

Future Trends

The web in 3D

Until now...

We have seen the web in a *static* way

All the content is a “*two dimensional*” content



Until now...

We have seen the web in a *static* way

All the content is a “*two dimensional*” content



Making the web a big
flatland world

Simulate a third dimension

We can already *simulate* a third dimension on a display

And also pretty well...



Making the Web 3D

*But **WHY** and **HOW** should
we make the **web** 3D?*

Making the Web 3D... Why?



*It is pretty
cool*

it is already powerful

*it is “potentially”
cross-platform*

Making the Web 3D... Why?

I remember,

Let's share our memories
and make sure this website does not disappear.

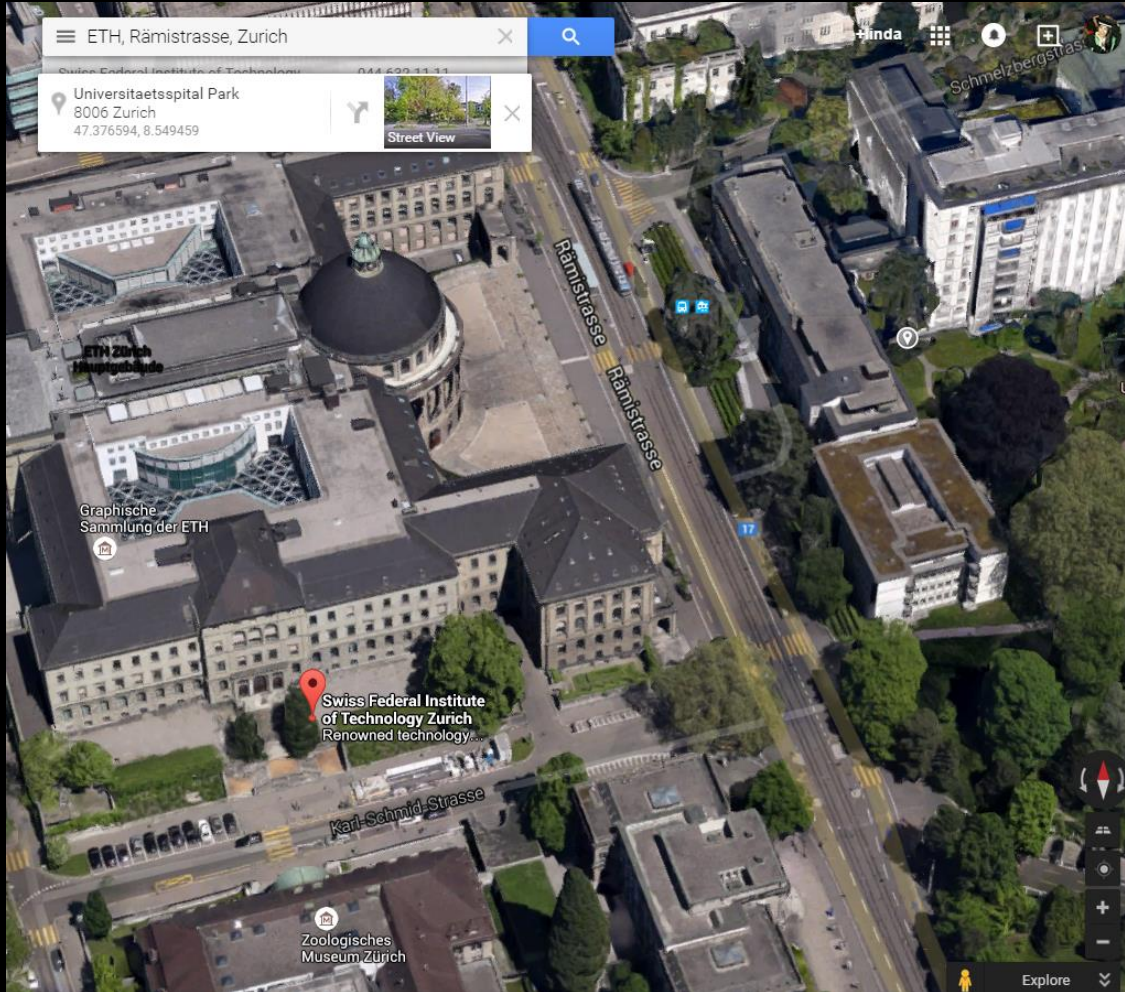
14%
1%
FALSE FROM
MEMORIES



*it creates an
experience*

that is harder to forget

Making the Web 3D... Why?



