

CS247L, Wed April 9, 2014 (Sunny)



https://www.youtube.com/watch?v=AjxWeZg-_F8

Use the tool your most familiar/comfortable with
HCI vs Software Engineering?



Java and Javascript are similar like Car and Carpet are similar.

<http://en.wikipedia.org/wiki/JavaScript>

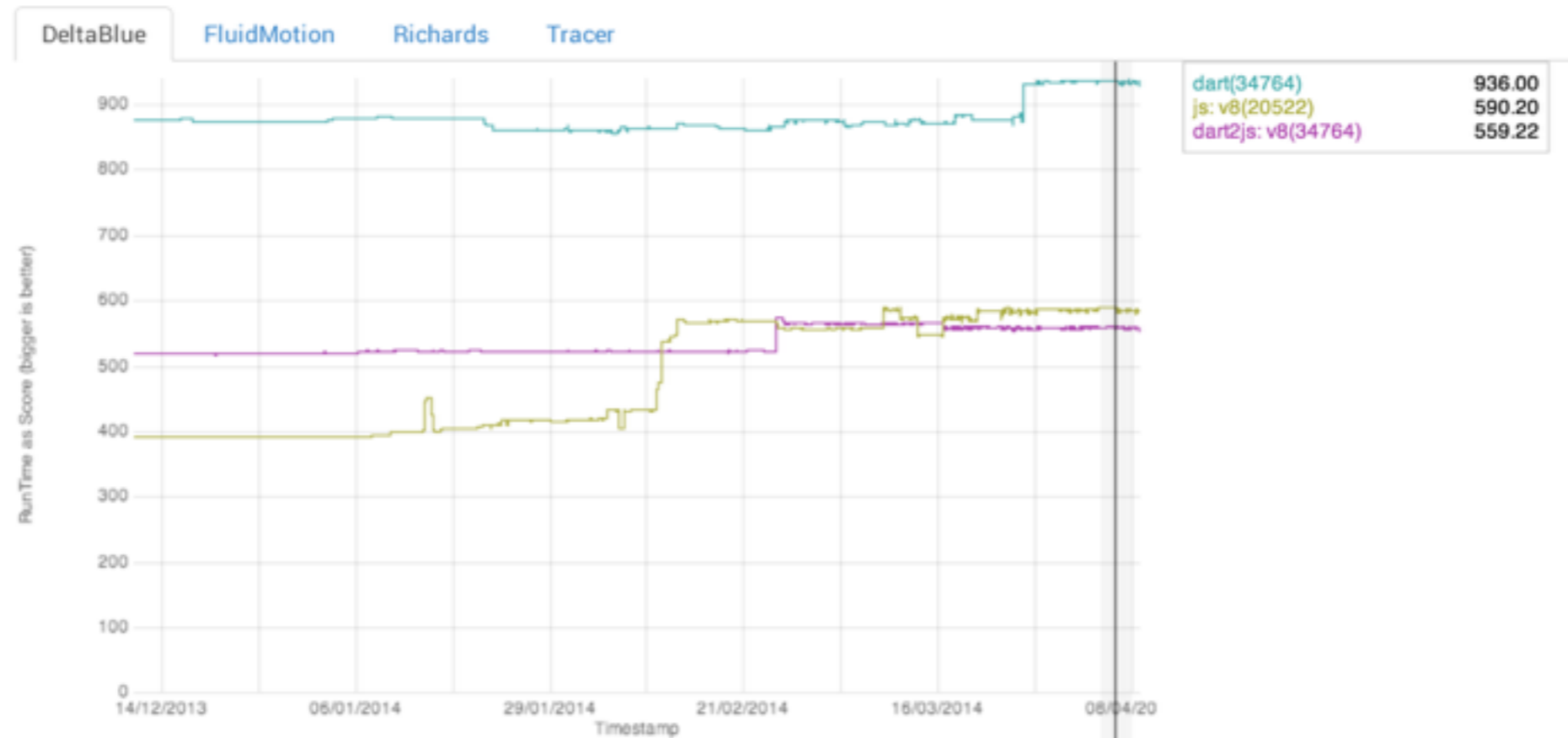
Program Source Code	CPU secs	Elapsed secs	Memory KB	Code B	≈ CPU Load
regex-dna					
JavaScript V8	3.81	3.83	395,464	373	0% 0% 1% 100%
Java	21.40	21.42	563,636	1284	0% 1% 1% 100%
spectral-norm					
JavaScript V8	15.70	15.71	9,280	328	0% 1% 1% 100%
Java	17.09	17.10	21,152	514	0% 0% 1% 100%
fannkuch-redux					
JavaScript V8	78.88	78.90	7,452	539	0% 1% 1% 100%
Java	68.89	68.91	19,892	1282	1% 1% 1% 100%
n-body					
JavaScript V8	36.31	36.32	9,644	1287	0% 0% 0% 100%
Java	22.66	22.67	19,568	1424	0% 0% 0% 100%
binary-trees					
JavaScript V8	46.18	46.25	584,248	467	0% 1% 0% 100%
Java	22.96	22.99	448,112	603	0% 0% 1% 100%
k-nucleotide					
JavaScript V8	98.43	98.52	70,076	1249	0% 1% 1% 100%
Java	48.57	48.61	505,840	1602	0% 0% 1% 100%
fasta					
JavaScript V8	17.66	17.67	9,472	791	0% 1% 0% 100%
Java	5.37	5.37	20,888	1507	0% 1% 1% 100%
reverse-complement					
JavaScript V8	8.74	8.75	269,748	787	0% 1% 1% 100%
Java	1.86	1.87	517,532	745	0% 1% 1% 100%

<http://benchmarksgame.alioth.debian.org/u64/javascript.php>

V8 Engine? Dart? ASM.js?

