Runtime DevTools for WebXR

Landscape of WebVR Developer Tools

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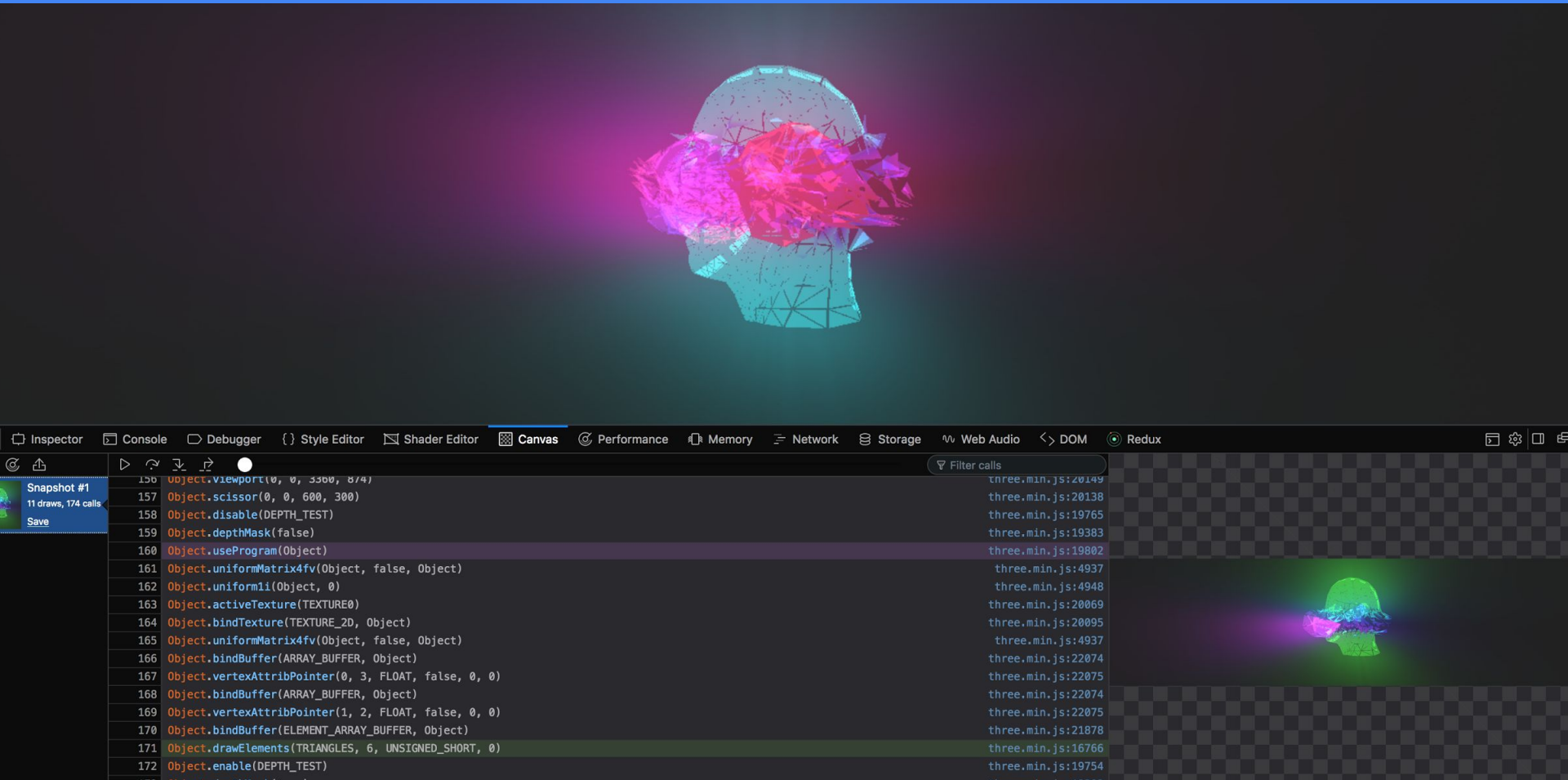
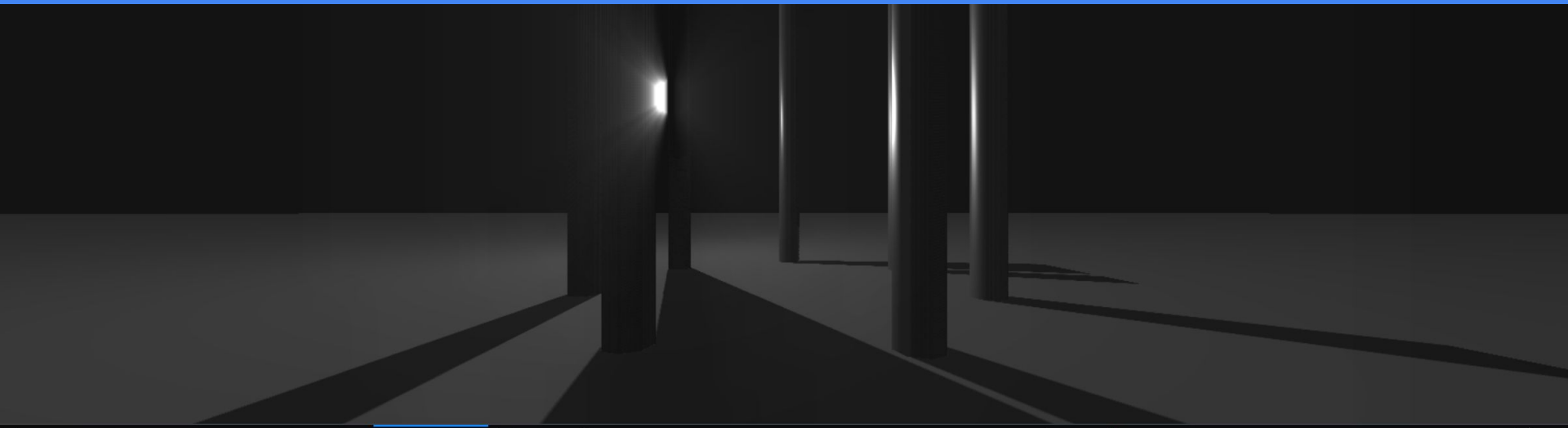
Classification

