

Desenvolvimento de Games para Web



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Apresentação

- Bacharel em CC (MACKENZIE/SP)
- Mestre em EE (MACKENZIE/SP)
- Doutor em CC (UFSCar/SC)
- Especialista (JavaEE Fullstack)
- Coordenador do Curso de Sistemas de Informação – ASSER Rio Claro
- Consultor de Engenharia de Software



Conteúdo

- Motivação
- Referências básicas
- Tecnologias para o desenvolvimento de games
 - Desktop
 - Dispositivos Móveis
 - Web 2.0
- Repositórios – Git e GitHub
- Exemplos
- Desenvolvimento web de games – 2048 e AsserEvol
- Dúvidas e Agradecimentos

Motivação





VESTIBULAR GRADUAÇÃO PÓS-GRADUAÇÃO CURSOS TÉCNICOS CURSOS DE EXTENSÃO

Sistemas de Informação



Objetivos do Curso

Sistemas de Informação estão cada vez mais presentes em nossas vidas e em diversas áreas operacionais, como por exemplo, produção, marketing, recursos

SISTEMAS DE INFORMAÇÃO

DESENVOLVIMENTO DE JOGOS PARA ANDROID

INTELIGÊNCIA ARTIFICIAL E ROBÓTICA COM ARDUINO

GESTÃO DE NEGÓCIOS, CRIATIVIDADE E EMPREENDEDORISMO

BANCO DE DADOS

REDES E SEGURANÇA DA INFORMAÇÃO

MONTE SUA PRÓPRIA STARTUP

RUA 7, 1193 - CENTRO - RIO CLARO

19 3523-2001

www.asser.edu.br

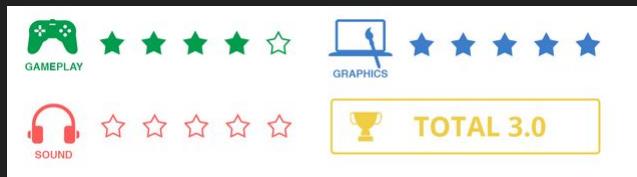
VESTIBULAR

ASSER Rio Claro



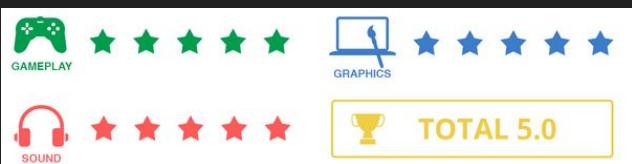
HexGL

- Jogo futurista
- HTML5/JS/WebGL
- Links
 - <https://github.com/BKcore/HexGL>
 - <http://hexgl.bkcore.com>



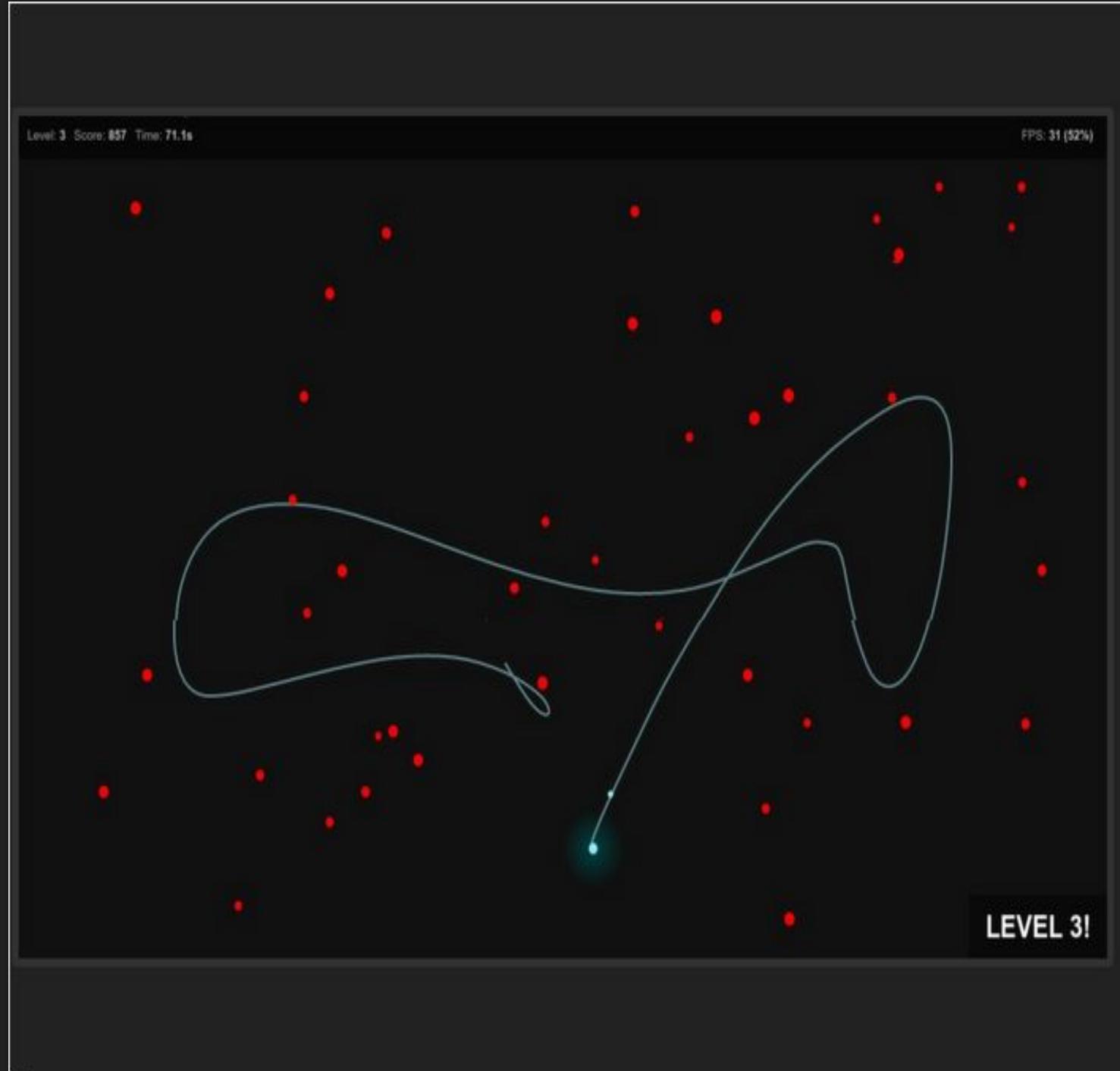
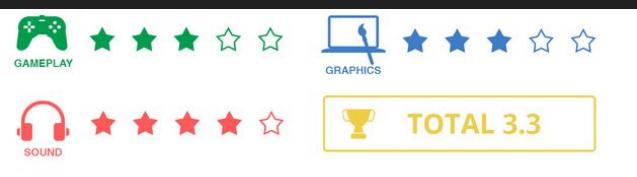
CrossCode