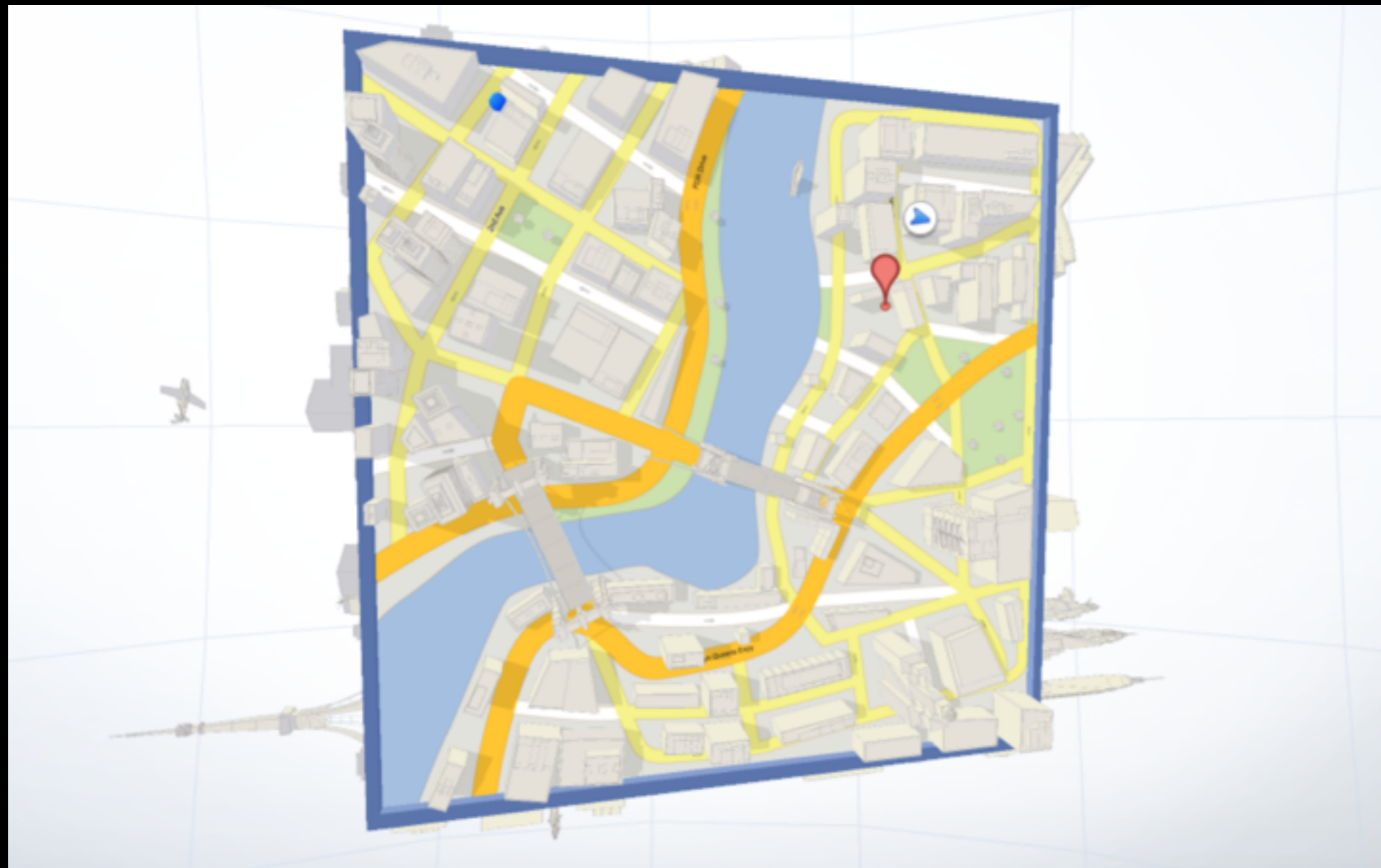
Dart VM and dart2js Performance

Tracking Dart VM and dart2js performance.