- Framework Agnostic
- Debugging platform features (WebVR, WebGL, etc)
- Debuggee requires no knowledge of tools

Firefox Developer Tools: Canvas Debugger



Firefox Developer Tools: Shader Editor



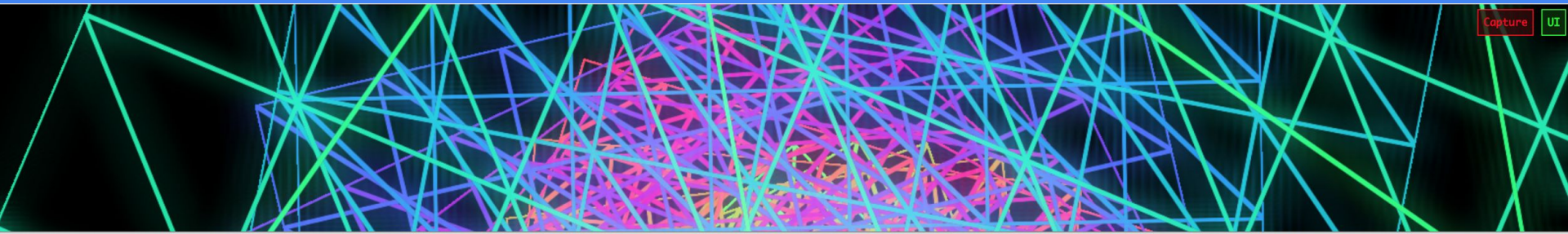
Inspector | Console | Debugger | Style Editor | **Shader Editor** | Canvas | Performance | Memory | Network | Storage | Web Audio | DOM | Redux