- Jogo 2D
- Retro Game
- Links
 - <http://www.cross-code.com/en/home>



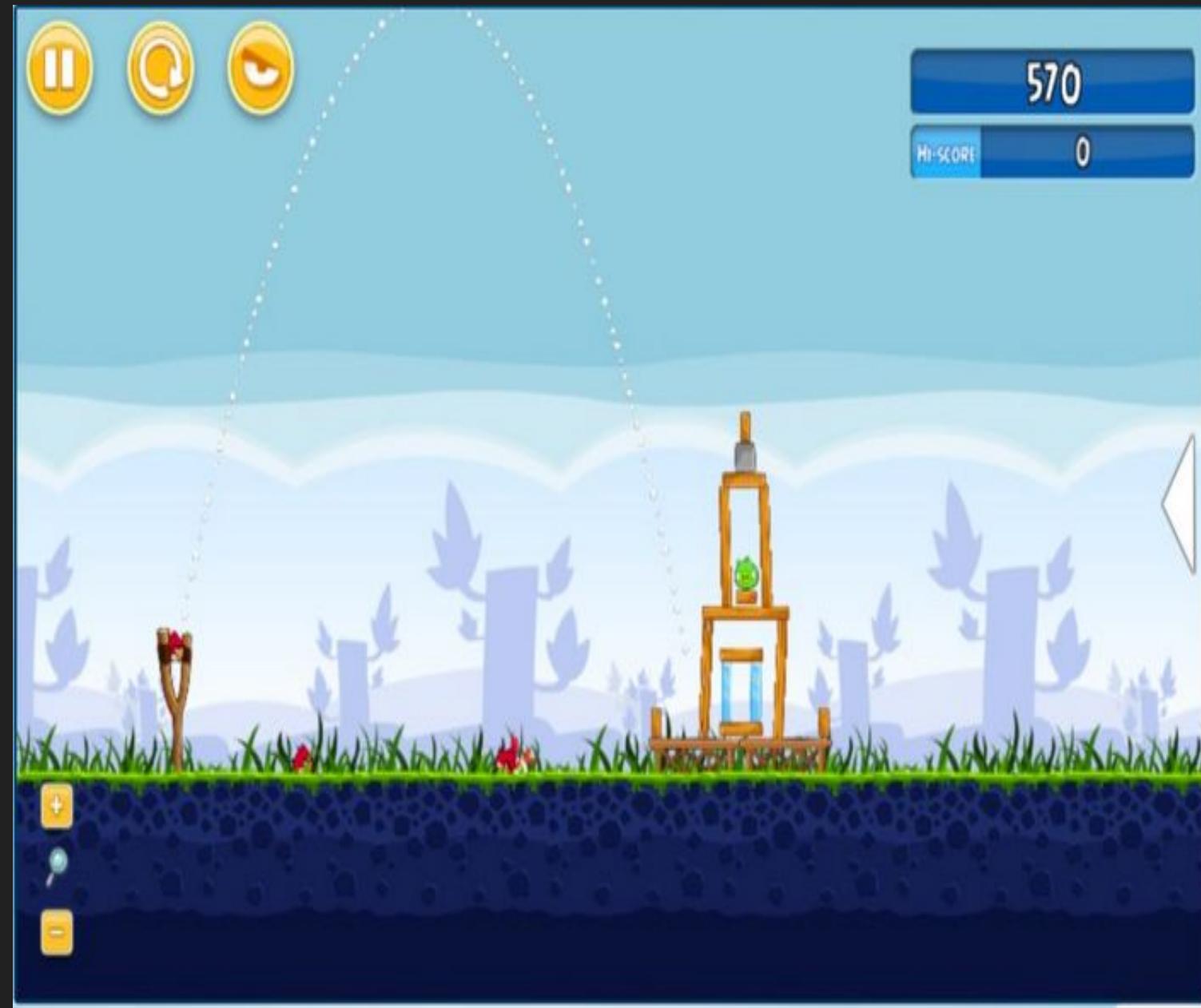
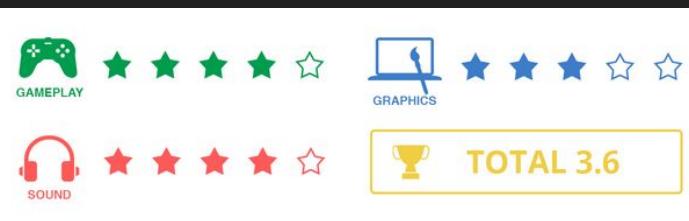
Sinuous

- Jogo 2D Aracade
- HTML5
- Links
 - <http://www.sinuousgame.com/>



Angry Birds

- Jogo 2D Aracade
- HTML5
- Links
 - <http://chrome.angrybirds.com/>

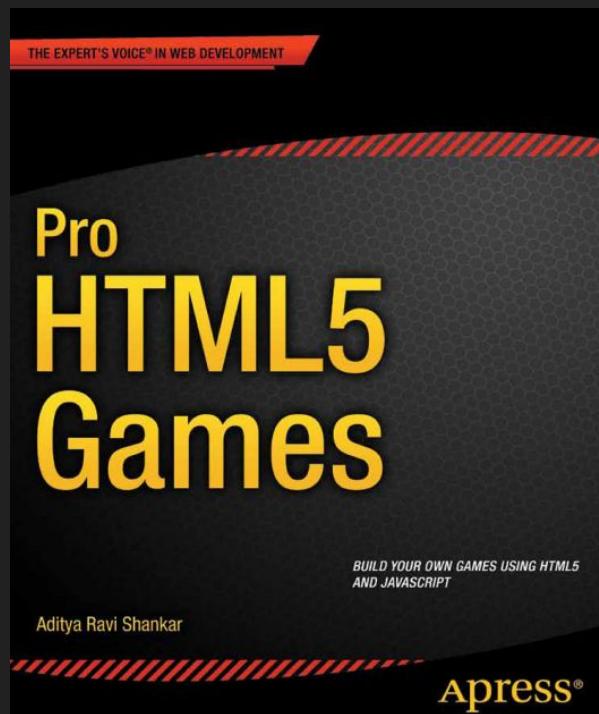


Motivação – Lista completa



- <http://tutorialzine.com/2015/02/30-amazing-games-made-only-with-html5/>

Referências



<https://www.safaribooksonline.com>

The screenshot shows the homepage of [Safari Books Online](https://www.safaribooksonline.com/home/). The interface includes a navigation bar with back, forward, search, and user profile icons. A sidebar on the left features a play button icon and several small, light-gray icons for different sections like 'In Your Queue' and 'Recent Items'. The main content area is divided into several sections:

- In Your Queue:** Displays two book covers: "Head First Design Patterns" and "Unity Game Development 24 Hours".
- Recent Items:** Displays two book covers: "Pro HTML5 Games" and "AI for Game Developers".
- Popular in Your Topics:** Displays a row of items including books like "Learning Spark", "Core Java for the Impatient", "Soft Architecture Patterns", "Introduction to Data Science with R", and videos like "The Indie Game Developer Handbook" and "Just Enough Math".

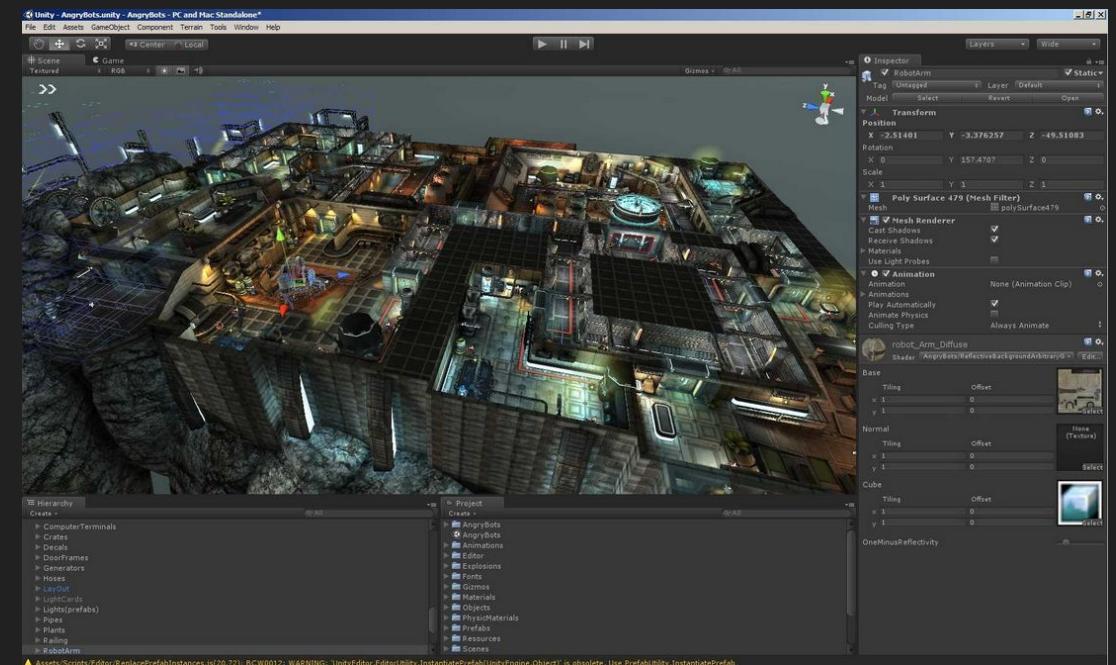
The overall layout is clean with a white background and a dark header bar.