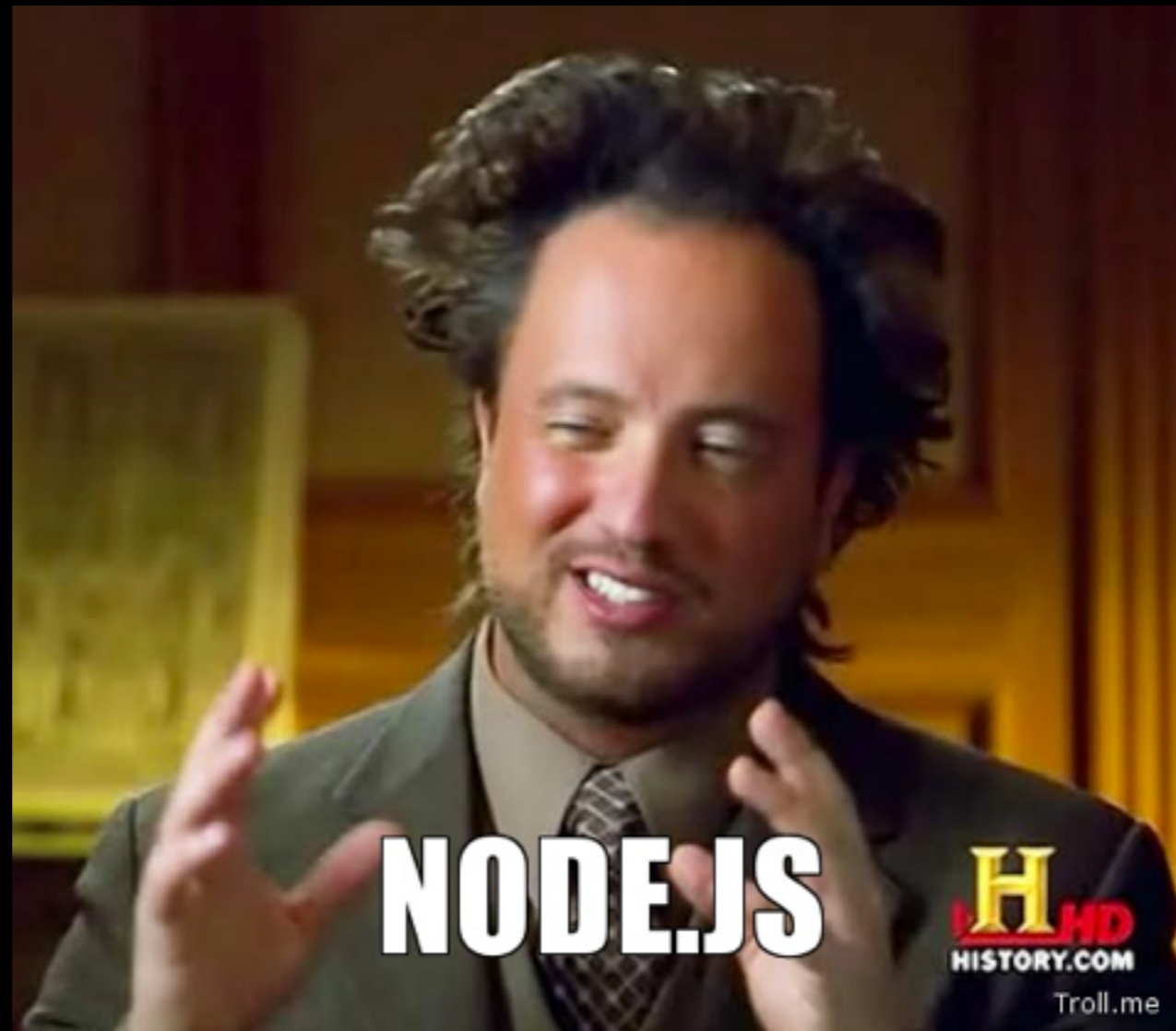


<http://techcrunch.com/2014/03/12/epic-partners-with-mozilla-to-port-unreal-engine-4-to-the-web/>

WebGL



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



<http://nodejs.org/industry/> (who's using)



AN EXAMPLE: WEBSERVER

This simple web server written in Node responds with "Hello World" for every request.

```
var http = require('http');
http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/plain'});
  res.end('Hello World\n');
}).listen(1337, '127.0.0.1');
console.log('Server running at http://127.0.0.1:1337/');
```

Express is one of the frameworks for Node.js

<http://expressjs.com/>

```
app.get('/', function(req,res){
  res.json({msg:'received: ' + req.query.message})
});
```

```
app.get('/home', function(req,res){
  res.render('template_name',template_object)
});
```

```
app.post('/new_user', function(req,res){
  database_transaction(function(){
    res.json({msg:'saved: ' + req.body.user.name})
  }
});
```

In express...

1. Express server receives get/post request
2. Router function parses the request parameters (optional)
3. Do some database calls and get results (optional)
4. Find the template to render the results (optional, you can return the result JSON object directly by `res.json` or `res.end`)
5. Send back the rendered page or JSON object (optional)

Browser receives rendered page and
execute JS (if there is) in browser

Lots of templates - handlebars , jade

<https://github.com/joyent/node/wiki/modules#templating>

Raw HTML

```
<body>
  <h1>Jade - node template engine</h1>
  <div id="container" class="col">
    <p>You are amazing</p>
    <p>
      Jade is a terse and simple
      templating language with a
      strong focus on performance
      and powerful features.
    </p>
  </div>
</body>
```

Jade

```
body
  h1 Jade - node template engine
  #container.col
    if youAreUsingJade
      p You are amazing
    else
      p Get on it!
  p.
    Jade is a terse and simple
    templating language with a
    strong focus on performance
    and powerful features.
```

Templates can allow you to do some crazy stuff

```
.form_wrapper(class= style+"_wrapper")
- each field in form
  if field.type
    .input_wrapper(class= style)
    .label!= field.label
    .input_field
    case field.type
      when "short_text"
        input(id= field.rid, placeholder= field.placeholder, value= field.fill)
      when "password_text"
        input(id= field.rid, placeholder= field.placeholder, type="password", value= field.fill)
      when "long_text"
        textarea(id= field.rid, placeholder= field.placeholder)
        if field.fill
          = field.fill
        else
          = field.placeholder
      when "image_upload"
        .form_image_upload(id= field.rid)
      when "mult_select_list"
        .form_mult_select_list(id= field.rid)
      when "checkbox"
        form(id= field.rid)
        each o in field.options
          .checkbox_option
          input.checkbox_select(value= o,type="checkbox",name= field.data_attr)
          .checkbox_label= o
      when "radio_button"
        form(id= field.rid)
        each o in field.options
          .radio_option
          input.radio_select(value= o,type="radio",name= field.data_attr)
          .radio_label= o
```



```
<div class="post">
  <h1>By {{fullName author}}</h1>
  <div class="body">{{body}}</div>

  <h1>Comments</h1>

  {{#each comments}}
  <h2>By {{fullName author}}</h2>
  <div class="body">{{body}}</div>
  {{/each}}
</div>
```

+

```
var context = {
  author: {firstName: "Alan", lastName: "Johnson"},
  body: "I Love Handlebars",
  comments: [{
    author: {firstName: "Yehuda", lastName: "Katz"},
    body: "Me too!"
  }]
};
```

```
Handlebars.registerHelper('fullName', function(person) {
  return person.firstName + " " + person.lastName;
});
```

=

```
<div class="post">
  <h1>By Alan Johnson</h1>
  <div class="body">I Love Handlebars</div>

  <h1>Comments</h1>

  <h2>By Yehuda Katz</h2>
  <div class="body">Me Too!</div>
</div>
```


Handlebars can be used on client/backend

```
35 <script id="tiles" type="text/x-handlebars-template">
36   <div class="tile">
37     {{#if link}}
38     <a id="{{id}}" class="title" target="_blank" href="{{link}}">
39       <div class="cover" style="background-image:url('{{cover}})"></div>
40       <div class="title_text">{{title}}<div class='link_icon'></div></div>
41     </a>
42     {{else}}
43     <a id="{{id}}" class="title">
44       <div class="cover" style="background-image:url('{{cover}})"></div>
45       <div class="title_text">{{title}}<div class='link_expand'></div><
46     </a>
47   {{/if}}
48   <div class="content">
49     <div class="tag type_{{type}}">{{tag}}</div>
50     {{#labels}}
51       <div class="label">{{this}}</div>
52     {{/labels}}
53     <div class="time">{{time}}</div>
54     <div class="desc">{{desc}}</div>
55   </content>
56 </div>
57 </script>
```

```
341 var gesture = {
342   labels : ["Leap motion", "nodejs", "Web Audio", "UI/UX"],
343   links : [],
344   images : [],
345   full_text : [],
346   cover : "covers/catmotion.jpg",
347   type : 1,
348   link : "offshore/gesture/" ,
349   desc : "An interactive HTML5 music improvisation game that creates social exp
350   title : "Cat Motion" ,
351   time : "CS247 Interactive Design Studio, Feburary 2013"
352 };
```