rogram 0
rogram 1
rogram 2
rogram 3
rogram 4
rogram 5

```
precision highp float;
precision highp int;
#define SHADER_NAME MeshDistanceMaterial
#define VERTEX_TEXTURES
#define GAMMA_FACTOR 2
#define MAX_BONES 0
#define BONE_TEXTURE
#define FLIP_SIDED
#define NUM_CLIPPING_PLANES 0
uniform mat4 modelMatrix;
uniform mat4 modelViewMatrix;
uniform mat4 projectionMatrix;
uniform mat4 viewMatrix;
uniform mat3 normalMatrix;
uniform vec3 cameraPosition;
attribute vec3 position;
attribute vec3 normal;
attribute vec2 uv;
#ifdef USE_COLOR
  attribute vec3 color;
#endif
#ifdef USE_MORPHTARGETS
  attribute vec3 morphTarget0;
  attribute vec3 morphTarget1;
```

```
precision highp float;
precision highp int;
#define SHADER_NAME MeshDistanceMaterial
#define GAMMA_FACTOR 2
#define FLIP_SIDED
#define NUM_CLIPPING_PLANES 0
#define UNION_CLIPPING_PLANES 0
uniform mat4 viewMatrix;
uniform vec3 cameraPosition;
#define TONE_MAPPING
#ifndef saturate
  #define saturate(a) clamp( a, 0.0, 1.0 )
#endif
uniform float toneMappingExposure;
uniform float toneMappingWhitePoint;
vec3 LinearToneMapping( vec3 color ) {
  return toneMappingExposure * color;
}
vec3 ReinhardToneMapping( vec3 color ) {
  color *= toneMappingExposure;
  return saturate( color / ( vec3( 1.0 ) + color ) );
}
#define Uncharted2Helper( x ) max( ( ( x * ( 0.15 * x + 0.10 * 0.50 ) + 0.20 * 0.02 ) / ( x * ( 0.15 *
vec3 Uncharted2ToneMapping( vec3 color ) {
```

WebGL Inspector



Trace | Timeline | State | Textures | Buffers | Programs

Frame Control: Normal | Slowed | Paused

Buffer 51
Buffer 52
Buffer 53
Buffer 54
Buffer 55
Buffer 56
Buffer 57
Buffer 58
Buffer 59
Buffer 60
Buffer 61
Buffer 62
Buffer 63
Buffer 64
Buffer 65
Buffer 66
Buffer 67
Buffer 68
Buffer 69
Buffer 70
Buffer 71
Buffer 72
Buffer 73
Buffer 74
Buffer 75
Buffer 76
Buffer 83
Buffer 84
Buffer 85

Buffer 63 / ARRAY_BUFFER

BUFFER_SIZE	768
BUFFER_USAGE	STATIC_DRAW

Preview Options

Mode: LINE_LOOP
Position Attribute: +0 / 3 * FLOAT
Element Array: Buffer 62
Element Type: UNSIGNED_SHORT
Start: 0
Count: 294

Structure (from last draw)

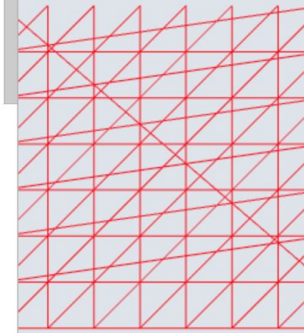
offset	size	type	stride	normalized
0	3	FLOAT	0	false

History

bufferData(ARRAY_BUFFER, [-0.5,0.5,0,-0.3571428656578064,0.5,0,-0.2142857164144516,0.5,0,-0.0714285746216774,0.5,0,0.0714285746216774,0.5,0,0.2142857164144516,0.5,

