Responsive Games 2.0

aranja

Games are the reason
I became a programmer

A long time ago in a galaxy far, far away....

"More than a publishing phenomenon, 'Dummies' is a sign of the times." — The New York Times

NEW!

7 MILLION DUMMIES BOOKS IN PRINT

QBASIC PROGRAMMING FOR DUMMIES™

A Reference for the Rest of Us!™

by Douglas Hergert

The Fun and Easy Way to Learn QBasic Programming

Your Guided Tour of the QBasic Environment & Language

How to Write Programs — Explained in Plain English

Covers Versions of QBasic Shipped with DOS 5.0 & On

IDG BOOKS

colors.bas

```
SUB rainbow(x,y, c, radius)
    ' Draws a circular rainbow. Our rainbow is a circle with thickness,
    ' where color is defined by the angle (determined using arctangent).
    ' In order to draw a thick circle, we simply draw a box and ignore
    ' those pixels that are not part of the arc. The selection is done
    ' by measuring the distance from the origo. Only pixels that fall
    ' within the certain range are accepted.
    minr = radius * 0.6
    minr2 = minr*minr        ' minimum radius ^ 2
    maxr2 = radius*radius    ' maximum radius ^ 2
    pi! = 3.14159!
    xradius = radius*4/3      ' aspect ratio correction
    FOR py=-radius TO radius
        py2 = py*py
        FOR px=-xradius TO xradius
            pxr! = px*3/4
            r = pxr!*pxr! + py2
            IF r >= minr2 AND r <= maxr2 THEN
                ' angle! = ATAN2(py, px) -- only QBasic does not have ATAN2.
                IF px = 0 THEN angle! = SGN(py) * pi!*  0.5 ELSE angle! = ATN(py / pxr
                IF px < 0 THEN angle! = angle! + pi!
                IF py < 0 THEN angle! = angle! + pi! + pi!
                ' Convert angle into a color and place the pixel.
                cc! = angle! * 12 / pi! + 6
                cc = INT(cc! + RND) ' Quantize with random dithering
                PSET(x+px, y+py), c + (cc + 24) MOD 24
            END IF
        NEXT
    NEXT
END SUB

SUB Speak(x,y, e$, f$) STATIC
    IF f=0 THEN f = FREEFILE: OPEN "VOX" AS f
    IOCTL f, e$ + "~" + f$ + "$"
    ' Speak text. This is something I added to my copy of DOSBox.
    ' Feel free to comment out those two lines if it does not work for you.
    IF y>=200 THEN EXIT SUB
END SUB
END SUB
```
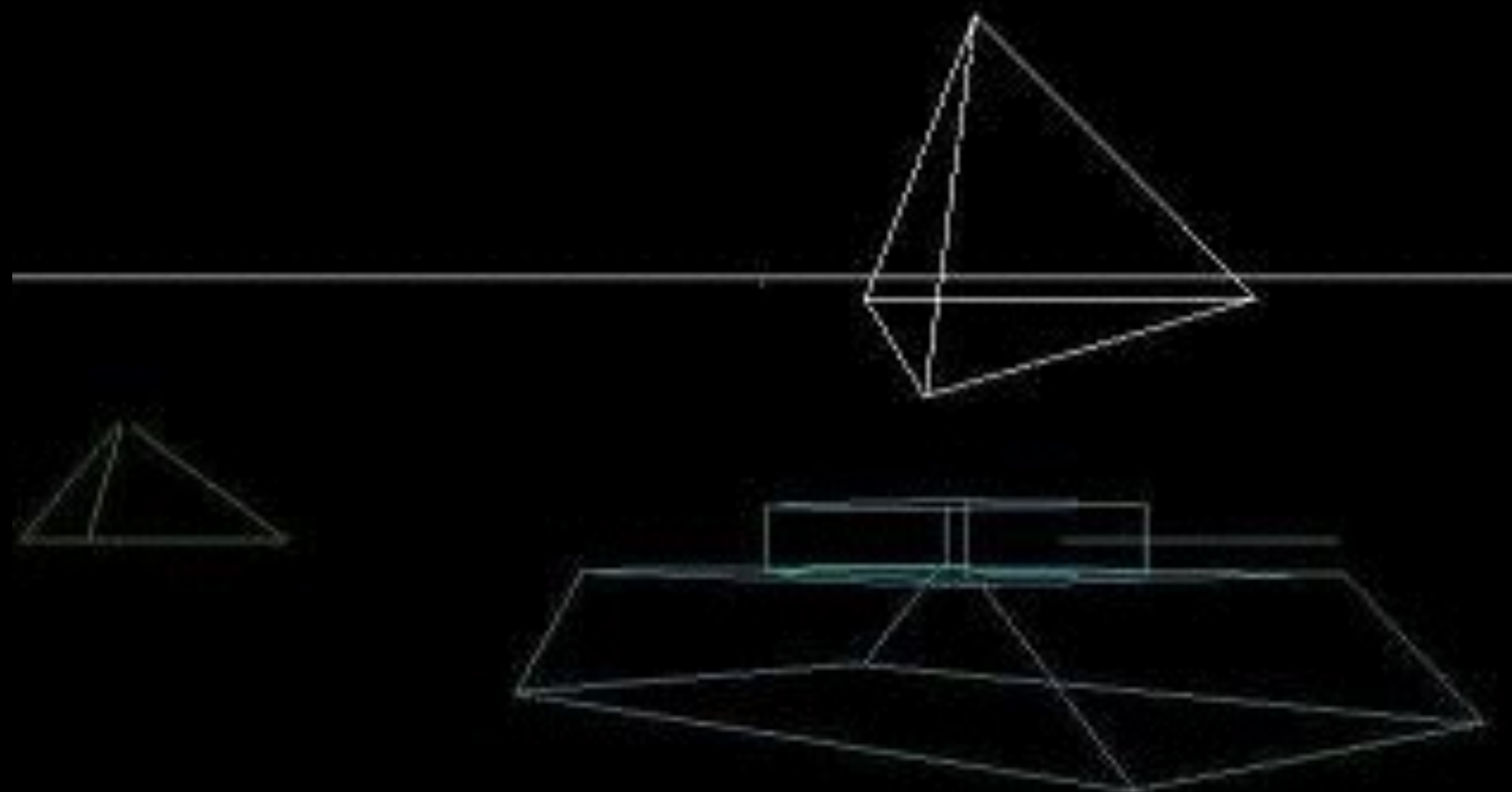
Me

