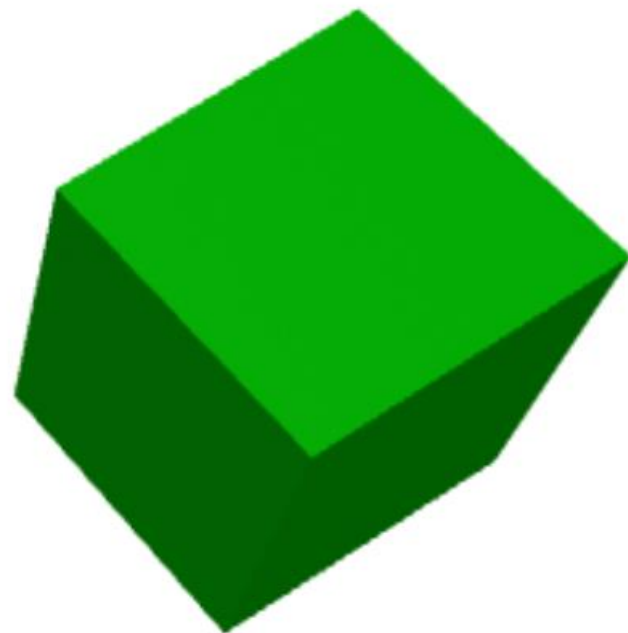
The background of the slide is a light gray grid with various geometric shapes and lines. On the left side, there is a cluster of colorful squares (magenta, green, black, purple, orange, blue, and olive) of different sizes, some with black outlines and shadows, connected by thin black lines. On the right side, there is a more sparse arrangement of similar shapes in various colors (pink, light blue, light green, light orange, light purple, and light gray) scattered across the grid.

AR/VR Workshop

Basic geometric objects

Phillip G. Bradford
University of Connecticut

Module demo highlights: 3D geometric shapes



Outline

A-frame scenes

Basic A-frame geometric objects

New web tab:

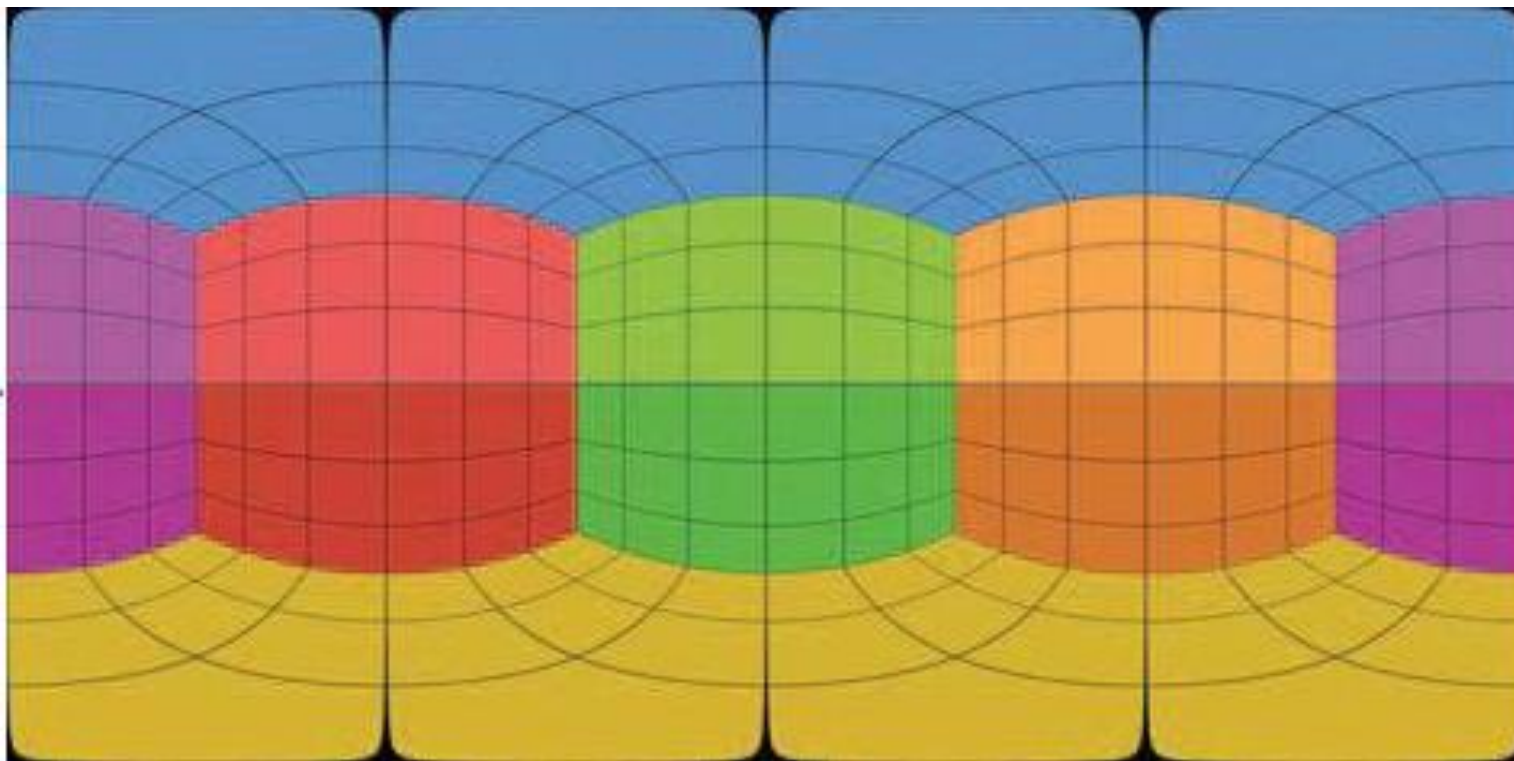
https://www.w3schools.com/colors/colors_picker.asp

