OPEN
WORLD
FORUM

THINKCODE
EXPERIMENT

WEIO

Web of Things Platform

Uros Petrevski & Drasko Draskovic

nodesign.net

Want to make Internet of Things?

2015

25 billion connected objects

2020

50 billion connected objects

but...

How to innovate?
How to create NéoObjects?

how to

LEARN

INNOVATE

PRODUCE

?

usages, poetry

Today we have one user friendly tool that comes from Italy

ARDUINO

is great to learn basics but...

We need versatile and friendly platform that can be easily connected with Web services or offer new ones. Connecting objects must be as easy as “hello world“

Today we have miniature and cheap computer coming from UK

Raspberry Pi

is great real computer but...

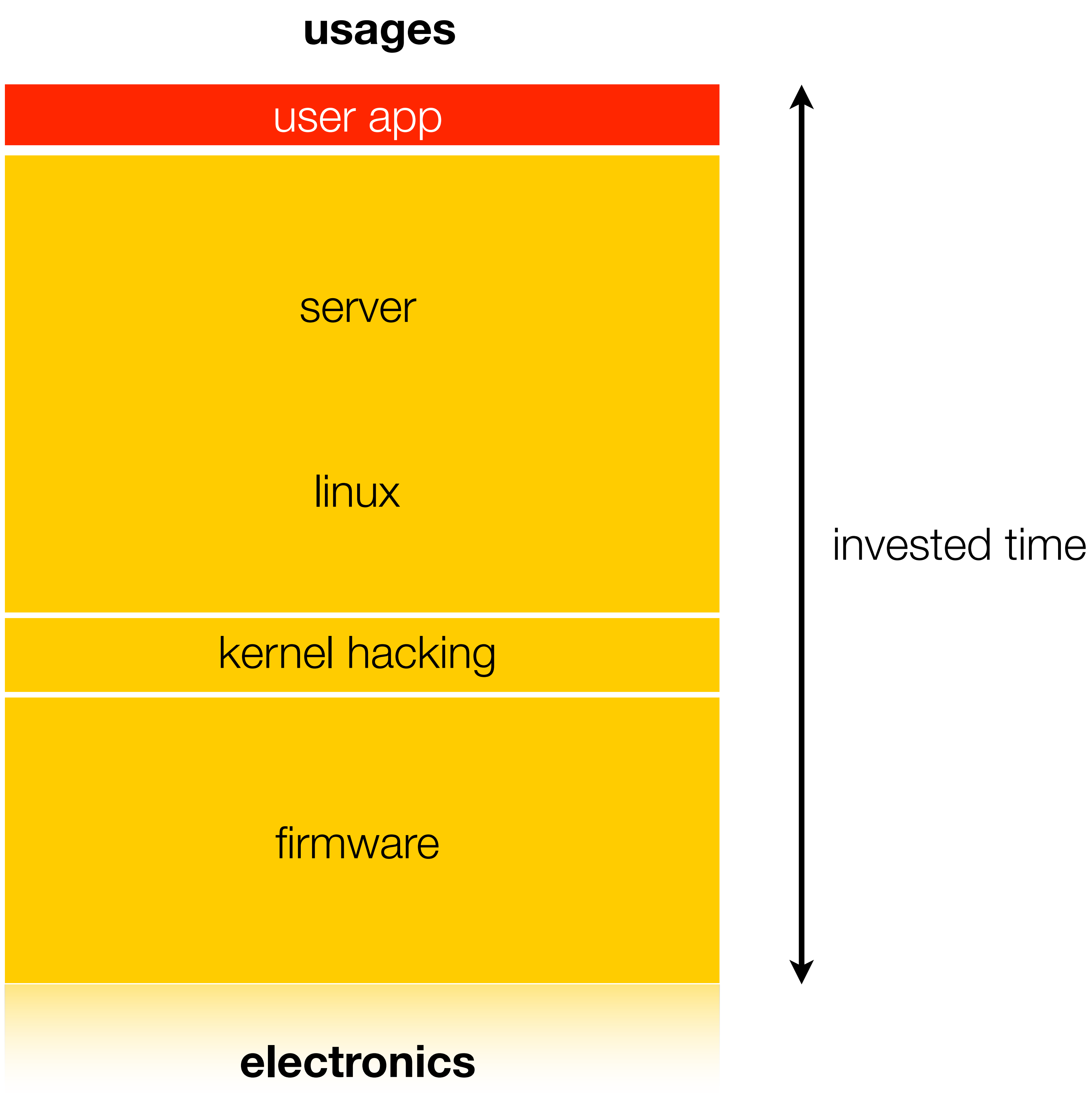
NéoObjects need dedicated interfaces and hardware. Computers are too generalist platform for them. Also, they need wireless connectivity.

How we are making NéoObjects today?

Think USAGE
Think Object

MAKE!

but...



usages

user app

server

linux

kernel hacking

firmware

electronics

invested time

Hey, do you know that firmware hacking, crosscompiling, and Linux patching are not for kids ;-)

but that's long way to go...

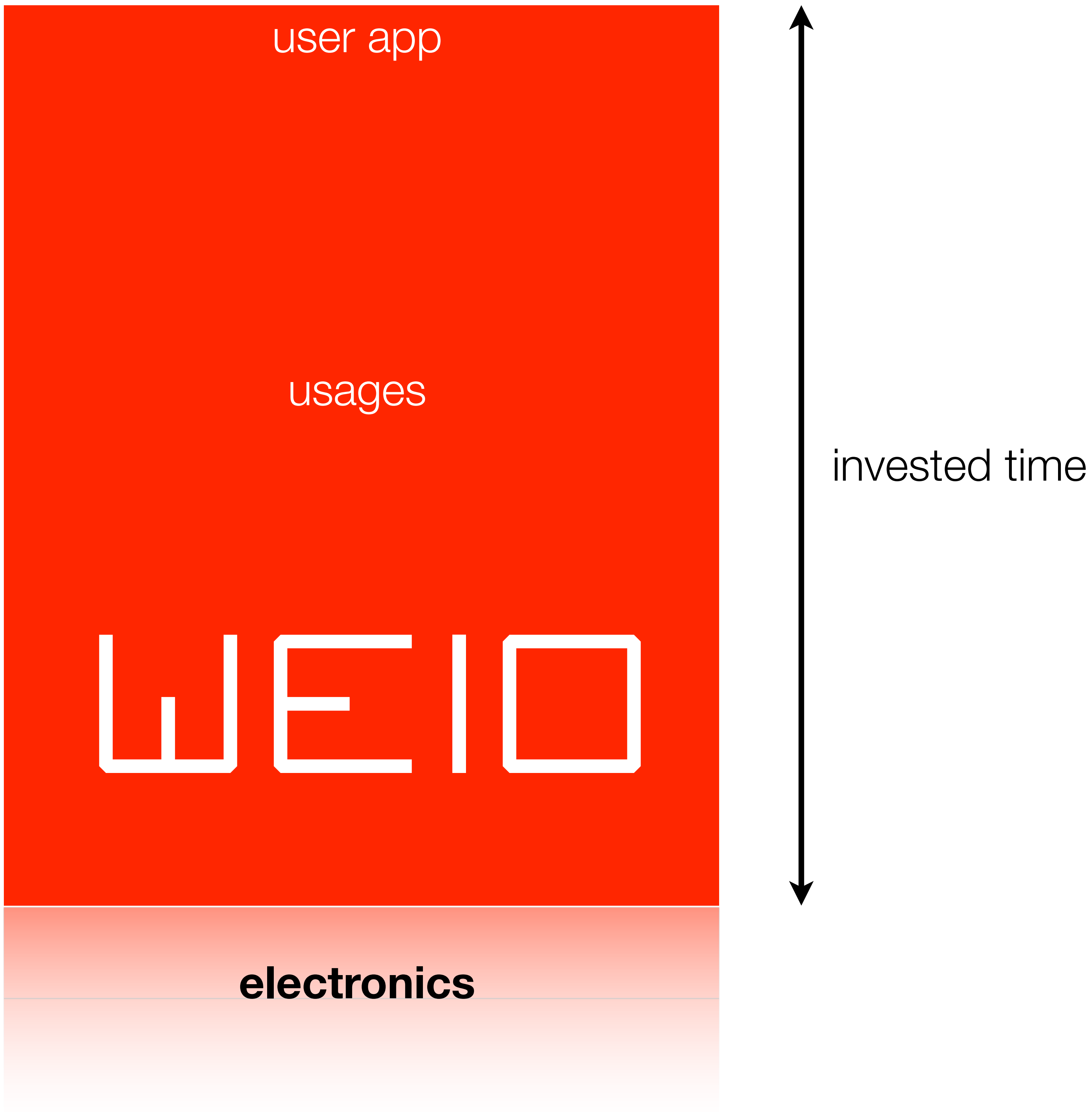
WHO WILL LEARN ALL OF THIS?

here we go!