Minions

Now I Make Games For Google

Why Bother?

aranja

Touches All Disciplines

Physics

Math

Graphics

Sound

Usability

Design

Distributed Systems

Security

Deal With Limits

Memory   CPU   GPU

Why Web?

aranja

"Writing Web Games Makes You a Better Web Programmer"
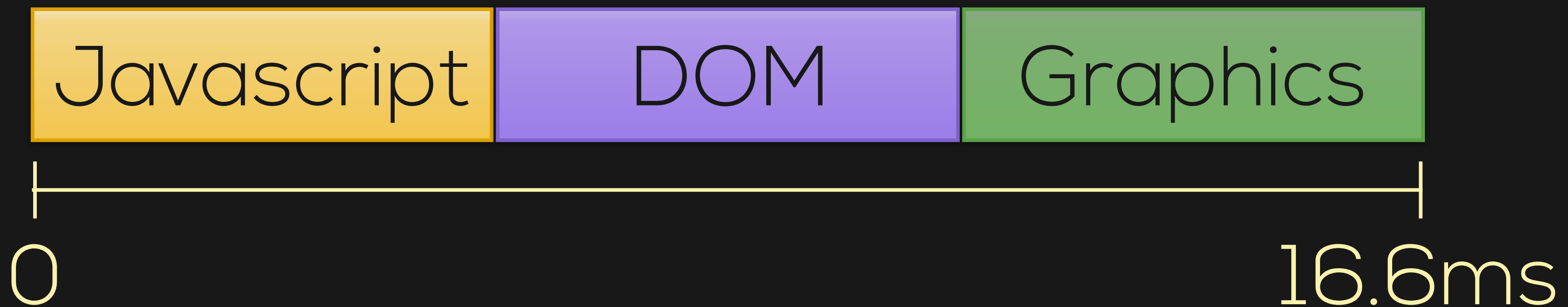
- Eirikur's ~~Law Fact Theory~~ Quote

