

The Inclusive Web



**Hands on with
HTML5 and jQuery**

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Inclusive Design Research Centre

fluidproject.org

A bit about us, quickly



inclusive design research centre
OCAD University

fluid*



fluid*engage



«opencast»



collectionspace



What is accessibility?

Rethinking Disability



Rethinking Disability



Rethinking Disability

A **mismatch** between the
user
and the
user interface

Disability is a usability issue

```
C:\>DIR A:
```

```
Not ready reading drive A  
Abort, Retry, Fail?_
```



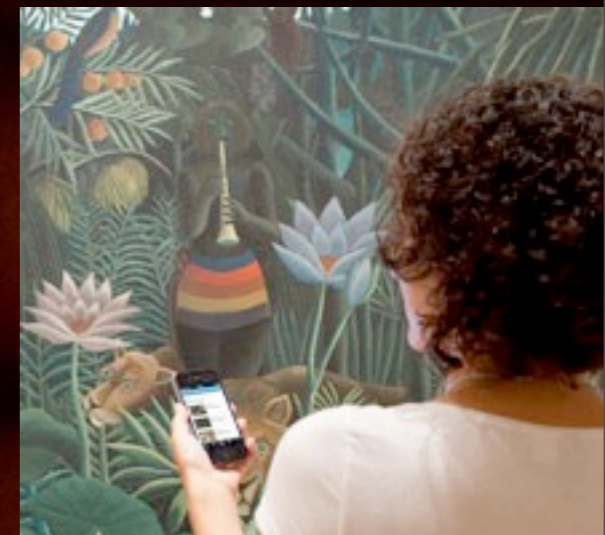

Disability is contextual

Designing for Context

The desktop version of the Amazon.com website features a complex layout. At the top, it includes the Amazon logo, a personalized greeting for 'Colin Clark', and navigation links for 'Today's Deals', 'Gifts & Wish Lists', and 'Gift Cards'. A search bar is prominently displayed with a 'GO' button. Below the search bar, there are several promotional banners: one for 'New Cameras from Canon', a large 'Kindle' advertisement titled 'The #1 Bestseller on Amazon' with pricing information (\$139 Wi-Fi, \$189 Free 3G+Wi-Fi), and an advertisement for 'endless style for miles' featuring a woman in a red dress. A 'Shop Fossil Gifts for Men' section is visible at the bottom left, showcasing watches, sunglasses, and wallets. The right side of the page contains a 'TurboTax' advertisement.

The mobile version of the Amazon.com website is designed for a smaller screen. It features a clean, minimalist layout with a white background and blue accents. The top navigation bar includes the Amazon logo, a 'Deals' icon, and links for 'Cart' and 'Wish List'. A search bar is centered below the navigation bar. A prominent banner for the 'Amazon App for iPhone' is displayed. Below this, a 'Kindle #1 Bestselling Product on Amazon' advertisement is shown. At the bottom, a 'Shop All Departments' section is visible, with dropdown menus for 'Books' and 'Movies, Music & Games'. The mobile interface includes a standard iOS-style navigation bar at the very bottom with back, forward, home, and app icons.

Disability is environmental



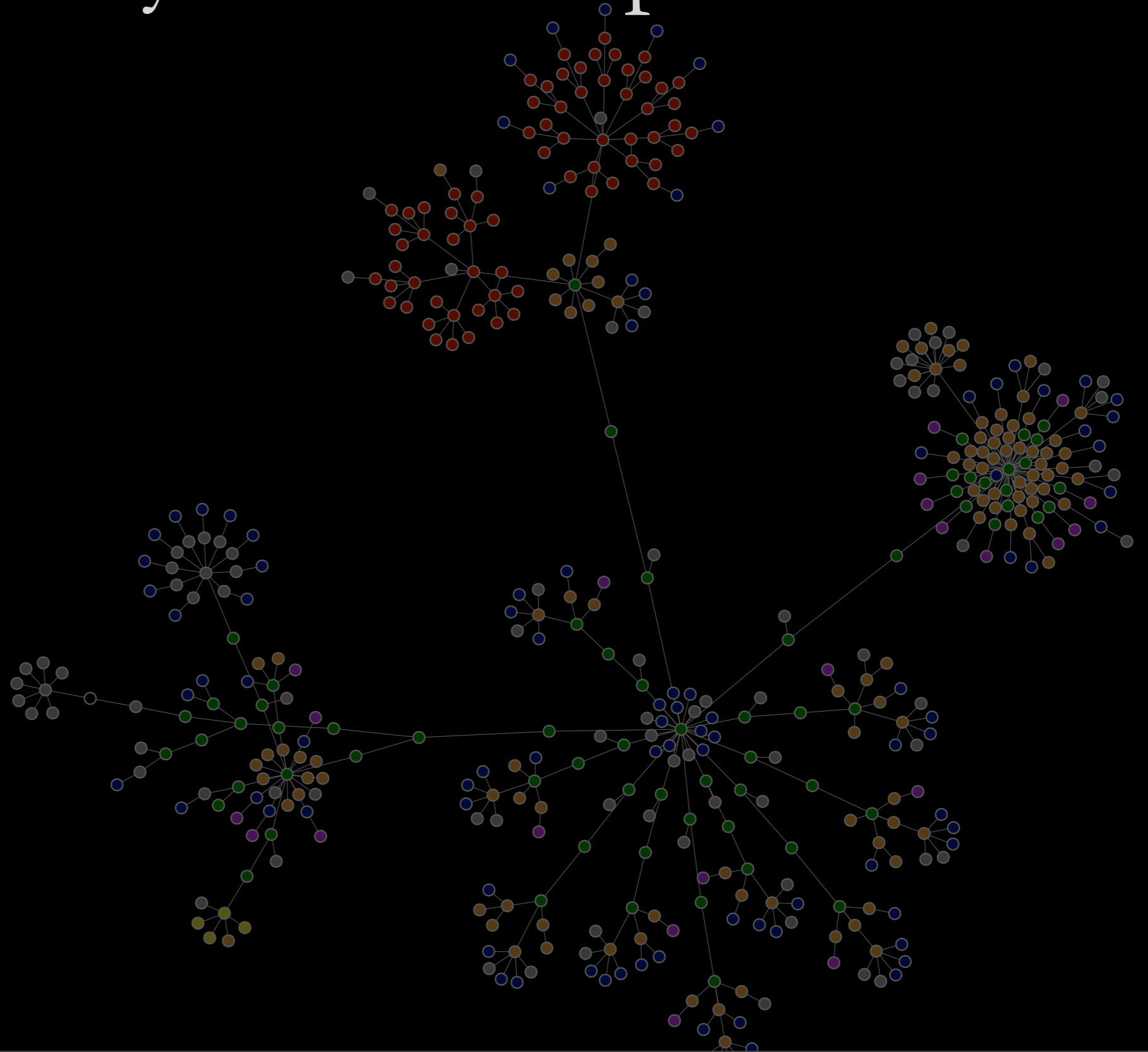
Accessibility is...