[Cat Motion](#)

Academic Leap motion nodejs
Web Audio UI/UX

CS247 Interactive Design Studio,
Feburary 2013

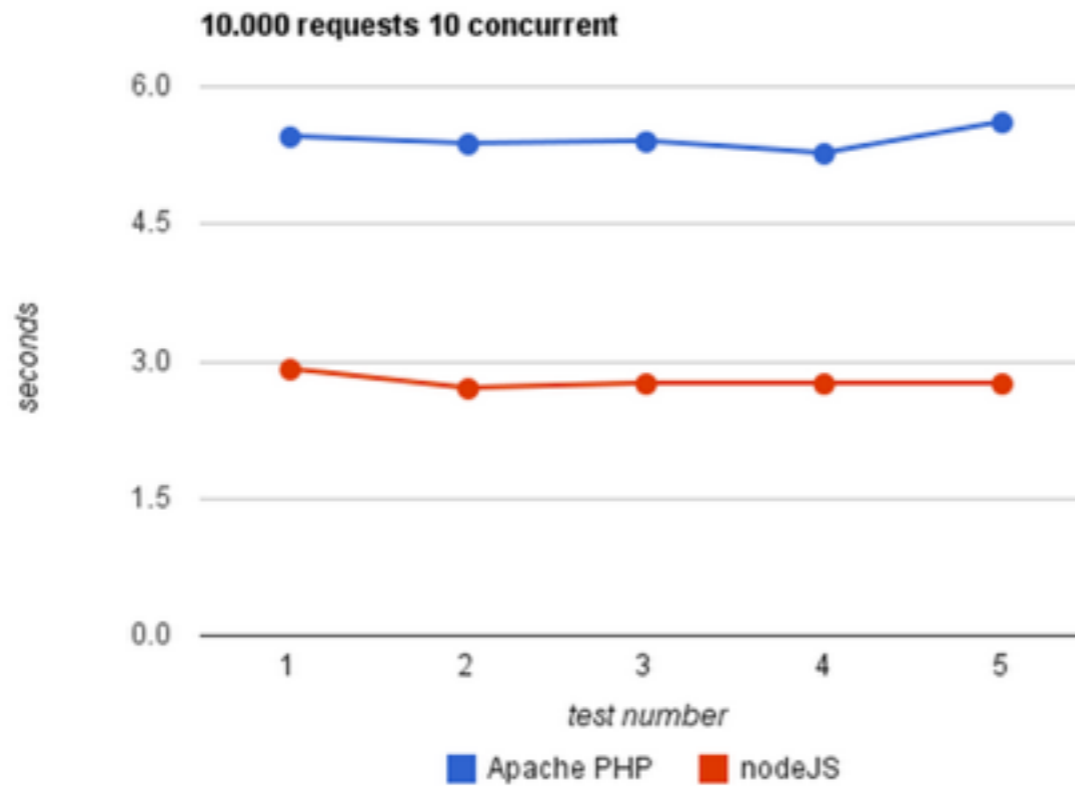
An interactive HTML5 music improvisation
game that creates social experience with
finger gestures (LEAP motion and Node.js)

[Watch video demo](#)


```
/usr/sbin/ab -n 100000 -c 1000 http://localhost:8080/
```

10.000 requests, 10 concurrent

x	1	2	3	4	5
Apache PHP	5.451	5.373	5.388	5.257	5.612
nodeJS	2.915	2.704	2.747	2.763	2.749