WEIO

We need new friendly and desirable interfaces that will connect Web directly to electronics. Thus people will think more USAGE than how to do something

Web language



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We need new graphical environment that will offer possibility to make rich user applications and new graphical programming tools and...

...it must be zero installation, super easy configuration and cross platform (desktop & mobile) and...

... we must be able to possess our development tools at any time...

And it must be Open Source!

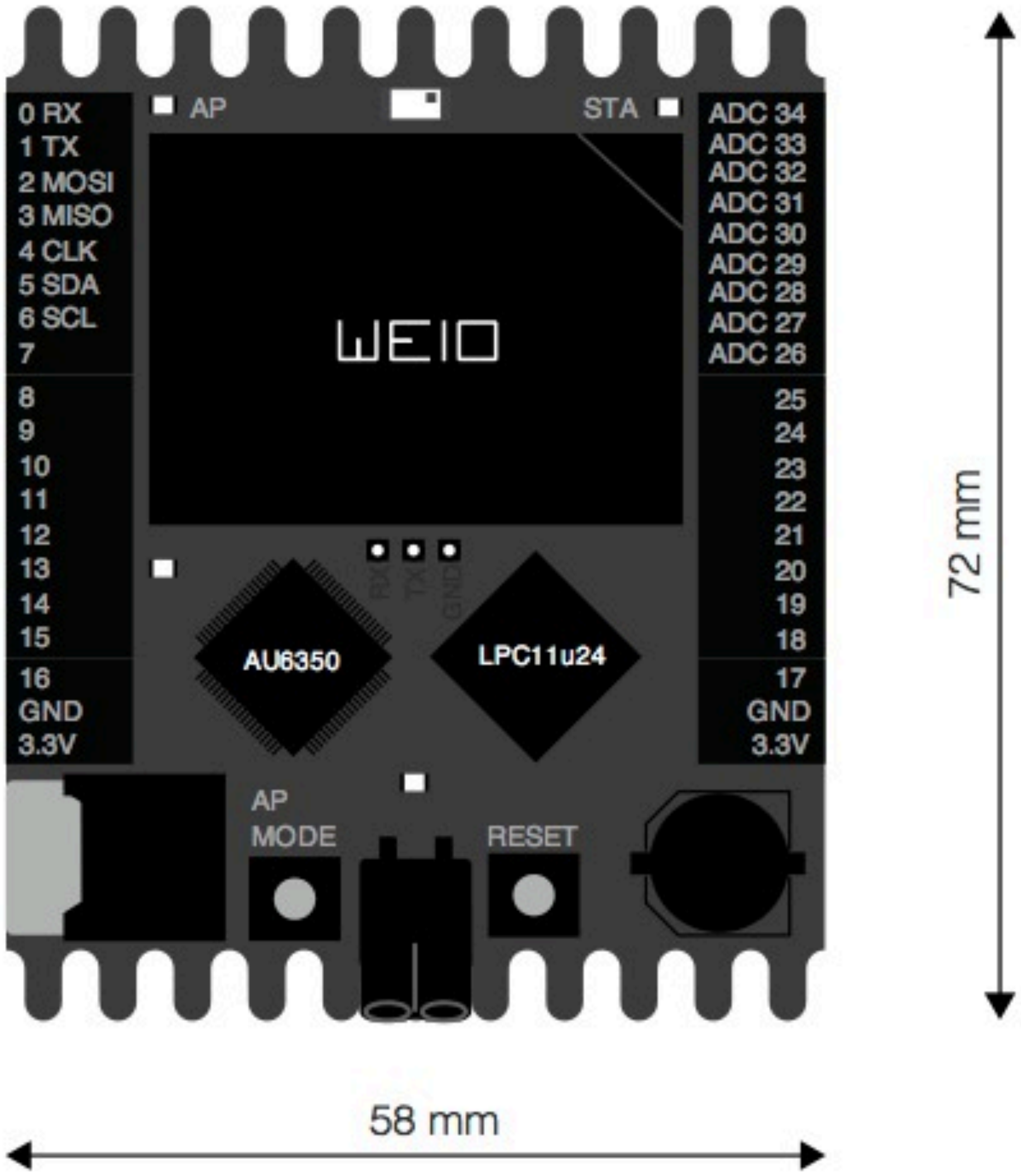
... and innovative USAGES will follow with beautiful interfaces once you have developed that environment that environment is called Web.

What is WEIO

Prototype, produce and learn to make NéoObjects only using the language of the Web

How many of you know to make simple Web site?

How many of you know to program hardware?



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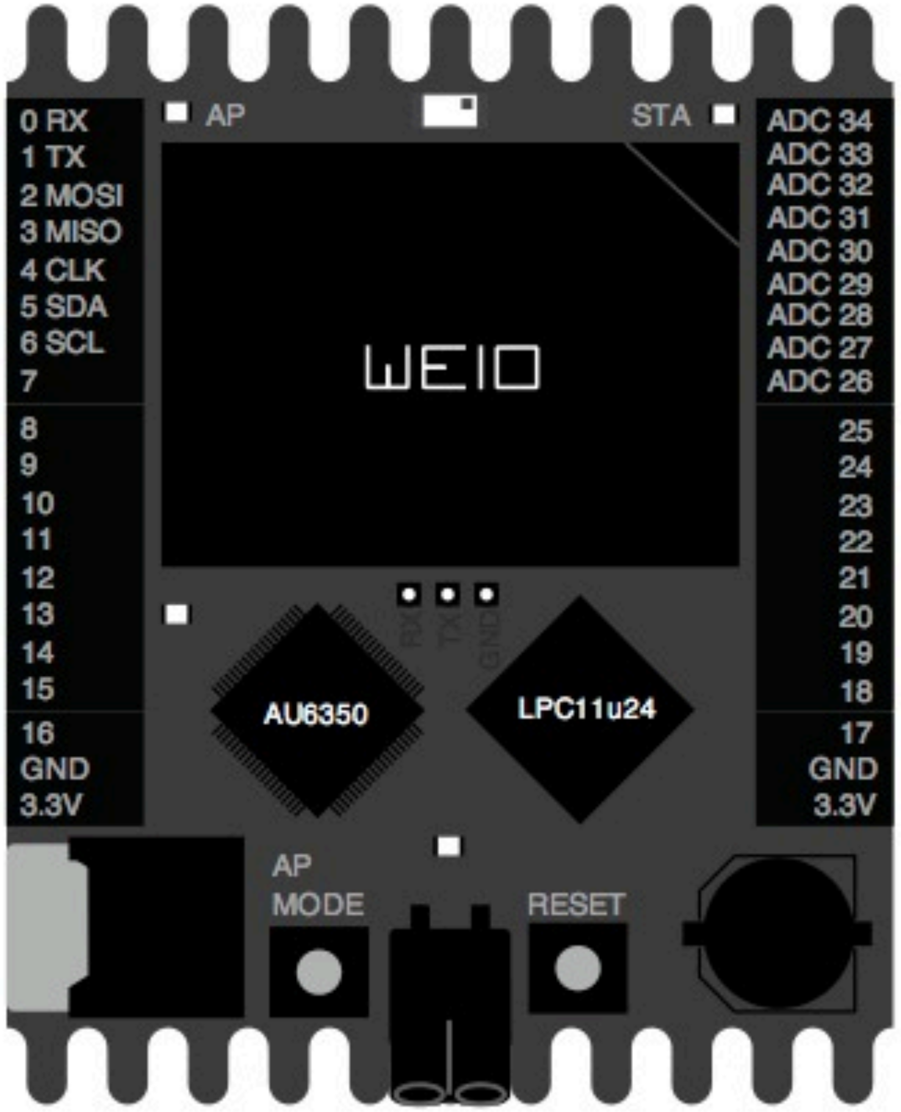
All in one