the **ability of the system**
to **accommodate the needs of the user**

the web today

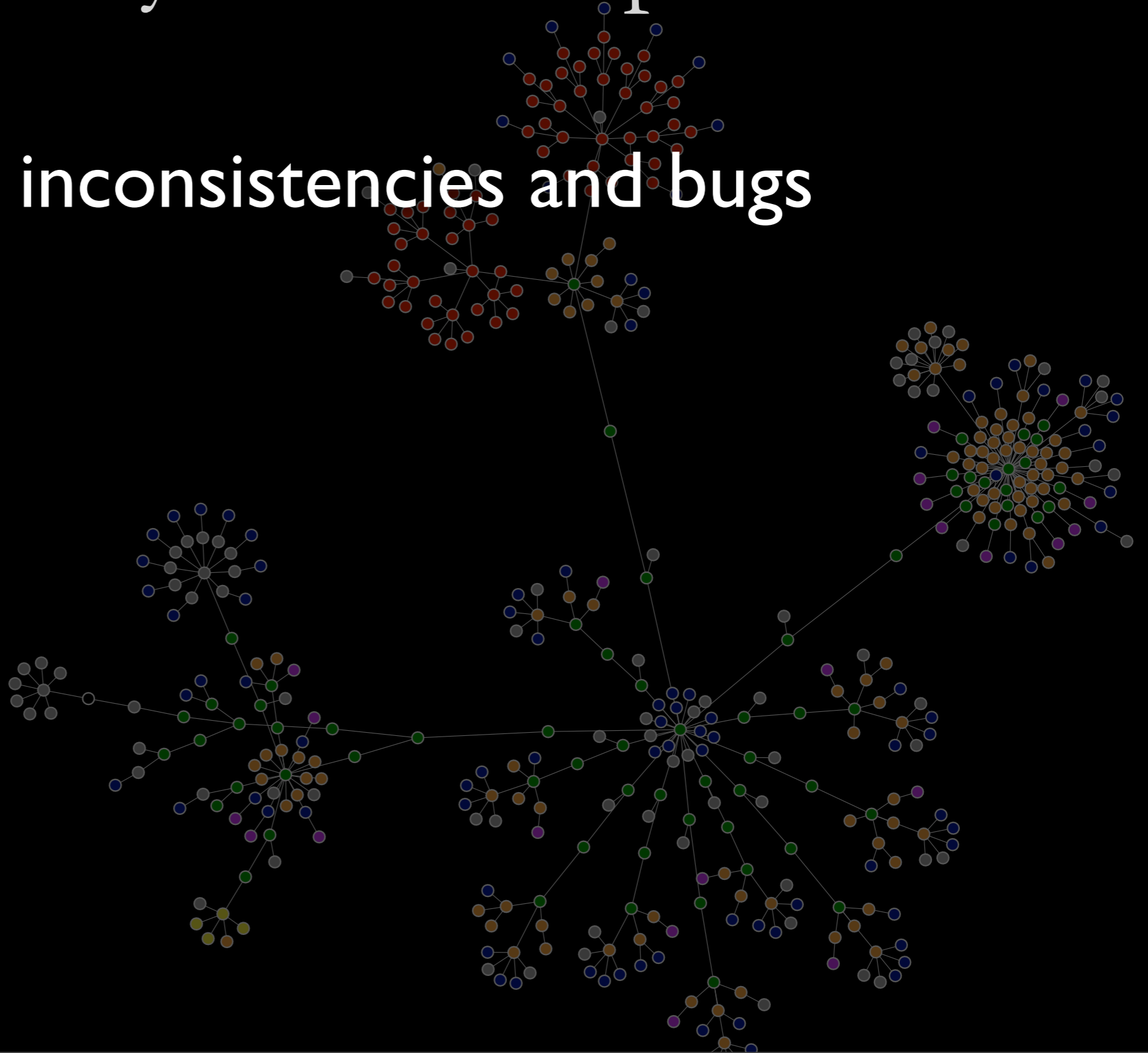


jQuery Hits the Spot



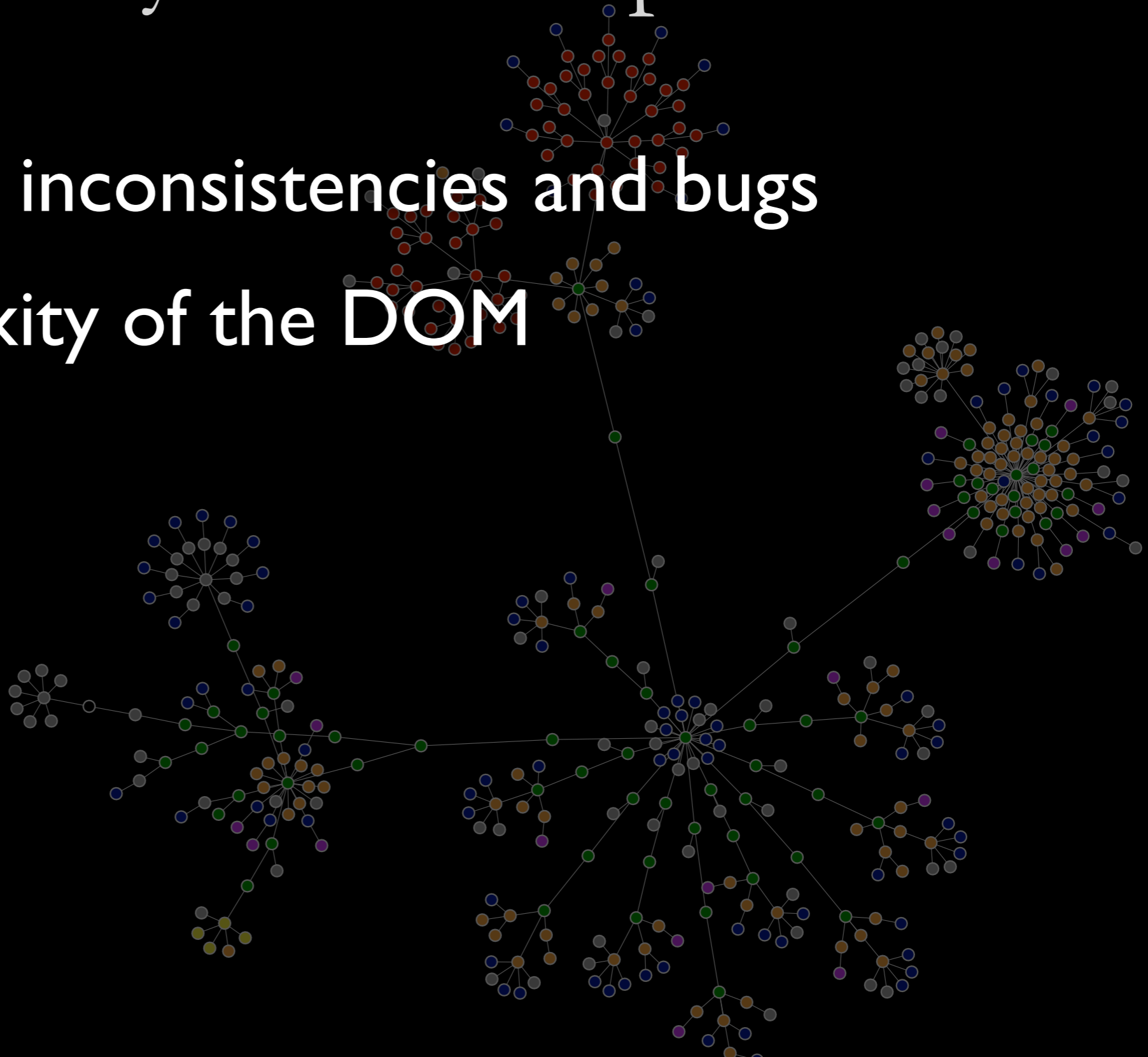
jQuery Hits the Spot

- **Browser inconsistencies and bugs**