*it adds
information*

*adding a third
dimension
adds “content”*

Making the Web 3D... How?



Making the Web 3D... How?

Unreal Engine

You can now create your graphic 2 or 3D application with unreal engine and then *port* it into the web application



Making the Web 3D... How?

Unreal Engine

With the combination of **Emscripten** and **asm.js**, developers can compile C++ code into JavaScript

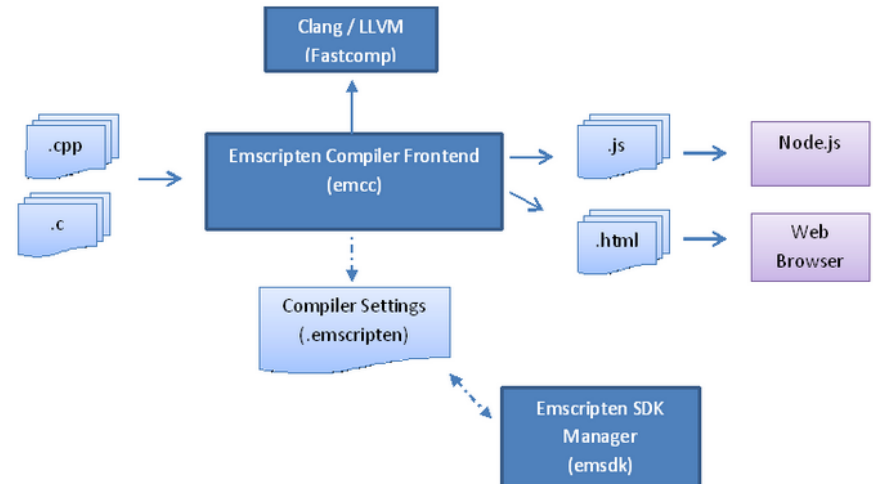
asm.js

It is a subset of JavaScript, the industry-standard language that runs in all web browsers

Designed to be very easy to optimize

Emscripten

Open source compiler from C/C++ to asm.js



Making the Web 3D... How?

