The Great Rebalancing

9/30/16

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VR/AR Initiative program lead

Entertainment Technology Center @ USC

2016 AES INTERNATIONAL CONFERENCE ON AUDIO FOR VIRTUAL AND AUGMENTED REALITY

C L O U D S
A VR and traditional monitor experience

C L O U D S

Commercial Definition

VR – Blocks out world

AR – see-thru overlay

In Augmented Reality, the world that you would normally see if you walked down the aisle without the screen is being augmented – enhanced, supplemented, added to - with additional data and experiences.

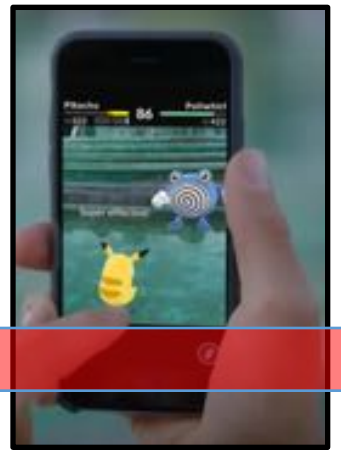
In Virtual Reality you are virtually – nearly, almost – but not really there in the grocery store aisle.

The AR – Reality – VR Continuum

Augmented Reality

Reality

Virtual Reality



Transitional
Mixed Reality
Blended Reality

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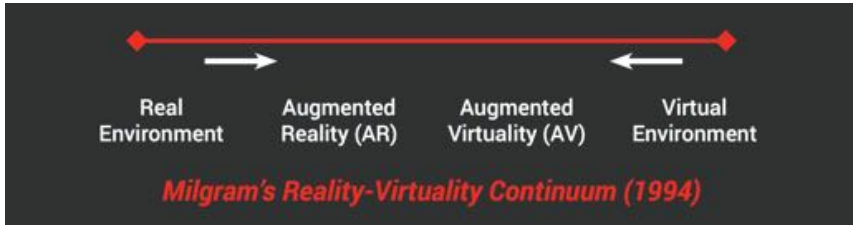

VR platforms and markets

Magic Window

Niche
$$$

HMD – Head Mounted Display

Cellphone-based VR

Group or Location-based VR

Location Based Entertainment

China's Suning Commerce Group plans to open 300 9D VR experiences in the next 3 months

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Strong vs. Weak AR

- Weak AR
  - Imprecise tracking
  - No knowledge of environment
  - Limited interactivity
  - Handheld AR

- Strong AR
  - Very accurate tracking
  - Seamless integration into real world
  - Natural interaction
  - Head mounted AR

Source: Mark Billinghurst, Intro to AR lecture

Core Characteristics of VR

Sense of **Presence**

Heightened Sense of **Empathy**

Agency

VR/AR

UX / UI

Sound

Image

The 10 VR Commandments every VR experience creator should follow

1. Thou shall limit the bounds of player space
2. Thou shall recall that not every sense works
3. If thine avatar sits, thou should also be sitting
4. Thou shall establish trust with the player
5. Thy gloves are thy friends
6. Thou shall cast out unworthy menus
7. Thine kingdom need not be be realistic
8. But thine kingdom must be carefully built
9. Thou hast nice legs. Cast thine eyes upon them
10. **Thou shall rest only when sound is also worthy**

Source: Techradar.com

Decision

Camera-captured VR

Locked to camera position

The Director's Journey

Computer Rendered VR

Free to wander (Story world)

Subtle coercion

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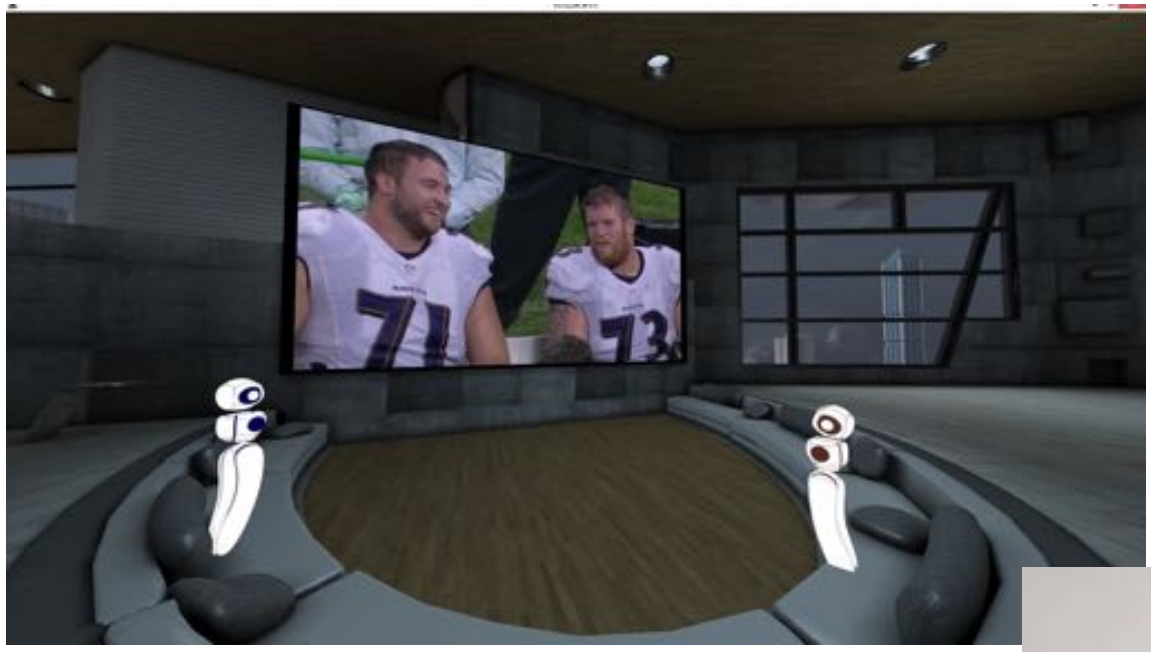
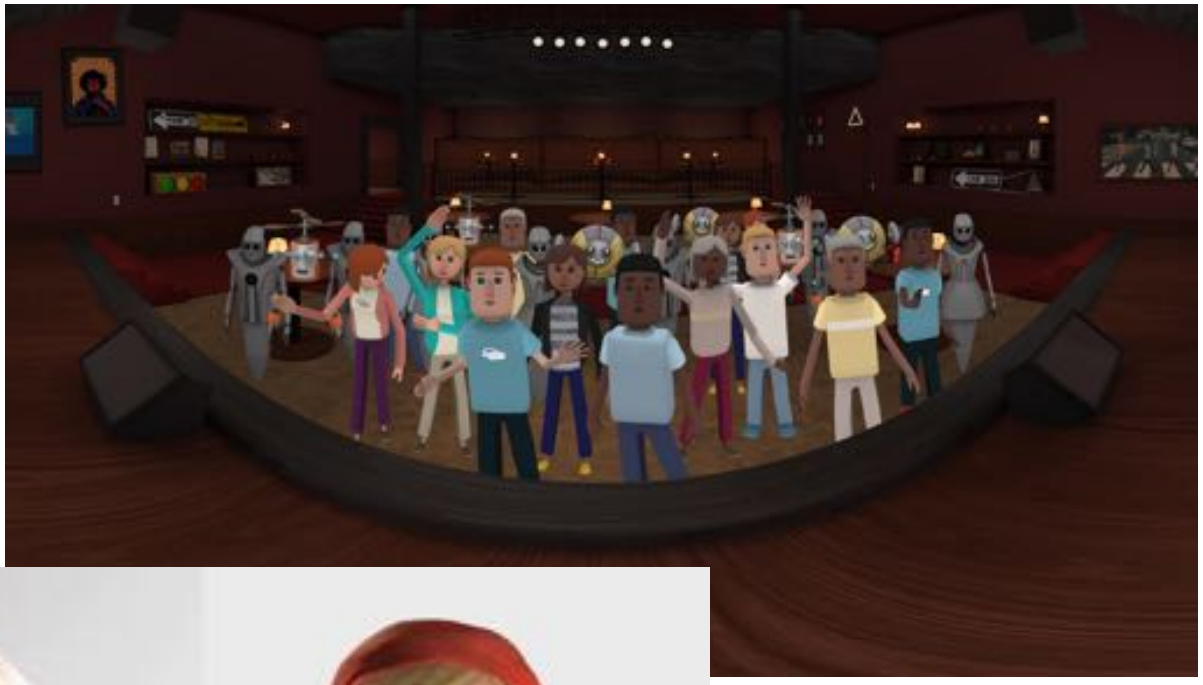
Social VR as killer app