Desenvolvimento de Games

- PCs/Desktops
- Consoles
- Dispositivos móveis



Blender 3D Render



Aceleração Gráfica com GPU

- GPU: 2x Kepler GK210
- 2,91 Tflops – precisão dupla
- 8,74 Tflops – precisão simples
- Largura de Banda – 480 GB/sec
- Memória GDDR5 – 24 GB (12GB per GPU)
- CUDA cores: 4992 (2496 per GPU)

Core i7 ~ 20 Gflops



Aceleração Gráfica com GPU

- GPU: 2x Kepler GK210
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Desempenho Computacional	
Ordem de grandeza	Quantidade(flop/s)
megaflop/s	10^6
gigaflop/s	10^9
teraflop/s	10^{12}
petaflop/s	10^{15}
exaflop/s	10^{18}
zettaflop/s	10^{21}
yotta flop/s	10^{24}



Core i7 ~ 20 Gflops

Tecnologias para o desenvolvimento de games na web

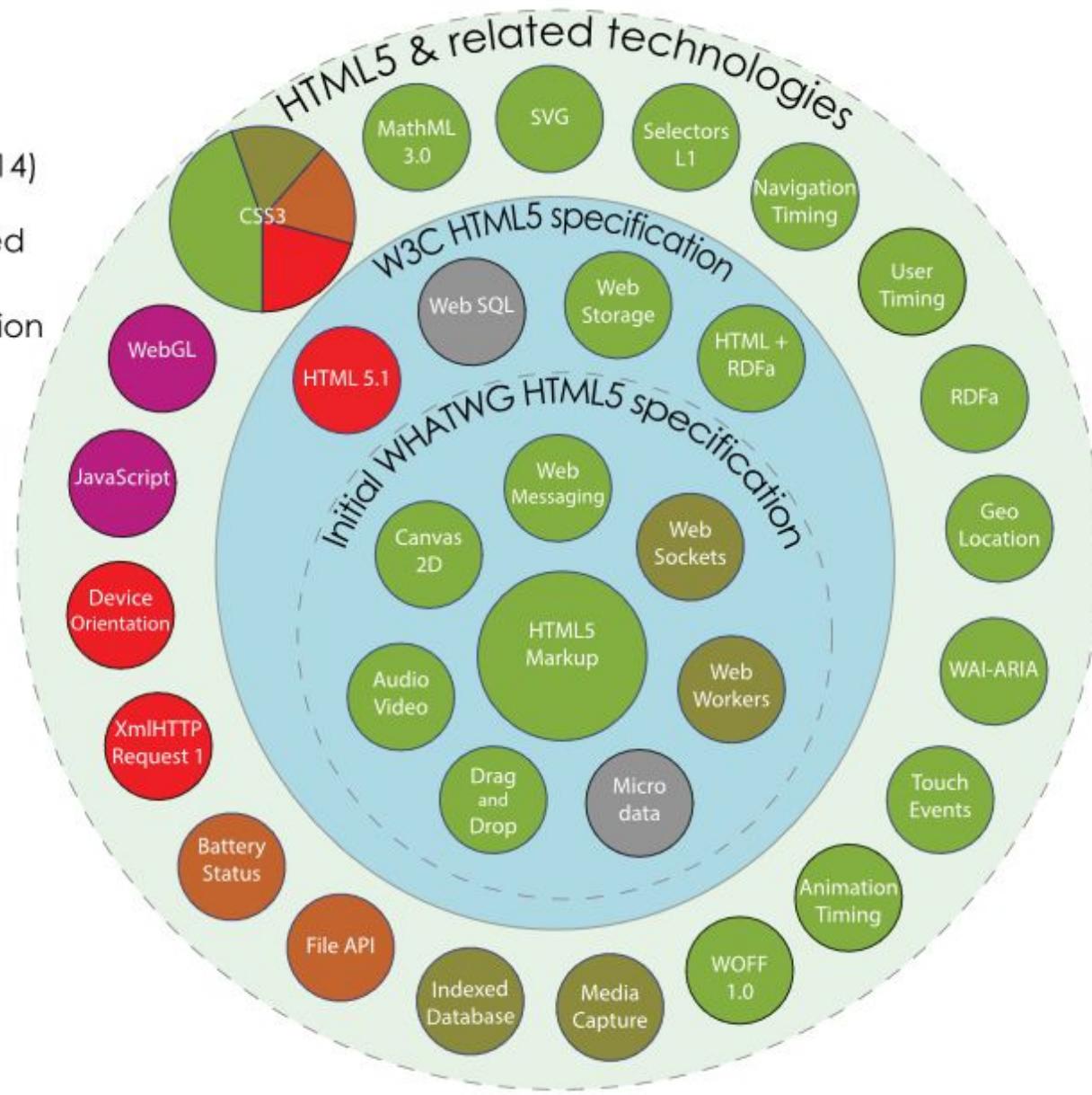




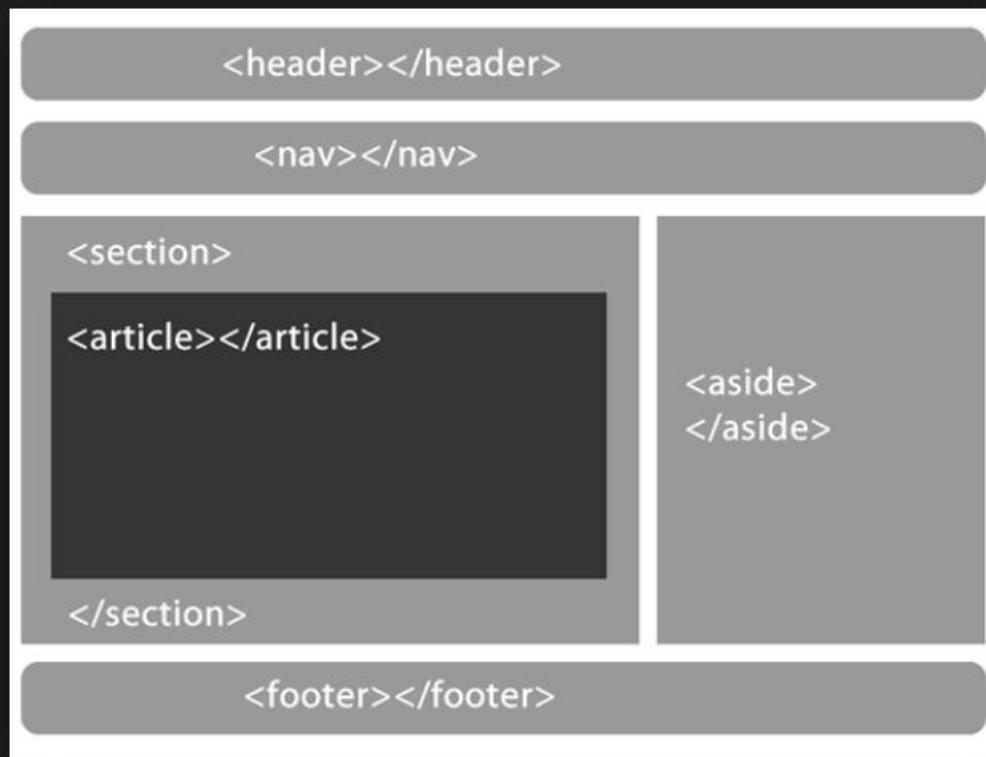
HTML5

Taxonomy & Status (October 2014)

- Recommendation/Proposed
- Candidate Recommendation
- Last Call
- Working Draft
- Non-W3C Specifications
- Deprecated or inactive



HTML5 – Design Wireframes



HTML5 - Exemplo



Edit This Code:

```
<!DOCTYPE html>
<html>
<body>

<canvas id="myCanvas" width="200" height="100" style="border:1px solid
#000000;">
Your browser does not support the HTML5 canvas tag.
</canvas>

</body>
</html>
```

[See Result »](#)

Result:



CSS3



```
div { color: #fefefe; }
```

↓
ELEMENT/
SELECTOR

↓
PROPERTY

↓
VALUE

CSS3 - Exemplo



Edit This Code:

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
    background-color: #d0e4fe;
}

h1 {
    color: orange;
    text-align: center;
}

p {
    font-family: "Times New Roman";
    font-size: 20px;
}
</style>
</head>
<body>

<h1>My First CSS Example</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

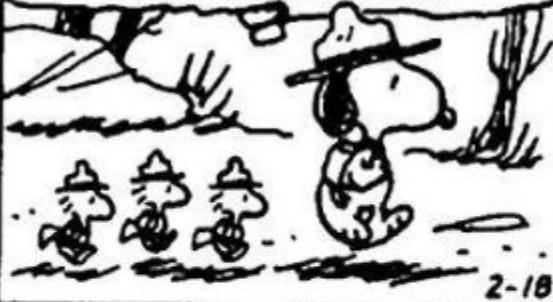
See Result »

Result:

My First CSS Example

This is a paragraph.

QUANDO CAMINHAMOS
NO BOSQUE,
PRECISAMOS ESTAR
PREPARADOS PARA
EMERGÊNCIAS...



HÁ UM CHAMADO
ESPECIAL QUE USAMOS
SE PRECISAMOS DE
AJUDA



PRESTEM
MUITA
ATENÇÃO



MÃE!



