

# HTML5 JavaScript APIs

jsconf.eu 2009



**2022**



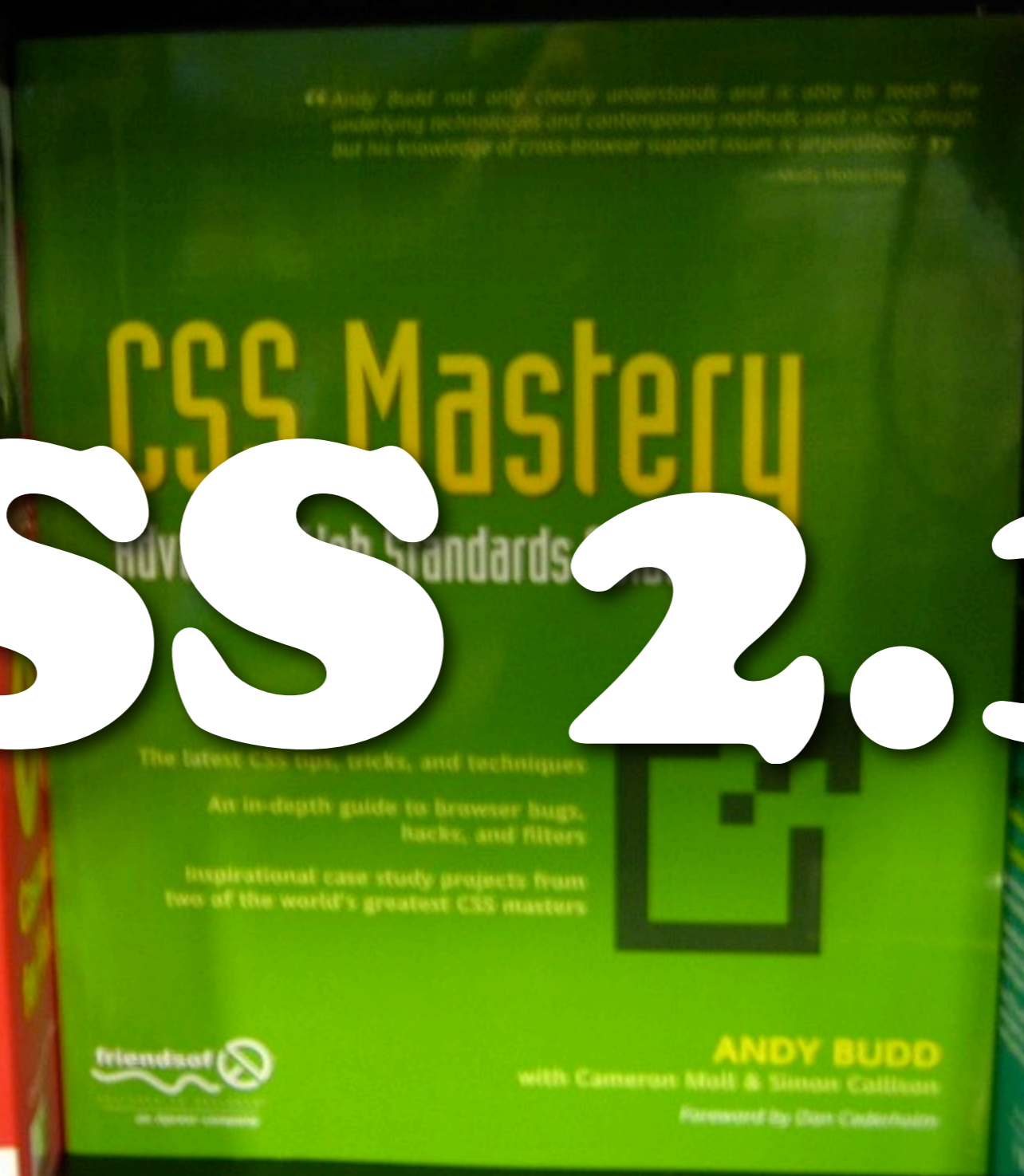




**2022 =**  
**two completely**  
**interoperable**  
**implementations**



# CSS 2.1





**HTML5**



# HTML5

**Web Forms**

**Offline**

**History API**

**Audio/Video**

**Drag & Drop**

**Undo**

**Canvas**

**Editable**

**X-Domain**

**Messaging**



**“HTML5”**



# **“HTML5”**

- **Web Forms 2.0**
- **Storage**
- **Audio & Video**
- **Geolocation**
- **Canvas**
- **Workers**
- **Offline**

# “HTML5”

- **Web Forms 2.0**
- **Audio & Video**
- **Canvas**
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- **Storage**
- **Geolocation**
- **Workers**



# “HTML5”

- **Web Forms 2.0**
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# Web Forms 2.0

Actual search for "web forms", wtf? [http://tr.im/webforms\\_pic](http://tr.im/webforms_pic) →





