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# HTML5: The New UI Library For Games

- ⦿ Chad Austin
- ⦿ Technical Director, IMVU

# HTML IS WINNING





# Browser wars are hotter than ever

- ⌘ Features like canvas, SVG, CSS3, becoming standard
- ⌘ GPU accelerated compositing & rasterization
- ⌘ Tracing JITs



# Terminology

- ⌚ HTML = markup + CSS + JS + Canvas + sockets + etc.
- ⌚ Mozilla = Firefox = Gecko



# HISTORY OF IMVU'S UI



# 2004-2007: C++ & OpenGL



# C++, GL, Win32

## Cons

- Hard to find talent

- Hard to maintain

- Long recompiles and iteration times

- Inflexible





# 2007-2009: Flash



# Flash, Flex

## Pros

- Able to iterate

- Easy animation, video

## Cons

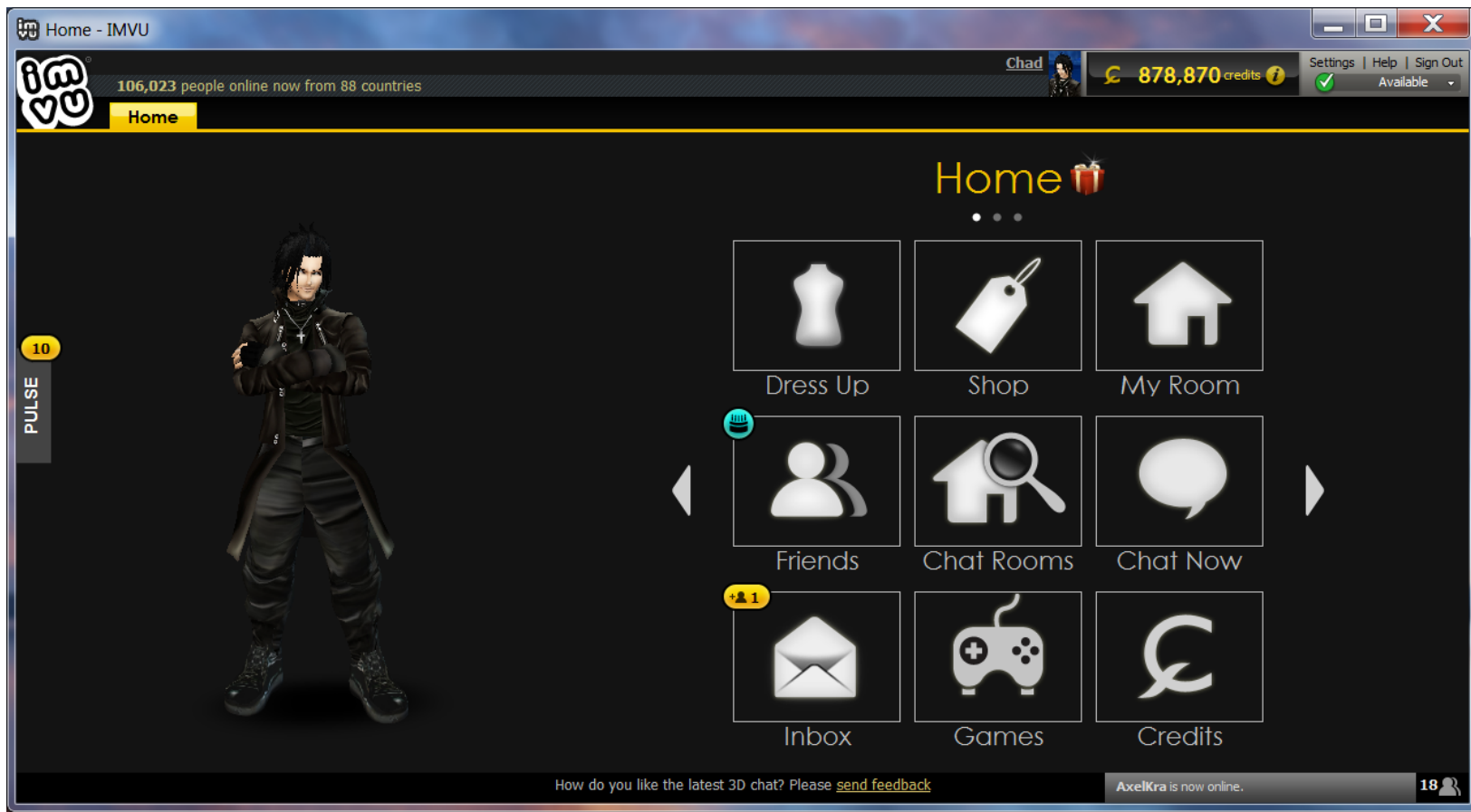
- High memory usage, address space leaks