Plug & Web
Web & Objects
Wireless & Less wires

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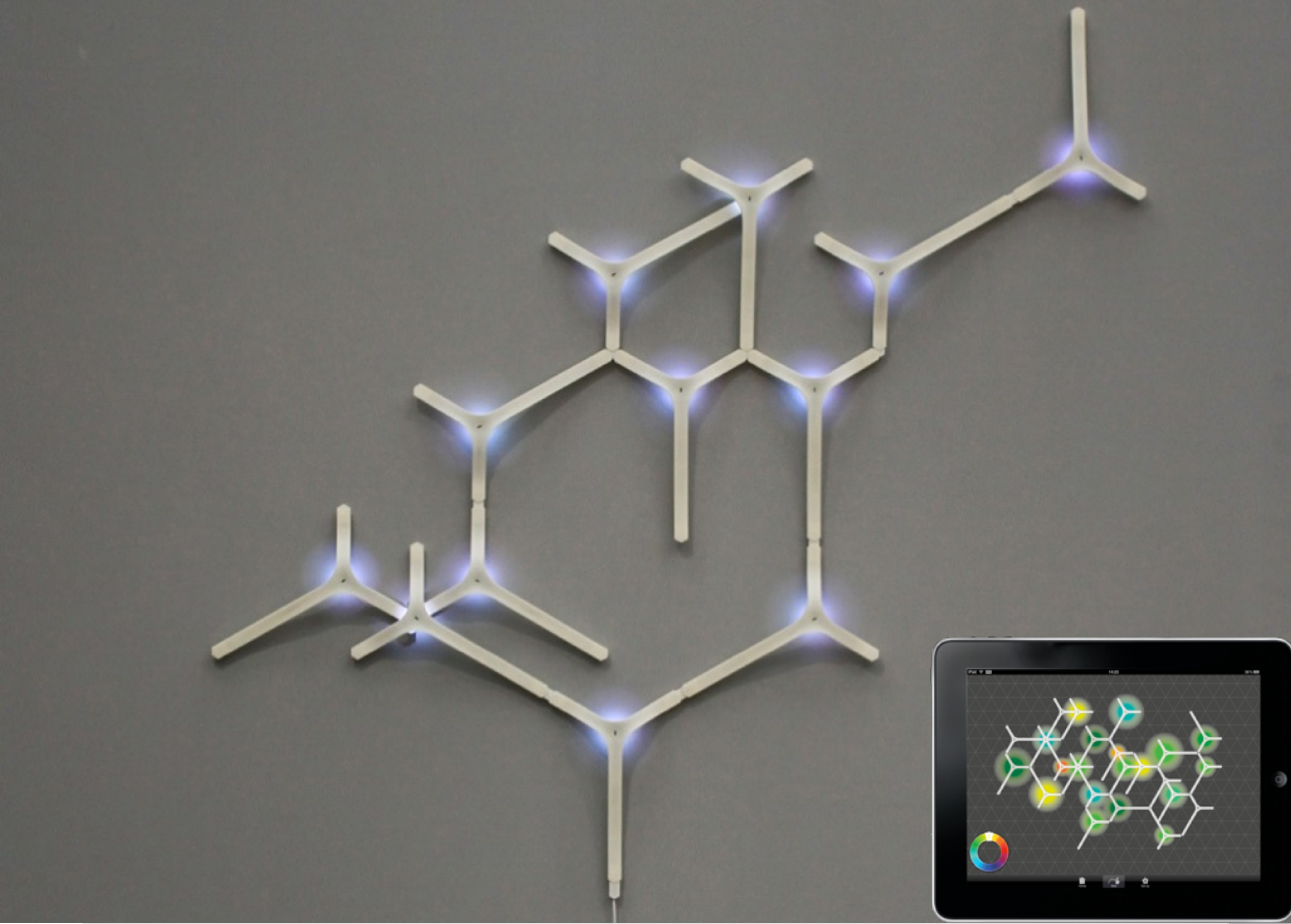
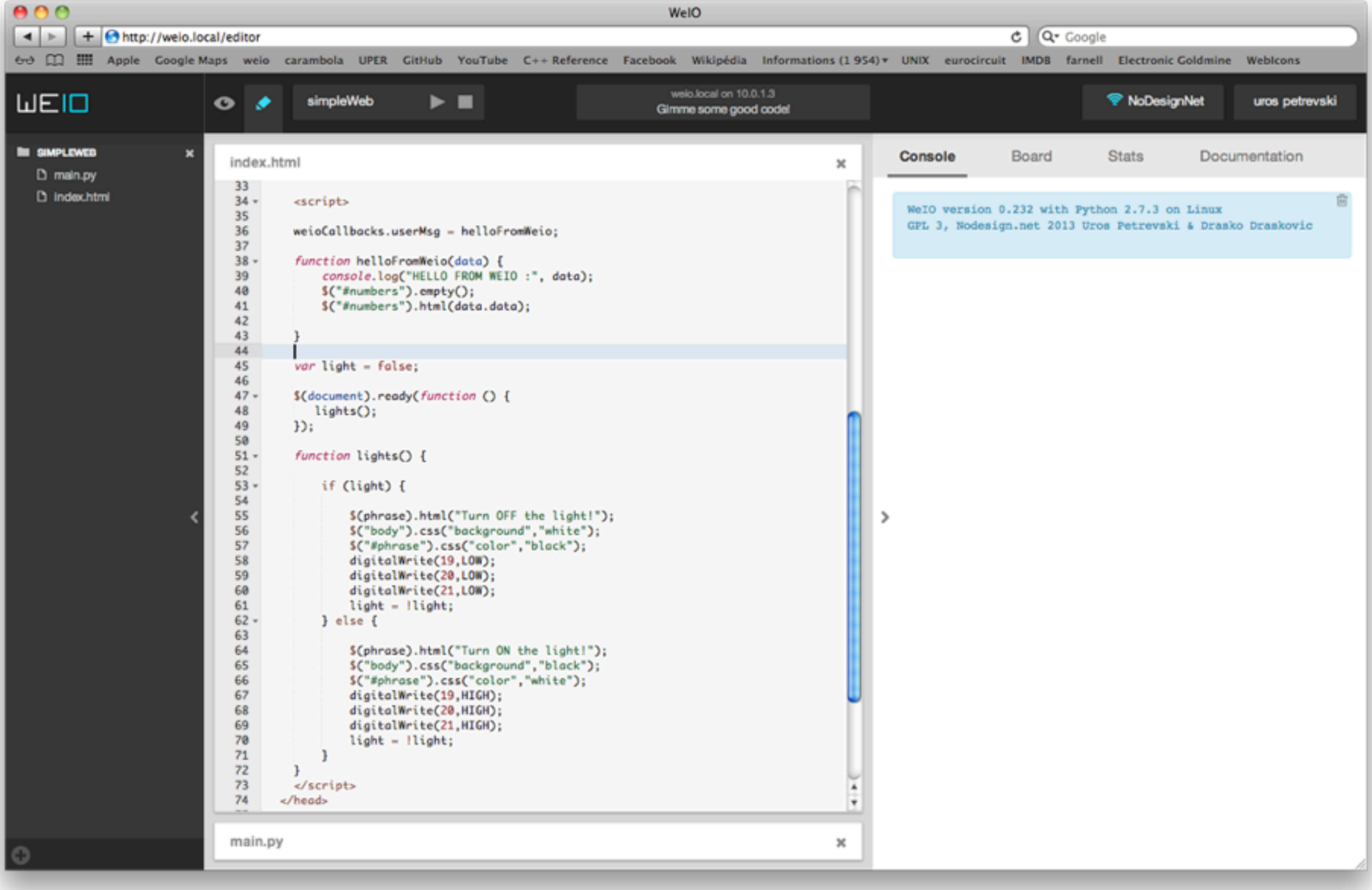
WeIO makes that each object has it's own web site, more precisely has it's own WebApp

Finally programing connected objects means making WebApps for your objects

What we make with WeIO at nodesign.net



How WeIO programming environment looks like?



index.html

```
    <script>

    weioCallbacks.userMsg = helloFromWeio;

    function helloFromWeio(data) {
        console.log("HELLO FROM WEIO :", data);
        $("#numbers").empty();
        $("#numbers").html(data.data);

    }

    var light = false;

    $(document).ready(function () {
       lights();
    });

    function lights() {

        if (light) {

            $(phrase).html("Turn OFF the light!");
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        }
    }
    </script>
  </head>
```

main.py

```
WeIO version 0.232 with Python 2.7.3 on Linux
GPL 3, Nodesign.net 2013 Uros Petrevski & Drasko Draskovic
```