***"JavaScript is only good  
for image roll overs &  
form validation"***

**"JavaScript is only good  
for ~~image roll overs &~~  
form validation"**

**:hover**

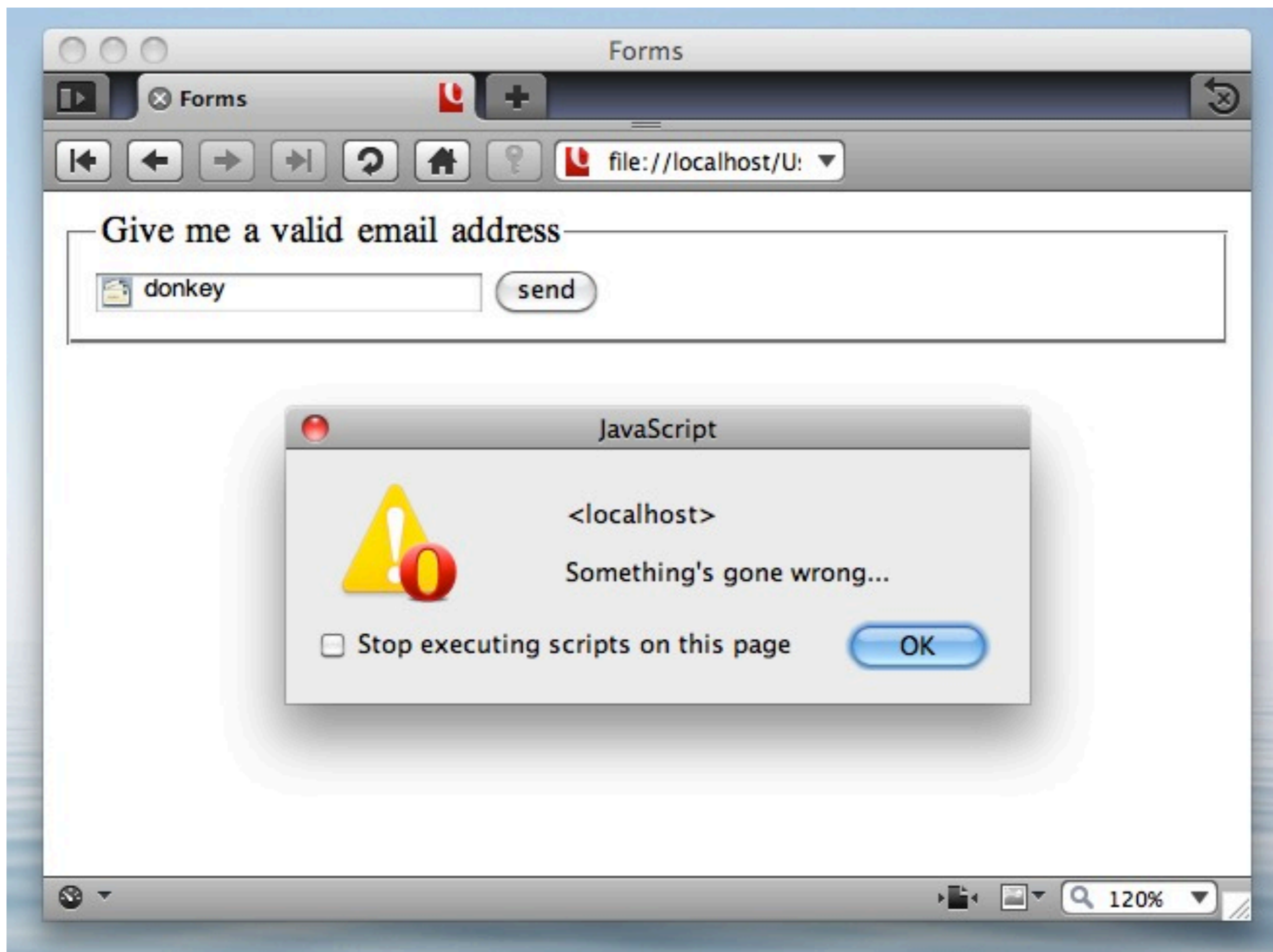


**"JavaScript is only good  
for ~~image roll overs &  
form validation~~"**

**.hasFeature( 'WebForms', '2.0' )**

**"JavaScript is only good  
for ~~image roll overs &  
form validation~~  
awesome shit"**

**.hasFeature( 'WebForms', '2.0' )**



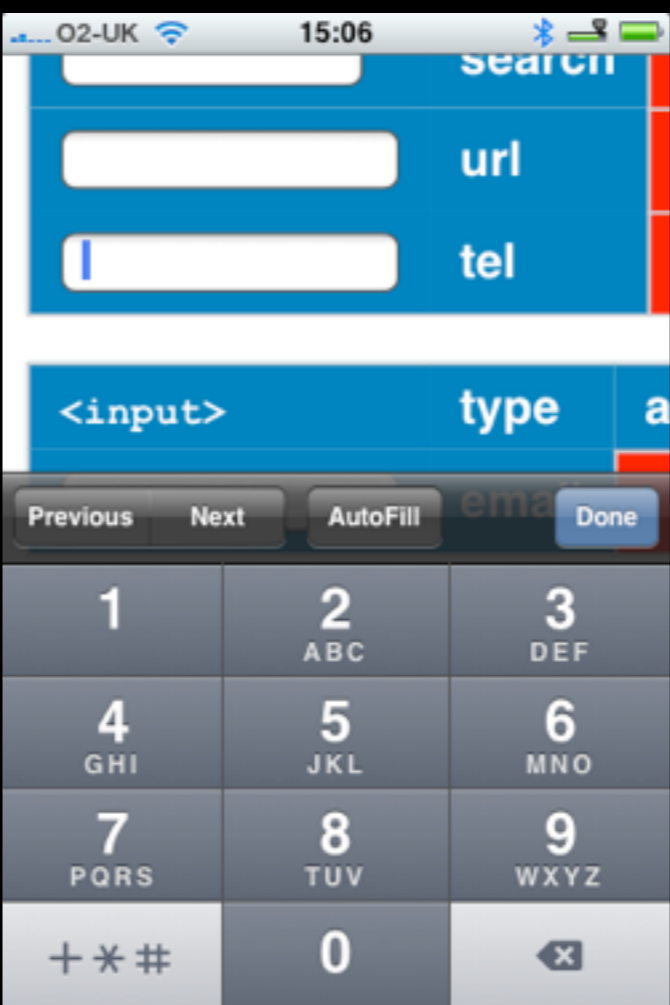
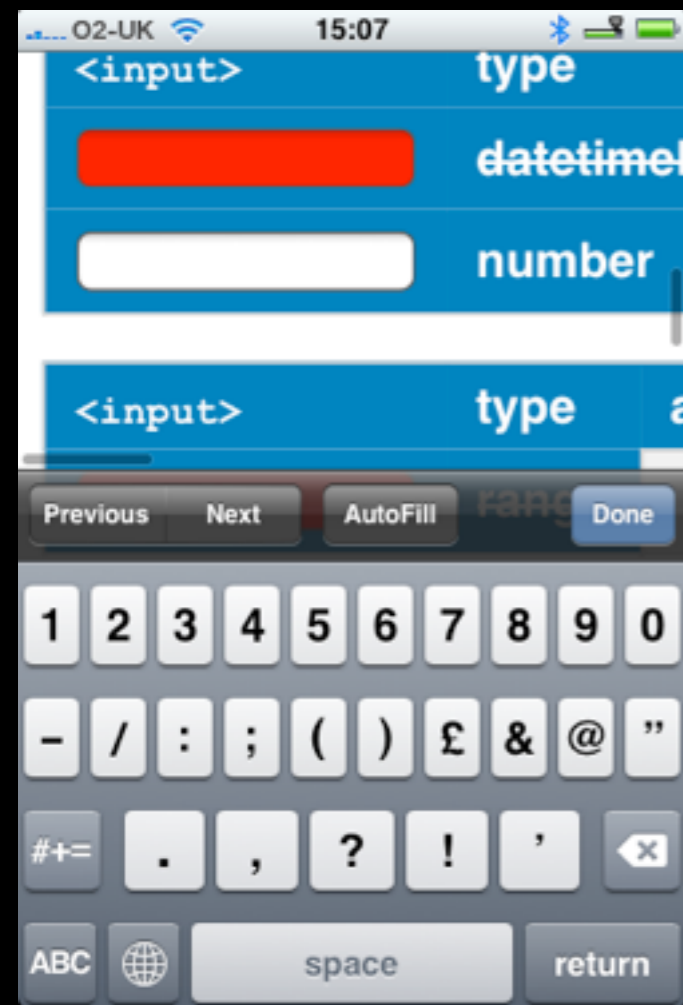
```
var f = document.querySelector( 'form' );  
f.onsubmit = function () {  
    if ( this.checkValidity() ) {  
        alert( "It's all okay" );  
    } else {  
        alert( "Something's gone wrong..." );  
        return false;  
    }  
};
```

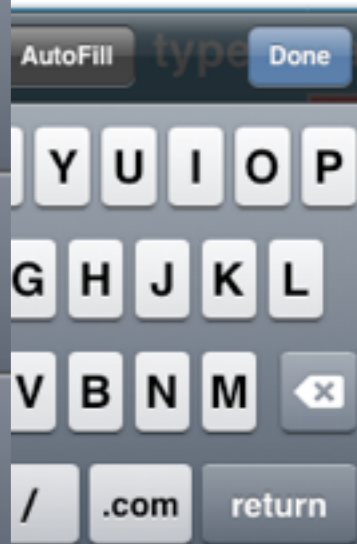
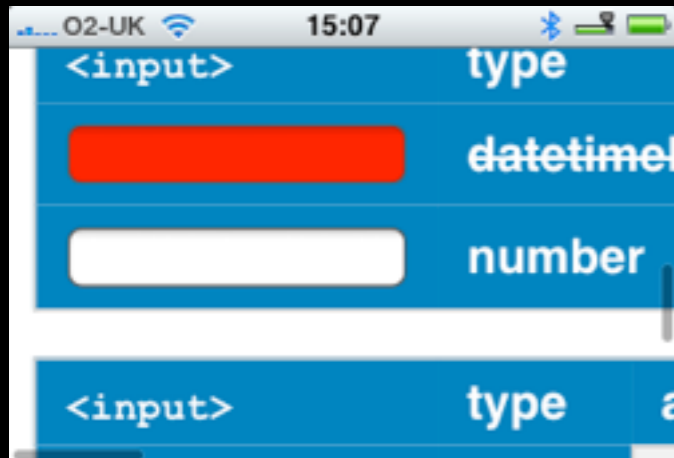


**Less JavaScript  
on donkey work**

**==**

***more JavaScript  
on awesome work.***







# Native Media Elements





```
<object classid="clsid:d27cddb6e-  
height="344" codebase="http://do  
flash/swflash.cab#version=6,0,40  
<param name="allowFullScreen" va  
<param name="allowscriptaccess"  
<param name="src" value="http://  
<param name="allowfullscreen" va  
<embed type="application/x-shock  
src="http://www.youtube.com/v/oH  
allowscriptaccess="always" allow  
</embed>  
</object>
```

```
<video src="dizzy.ogv" />
```



# WATCH WHATEVER WHENEVER.



With Sony's Betamax SL-8600 video recorder, you can see any TV show you want to see anytime you want to see it.

Because Betamax, which plugs into any TV set and is easy to operate, can videotape a show up to three-hours long (with the L-750 videocassette) while you're doing something else—even while you're out of the house, by setting the electronic timer.

It can also videotape something off one channel while you're watching another channel.

And remember, Sony has more experience in videorecorders than anyone (over 20 years!). In fact, we've sold more videorecorders to broadcasters and industry than any other consumer manufacturer. We even make our own tape.

For years you've watched TV shows at the times you've had to. Now you can watch them at the times you want to.



```
<video>
```

```
  <source src="dizzy.ogv" />
```

```
  <source src="dizzy.mp4" />
```

```
</video>
```





```
<video>
```

```
  <source src="dizzy.ogv" />
```

```
  <source src="dizzy.mp4" />
```

```
</video>
```

```
<video>
```

```
<source src="dizzy.ogv" />
```

```
<source src="dizzy.mp4" />
```

```
<!-- QuickTime support -->
```

```
<object><param></object>
```

```
</video>
```

```
<video>
```

```
<source src="dizzy.ogv" />
```

```
<source src="dizzy.mp4" />
```

```
<!-- QuickTime support -->
```

```
<object><param></object>
```

```
<!-- down to flash -->
```

```
<object><param></object>
```

```
</video>
```

```
<video>
```

```
  <source src="dizzy.ogv" />
```


```
  <source src="dizzy.mp4" />
```

```
</video>
```



Dizzy

file:///Users/remy/Desktop/html5js/ Google



play 00:00 / 00:25

The image shows a browser window titled "Dizzy" with a file path in the address bar: "file:///Users/remy/Desktop/html5js/". A search bar with the "Google" logo is also present. The main content area displays a video player with a blurry frame of a black and white cat on a wooden floor. A mouse cursor is visible over the video. At the bottom left of the video player, there is a "play" button and a timestamp "00:00 / 00:25".

```
if ( video.paused ) {  
    if ( video.ended ) {  
        video.currentTime = 0;  
    }  
    video.play();  
} else {  
    video.pause();  
}
```

```
if (video.paused) {  
    if (video.ended) {  
        video.currentTime = 0;  
    }  
    video.play();  
} else {  
    video.pause();  
}
```

```
if (video.paused) {  
    if (video.ended) {  
        video.currentTime = 0;  
    }  
    video.play();  
} else {  
    video.pause();  
}
```



```
if (video.paused) {  
    if (video.ended) {  
        video.currentTime = 0;  
    }  
    video.play();  
} else {  
    video.pause();  
}
```