Smoother Animations
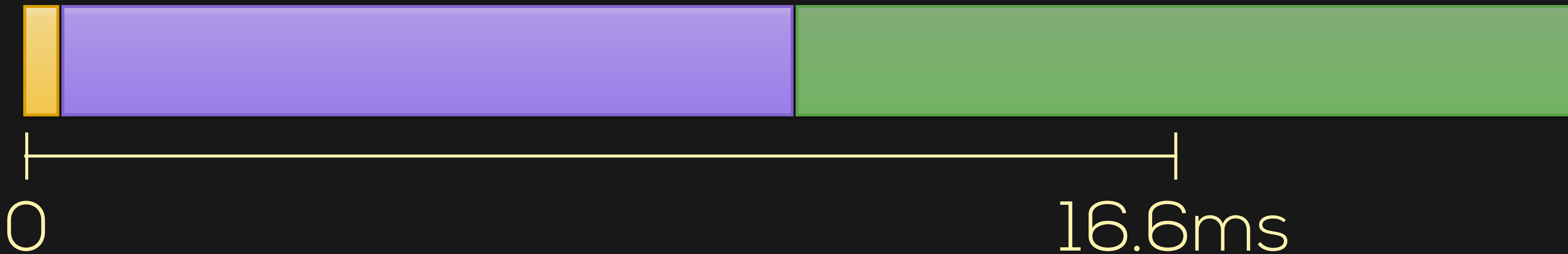
For 60 FPS
You Only Have 16ms
For Everything

