

# **Accessibility for the Immersive Web**

## **Accessible Locomotion for WebXR**

Roland Dubois @rolanddubois



What do we  
**think** when  
we hear VR

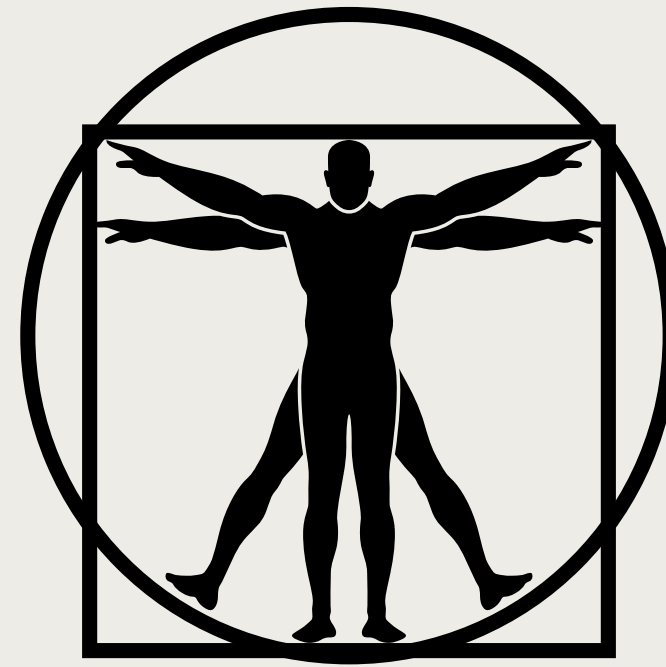




# How do we interact and **play** in VR?

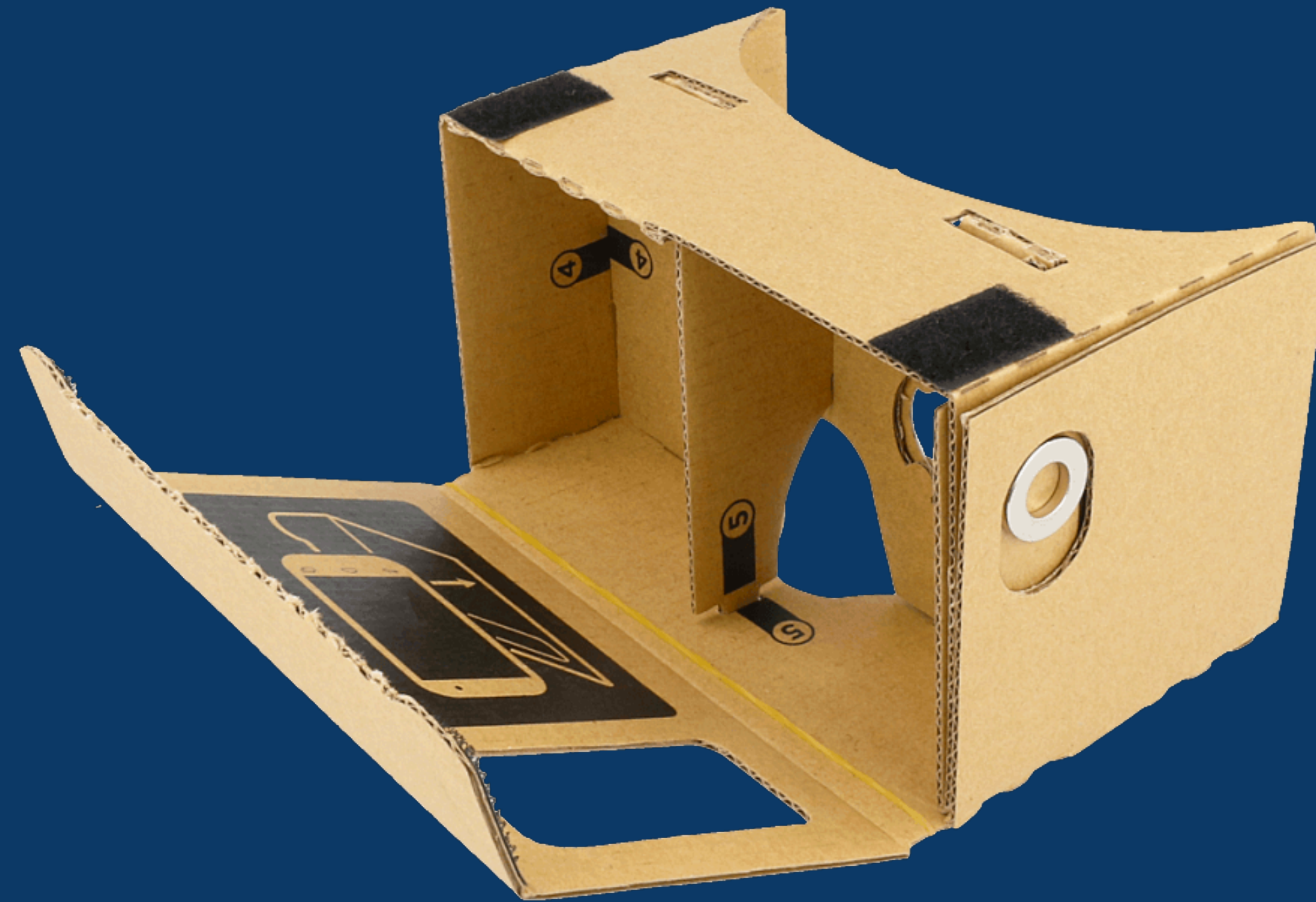






**Is VR inherently  
inaccessible?**





# 2014 Google Cardboard



GOOGLE / TECH / VIRTUAL REALITY

# Google's Cardboard turns your Android device into a VR headset

103

By Josh Lowensohn | Jun 25, 2014, 2:55pm EDT

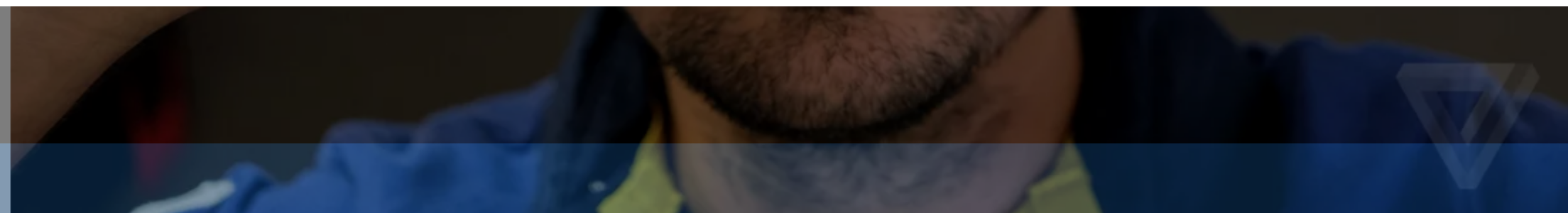
Source [Google Cardboard \(Google Play\)](#), [Google Cardboard](#), and [Google Cardboard \(Google+\)](#)

f t SHARE



"Virtual reality has made exciting progress over the past several years. However, developing for VR still requires expensive, specialized hardware," Google said on [the project's page](#). "Thinking about how to make VR accessible to more people, a group of VR enthusiasts at Google experimented with using a smartphone to drive VR experiences."

## THIS IS LOW-COST VIRTUAL REALITY



<https://www.theverge.com/2014/6/25/5842188/googles-cardboard-turns-your-android-device-into-a-vr-headset>

While Facebook's virtual reality effort involved [a multibillion-dollar purchase of Oculus VR](#),

This clever scam lets advertisers make money by draining your Android phone





**2015 nytvr App**

# The New York Times Teams with Google for Virtual Reality Experience

Posted October 21, 2015 by [Mark J. Miller](#)



The *Times* is rewarding its print subscribers with free Google Cardboard viewers. According to [TheVerge.com](#), the app, set to launch in early November, will release a series of VR short films in the next year. The first film, *The Displaced*, produced in partnership with Vrse, follows refugee children from South Sudan, eastern Ukraine and Syria.

Virtual reality is the new black, apparently. Plenty of brands are experimenting with it this year and now *The New York Times*—the Old Gray Lady herself—is giving it a whirl with a new app, NYT VR.

## brandchannel:

The latest news.  
The expert analysis.  
Delivered directly to you.