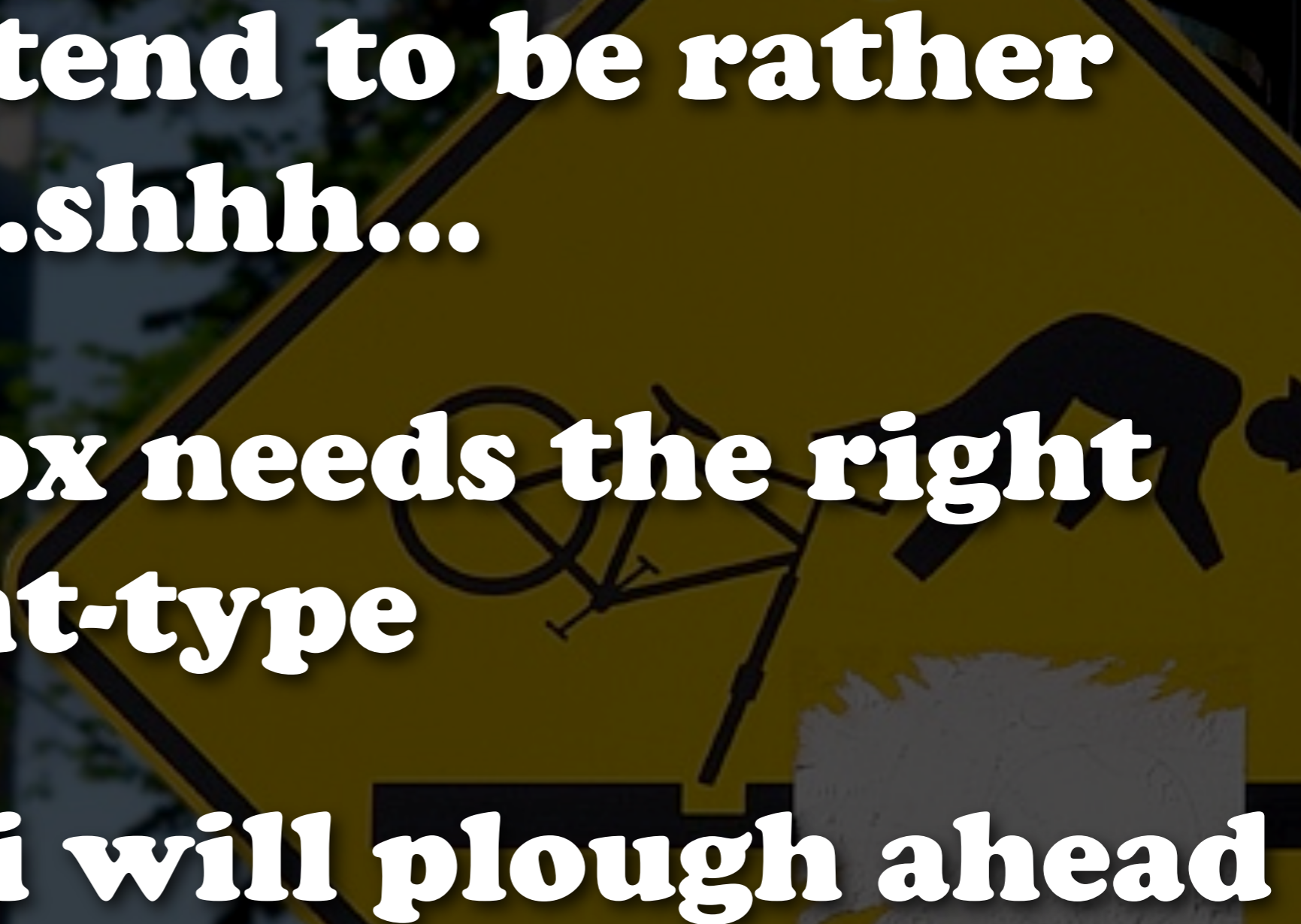
```
addEvent(  
  video,  
  'timeupdate',  
  function () {  
    positon.innerHTML =  
      ↪ asTime(this.currentTime);  
  }  
);
```

```
addEvent(  
  video,  
  'timeupdate',  
  function () {  
    positon.innerHTML =  
      ↪ asTime(this.currentTime);  
  }  
);
```

```
addEvent(  
  video,  
  'timeupdate',  
  function () {  
    positon.innerHTML =  
      ↪ asTime(this.currentTime);  
  }  
);
```



- `play()`, `pause()`
- `paused`, `ended`, `currentTime`
- `canplay`, `timeupdate`, `ended`
- **and a bunch more.**

- **Bugs tend to be rather quiet...shhh...**
  - **Firefox needs the right content-type**
  - **Safari will plough ahead**
- 

**Accessibility?**



R&D TV Episode 2

http://open.bbc.co.uk/rad/demos/html5/rdtv/episode2/ Google



▼ Programme chapters

Maximising the serendipity of travel

This is a proof of concept demonstration of HTML pluginless Video and Audio playback, showing AV content synchronised to chapters, allowing direct access to specific sections

<http://open.bbc.co.uk/rad/demos/html5/rdtv/episode2/>

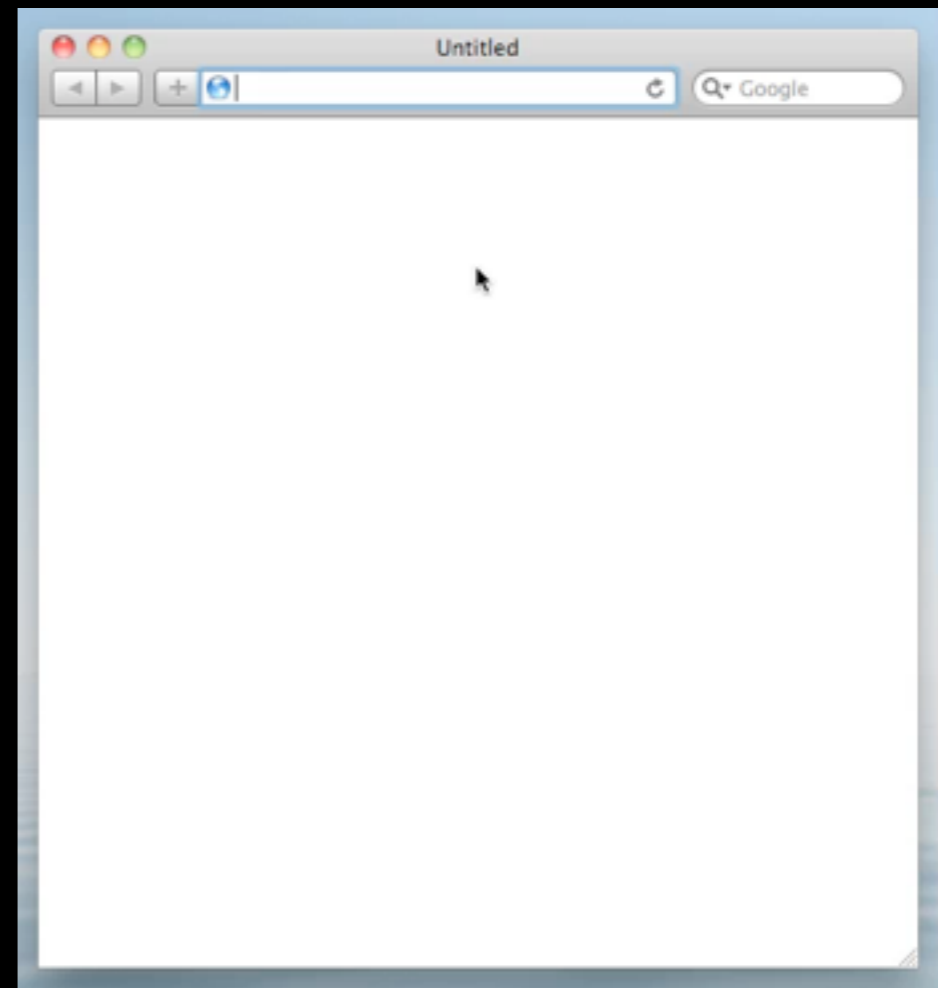
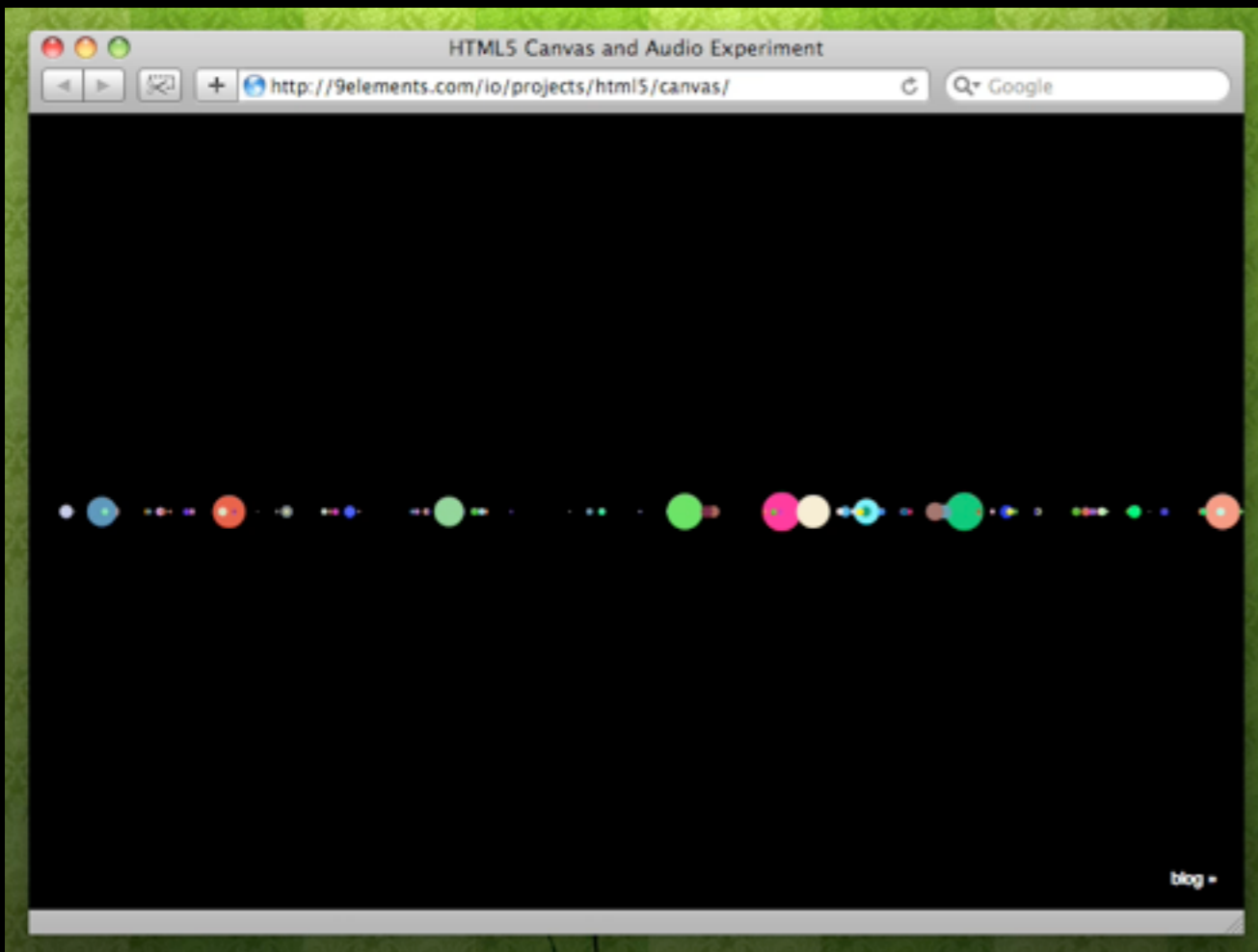