Frame Budget
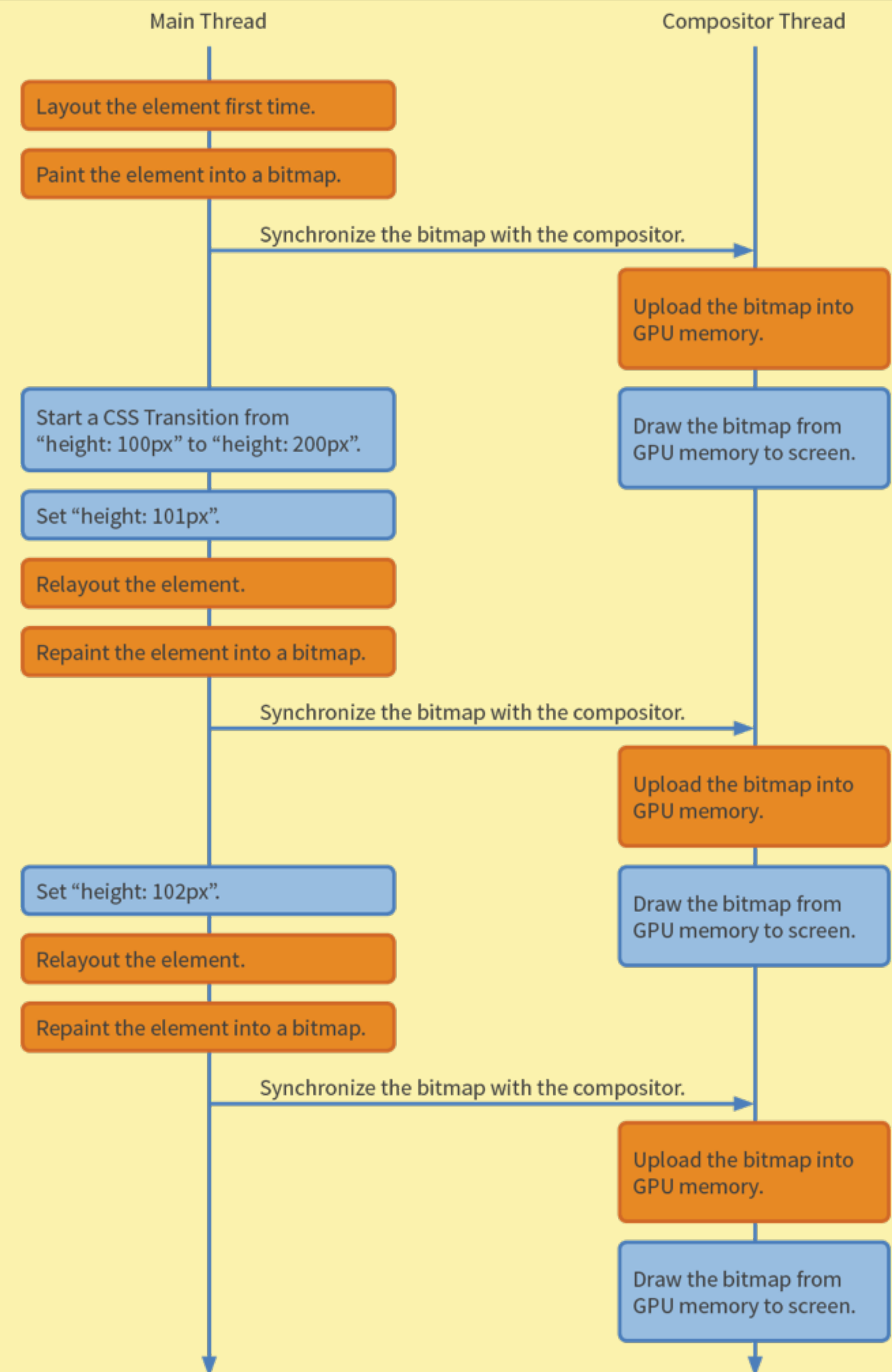
More Like This
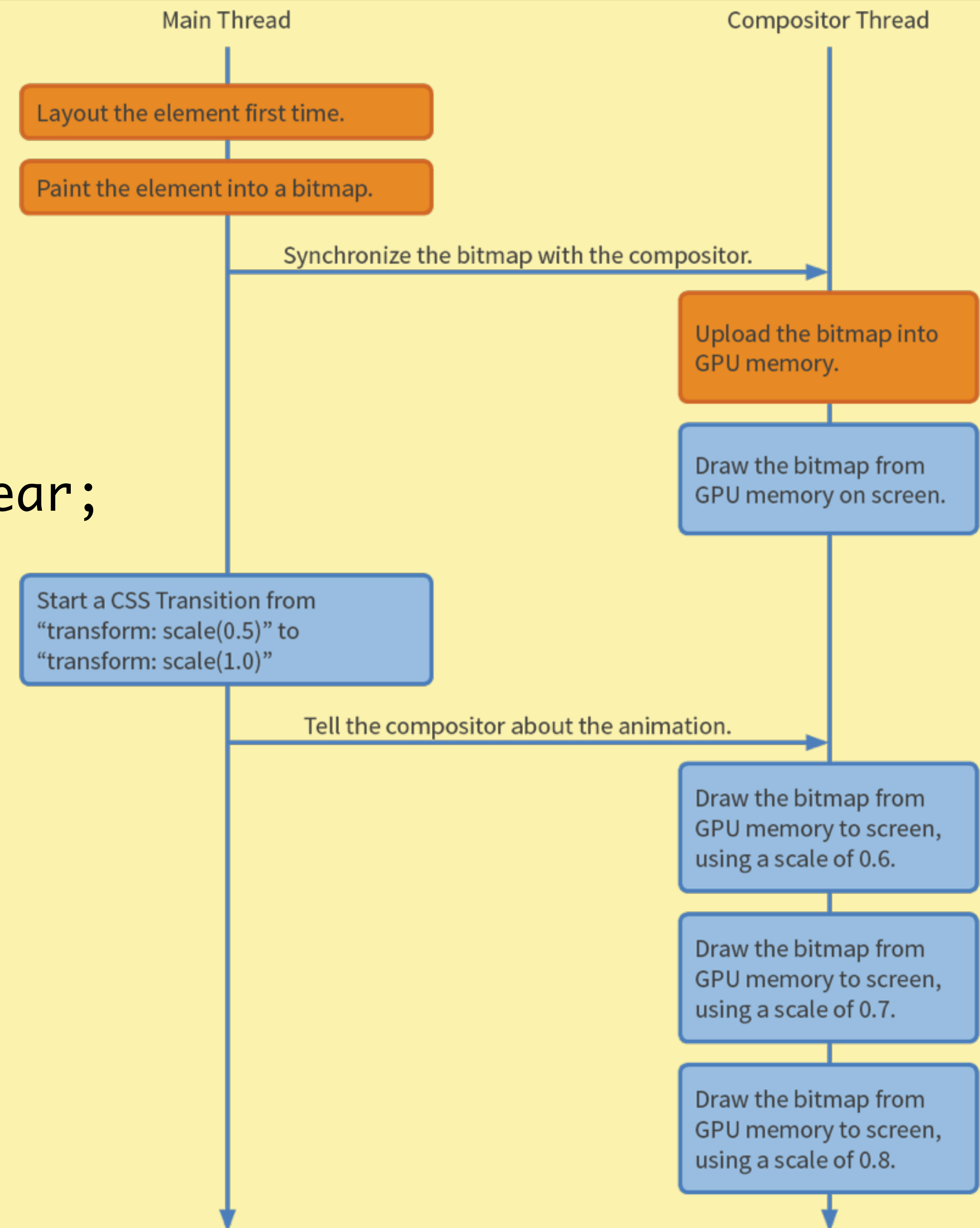
Get To The GPU