- Loong mxmhc compile times

- Buggy



# 2009+: HTML




# Pros!

- ⌚ Very fast iteration
- ⌚ Matched intended design to the pixel
- ⌚ Performance was fantastic
- ⌚ Render to texture and composite in 3D scene




# 2009+: HTML



Chad


op AGE✓ STAFF

Male Age: 29  California, USA

✓ "Five years of IMVU"

Availability: ✓ Online


Member since: 08/30/05 Last online: 08/24/10


 web profile


✓ my interests


pencil, baR, EBM, test driven development, agile software development, Guild Wars, Pens, Foo, obscure japanese games


✓ my affinity


Relationship:  Married




Orientation:  Straight

Here for:  Other

Drinking:  Light

Smoking:  Never

 30 badges display



Info

# 2009+: HTML



# 2009+: HTML



# BENEFITS OF HTML





# Lingua Franca



# Hot Reloading, Firebug

The screenshot displays a 3D chat application interface with a grid of user avatars and names. The users shown are: littlesophie, MagdeleenAndraste, Guest\_missfantastic1, QueenSensual, Shadokotsu, TiffaniaImmortal, Vitalic, XliefreakoutX, XStaarUchihaX, ZP, 1AK, and Adrenalynn. Each user entry includes a status indicator (e.g., 'Now at: Nadindel Forest' or 'Online') and a small avatar image.

Overlaid on the bottom half of the image is the Firebug developer tool. The 'Inspect' tab is active, showing the HTML structure of the page. The selected element is a `<span>` with the class `now-at-text`, containing the text 'Now at:'. The HTML code is as follows:

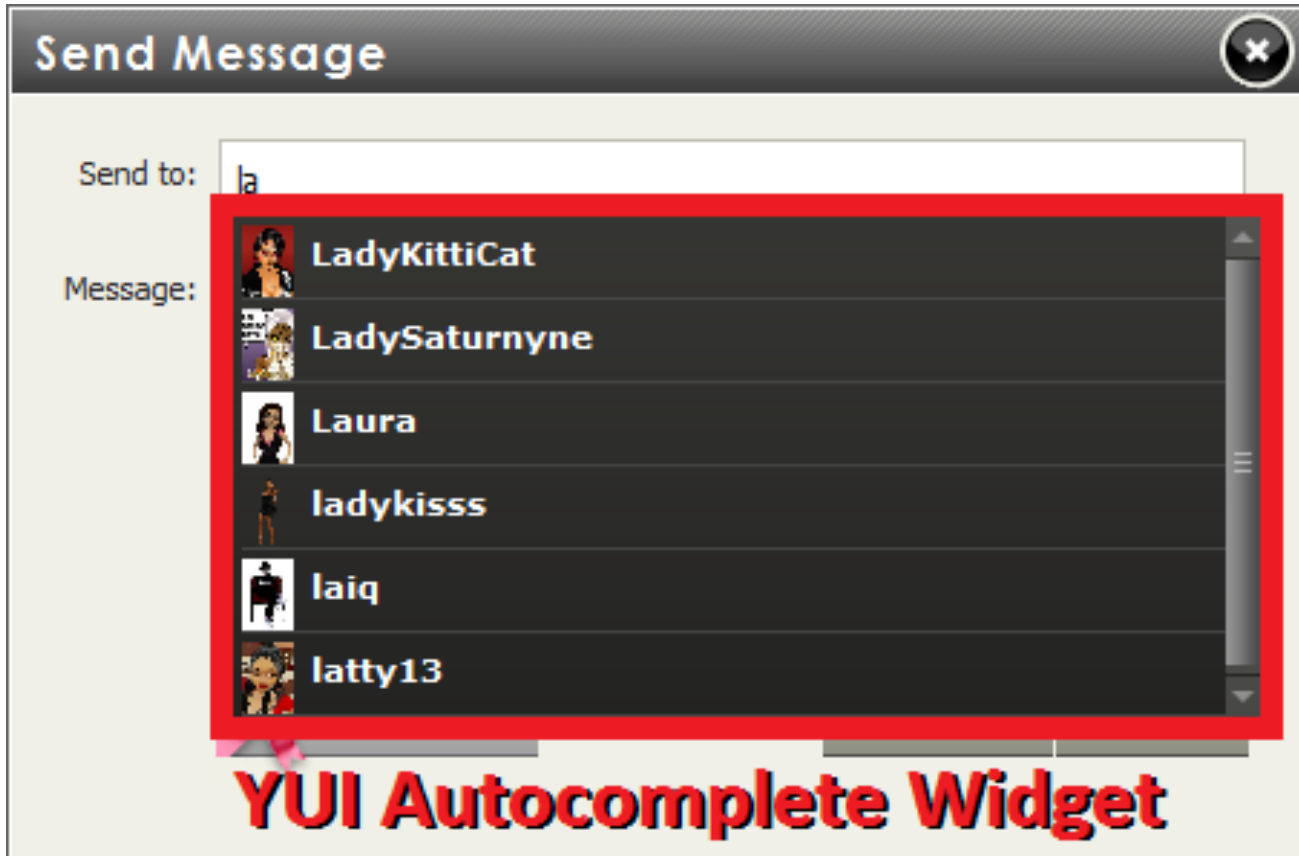
```
<div class="birthday-content">
<div class="availability">
  <span class="online-icon"/>
  <span class="location-details has-location">
    <span class="location-text">
      <span class="now-at">
        <span class="now-at-text">Now at:</span>
        <span class="location">Dark Tavern For Lost Souls</span>
      </span>
      <span class="vip-icon"/>
      <span class="ap-icon"/>
    </span>
  </div>
</div>
</div>
```