From "Water Poverty" by Andrick Bregman

Abel Gance's Napoleon
1927

Live VR Production
NY Philharmonic – Concerts in the Park

If you ’teleport’ from one camera location to the next, how do you transition the spatial audio?

Walk-around concert experience

Vrtify

- Immersive 360 4D Sound
- Many mikes let you move around in the VR concert space
- 70/30 split with artists

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VR is transforming industries

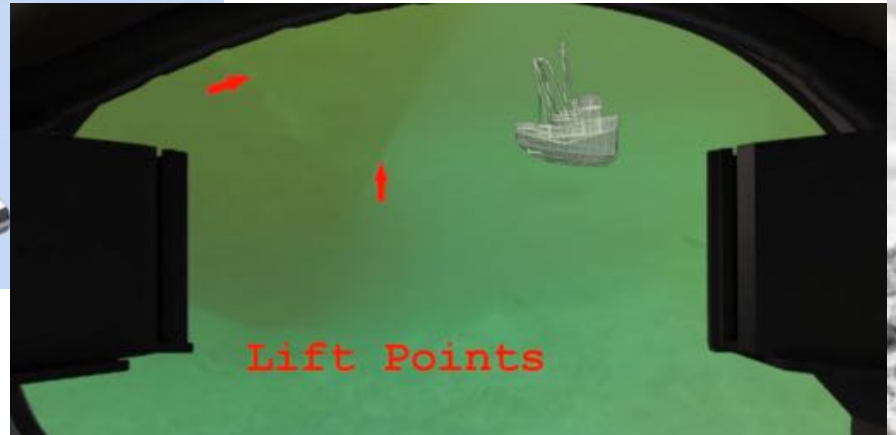
Neurosurgery

Public Works

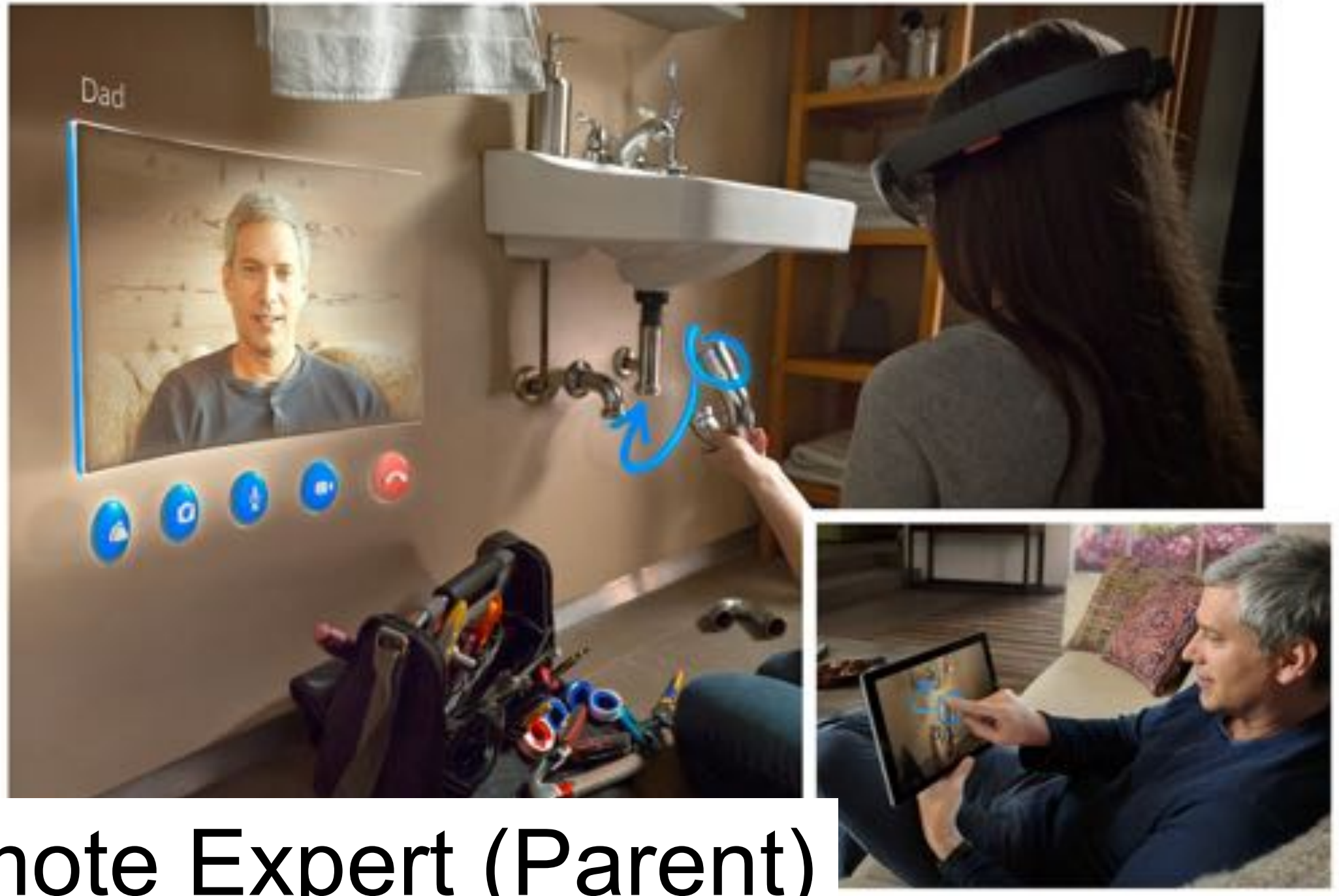
Seniors

Architectural modeling including acoustic modeling

AR will dominate



Workplace efficiencies



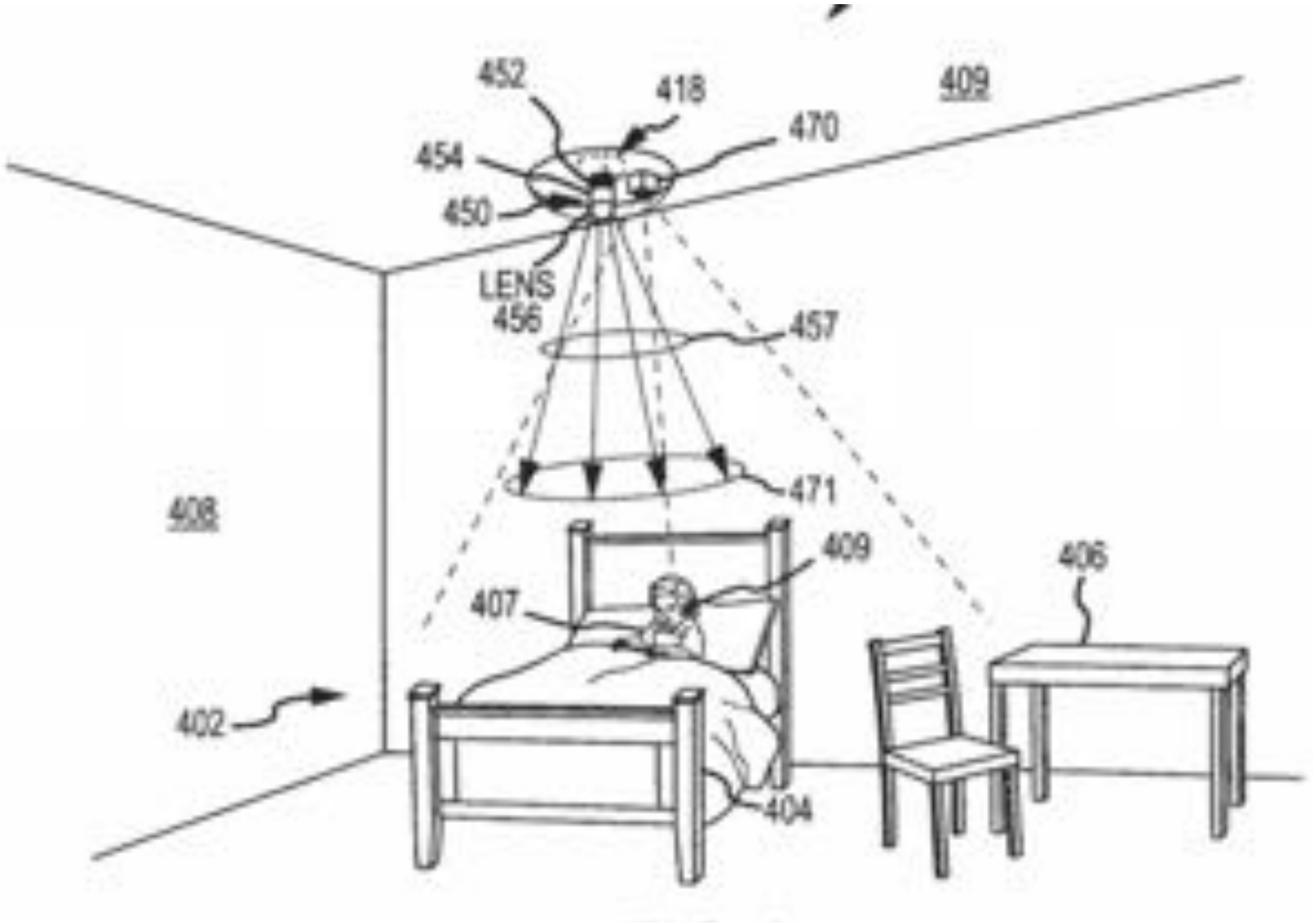
Remote Expert (Parent)

F-35's $400,000 AR HMD Helmet

Full spherical view around jet

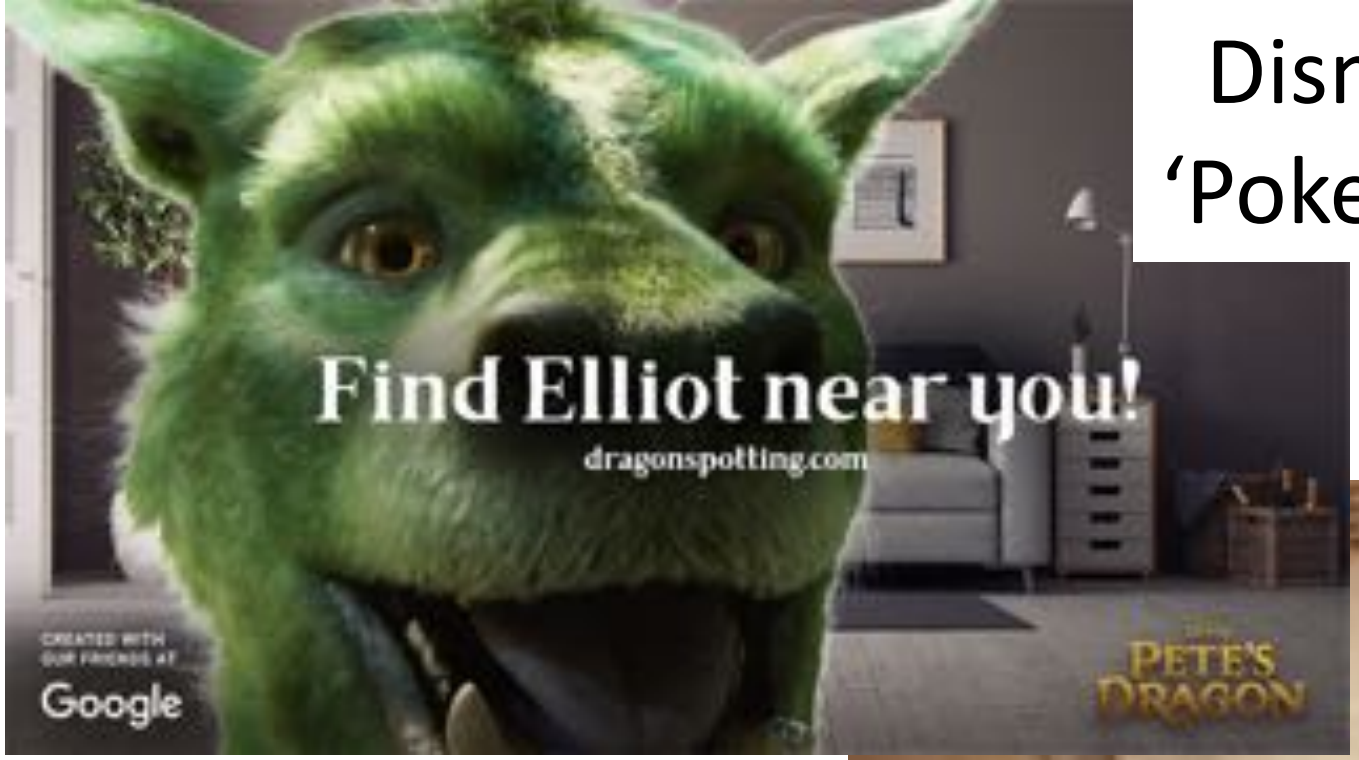
Identifies, zooms in on, and can target objects of interest