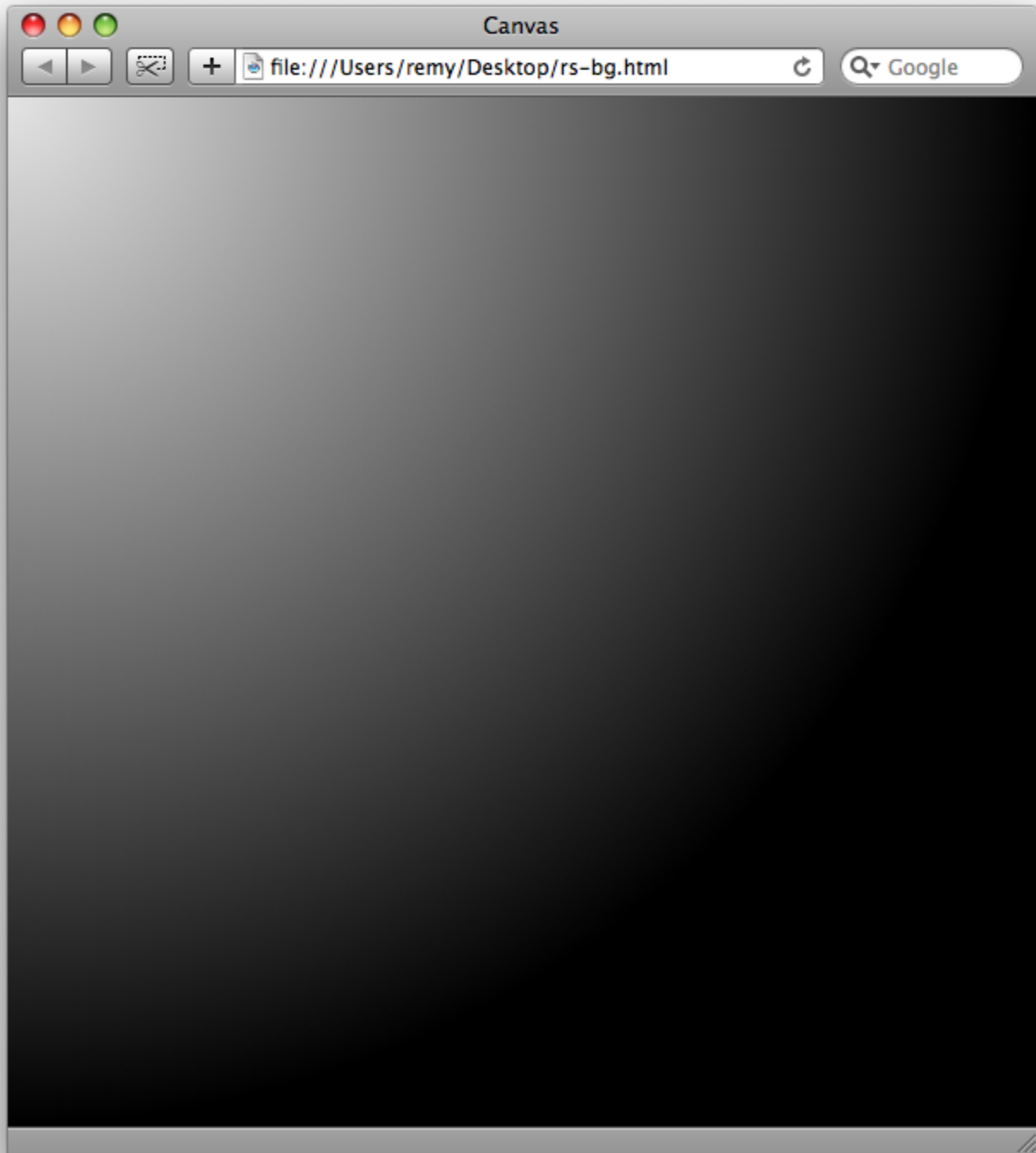


# Canvas

(+ `excanvas.js`)







```
<!DOCTYPE html>
<html>
<head>
  <title>Canvas</title>
</head>
<body>
  <canvas></canvas>
</body>
</html>
```

```
var ctx = canvas.getContext( '2d' );
```

```
var ctx = canvas.getContext( '2d' );
```

```
// Create radial gradient
```

```
var grad = ctx.createRadialGradient(0,0,0,0,0,600);
```



```
var ctx = canvas.getContext( '2d' );  
  
// Create radial gradient  
var grad = ctx.createRadialGradient( 0, 0, 0, 0, 0, 600 );  
grad.addColorStop( 0, '#E4E4E4' );  
grad.addColorStop( 1, '#000' );
```

```
var ctx = canvas.getContext( '2d' );

// Create radial gradient
var grad = ctx.createRadialGradient(0,0,0,0,0,600);
grad.addColorStop(0, '#E4E4E4');
grad.addColorStop(1, '#000');

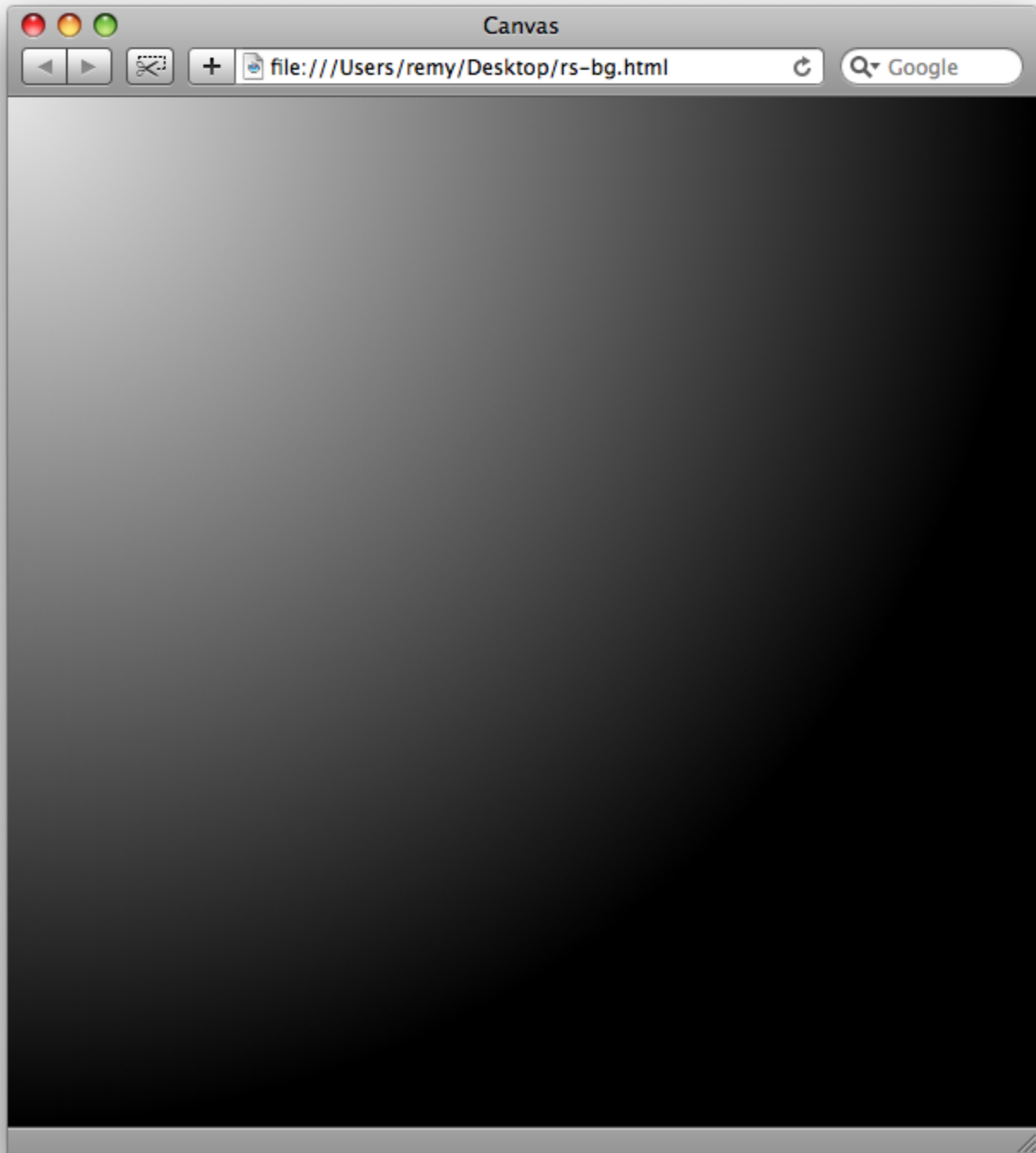
// assign gradients to fill
ctx.fillStyle = grad;
```

```
var ctx = canvas.getContext( '2d' );

// Create radial gradient
var grad = ctx.createRadialGradient(0,0,0,0,0,600);
grad.addColorStop(0, '#E4E4E4');
grad.addColorStop(1, '#000');

// assign gradients to fill
ctx.fillStyle = grad;

// draw 600x600 fill
ctx.fillRect(0,0,600,600);
```



```
ctx.toDataURL("image/png");
```