The 'Style' pane on the right shows the CSS rules applied to the selected element. It includes rules from `FriendList.css` and `div.availability`, such as `-moz-user-select: -moz-none;`, `color: #ABABAB;`, and `font-size: 93%;`.

At the bottom of the Firebug window, there is a feedback prompt: 'How do you like the latest 3D chat? Please [send feedback](#)'.


In the bottom right corner of the application window, there is a user count '14' next to a small icon.

# jQuery, YUI




# Advertising

Chat Rooms - IMVU



94,371 people online now from 88 countries

HomeChat Rooms

Guest **crashtest2**

1,000 credits

Settings | Help | Sign Out

Available

Click to edit your profile

Search...

Filters

Occupancy

- Empty Rooms
- 1-3 People
- 4-6 People
- 7-9 People


[VIP only rooms](#)

Recently Visited

My Favorites

Showing page 1 of 7815

12345>




**In Your DREAM Club**  
by eddhot99

this place is for u to come relax and have fun.thier r lots of activities that u can make:dance, swim, play(on the broom stick, and much more. feel free to do wt ever u want but hitting and fighting its a romantic room come u and ur bf or gf and relax.

7 / 10

InfoGo




**Thailand Pond**  
by EstherGlamorous

Welcom every body to Thailand Jungle. This room is Thai community, Pond side and also club house...we also have music station which is Ipod thing you have to step on it to get the radio chanel...The owner is EstherGlamorous. plz be respect to each other n

7 / 10

InfoGo




**Sun Set Beach**  
by ZacZombie

Want to have a party, or have fun with your gf/bf. Just come to this room.But never forget your swimming outfit.LOL...

8 / 10

InfoGo




**Night Pool Party Wow!!**  
by lilil

How do you like the latest 3D chat? Please [send feedback](#)


**THE TOSHIBA SATELLITE® A660.**

\$360 total savings after money off and free 8GB memory upgrade. Starting at \$999.