3D images

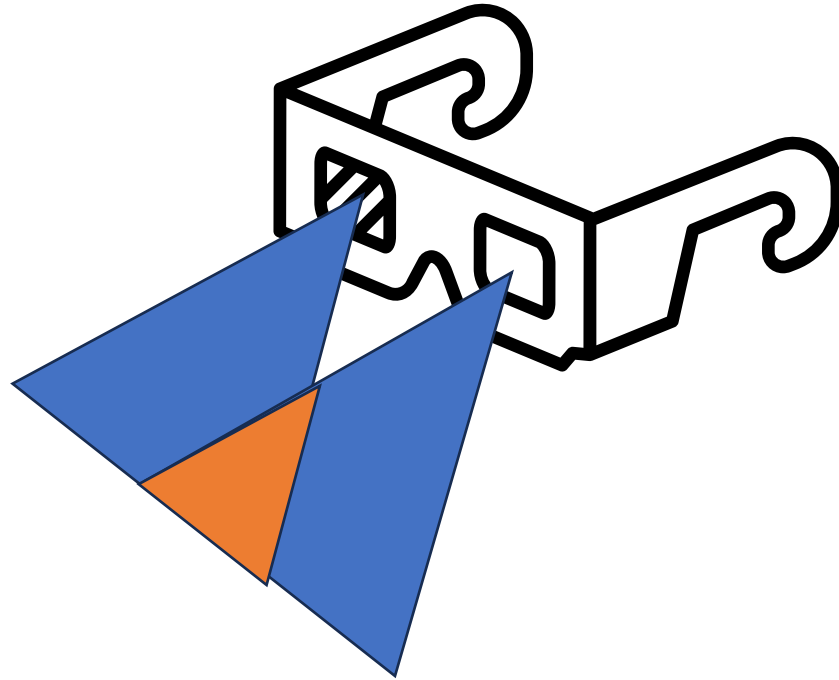
2D images most common

https://en.wikipedia.org/wiki/VR_photography

VR Images



Viewing VR Images



Field-of-vision intersection 60°

Field-of-vision = 110° left 110° right – 60° intersection

Scenes and geometric objects

Primitive	What	Link
a-scene	Global root object contains all entities	https://aframe.io/docs/1.4.0/core/scene.html
a-text	Text	https://aframe.io/docs/1.4.0/primitives/a-text.html
a-box	3D Box	https://aframe.io/docs/1.4.0/primitives/a-box.html
a-cylinder	3D cylinder	https://aframe.io/docs/1.5.0/primitives/a-cylinder.html
a-plane	2D plane	https://aframe.io/docs/1.5.0/primitives/a-plane.html
a-sphere	3D Sphere	https://aframe.io/docs/1.4.0/primitives/a-sphere.html