Disney patent turns hotel rooms into interactive environments



Projection and audio, plus sound and motion capture

Disney and Google Cloud Vision ‘Pokemon’ plus image recognition

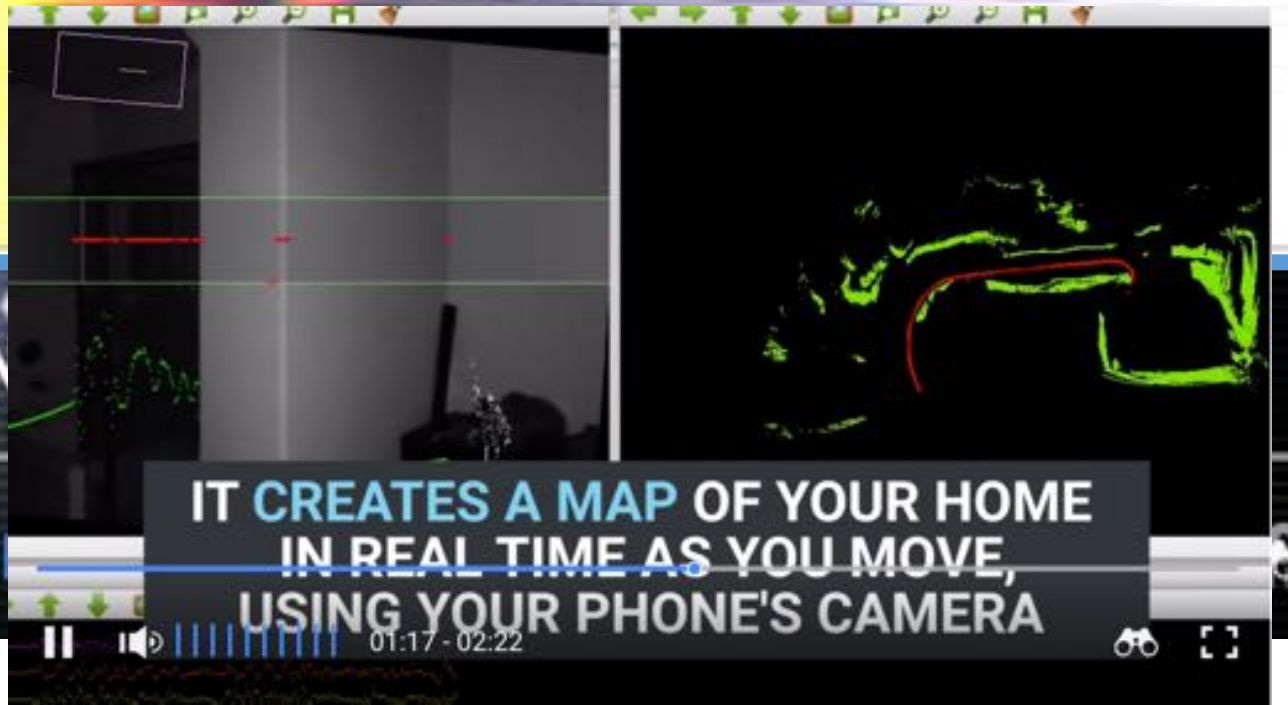


YOU ALSO HAVE TO WEAR HEADPHONES, AS SOUND IS A BIG PART OF THE EXPERIENCE

THIS IS

NIGHT

TERRO

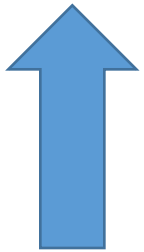


Lack of **standardization** slows consumer adoption

How would you define a

“Hollywood-Quality VR Experience”?

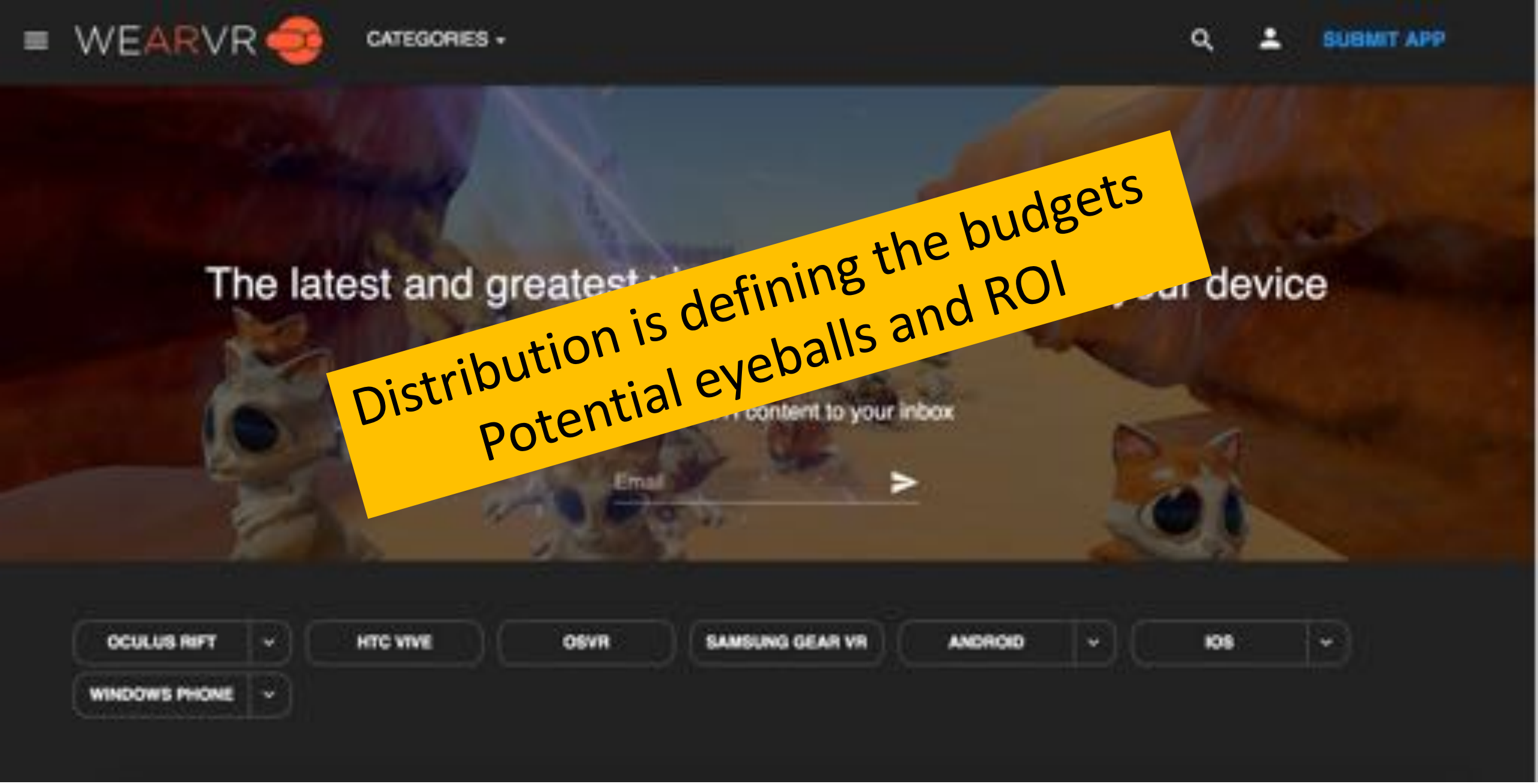
Winning VR experiences will shape hardware development