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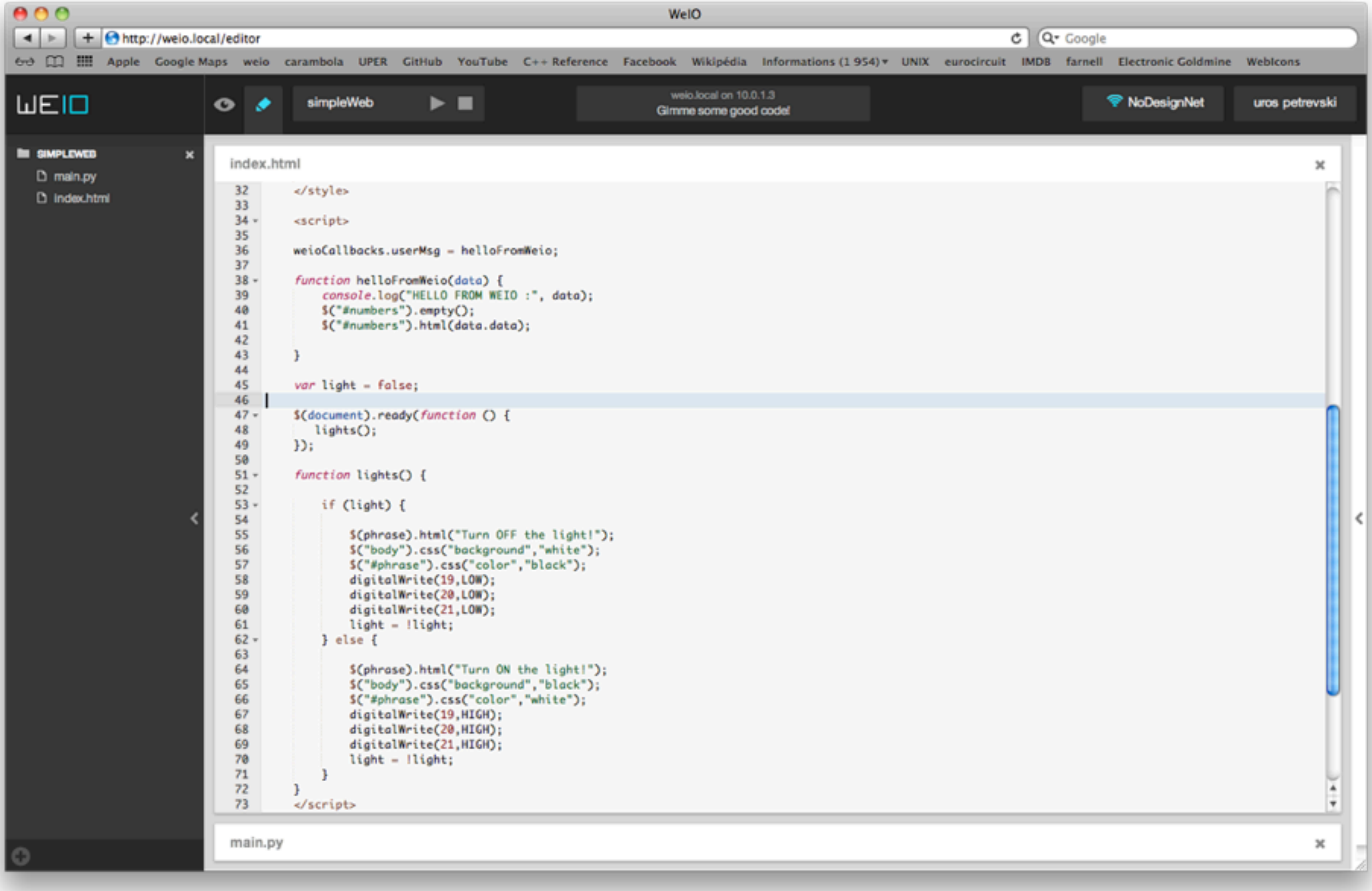

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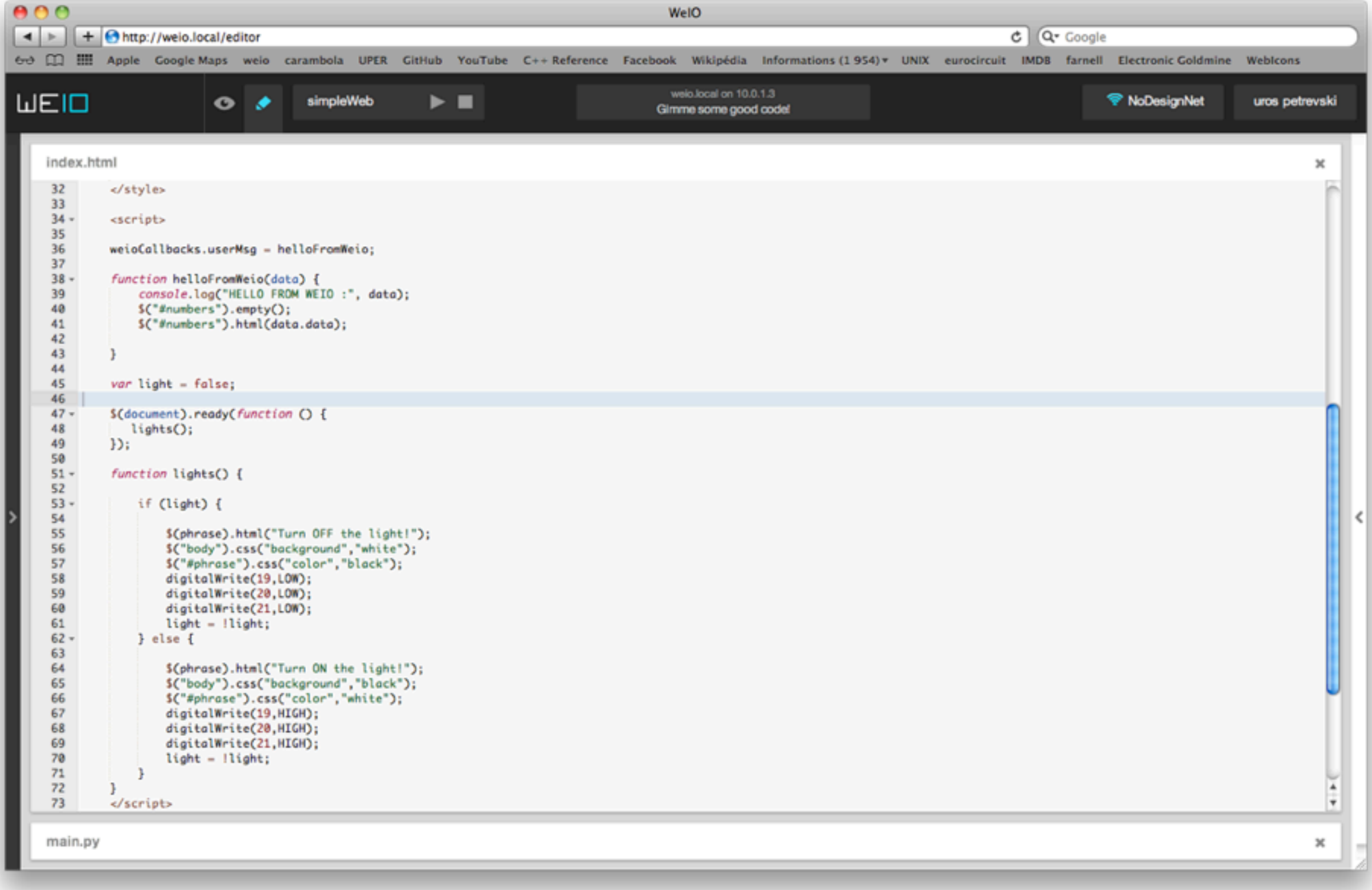
WeIO
http://weio.local/editor
Google
Apple Google Maps weio carambola UPER GitHub YouTube C++ Reference Facebook Wikipédia Informations (1 954) UNIX eurocircuit IMDB farnell Electronic Goldmine WebIcons
WEIO
simpleWeb
weio.local on 10.0.1.3
Gimme some good code!
NoDesignNet
uros petrevski
index.html
main.py

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</style>

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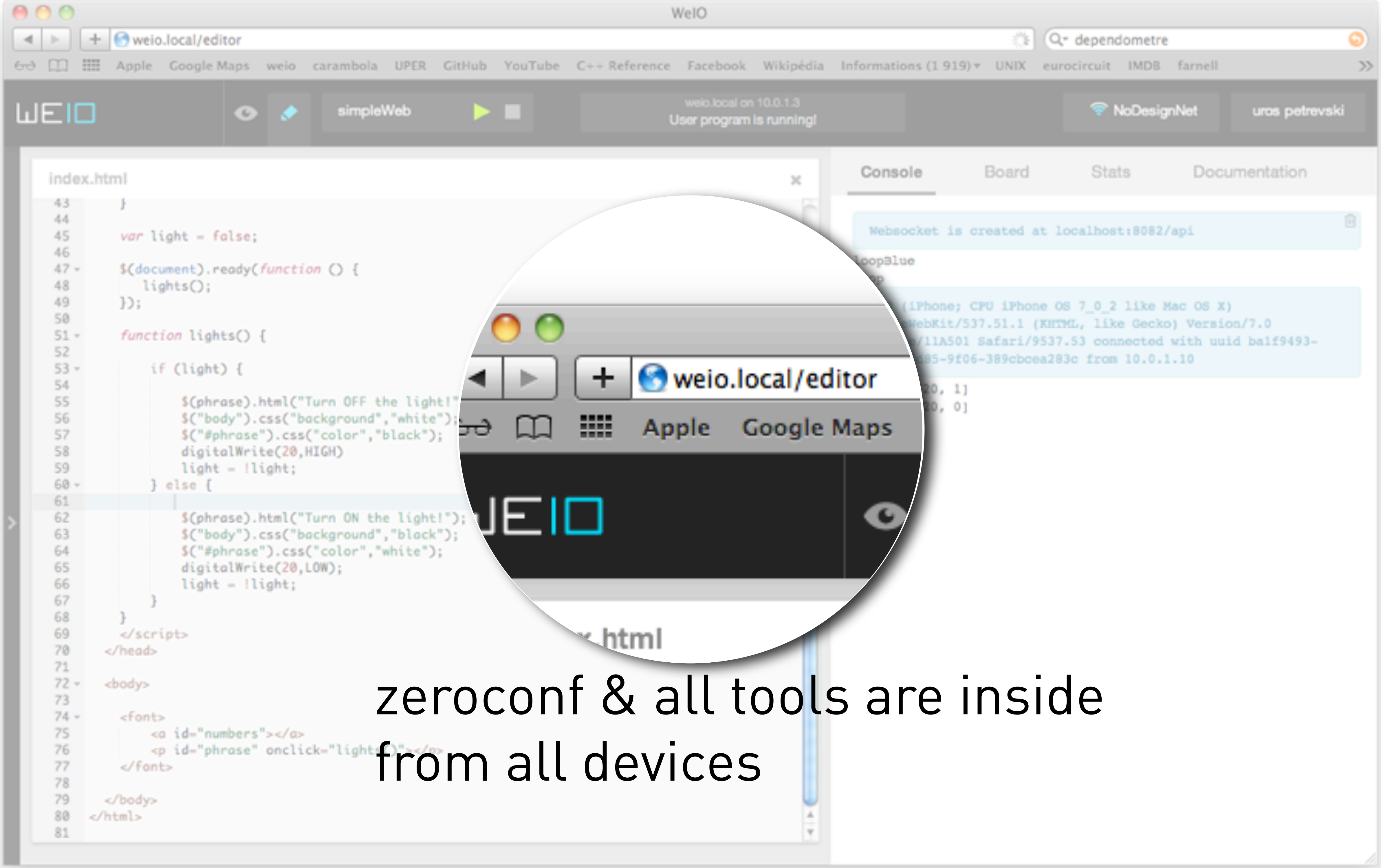