JavaScript



Edit This Code:

[See Result »](#)

```
<!DOCTYPE html>
<html>
<body>

<canvas id="myCanvas" width="200" height="100" style="border:1px solid
#d3d3d3;">
Your browser does not support the HTML5 canvas tag.</canvas>

<script>
var c = document.getElementById("myCanvas");
var ctx = c.getContext("2d");
ctx.moveTo(0,0);
ctx.lineTo(200,100);
ctx.stroke();
</script>

</body>
</html>
```

Result:



Repositórios de Games – Git e GitHub

- <https://github.com/blog/1337-github-game-off-winners>

The screenshot shows a GitHub blog post titled "GitHub Game Off Winners". The post was published on December 18, 2012, by user leereilly under the "Watercooler" category. It discusses the first GitHub Game Off competition, which received over 1337 forks and nearly 200 playable games. The post highlights the winning entries, runner-ups, and honorable mentions, noting that the source code is available on GitHub. It also expresses gratitude to the judges and David Farrell. The sidebar on the right lists categories like Featured, All Posts, New Features, Engineering, Enterprise, Conferences, Meetups, New Hires, and Watercooler, with Watercooler being the active tab. A "Subscribe" button is also visible.

GitHub Game Off Winners

December 18, 2012 | leereilly | Watercooler

Last month, we challenged you to create a web-based game loosely built around the theme of forking, branching, cloning, pushing, and/or pulling for our very first game jam, the [GitHub Game Off](#). There were over 1337 forks and almost 200 playable games at the end of the competition. Today, we're announcing the winners!

Our panel of expert judges played and rated every game; the five winning entries below received the highest overall marks. We would also like to recognize six runners up and seven honorable mentions. Not only are all these awesome games free and available now for anyone to play, the source code is all publicly available on GitHub. If you're inspired to learn about (or improve your skills with) game development, or even create your own game, just check out the repositories below.

Congratulations to all our winners, and thanks to everyone who took part and made it a success! Special thanks to [David Czarnecki](#), [Eric Preisz](#), [Matt Hackett](#), [Romana Ramzan](#) for judging all of the entries, and a nod of appreciation to [David Farrell](#) for allowing us to bounce ideas off of him.