Plural

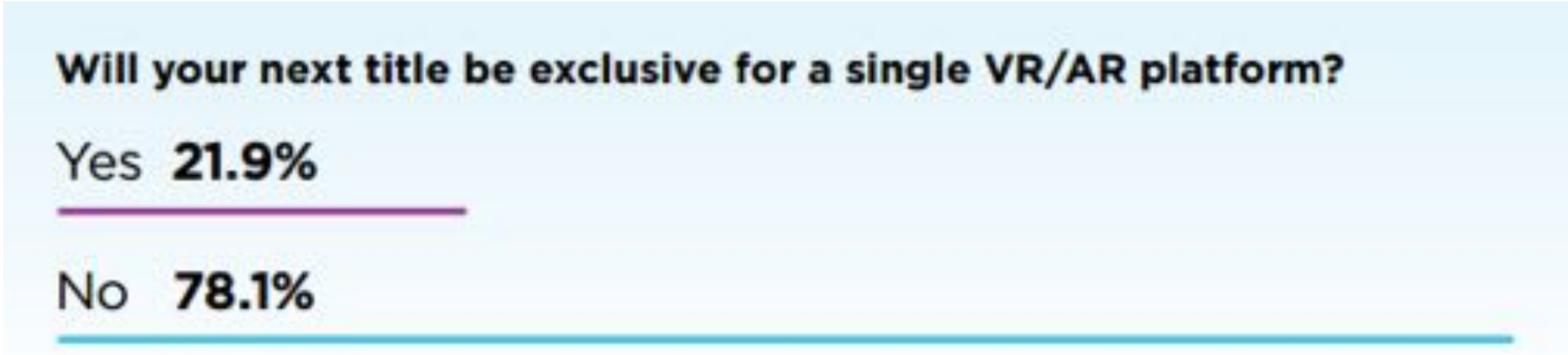
A variety

What can we standardize?



Distribution is defining the budgets
Potential eyeballs and ROI

78% of AR/VR Developers Not Planning Platform-exclusive Content



Source the [VR/AR Innovation Report survey published by VRDC]

Huge issues currently being ceded to ‘the market’

Ethics / Psychology

Social / Psychology

Personal space controls or ratings?

You are a node on the internet of things!

Back-channel data

- Every move and response is tracked
- Ownership, monetization, ethics,…

Social Norms and Responsibilities (+ Legal issues)

"Pokemon Go is just some markers on a map. The politics is **someone else's problem**,…"

Brendan Keogh, Australian Journalist

Online gamer died on Poolbeg Pier 'capture' mission

5/12/16 Irish Times

VR/AR

UX / UI

Sound

Image

The 5 Universal UI Components

Navigation
Selection
Manipulation
System Control
Data Input

Wanted
Intuitive User Interface

Source: Voices of VR podcast, Doug Bowman interview

Hand tracking and avatar interaction

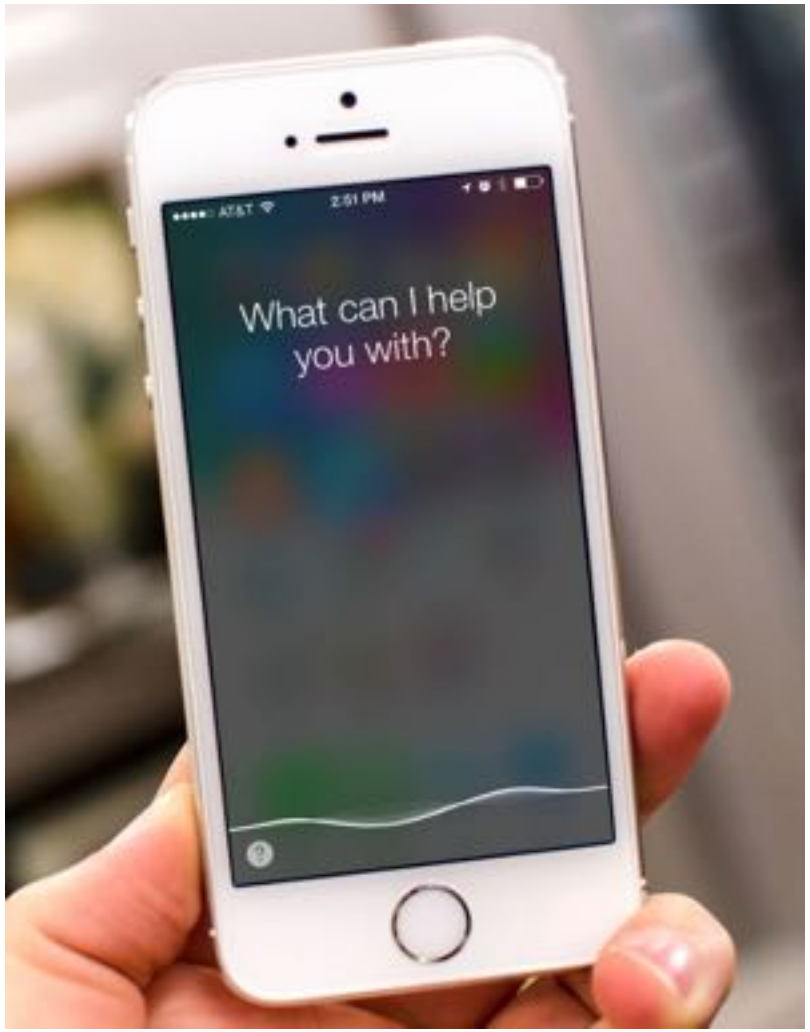
Oculus Rift + Leap Motion

Midas Touch

UI – Voice Recognition

Amazon
Echo (Alexa)