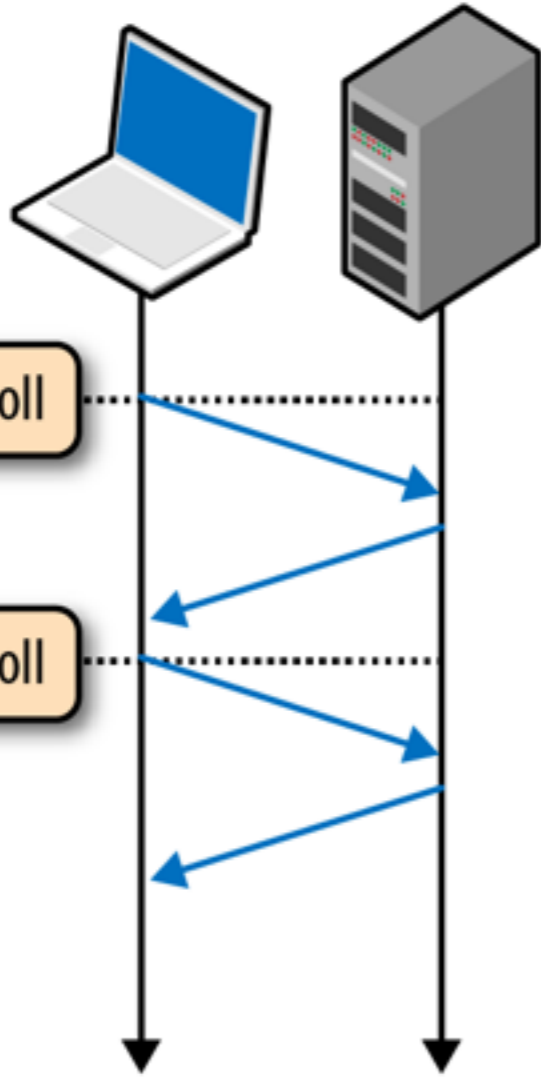


<https://code.google.com/p/node-js-vs-apache-php-benchmark/wiki/Tests>

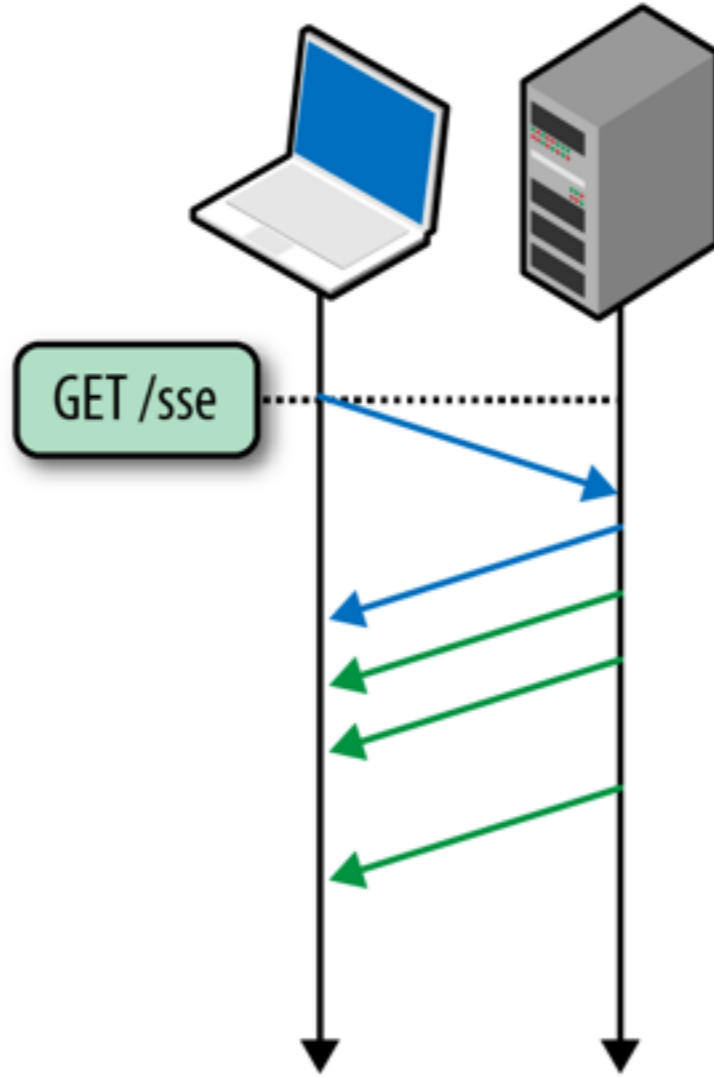


Firestore

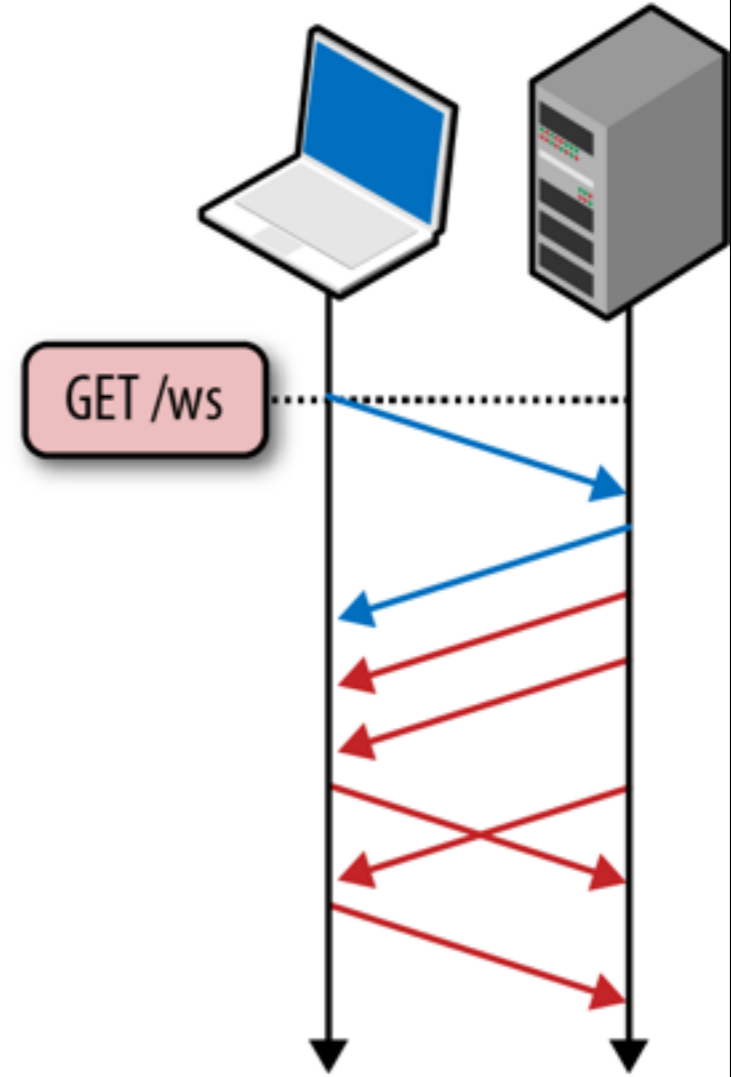
XHR polling



SSE



WebSocket

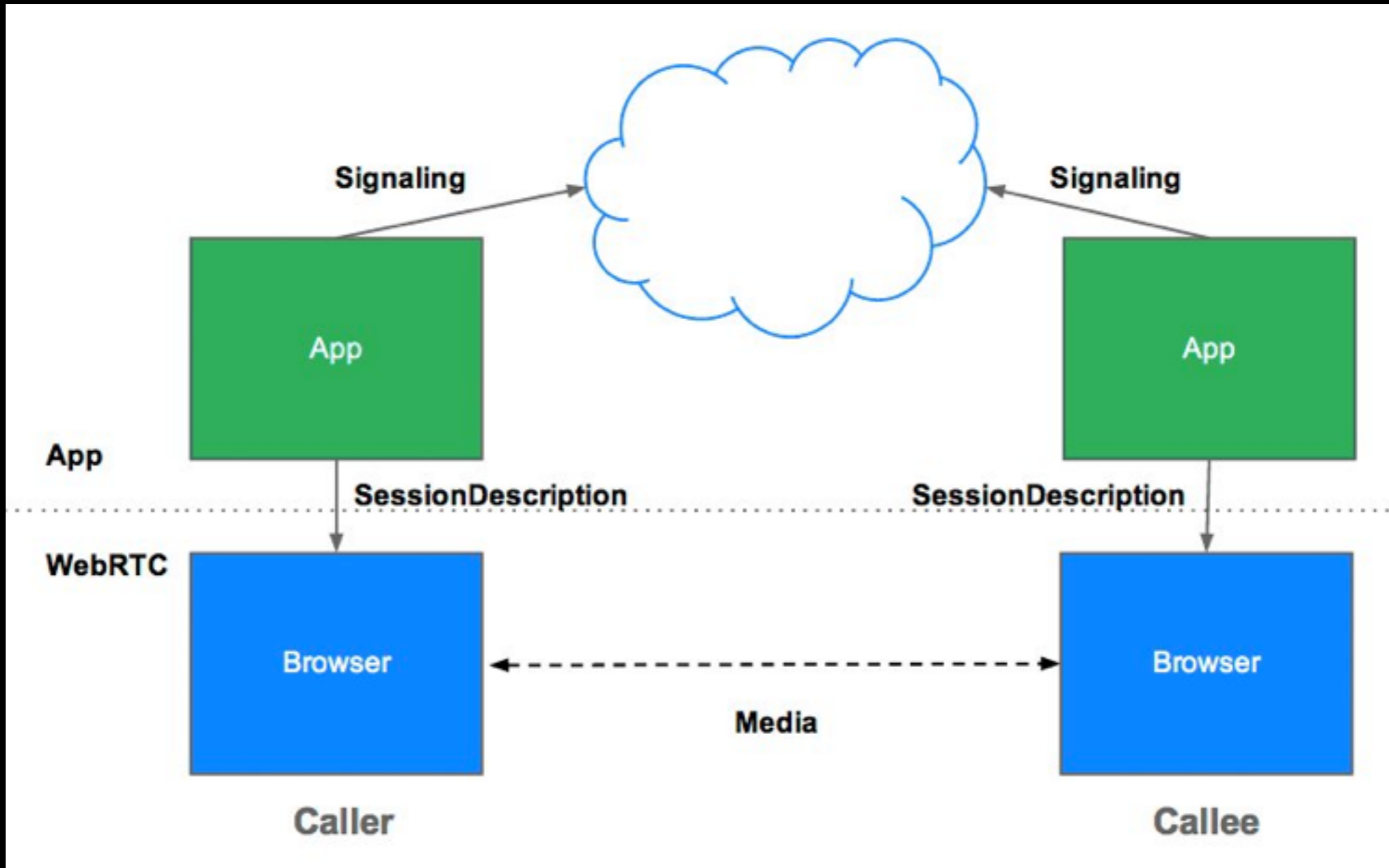


→ HTTP protocol

→ EventSource protocol

→ WebSocket protocol

WebRTC



<http://www.webrtc.org/demo>

Socket.io in Nodejs (in case you want to cook your own)

SERVER

```
var io = require('socket.io').listen(80);

io.sockets.on('connection', function (socket) {
  socket.emit('news', { hello: 'world' });
  socket.on('my other event', function (data) {
    console.log(data);
  });
});
```

CLIENT

```
<script src="/socket.io/socket.io.js"></script>
<script>
  var socket = io.connect('http://localhost');
  socket.on('news', function (data) {
    console.log(data);
    socket.emit('my other event', { my: 'data' });
  });
</script>
```

<http://socket.io/>

Code give-away (same P3 starter logic in socket.io)

```
3 // send to current request socket client
4 socket.emit('message', "this is a test");
5
6 // sending to all clients, include sender
7 io.sockets.emit('message', "this is a test");
8
9 // sending to all clients except sender
10 socket.broadcast.emit('message', "this is a test");
11
12 // sending to all clients in 'game' room(channel) except sender
13 socket.broadcast.to('game').emit('message', 'nice game');
14
15 // sending to all clients in 'game' room(channel), include sender
16 io.sockets.in('game').emit('message', 'cool game');
17
18 // sending to individual socketid
19 io.sockets.socket(socketid).emit('message', 'for your eyes only');
20 */
21 module.exports = function(io){
22   var current_users = {};
23   io.set('log_level', 1);
24   io.sockets.on('connection', function(socket){
25     socket.emit('connected', {m:'ok'});
26
27     socket.on('new_user', function(data){
28       console.log('new user connected: ' + data.username);
29       current_users[socket.id] = {
30         name: data.username,
31         color: "#"+((1<<24)*Math.random()|0).toString(16)
32       }
33       io.sockets.emit('to_all', {m:data.username+' joined the room.',c:'#eee'});
34     });
35