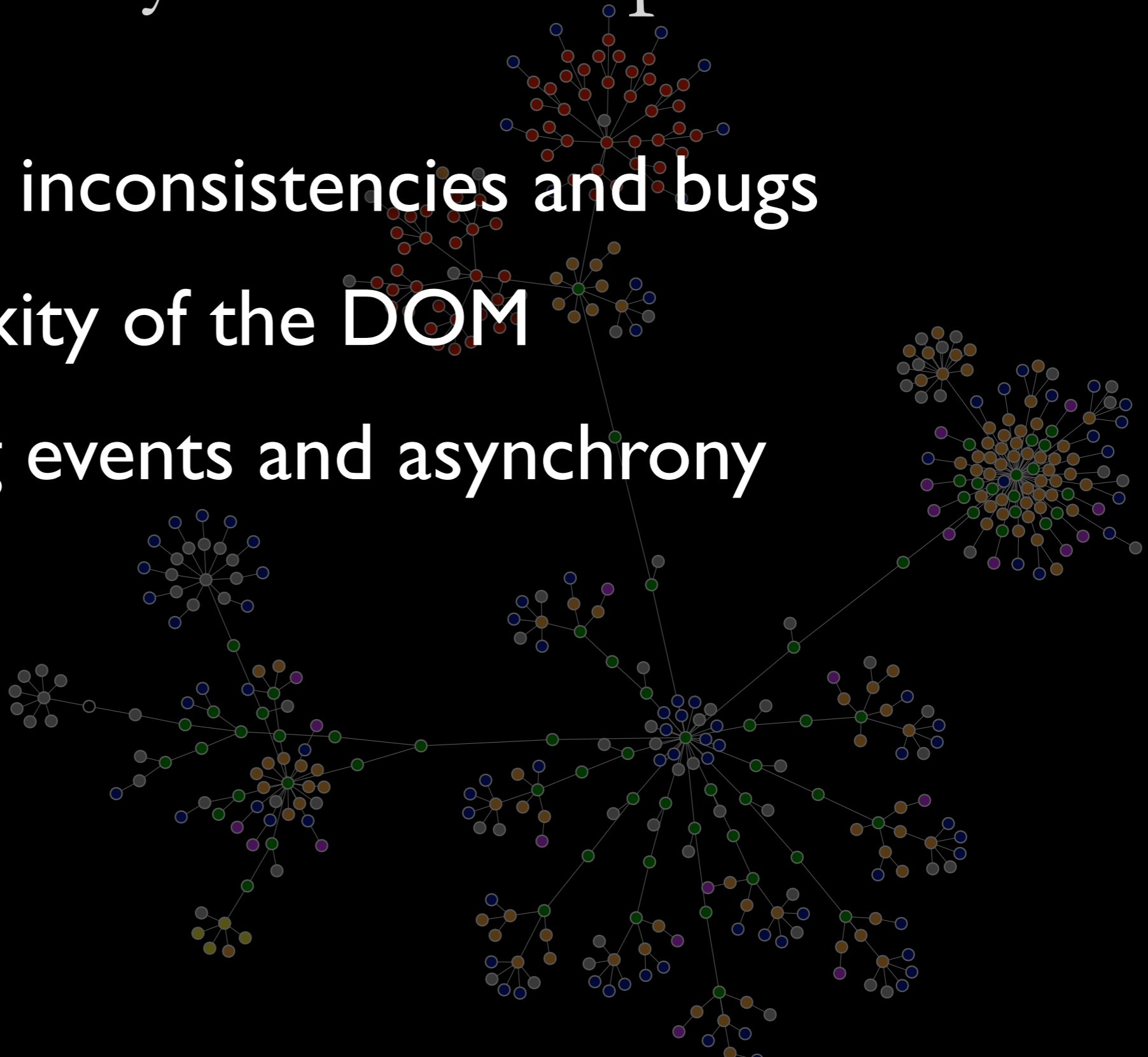
jQuery Hits the Spot

- **Browser inconsistencies and bugs**
- **Complexity of the DOM**



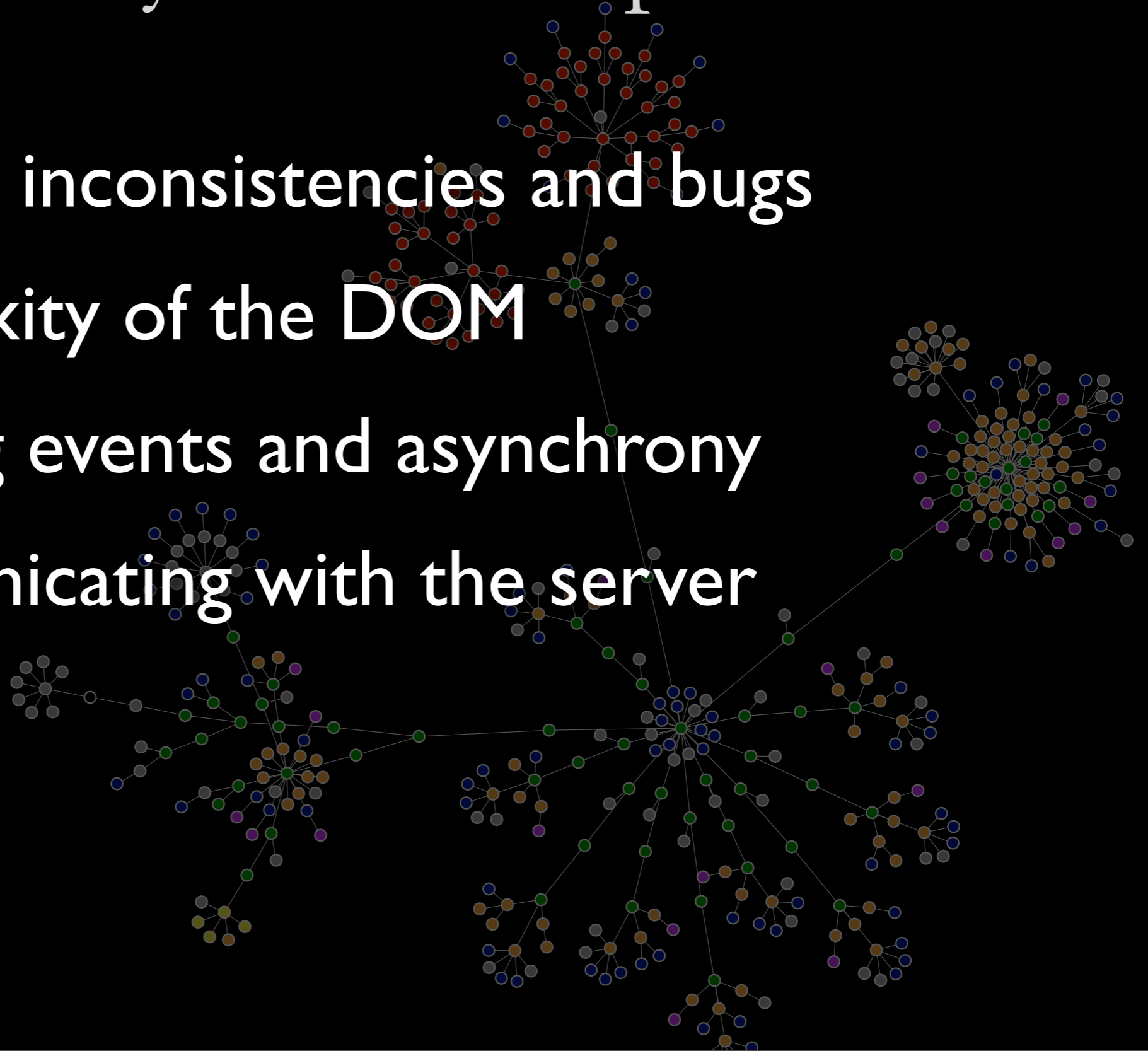
jQuery Hits the Spot

- Browser inconsistencies and bugs
- Complexity of the DOM
- Handling events and asynchrony