[Get the daily newsletter](#)



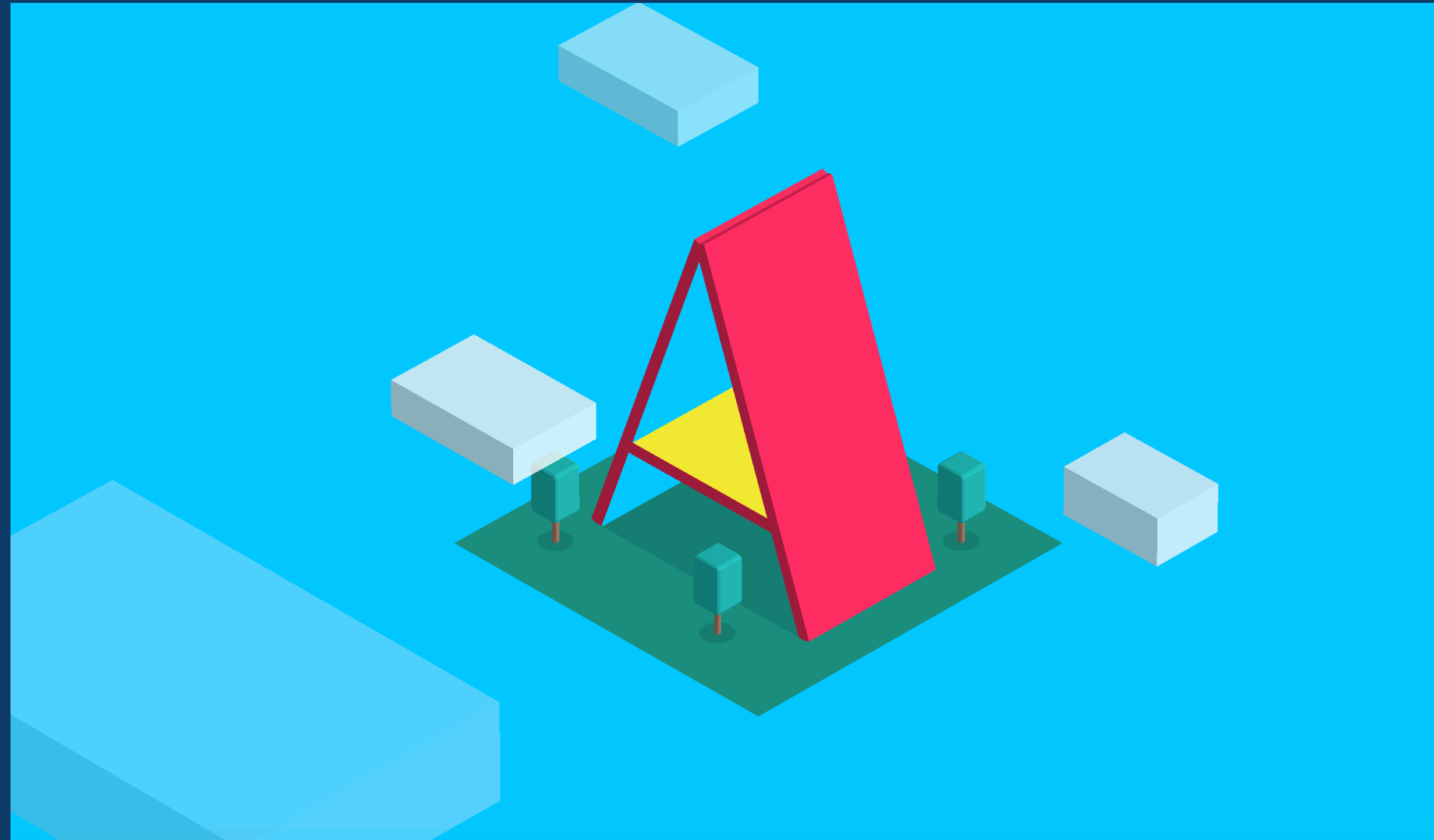
A podcast about  
changes in  
business,  
consumers,  
and where the  
two converge.