36     socket.on('user_msg', function(data){
37       user = current_users[socket.id];
38       io.sockets.emit('to_all', {m:user.name+' : '+data.m,c:user.color});
39     });
40
41     socket.on('user_vid', function(data){
42       user = current_users[socket.id];
43       io.sockets.emit('to_all', {m:user.name+" : "+data.m,v:data.v,c:user.color});
44     });
45
46     socket.on('disconnect', function(){
47       user = current_users[socket.id];
48       io.sockets.emit('to_all', {m:user.name+' left the room.',c:'#eee'});
49     });
50   });
51 }
```


less stylus



Of course



```

1 .module_dropdown
2   position: relative
3   @include no_select
4   text-align: left
5   .dropdown_selected
6     padding: 10px
7     .dropdown_image
8       @extend .inline_block
9       width: 1.3em
10      height: 1.3em
11      background-size: cover
12      margin-right: 10px
13      background-repeat: no-repeat
14     .dropdown_text
15       @extend .inline_block
16       @include transition(0.1s)
17       cursor: pointer
18       color: $clr_grey1
19       &:hover
20         color: $clr_grey2
21     i
22       margin: 0 10px
23       cursor: pointer
24       color: $clr_green
25       @include transition(0.1s)
26       &:hover
27         color: $clr_dark
28       &.hover
29         color: $clr_dark !important
30

```

```

29 #intro{
30   background-size: cover;
31   background-repeat: no-repeat;
32   color: white;
33   padding: 40px;
34   padding-top: 250px;
35   line-height: 1.4;
36   #owner_image{
37     background-size: cover;
38     width: 70px;
39     height: 70px;
40     display: inline-block;
41     vertical-align: middle;
42     @media (max-width: @size_m) {width: 50px; height: 50px}
43     @media (max-width: @size_s) {width: 45px; height: 45px}
44   }
45   #owner_name{
46     display: inline-block;
47     vertical-align: middle;
48   }
49   #site_name{
50     font-size: 80px;
51     font-weight: 400;
52     @media (max-width: @size_m) {font-size: 60px}
53     @media (max-width: @size_s) {font-size: 50px}
54   }
55   #site_motto{
56     font-size: 18px;
57   }
58   #site_links{
59     font-size: 18px;
60     padding-top: 10px;
61     a{
62       margin-right: 10px;
63     }
64   }
65 }