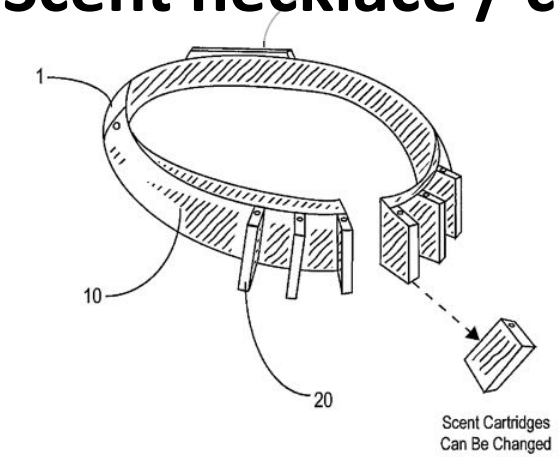
Google
Home

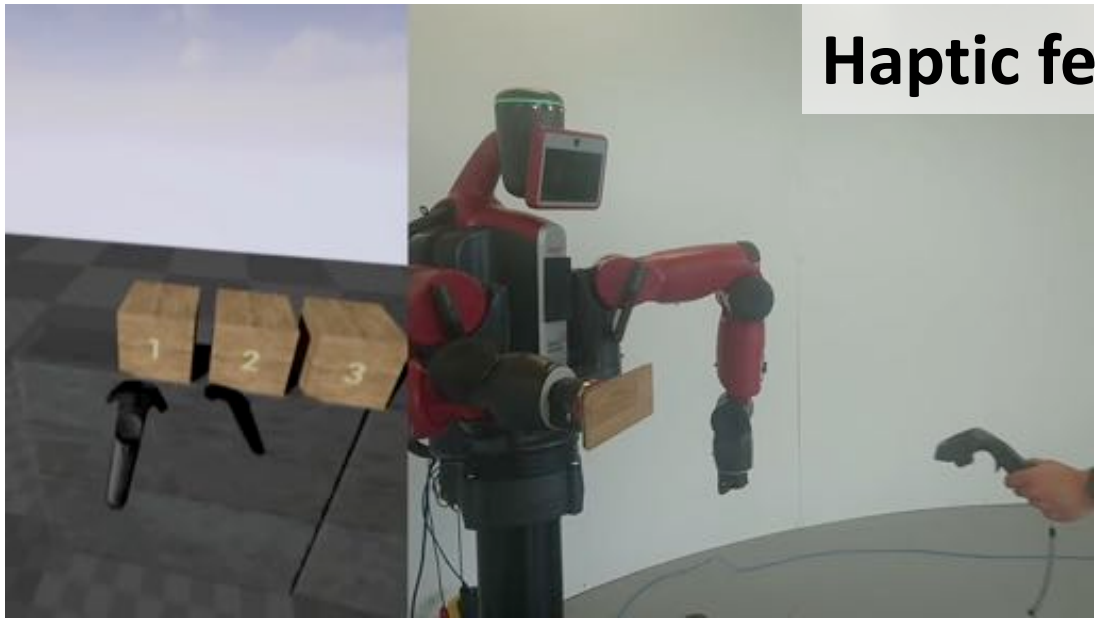


Apple
Siri

Other sensory I/O

Scent necklace / collar





Haptic feedback

Galvanic Vestibular Stimulation

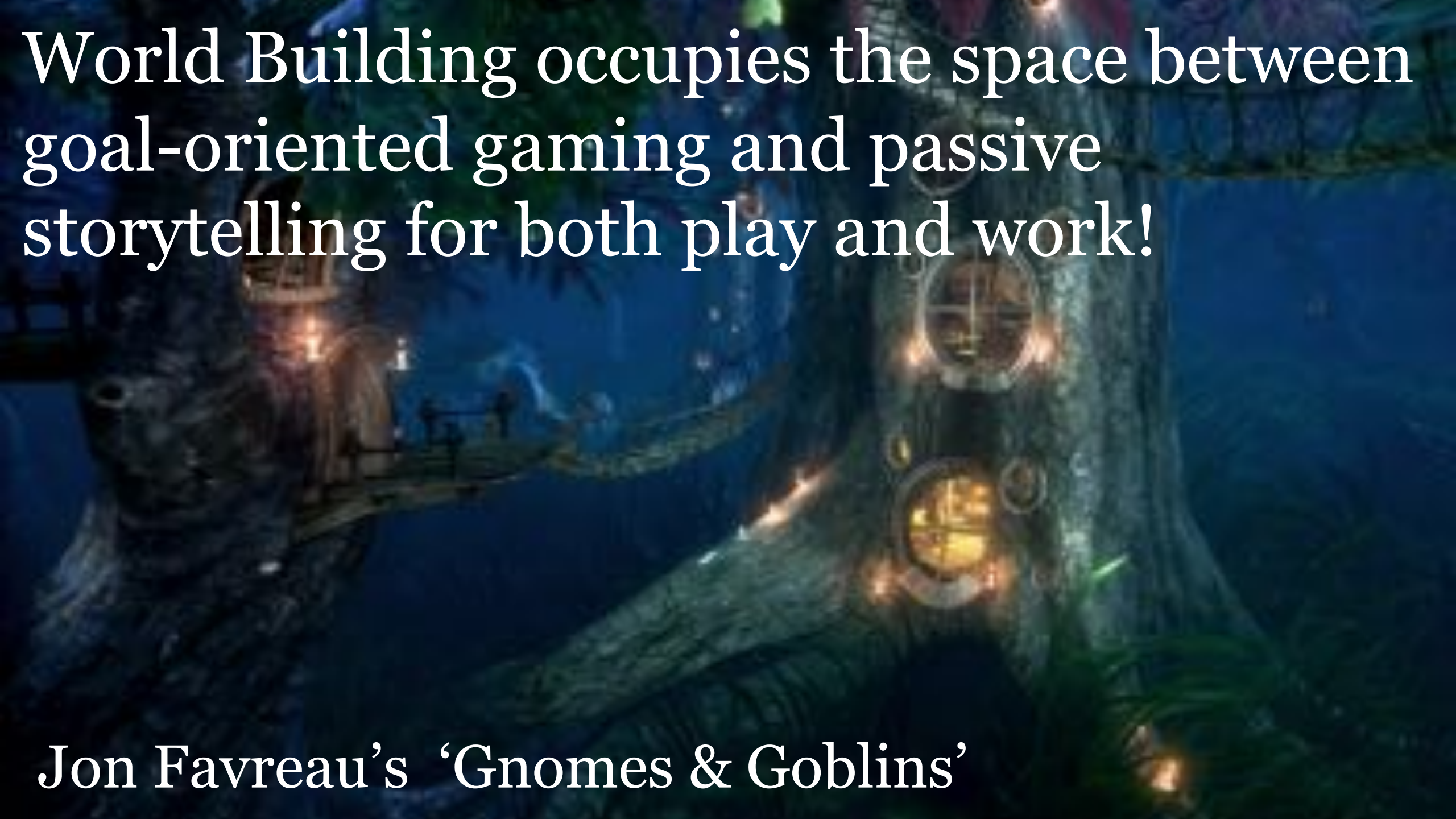
Synchronized heartbeats
Out-of-body experience

World Building

Storymaking

Engagement + storytelling

Part of the challenge of “Jungle Book” was to
make the technology disappear.
I want to find the humanity in the technology.
Director Jon Favreau

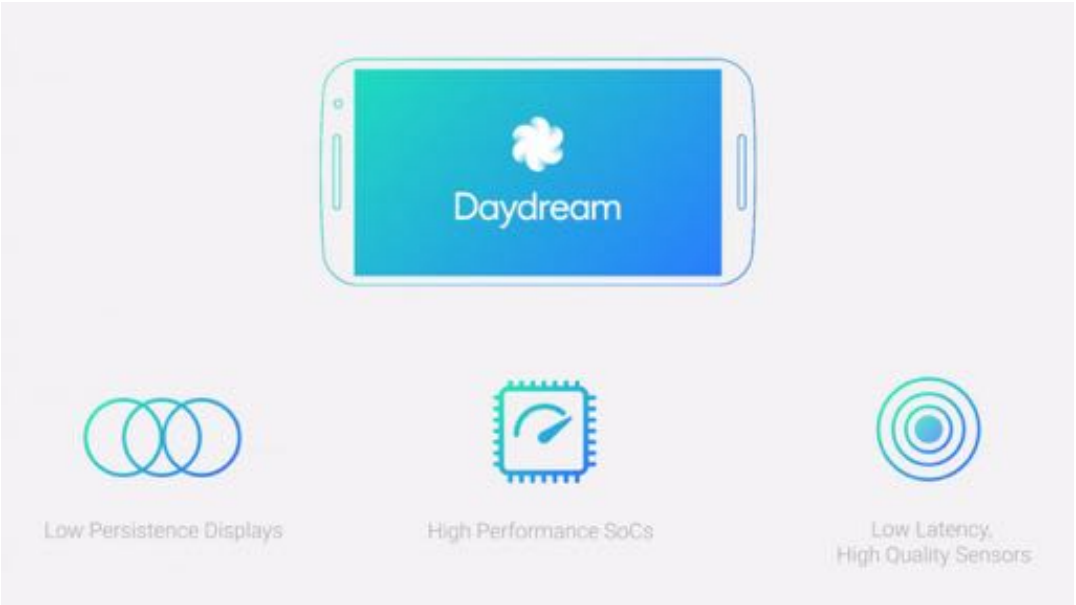


World Building occupies the space between goal-oriented gaming and passive storytelling for both play and work!

