

VR with Google: WebVR and Blocks

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First Time Meeting me?

I am: Shivank Shekhar (@GeekyShiva)

- bumblebee Fan 😊
- VR Alchemist
- I am the global Co-Chair for WebVR Industry Committee at VRAR Association.
- WebVR Contributor at Mozilla
- VR/AR developer and Blockchain Consultant.

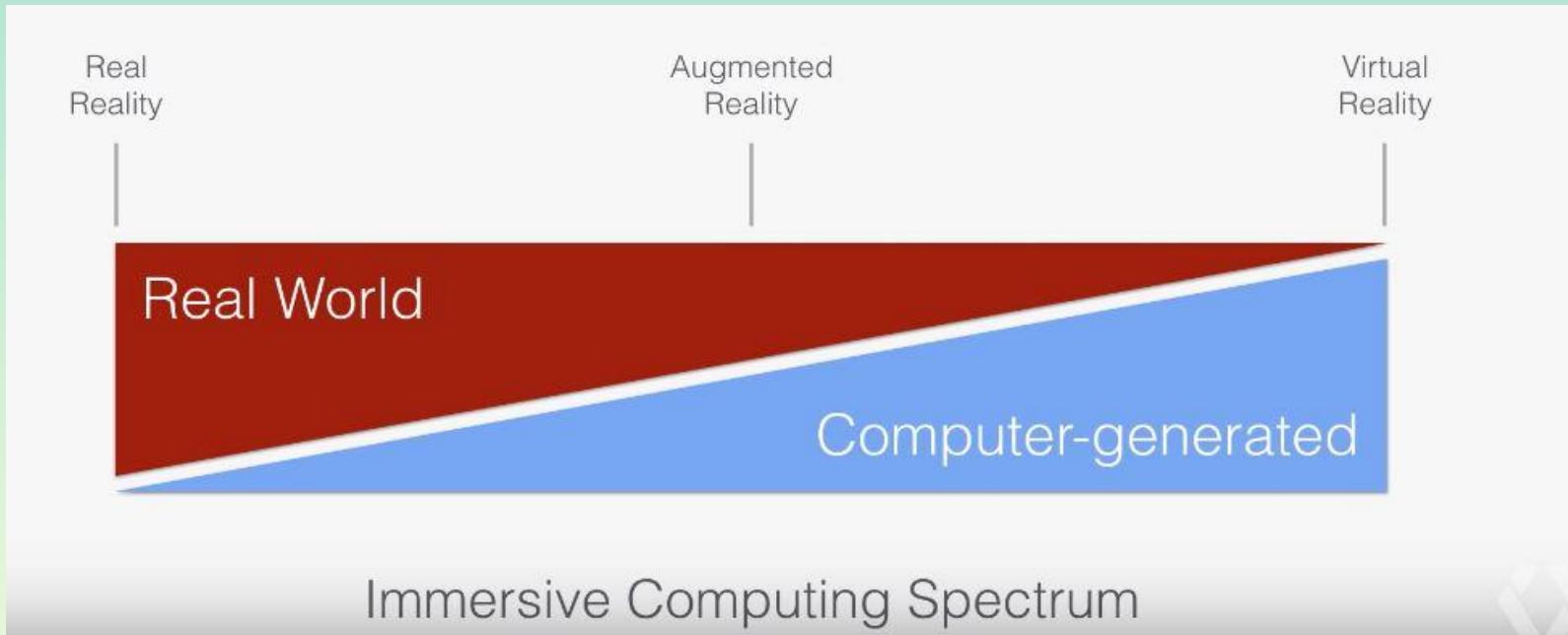


Agenda

- Introduction to XR
- Brief introduction to WebVR
- Examples
- Breakdown demo
 - AFrame
 - Networked AFrame
 - Javascript
- Summary
- Useful Resources
- Questions



Realities



Virtual Reality

- Immersion into another world
- Usually uses a headset and mobile device
- Does not interact with the real world
- Experiential Information

Augmented Reality

- Overlay of objects in world around you
- Use of a phone or viewing device
- Usually uses target image

The background image is a wide-angle aerial photograph of a vast, rugged mountainous landscape. In the foreground, there are dark, craggy peaks. Below them, a valley is filled with numerous small, light-colored terraced fields that follow the contours of the land. A winding road or path cuts through these fields, leading towards the horizon. The sky is clear and blue.

Computing that
works more like we do



Why VR/AR/MR etc.?

Chrome

56.7%

Safari

24.74%

Samsung Internet

10.19%

Android

3.34%

IEMobile

1.33%

Opera

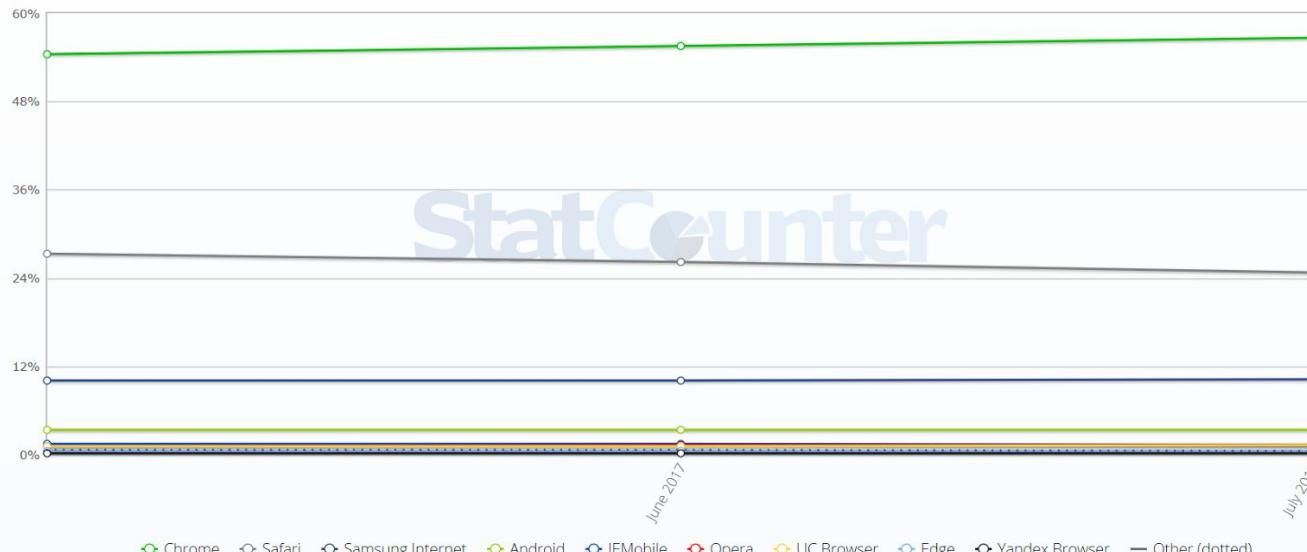
1.28%

July 2017

Mobile Browser Market Share in Europe

[Edit Chart Data](#)

May to July 2017





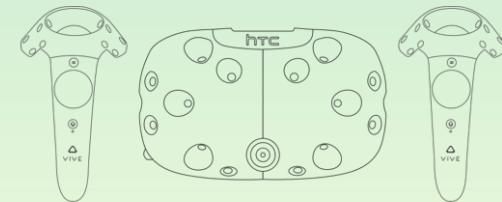
shippy mcshipface

What is WebVR?