# ctx.toDataURL("image/png");

```
data:image/  
png;base64,iVBORw0KGgoAAAANSUHEUgAAAMgAAADICAYAAACTWK6eAAAFxULEQVR4Ae3dQW5jORAEUXvQ97+yez  
CzNQpNyPwdIp+XJkVlRTKgheGvz69/fz78IIDAtwT+  
+fa3fokAAv8RIIiLgMBAgCADHEsIEMQdQGAgQJABjiUECOIOIDAQIMgAxxICBHEHEBgIEGSAYwkBgrgDCAwECDLAs  
YQAQdwBBAYCBB...  
fuQfHehf6/8Ik  
+4aAYKs8bL7Mg  
+zICBLmsc00uE  
+4aAYKs8bL7Mg  
+zICBLmsc00uESDIGi+7LyNAkMsKN+4aAYKs8bL7MgI//3R3T1m/  
7AqdPa5PkLP7Nd2LBAjyIkAvP5sAQc7u13QvEiDIiwC9/  
GwCBDm7X909SIAgLwL08rMJEOTsfk33IgGCvAjQy88mQJCz+zXdiwR+/i/pLwba/fLPj7/zPe5fH1+7R3P+BgI  
+QTZAdeQ5BAhyTpcm2UCAIBug0vIcAgQ5p0uTbCBAkA1QHxkOAYKc06VJNhAgyAaojjyHAEHO6dIkGwgQZANUR55D  
gCDndGmSDQQIsgGqI88hQJBzujTJBgIE2QDVkecQIMg5XZpkAwGcbIDqyHMIEOScLk2ygQBBNkB15DkECHJOlybZQ  
IAgG6A68hwCBDmnS5NsIECQDVAdeQ4BgpzTpUk2ECDIBqiOPicAQc7p0iQbCBBkA1RHnkOAIod0aZINBAiyAaojzy  
FAkHO6NMkGAgTZANWR5xC47ununrJ+zuV9YhKfIE9Q9h5vS4Agblud4E8QIMgTlL3H2xIgyNtWJ/  
gTBajyBGXv8bYECpk21Qn+BAGCPEHze7wtAYK8bXWCP0GAIE9Q9h5vS+C6v6TXm/r801/j/vHla9y/vRo  
+Qb7F4pcI/E  
+AIG4CAgMBggxwLCFAEHcAgYEAQQY4lhAgidUawECAIAMcSwgQxB1AYCBAkAG0JQQI4g4gMBAgyADHEgIEcQcQGAg  
QZIBjCQGCuAMIDAQIMsCxhABB3AEEBgIEGeBYQoAg7gACAwGCDHAsIUAQdwCBgQBBBjiWECCIO4DAQIAGaxxLCBDE  
HUBgIECQAY4lBAjidiAwECDIAMcSagRxBxAYCBBkgGMJAU93j90BT1lvFeITpNWHNDECBIkVIk6LAEFafUgTI0CQW  
CHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBI  
kVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0C  
QWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDEC  
BIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI  
0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHND  
ECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUg  
TI0CQWCHitAgQpNWHNDECBIkVIk6LAEFafUgTI0CQWCHitAgQpNWHNDECvwHnaxGSkeUPVAAAAABJRu5ErkJggg==
```

**data:image/png;base64,...**

**Canvas**

**+**

**drawImage**

**+**

**Video**

**=**





NG  
OPER

HOUSE OF  
Frankenstein  
THE FEAR STAR



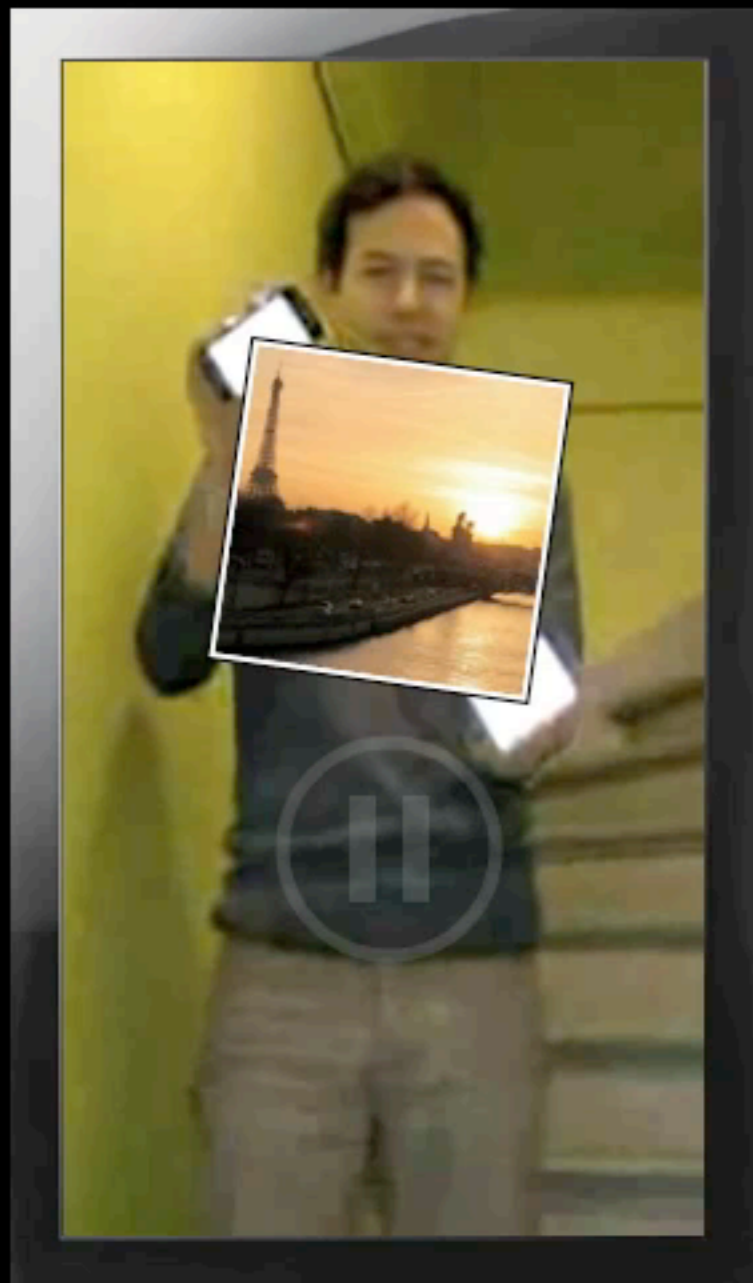


NG  
OPER

HOUSE OF  
anki  
E FEAR STAR



### Click to play:



### Choose a pattern:

Video:



Image:

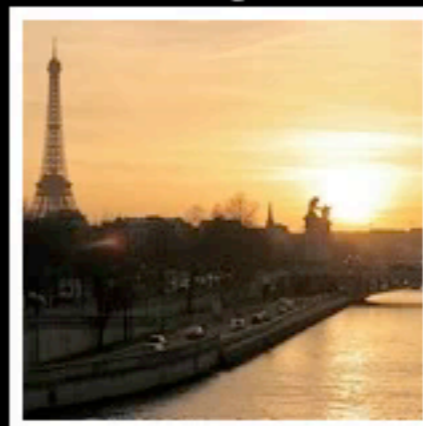
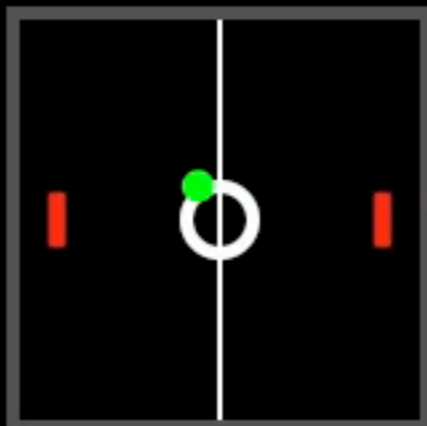


Image:



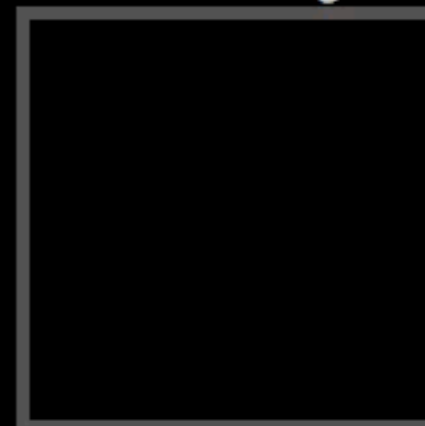
Canvas:



Your text:

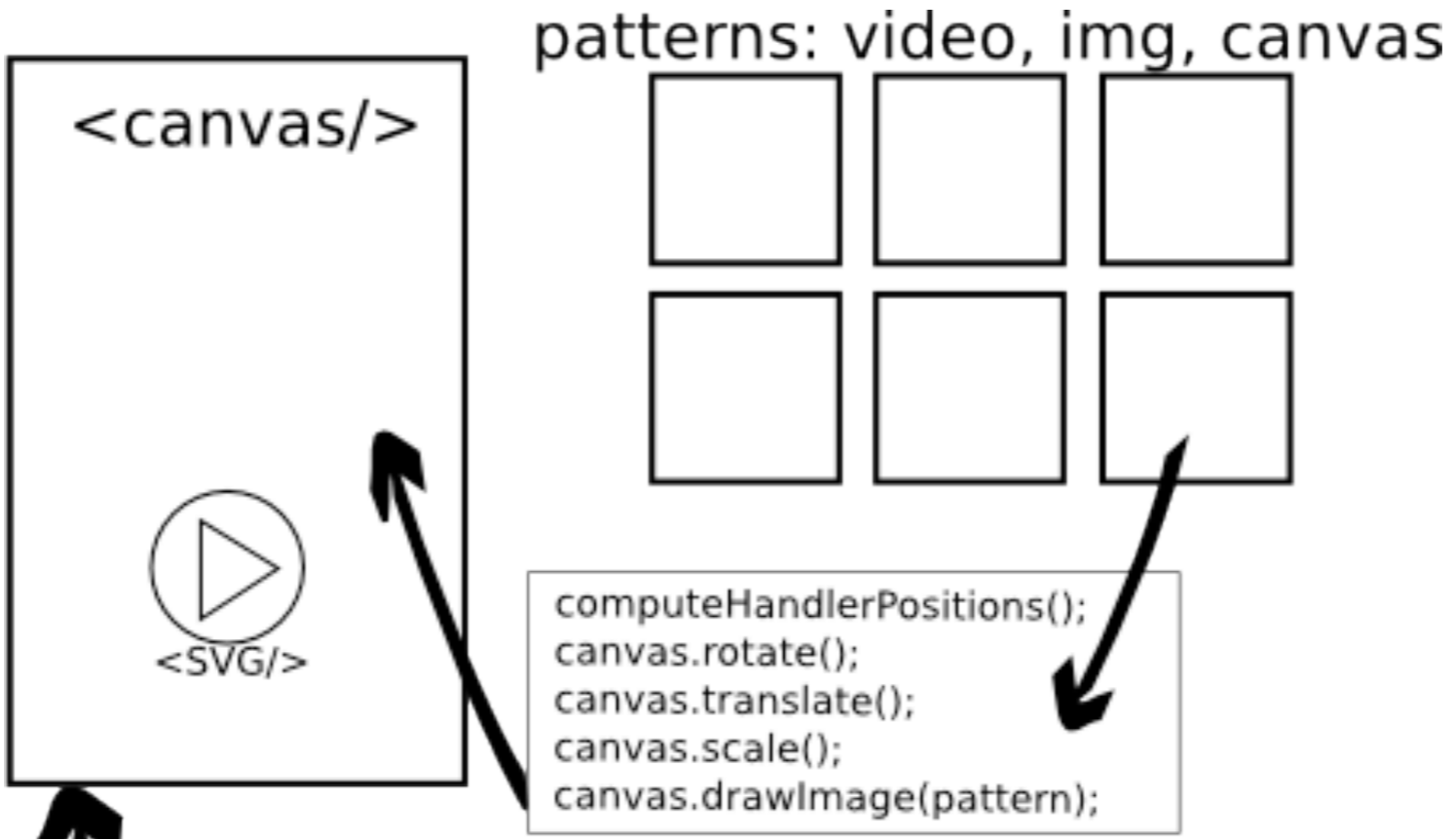


Your drawing:

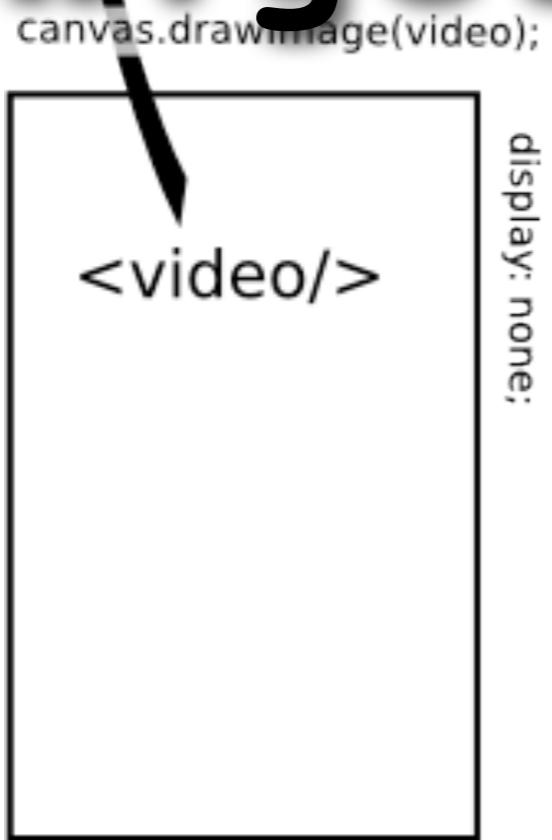


clear 3





# `ctx.drawImage()`



```
frame = ctx.getImageData(0, 0, w, h);
```

```
i = 0; // or via loop
```

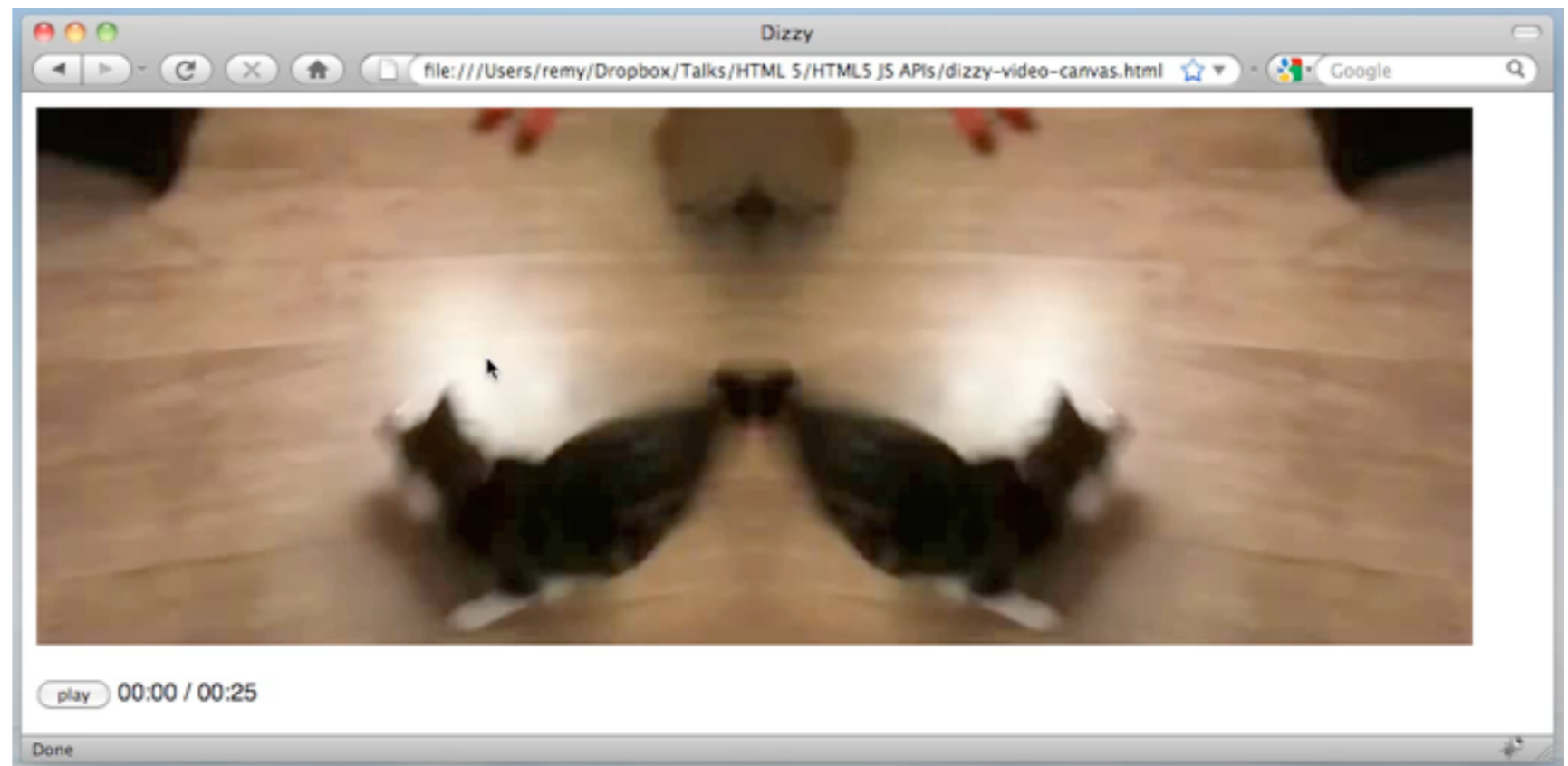
```
r = frame.data[i + 0];
```

```
g = frame.data[i + 1];
```

```
b = frame.data[i + 2];
```

```
ctx.translate(canvas.width/2, canvas.height/2);  
ctx.scale(-1, 1);  
ctx.translate(-canvas.width/2, -canvas.height/2);
```

```
ctx.drawImage(  
  video, 0, 0,  
  video.width,  
  video.height,  
  0, 0,  
  canvas.width,  
  canvas.height);
```