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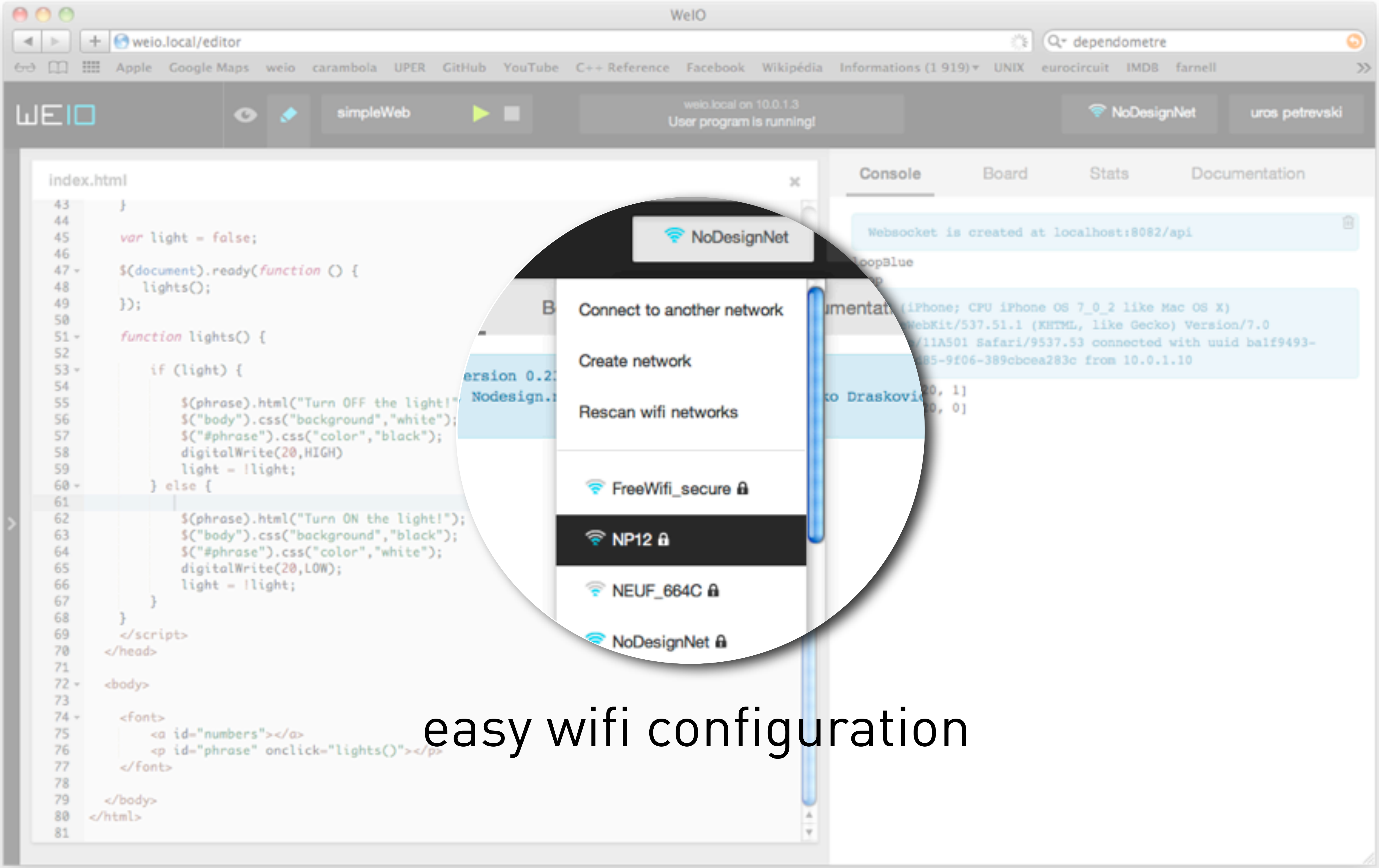
  <body>

    <font>
      <a id="numbers"></a>
      <p id="phrase" onclick="lights()"></p>
    </font>

  </body>
</html>
```

```
Websocket is created at localhost:8082/api
loopBlue
(iPhone; CPU iPhone OS 7_0_2 like Mac OS X)
WebKit/537.51.1 (KHTML, like Gecko) Version/7.0
/11A501 Safari/9537.53 connected with uuid ba1f9493-
85-9f06-389cbcea283c from 10.0.1.10
20, 1]
20, 0]
```

zeroconf & all tools are inside from all devices



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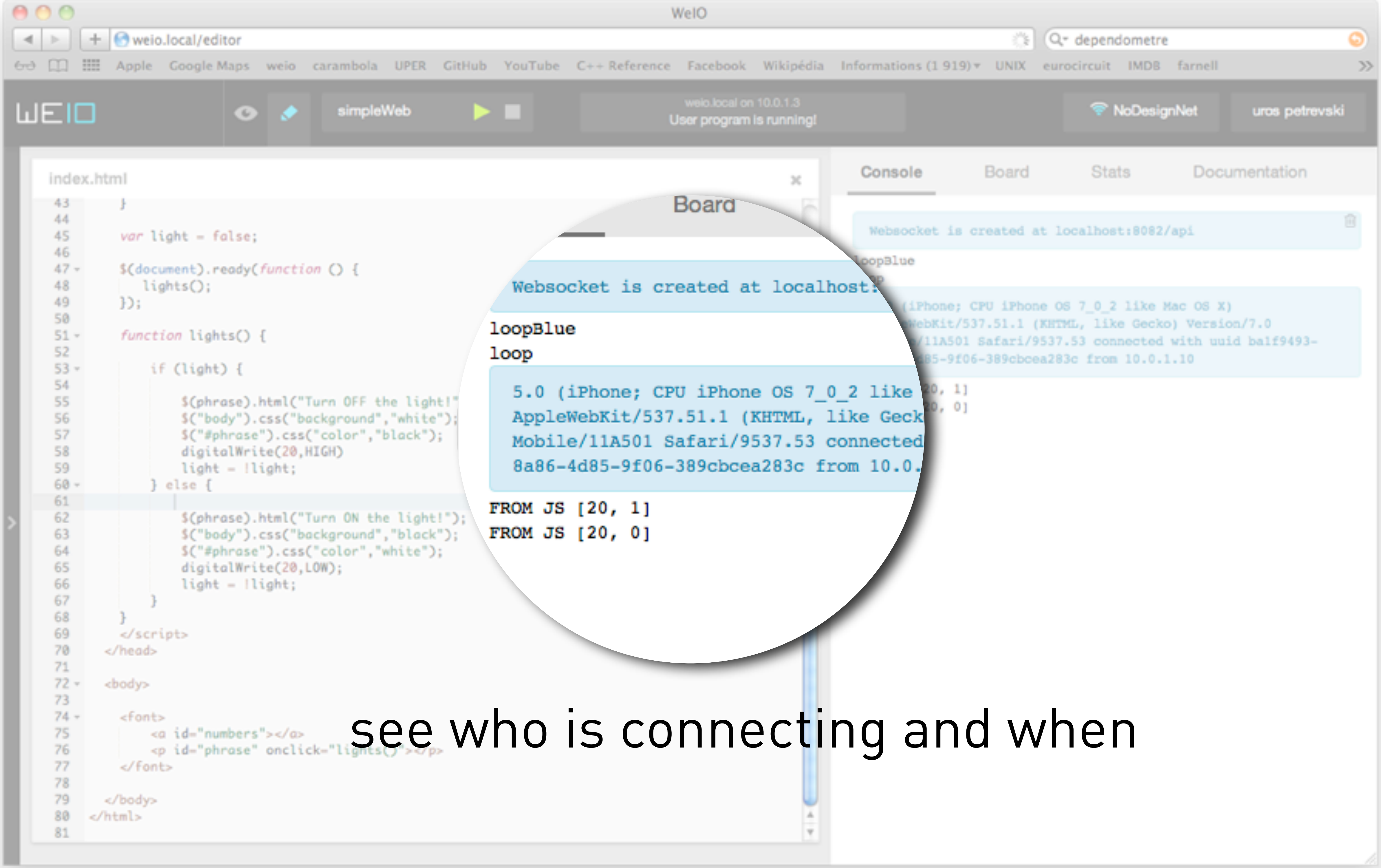
d85-9f06-389cbcea283c from 10.0.1.10
20, 1]
20, 0]
```

```
ersion 0.2
Nodesign.
ko Draskovic
```