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# DEMO



# PERFORMANCE?



# If your browser can handle this...



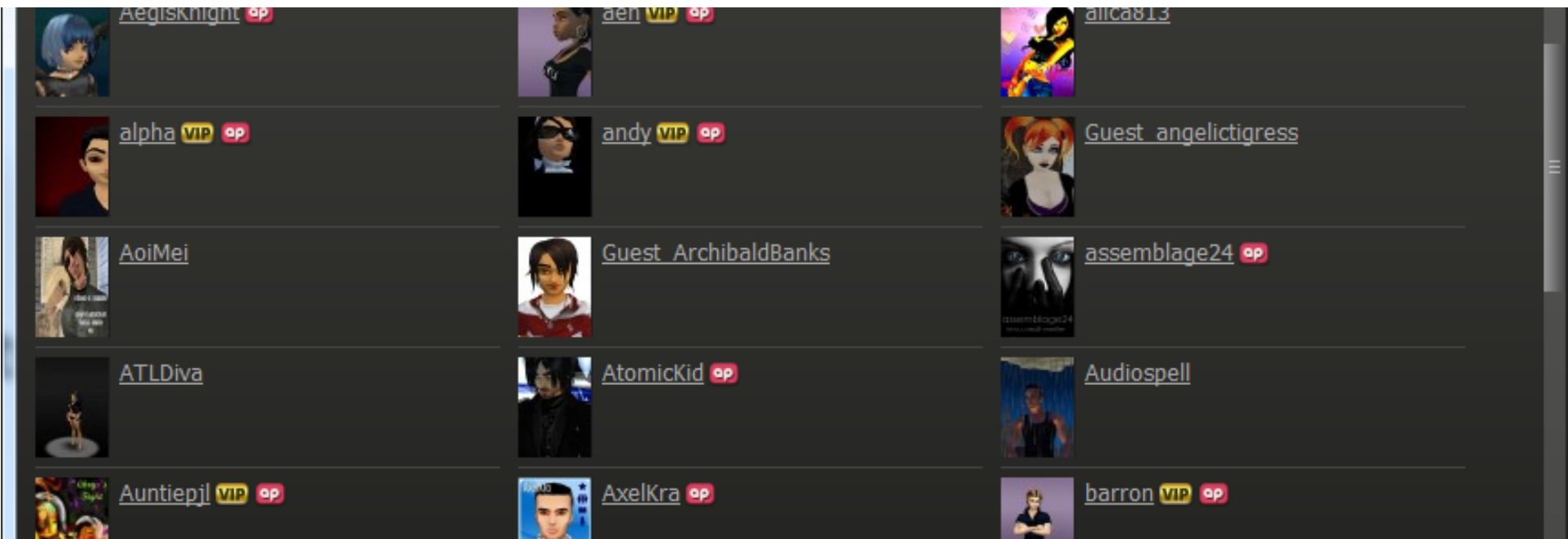
# Performance

- ⌚ Not a bottleneck for us
- ⌚ Even 3D overlays!
- ⌚ <1 MB per Gecko document loaded  
1000s of friends, inventory items