WebVR



WebVR is a *JavaScript API* for creating immersive 3D, *Virtual Reality* experiences in your *browser*. It provides access to VR devices.

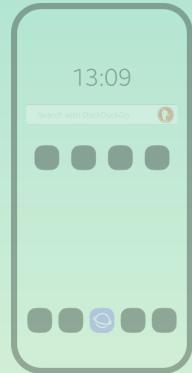




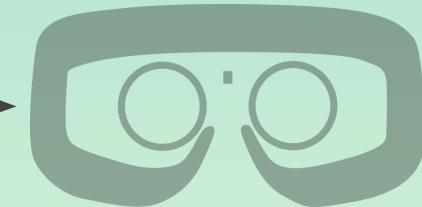
Content



Browser



Device*



Headset**



WebVR

Easy to share

Just click on a link or go to a website.

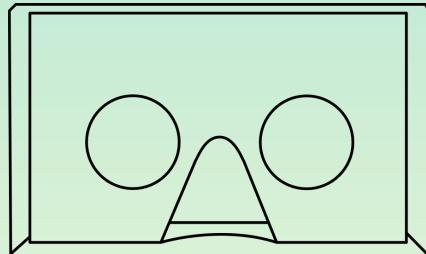
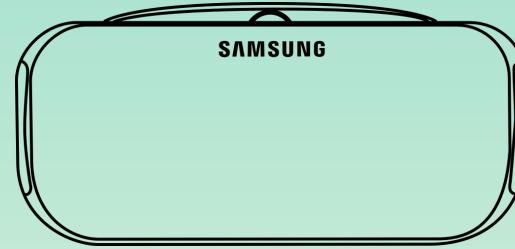
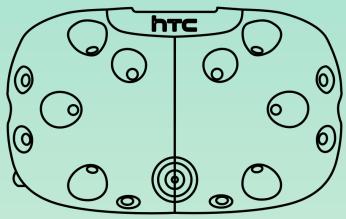
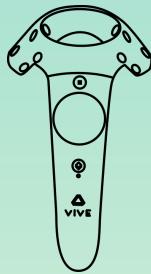
Cross-platform

Runs on phones, computers and lots of headsets.

Accessible

Most WebVR content can be viewed without a headset.

WebVR

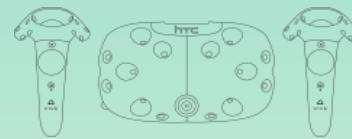




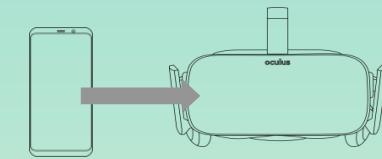
Google VR SDK
(iOS/Android/Unity)



Oculus Mobile SDK



Viveport SDK
(Android/Windows)



WebVR

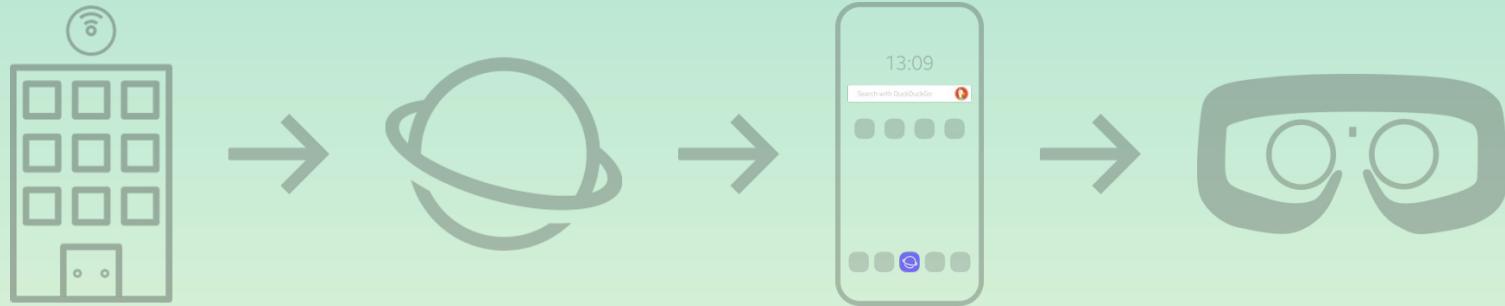
Widest **delivery** network in existence: the **Web**

Cost of entry for simple experiences for consumers translates to access to a browser in a device.

Delivery Platform



And there's more...



From a physical object to the browser to your home screen to your headset.

DEMO



DEMO

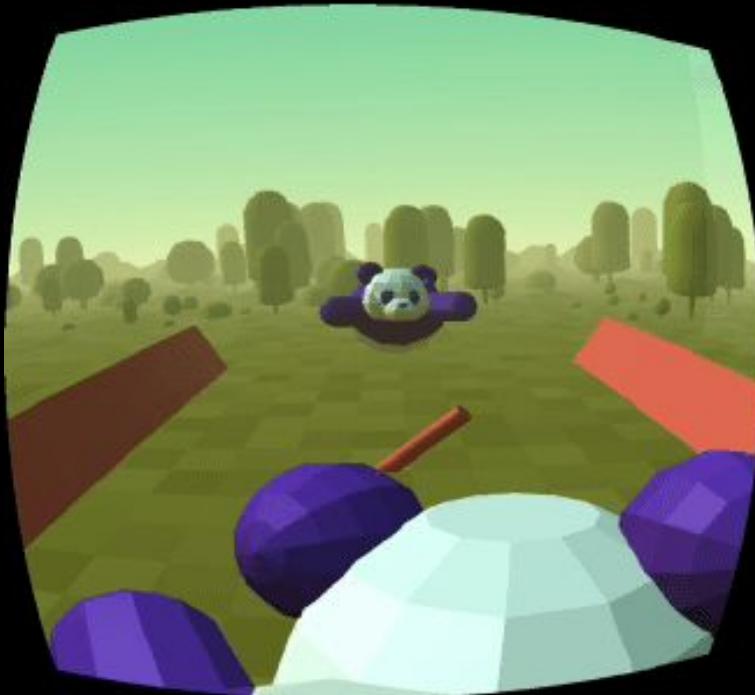
Join in by visiting : hungry-pandas.glitch.me