The Game Off will be back in 2013! 🎉 🎉 🎉

Featured

All Posts

New Features

Engineering

Enterprise

Conferences

Meetups

New Hires

Watercooler

Subscribe

Física em Games

PHYSICS FORMULAS

$$F_s = -kx$$
$$= x_0 + \frac{1}{2}at^2 + v_0t$$

$$f_k \leq \mu s N$$
$$v = v_0 + at$$
$$U_g = mg\Delta h$$

$$-\frac{dU}{dx}$$

$$\frac{v^2}{R} = \omega^2 R$$

$$\pi \sqrt{\frac{I}{mgR}}$$

$$\sqrt{\frac{m}{k}}$$

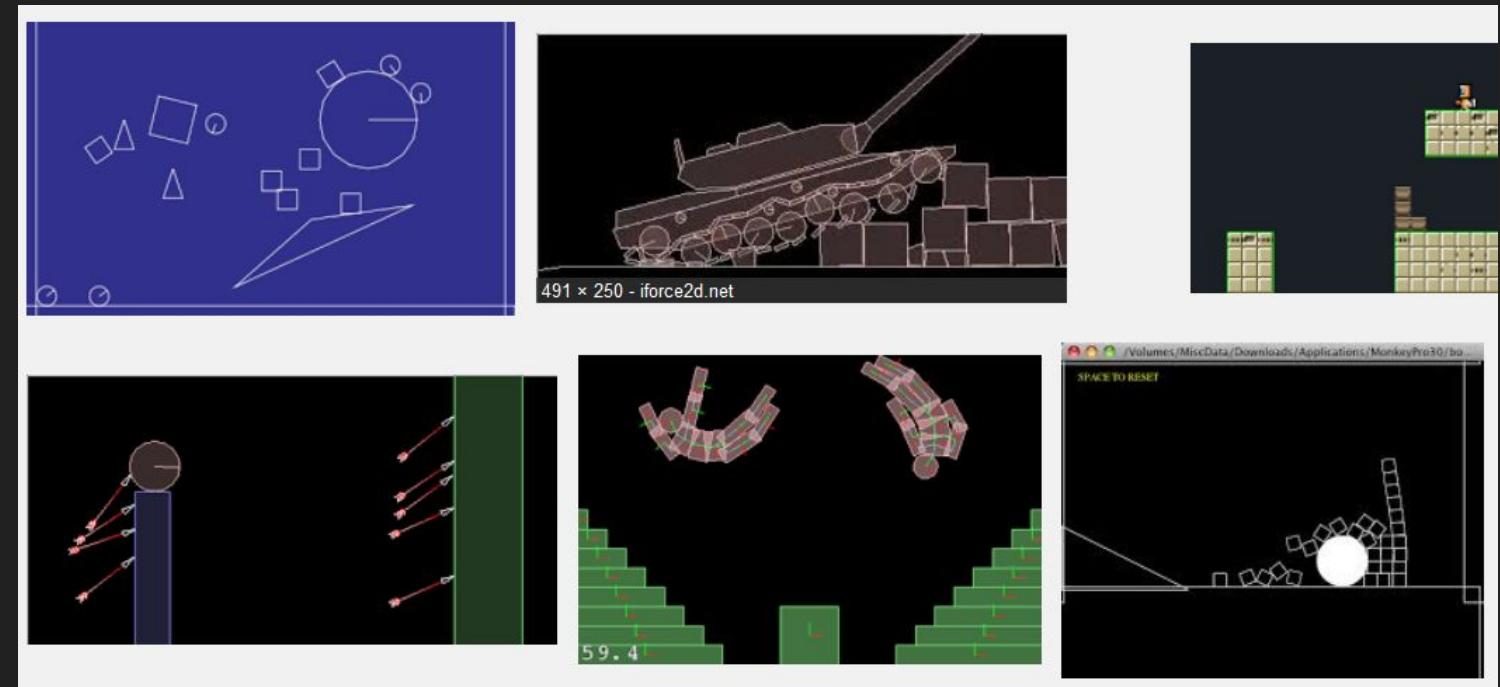
$$U_s = \frac{1}{2}kx^2$$

$$\vec{p} = m \cdot \vec{v}$$

$$P = \frac{dW}{dt} \quad W = \int \vec{F} \cdot d\vec{s}$$

$$E = mc^2$$

Frameworks - Física



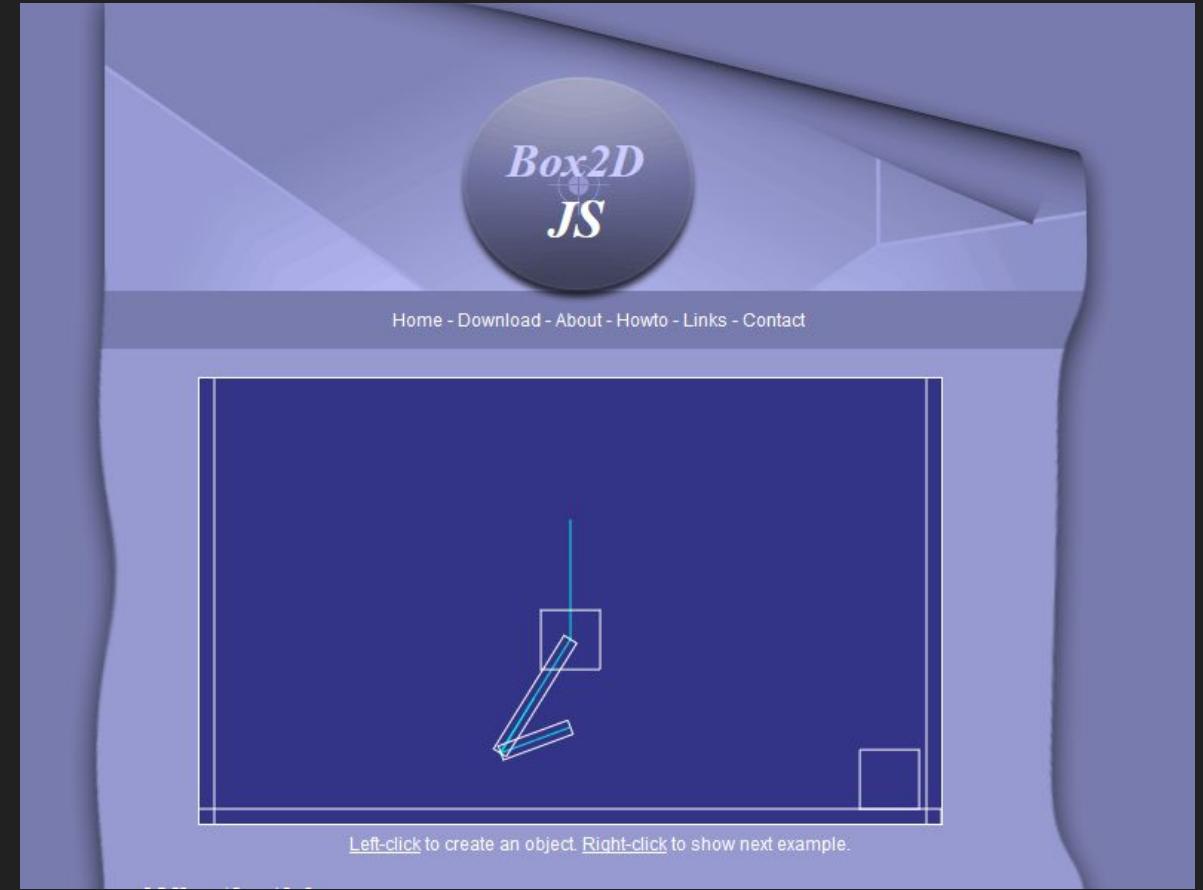
<https://github.com/flyover/box2d.js>

Box2D JavaScript examples and demos

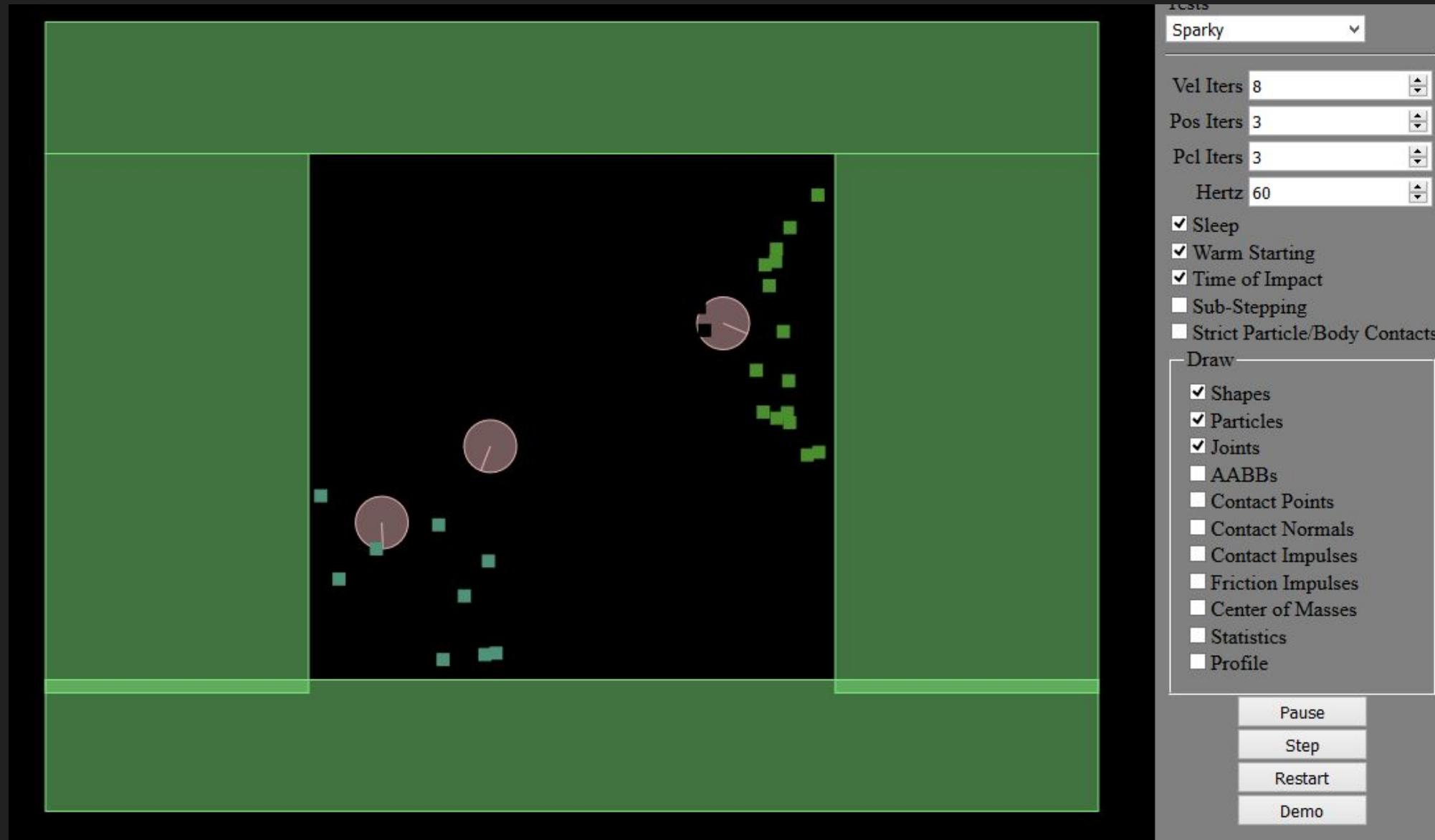
1. [00](#) - most basic example
2. [01](#) - simple example
3. [01.01](#) - simple Box2d example with configurable velocity and position iteration values
4. [02](#) - side by side com
5. [03](#) - box2d in a web v
6. [04](#) - side by side com
7. [05](#) - box2d in a web v
8. [06](#) - box2d in a web v
9. [07](#) - box2d with poly!
10. [08](#) - box2d with conc
11. [09](#) - box2d with joint:
12. [10](#) - box2d with revol
13. [11](#) - box2d with Impu
14. [12](#) - box2d with Colli
15. [13](#) - box2d with Dista
16. [14](#) - box2d with mou
17. [15](#) - box2d with pulle
18. [16](#) - box2d with chair
19. [17](#) - box2d with draw



<https://box2d-javascript-fun.appspot.com/>



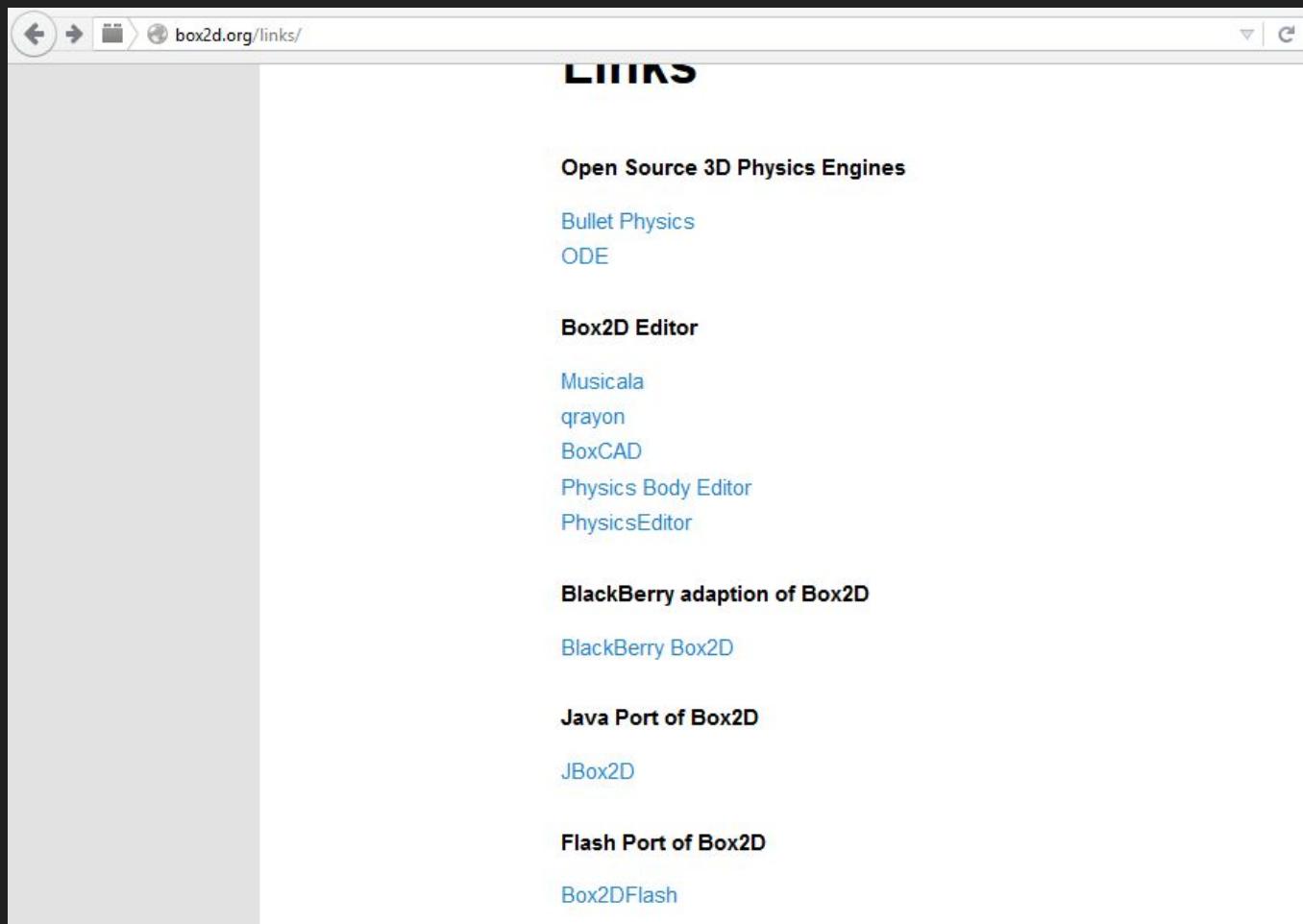
<http://box2d-js.sourceforge.net/index2.html>



<https://cdn.rawgit.com/flyover/box2d.js/master/Box2D/Build/Testbed/index.html>

Lista completa ...