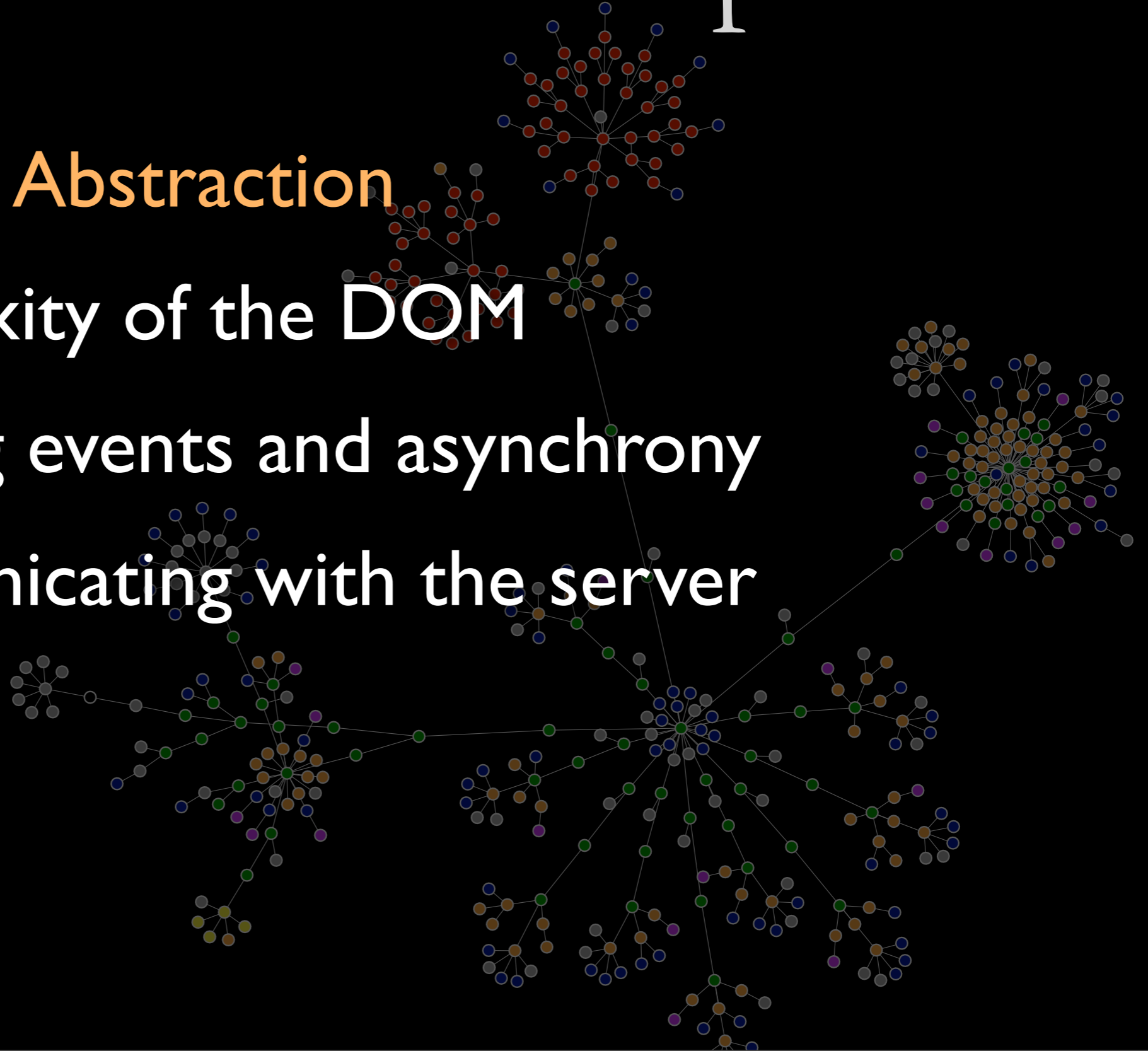
jQuery Hits the Spot

- **Browser inconsistencies and bugs**
- **Complexity of the DOM**
- **Handling events and asynchrony**
- **Communicating with the server**



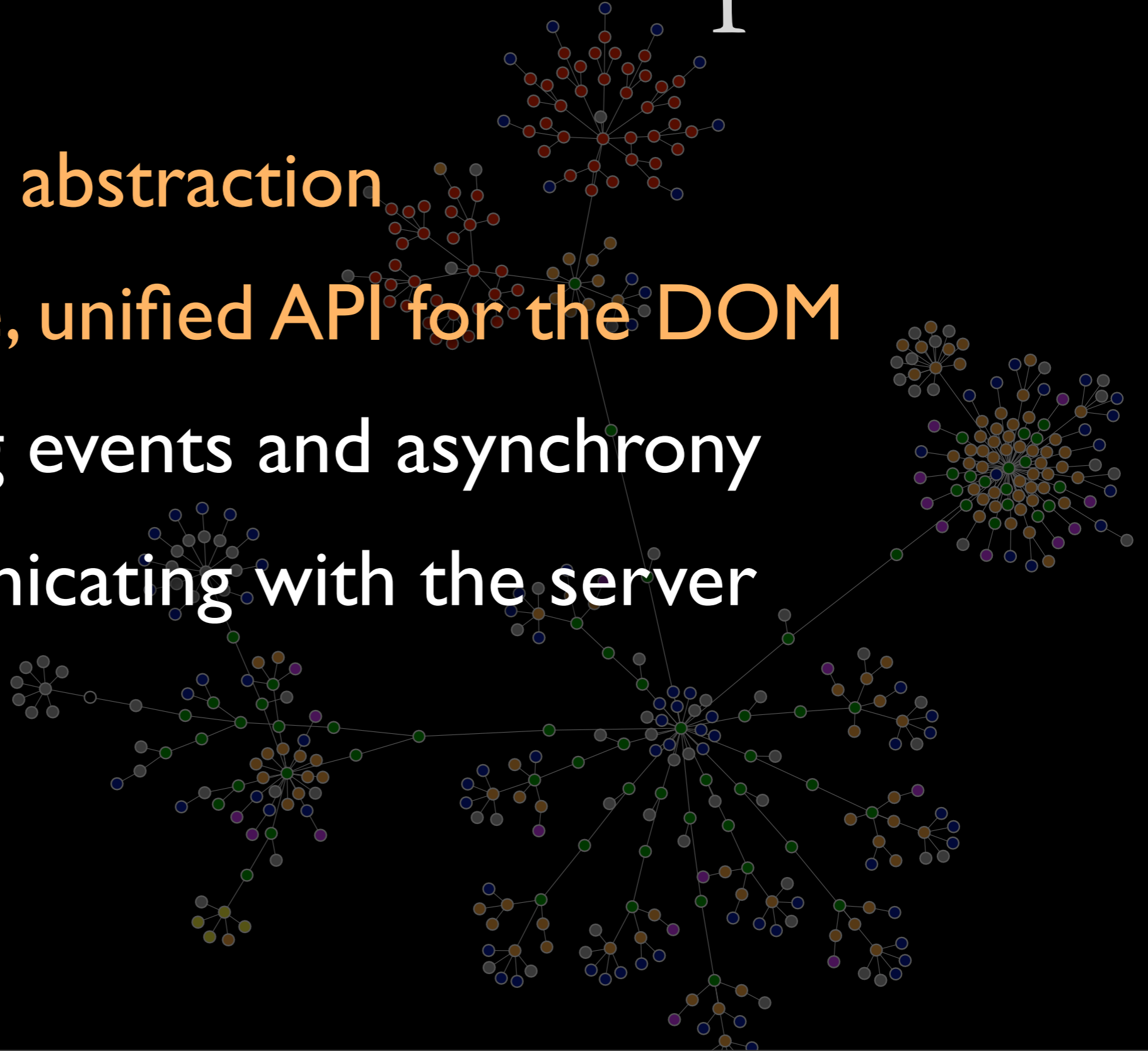
Toolkits can help!

- **Browser Abstraction**
- Complexity of the DOM
- Handling events and asynchrony
- Communicating with the server