<https://hungry-pandas.glitch.me/>

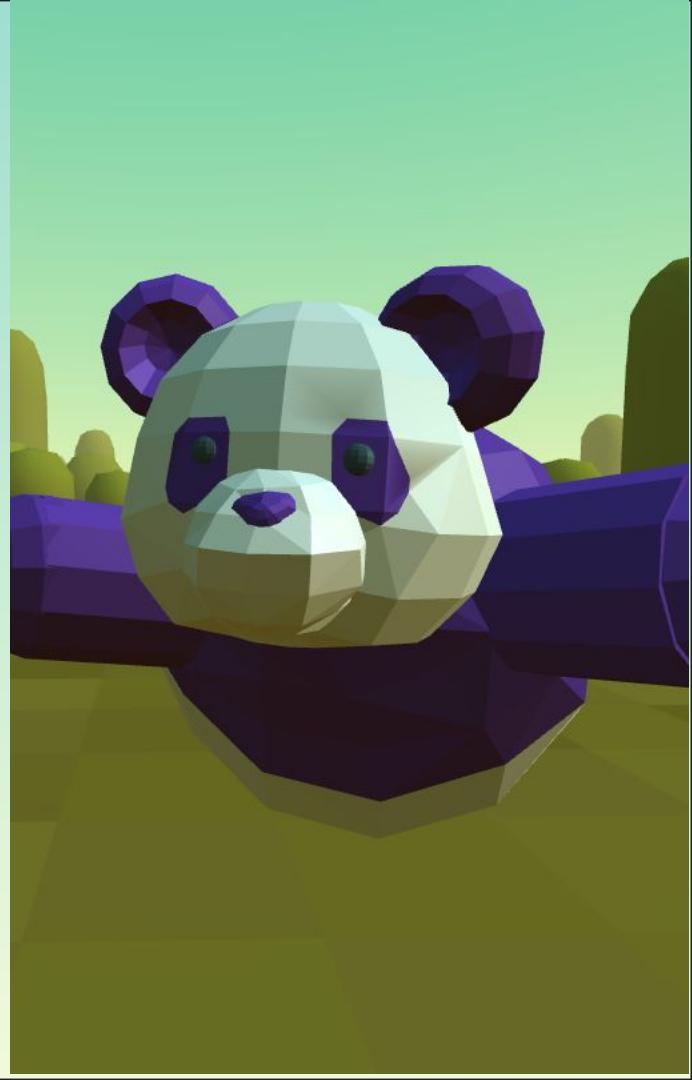


Gifs

Incase the demo breaks



How did we make Hungry Pandas?



Using Magic

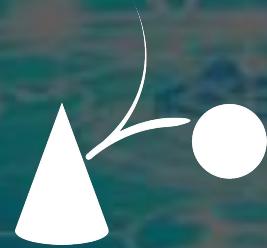




VR



Multi-user



Physics



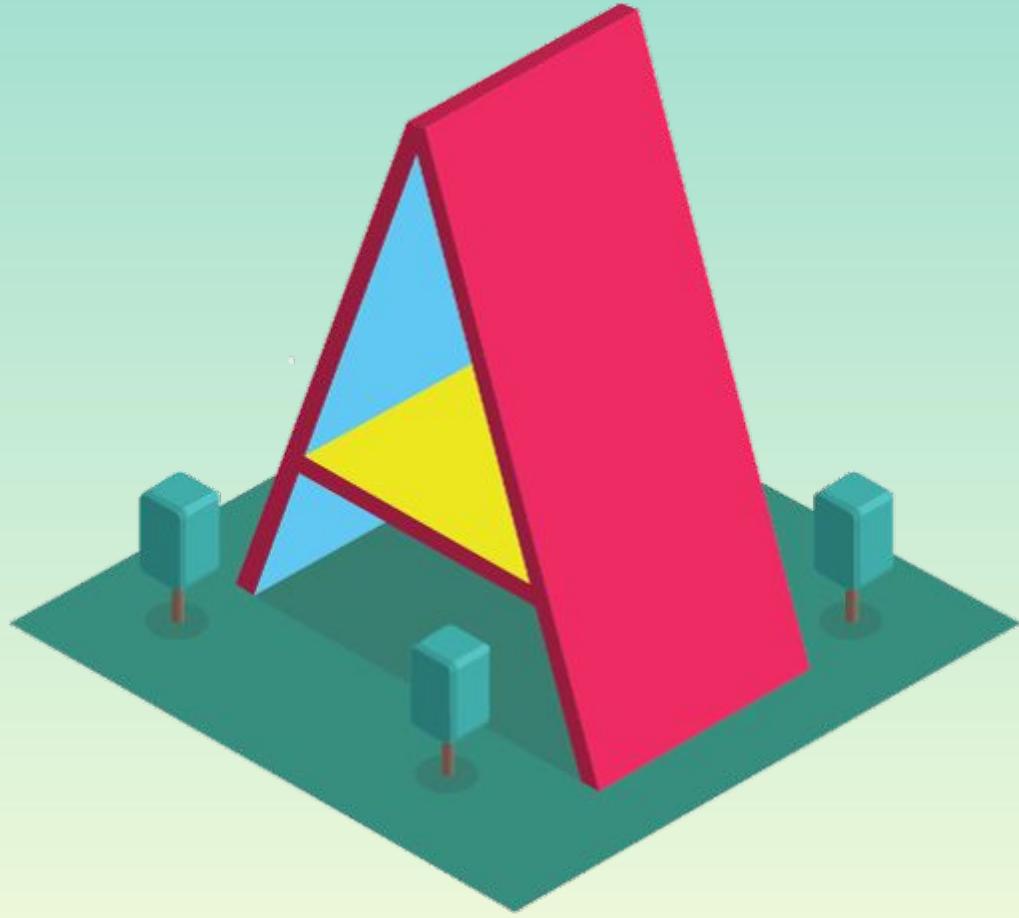
3D Models



Fish



Magic

 **A-Frame**

Before A-Frame?

How things worked?

Import WebVR Polyfill

Build UI for Entering VR

Geometry + Material + Add

Set up Camera

Initialize scene

Too hard to create WebVR experiences.