## most popular:

[5 Questions with Airbus](#)





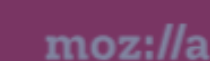
**2015 MozVR team releases A-Frame**

A web framework for building  
virtual reality experiences

Make WebVR with HTML and Entity-Component  
Works on Vive, Rift, Daydream, GearVR, desktop

GET STARTED

## Used by

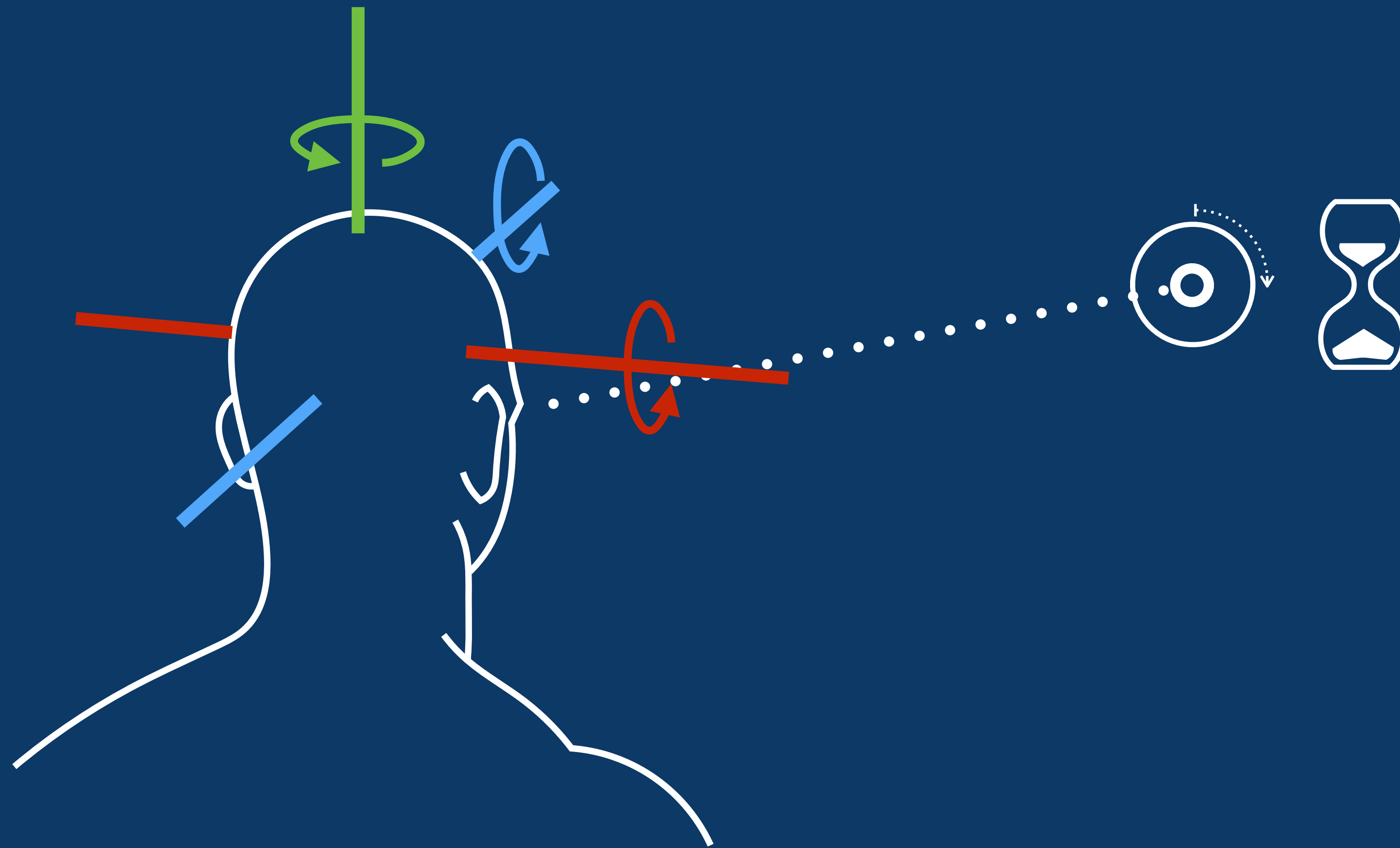




**VR ≠ the Immersive web (WebXR)**

**VR is not a toy. It's a new medium.**

**New media can't be exclusive**



**Is the fallback input for mobile VR  
inclusive enough for everyone?**





# Navigating VR for Physically Disabled Users

with Binary Input Controls



**NSCISC: >250.000 people with quadriplegia (tetraplegia) in the US each year**

**Majority:** Neurological disease/disorders & birth defects (MS/ALS/Polio/...)

**Random accidents: Statistically every 41 min a person in the US sustains a traumatic spinal cord injury (many paralyzing)**



# Sip-and-Puff

- **introduced to navigate wheelchairs in the 1960s**
- **two (stereo) input frequencies: sip/puff - strong/soft/continuous**
- **rebirth in IOT and AT for productivity software**

# From Sip-and-Puff To Binary





A group of people in a workshop setting. A woman with curly hair is standing on the left, gesturing with her right hand. A man is standing on the right, talking. Several other people are seated at desks with laptops in the background. The scene is dimly lit with warm tones.