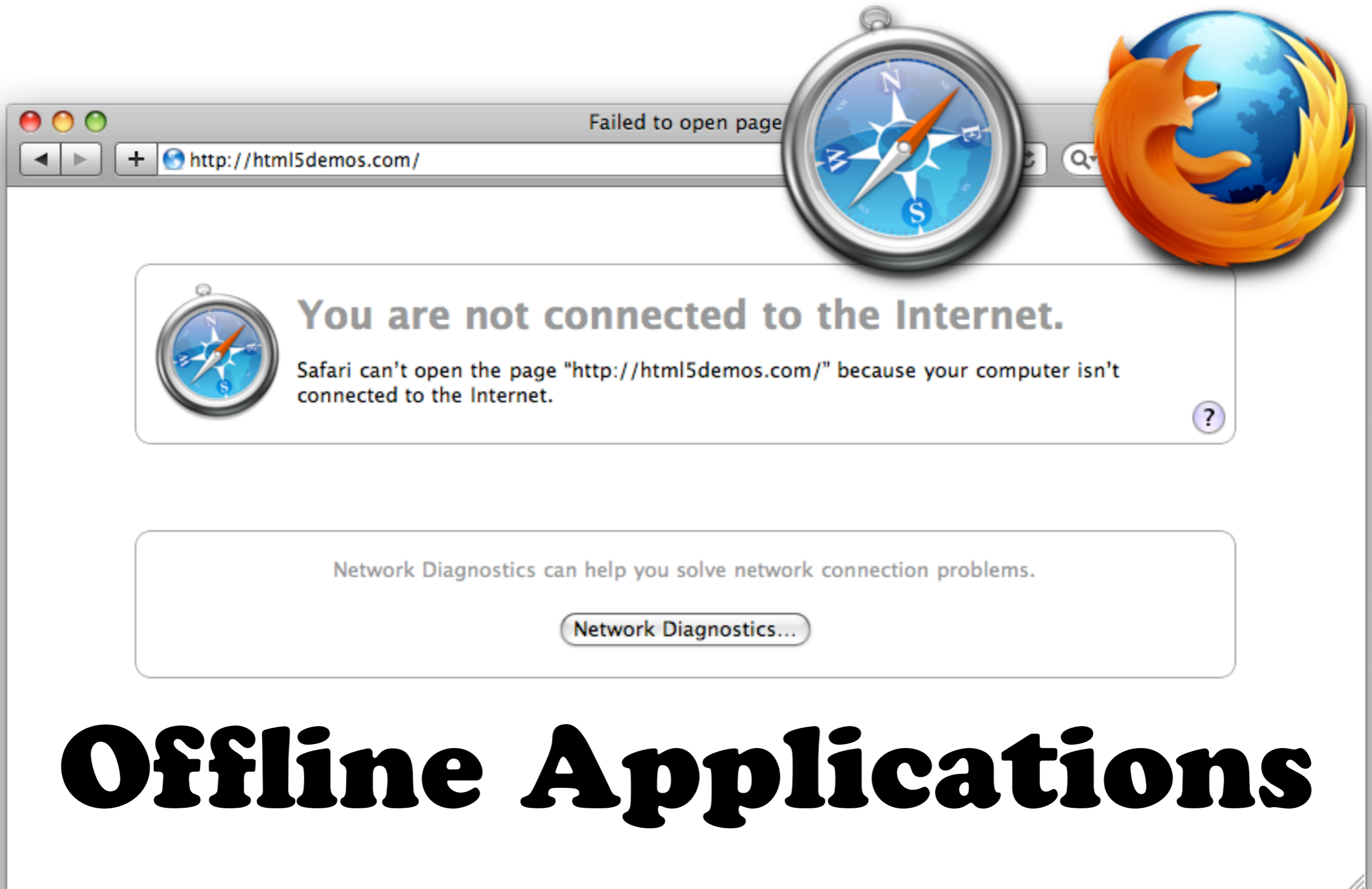


**Don't use for evil**





# Offline Applications



# Offline Applications

# Offline Apps

- **Application cache**
- **Events: offline, online**
- **navigator.onLine property**

remysharp.com/demo/... ↻

Google



<http://icanhaz.com/rubiks>



# Enable

```
<!DOCTYPE html>
```

```
<html manifest="my.manifest">
```

```
<body>
```

```
<!-- my page -->
```

```
</body>
```

```
</html>
```

# **my.manifest**

**CACHE MANIFEST**

**images/shade.jpg**

**images/bin.jpg**

**#version 13**

# Cache

- **First line: CACHE MANIFEST**
- **Requires text/cache-manifest**
- **Recommend using versioning**
- **window.applicationCache**
- **Add it last!**

**The process**









# **Storage**

**(giant cookies)**



**key/val**

**SQLite**





# key/value

window based

**sessionStorage**

**localStorage**

```
.setItem(key, value);
```

```
.getItem(key);
```



# key/value

window based

**sessionStorage**

domain based

**localStorage**

```
.setItem(key, value);
```

```
.getItem(key);
```



HTML5 Demo: storage

http://html5demos.com/storage

- sessionStorage is empty
- localStorage is empty

sessionStorage:

localStorage:

[HTML5 demo](#)

Elements Resources Scripts Profiles Database Search Databases

Key	Value
value	jamin' a session out
timestamp	1257523159730

DATABASES

LOCAL STORAGE

- html5demos.com

SESSION STORAGE

- html5demos.com



# SQLite

***"User agents must implement the SQL dialect supported by Sqlite 3.6.19"***

**Another one that fails  
super silently :(**



```
db = openDatabase("demo", "1.0",  
"sample", 200000);  
db.transaction(function (tx) {  
    tx.executeSql('SELECT * FROM tweets  
WHERE mention = ?', [mention], function  
(tx, results) {  
        // do something with results  
    });  
});
```



```
db = openDatabase("demo", "1.0",  
"sample", 200000);  
  
db.transaction(function (tx) {  
    tx.executeSql('SELECT * FROM tweets  
WHERE mention = ?', [mention], function  
(tx, results) {  
        // do something with results  
    });  
});
```

```
db = openDatabase("demo", "1.0",  
"sample", 200000);  
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    tx.executeSql('SELECT * FROM tweets  
WHERE mention = ?', [mention], function  
(tx, results) {  
        // do something with results  
    });  
});
```

```
db = openDatabase("demo", "1.0",  
"sample", 200000);  
db.transaction(function (tx) {  
    tx.executeSql('SELECT * FROM tweets  
WHERE mention = ?', [mention], function  
(tx, results) {  
        // do something with results  
    });  
});
```



# Web Database

We're using the Web Database API to store [my tweets](#), so there's no Twitter API hit on load.

In addition, I'm using the `since_id` when we make new requests, so I shouldn't be doubling up on tweets.

## DATABASES

- html5demos
  - tweets

LOCAL STORAGE

SESSION STORAGE

> `SELECT * FROM tweets LIMIT 5;`

id	text	created_at	sc...	...	
5...	Sneaking out of the #jsconf talks to touch up my slides. #ooermissus	Sat Nov 07 0...	rem	f...	
5...	Hmm - @fullfrontalconf T-shirt at #jsconf or not. It's one of the cle...	Sat Nov 07 0...	rem	f...	
5...	What a beautiful morning. The gods look favourably upon us JavaScr...	Sat Nov 07 0...	rem	f...	
5...	@robertnyman What? What frickin' time did you get up!? I've manag...	Sat Nov 07 0...	rem	f...	
5...	@peterwilsoncc Just a song :-)	Sat Nov 07 0...	rem	f...	