Unreal Engine

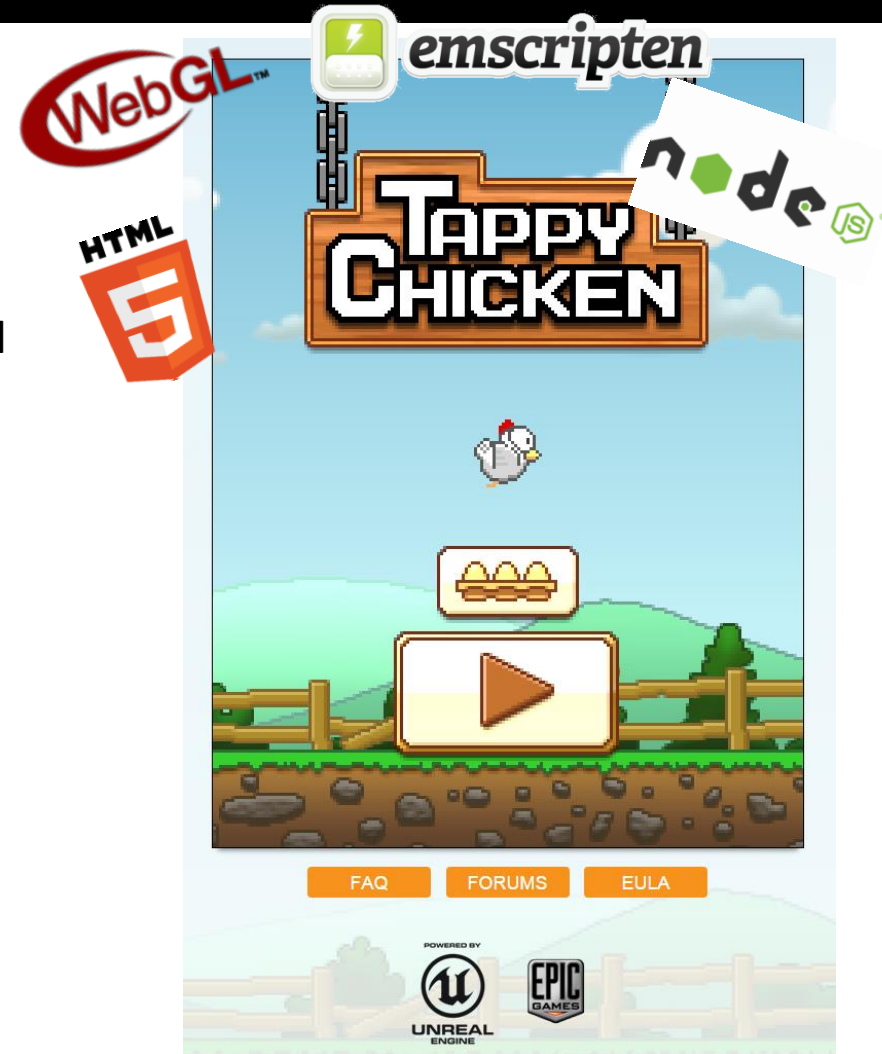
Still under development

Currently, it is not cross-platform

It is necessary to have some knowledge on unreal and C/C++

But the *unreal* community is pretty big and helpful

It could sound as an *overkill*



Making the Web 3D... How?


WebGL



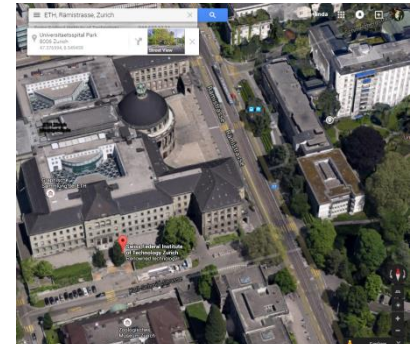
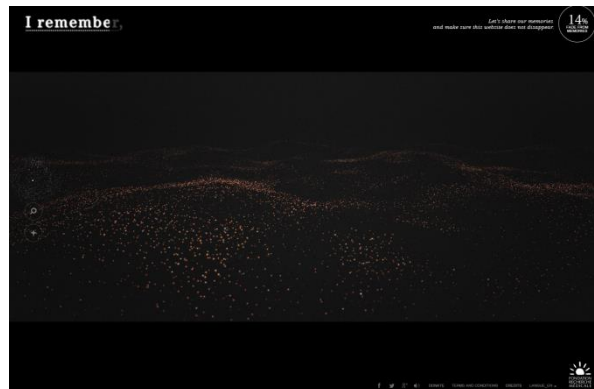
WebGL (Web Graphics Library) is a JavaScript API for rendering 3D and 2D computer graphics

It is based on OpenGL ES 2.0

It works without using any additional plugins and mostly on all browsers (mobile and desktop)

Its *output* is inserted in a HTML5 canvas 

WebGL elements can be used together with all the other HTML tags



Making the Web 3D

WebGL – three.js

To help developers in creating 3 or 2D applications, plugins for WebGL has been built

With three.js you can create web applications using WebGL in an easier way

Let's create a simple example using three.js

The logo for three.js, featuring the text "three.js" in a stylized, lowercase font. The "three" is in a dark blue color, and ".js" is in a lighter blue color. The logo is set against a light gray rectangular background.

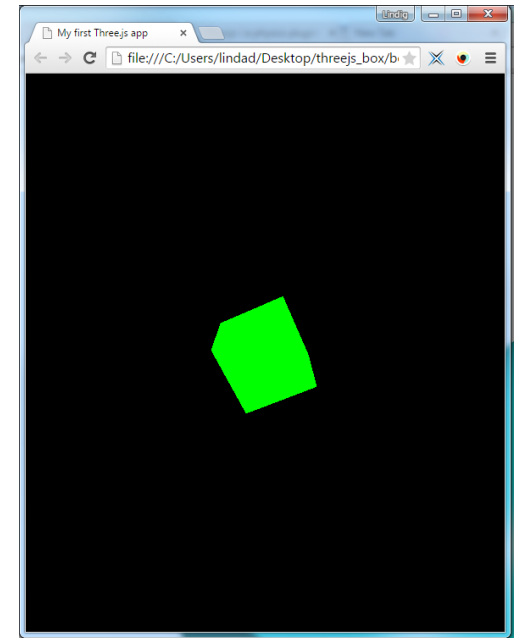
three.js

“The aim of the project is to create a lightweight 3D library with a very low level of complexity — in other words, for dummies”