Create render loop

Listen to window resize

Search for VREffect

Instantiate renderer

Declare canvas

Add lighting

A-Frame

three.js

WebGL

WebGL

WebVR

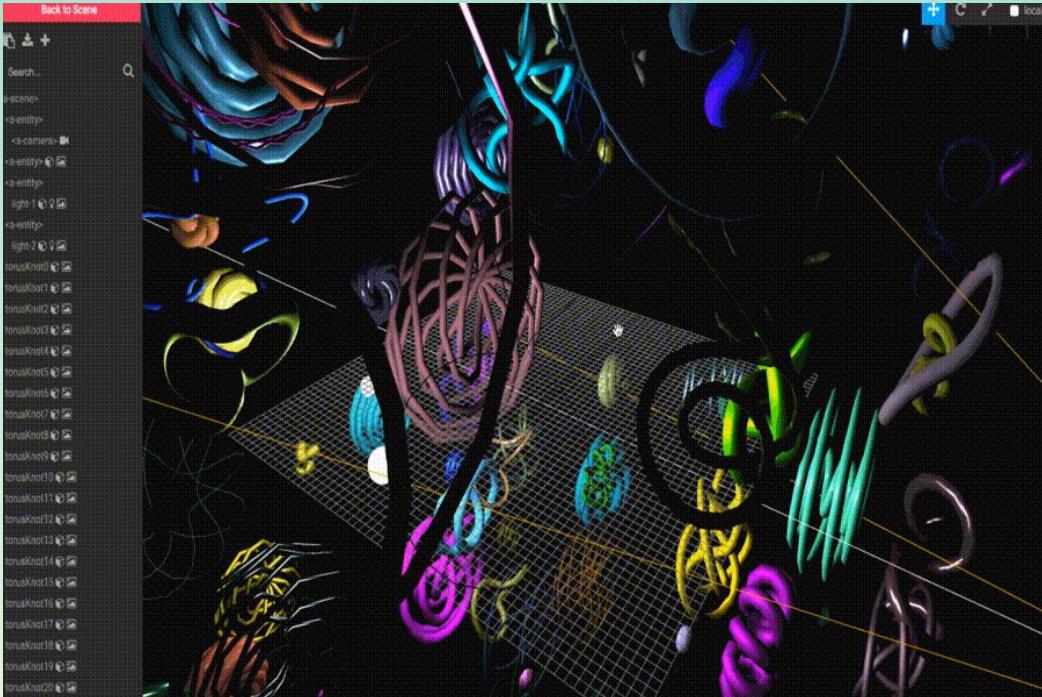


flat experiences

VR experiences

Features

- VR made simple
- Declarative HTML
- Cross Platform
- Entity-Component Architecture
- Visual Inspector
- Registry
- Components

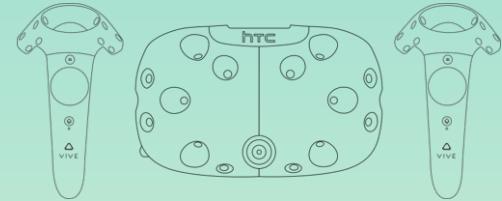




Google VR SDK
(iOS/Android/Unity)



Oculus Mobile SDK



Viveport SDK
(Android/Windows)

