

# Desenvolvimento de Games para Web com HTML5/CSS/JS



Prof. Dr. Erik Aceiro Antonio

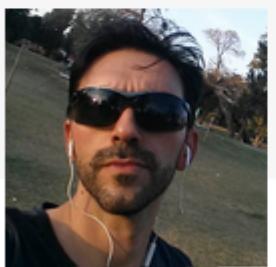
**Coordenador do Curso de Sistemas de Informação – Faculdade ASSER Rio Claro**

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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



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91 REPUTATION



## Erik

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I'm very interested to learning and shared some of my skills. I work with Java, JavaFX, JavaEE, Spring, MVC/MVP/AOP, Functional Programming, Oracle Data Base, Software Architecture and Software Engineering.

I have doctorate in Computer Science at Federal University of São Carlos/Brazil.

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	<a href="#">enums</a>	SCORE 2	POSTS 1	
	<a href="#">weka</a>	SCORE 1	POSTS 2	

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## Sistemas de Informação



**SISTEMAS DE INFORMAÇÃO**

-  **DESENVOLVIMENTO DE JOGOS PARA ANDROID**
-  **INTELIGENCIA ARTIFICIAL E ROBÓTICA COM ARDUINO**
-  **GESTÃO DE NEGÓCIOS, CRIATIVIDADE E EMPREENDEDORISMO**
-  **BANCO DE DADOS**
-  **REDES E SEGURANÇA DA INFORMAÇÃO**
-  **MONTE SUA PRÓPRIA STARTUP**

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**O CURSO**

Sistemas de Informação estão cada vez mais presentes em nossas vidas e em diversas áreas operacionais, como por exemplo, produção, marketing, recursos humanos, finanças, administração entre outras.

O curso de Bacharelado em Sistemas de Informação contém disciplinas que exploram desde a arquitetura de computares a inteligência artificial e robótica, passando por gestão empresarial e desenvolvimento de aplicativos como, por exemplo, mobile, games e web.

**O MERCADO DE TRABALHO**

O mercado de trabalho para quem se forma em Sistemas de Informação é vasto, visto que todas as grandes empresas possuem setores de TI e cada vez mais percebe-se a falta de profissionais formados nessa área para auxiliar na condução desses setores.

A matriz curricular 2016 foi elaborada para que, desde o início, os alunos recebam sólidos conhecimentos para atuarem na área de TI de grandes empresas, resolvendo problemas por meio de raciocínio lógico e buscando solução para os desafios das organizações.

NA ASSER VOCÊ TAMBÉM PODE:  
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**LOGOS**



presentes em nossas vidas e em diversas áreas operacionais

produção, marketing, recursos



# Conteúdo

- Motivação
- Referências básicas
- Tecnologias para o desenvolvimento de games
  - Desktop / Dispositivos Móveis / Web 2.0
  - HTML5/CSS/JS
  - Repositórios – Git e GitHub
  - Frameworks
- Exemplos e Hands-on
- Dúvidas e Agradecimentos

Motivação



**blood “cas:” , r**

**8 bits**

**16 Kbytes/memória**

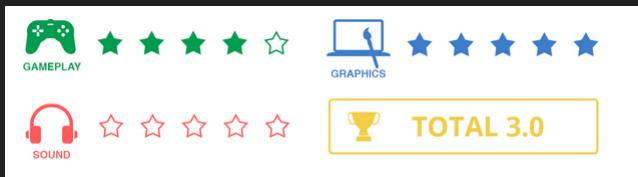


# 20 Games That Defined MSX Gaming

created by applemctom

## HexGL

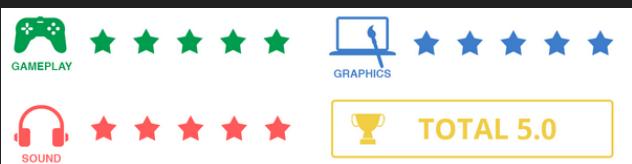
- Jogo futurista
- HTML5/JS/WebGL
- Links
  - <https://github.com/BKcore/HexGL>
  - <http://hexgl.bkcore.com>





# CrossCode

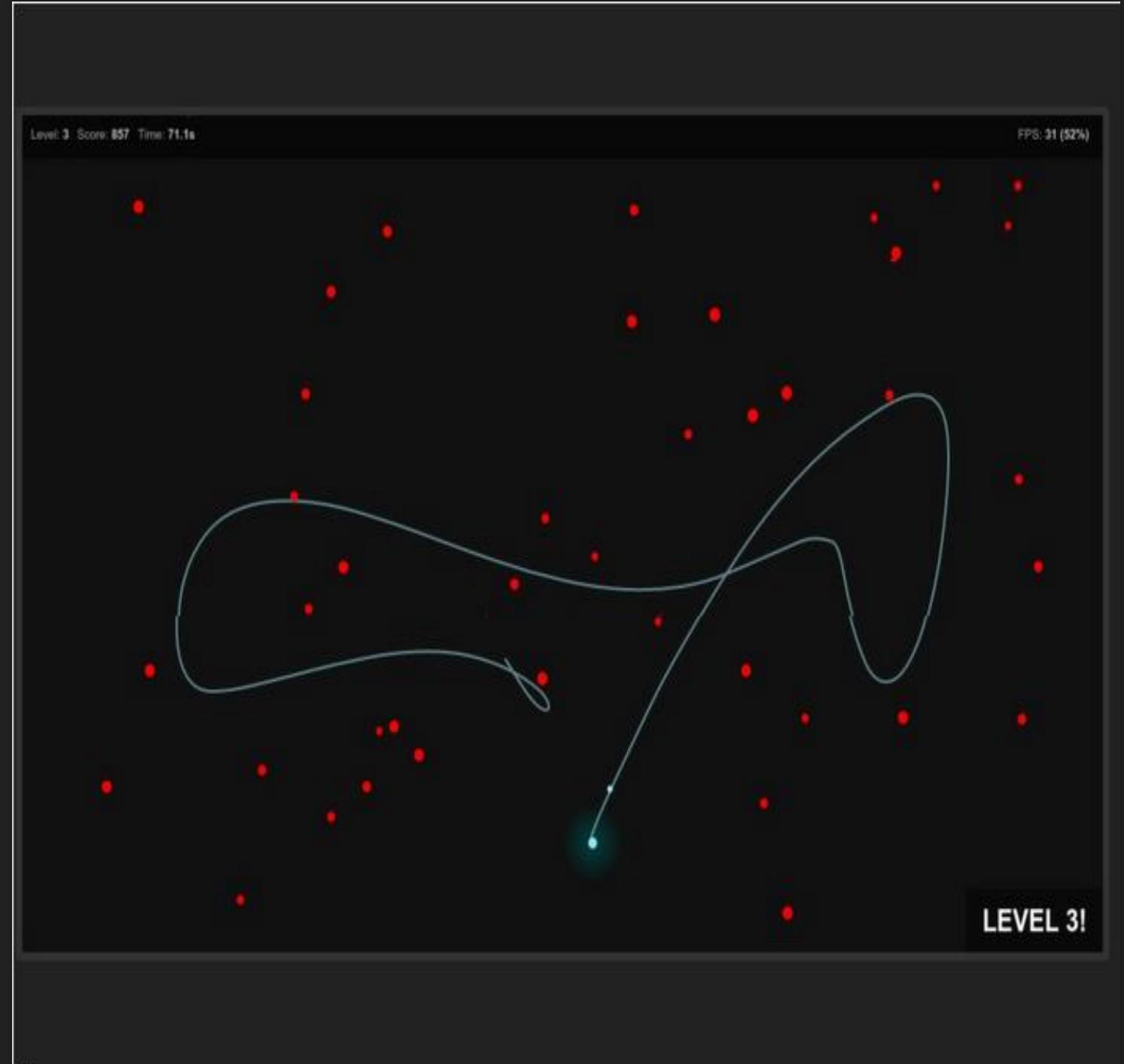
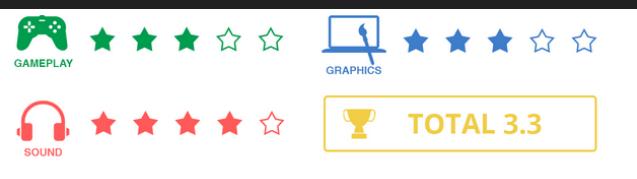
- Jogo 2D
- Retro Game
- Links
  - <http://www.cross-code.com/en/home>





# Sinuous

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



## Angry Birds

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



GAMEPLAY



GRAPHICS



SOUND

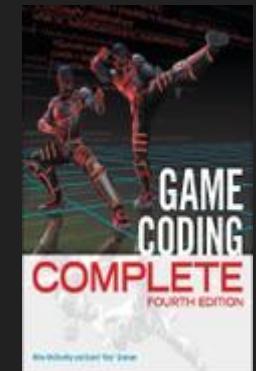
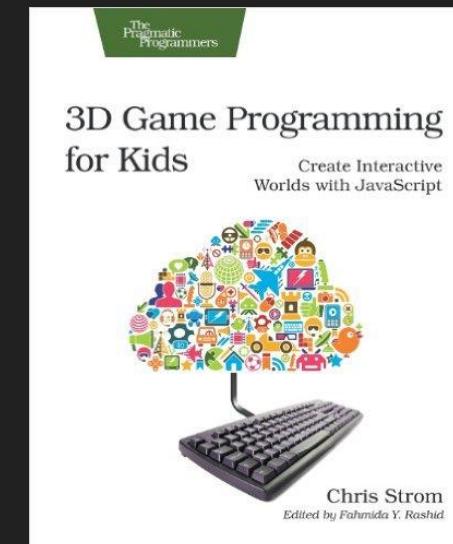
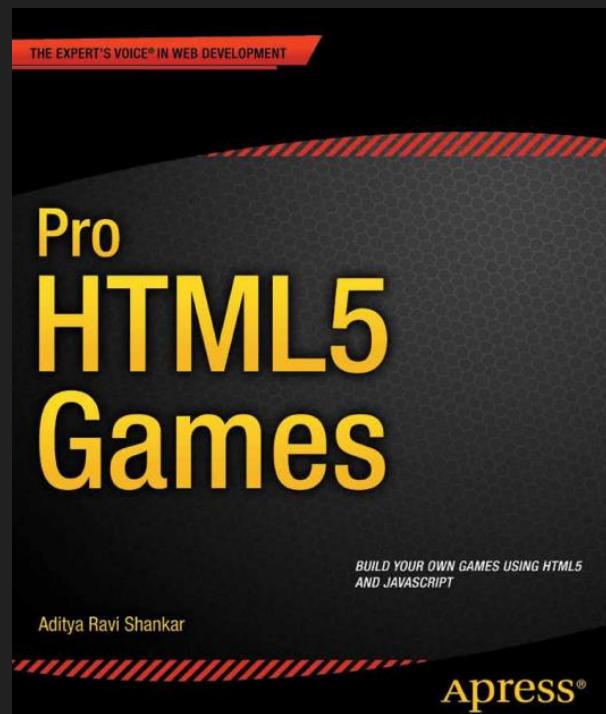


## Motivação – Lista completa



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

# Referências



<https://www.safaribooksonline.com>

Hi aceiro

In Your Queue

Everything

Recent Items

Popular in Your Topics

See more

See more

See more

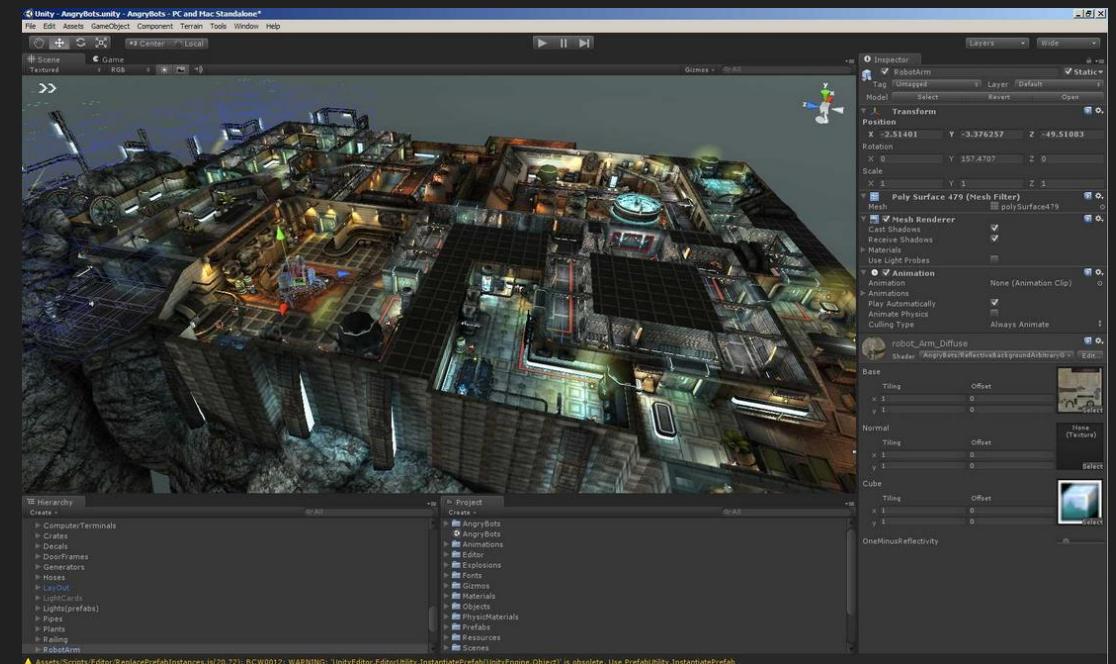
The screenshot shows the Safari Books Online homepage. At the top, there's a navigation bar with a search field and various icons. On the left, a sidebar features a play button icon and several small icons representing different categories like books, videos, and webcasts. The main content area is divided into sections: 'In Your Queue' (with book covers for 'Head First Design Patterns' and 'Unity Game Development'), 'Recent Items' (with book covers for 'MELScripting for MAYA Animators', 'GAME CODING COMPLETE', 'Data Anal', 'Pro HTML5 Games', and 'AI for Game Developers'), and 'Popular in Your Topics' (with book and video covers for 'Learning Spark', 'Core Java for the Impatient', 'Soft Architecture Patterns', 'Introduction to Data Science with R', 'The Indie Game Developer Handbook', 'Just Enough Math', and 'Head First Android Development'). Each item has a 'See more' link at the bottom right.