Jon Favreau's 'Gnomes & Goblins'

World Building → Infinite Possibilities → OS

Windows Holographic OS (VR/AR OS)



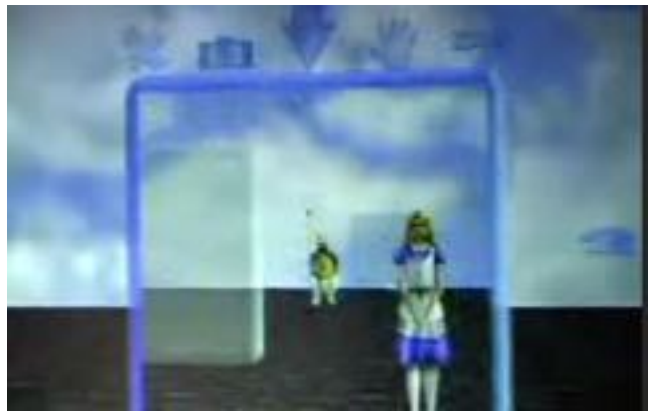
Google Daydream VR

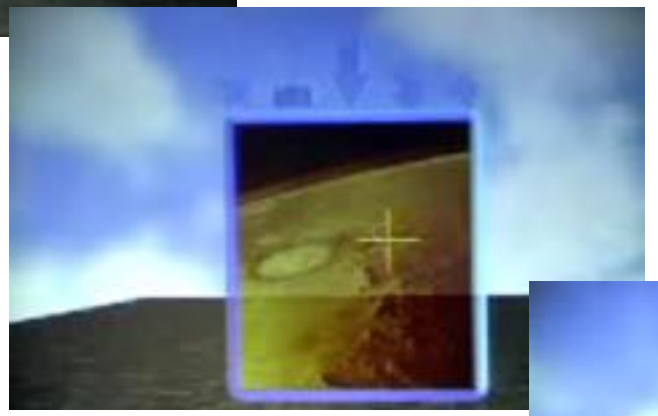
WebVR work at W3C

Open Croquet
3D Virtual Space Environment

complete dynamic object-oriented language

Alan Kay and David A. Smith





Avatars of Alice and the White Rabbit
True shared space - they see each other
Windows are portals to other worlds
Alice can place the portal to a world into her pocket

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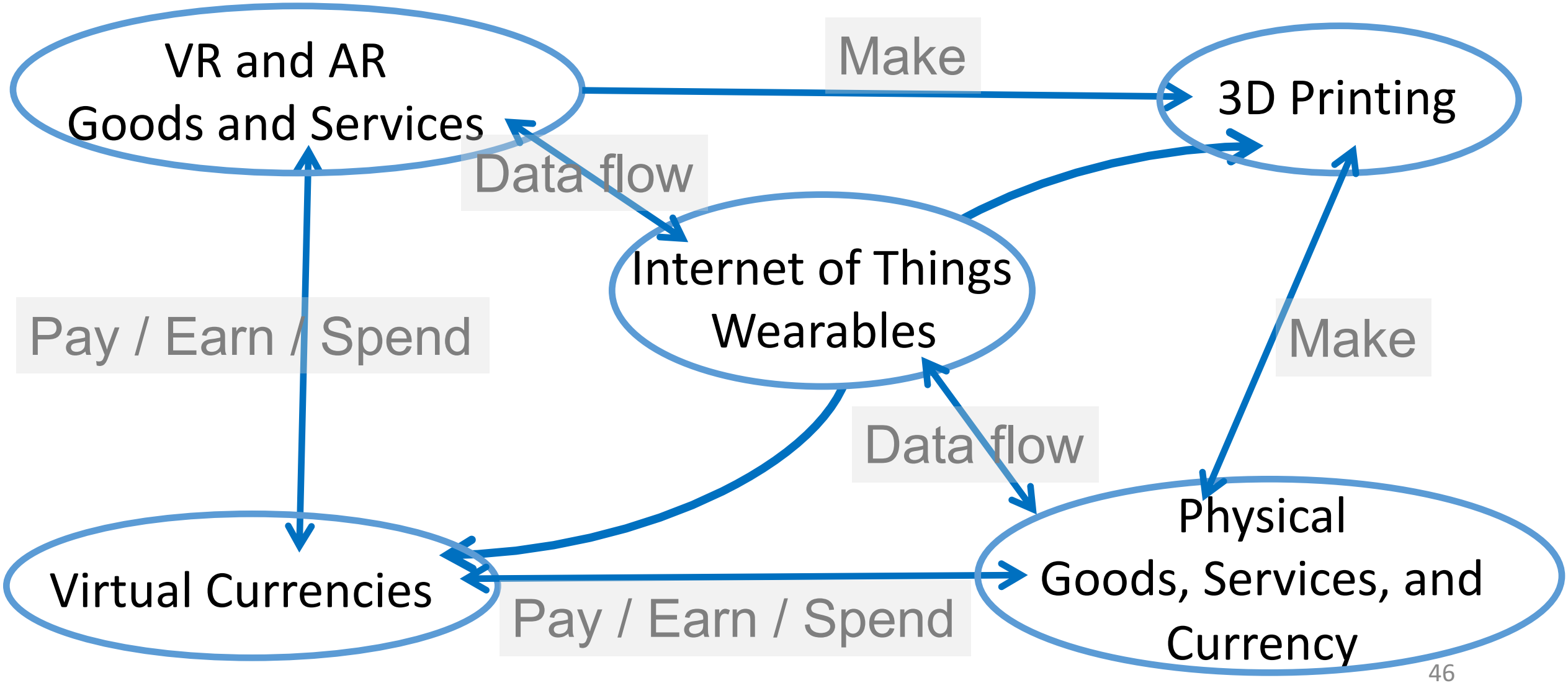
Erasing the boundaries between real and virtual work and play



IoT (Internet of Things)

Input

Everything is a node on the network,
including you!