easy wifi configuration



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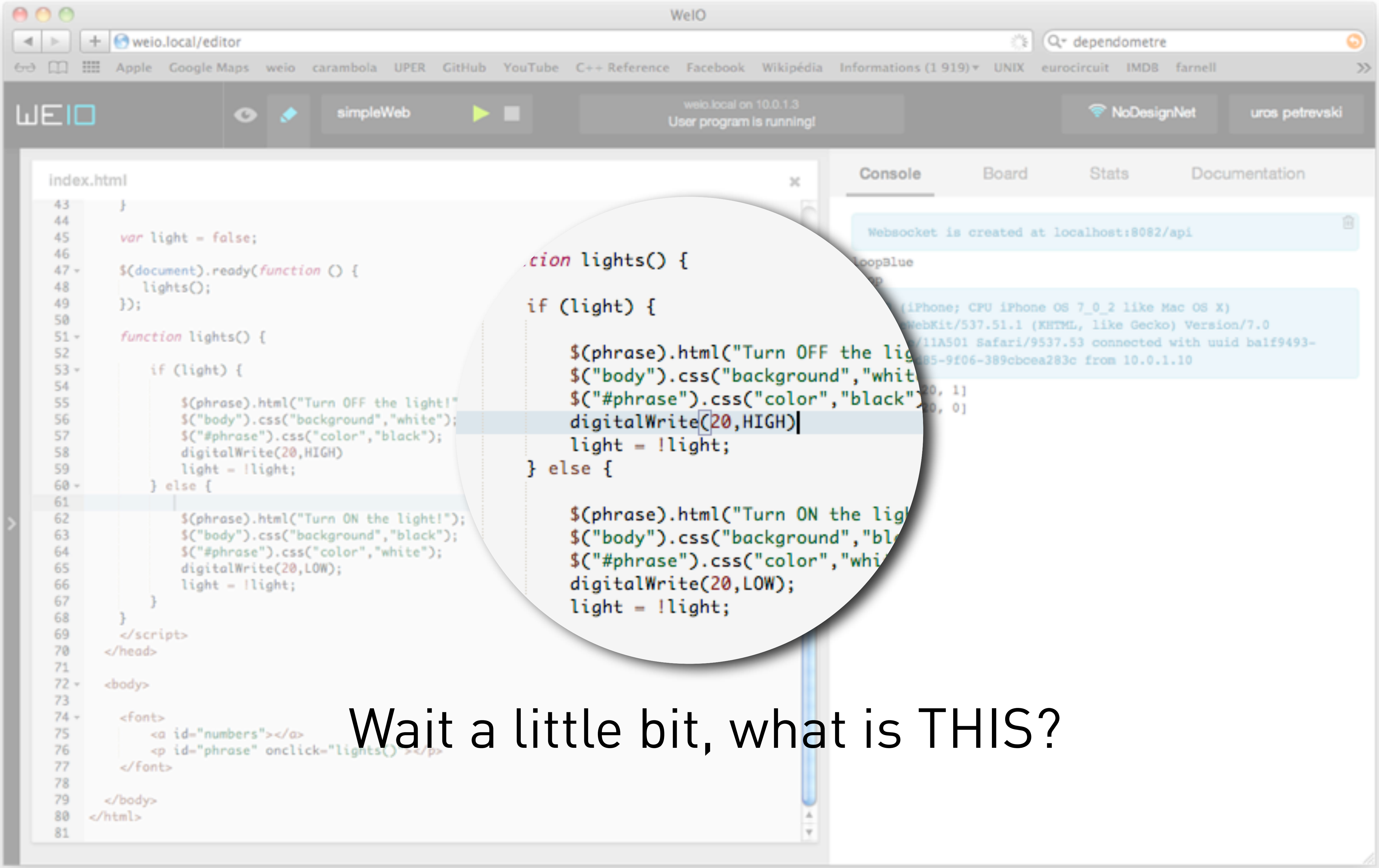
loopBlue
loop
5.0 (iPhone; CPU iPhone OS 7_0_2 like Mac OS X)
AppleWebKit/537.51.1 (KHTML, like Gecko) Version/7.0
Mobile/11A501 Safari/9537.53 connected with uuid ba1f9493-
8a86-4d85-9f06-389cbcea283c from 10.0.1.10
FROM JS [20, 1]
FROM JS [20, 0]
```

see who is connecting and when



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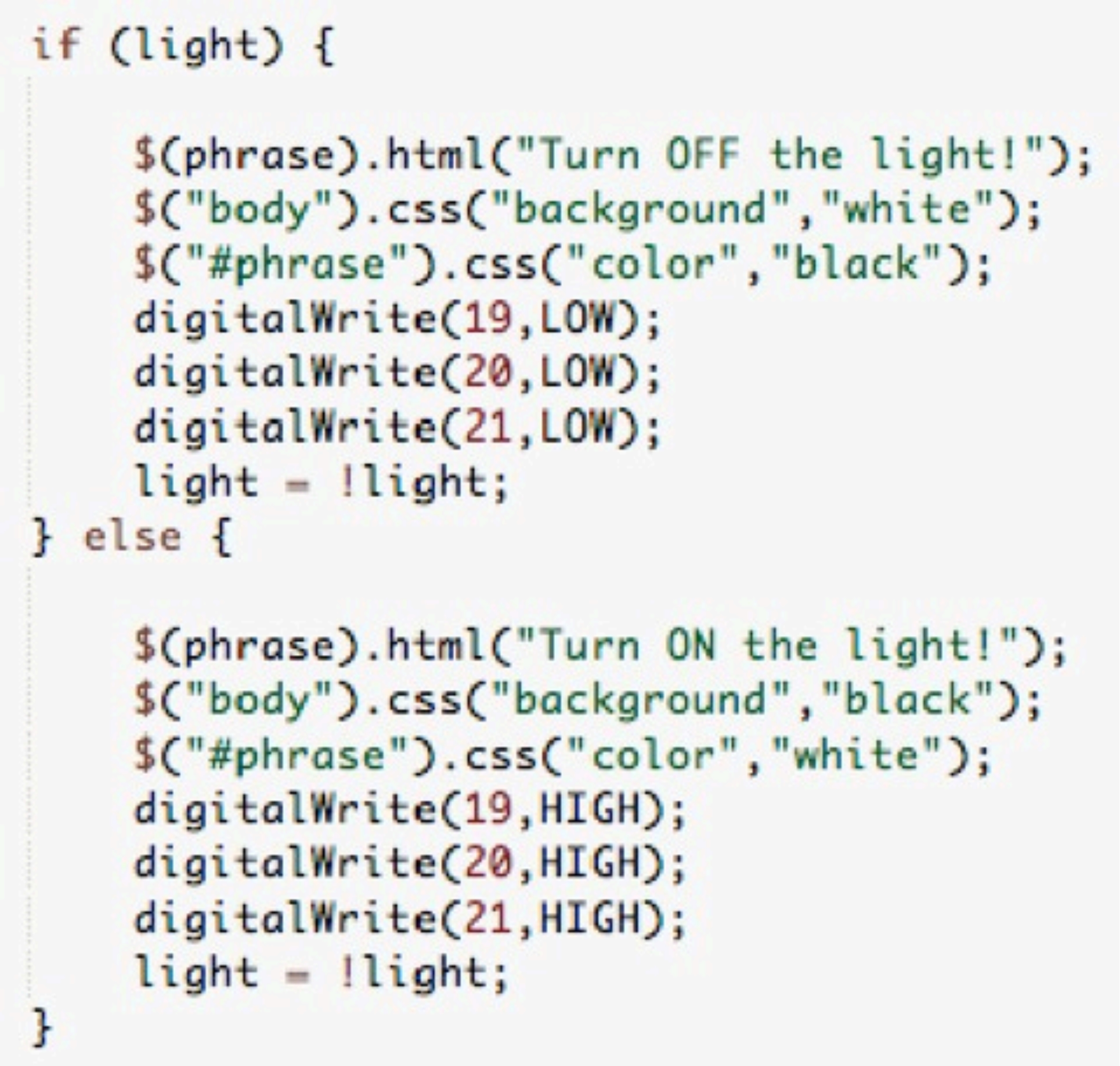
85-9f06-389cbcea283c from 10.0.1.10
20, 1]
20, 0]
```

Wait a little bit, what is THIS?