<http://box2d.org/links/>



Frameworks - Gráficos



OpenGL ES 2.0 for the Web

WebGL is a cross-platform, royalty-free web standard for a low-level 3D graphics API based on OpenGL ES 2.0, exposed through the HTML5 Canvas element as Document Object Model interfaces. Developers familiar with OpenGL ES 2.0 will recognize WebGL as a Shader-based API using GLSL, with constructs that are semantically similar to those of the underlying OpenGL ES 2.0 API. It stays very close to the OpenGL ES 2.0 specification, with some concessions made for what developers expect out of memory-managed languages such as JavaScript.

WebGL brings plugin-free 3D to the web, implemented right into the browser. Major browser vendors Apple (Safari), Google (Chrome), Mozilla (Firefox), and Opera (Opera) are members of the WebGL Working Group.

- [WebGL 1.0 Specification](#)
- [WebGL Public Wiki](#)
- [WebGL Public Mailing List \(spec discussion\)](#) and [Public Mailing List Archives](#)
- [WebGL Reference Card](#)
- [Google Groups](#) and [StackOverflow](#) discussions on developing with WebGL
- [Filing bugs about the WebGL spec or conformance tests](#)
- [WebGL Security white paper](#)

<https://www.khronos.org/webgl/>



WebGL Specification

Version 1.0.3, 27 October 2014

This version:

<https://www.khronos.org/registry/webgl/specs/1.0.3/>

WebIDL: <https://www.khronos.org/registry/webgl/specs/1.0.3/webgl.idl>

Latest version:

<https://www.khronos.org/registry/webgl/specs/latest/1.0/>

WebIDL: <https://www.khronos.org/registry/webgl/specs/latest/1.0/webgl.idl>

Previous version:

<https://www.khronos.org/registry/webgl/specs/1.0.2/>

WebIDL: <https://www.khronos.org/registry/webgl/specs/1.0.2/webgl.idl>

Editor:

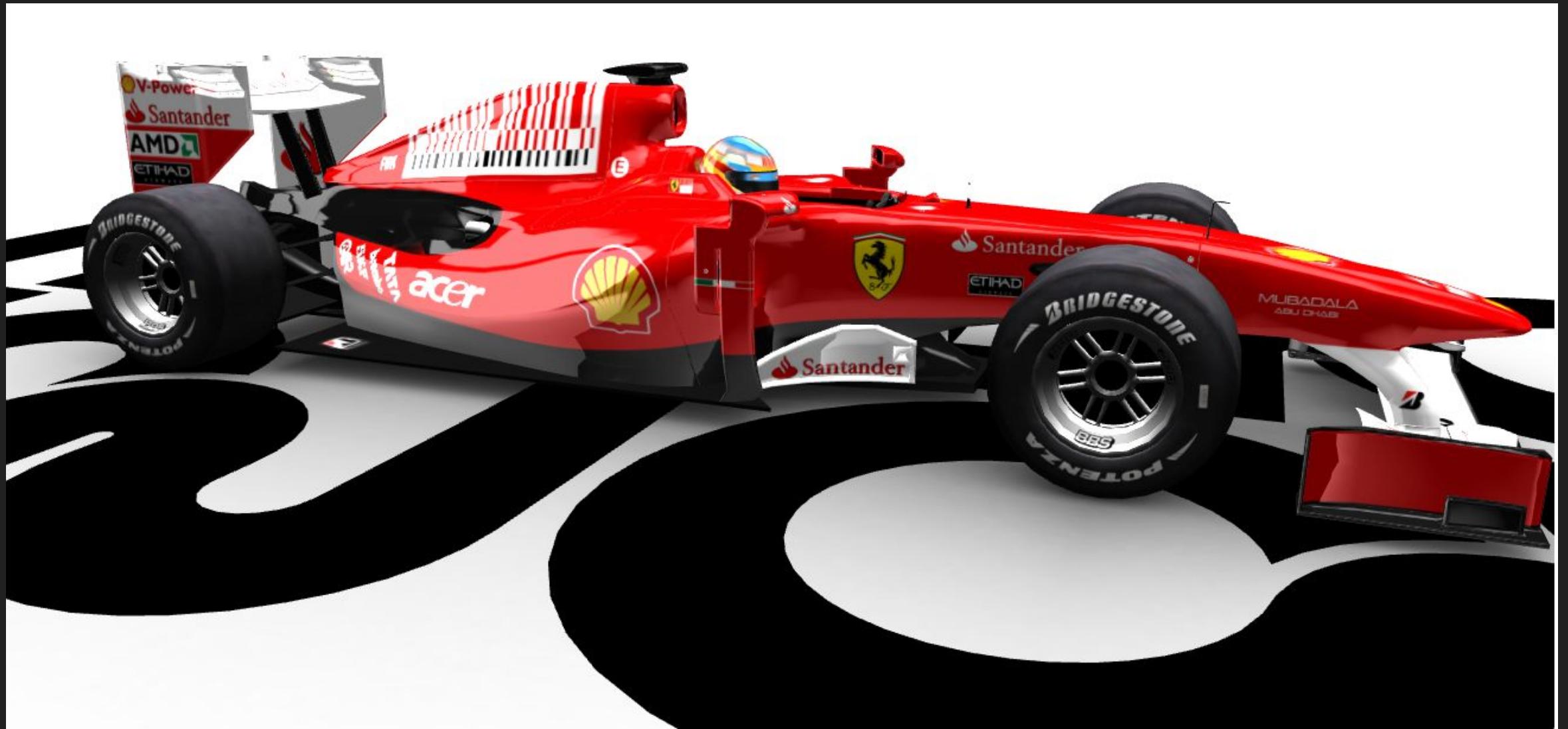
[Dean Jackson \(Apple Inc.\)](#)

Copyright © 2014 Khronos Group

Abstract

This specification describes an additional rendering context and support objects for the [HTML 5 canvas element \[CANVAS\]](#). This context allows rendering using an API that conforms closely to the OpenGL ES 2.0 API.

<https://www.khronos.org/registry/webgl/specs/1.0/>



<http://helloracer.com/webgl/>

<http://www.awwwards.com/22-experimental-webgl-demo-examples.html>

three.js ^{r72}

[examples](#), [more](#)

[download](#), [cdn](#)