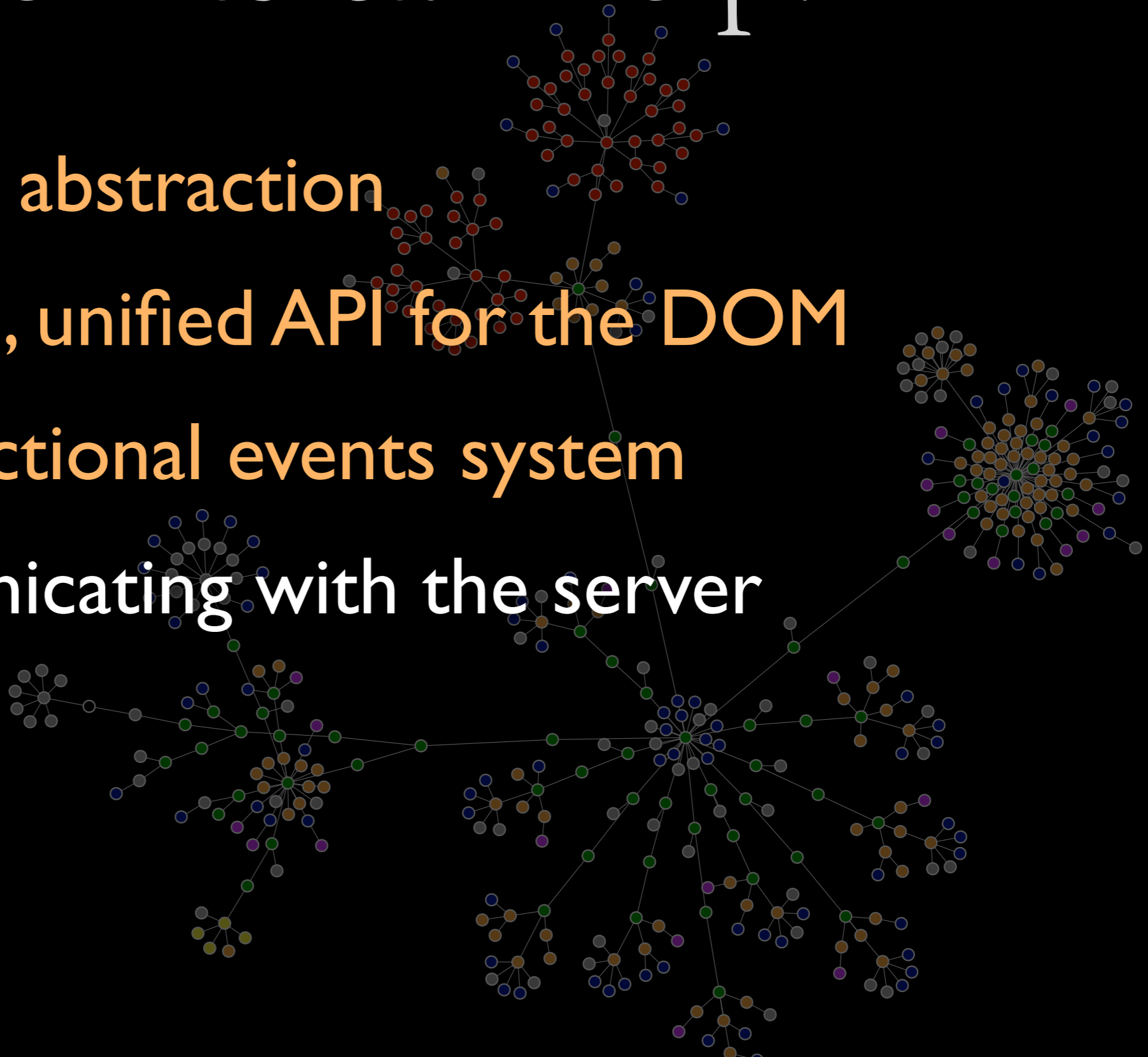
Toolkits can help!

- **Browser abstraction**
- **A simple, unified API for the DOM**
- Handling events and asynchrony
- Communicating with the server



Toolkits can help!

- **Browser abstraction**
- **A simple, unified API for the DOM**
- **Easy, functional events system**
- **Communicating with the server**



Toolkits can help!

- Browser abstraction
- A simple, unified API for the DOM
- Easy, functional events system
- Built-in AJAX, XML, and JSON



Without jQuery

```
function stripeListElements() {  
    // get the items from the list  
    var myItems = document.getElementsByTagName("li");  
    // skip line 0 as it's the header row  
    for(var i = 0; i < myItems.length; i++) {  
        if ((i % 2) === 0) {  
            myItems[i].className = "striped";  
        }  
    }  
}
```


With jQuery

```
jQuery("li");
```

With jQuery

```
jQuery("li:even");
```

With jQuery

```
jQuery("li:even").addClass("striped");
```

Accessible systems are...

- Flexible
- Separable
- Modifiable



Graceful Degradation

Markup

```
<!-- Only shown if browser doesn't support JavaScript -->  
<label for="..." class="fl-progEnhance-basic">Add File:</label>
```

```
<!-- Only shown if JavaScript is turned on -->  
<div class="fl-progEnhance-enhanced">
```

It's just a couple of classes!

Styles

```
.fl-progEnhance-enhanced {display:none}  
.fl-progEnhance-basic {}
```

Hide the fancy stuff, show the basics by default.

The Code

```
// Use JavaScript to hide basic markup.  
$("head").append("<style type='text/css'>  
    .fl-progEnhance-basic{ display: none; }  
    .fl-progEnhance-enhanced { display: block; }  
</style>");
```

Use JavaScript to flip the styles around!

how assistive technology works

keyboard navigation & aria

Opaque Markup

```
<!-- This is a Tabs widget. -->  
<!-- How would you know, looking only at the markup? -->
```

```
<ol>  
  <li id="ch1Tab">  
    <a href="#ch1Panel">Chapter 1</a>  
  </li>  
  <li id="ch2Tab">  
    <a href="#ch2Panel">Chapter 2</a>  
  </li>  
  <li id="quizTab">  
    <a href="#quizPanel">Quiz</a>  
  </li>  
</ol>  
<div>  
  <div id="ch1Panel">Chapter 1 Stuff</div>  
  <div id="ch2Panel">Chapter 2 Stuff</div>  
  <div id="quizPanel">Quiz Stuff</div>  
</div>
```

Opaque Markup: Tabs

CHAPTER 1

CHAPTER 2

QUIZ

Chapter 1 Prolegomena

What is logic?

Logic is the study of the consistency of beliefs. For beliefs to be consistent it must be possible for them to obtain at the same time. For example, it is illogical to believe that the sky is completely blue and that the sky is completely red because the sky being entirely blue is inconsistent with its being entirely red, i.e. it is not possible for the sky to be entirely red at the same time as its being entirely blue.

Logic is also a study of "logical consequence", i.e. what follows by necessity from something else. By studying inconsistency of beliefs, philosophers are able to study the validity of arguments, as will be shown later. Methods of finding whether certain arguments are valid is described later.

The symbolisation of these sentences, known as formalisation, simplifies and quickens this process. It also enables the philosopher to clarify ideas using an unambiguous language in which to represent thoughts. The sophistication of the language used enables greater insights into the significance of these thoughts (and a cursory analysis of more logical languages is described in Other Logics).

ARIA fills the gap



Roles, States, Properties

- **Roles** describe widgets not present in HTML 4
slider, menubar, tab, dialog
- **Properties** describe characteristics:
draggable, hasPopup, required
- **States** describe what's happening:
busy, disabled, selected, hidden

Using ARIA

```
<!-- Now *these* are Tabs! -->
<ol role="tablist">
  <li id="ch1Tab" role="tab">
    <a href="#ch1Panel">Chapter 1</a>
  </li>
  <li id="ch2Tab" role="tab">
    <a href="#ch2Panel">Chapter 2</a>
  </li>
  <li id="quizTab" role="tab">
    <a href="#quizPanel">Quiz</a>
  </li>
</ol>
<div>
  <div id="ch1Panel" role="tabpanel"
    aria-labelledby="ch1Tab">Chapter 1 Stuff</div>
  <div id="ch2Panel" role="tabpanel"
    aria-labelledby="ch2Tab">Chapter 2 Stuff</div>
  <div id="quizPanel" role="tabpanel"
    aria-labelledby="quizTab">Quiz Stuff</div>
</div>
```

Adding ARIA in code

```
// Identify the container as a list of tabs.
tabContainer.attr("role", "tablist");

// Give each tab the "tab" role.
tabs.attr("role", "tab");

// Give each panel the appropriate role,
panels.attr("role", "tabpanel");
panels.each(function (idx, panel) {
    var tabForPanel = that.tabs.eq(idx);
    // Relate the panel to the tab that labels it.
    $(panel).attr("aria-labelledby", tabForPanel[0].id);
});
```


Keyboard Navigation

- Everything that works with the mouse should work with the keyboard
- ... but not always in the same way
- Support familiar conventions

http://dev.aol.com/dhtml_style_guide

Keyboard Conventions

- **Tab** key focuses the control or widget
- **Arrow keys** select an item
- **Enter** or **Spacebar** activate an item

Tab is handled by the browser. For the rest, you need to write code. A lot of code.

Keyboard navigation: Tabs

[CHAPTER 1](#)

CHAPTER 2

[QUIZ](#)

Chapter 1 Prolegomena

What is logic?