# **Reality Virtually Hackathon 2019** **@MIT Media Lab**

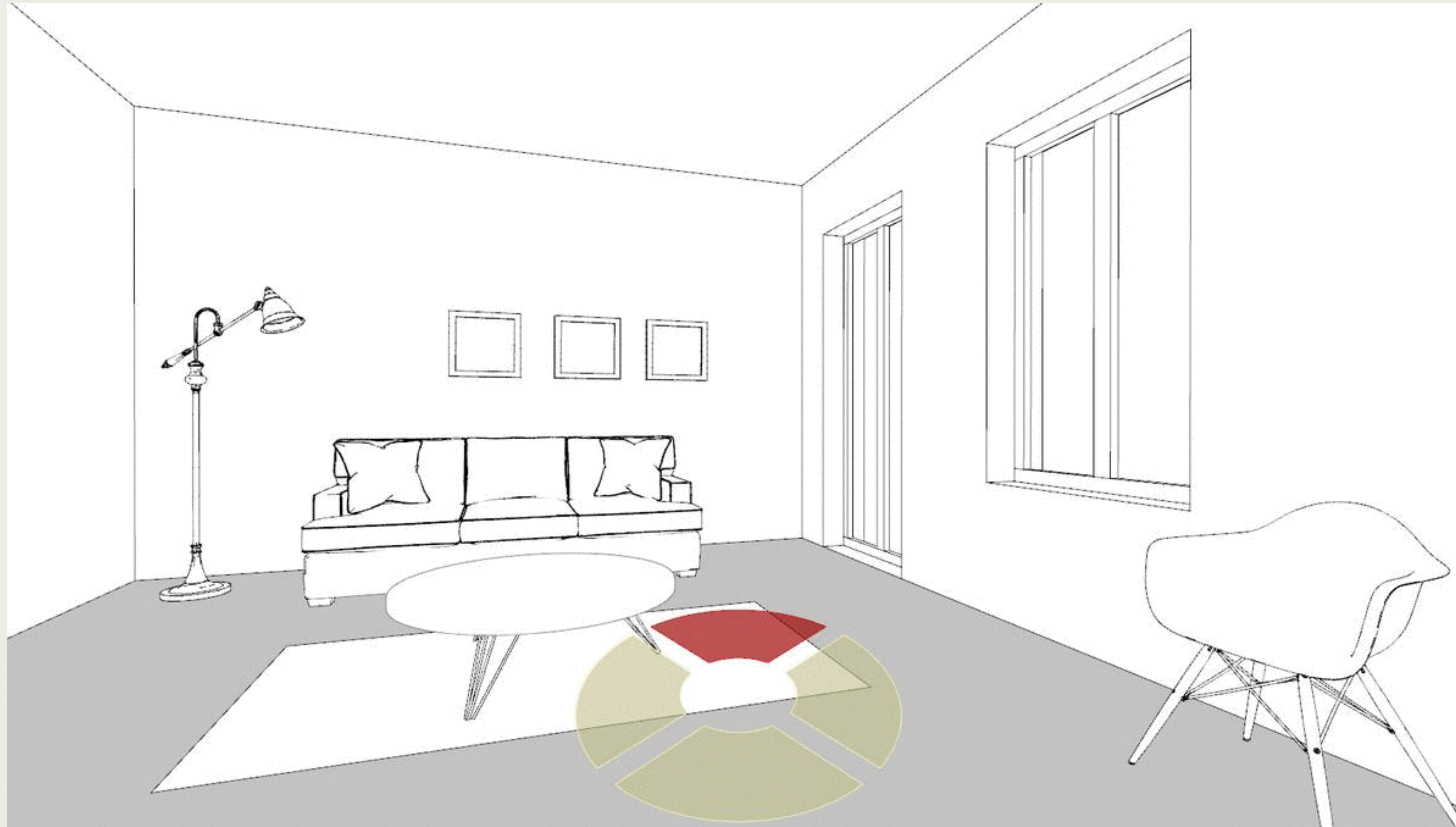


# Binary Input

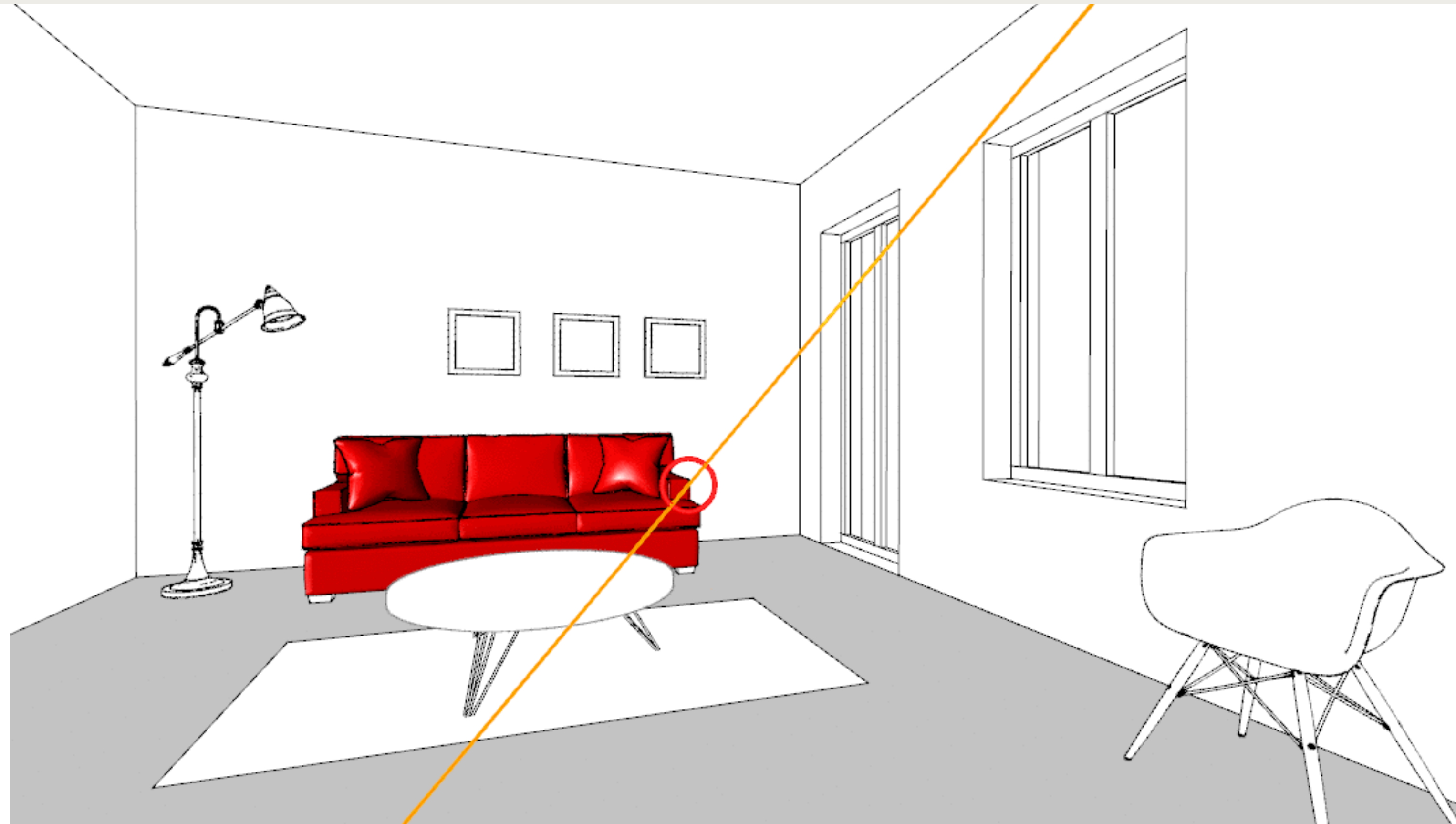
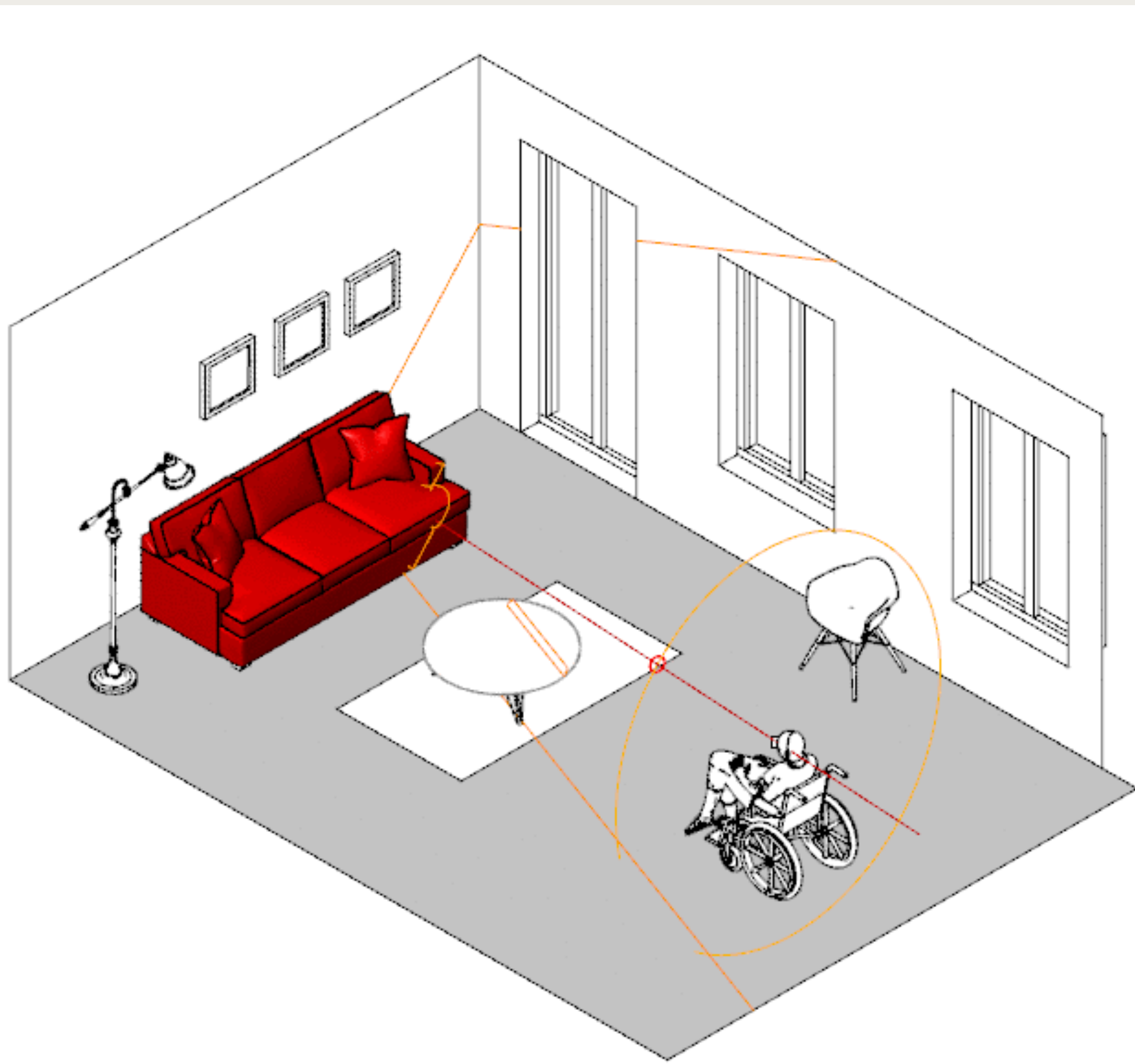
- **single button control**
- **binary input frequencies: on/off - short/long/continuous**
- **mapped with the W3C standard Gamepad API to enable assistive technology (AT) devices**



# Locomotion Mode



# Interaction Mode





433 Hackers

110 Team submissions

**Best Application For  
Accessibility**

**Wayfair Way-more**

**Best Use of an HTC Vive Focus**

3x winner at the **world's largest,  
most diverse XR Hackathon.**

January 17-21st, 2019 @ the MIT  
Media Lab, Boston





# Thanks!

**Roland Dubois**

**[rolanddubois.com](http://rolanddubois.com)**

**@rolanddubois**

**#aframe\_nyc #webxr @aframevr**