Some CSS

Canvas

WebGL

The Compositor

a short <aside>

```
div {
    height: 100px;
    transition: height 1s linear;
}

div:hover {
    height: 200px;
}
```

Main Thread

- Layout the element first time.
- Paint the element into a bitmap.
- Synchronize the bitmap with the compositor.
- Start a CSS Transition from "height: 100px" to "height: 200px".
- Set "height: 101px".
- Relayout the element.
- Repaint the element into a bitmap.
- Synchronize the bitmap with the compositor.
- Set "height: 102px".
- Relayout the element.
- Repaint the element into a bitmap.
- Synchronize the bitmap with the compositor.

Compositor Thread

- Upload the bitmap into GPU memory.
- Draw the bitmap from GPU memory to screen.
- Upload the bitmap into GPU memory.
- Draw the bitmap from GPU memory to screen.
- Upload the bitmap into GPU memory.
- Draw the bitmap from GPU memory to screen.

</aside>

CSS On The GPU

Triggers

3D Transform

Transition

Animation

Styles

Transform

Opacity

Filters (depends)

That's Boring

CSS is so 2005

When caniuse.com 3D?

wOOt!!!

WebGL - 3D Canvas graphics 📄 - OTHER

Method of generating dynamic 3D graphics using JavaScript, accelerated through hardware
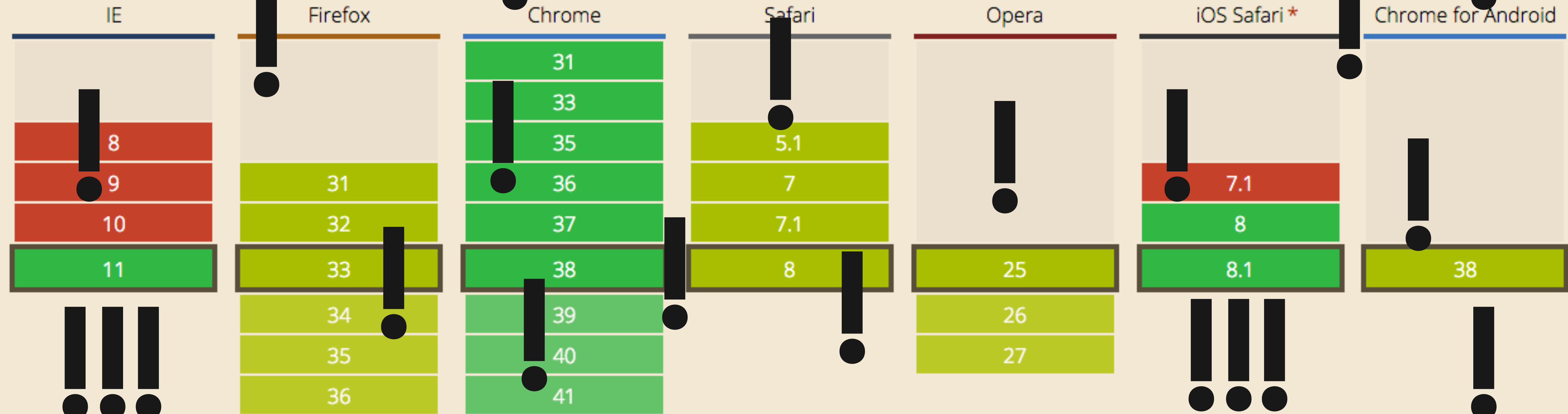
| Global | 48.?7% + 26.37% = 74.64% |
| Iceland | 61.?7% + 28.94% = 90.71% |

Current aligned | Usage relative | Show all

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Chrome for Android
		31				
		33				
8		35	5.1			
9	31	36	7		7.1	
10	32	37	7.1		8	
11	33	38	8	25	8.1	38
	34	39		26		
	35	40		27		
	36	41				

The Time Is Now

aranja

Standards are Here

Libraries are Here

Matter.js	Physics
Pixi.js	2D
BabylonJS	3D
WS	Multiplayer

Engines are Coming

Let's Make Games

aranja

Write Once

Run On Windows, Mac and Linux
And Tablets
And Mobile
And Future Platforms