# 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

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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



# CUDA C

## Standard C Code

```
void saxpy_serial(int n,
                  float a,
                  float *x,
                  float *y)
{
    for (int i = 0; i < n; ++i)
        y[i] = a*x[i] + y[i];
}

// Perform SAXPY on 1M elements
saxpy_serial(4096*256, 2.0, x, y);
```

## Parallel C Code

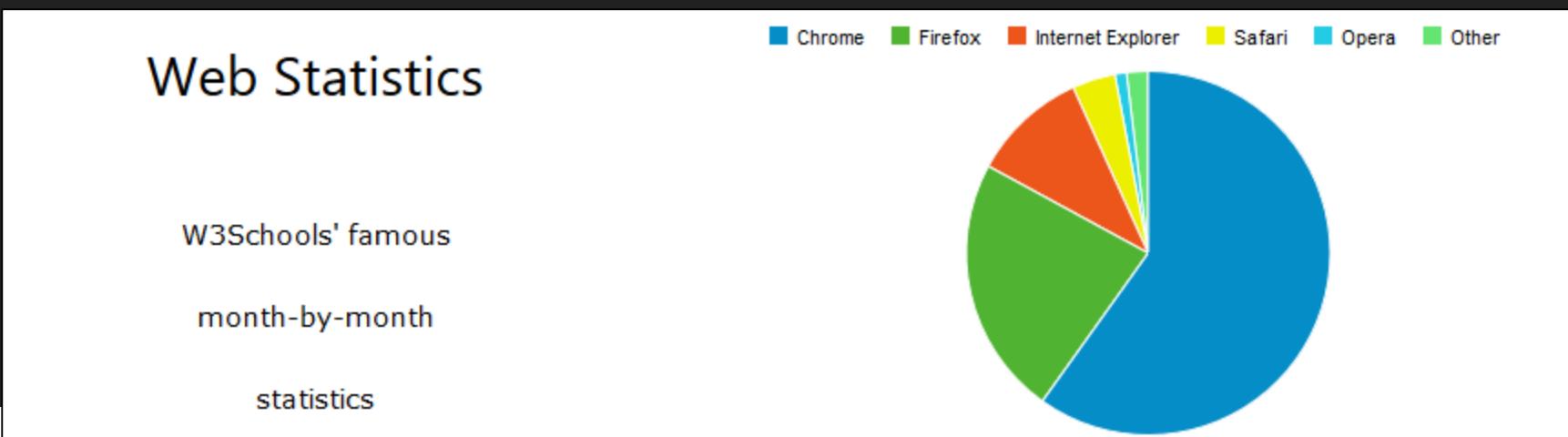
```
__global__
void saxpy_parallel(int n,
                     float a,
                     float *x,
                     float *y)
{
    int i = blockIdx.x*blockDim.x +
            threadIdx.x;
    if (i < n) y[i] = a*x[i] + y[i];
}

// Perform SAXPY on 1M elements
saxpy_parallel<<<4096, 256>>>(n, 2.0, x, y);
```

# Tecnologias para o desenvolvimento de games na web



# God bles you...



# God bles you...

<http://www.sublimetext.com/>



# Sublime Text

Navegador Google Chrome x https://www.google.com.br/chrome/browser/desktop/ JB

# Use um navegador da Web gratuito e mais rápido

div#footer 1079.2px x 280.6px

Elements Network Sources Timeline Profiles Resources Audits Console

```
<!DOCTYPE html>
<html class=" consumer js flexbox flexboxlegacy canvas canvastext webgl no-touch geolocation postmessage websqldatabase indexeddb hashchange history draganddrop websockets rgba hsla multiplebgs backgroundsize borderimage borderradius boxshadow opacity cssanimations csscolumns cssgradients cssreflections csstransforms csstransforms3d csstransitions fontface generatedcontent video audio localstorage sessionstorage webworkers applicationcache svg inlinesvg smil svgclippaths build-stable chrome win win8 win64 win64-capable twisty-js" data-country="br" lang="pt-BR" id="win64">
  <head>...</head>
  <body class="grid">
    <div class="compact" id="header">...</div>
    <div class="browser-landing" id="main">...</div>
    <div id="footer">...</div>
    <iframe frameborder="0" src="about:blank" class="modal-dialog-bg" style="border: 0px; vertical-align: bottom; display: none; opacity: 0;">...</iframe>
    <div class="modal-dialog-bg" style="display: none; opacity: 0.5;"></div>
    <div class="modal-dialog mode-eula win platform-win" id="eula-dialog" tabindex="0" aria-labelledby="" role="dialog" style="display: none; left: 148.5px; top: 13.6px;">...</div>
    <span tabindex="0" style="display: none; position: absolute; left: 148.5px; top: 13.6px;"></span>
    <script src="/chrome/assets/common/js/chrome-installer.min.js">
      </script>
    <script>...</script>
    <iframe src="//2542116.fl.doubleclick.net/activityi;src=2542116;type=clien612;cat=chrom0;ord=1;num=6818933023605.496?" width="1" height="1" style="display: none;">...</iframe>
    <script>...</script>
    <iframe name="oauth2relay587903225" id="oauth2relay587903225" src="https://accounts.google.com/o/oauth2/postmessageRelay?parent=https%3A%2F%2Fwww.google.com.br#rpctoken=217559667&forcesecure=1" tabindex="-1" style="width: 1px; height: 1px; position: absolute; top: -100px;">...</iframe>
  </body>
</html>
```

#win64 body#grid

Styles Computed Event Listeners » chrome.min.css:1

body { color: #333; font: 13px/18px 'Open Sans', arial, sans-serif; font-weight: 400; }

\* { margin: 0; padding: 0; }

body { display: block; margin: 8px; }

margin - border - padding - 1079.200 x 4599.110 - - -

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## Tardigrades (also known as waterbears or moss piglets)<sup>[2][3]</sup>

are water-dwelling, segmented micro-animals, with eight legs.<sup>[2]</sup>

They were first described by the German pastor J.A.E. Goeze in 1773. The name Tardigrada (meaning "slow stepper") was given three years later by the Italian biologist Lazzaro Spallanzani.<sup>[4]</sup>

Tardigrades are classified as extremophiles, organisms that can thrive in a physically or geochemically extreme condition that would be detrimental to most life on Earth.<sup>[5][6]</sup> For example, tardigrades can withstand

### Tardigrade

Temporal range: Cambrian–Recent<sup>[1]</sup>

PreЄ Є O S D C P T J K Pg N



The tardigrade *Hypsibius dujardini*

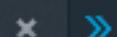
### Scientific classification

Kingdom: Animalia

Superphylum: Ecdysozoa

(unranked): Panarthropoda

Unranked: Tactopoda



# HTML + CGI

In the old days...