A-Frame

WebVR



SAMSUNG Gear VR



Google Cardboard



Daydream



oculus



VIVE



HoloLens



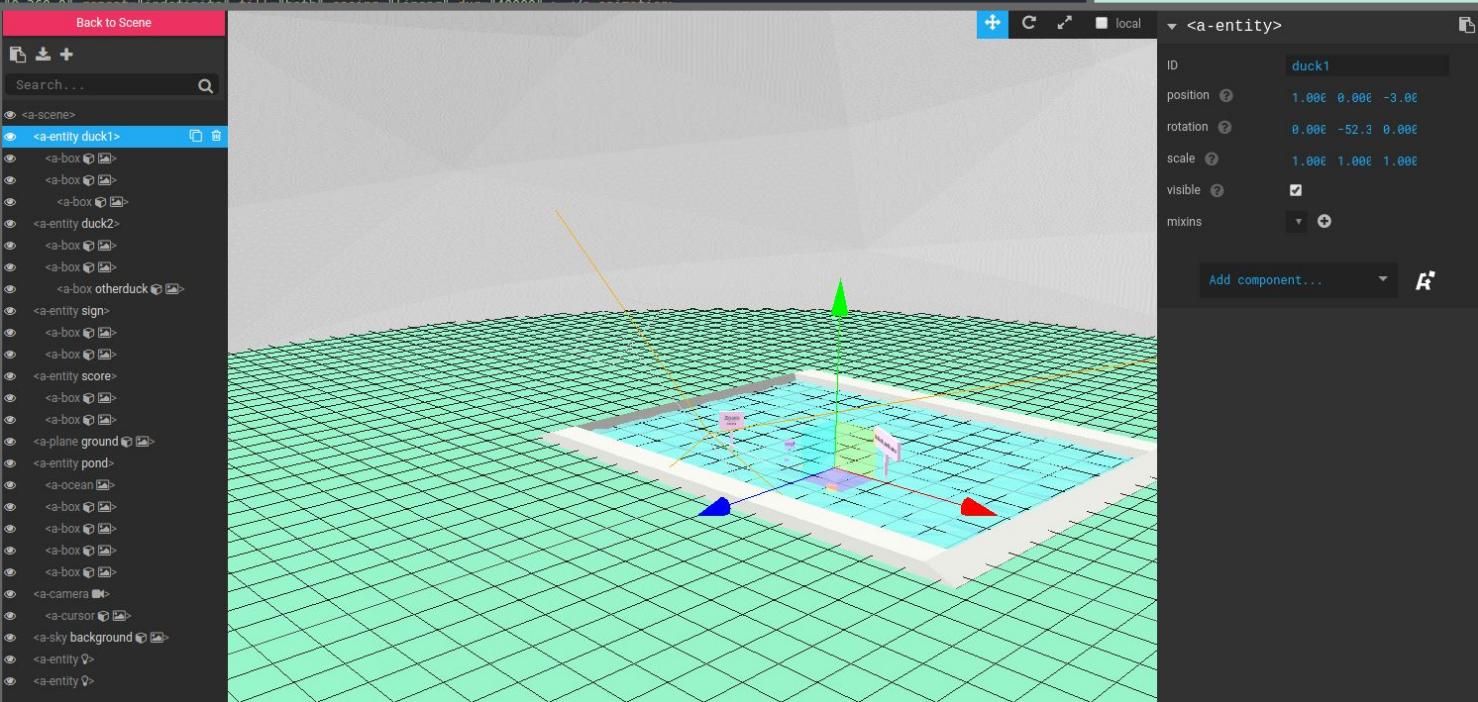
* ✓ Compatible with WebVR

source: webvr.rocks

```

66
67 <a-assets>
68   
69 </a-assets>
70
71 <a-entity id="duck1" position="1 0 -3">
72   <a-box color="#fdfdf9" scale="0.1 0.1 1"> </a-box>
73   <a-animation attribute="rotation" to="0 -360 0" repeat="indefinite" fill="both" easing="linear" dur="30000"> </a-animation>
74   <a-box color="#fdfdf9" scale="0.1 0.1 1" position="0 0 1">
75     <a-animation attribute="rotation" to="0 360 0" easing="linear" dur="4000" begin="mouseenter"> </a-animation>
76     <a-box color="#fdfdf9" position="20 0 -10" change-color-on-hover="color: white" scale="2 3 3" collision-check="el: #otherduck; radius: 0.15; other-radius: 0.15;"> </a-box>
77   </a-box>
78 </a-entity>
79
80 <a-entity id="duck2" position="-1.2 0 -3.3">
81   <a-box color="#ca96fd" scale="0.1 0.1 1"> </a-box>
82   <a-animation attribute="rotation" to="0 -360 0" repeat="indefinite" fill="both" easing="linear" dur="30000"> </a-animation>
83   <a-box color="#ca96fd" scale="0.1 0.1 1" position="0 0 1">
84     <a-animation attribute="rotation" to="0 360 0" easing="linear" dur="4000" begin="mouseenter"> </a-animation>
85     <a-box id="otherduck" color="#ca96fd" position="20 0 -10" change-color-on-hover="color: white" scale="2 3 3" collision-check="el: #duck1; radius: 0.15; other-radius: 0.15;"> </a-box>
86   </a-box>
87 </a-entity>
88
89 <a-entity id="sign" position="2.5 1 -3">
90   <a-animation attribute="rotation" to="0 360 0" repeat="indefinite" fill="both" easing="linear" dur="30000"> </a-animation>
91   <a-box color="#fed6fa" position="0 0 0.5" scale="0.5 0.5 0.5" rotation="0 0 0"> </a-box>
92   <a-box color="#fed6fa" position="0 0 0.5" scale="0.5 0.5 0.5" rotation="0 0 0"> </a-box>
93 </a-entity>
94
95 <a-entity id="score" position="-2.5 1 -3">
96   <a-animation attribute="rotation" to="0 360 0" repeat="indefinite" fill="both" easing="linear" dur="30000"> </a-animation>
97   <a-box color="#fed6fa" position="0 0 0.5" scale="0.5 0.5 0.5" rotation="0 0 0"> </a-box>
98   <a-box color="#fed6fa" position="0 0 0.5" scale="0.5 0.5 0.5" rotation="0 0 0"> </a-box>
99 </a-entity>
00

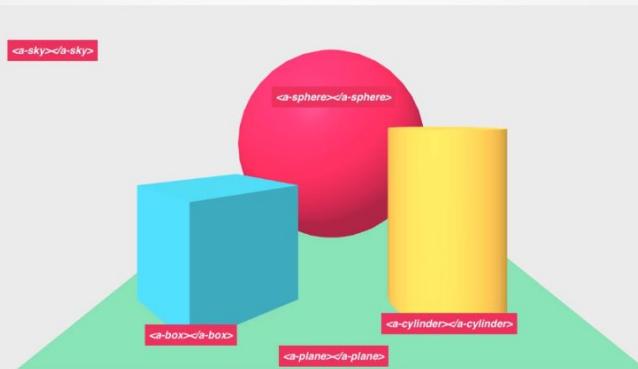
```



Start with *Hello, WebVR*

A-Frame provides easy-to-use HTML elements for starters called [primitives](#). In the sections below, we'll modify basic meshes through HTML attributes (e.g., change colors, positions, rotations, scale) and get a feel for the workflow.

```
<a-scene> HTML attribute name HTML attribute value
  <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a-box>
</b> HTML element name Opening tag
```