Making the Web 3D

WebGL – three.js

```
1 <html>
2   <head>
3     <title>My first Three.js app</title>
4     <style>
5       body { margin: 0; }
6       canvas { width: 100%; height: 100% }
7     </style>
8   </head>
9   <body>
10    <script src="js/three.min.js"></script>
11    <script>
12      var scene = new THREE.Scene();
13      var camera = new THREE.PerspectiveCamera( 75, window.innerWidth/window.innerHeight, 0.1, 1000 );
14
15      var renderer = new THREE.WebGLRenderer();
16      renderer.setSize( window.innerWidth, window.innerHeight );
17      document.body.appendChild( renderer.domElement );
18
19      var geometry = new THREE.BoxGeometry( 1, 1, 1 );
20      var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
21      var cube = new THREE.Mesh( geometry, material );
22      scene.add( cube );
23
24      camera.position.z = 5;
25
26      var render = function () {
27        requestAnimationFrame( render );
28
29        cube.rotation.x += 0.01;
30        cube.rotation.y += 0.01;
31
32        renderer.render(scene, camera);
33      };
34
35      render();
36    </script>
37  </body>
38 </html>
```

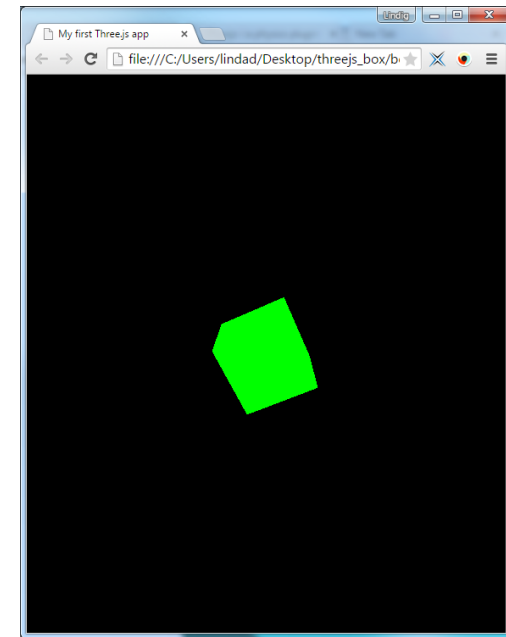


Making the Web 3D

WebGL – three.js

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var renderer = new THREE.WebGLRenderer();  
  