Behaviour

Presentation

Structure

HTML

# DYNAMIC HTML (1)

## DHTML days (1)

Behaviour

JS

Presentation

HTML

Structure

JS

# DYNAMIC HTML (2)

## DHTML days (2)

Behaviour

Presentation

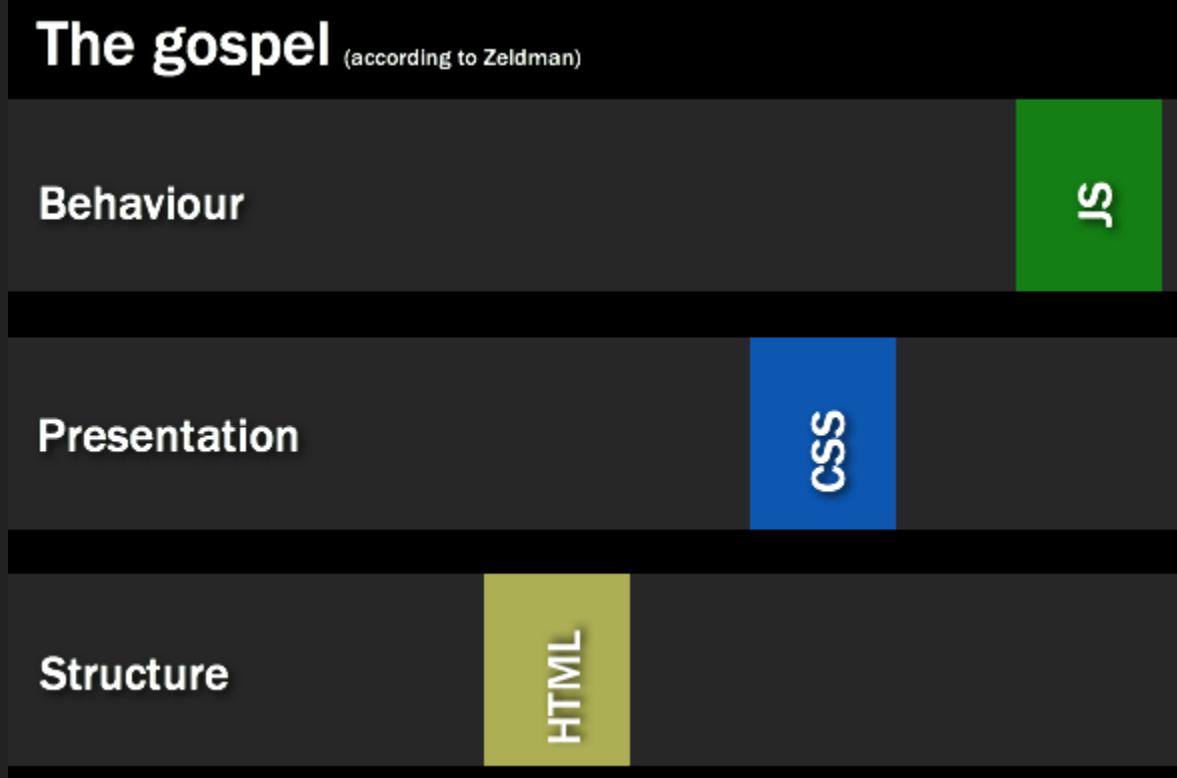
Structure

HTML

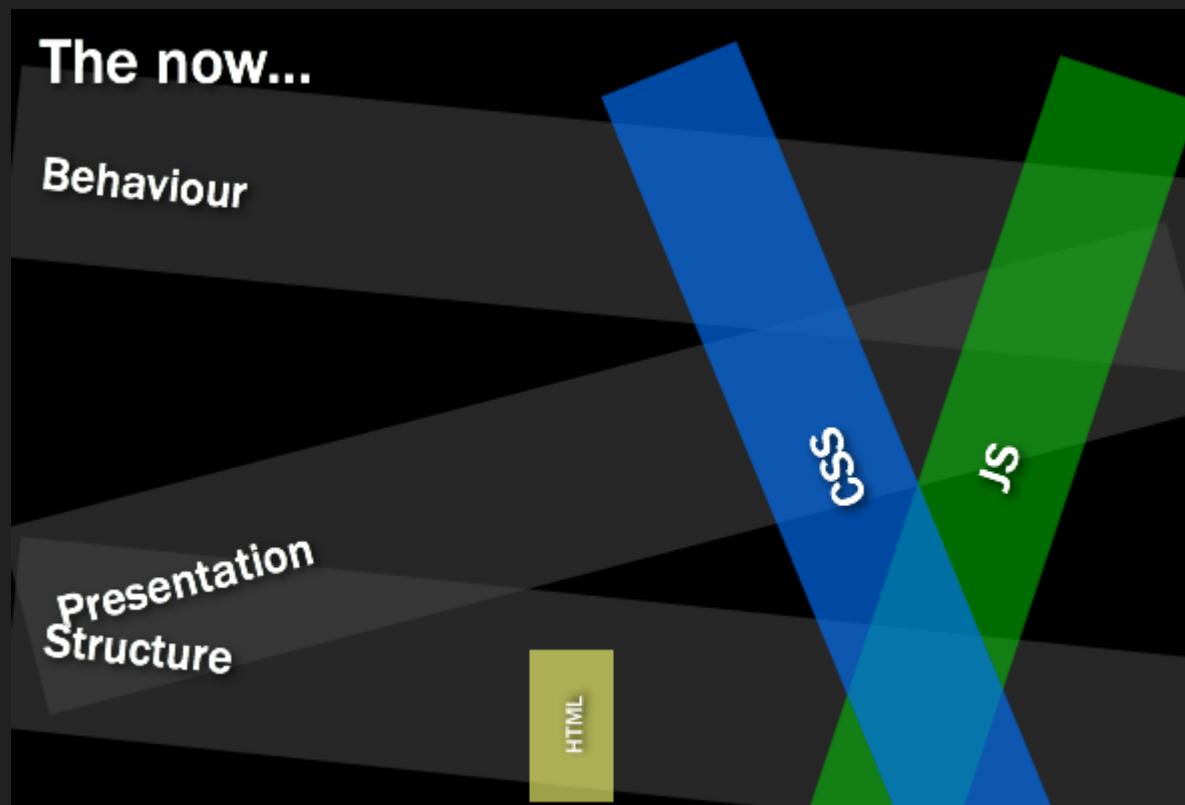
CSS

JS

# SoC – Separation of Concern



# Atualmente...



<https://www.christianheilmann.com/2011/08/15/getting-rusty-we-need-new-best-practices-for-a-different-development-world/>

# SoC – Separation of Concerns



O que você quer com HTML/CSS/JS



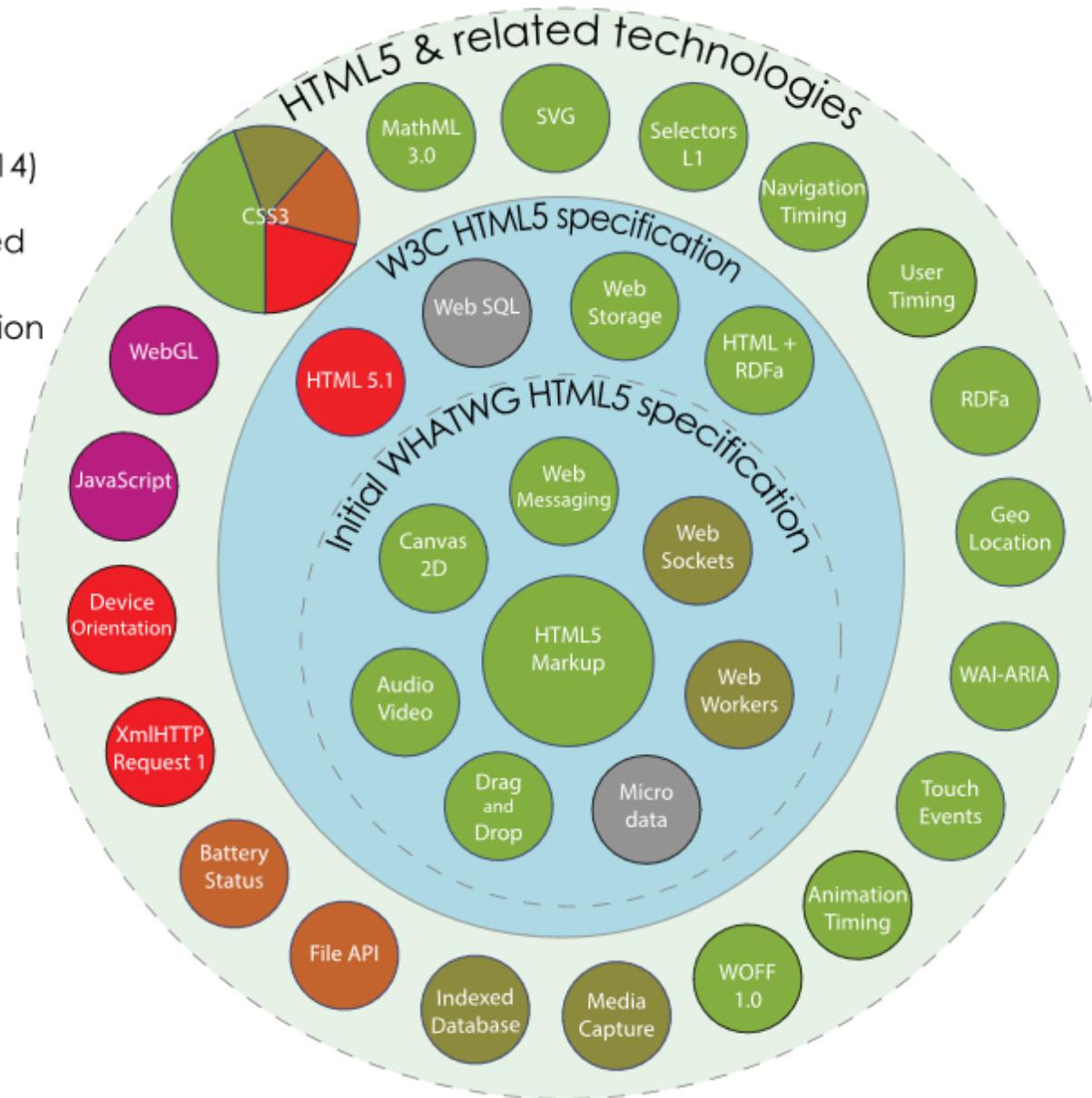
Como você pode deixar



# HTML5

Taxonomy & Status (October 2014)