Usage in frame 717

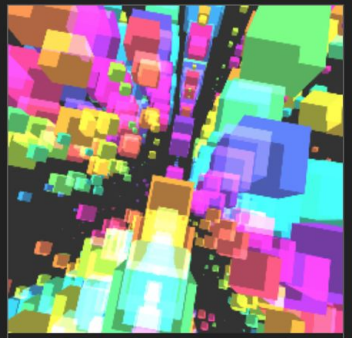
38 bindBuffer(ARRAY_BUFFER, [Buffer 63])



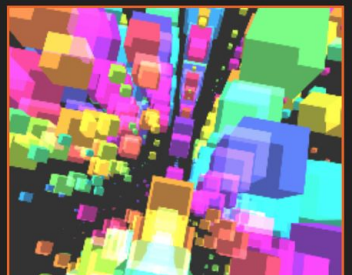
spector.js

Search... X | Captures | Information | Init State | Commands (7204) | End State

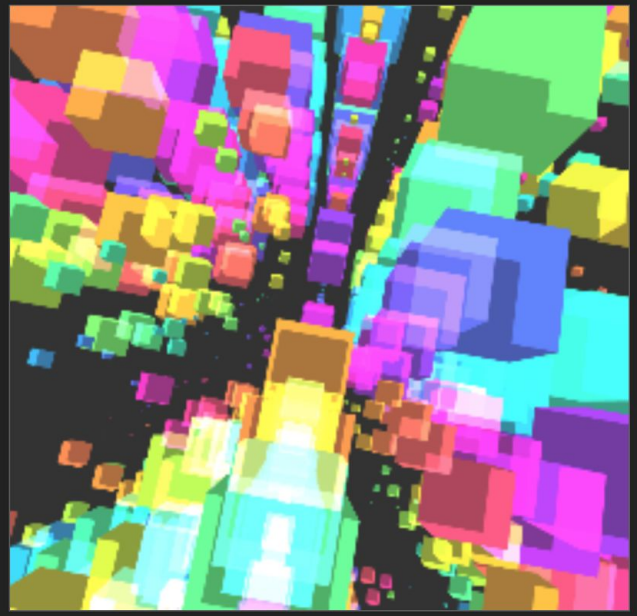
Canvas frame buffer



Canvas frame buffer



drawElements: TRIANGLES, 36, UNSIGNED_SHORT, 0 Vertex Fragment
useProgram: WebGLProgram - ID: 0
uniformMatrix4fv: WebGLUniformLocation - ID: 0, false, [..(16)..]
uniformMatrix4fv: WebGLUniformLocation - ID: 1, false, [..(16)..]
uniform4fv: WebGLUniformLocation - ID: 2, [..(4)..]
bindBuffer: ARRAY_BUFFER, WebGLBuffer - ID: 1472
vertexAttribPointer: 0, 3, FLOAT, false, 0, 0
bindBuffer: ELEMENT_ARRAY_BUFFER, WebGLBuffer - ID: 1473
drawElements: TRIANGLES, 36, UNSIGNED_SHORT, 0 Vertex Fragment
useProgram: WebGLProgram - ID: 0
uniformMatrix4fv: WebGLUniformLocation - ID: 0, false, [..(16)..]
uniformMatrix4fv: WebGLUniformLocation - ID: 1, false, [..(16)..]
uniform4fv: WebGLUniformLocation - ID: 2, [..(4)..]
bindBuffer: ARRAY_BUFFER, WebGLBuffer - ID: 1474
vertexAttribPointer: 0, 3, FLOAT, false, 0, 0
bindBuffer: ELEMENT_ARRAY_BUFFER, WebGLBuffer - ID: 1475
drawElements: TRIANGLES, 36, UNSIGNED_SHORT, 0 Vertex Fragment
useProgram: WebGLProgram - ID: 0
uniformMatrix4fv: WebGLUniformLocation - ID: 0, false, [..(16)..]