```


Want more fun?

```
# Assignment:
number = 42
opposite = true

# Conditions:
number = -42 if opposite

# Functions:
square = (x) -> x * x

# Arrays:
list = [1, 2, 3, 4, 5]

# Objects:
math =
  root: Math.sqrt
  square: square
  cube: (x) -> x * square x

# Splats:
race = (winner, runners...) ->
  print winner, runners

# Existence:
alert "I knew it!" if elvis?

# Array comprehensions:
cubes = (math.cube num for num in list)
```



```
var cubes, list, math, num, number, opposite, race, square,
    __slice = [].slice;

number = 42;

opposite = true;

if (opposite) {
  number = -42;
}

square = function(x) {
  return x * x;
};

list = [1, 2, 3, 4, 5];

math = {
  root: Math.sqrt,
  square: square,
  cube: function(x) {
    return x * square(x);
  }
};

race = function() {
  var runners, winner;
  winner = arguments[0], runners = 2 <= arguments.length ?
  __slice.call(arguments, 1) : [];
  return print(winner, runners);
};

if (typeof elvis !== "undefined" && elvis !== null) {
  alert("I knew it!");
}
```

<http://coffeescript.org/>



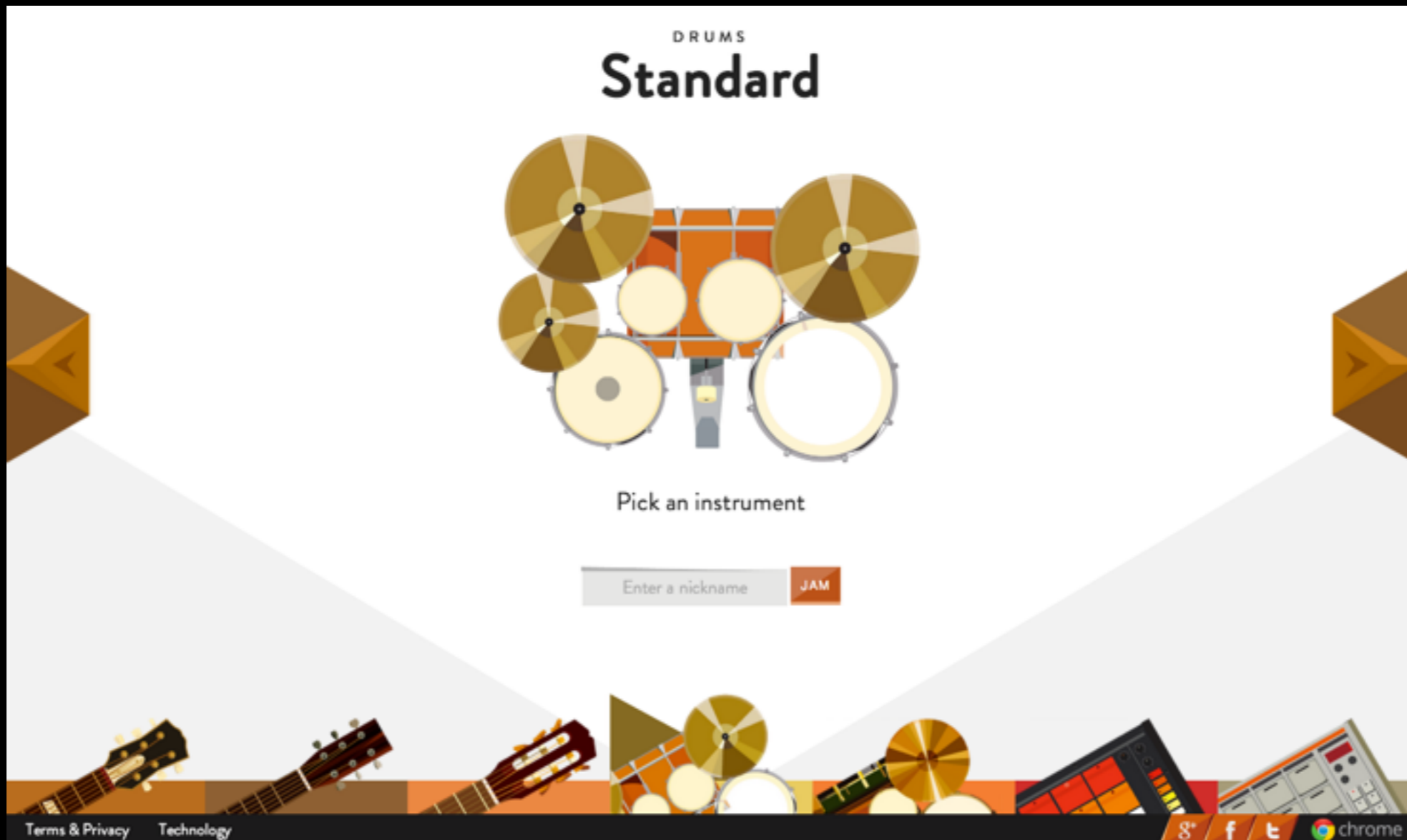
GRUNT

The JavaScript
Task Runner

<http://gruntjs.com/>

```
78 watch:
79   scripts:
80     files: ["coffeescript/app/*.coffee", "coffeescript/ready/*.coffee", "coffeescript/init/*.coffee"]
81     tasks: ["coffee:compile", "uglify:init", "uglify:app", "uglify:ready"]
82   styles:
83     files: ["sass/*.sass", "sass/modules/*.sass"]
84     tasks: ["concat:concat_sass_day", "concat:concat_sass_night", "sass:compile"]
85   templates:
86     files: "jade/*.jade"
87     tasks: ["jade:compile", "uglify:templates"]
88
89 grunt.loadNpmTasks "grunt-contrib-concat" # use for concat sass files
90 grunt.loadNpmTasks "grunt-contrib-sass"
91 grunt.loadNpmTasks "grunt-contrib-coffee"
92 grunt.loadNpmTasks "grunt-contrib-uglify"
93 grunt.loadNpmTasks "grunt-contrib-watch"
94 grunt.loadNpmTasks "grunt-contrib-jade"
95 grunt.loadNpmTasks "grunt-contrib-jasmine"
96 grunt.registerTask "default", ["watch"]
97 grunt.registerTask "minlib", ["uglify:minlib"]
98 grunt.registerTask "test", ["coffee:test", "jasmine"]
99
```

Jam with Chrome



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

2048 Multi-player

2048 - Multiplayer

Join the numbers and get to the 2048 tile! Your square is on the left!