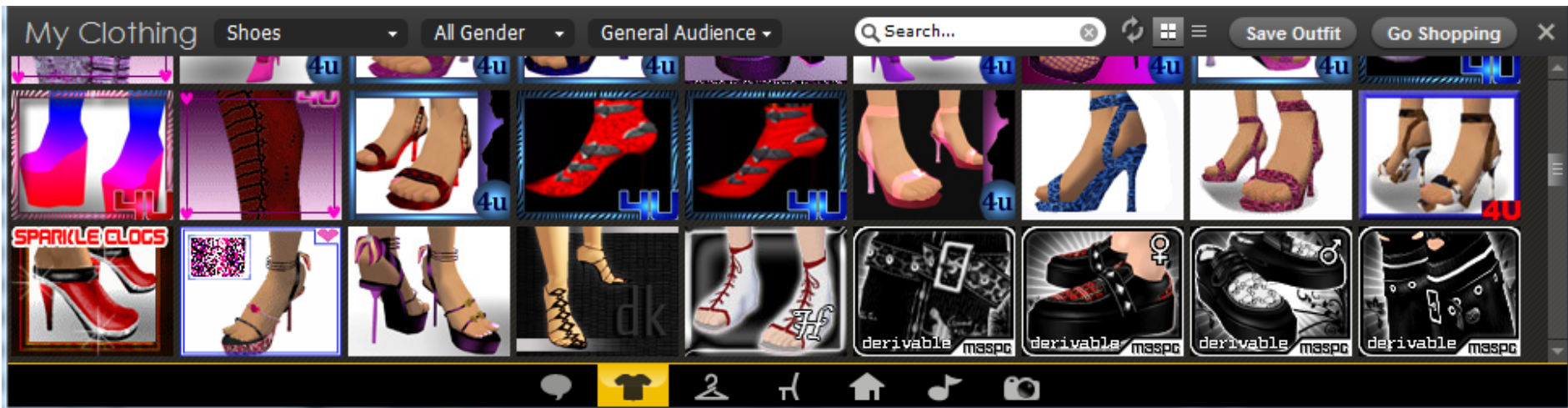


# Performance (Friends)



Some DOM ops are  $O(n)$ , use b-tree

# Performance (Inventory)



# Today's Drawbacks

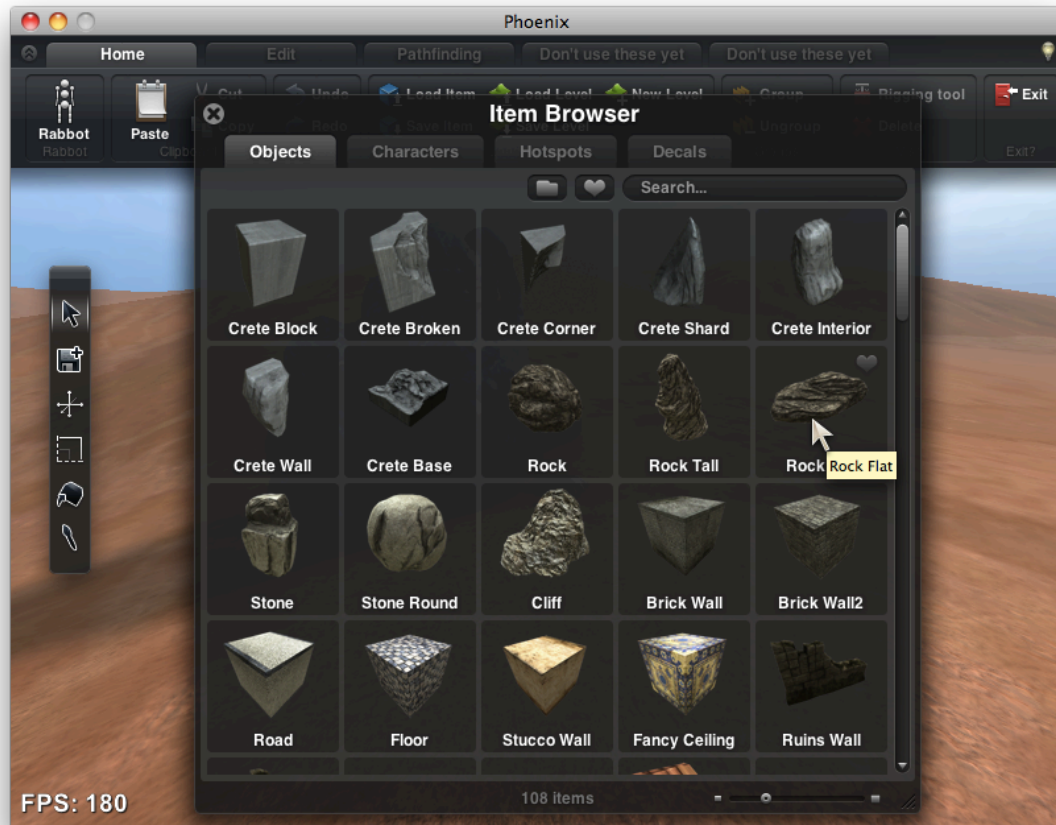
- ⌚ Elaborate animation still easier in Flash than SVG/Canvas/JS
- ⌚ 3D: WebGL not prime time yet
- ⌚ Tracing JITs hungrier than Lua/C++