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



# HTML5 – Design Wireframes



<header></header>

<nav></nav>

<section>

<article></article>

</section>

<footer></footer>

<aside>  
</aside>

<header>

<nav>

<section>  
<header>

<article>

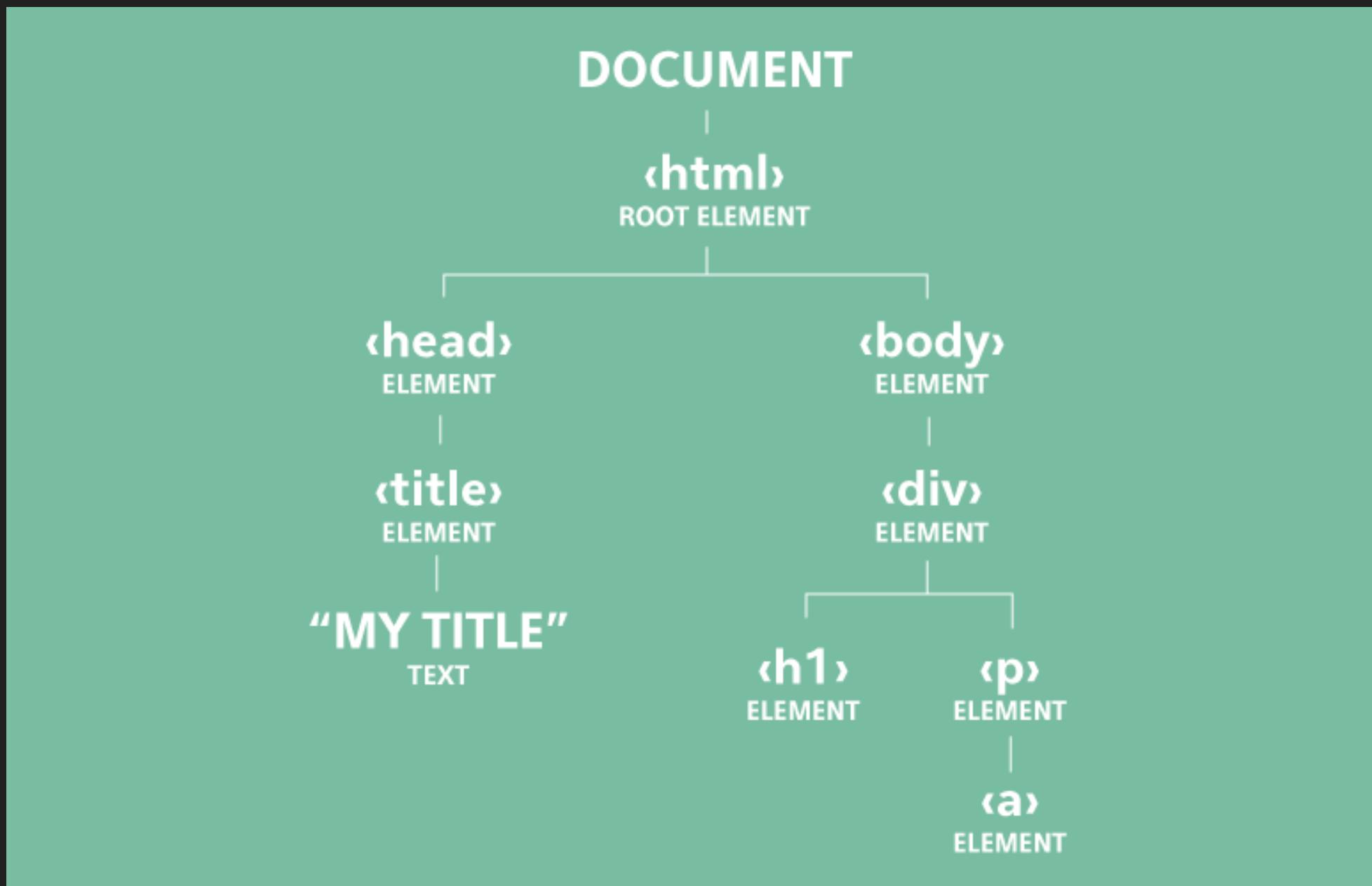
<footer>

<aside>

<footer>

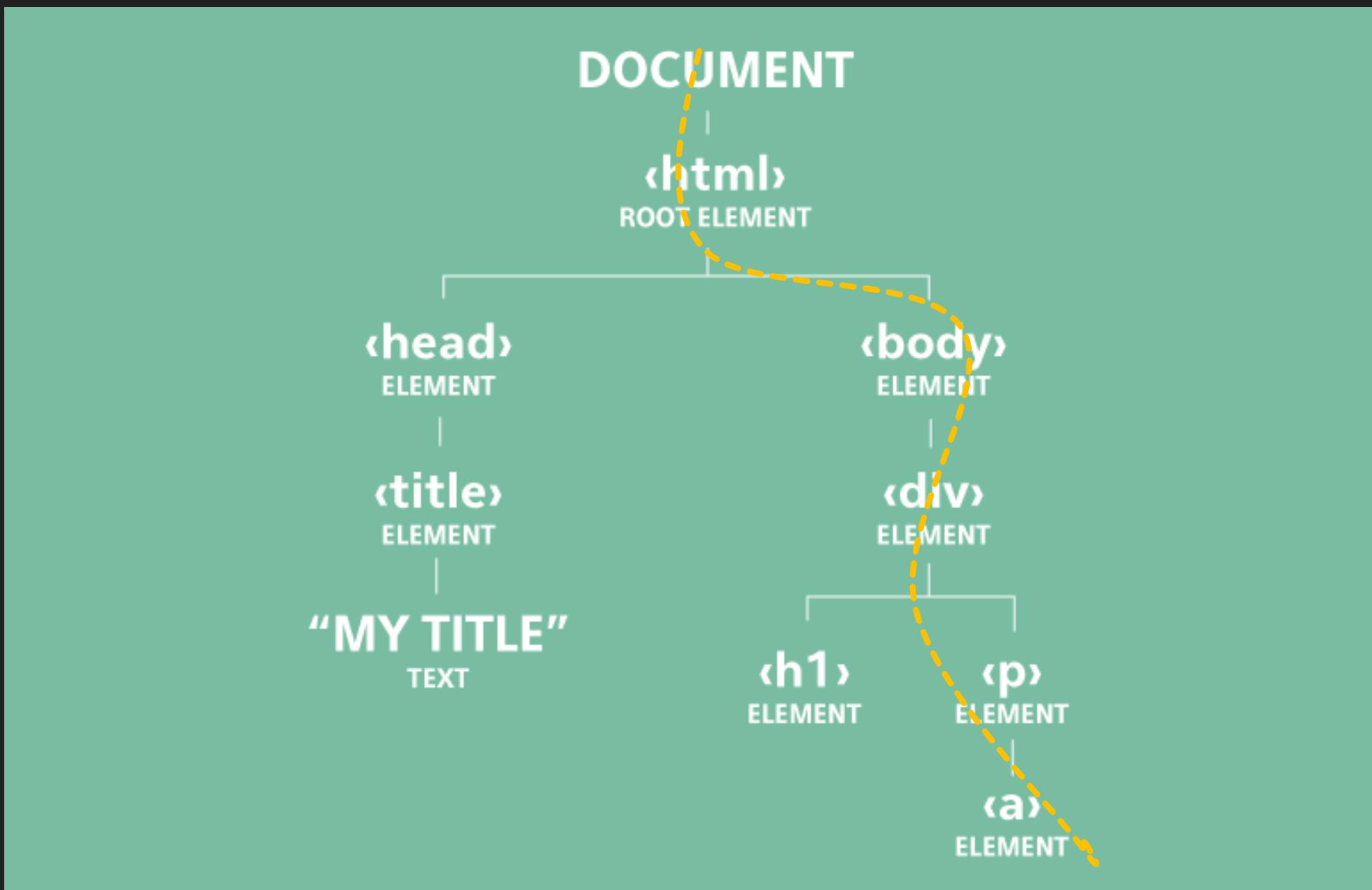
## Document Object Model

# DOM



## Document Object Model

# DOM





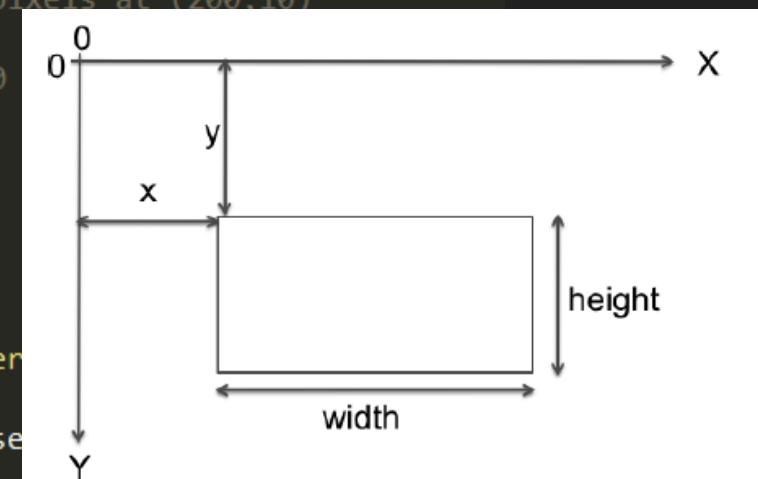
```
1 <!DOCTYPE html>
2 <html>
3     <head>
4         <meta http-equiv="Content-type" content="text/html; charset=utf-8">
5         <title>Sample HTML5 File</title>
6         <script type="text/javascript" charset="utf-8">
7             function pageLoaded(){
8                 // Get a handle to the canvas object
9                 var canvas = document.getElementById('testcanvas');
10
11                 // Get the 2d context for this canvas
12                 var context = canvas.getContext('2d');
13                 // FILLED RECTANGLES
14                 // Draw a solid square with width and height of 100 pixels at (200,10)
15                 context.fillRect (200,10,100,100);
16                 // Draw a solid square with width 90 and height of 30 pixels at (50,70)
17                 context.fillRect (50,70,90,30);
18
19             }
20         </script>
21     </head>
22     <body onload="pageLoaded();">
23         <canvas width="600" height="400" id="testcanvas" style="border:1px solid black;">
24             Your browser does not support the HTML5 Canvas tag. Please shift to a newer browser
25         </canvas>
26         
27     </body>
28 </html>
29
```

## HTML5 - Exemplo



```
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16                context.fillRect (50,70,90,30);
17            }
18        </script>
19    </head>
20    <body onload="pageLoaded();">
21        <canvas width="600" height="400" id="testcanvas" style="border: 1px solid black;>
22            Your browser does not support the HTML5 Canvas tag. Please upgrade your browser.
23        </canvas>
24        
25    </body>
26 </html>
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28
```

Experimental-webgl for 3d





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25         </canvas>
26         
27     </body>
28 </html>
29
```

## HTML5 - Exemplo

# CSS3 - Exemplo



```
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-type" content="text/html; charset=utf-8">
    <title>Froot Wars</title>
    <script src="js/jquery.min.js" type="text/javascript" charset="utf-8"></script>
    <script src="js/game.js" type="text/javascript" charset="utf-8"></script>
    <link rel="stylesheet" href="styles.css" type="text/css" media="screen" charset="utf-8">
  </head>

  <body>
    <div id="gamecontainer">
      <canvas id="gamecanvas" width="640" height="480" class="gamelayer">
        </canvas>
```



```
1 #gamecontainer {  
2     width:640px;  
3     height:480px;  
4     background: url(images/splashscreen.png);  
5     border: 1px solid black;  
6 }  
7  
8 .gamelayer {  
9     width:640px;  
10    height:480px;  
11    position:absolute;  
12    display:none;  
13 }  
14  
15 /* Game Starting Menu Screen */  
16 #gamestartscreen {  
17     padding-top:250px;  
18     text-align:center;  
19 }  
20  
21 #gamestartscreen img {  
22     margin:10px;  
23     cursor:pointer;  
24 }  
25  
26 /* Level Selection Screen */  
27 #levelselectscreen {  
28     padding-top:150px;  
29     padding-left:50px;  
30 }
```

## CSS3 - Exemplo

## Animation loop !

```
function animationLoop(){
    // Iterate through all the items in the game
    //And move them
}

function drawingLoop(){
    //1. Clear the canvas
    //2. Iterate through all the items
    //3. And draw each item
}
```

```
// Call drawingLoop() every 20 milliseconds
var gameLoop = setInterval(drawingLoop,20);

// Stop calling drawingLoop() and clear the gameLoop variable
clearInterval(gameLoop);
```

# Animation loop !

```
1 // Setup requestAnimationFrame and cancelAnimationFrame for use in the game code
2 (function() {
3     var lastTime = 0;
4     var vendors = ['ms', 'moz', 'webkit', 'o'];
5     for(var x = 0; x < vendors.length && !window.requestAnimationFrame; ++x) {
6         window.requestAnimationFrame = window[vendors[x] + 'RequestAnimationFrame'];
7         window.cancelAnimationFrame =
8             window[vendors[x] + 'CancelAnimationFrame'] || window[vendors[x] + 'CancelRequestAnimation']
9     }
10
11    if (!window.requestAnimationFrame)
12        window.requestAnimationFrame = function(callback, element) {
13            var currTime = new Date().getTime();
14            var timeToCall = Math.max(0, 16 - (currTime - lastTime));
15            var id = window.setTimeout(function() { callback(currTime + timeToCall); },
16                timeToCall);
17            lastTime = currTime + timeToCall;
18            return id;
19        };
20
21    if (!window.cancelAnimationFrame)
22        window.cancelAnimationFrame = function(id) {
23            clearTimeout(id);
24        };
25 })();
26
27 $(window).load(function() {
28     game.init();
29 });
30
```