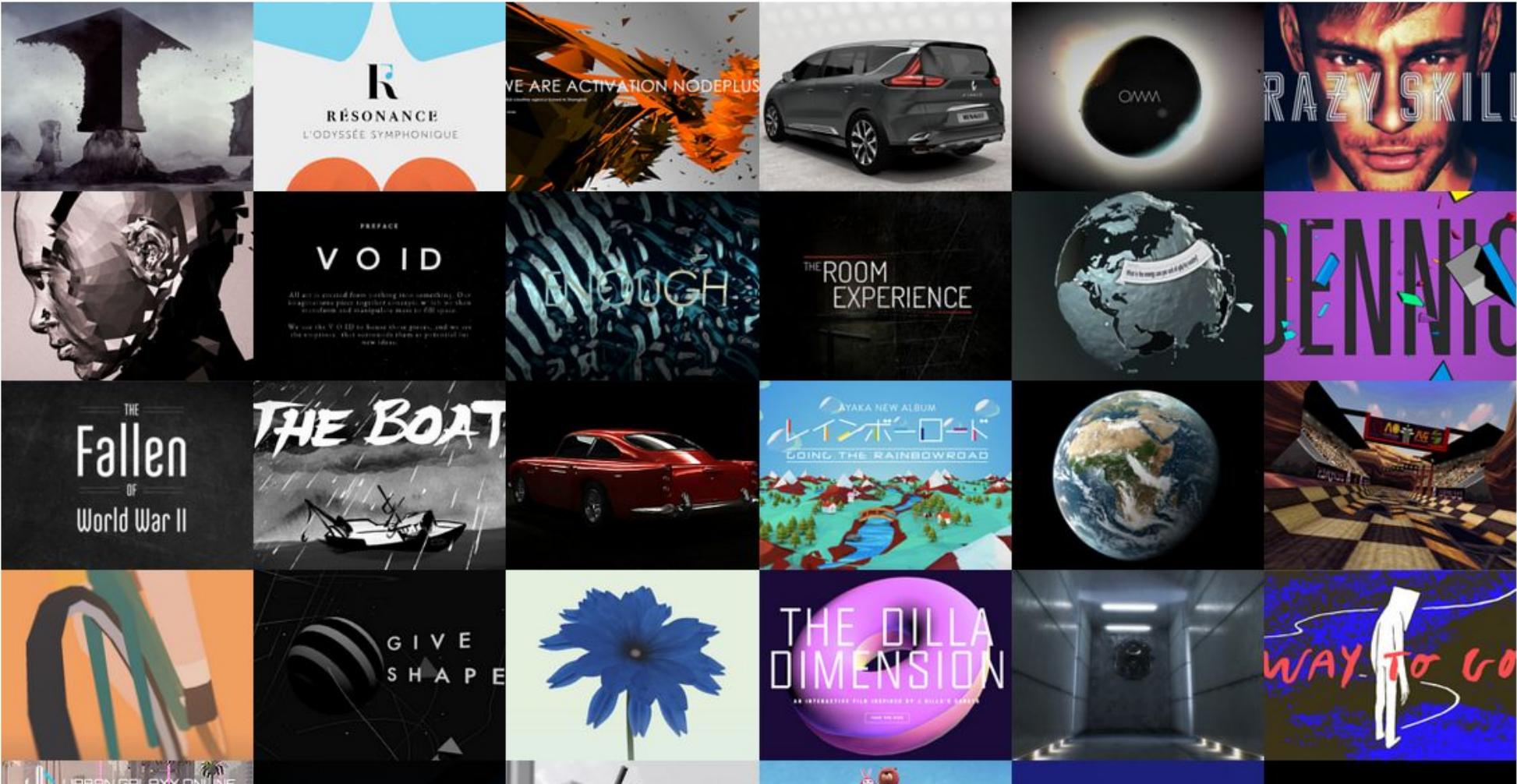
[getting started](#)
[documentation](#)
[chat](#)
[help](#)

[github](#)
[contributors](#)
[wiki](#)
[issues](#)

[editor \(beta\)](#)

featured projects

[more projects](#)



Interactive
3D Graphics

Taught by Eric Haines



UDACITY



Three.js Cookbook

O que é three.js ?

Three.js é uma biblioteca que faz o WebGL 3D fácil de ser utilizado no Browser. Enquanto um simples cubo no WebGL pode precisar de muitas linhas de JS, um código em Three.js é equivalente a uma fração de linhas de código

Three.js

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset=utf-8>
    <title>My first Three.js app</title>
    <style>
      body { margin: 0; }
      canvas { width: 100%; height: 100% }
    </style>
  </head>
  <body>
    <script src="js/three.min.js"></script>
    <script>
      // Our Javascript will go here.
    </script>
  </body>
</html>
```

```
<html>
  <head>
    <title>My first Three.js app</title>
    <style>
      body { margin: 0; }
      canvas { width: 100%; height: 100% }
    </style>
  </head>
  <body>
    <script src="js/three.min.js"></script>
    <script>
      var scene = new THREE.Scene();
      var camera = new THREE.PerspectiveCamera( 75, window.innerWidth/window.innerHeight, 0.1, 1000 );

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

      var geometry = new THREE.BoxGeometry( 1, 1, 1 );
      var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
      var cube = new THREE.Mesh( geometry, material );
      scene.add( cube );

      camera.position.z = 5;

      var render = function () {
        requestAnimationFrame( render );

        cube.rotation.x += 0.1;
        cube.rotation.y += 0.1;

        renderer.render( scene, camera );
      };

      render();
    </script>
  </body>
</html>
```

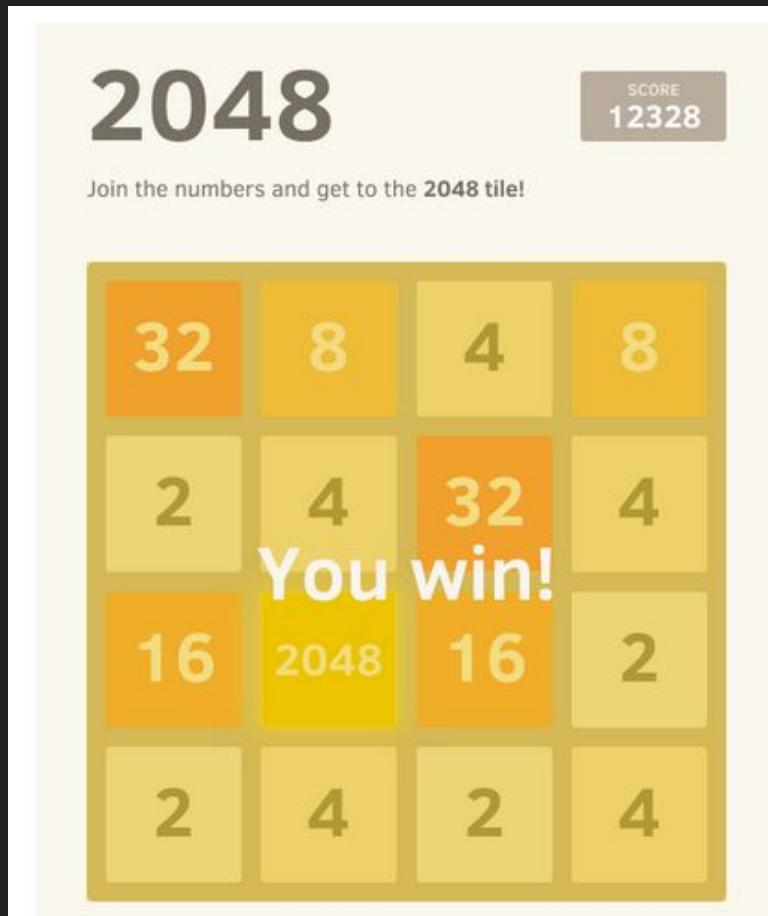
Exemplos



Gabriele Cirulli
gabrielecirulli

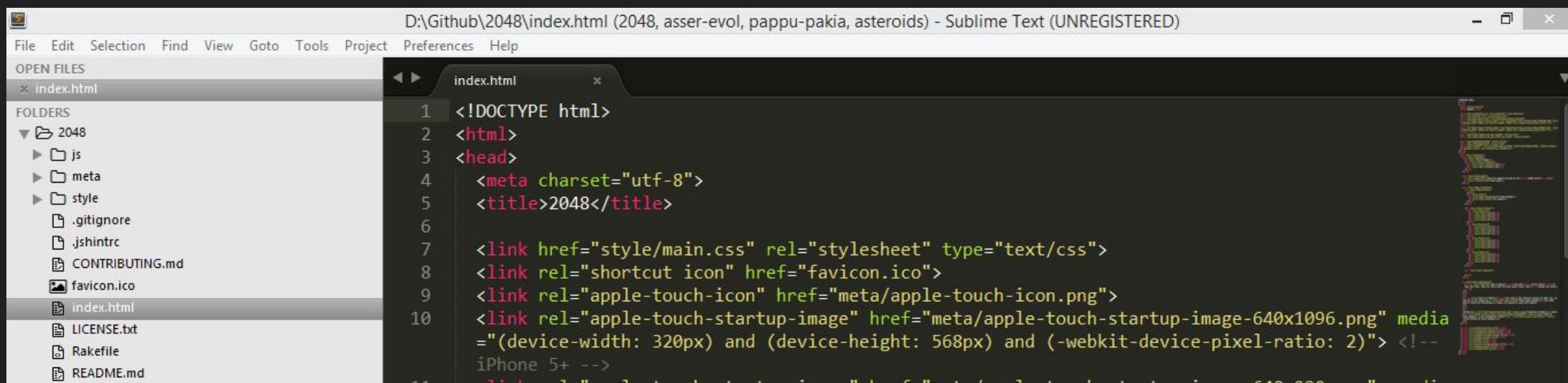
 Impraise
 Italy
 <http://www.gabrielecirulli.com>
 Joined on 30 Jun 2011

1.6k Followers **169** Starred **5** Following



<https://github.com/gabrielecirulli>

Arquitetura do 2048

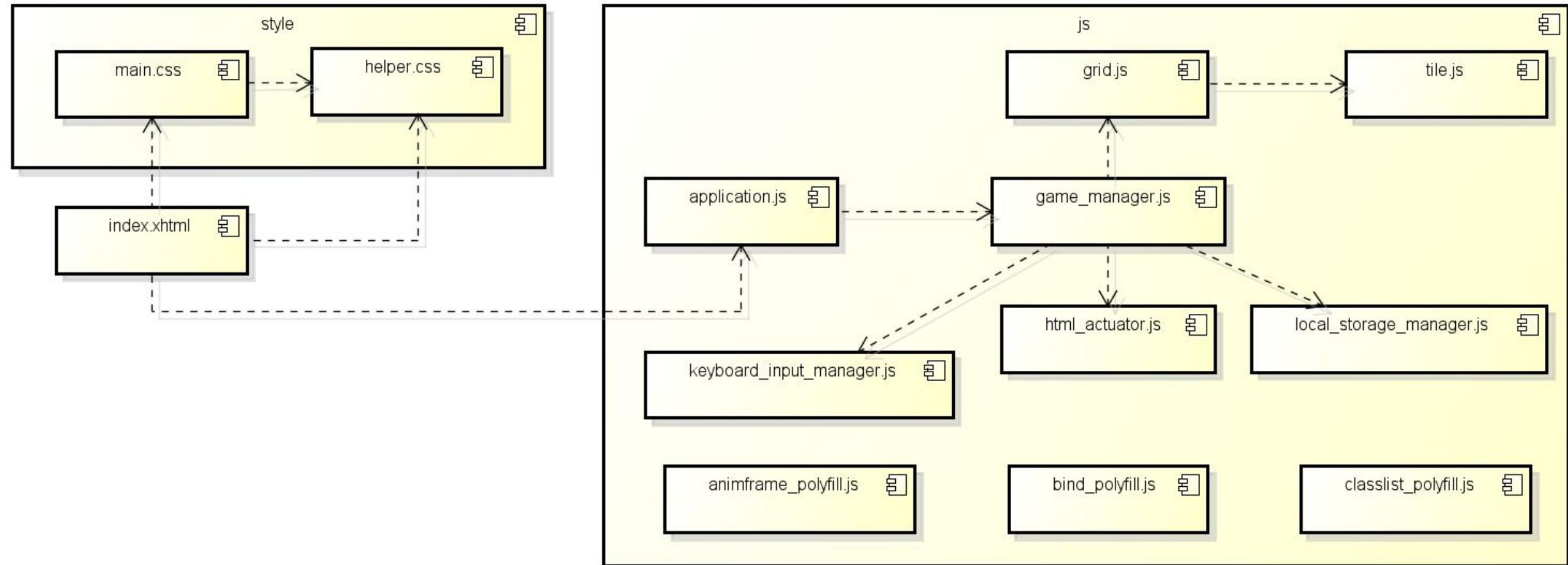


The screenshot shows a Sublime Text window displaying the `index.html` file of a GitHub repository for a 2048 game. The repository path is `D:\Github\2048\index.html`. The file content is as follows:

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <title>2048</title>
  <link href="style/main.css" rel="stylesheet" type="text/css">
  <link rel="shortcut icon" href="favicon.ico">
  <link rel="apple-touch-icon" href="meta/apple-touch-icon.png">
  <link rel="apple-touch-startup-image" href="meta/apple-touch-startup-image-640x1096.png" media="(device-width: 320px) and (device-height: 568px) and (-webkit-device-pixel-ratio: 2)"> <!--
    iPhone 5+ -->
```