Canvas frame buffer

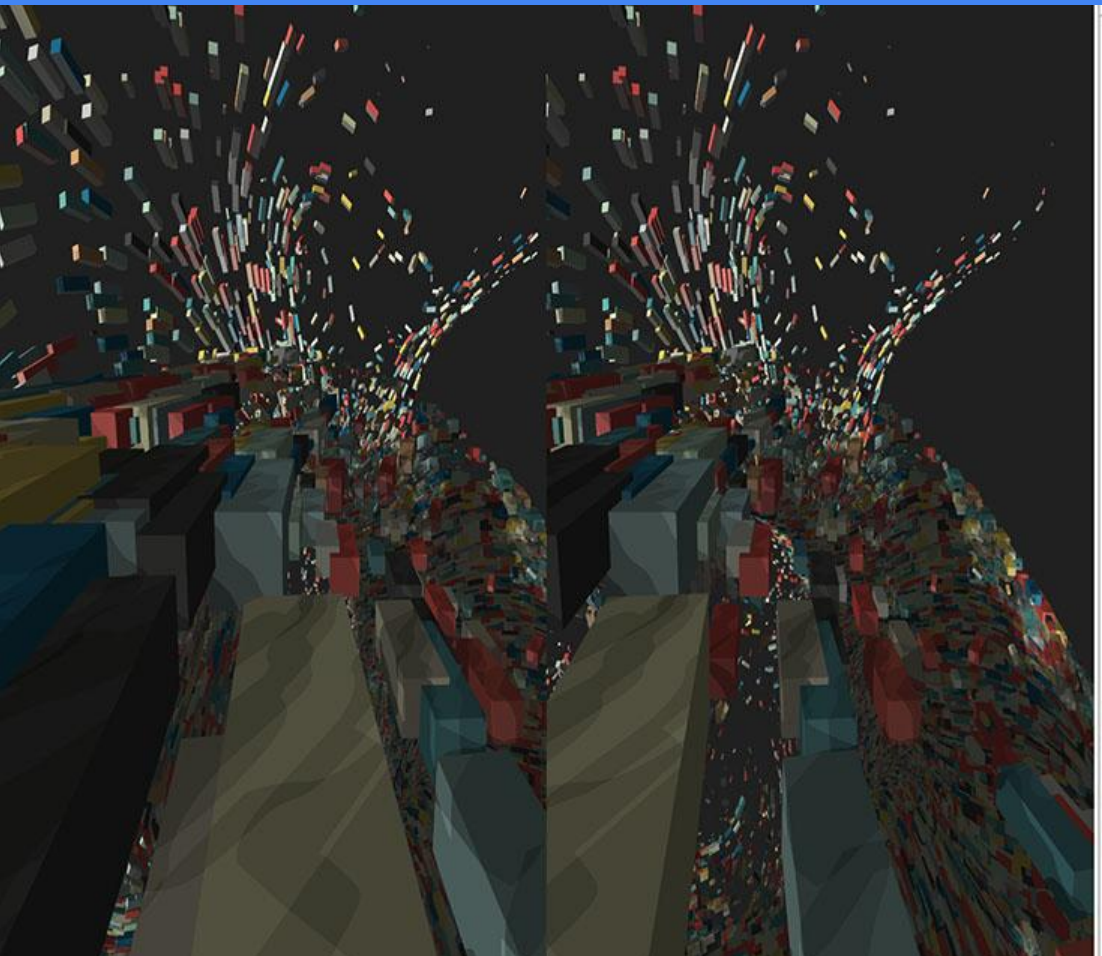
Global

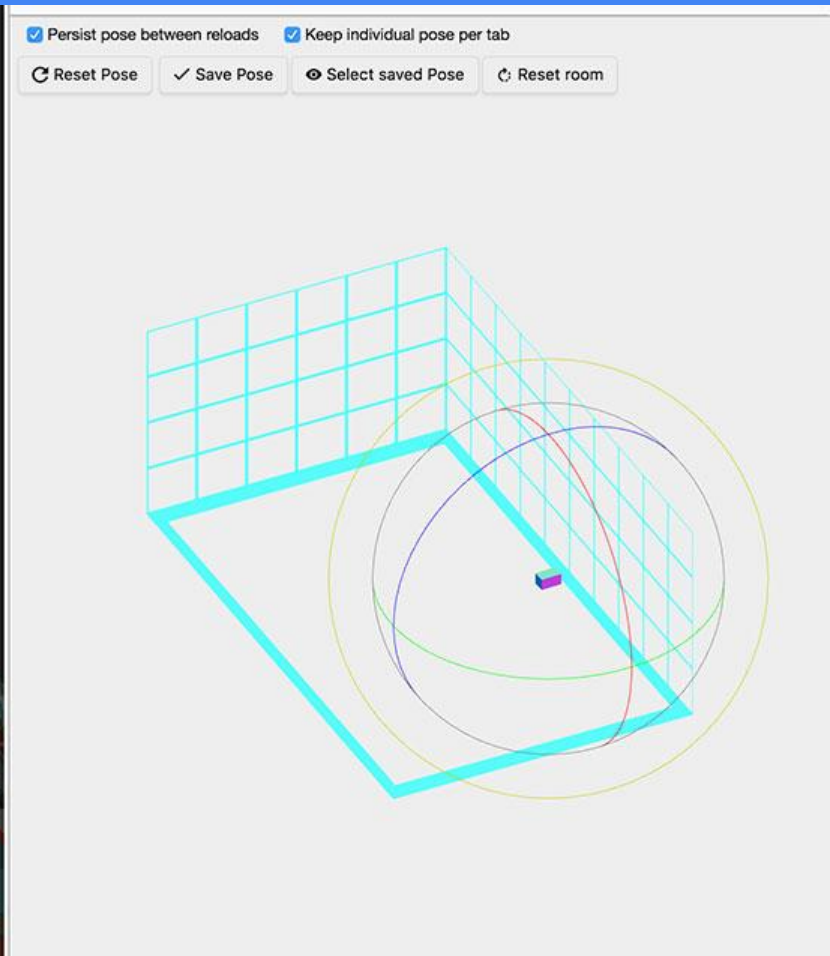
name: drawElements (Open help page)
duration: 0.0100
status: Unknown