```
1 // Setup requestAnimationFrame and cancelAnimationFrame for use in the game code
2▼ (function() {
3     var lastTime = 0;
4     var vendors = ['ms', 'moz', 'webkit', 'o'];
5▼   for(var x = 0; x < vendors.length && !window.requestAnimationFrame; ++x) {
6       window.requestAnimationFrame = window[vendors[x] + 'RequestAnimationFrame'];
7       window.cancelAnimationFrame =
8           window[vendors[x] + 'CancelAnimationFrame'] || window[vendors[x] + 'CancelRequestAnimation
9   }
10
11▼ if (!window.requestAnimationFrame)
12▼   window.requestAnimationFrame = function(callback, element) {
13     var currTime = new Date().getTime();
14     var timeToCall = Math.max(0, 16 - (currTime - lastTime));
15     var id = window.setTimeout(function() { callback(currTime + timeToCall); },
16     timeToCall);
17     lastTime = currTime + timeToCall;
18     return id;
19   };
20
21▼ if (!window.cancelAnimationFrame)
22   window.cancelAnimationFrame = function(id) {
23     clearTimeout(id);
24   };
25
26 $(window).load(function() {
27     game.init();
28 });
29
30
```

# Outros recursos úteis

- Repositórios

- Frameworks

- CG – Computação Gráfica

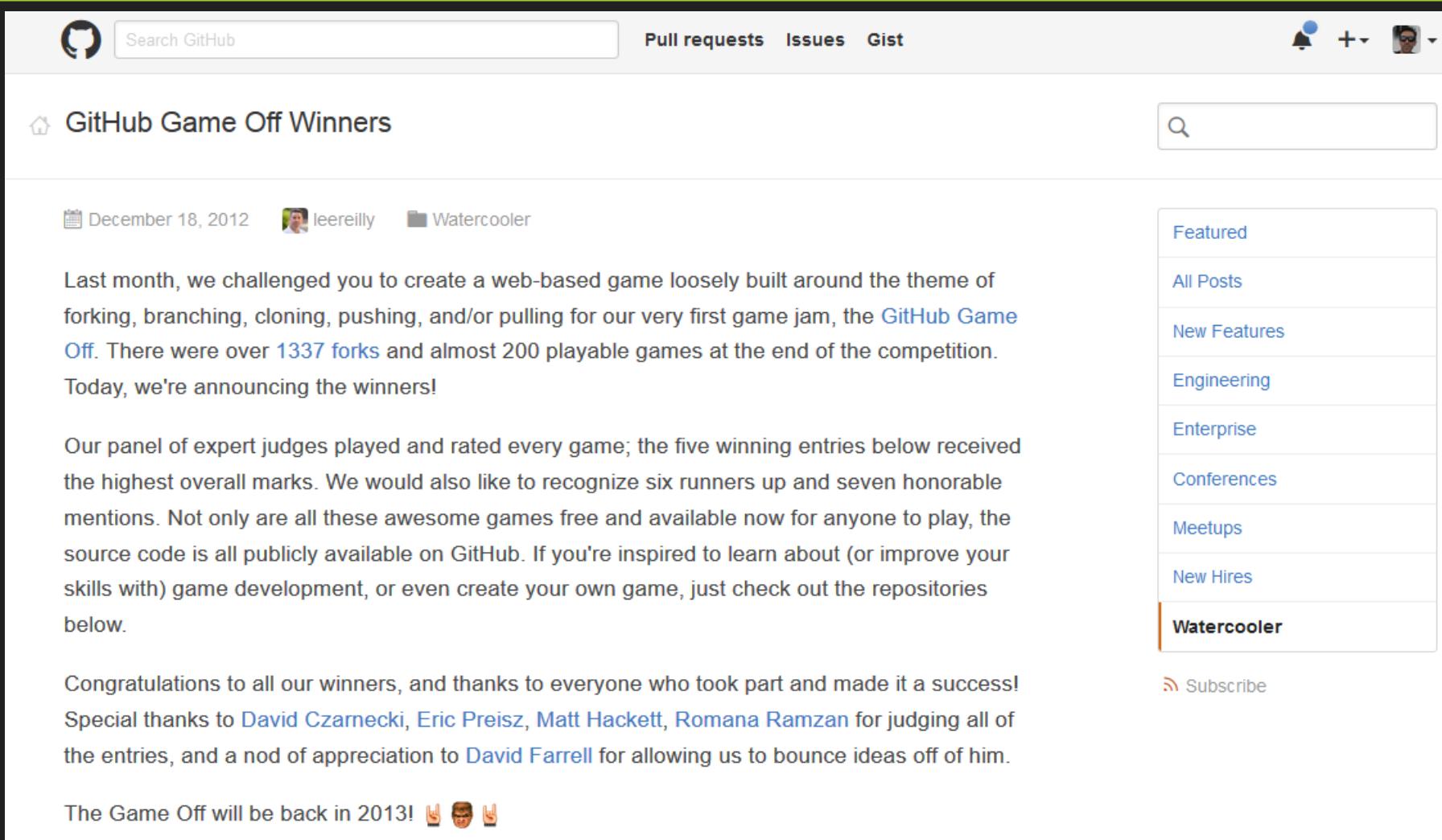
- IA – Inteligência Artificial

- Física, Modelagem e Simulação

# Repositórios de Games – Git e GitHub

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

1337 forks!



The screenshot shows a GitHub blog post titled "GitHub Game Off Winners". The post is dated December 18, 2012, and was written by leereilly. It features a sidebar with links to "Featured", "All Posts", "New Features", "Engineering", "Enterprise", "Conferences", "Meetups", "New Hires", and "Watercooler" (which is highlighted with an orange border). The main content discusses the GitHub Game Off competition, noting over 1337 forks and nearly 200 games. It highlights five winning entries and mentions judges like David Czarnecki, Eric Preisz, Matt Hackett, and Romana Ramzan. The post concludes with a note about the Game Off returning in 2013.

Search GitHub

Pull requests Issues Gist

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

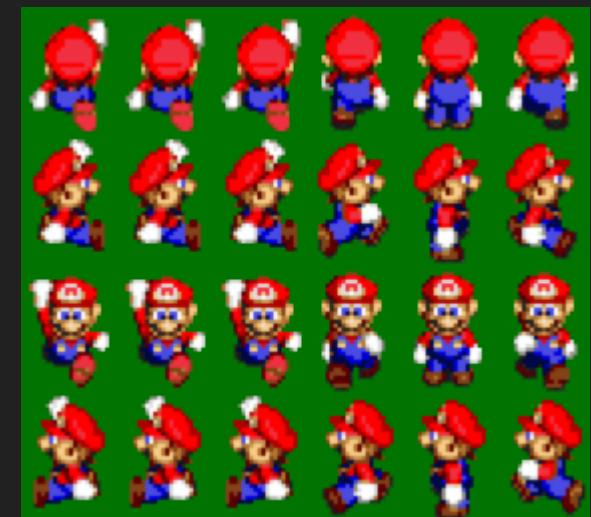
New Hires

**Watercooler**

Subscribe

<http://phaser.io/examples/v2/category/basics>

The screenshot shows the Phaser Examples website's navigation bar with links for NEWS, LEARN, DOWNLOAD, PHASER (highlighted), EXAMPLES, COMMUNITY, and SHOP. A search bar at the top right contains the placeholder "Search Examples (i.e. shadow)" with a magnifying glass icon. Below the search bar, the word "BASICS" is prominently displayed in large white letters. To the left of "BASICS" is a "Back to Examples" link with a left arrow icon. On the left side, there is a sidebar with icons and labels for ALL (620), ANIMATION (18), ARCADE PHYSICS (46), AUDIO (12), BASICS (7), BITMAPDATA (21), and BOX2D (40). The main content area features three examples: "01 LOAD AN IMAGE" showing a portrait of a man with a mustache; "02 CLICK ON AN IMAGE" showing the same portrait with a cursor; and "03 MOVE AN IMAGE" showing the portrait again with a cursor. A color gradient bar runs horizontally across the bottom of the main content area. In the bottom right corner of the main content area, there is a dark box containing the text "- phaser - with a sprinkle of pixi dust."



## PHYSICS FORMULAS

$$F_s = -kx$$

$$= x_0 + \frac{1}{2} a t^2 + v_0 t$$

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

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

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

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

$$f_k \leq \mu_s N$$

$$v = v_0 + at$$

$$U_g = mgh$$

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

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

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

$$E = mc^2$$

## **FAST AND ACCURATE SYMMETRIC EULER ALGORITHM FOR ELECTROMECHANICAL SIMULATIONS**

Jouko Niiranen

ABB Industry Oy, PO Box 184

FIN-00381 Helsinki, Finland

Fax: +358-10 22 22 531; e-mail: jouko.niiranen@fi.abb.com

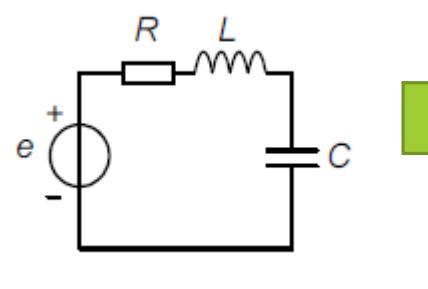
**NOTE: The method became later known as "Symplectic Euler"**

**Abstract:** Many filters, power converters, AC electric motors and their shaft mechanics are characterized by even order differential equation systems that are oscillatory in their nature. The low damping causes problems with the accuracy of both the forward and the backward Euler algorithms. However, the symmetric Euler algorithm, which is even simpler than the forward Euler, gives an accuracy that is comparable to the accuracy obtained by the trapezoidal method without requiring matrix inversion. The symmetric Euler algorithm is often confused with the forward Euler and is thus

when the capacitor voltage is initially assumed to be zero.