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TabIndex examples

```
<!-- Tab container should be focusable -->
<ol id="animalTabs" tabindex="0">
  <!-- Individual Tabs shouldn't be focusable -->
  <!-- We'll focus them with JavaScript instead -->
  <li id="tab1">
    <a href="#cats" tabindex="-1">Cats</a>
  </li>
  <li id="tab2">
    <a href="#cats" tabindex="-1">Dogs</a>
  </li>
  <li id="tab3">
    <a href="#cats" tabindex="-1">Alligators</a>
  </li>
</ol>
```

Making Things Tabbable

- Tabindex varies subtly across browsers
- `jquery.attr()` normalizes it as of 1.3
- For all the gory details:

[http://fluidproject.org/blog/2008/01/09/
getting-setting-and-removing-tabindex-values-with-javascript/](http://fluidproject.org/blog/2008/01/09/getting-setting-and-removing-tabindex-values-with-javascript/)

```
// Make the tablist accessible with the Tab key.  
tabContainer.attr("tabindex", "0");  
// And take the anchors out of the Tab order.  
$("a", tabs).attr("tabindex", "-1");
```

Adding the Arrow Keys

```
// Make each tab accessible with the left and right arrow keys.
tabContainer.fluid("selectable", {
  selectableSelector: that.options.selectors.tabs,
  direction: fluid.a11y.orientation.HORIZONTAL,
  onSelect: function (tab) {
    $(tab).addClass(that.options.styles.highlighted);
  },

  onUnselect: function (tab) {
    $(tab).removeClass(that.options.styles.highlighted);
  }
});
```

Making Them Activatable

```
// Make each tab activatable with Spacebar and Enter.  
tabs.fluid("activatable", function (evt) {  
    // Your handler code here. Maybe the same as .click()?  
});
```

Documentation

- Tutorial:

<http://wiki.fluidproject.org/display/fluid/Keyboard+Accessibility+Tutorial>

- API Reference:

<http://wiki.fluidproject.org/display/fluid/Keyboard+Accessibility+Plugin+API>

the web tomorrow

“you have to use flash for that”

“the web can’t do that!”

“you need an app for that!”

HTML



ARCADE FIRE

THE WILDERNESS DOWNTOWN

An interactive film by Chris Milk
Featuring "We Used To Wait"
Built in HTML5

Enter the address of the home where you grew up

SEARCH

[?]

music and video

Points: 7820

Record: 54175



The Music is On
Toggle Editor

Music: Mauri Helkkinen (a.k.a. Drowsy)