The left sidebar shows the project structure with files like `index.html`, `LICENSE.txt`, `Rakefile`, and `README.md`.

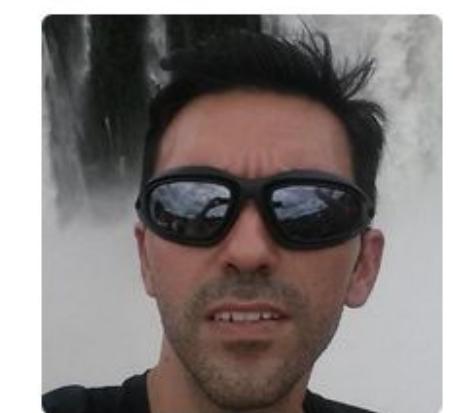
Design – 2048 (Domain-Driven Development)



Bottom-up

Top-Down

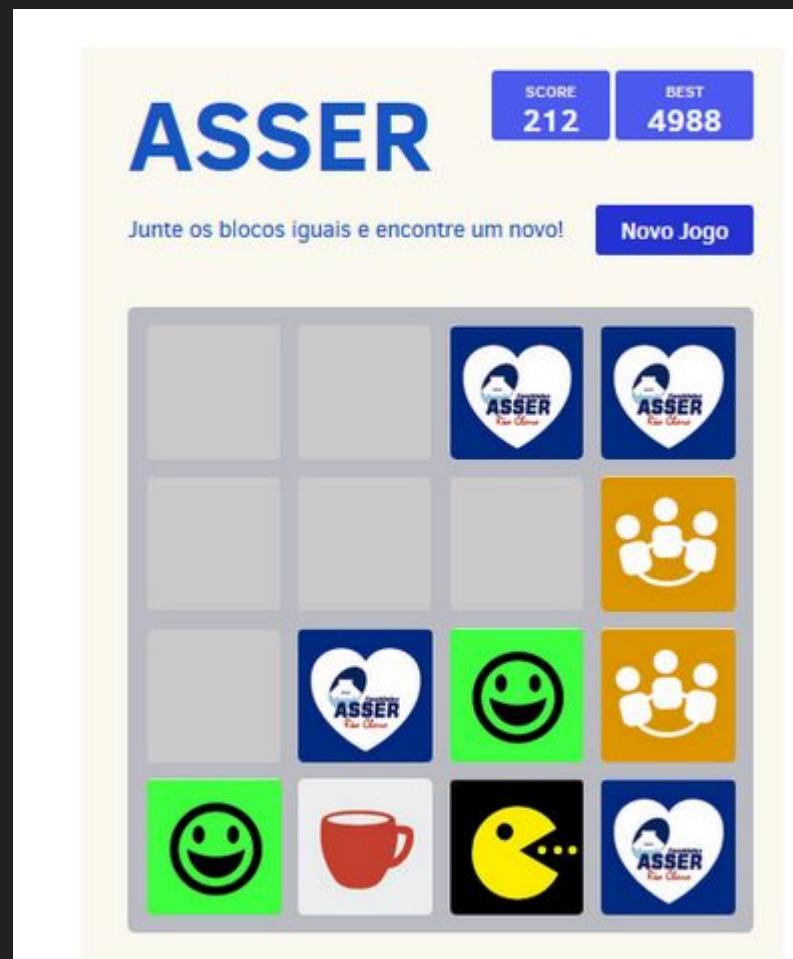
Desenvolvimento - AsserEvol



Erik Aceiro
Antonio
aceiro

Joined on 20 Aug 2013

1 Follower 26 Starred 4 Following



<https://github.com/aceiro>

HTMLActuator – Pequena alteração

```
HTMLActuator.prototype.addTile = function (tile) {
  var self = this;

  var wrapper = document.createElement("div");
  var inner = document.createElement("div");
  var position = tile.previousPosition || { x: tile.x, y: tile.y };
  var positionClass = this.positionClass(position);

  // We can't use classlist because it somehow glitches when replacing classes
  var classes = ["tile", "tile-" + tile.value, positionClass];

  if (tile.value > 2048) classes.push("tile-super");

  this.applyClasses(wrapper, classes);

  inner.classList.add("tile-inner");
  inner.textContent = tile.value;

  if (tile.previousPosition) {
    // Make sure that the tile gets rendered in the previous position first
    window.requestAnimationFrame(function () {
      classes[2] = self.positionClass({ x: tile.x, y: tile.y });
      self.applyClasses(wrapper, classes); // Update the position
    });
  } else if (tile.mergedFrom) {
    classes.push("tile-merged");
    this.applyClasses(wrapper, classes);
  }
}
```

Dúvidas !

Obrigado

Prof. Dr. Erik Aceiro Antonio

sinf@asser.com.br

aceiro@gmail.com