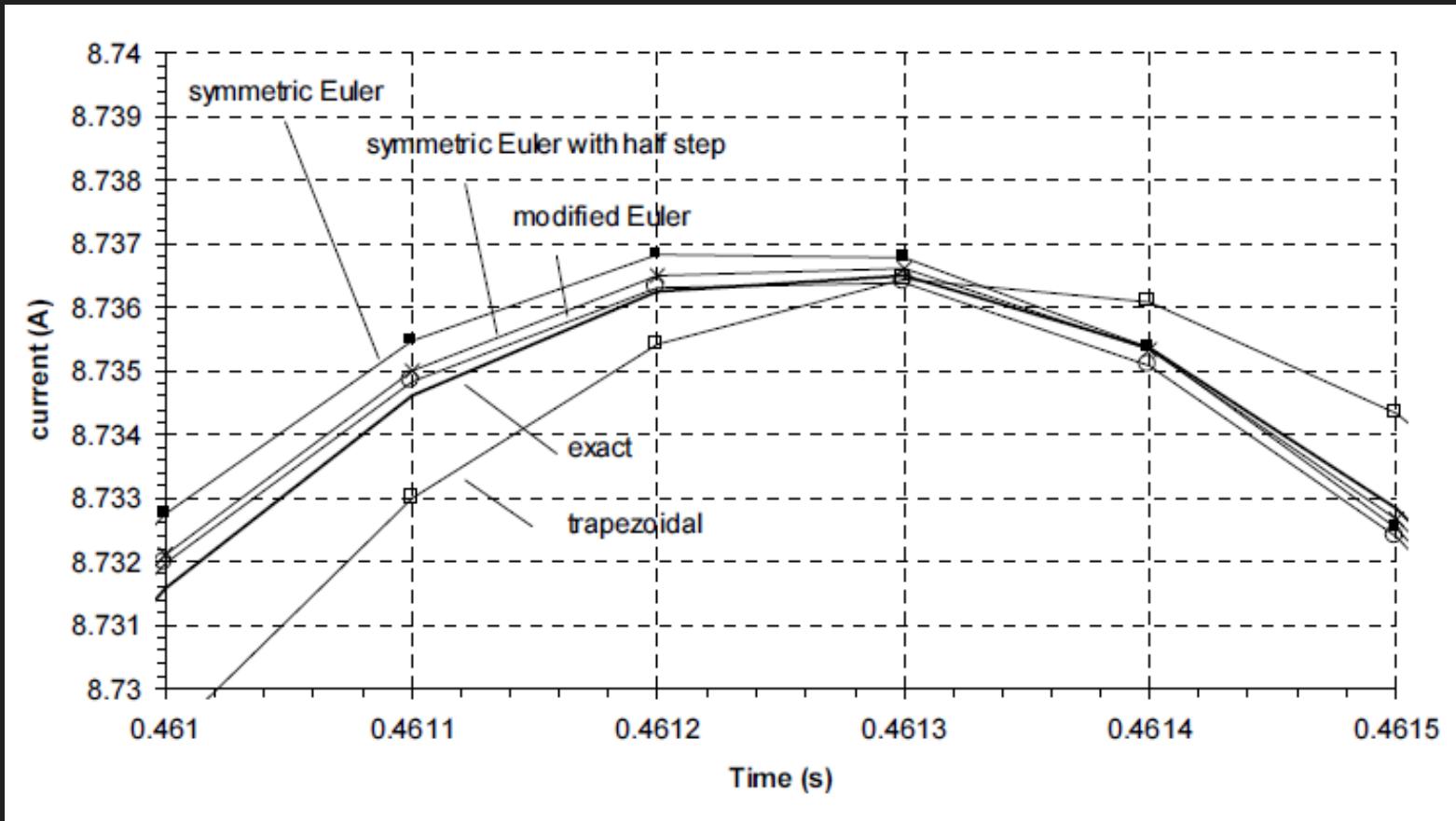
For the numerical solution this equation is transformed into two integral equations

$$\begin{cases} i = \frac{1}{L} \int (e(t) - Ri - u_C) dt \\ u_C = \frac{1}{C} \int idt \end{cases} \quad (2)$$



$$e(t) = L \frac{di}{dt} + Ri + \frac{1}{C} \int i dt$$

$$\begin{cases} i_{n+1} = i_n + \frac{t_\Delta}{L} (e_n - Ri_n - u_{Cn}) \\ u_{Cn+1} = u_{Cn} + \frac{t_\Delta}{C} i_n \end{cases}$$



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



HÁ UM CHAMADO  
ESPECIAL QUE USAMOS  
SE PRECISAMOS DE  
AJUDA



PRESTEM  
MUITA  
ATENÇÃO



MÃE!

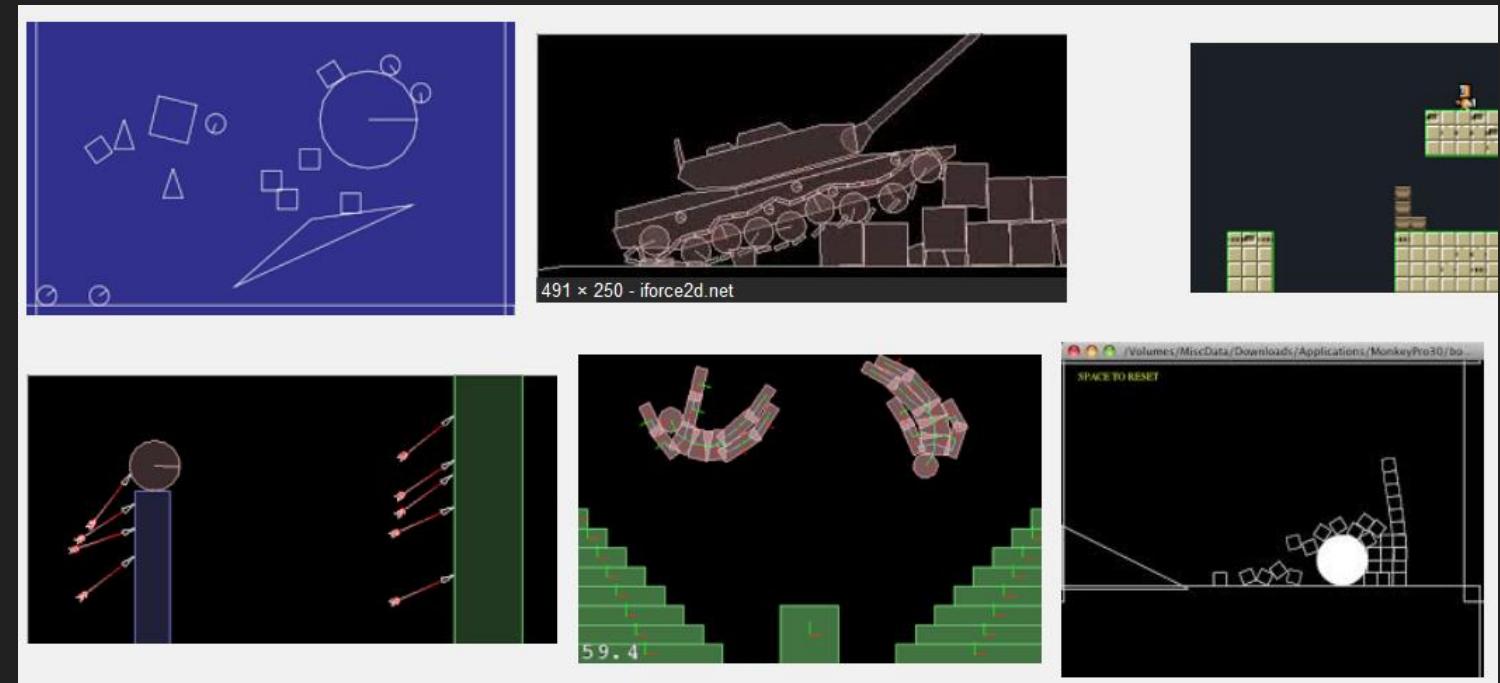


# Engines - Framework

- cannon.js
  - <http://www.cannonjs.org/>
- matter.js
  - <http://brm.io/matter-js/>
- PhysicsJS
  - <http://wellcaffeinated.net/PhysicsJS/>
- Processing
  - <http://processingjs.org/>
- Box2D
  - <https://github.com/hecht-software/box2dweb>
  - <https://github.com/hecht-software/box2dweb/wiki>
  - [http://www.box2dflash.org/docs/2.0.2/manual#Box2D\\_v2.0.1\\_User\\_Manual](http://www.box2dflash.org/docs/2.0.2/manual#Box2D_v2.0.1_User_Manual)
- Physijs
  - <http://chandlerprall.github.io/Physijs/>
- EaselJs
  - <https://github.com/CreateJS/EaselJS>

Engine	2D	3D	WebGL
Cannon.js		<b>SIM</b>	<b>SIM</b>
Matter.js	<b>SIM</b>		<b>SIM</b>
Physics.js	<b>SIM</b>		*****
Processing.js	<b>SIM</b>		*****
Box2D.js	<b>SIM</b>		<b>SIM</b>
Physi.js	<b>SIM</b>		<b>SIM</b>
EaselJs	<b>SIM</b>		

# Frameworks - Física



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

## Box2D JavaScript examples and demos

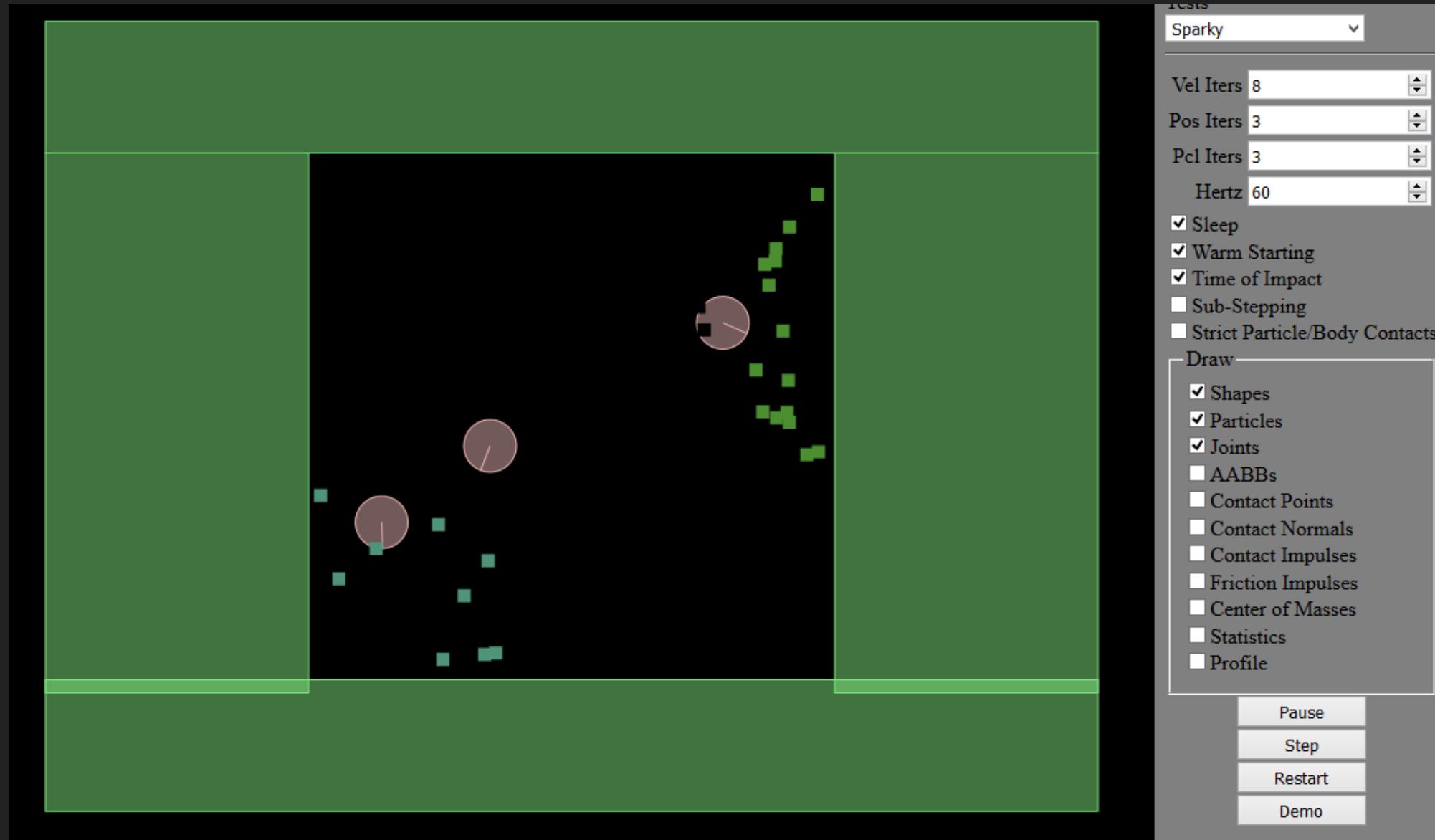
1. [00](#) - most basic example
2. [01](#) - simple example
3. [01.01](#) - simple Box2d example with configurable velocity and position iteration values
4. [02](#) - side by side com
5. [03](#) - box2d in a web v
6. [04](#) - side by side com
7. [05](#) - box2d in a web v
8. [06](#) - box2d in a web 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>

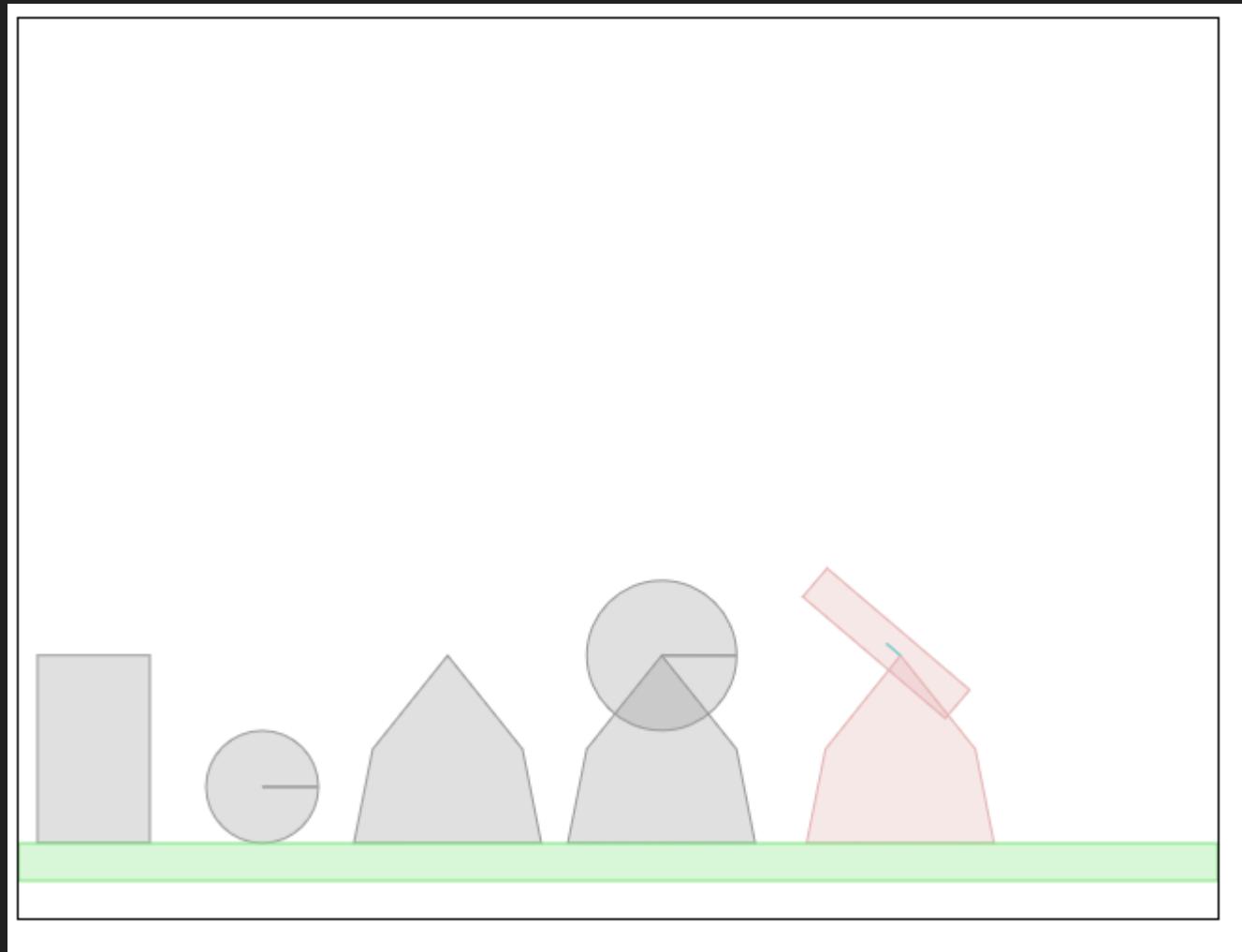


<https://cdn.rawgit.com/flyover/box2d.js/master/Box2D/Build/Testbed/index.html>

**Lista completa ...**

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

# Exemplo



**Hands-on**



# Alterações

- Adicione chamada para a biblioteca main.js
- Adicione a carga do init() para iniciar o game
- Crie um piso no arquivo main.js
- Crie um evento utilizando para iniciar a captura de um evento de clique do mouse. Em seguida, adicione a criação dos círculos aleatoriamente

# 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](#)

Khronos Specification



### 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](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](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](https://www.khronos.org/registry/webgl/specs/1.0.2/webgl.idl)

Editor:

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

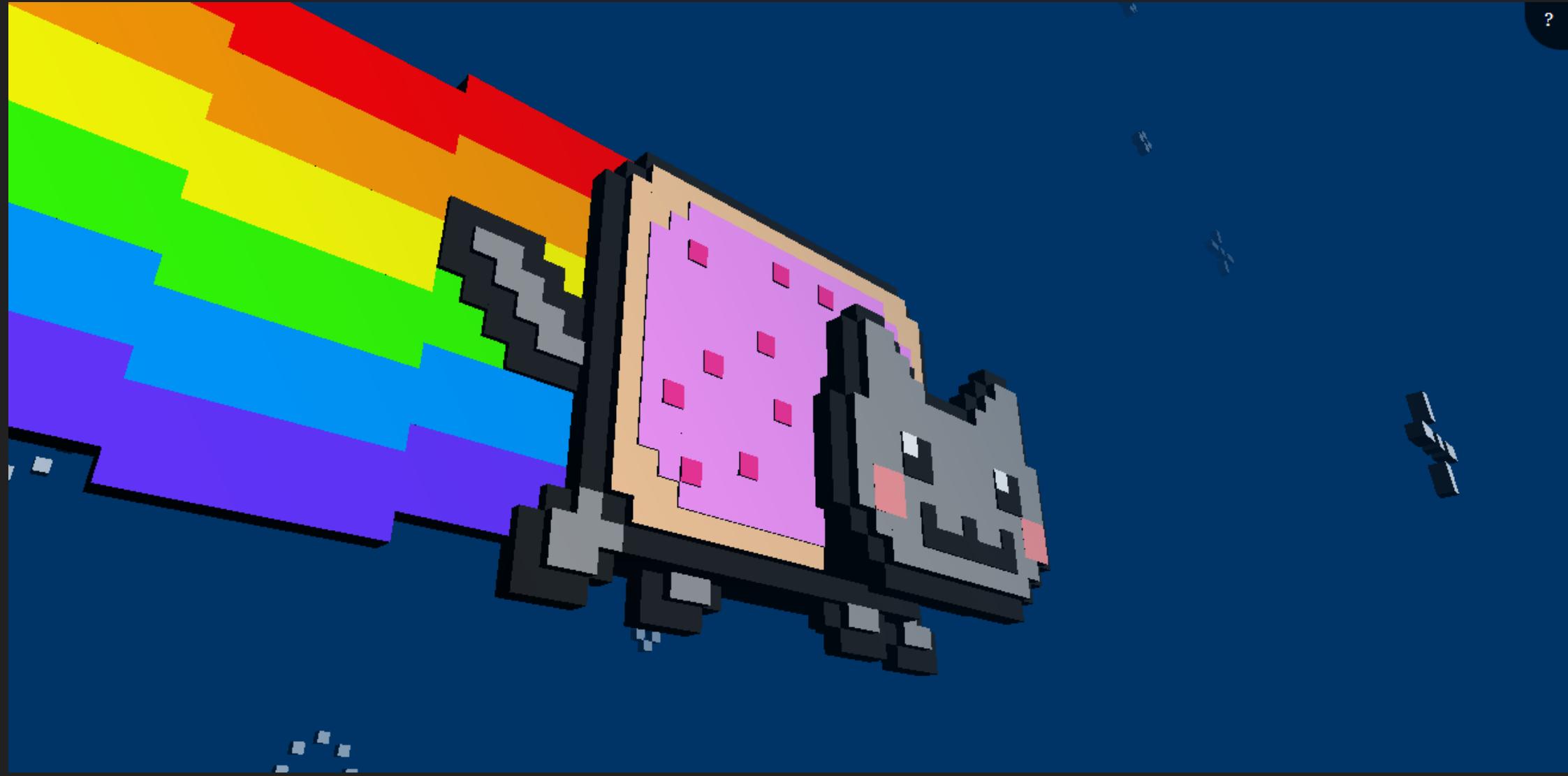
Copyright © 2014 Khronos Group

### Abstract

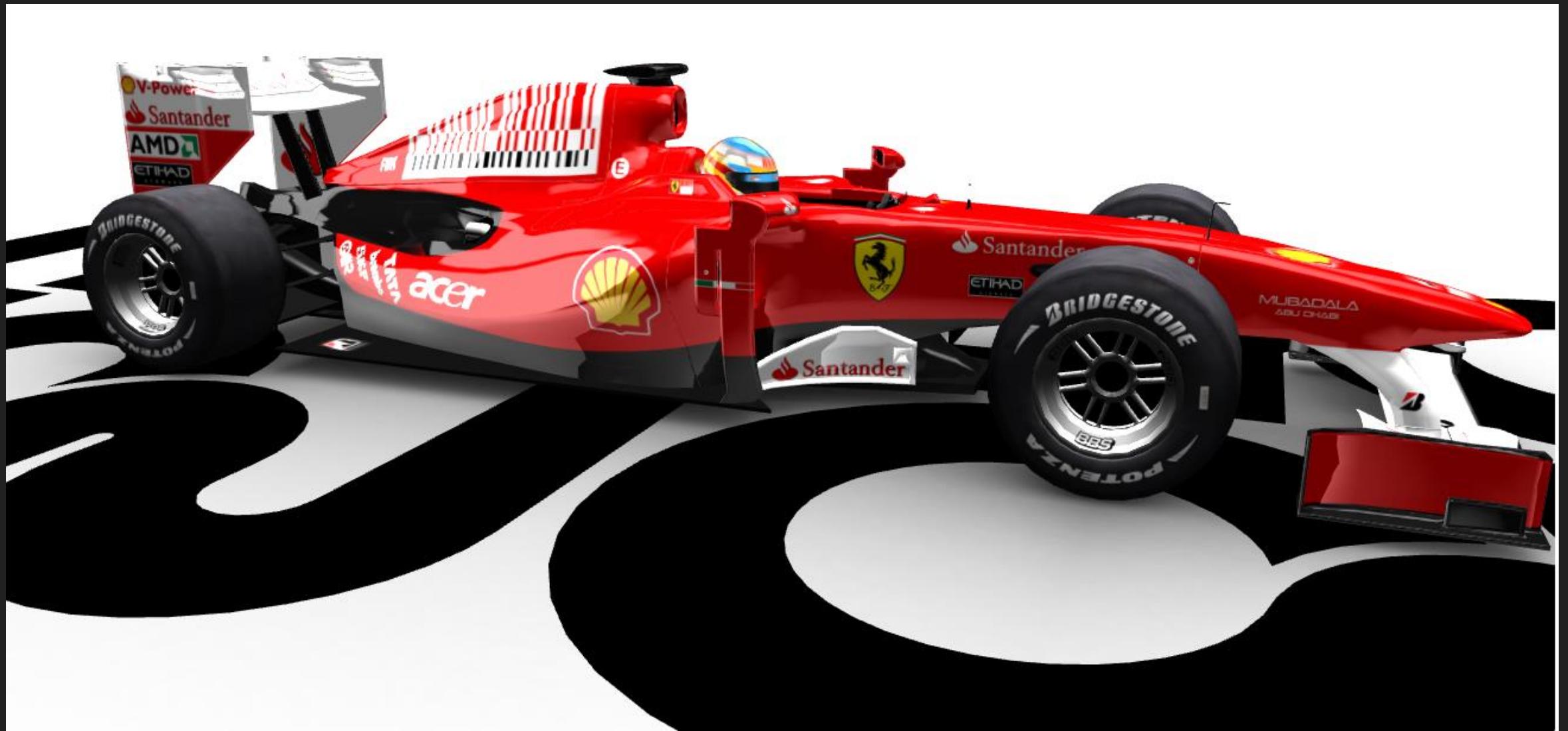
This specification describes an additional rendering context and support objects for the [HTML 5 canvas element \[CANVAS\]](#). This context allows rendering using an API that conforms closely to the OpenGL ES 2.0 API.

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

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



<https://dl.dropboxusercontent.com/u/6213850/WebGL/nyanCat/nyan.html>



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

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

three.js <sup>r72</sup>

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

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

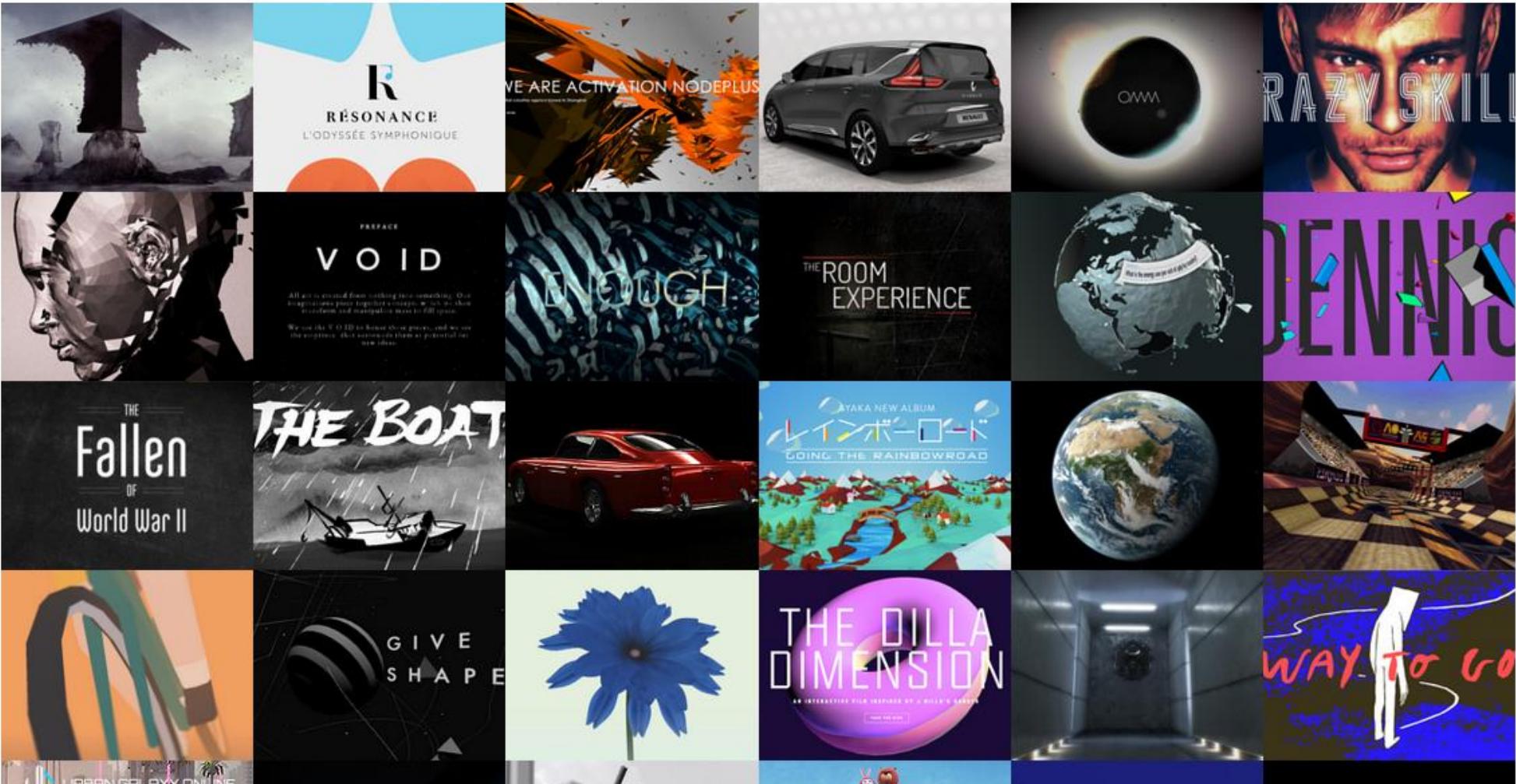
[getting started](#)  
[documentation](#)  
[chat](#)  
[help](#)

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

[editor \(beta\)](#)

featured projects

[more projects](#)



Interactive  
3D Graphics

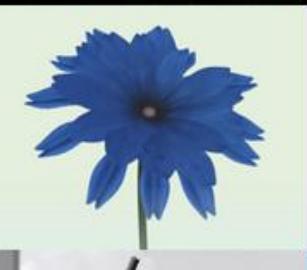
Taught by Eric Haines



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 );

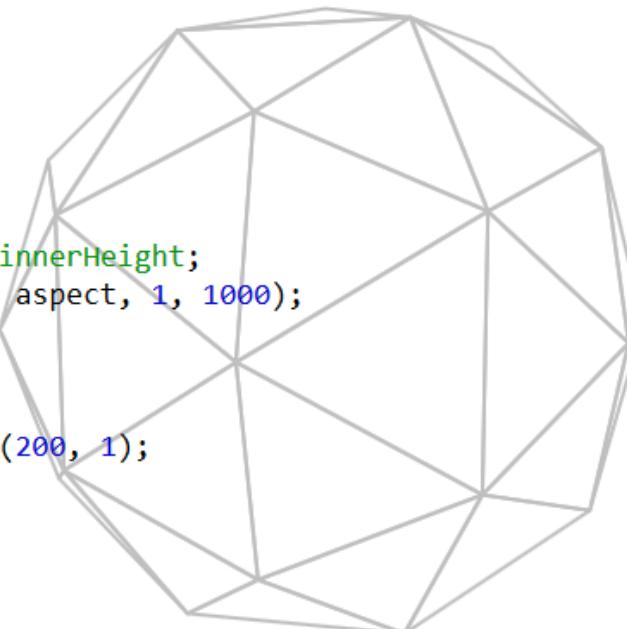
        cube.rotation.x += 0.1;
        cube.rotation.y += 0.1;

        renderer.render( scene, camera );
      };

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

<http://gamingjs.com/ice/>