games



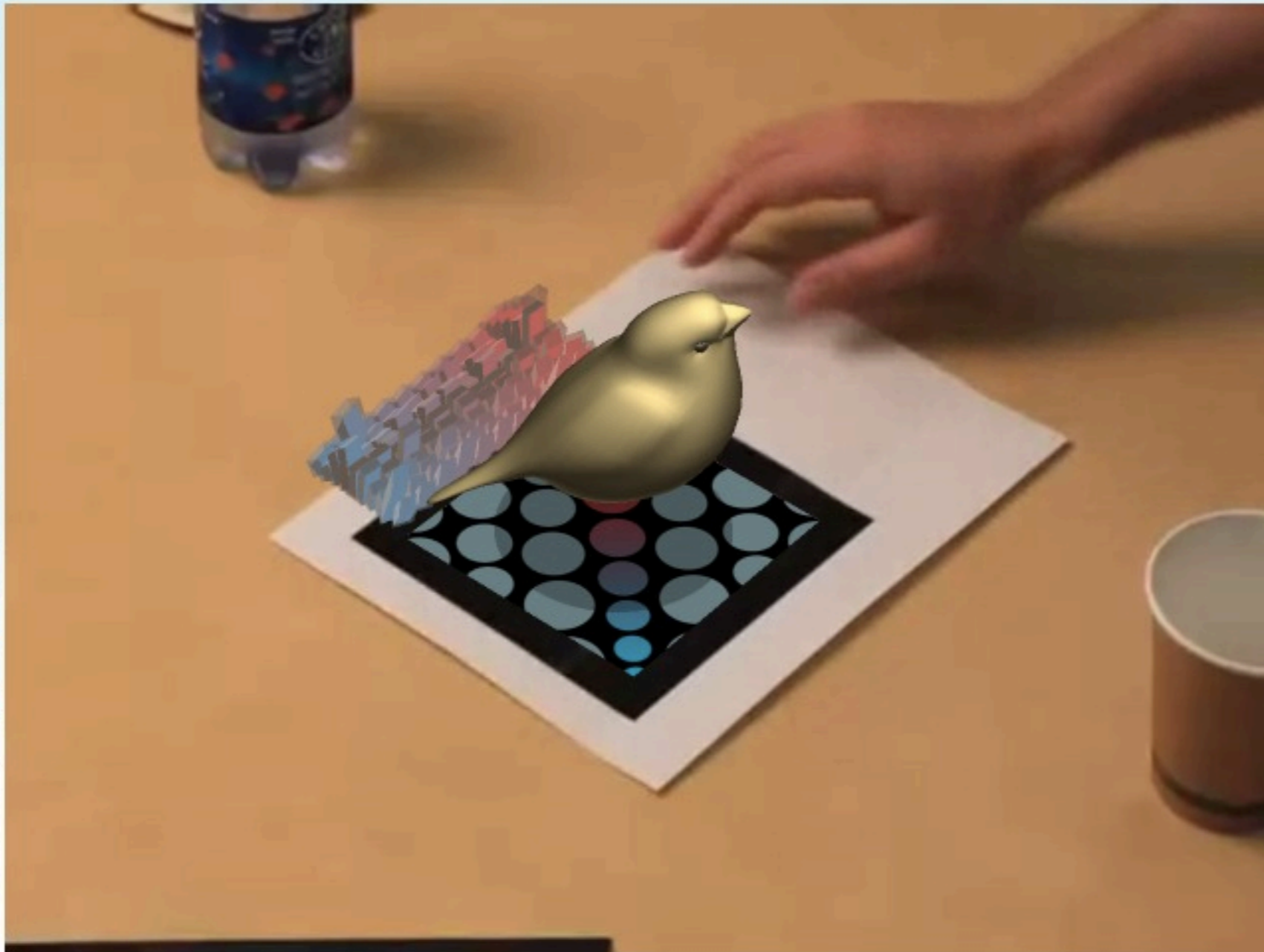
SPOOK



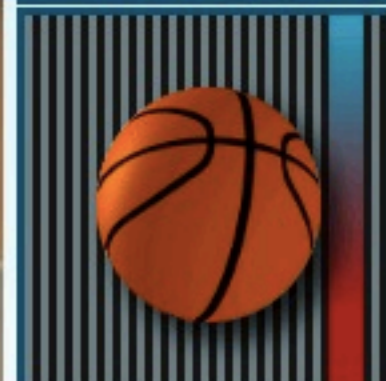
BIRD



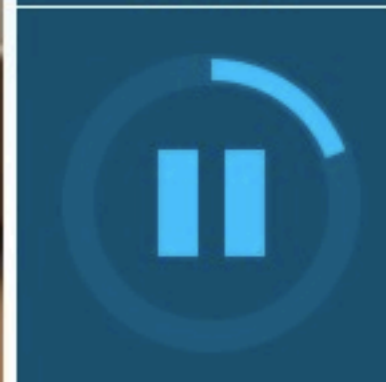
LOTUS



DRAW A PICTURE



PLAY BALL

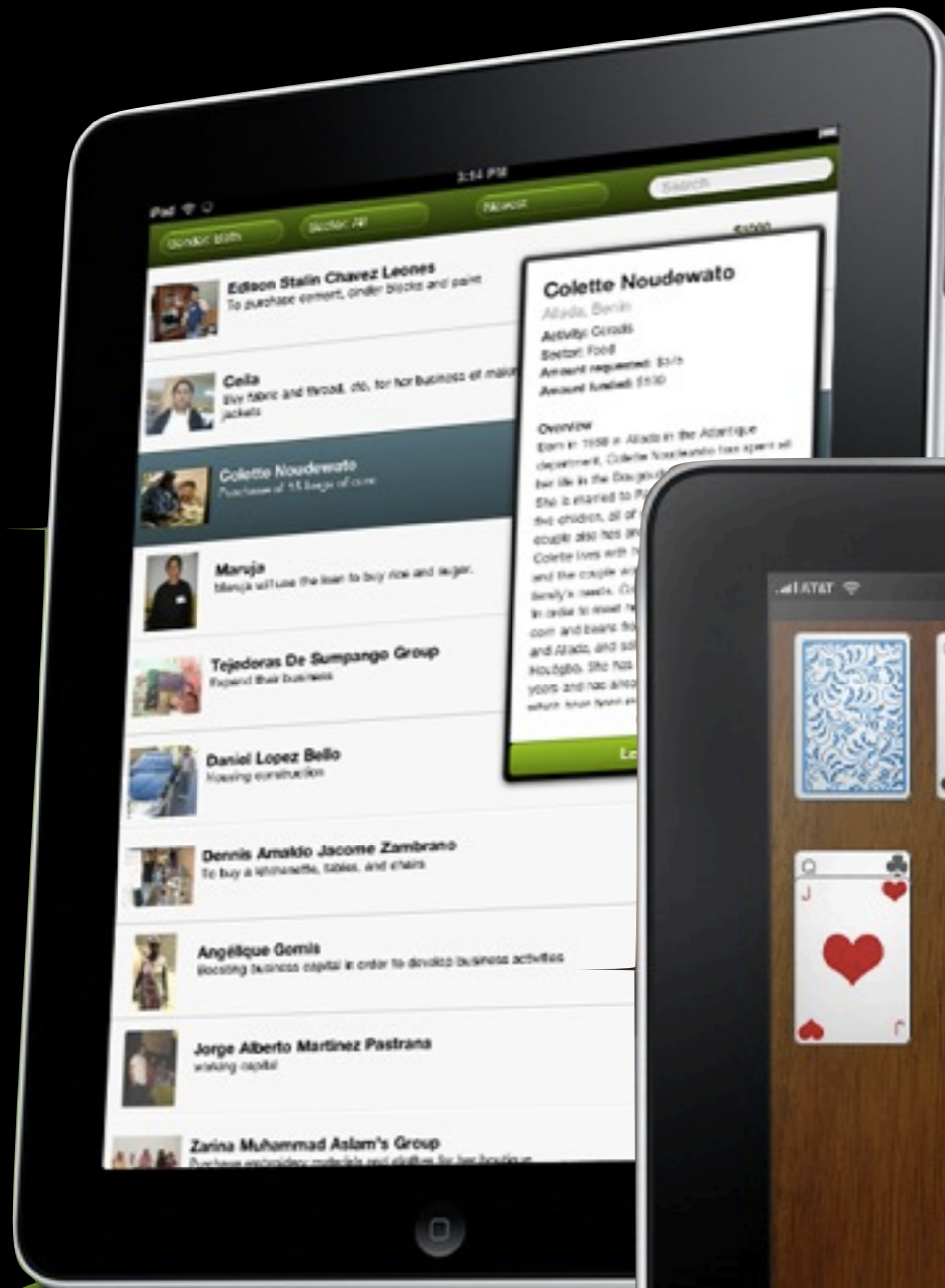


PRESS PLAY

PICK SOMETHING FROM THE SIDEBARS TO PLACE INTO THE VIDEO, THEN USE THE BUTTON BELOW TO

Turn augmented reality off

augmented reality



mobile

Beyond the buzzword...

- Media, drawing, animation, and interactivity

`<audio>`, `<video>`, `<canvas>`

- New widgets—you don't have to roll your own

`<progress>`, `<menu>`

- Richer semantics for forms and documents

`<article>`, `<nav>`, `<input type="date">`

Other cool stuff...

- **CSS3**

transition, transform, gradient

- **Working with files**

File API, FormData, XHR Level 2

- **Coming soon**

Device, Text to Speech!

What about accessibility?

Making use of semantics



What's coming

- Headings

Based on nesting within sections

- Continued enhancements from semantics

e.g. improved AT awareness for navigation `<nav>`

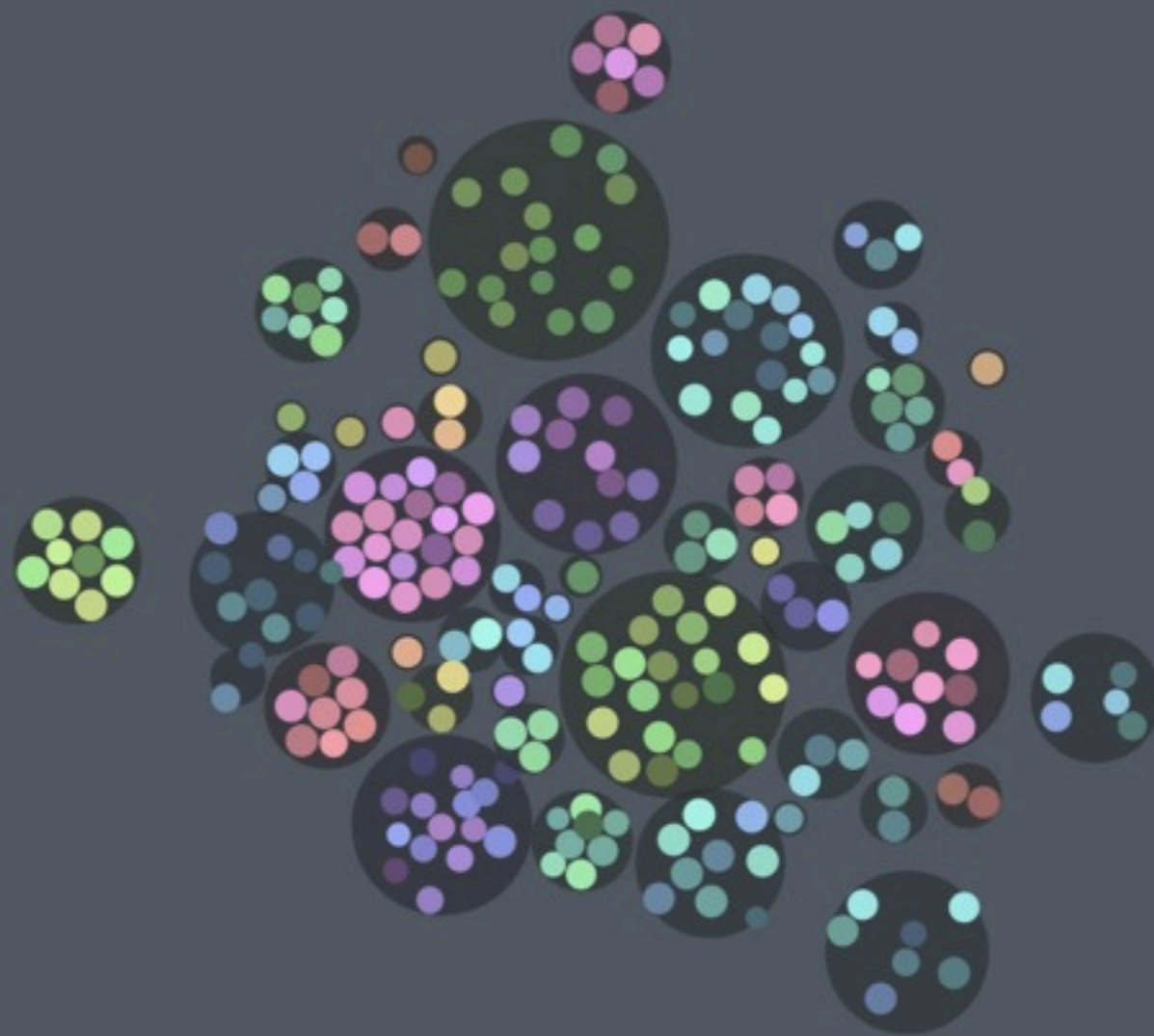
- Native widgets

Canvas Accessibility

fizz

This is Fizz, by Bloom. Big circles are people, small circles are their status updates. [tell me more](#) !

We would love your feedback!