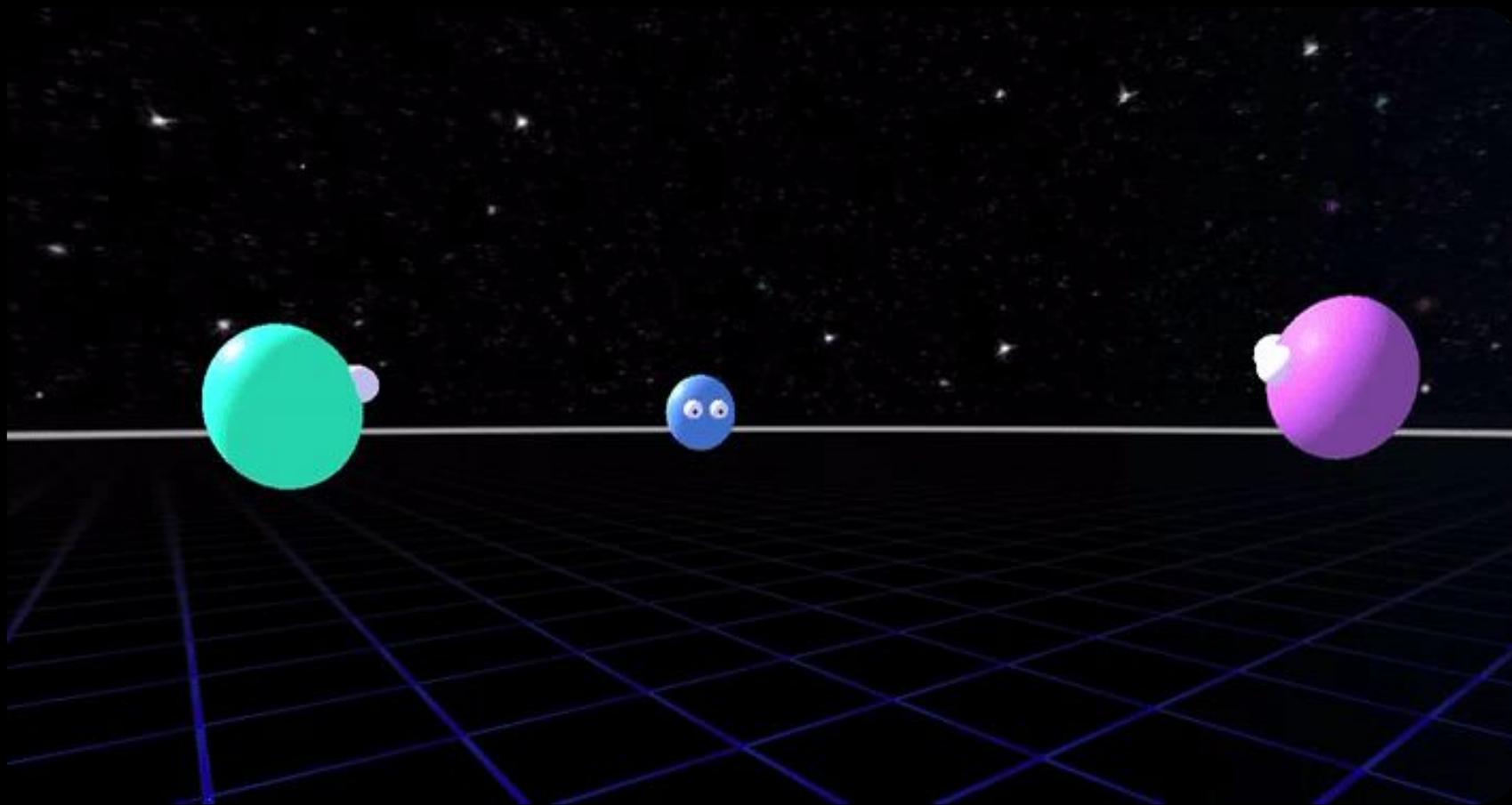


<https://aframe.io/aframe-school/>

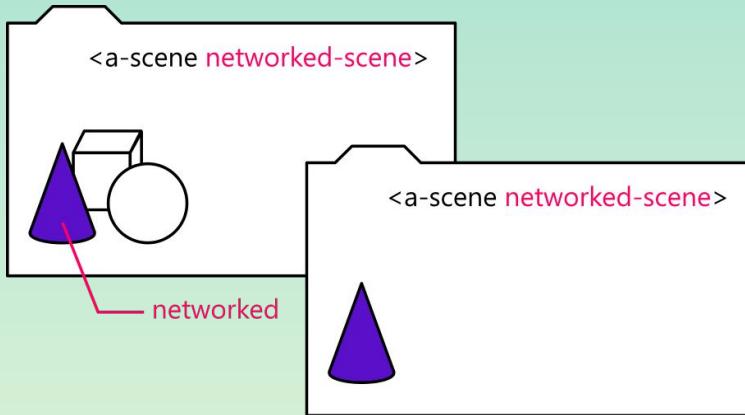


NETWORKED A-FRAME

<https://github.com/haydenjameslee/networked-aframe>



How does it work?



Uses a 'networked-scene' system for the scene identifying sessions by 'app' and 'room'.

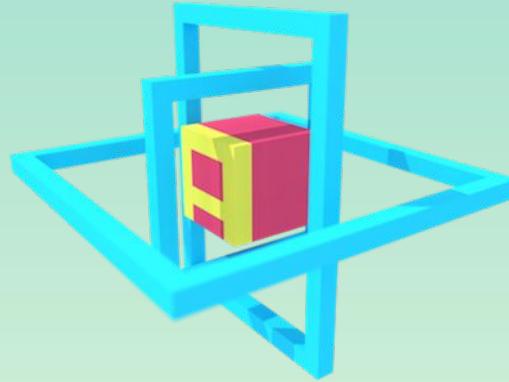
Uses a 'networked' component on entities to sync them.

Utilizes templates to represent the networked entity.

It can broadcast messages to connected peers.

Based in WebRTC / WebSockets and PEER.js



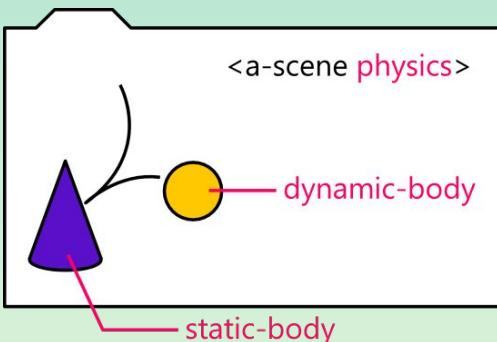


• A-FRAME PHYSICS SYSTEM

<https://github.com/donmccurdy/aframe-physics-system>



How does it work?



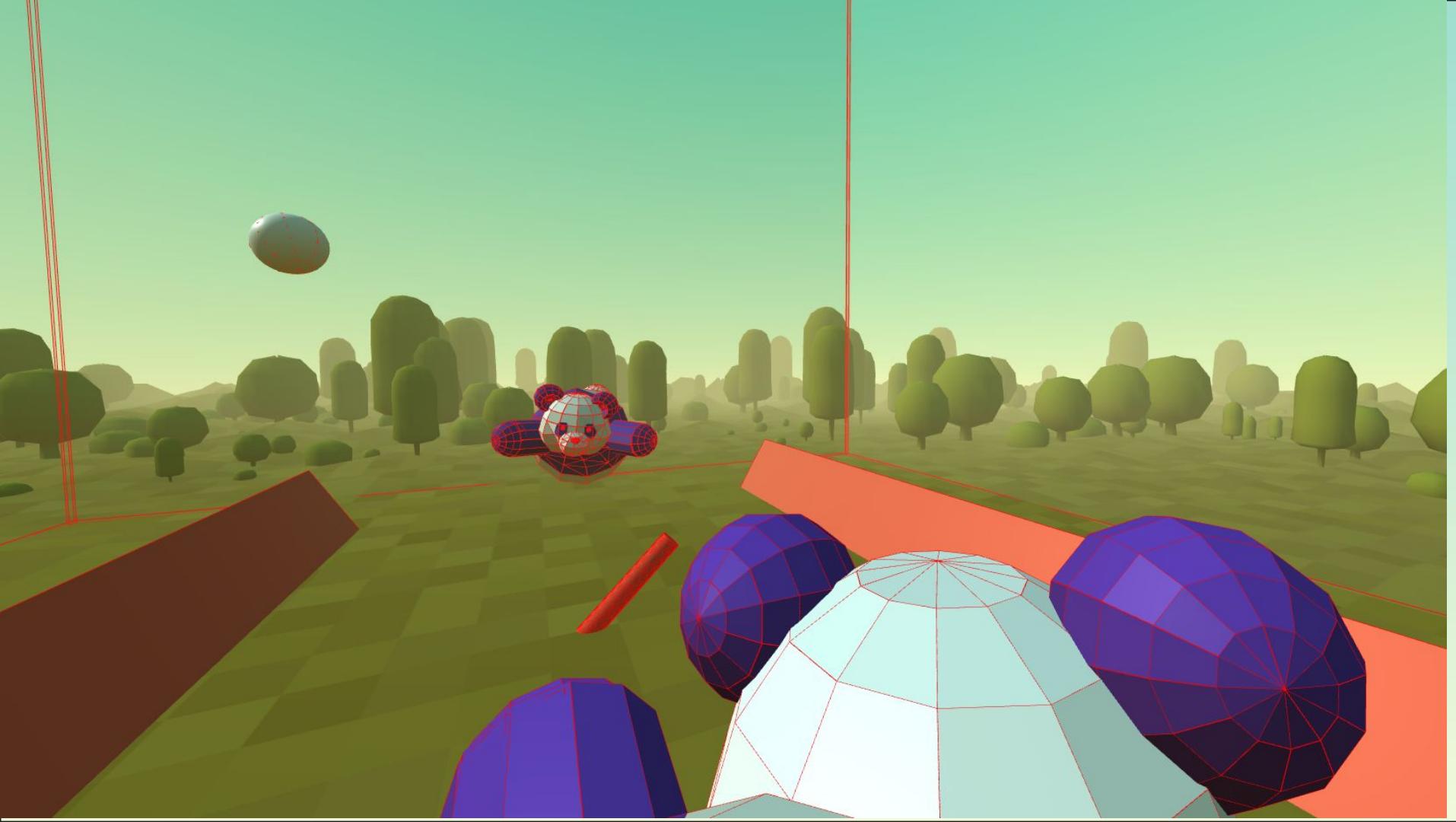
Uses a 'physics' system for the scene managing objects, their rendering and physics simulation.