```
1 <body></body>
2 <script src="http://gamingJS.com/Three.js"></script>
3 <script src="http://gamingJS.com/ChromeFixes.js"></script>
4 <script>
5   var camera, scene, renderer;
6   var geometry, material, mesh;
7
8   init();
9   animate();
10
11  function init() {
12    scene = new THREE.Scene();
13
14    var aspect = window.innerWidth / window.innerHeight;
15    camera = new THREE.PerspectiveCamera(75, aspect, 1, 1000);
16    camera.position.z = 500;
17    scene.add(camera);
18
19    geometry = new THREE.IcosahedronGeometry(200, 1);
20    material = new THREE.MeshBasicMaterial({
21      color: 0x000000,
22      wireframe: true,
23      wireframeLinewidth: 2
24    });
25
26    mesh = new THREE.Mesh(geometry, material);
27    scene.add(mesh);
28
29    renderer = new THREE.CanvasRenderer();
30    renderer.setClearColorHex(0xffffffff);
```



UPDATE   HIDE CODE   ⋮

**Hands-on**



# Alterações

## 1. Modifique os valores do material

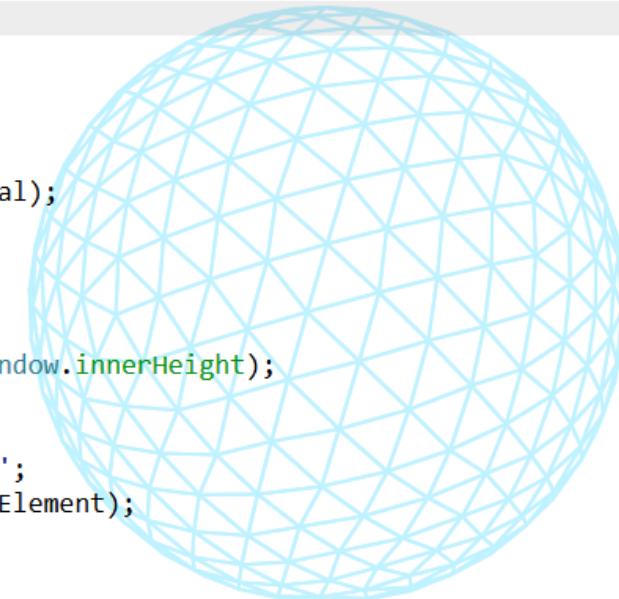
```
geometry = new THREE.IcosahedronGeometry(200, 3);
material = new THREE.MeshBasicMaterial({
    color: 0xafe,
    wireframe: true,
    wireframeLineWidth: 2
});