Geometric terms

Mesh or geometry

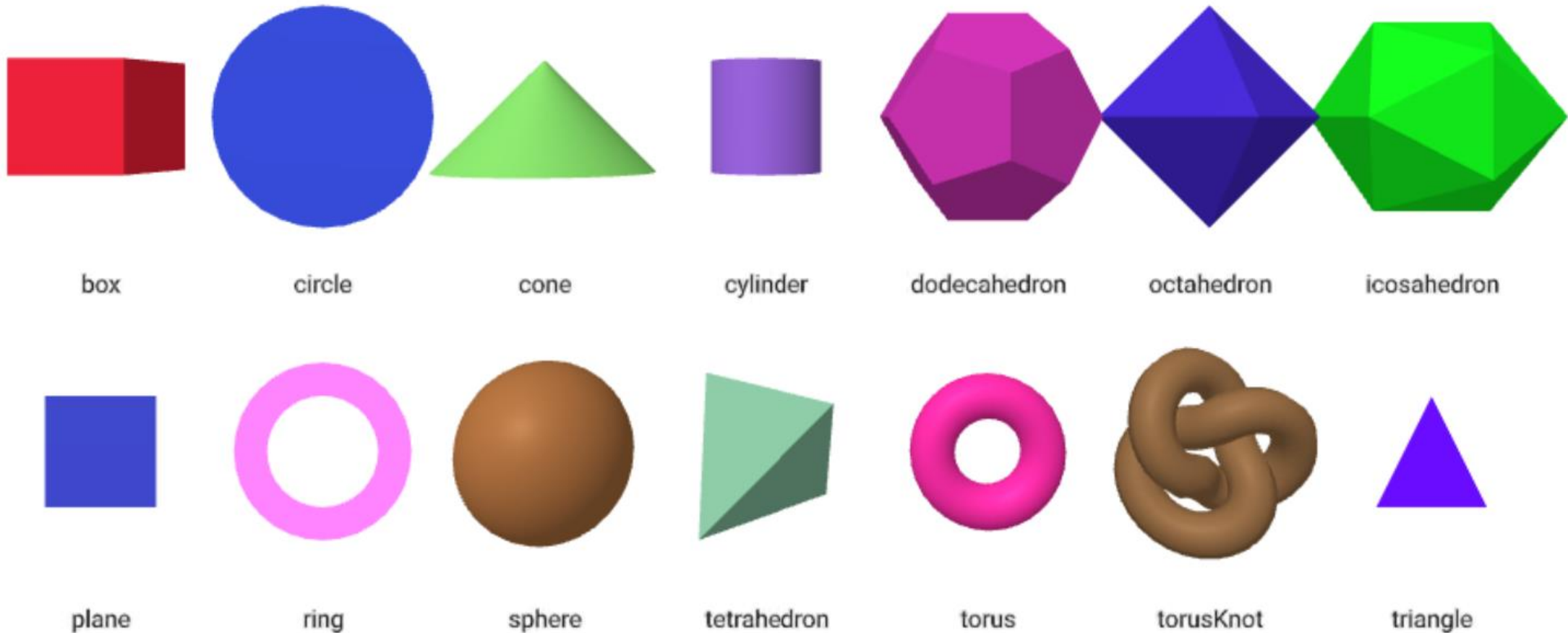
Vertices, edges and faces defining a 3D object

Texture

Color and appearance of a surface

Full representation: mesh and texture

Pre-defined A-Frame geometries



Textures

Another tab

<https://github.com/aframevr/sample-assets/tree/master/assets/images>

Make our own src="..."