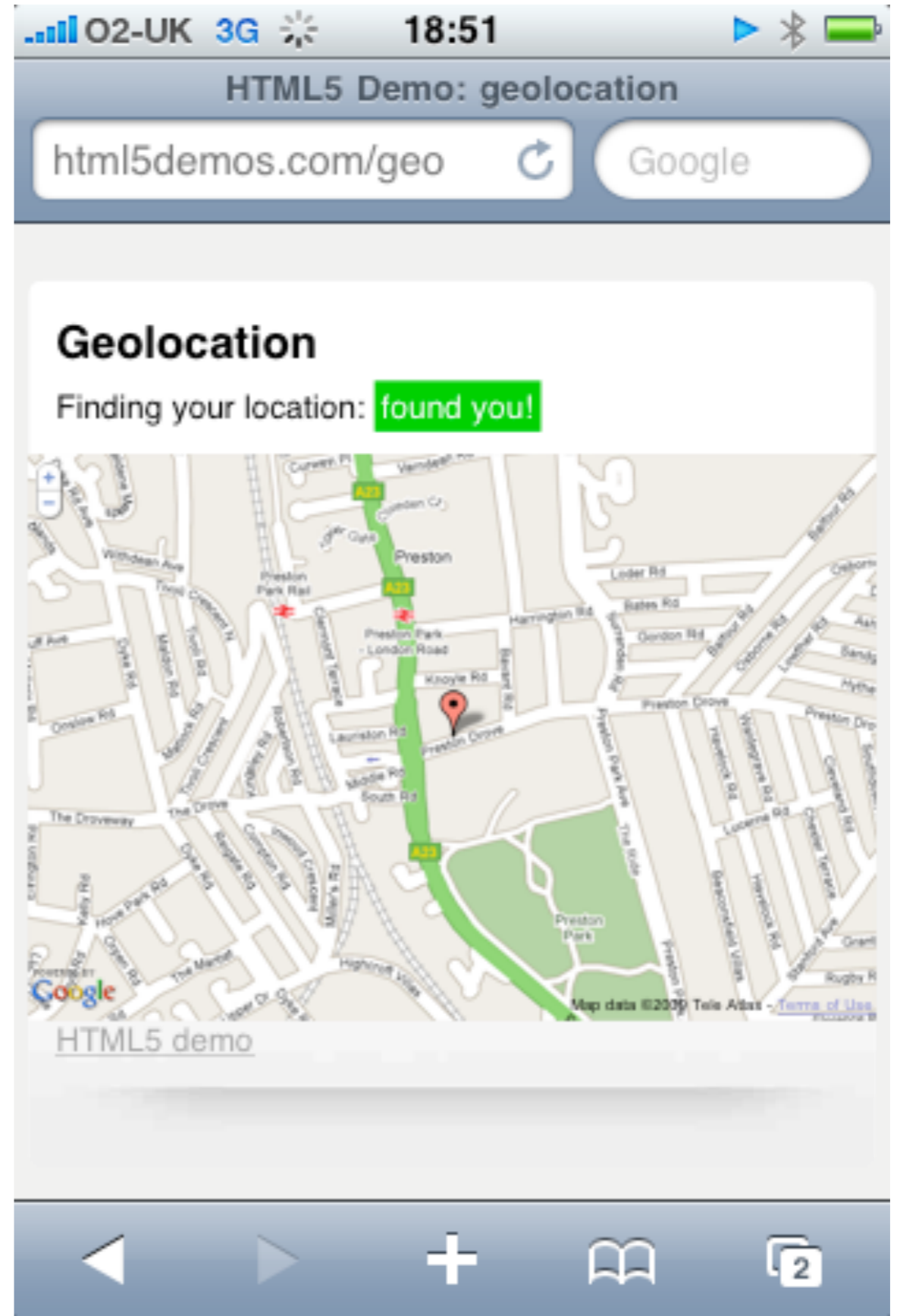
# Geolocation





# Geolocation









**Not always accurate!**

```
navigator
```

```
  .geolocation
```

```
  .getCurrentPosition(
```

```
    success,
```

```
    err
```

```
  );
```



▼ coords	undefined latitude=51.500152 longitude=-0.1
CONTENT_NODE	64
DOM_OBJECT	8
EAGER_CLASSINFO	32
MAIN_THREAD_ONLY	4
PLUGIN_OBJECT	16
RESERVED	2147483648
SINGLETON	1
THREADSAFE	2
accuracy	140000
altitude	0
altitudeAccuracy	0
classDescription	"wifi geo position coords object"
classID	null
contractID	""
flags	8
heading	0
implementationLanguage	2
latitude	51.500152
longitude	-0.126236
speed	0



# Web Workers





- **"Threads"**
- **Native or via Gears (or setTimeout hack?)**
- **Sandboxed**
- **Debugging?**



HTML5 Demo: worker reference point

http://html5demos.com/non-worker



Google


# Non Worker (for reference)

Canvas is running whilst an prime number finder runs - this will cause your browser to hang

Prime found: 2363741

start worker



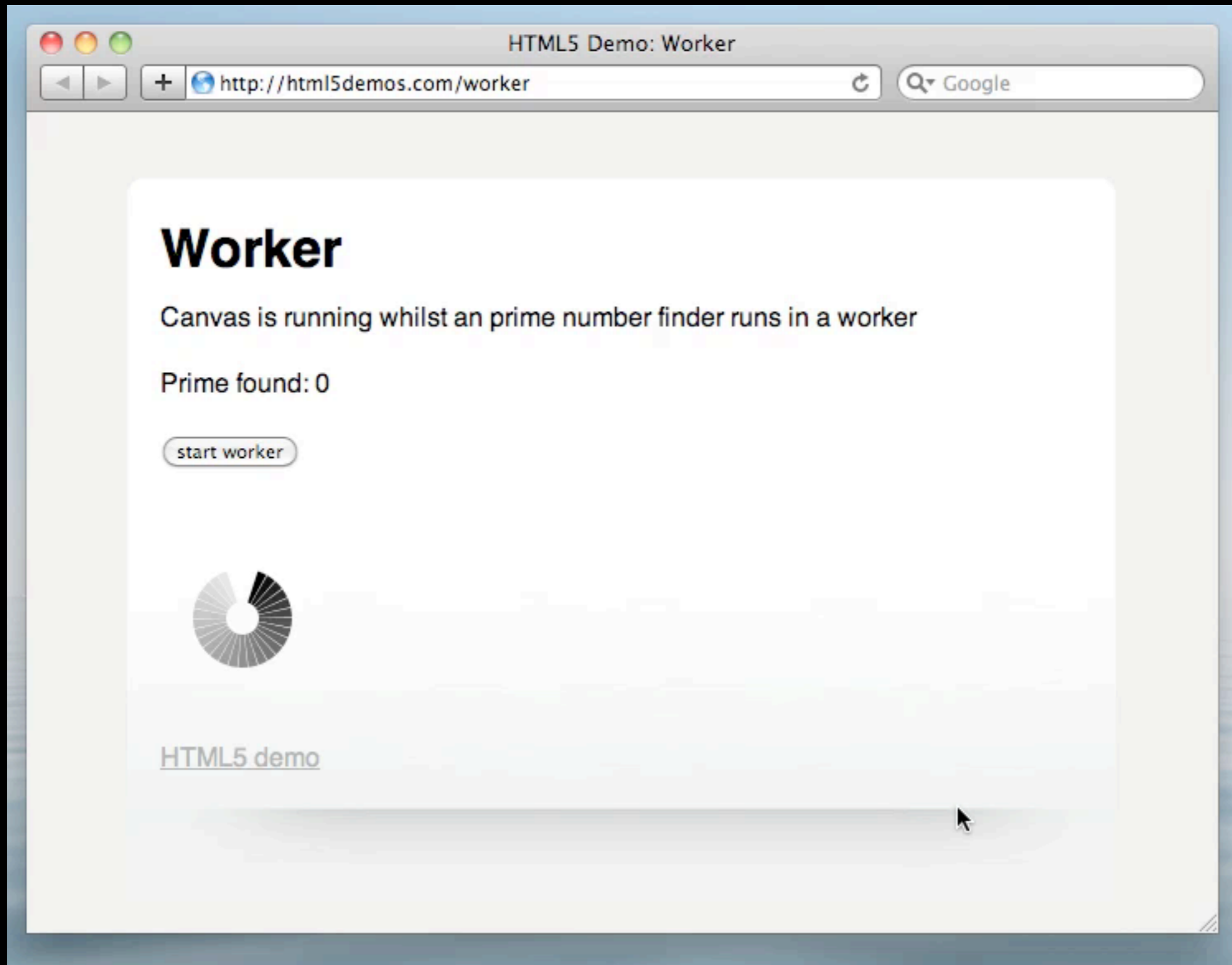


### Slow Script

Safari is no longer responding because of a script on the webpage "HTML5 Demo: worker reference point" (<http://html5demos.com/non-worker>). Do you want to stop running the script, or let it continue?

Stop Continue

[HTML5 demo](#)



**<http://html5demos.com/worker>**

● **importScripts**

● **postMessage**

● **onmessage**

● **onconnect**



# app.html

```
var w = new Worker( 'worker.js' );
```

```
w.onmessage = function (event) {  
    alert( "msg: " + event.data );  
};
```

```
w.postMessage( 'run' );
```

# worker.js

```
importScripts('xhr.js', 'db.js');
```

```
onmessage = function (event) {  
    if (event.data == 'run') {  
        run();  
    }  
};
```

```
function run() {  
    var data = doCrazyNumberCrunch();  
    postMessage(data);  
}
```

# worker.js

```
importScripts('xhr.js', 'db.js');
```

```
onmessage = function (event) {  
    if (event.data == 'run') {  
        run();  
    }  
};
```

```
function run() {  
    var data = doCrazyNumberCrunch();  
    postMessage(data);  
}
```



# worker.js

```
importScripts('xhr.js', 'db.js');
```

```
onmessage = function (event) {  
    if (event.data == 'run') {  
        run();  
    }  
};
```

```
function run() {  
    var data = doCrazyNumberCrunch();  
    postMessage(data);  
}
```

**And a  
lot  
more...**

**Attributes: data-\*, itemProp,  
sandbox (on iframes)**

**<progress>**

**<meter>**

**<datalist>**

**<ruby>**

**Microdata API,  
datagrid, XHR2 &  
upload progress**

**querySelector**

**Drag & Drop,  
History manager**

**ARIA overlap**



A group of people is standing on a floor completely covered with crumpled white paper. The scene is dimly lit, and the focus is on the lower half of the people and the sea of paper.

**<http://www.whatwg.org/html5/>**

**[http://tr.im/whatwg\\_complete](http://tr.im/whatwg_complete)**

**<irc://irc.freenode.net/#whatwg>**



# **Remy Sharp**

**@rem**

**(another)**

**JavaScript Conference:  
full-frontal.org**

**<http://html5demos.com>**

**Links: [http://tr.im/rs\\_jsconfeu](http://tr.im/rs_jsconfeu)**



***Pro tip: cats can't  
code for crap***