Uses a 'static-body' component on entities that don't react to physics but interact with them.

Utilizes a 'dynamic-body' component for entities that are affected by physics (gravity, friction, ...).

It implements collision detection.

Based in CANNON.js



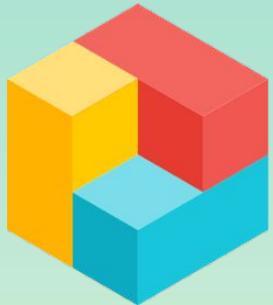
Web Audio

<http://bit.ly/webaudio-api>



Different sources like media from page, live mic streams, oscillator sounds

Panning effects for spatialized sound

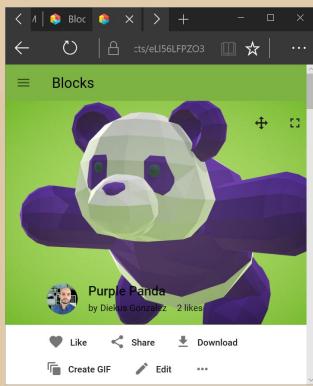
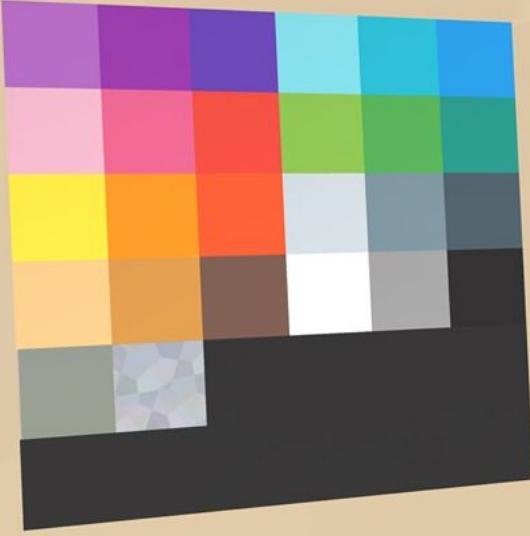


Blocks, blender, Paint 3D, A-Painter...

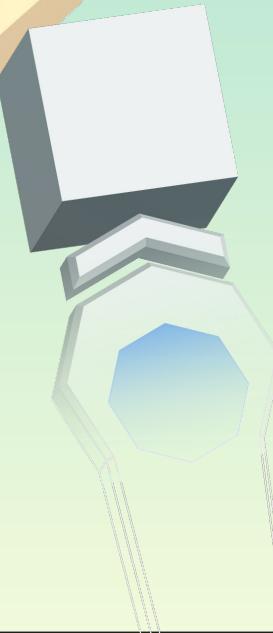
<https://vr.google.com/blocks/>



Build beautiful models for your VR content using VR ☺



<https://vr.google.com/objects/eLI56LFPZO3>



Google ❤



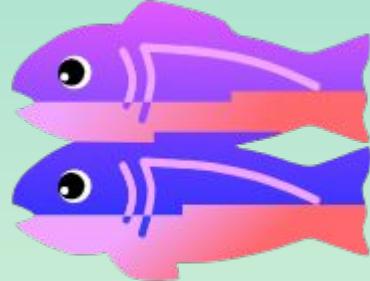
Daydream 2.0 Euphrates



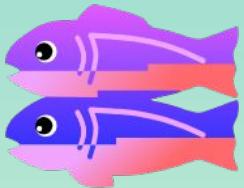
Google Cardboard

JUMP





<https://glitch.com>



Code in one tab - See the results live in another

wooden-pasta Show Live Live

Share 4

Logs

+ New File

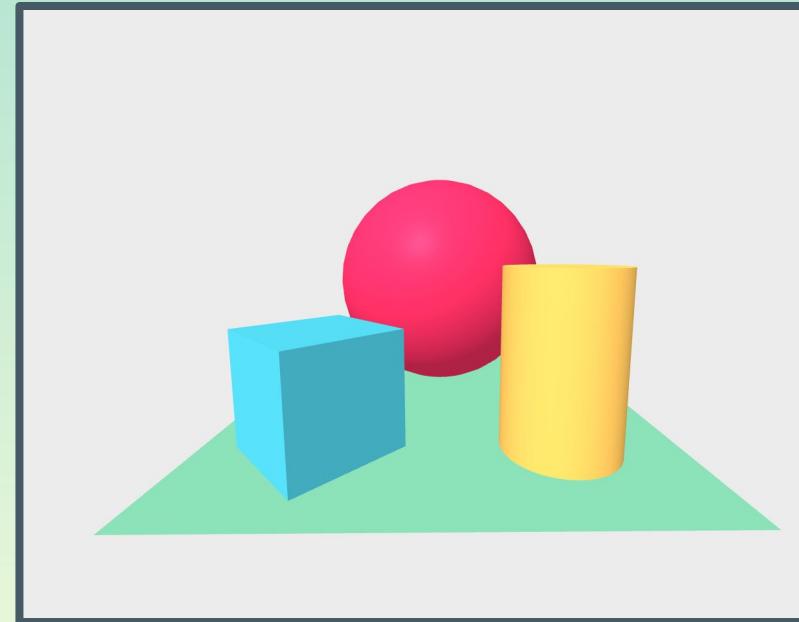
assets .env

index.html ▼

README.md

solution.html

```
1  <!DOCTYPE html>
2  <html>
3    <head>
4      <title>Hello, WebVR! - A-Frame</title>
5      <meta name="description" content="Hello, WebVR! - A-Frame">
6      <script src="https://aframe.io/releases/0.5.0/aframe.min.js"></sc
7    </head>
8    <body>
9      <a-scene>
10        <a-box position="-1 0.5 -3" rotation="0 45 0" color="#4CC3D9"></a
11        <a-sphere position="0 1.25 -5" radius="1.25" color="#EF2D5E"></a
12        <a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color="#
13        <a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4"
14        <a-sky color="#ECECEC"></a-sky>
15      </a-scene>
16    </body>
17  </html>
```