Output

New ways of **experiencing and understanding**
the world around you

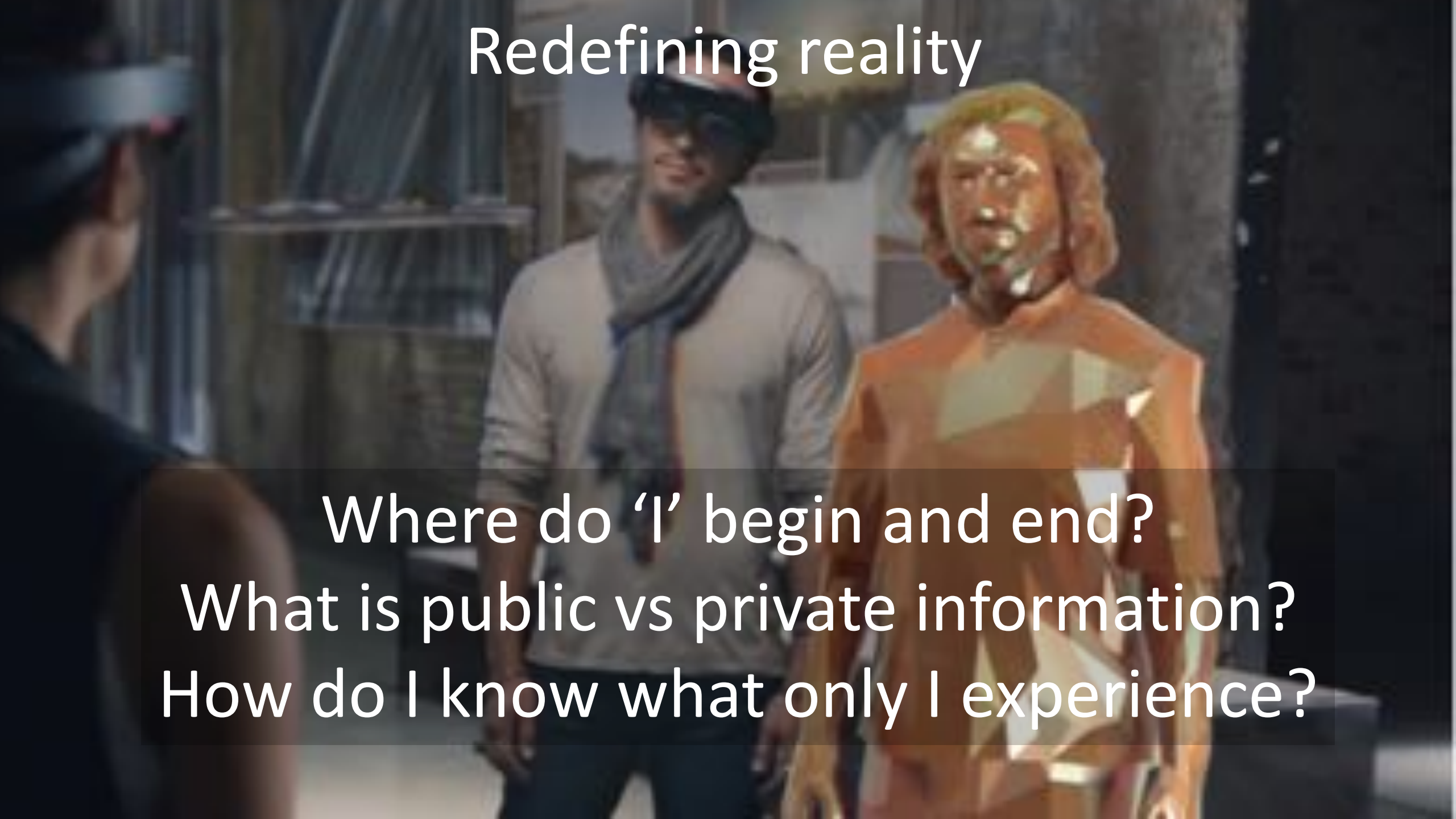
IoT, Wearables, Sensory Enhancement (Computer Vision, Spatial Audio I/O)

Cognitive enhancement via visual and auditory cues, symbols and reminders

Audio for pattern detection (ex. SETI project; “Contact”)

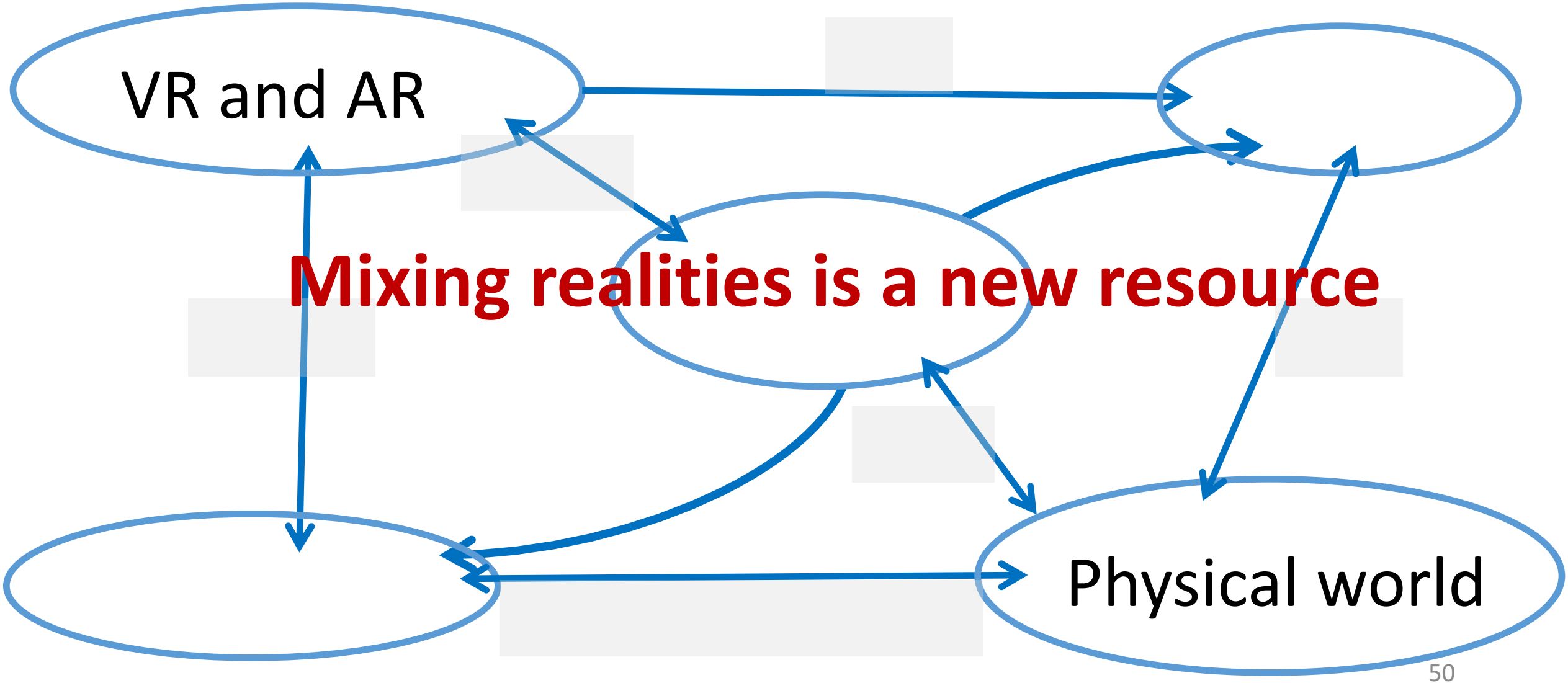
Auditory and visual sensations to compensate for **common age-related maladies**

Redefining reality



Where do ‘I’ begin and end?
What is public vs private information?
How do I know what only I experience?

Erasing the boundaries between real and virtual



Presence

Empathy

Agency

Technology is morally neutral

"The culture is ready for [VR+AR] now,
given the amount of tech that we touch right now
and the devices that we use daily."

Ted Schilowitz, Futurist, Fox Studio

Consumers don’t buy technologies, they buy the experiences that the technologies deliver

Thanks!

9/30/16

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