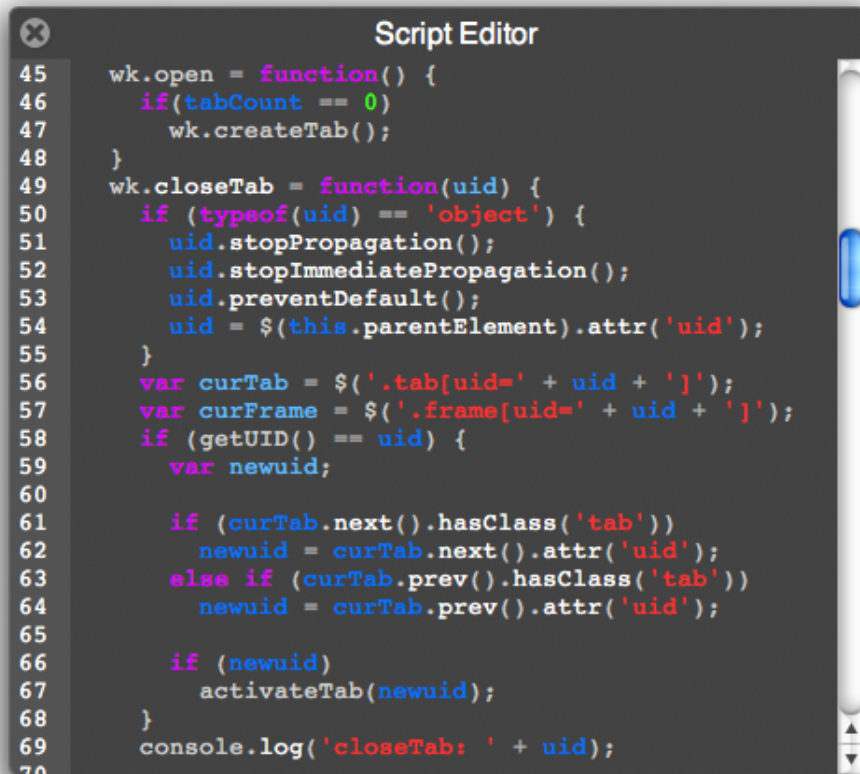
# WHO ELSE USES HTML FOR UI?



# Wolfire – Overgrowth



# Wolfire – Overgrowth (con't)



```
45 wk.open = function() {
46     if(tabCount == 0)
47         wk.createTab();
48 }
49 wk.closeTab = function(uid) {
50     if (typeof(uid) == 'object') {
51         uid.stopPropagation();
52         uid.stopImmediatePropagation();
53         uid.preventDefault();
54         uid = $(this.parentElement).attr('uid');
55     }
56     var curTab = $('.tab[uid=' + uid + ']');
57     var curFrame = $('.frame[uid=' + uid + ']');
58     if (getUID() == uid) {
59         var newuid;
60
61         if (curTab.next().hasClass('tab'))
62             newuid = curTab.next().attr('uid');
63         else if (curTab.prev().hasClass('tab'))
64             newuid = curTab.prev().attr('uid');
65
66         if (newuid)
67             activateTab(newuid);
68     }
69     console.log('closeTab: ' + uid);
70 }
```

# Electronic Arts – Skate 3



# Netflix on PlayStation 3





# In-game Browsers

- ⌘ Second Life
- ⌘ CCP – EVE Online
- ⌘ Funcom – Anarchy Online, Age of Conan
- ⌘ ArenaNet – Guild Wars 2



# Getting Started

- ⌚ WebKit <http://webkit.org/> vs. Gecko <https://developer.mozilla.org/en/Gecko>
- ⌚ We chose Gecko, most use WebKit (EA's PS3 port: <http://gpl.ea.com/skate3.html>)
- ⌚ Leverage entire stack: stream pixels from HTTP into texture



# Wrappers

- ③ <http://ubrowser.com/>
- ③ <http://wiki.secondlife.com/wiki/LIMozLib>
- ③ <http://wiki.secondlife.com/wiki/LLQtWebKit>
- ③ <http://www.khrona.com/products/awesomium/>
- ③ <http://berkelium.org/>



# Recap

- ⌚ HTML and web technologies are advancing quickly
- ⌚ Already suitable for in-game UIs
- ⌚ Rapid development and iteration
- ⌚ Worked for us, may work for you!



# Questions?

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<http://engineering.imvu.com>

We're hiring!