renderer.setSize( window.innerWidth, window.innerHeight );  
document.body.appendChild( renderer.domElement );
```

To do anything with three.js we need three things:
a scene, a camera and a render

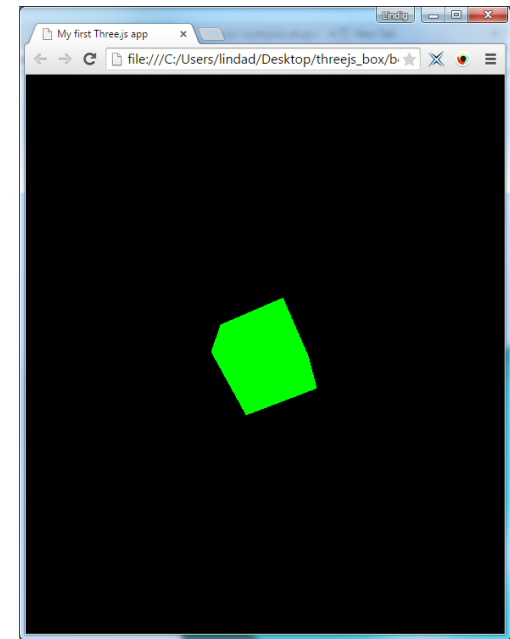


Making the Web 3D

WebGL – three.js

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camera.position.z = 5;
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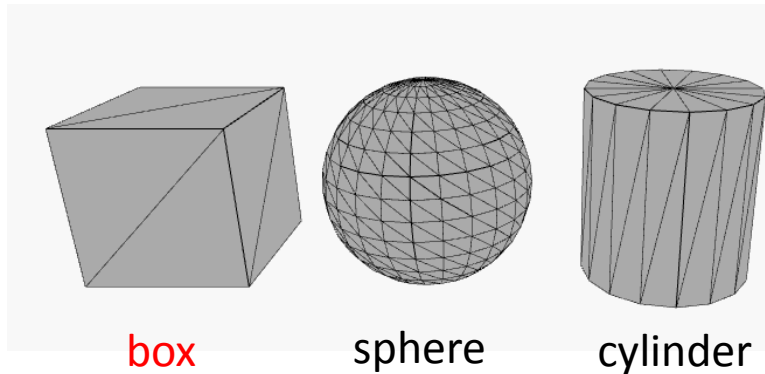
We then need to create the *object* we want to display.
In this case a cube. To define this object we have first
to define its geometry and its material.
Then we can add the box into the scene



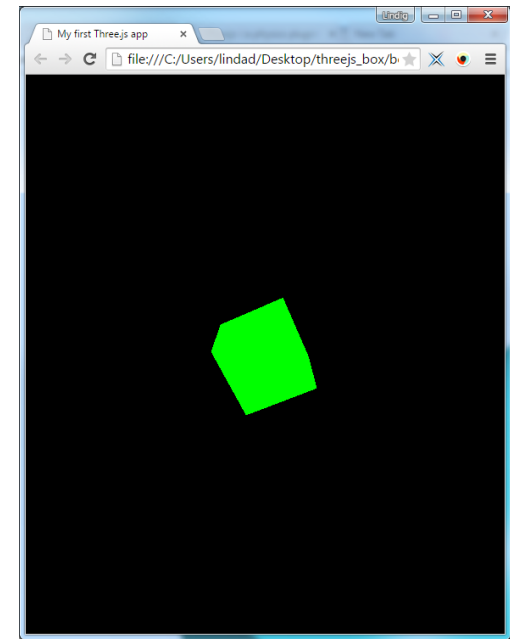
Making the Web 3D

WebGL – three.js

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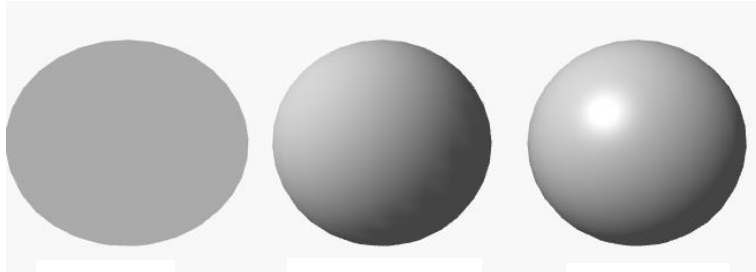
Some of the
geometry that
three.js provides



Making the Web 3D

WebGL – three.js

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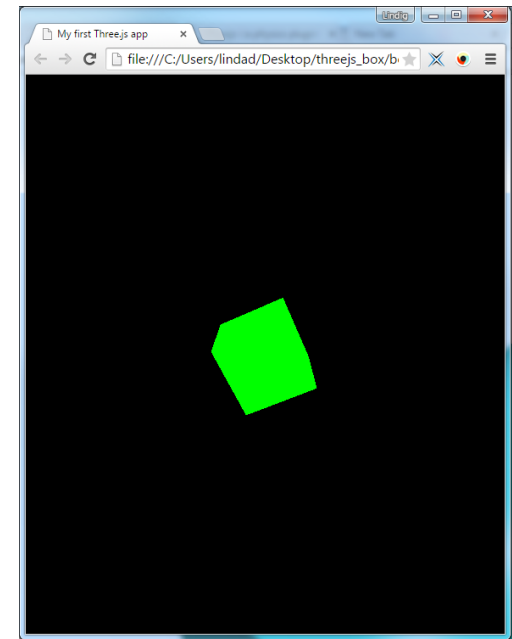


basic

lambert

phong

Some of the
materials that
three.js provides

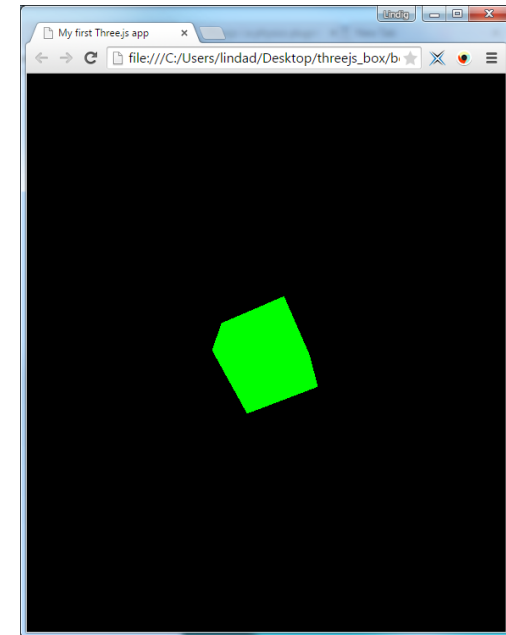


Making the Web 3D

WebGL – three.js

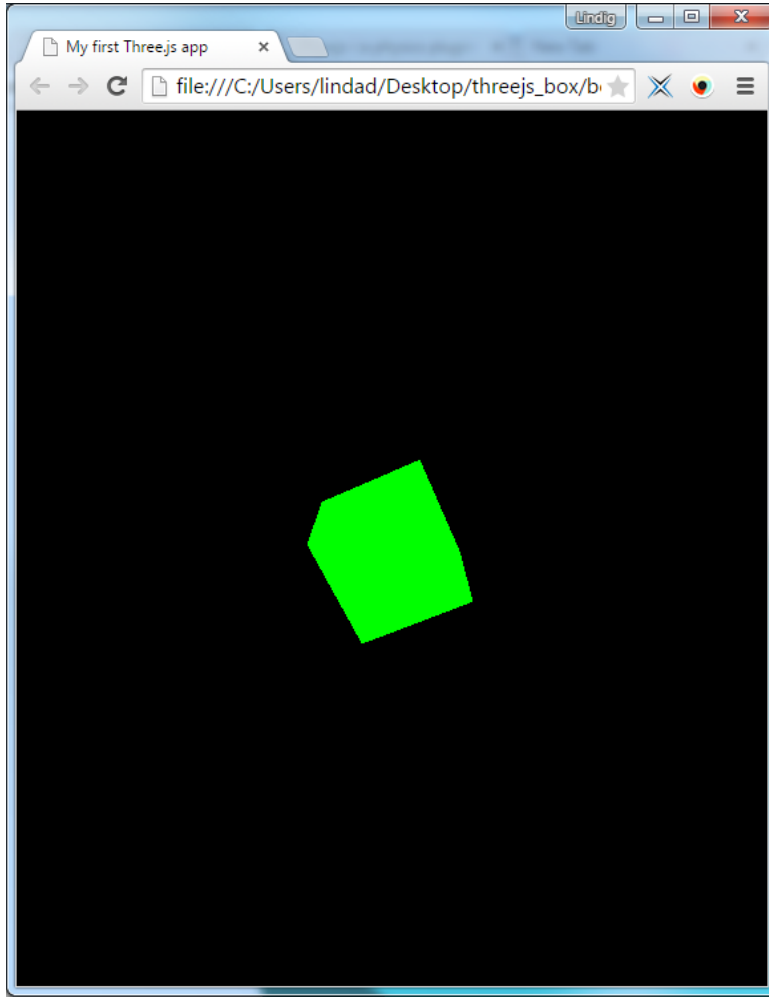
```
var render = function () {  
    requestAnimationFrame( render );  
  
