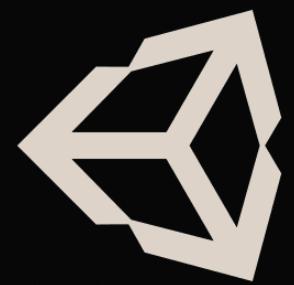
glAccum(GL_RETURN, 1);
glSwapBuffers();
```

Depth Of Field 

Focus Distance	41.8
Aperture (f-stop)	<input type="range" value="0.623"/> 0.623
Use Camera FOV	<input checked="" type="checkbox"/>
Kernel Size	Small 

designing for the real world





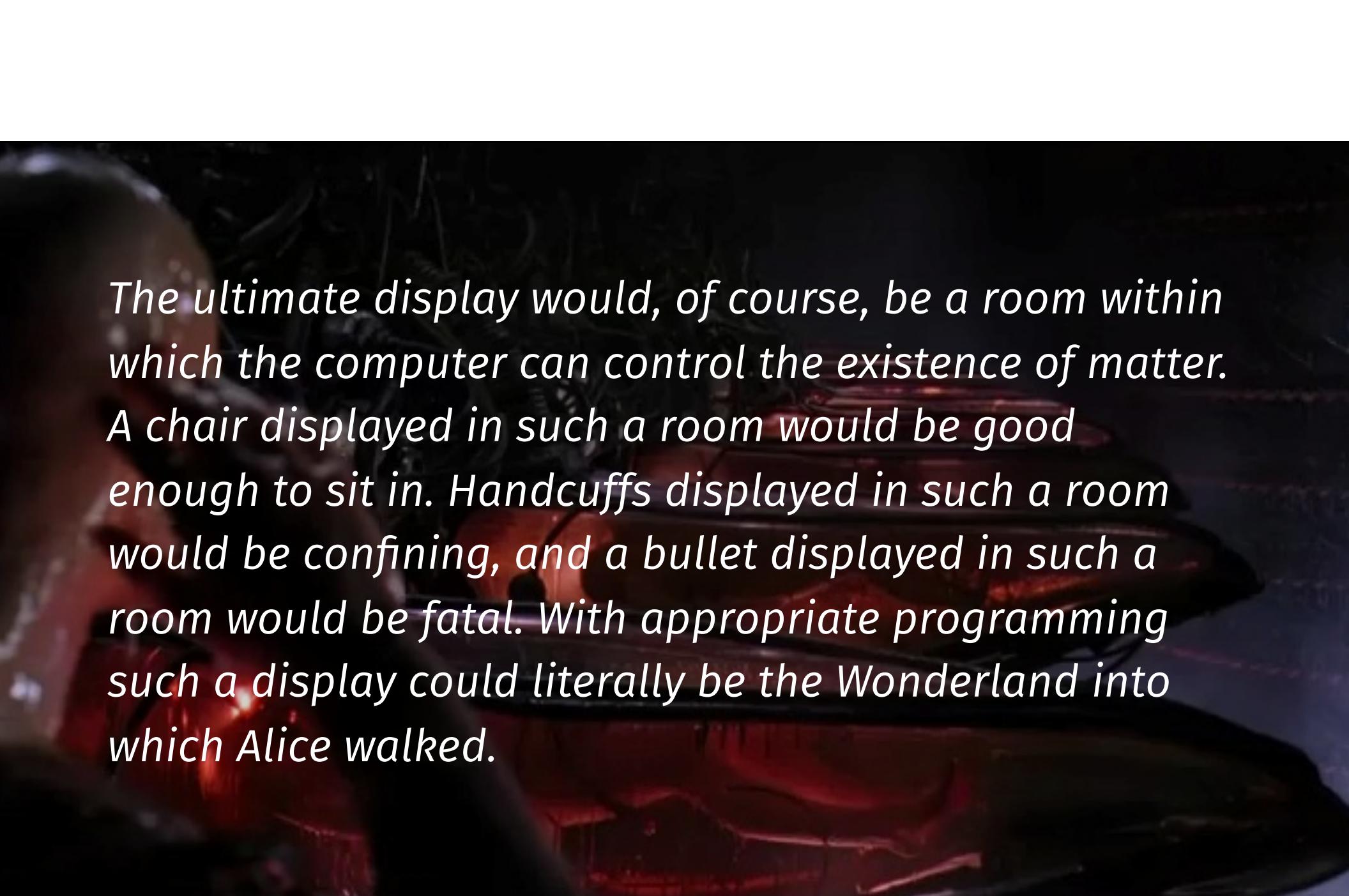
unity



Virtual Reality (LaValle) - Chapter 1

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

Set up Unity!



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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