Command Arguments

0: 4

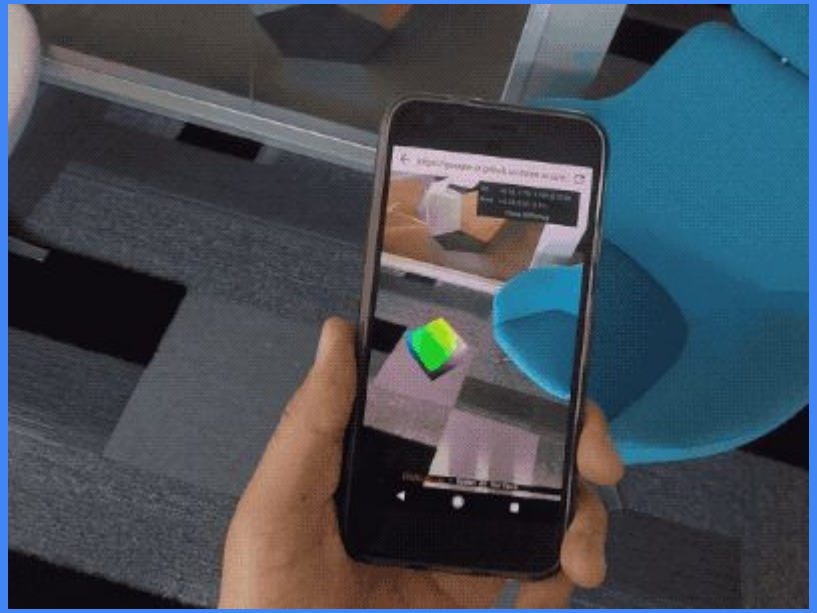
WebVR Extension



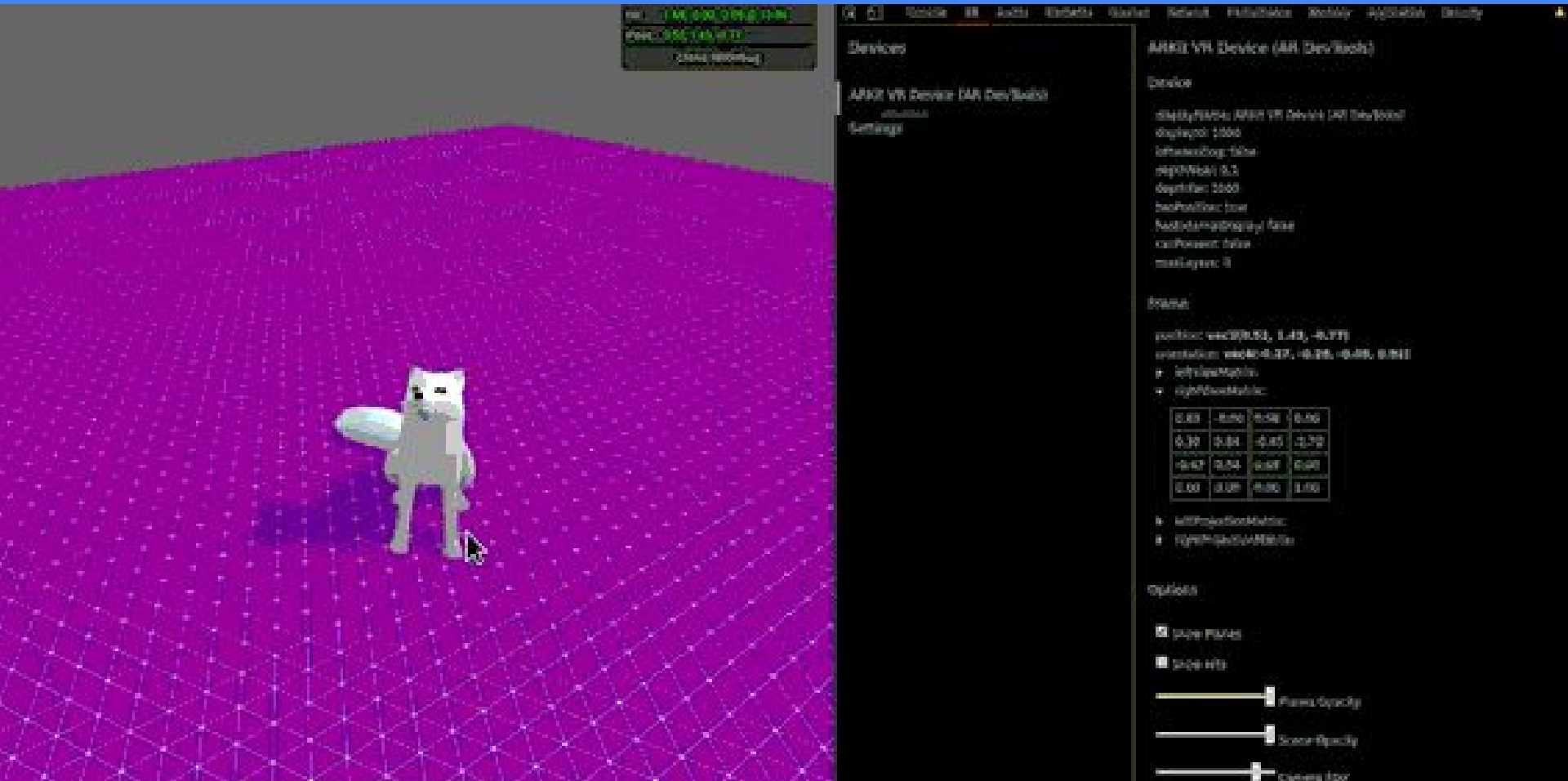


WebAR Prototypes

WebARonARKit
WebARonARCore
three.ar.js



XR DevTools prototype



Thanks!

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