    cube.rotation.x += 0.01;  
    cube.rotation.y += 0.01;  
  
    renderer.render(scene, camera);  
};  
render();
```

here we define the rotation speed
and direction of the box



Making the Web 3D

WebGL – three.js



three.js allows a lot more

Such as interactions

Making the Web 3D

... And now?

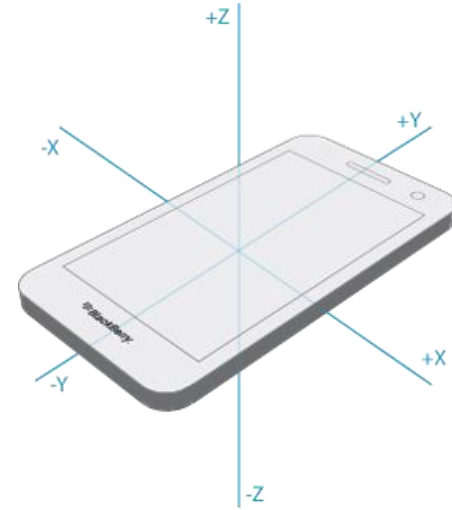
Adding a new dimension could improve the web

Making the Web 3D

... And now?

Adding a new dimension could improve the web

But how do we interact with such web sites?

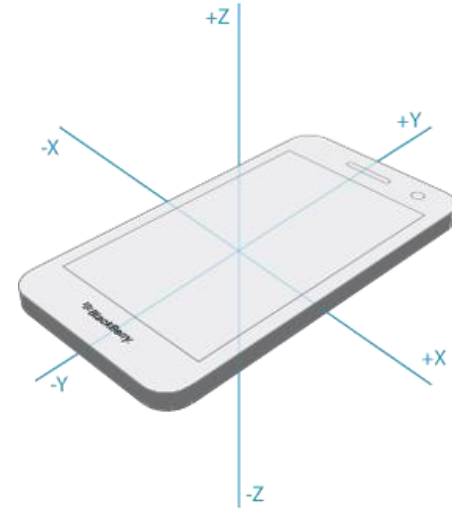


Making the Web 3D

... And now?

Adding a new dimension could improve the web

But how do we interact with such web sites?



The web is actually
ready for 3D...
Are you?