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```

We are driving electronics directly from HTML/Javascript

and from any device!

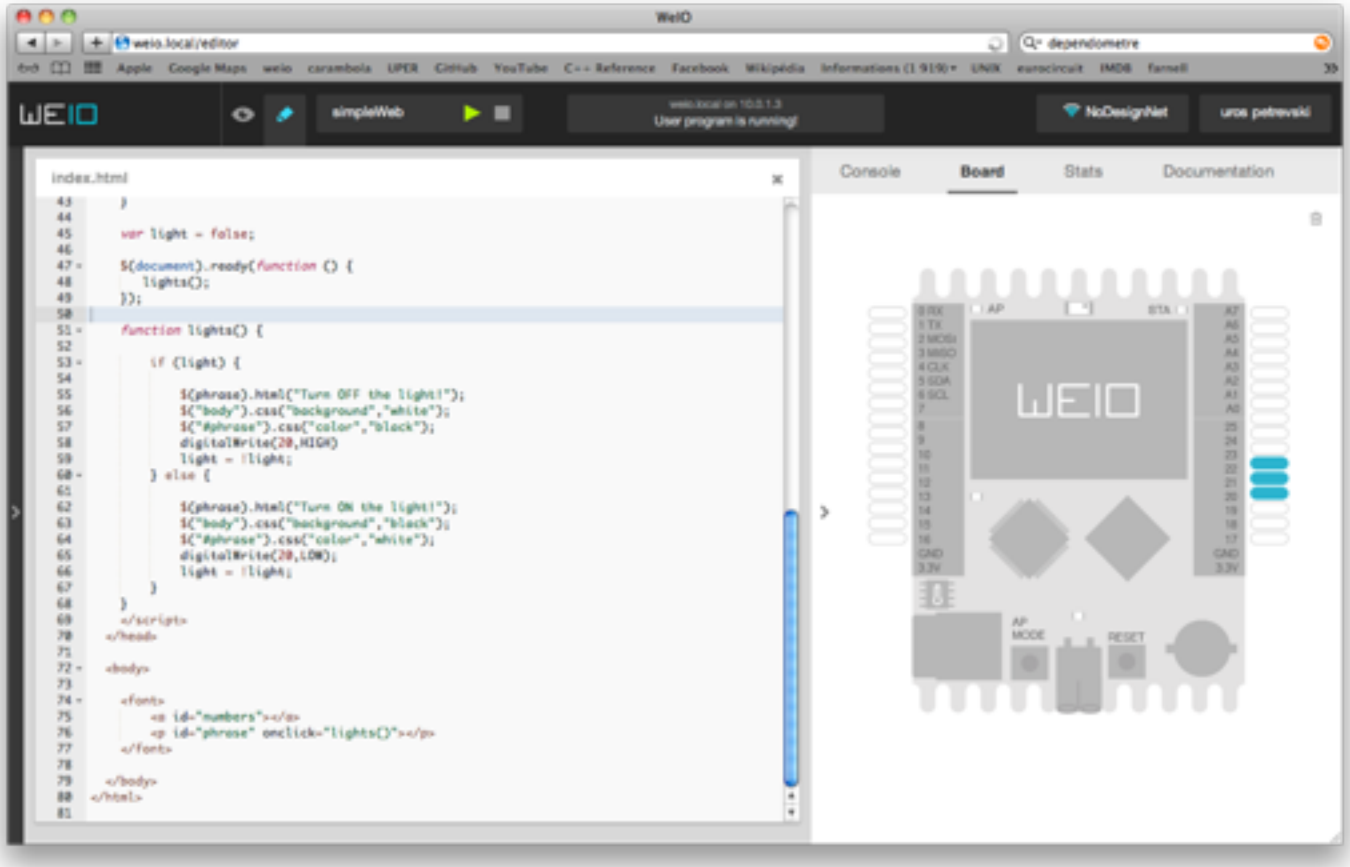
and of course with Arduino compatible API

And you will be ready to program really rich web apps.

WeIO natively supports jQuery, Bootstrap and ChartJS

but you can add whatever you want as library

but that's not all...



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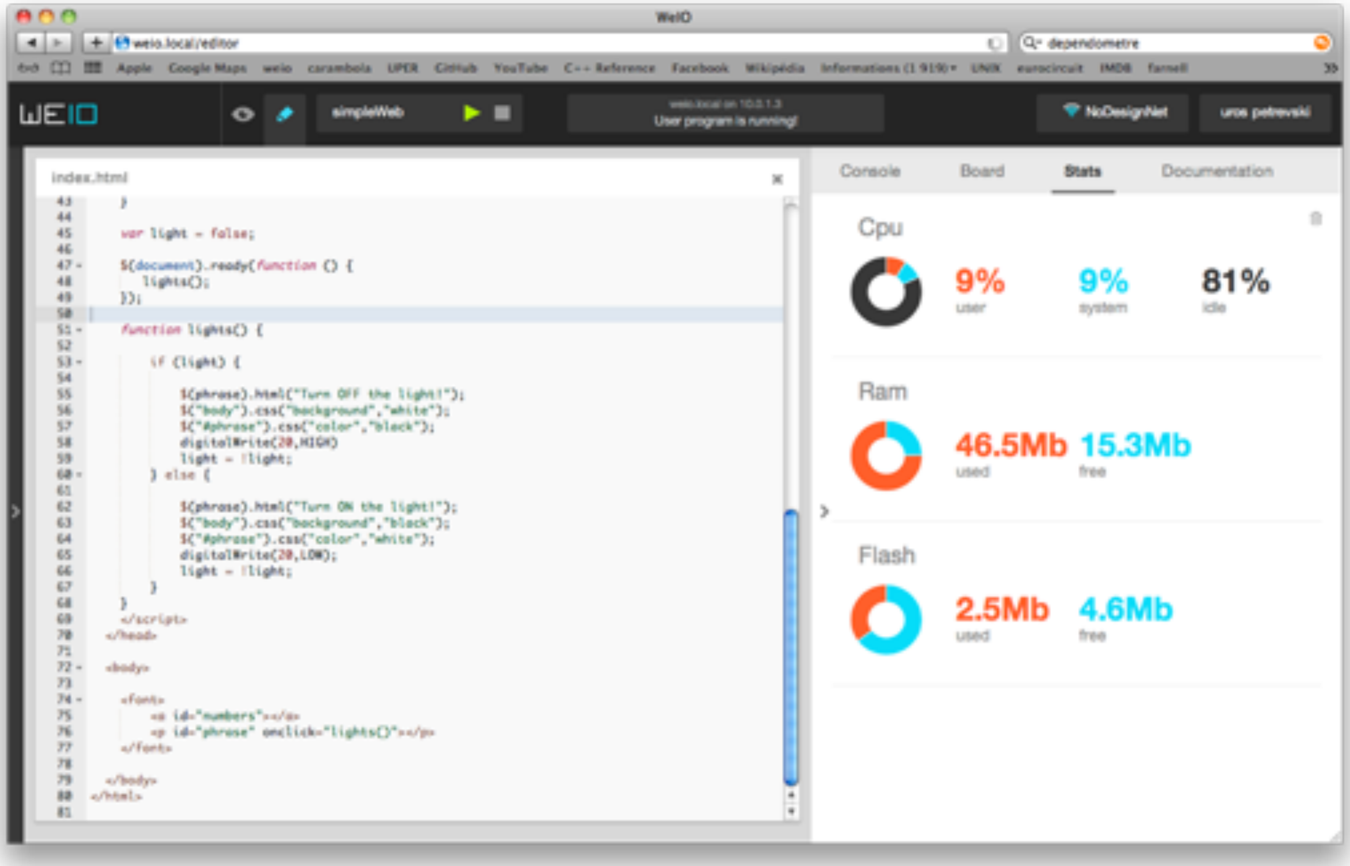
</html>
```

Visualize in realtime what are you doing with inputs and outputs at each moment



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  </body>
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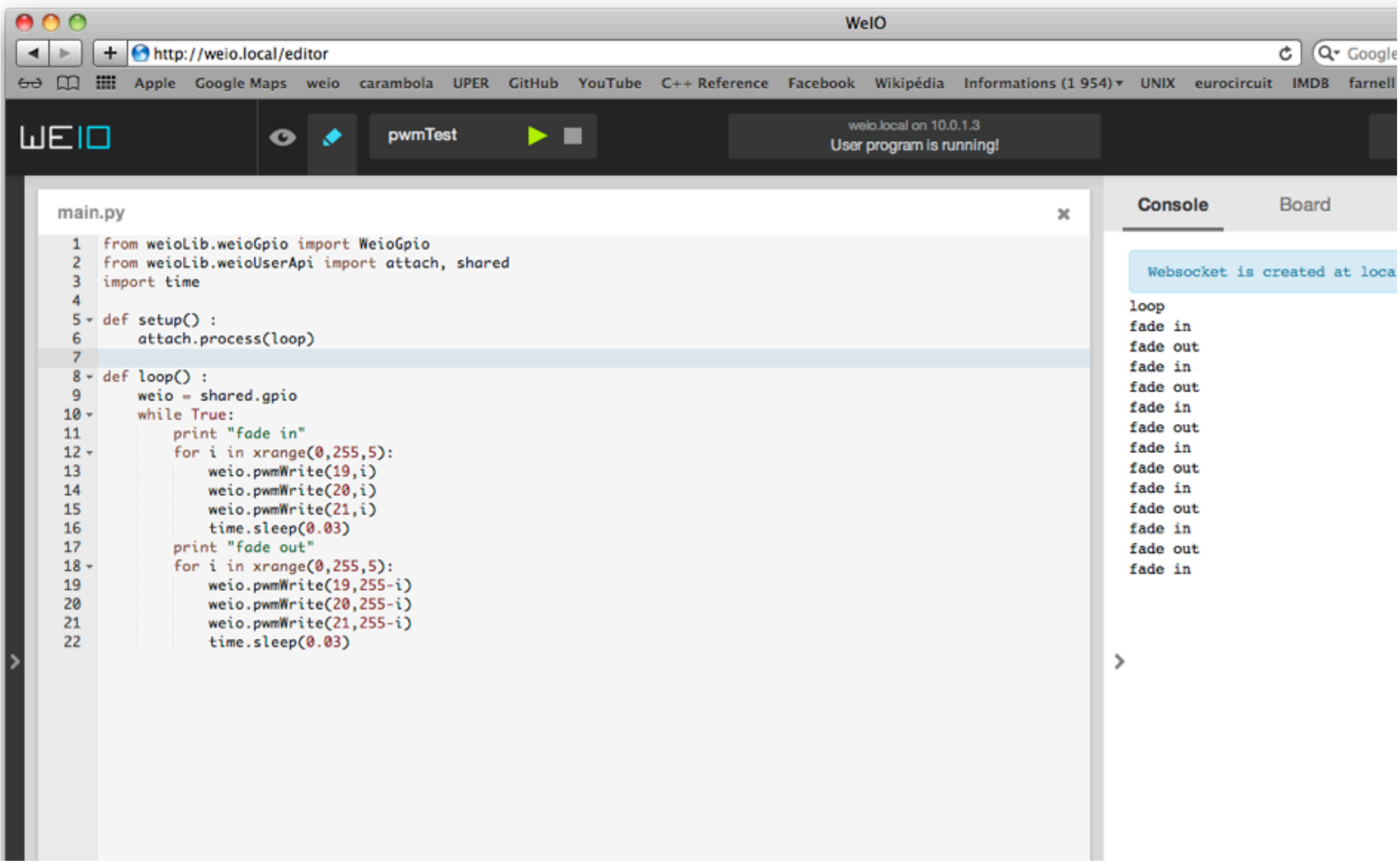
```