Canvas Accessibility

The screenshot displays the Bespin web editor interface. The browser window title is "example.txt - editing with Bespin". The address bar shows the URL "https://bespin.mozilla.com/editor.html#project=joewalker+pubj". The page content is a code editor with the following code:

```
1287 }
1288 }
1289
1290 // if highlight line is on, paint the highlight color
1291 if ((settings && settings.isSettingOn('highlightline')) &&
1292     (currentLine == ed.cursorManager.getCursorPosition().row)) {
1293     ctx.fillStyle = theme.highlightCurrentLineColor;
1294     ctx.fillRect(x + (Math.abs(this.xoffset)), y, cwidth, this.lineHeight);
1295 // if not on highlight, see if we need to paint the zebra
1296 } else if ((currentLine % 2) == 0) {
1297     ctx.fillStyle = theme.zebraStripeColor;
1298     ctx.fillRect(x + (Math.abs(this.xoffset)), y, cwidth, this.lineHeight);
1299 }
1300
1301 x += this.LINE_INSETS.left;
1302 cy = y + (this.lineHeight - this.LINE_INSETS.bottom);
1303
1304 // paint the selection bar if the line has selections
1305 var selections = this.selectionHelper.getRowSelectionPositions(currentLine);
1306 if (selections) {
1307     tx = x + (selections.startCol * this.charWidth);
1308     tw = (selections.endCol == -1) ? (lastColumn - firstColumn) * this.charWidth : (selections.endCol - selections.startCol) * this.charWidth;
1309     ctx.fillStyle = theme.editorSelectedTextBackground;
1310     ctx.fillRect(tx, y, tw, this.lineHeight);
1311 }
1312
1313 var lineMetadata = this.model.getRowMetadata(currentLine);
1314 var lineText = lineMetadata.lineText;
1315 var searchIndices = lineMetadata.searchIndices;
```

On the right side, there is a "Collaboration" sidebar titled "Users editing this file:". It lists several users with their names and IP addresses (10.2.76.7):

- joewalker
- joewalker
- joewalker
- joewalker
- dion
- bgalbs (You)
- kevin
- ascarida
- bgalbs (You)
- avibryant
- avibryant
- bgalbs (You) This window

The bottom status bar shows "Done".

Canvas Accessibility

1. Shadow DOM

2. Focus indicators

... not quite yet.

In the meantime...

1. Build alternatives

2. Degrade gracefully

The Bottom Line

- HTML5 is coming—experiment with it now
- Lots of great potential for improving access
- Assistive technologies are slow on the uptake
- Some features are going to be a challenge
(Canvas)

building cool stuff

an HTML5 uploader



Features

- Degrades gracefully
- Uploads multiple files at once
- Keyboard navigable
- Uses hot new HTML5 features:

FormData XMLHttpRequest Level 2 <progress> (almost!)

Dive right in: markup

```
<input type="file" multiple=""  
  id="d-uploader-filesControl"  
  class="d-uploader-filesControl fl-progEnhance-basic" />
```

Getting the files

```
filesControl.change(function () {  
    that.events.onAdd.fire(filesControl[0].files);  
});
```

```
demo.uploader.sendRequest = function (file, url, events) {
    var formData = new FormData();
    formData.append("file", file);

    // Create a new XHR.
    var xhr = new XMLHttpRequest();
    xhr.open("POST", url, true);

    // Register success and error listeners.
    xhr.onreadystatechange = function () {
        if (status === 200) {
            events.onSuccess.fire(file);
        } else {
            events.onError.fire(file);
        }
    };

    // Listen for progress events as the file is uploading.
    xhr.upload.onprogress = function (progressEvent) {
        events.onProgress.fire(file, progressEvent.loaded, progressEvent.total);
    };

    // Send off the request to the server.
    xhr.send(formData);
};
```

Fluid Travel Finder

fluid*

Trip Details

Departure:

City

Toronto

Departure Date

2011-06-01

Arrival:

City

Montreal

Return Date

2011-06-02

Number of Travellers

1



<http://fluidproject.org>

Contact Information

Name

My name is ...

Phone #

555-555-5555

E-Mail

my@email.com

Book My Trip



HTML5 Inputs

```
<input type="tel"> <!-- phone number -->
```

```
<input type="email"> <!-- e-mail address -->
```

```
<input type="date"> <!-- date -->
```

```
<input type="search"> <!-- search field -->
```

```
<!-- number field -->
```

```
<input type="number" min="0" max="10" step="1" value="1">
```

```
<!-- Like an autocomplete widget -->
```

```
<input list="dlist">
```

```
<datalist id="dlist"><option value="HTML5"></datalist>
```


HTML5 Inputs: attributes / properties

```
<label for="name">Name</label>  
<input type="text" id="name" placeholder="My name is ..."  
      required autofocus />
```

Geolocation

```
// test if geolocation api is supported
if (!!navigator.geolocation) {
    // success callback is passed a location object
    // coords property holds coordinate information
    // Firefox also has an address property
    navigator.geolocation.getCurrentPosition(success, error);
}
```

Geolocation: Location Object

```
// test if geolocation api is supported
if (!!navigator.geolocation) {
    // success callback is passed a location object
    navigator.geolocation.getCurrentPosition(success, error);
}
```



infusion



What's Infusion?

- Application framework built on top of jQuery
- UI components you can reuse and adapt
- Lightweight CSS framework for styling
- Accessibility tools and plugins for jQuery
- Open architecture: everything is configurable



Great UX is hard work

- Your code gets unruly as it grows
- UIs are hard to reuse or repurpose
- Design change requires big code change
- Accessibility is confusing
- Combining different code/libraries doesn't always work



Open Architecture:

Unlock your markup

Let developers *and users* in

A widget isn't just one thing

Question the rules

No Black Boxes

Transparent Apps

- M is where it's at
- Events inside and out
- Assistive technology *inside* the Web, not bolted on





UI Options & FSS

My Dashboard

User Interface Options

▼ Easier to see

Font style:

Minimum text size:

Text Spacing:

Line Spacing:

Contrast:

Background Images: Yes No

Simplified Layout: Yes No

► Easier to find

Preview window (updates automatically)

Tools

- Home
- Profile
- Membership
- Schedule
- Resources
- Worksite Setup
- Preferences
- Account

Reset Save and apply Cancel

Add Widgets

Edit Appearance



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UI Options & FSS

My Dashboard

User Interface Options

▼ Easier to see

Font style:

Minimum text size: px

Text Spacing:

Line Spacing:

Contrast:

Background Images: Yes No

Simplified Layout: Yes No

► Easier to find

Preview window (updates automatically)

More Tools		Settings	Close
Add Tools Toggle View			
Home		[remove]	
Profile		[remove]	
Membership		[remove]	
Schedule		[remove]	
Resources		[remove]	
Worksite Setup		[remove]	
Preferences		[remove]	
Account		[remove]	

Reset Save and apply Cancel

Add Widgets Edit Appearance

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CSS Frameworks

“If you’re going to use a framework, it should be yours; one that you’ve created. You can look at existing frameworks for ideas and hack at it. But the professionals in this room are not well served by picking up a framework and using it as-is.”

- Eric Meyer

Fluid Skinning System

- FSS is built to be hacked on
- Provides a core set of building blocks
- Reset, text, layouts, themes
- Namespaced: no conflicts with your stuff
- Themes for better legibility & readability

<http://wiki.fluidproject.org/x/96M7>

<https://github.com/jobara/workshops>

Questions?

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fluidproject.org

github.com/fluid-project



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Curb cut, Great PA-NJ, <http://www.flickr.com/photos/50393252@N02/4822063888/>

Stethoscope, Han-Oh Chung, <http://www.flickr.com/photos/chickenlump/2038512161/>

Texting while walking, Mobile Monday Amsterdam, <http://www.flickr.com/photos/momoams/2926622070/>

MOMA WiFi, <http://www.flickr.com/photos/89554035@N00/2445178036>

Plasticine iPhone, Paula Ortiz López, <http://www.flickr.com/photos/paulaortizlopez/5342740603/>

Skateboarder, Amin Samsudin, <http://www.flickr.com/photos/aminchoc/4108543387/>

Plasticine Animal, panshipanshi, <http://www.flickr.com/photos/panshipanshi/2123208719/>