JavaScript

Adding custom scripts to A-Frame

```
AFRAME.registerComponent('foo', {  
  schema: {...},  
  
  init: function () {  
    // Do something when component is plugged in  
  },  
  
  tick: function () {  
    // runs every frame  
  }  
});
```

```
AFRAME.registerComponent('game-setup',{
  init:function(){
    window.setTimeout(function(){
      let p = null;
      let scene = document.querySelector('a-scene');
      switch(NAF.c.network.connectedClients.length){
        case 0:
          p = this.createPlayer();
          p.setAttribute('position','0 3 9');
          document.querySelector('a-scene').setAttribute('spawn-balls', 'start', 'true');
          break;
        case 1:
          p = this.createPlayer();
          p.setAttribute('position','0 3 -9');
          //second player joins, balls can start coming out
          document.querySelector('a-scene').setAttribute('spawn-balls', 'start', 'true');
          break;
        default:
          p = this.createSpectator();
          p.setAttribute('position','5 10 15');
        }
        scene.appendChild(p);
      }, 3000);
    },
    tick:function(){
    },
    update:function(){
    }
});
```

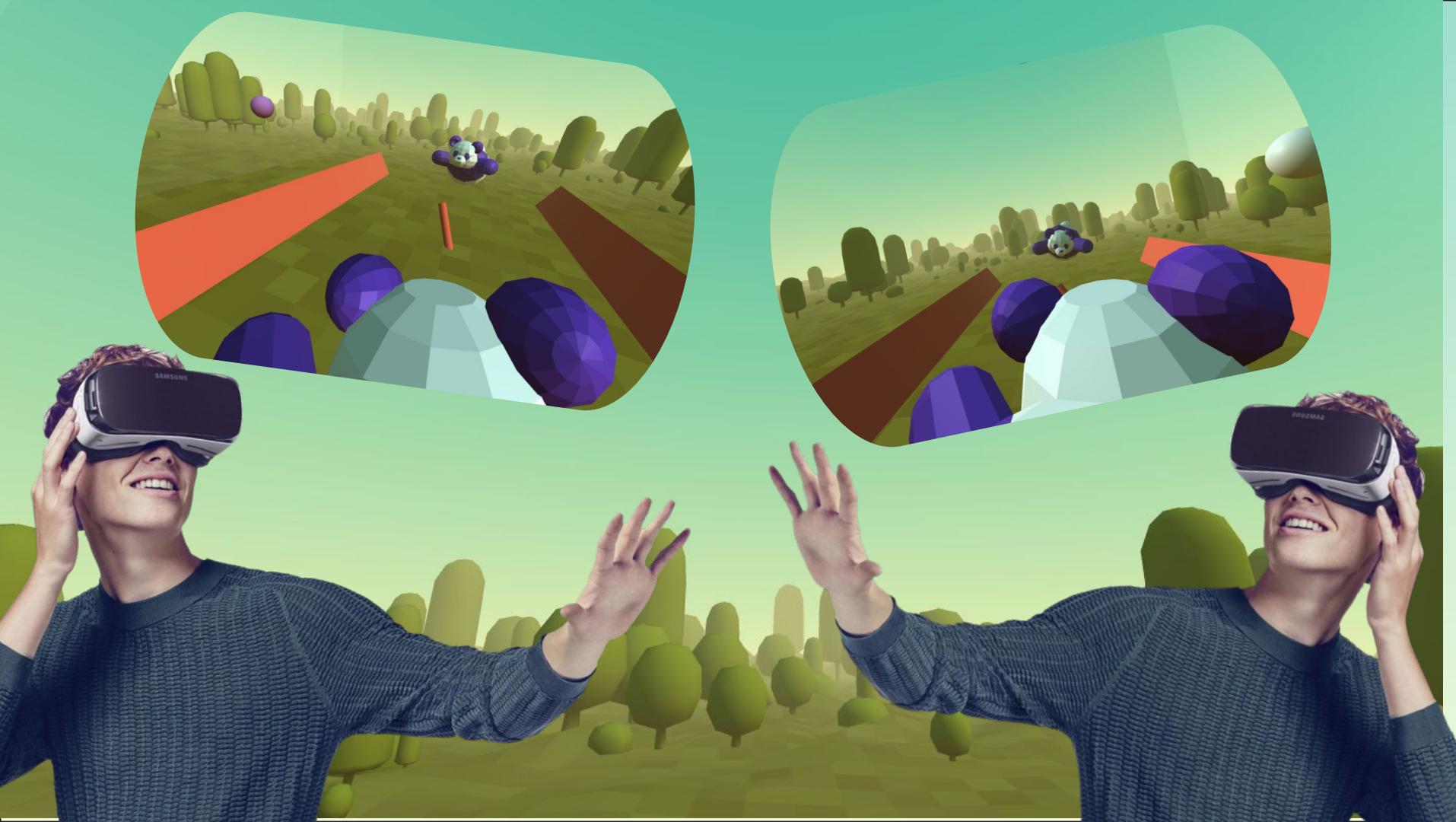




JS





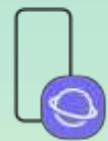


What about the Web on VR?

1- New browsers



Desktop browser

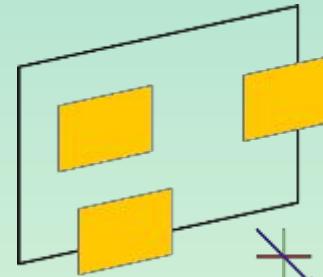


Mobile browser

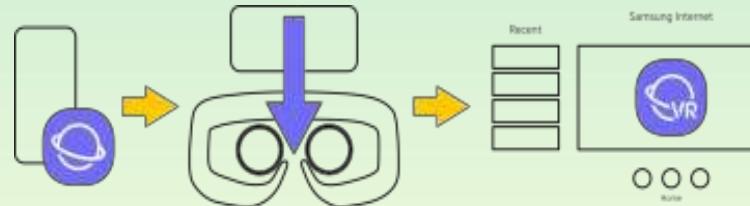


VR browser

3- New axis



2- New workflows





Augmented Reality





ARCore

vs.



ARKit

13:09



AR.js is here

Let's Build webAR

You now have the power to build worlds



Use it responsibly

Links

Code

<https://glitch.com/~hungry-pandas>

<https://aframe.io/>

<https://medium.com/samsung-internet-dev>

AR

<https://developers.google.com/ar/>

Slides

<https://github.com/GeekyShiva/VR-Workshop-and-Talks>

Questions?

 @shivank1995

 @GeekyShiva