SCORE 4912 Play Again! SCORE 632

4	8	2	
4	32	2	2
64	128	32	16
128	256	128	64

Winner!

2	2	8	2
16	64	32	4
4	32	4	
2			

Loser!

<http://emils.github.io/2048-multiplayer/>

Playing Pokemon



We hope to see you again!



Twitch Plays Pokemon
18d21h18m12s utc18:12.75
Randomized Fire Red starts in 2d 03:41:49
Democracy mode next input: 06
ANARCH 43
B 31
↓ 30
A 28
START 1
← 1

Alannad396 A
Stugbug A
Focasdima B
Razgrizxy ANARCH
Gtabes94 B
Domi_wl ANARCH
Hotsliceofjesus ANARCH
Sophiero ↓
Soy_el_lag A
Twister271 B
Jerrbles B
Genjar ANARCH
Mrpetrichor ↓
Sko,ji A
Garlicface ANARCH

<http://www.twitch.tv/twitchplayspokemon>

Now I'm going to go through the code in P3.. quickly..

Focus on interaction?



<http://www.chromeexperiments.com/tag/webcam-input/>

Experiments: Webcam Input 1-18 of 46

Show only ▾



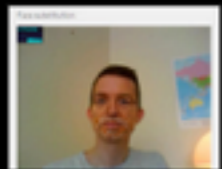
[Umazlizer](#)
Eiji Muroichi
★★★★



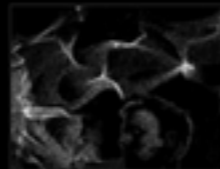
[Curtain Me](#)
Unmesh Shukla
★★★★★



[Paint Mirror](#)
Andy Sigler
★★★★



[Face Substitution](#)
Audun Mathias Øygard
★★★★



[Smoke & Mirror](#)
Daniel Brown
★★★★



[Stretch Mirror](#)
Andy Sigler
★★★★



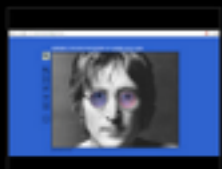
[Swarm Sandbox](#)
Sam Fox Royston
★★★★



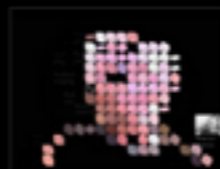
[We Are All Made of Stars](#)
Daniel Brown
★★★★★



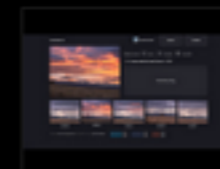
[Synth](#)
Steve Belovarich
★★★★★



[Cutouts](#)
asmallgrin
★★★★★



[Mirror](#)
Gwen Vanhee
★★★★



[time.lapse.co](#)
Bennett Feely
★★★★★



[Temporalis](#)
Josh Beckwith
★★★★★



[Colormotion](#)
VodkaBears
★★★★★



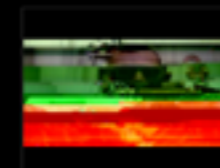
[Just A Reflektor: Tech Sandbox](#)
Google Data Arts Team
★★★★



[Just A Reflektor](#)
Arcade Fire
★★★★★



[Motion Detection](#)
DHD
★★★★★



[CorruptBrowser](#)
Makio135
★★★★★



Responsive Typography

Lorem ipsum dolor sit amet, consectetur adipiscing* elit, sed do eiusmod* tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.



Status : Tracking face

Show probability-map

120

CSS and UI inspirations (don't spend too much time)

<http://tympanus.net/Development/ProgressButtonStyles/>
<http://tympanus.net/Development/CreativeButtons/>
<http://tympanus.net/Tutorials/ShapeHoverEffectSVG/index.html>
<http://tympanus.net/Tutorials/AnimatedBorderMenus/index2.html>
<http://tympanus.net/Development/SidebarTransitions/>
<http://tympanus.net/Tutorials/CircularNavigation/>
<http://tympanus.net/Development/GridLoadingEffects/index2.html>
<http://tympanus.net/Tutorials/ExpandingSearchBar/>
<http://tympanus.net/Development/ModalWindowEffects/>
<http://tympanus.net/Development/PageTransitions/>
<http://tympanus.net/Development/FullscreenLayoutPageTransitions/>
<http://tympanus.net/Tutorials/ThumbnailGridExpandingPreview/>
<http://tympanus.net/Development/CircleFlipSlideshow/>
<http://tympanus.net/Development/3DBookShowcase/>
<http://tympanus.net/Development/SimpleDropDownEffects/index3.html>
<http://tympanus.net/Development/StickyCaptionsConcept/>
<http://tympanus.net/Development/DynamicGrid/index3.html>
<http://tympanus.net/Development/IconHoverEffects/>
<http://tympanus.net/Tutorials/NaturalLanguageForm/>
<http://tympanus.net/Tutorials/ExpandingOverlayEffect/>
<http://tympanus.net/Development/Stapel/index2.html>
<http://tympanus.net/Development/Baraja/>
<http://tympanus.net/Development/3YearsOfCodrops/>
<http://tympanus.net/Tutorials/FullscreenSlitSlider/>

bahance, dribbble, awwards..

Let's code in Firebase!

Work in team of 2, create a simple note keeping app where

- 1) You can add new entry, delete existing entries, and browse all entries.
- 2) While you're editing an entry, the person who has a specified URL can see your live-editing actions for the entry you're editing.
- 3) Use firebase , no backend required.
- 4) Work on the logic and a minimal, usable UI.