mesh = new THREE.Mesh(geometry, material);
scene.add(mesh);

renderer = new THREE.CanvasRenderer();
renderer.setClearColorHex(0xffffffff);
renderer.setSize(window.innerWidth, window.innerHeight);

document.body.style.margin = 0;
document.body.style.overflow = 'hidden';
document.body.appendChild(renderer.domElement);

function animate() {
```

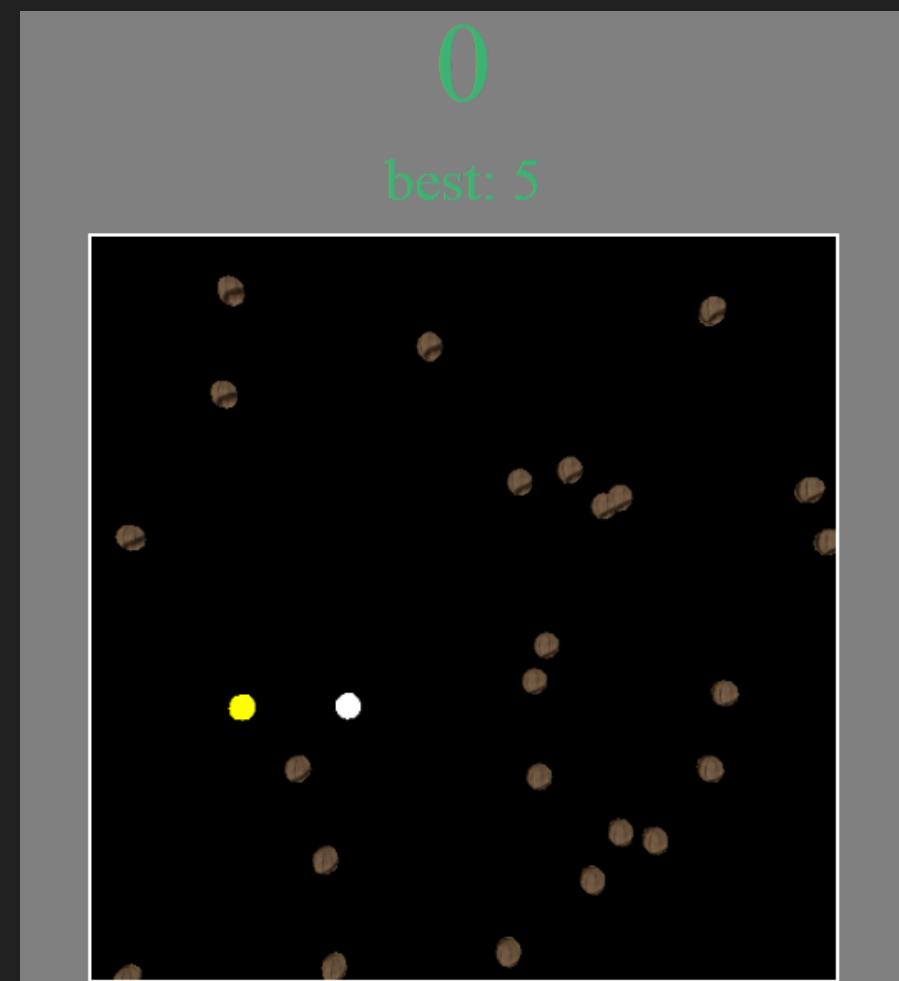


**Hands-on**



# Alterações

1. Modifique o código para gerar os inimigos e detectar a colisão



**Hands-on**



# Exemplos



**Gabriele Cirulli**  
gabrielecirulli

---

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

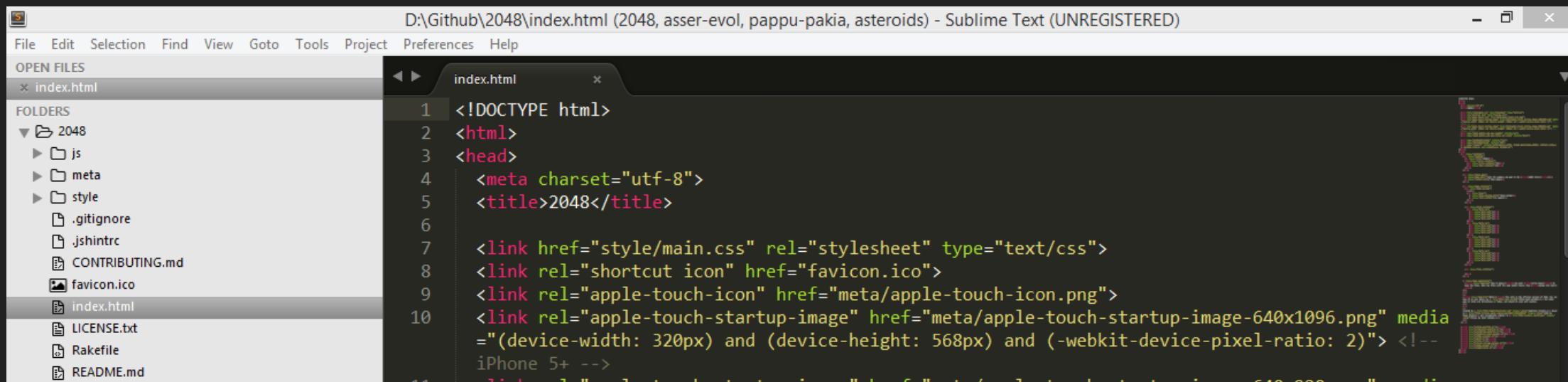
---

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



<https://github.com/gabrielecirulli>

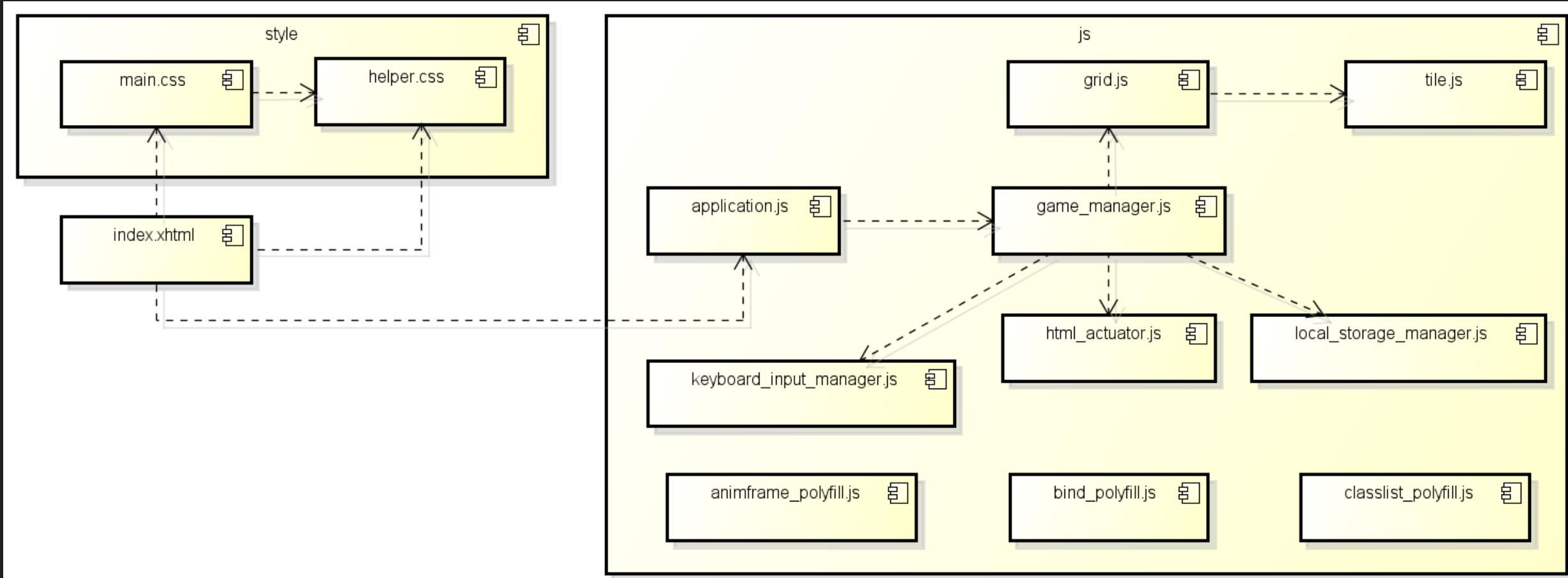
# Arquitetura do 2048



The screenshot shows a Sublime Text window displaying the `index.html` file from a GitHub repository named "2048". The repository contains files for the game, including JavaScript, CSS, and meta-data. The `index.html` file itself is a standard HTML document with meta charset and title tags, and links to external stylesheets and icons.

```
<!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+ -->
```

# Design – 2048 (Domain-Driven Development)



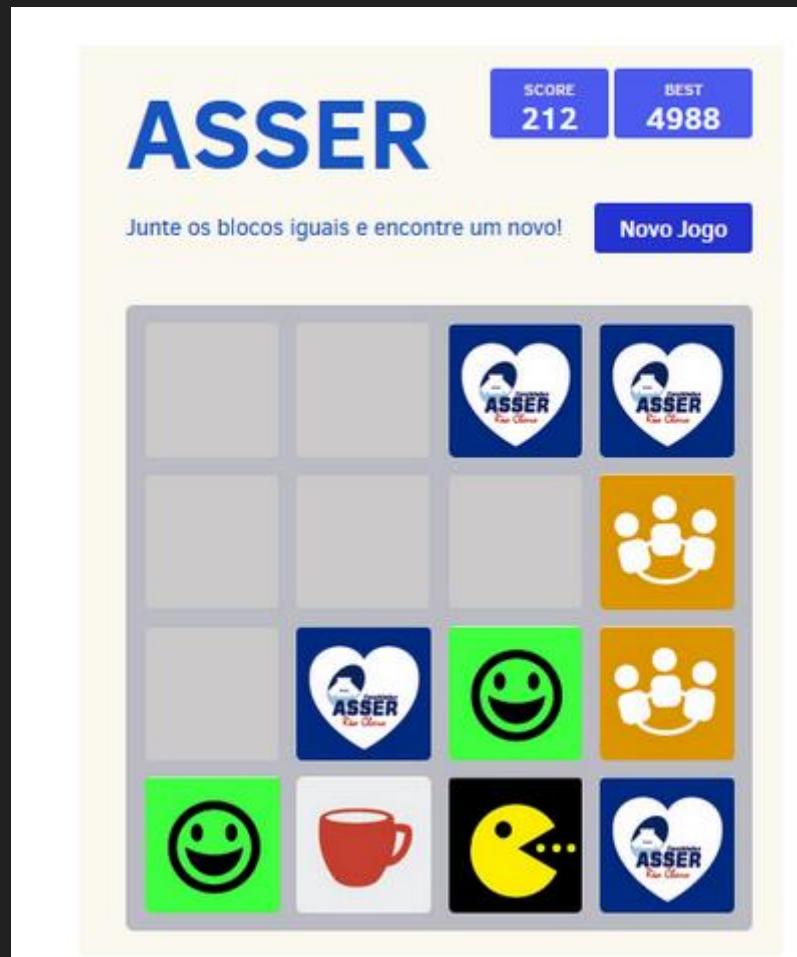
# Desenvolvimento - AsserEvol



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);
}
```



## Qual ponto podemos alterar ?

```
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);
  }
}
```

# HTMLActuator – Pequena alteração

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

  var wrapper = document.createElement("div");
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  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);
}
```



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

# 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];

  var imgElement = document.createElement("img");
  if (tile.value == 2) {
    imgElement.src = "imgs/1.jpg";
  } else if (tile.value == 4) {
    imgElement.src = "imgs/2.jpg";
```



# 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];
```

```
  var imgElement = document.createElement("img");
  if (tile.value == 2) {
    imgElement.src = "imgs/1.jpg";
  } else if (tile.value == 4) {
    imgElement.src = "imgs/2.jpg";
```

```
this.applyClasses(wrapper, classes);
```

```
inner.classList.add("tile-inner");
//inner.textContent = tile.value;
inner.appendChild(imgElement);
```

Dúvidas !

## Sistemas de Informação



**SISTEMAS DE INFORMAÇÃO**

-  **DESENVOLVIMENTO DE JOGOS PARA ANDROID**
-  **INTELIGENCIA ARTIFICIAL E ROBÓTICA COM ARDUINO**
-  **GESTÃO DE NEGÓCIOS, CRIATIVIDADE E EMPREENDEDORISMO**
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**O CURSO**

Sistemas de Informação estão cada vez mais presentes em nossas vidas e em diversas áreas operacionais, como por exemplo, produção, marketing, recursos humanos, finanças, administração entre outras.

O curso de Bacharelado em Sistemas de Informação contém disciplinas que exploram desde a arquitetura de computares a inteligência artificial e robótica, passando por gestão empresarial e desenvolvimento de aplicativos como, por exemplo, mobile, games e web.

**O MERCADO DE TRABALHO**

O mercado de trabalho para quem se forma em Sistemas de Informação é vasto, visto que todas as grandes empresas possuem setores de TI e cada vez mais percebe-se a falta de profissionais formados nessa área para auxiliar na condução desses setores.

A matriz curricular 2016 foi elaborada para que, desde o início, os alunos recebam sólidos conhecimentos para atuarem na área de TI de grandes empresas, resolvendo problemas por meio de raciocínio lógico e buscando solução para os desafios das organizações.

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presentes em nossas vidas e em diversas áreas operacionais

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