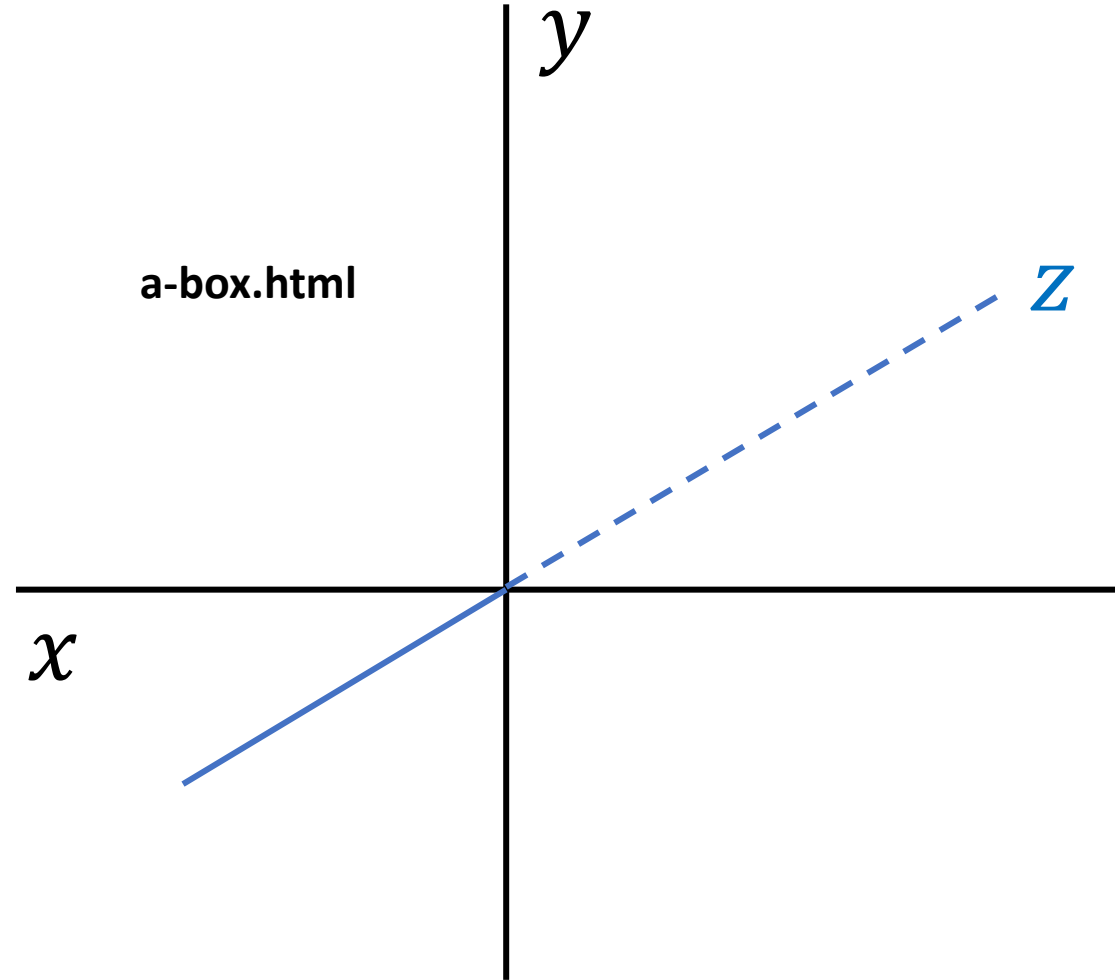
A-box – in a scene

```
<a-box position="1.5 1 -2.0">  
</a-box>
```

x: pitch

y: yaw

z: roll



A-box

```
<html>
  <head>
    <script src="https://aframe.io/releases/1.4.1/aframe.min.js"></script>
  </head>
  <body>
    <a-scene>
      <a-box position="1.5 1 -2.0" color="red"></a-box>
    </a-scene>
  </body>
</html>
```

Design/debug

CTRL-ALT-I in browser for debugging

ID	PGB box		
class			
position	0.000	2.000	-1.500
rotation	90.00	0.000	0.000
scale	1.000	1.000	1.000
visible	<input checked="" type="checkbox"/>		

Full visual representation = mesh + texture

<https://www.shadedrelief.com/natural3/pages/textures.html>

[a-sphere.html](#)

```
<a-scene>  
  <a-sphere position="0 3 -5" src="./IMAGES/waternormals.jpg"  
    radius="1">  
  </a-sphere>  
  
</a-scene>
```

Full visual representation = mesh + texture

A-box

```
<a-scene>
```

```
  <a-assets>
```

```
    
```

```
  <a-box position="0 3 -5" src="#boxTexture" radius="1"></a-box>
```

```
</a-scene>
```

Several geometric components

<a-box position="-1 0.5 -3" rotation="0 45 0" color="red"></a-box>

<a-sphere position="0 1.25 -5" radius="1.25" color="blue"></a-sphere>

<a-sky color="#e9f7ff "></a-sky>

Famous: Several geometric components

```
<a-box position="-1 0.5 -3" rotation="0 45 0" color="red">
```

```
</a-box>
```

```
<a-sphere position="0 1.25 -5" radius="1.25" color="blue">
```

```
</a-sphere>
```

```
<a-cylinder position="1 0.75 -3" radius="0.5" height="1.5" color="purple">
```

```
</a-cylinder>
```

```
<a-plane position="0 0 -4" rotation="-90 0 0" width="4" height="4"  
color="3cb371"></a-plane>
```

```
<a-sky color="#e9f7ff "></a-sky>
```