Visualize in realtime what is happening in OS and your program

What WYSIWYG is to press, WeIO is to programming connected objects

What if I want something that is standalone?

Well, do it in Python!



```
from weioLib.weioGpio import WeioGpio
from weioLib.weioUserApi import attach, shared
import time

def setup() :
    attach.process(loop)

def loop() :
    weio = shared.gpio
    while True:
        print "fade in"
        for i in xrange(0,255,5):
            weio.pwmWrite(19,i)
            weio.pwmWrite(20,i)
            weio.pwmWrite(21,i)
            time.sleep(0.03)
        print "fade out"
        for i in xrange(0,255,5):
            weio.pwmWrite(19,255-i)
            weio.pwmWrite(20,255-i)
            weio.pwmWrite(21,255-i)
            time.sleep(0.03)
```

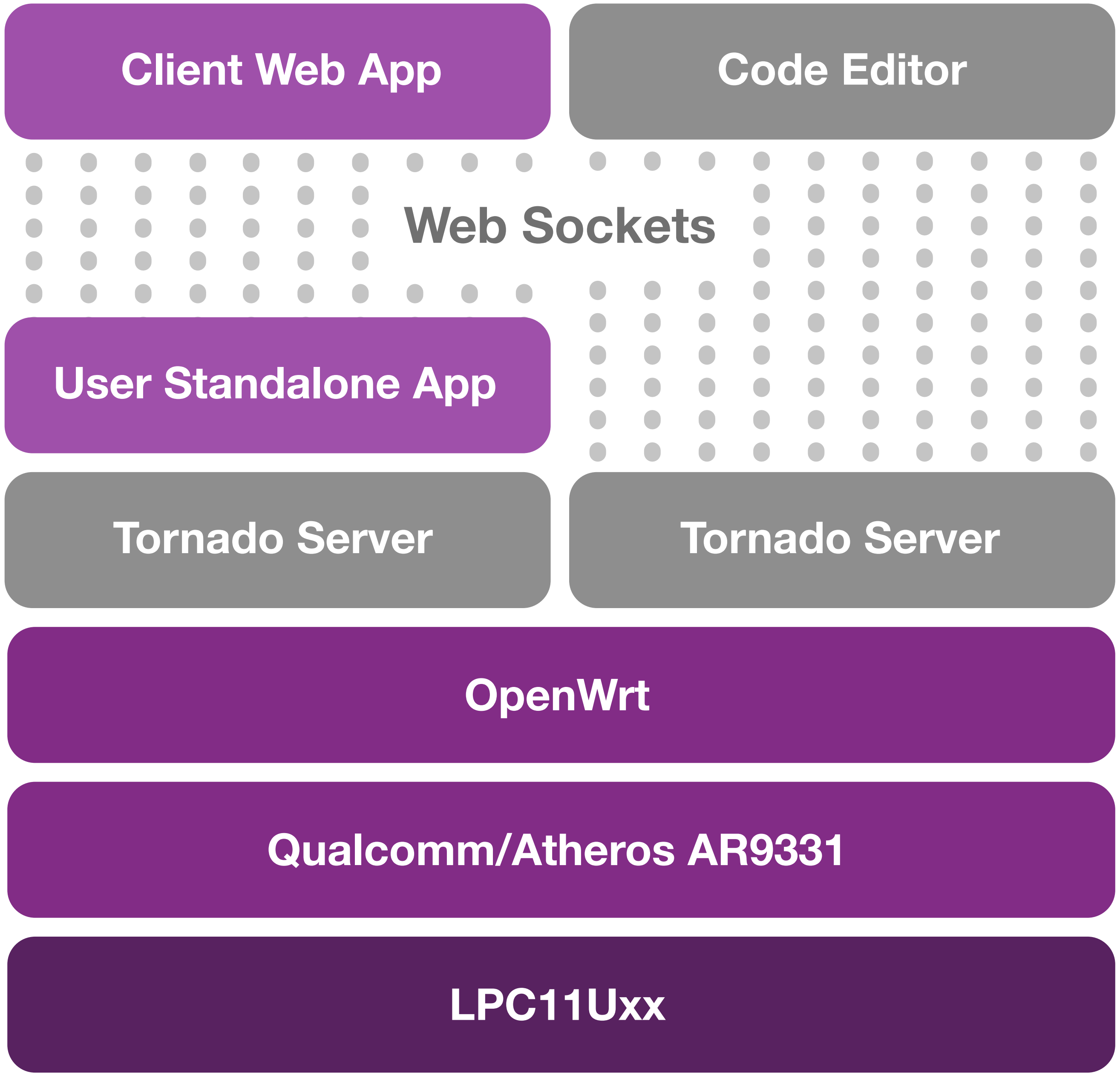
```
Websocket is created at loca
loop
fade in
fade out
fade in
fade out
fade in
fade out
fade in
fade out
fade in
fade out
fade in
fade out
fade in
```

nodesign.net

Future of programing microcontrolers is in interpreted languages

No more compiling, crosscompiling, lost months of setting up tools...

WeIO is NOT a toy!



Client Web App

Code Editor

Web Sockets

User Standalone App

Tornado Server

Tornado Server

OpenWrt

Qualcomm/Atheros AR9331

LPC11Uxx

Create,
innovate,
learn!

WEIO

is Open source and Open hardware project