

30 SNIFFS

# Making meaning in an internet of things

UX LONDON, MAY 30, 2014

1/4  
MILE  
WALKED  
SO FAR

50%  
50%

1.2 in. of  
rainfall  
this week

90°  
OUTDOOR





30 SNIFFS

[carladiana.com](http://carladiana.com)  
[@carladiana](https://twitter.com/carladiana)  
[smartinteractionlab.com](http://smartinteractionlab.com)  
[smartdesignworldwide.com](http://smartdesignworldwide.com)

UX LONDON, MAY 2014



Q Search...



Smart Design On What  
We'll Really Want From  
Robot Cars



1 of 5



Design is about people.  
That's smart.

An innovation consulting firm  
for a complex world

At Smart, we design products and services that grow businesses, shift industries and impact millions of people every day. We partner with clients who, like us, aspire to make a meaningful difference to how people work, live, learn and play.



# Physical-Digital



**Energy Hub**



**Connected appliances**



**Ethicon Medical Equipment**



**Under Armour**



**Ford SmartGauge**



**HP Large Format Printing**



**A maker-futurist**







SMART IxD LAB


Thoughts,  
observations and  
experimentation on  
interaction by:

SMART DESIGN

 Things We See

 Things We Make

 About Us

 Search

Check us out



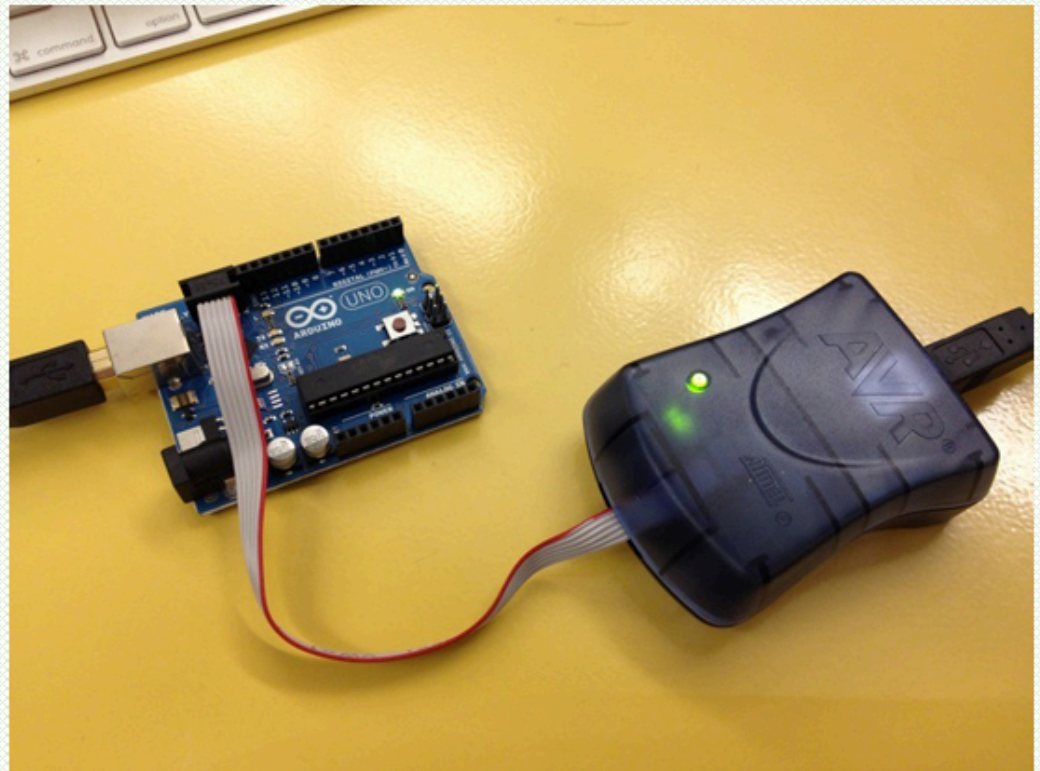
# LUFA EXAMPLE – TURNING YOUR ARDUINO INTO A KEYBOARD

Mar 19, 2012

 [leave a comment](#)

3. Hook up your Arduino like so. Open up terminal and navigate to the folder. Once there, run the following command to flash the new hex:

```
avrdude -p at90usb82 -F -P usb -c avrispmkii -U flash:w:arduino-keyboard-0.3.hex -  
U lfuse:w:0xFF:m -U hfuse:w:0xD9:m -U efuse:w:0xF4:m -U lock:w:0x0F:m
```



Once it is done (should take less than 10 seconds), unplug the USB cables and AVR Programmer.



[design](#) / [diy](#) / [internet of things](#)

# How can we design an internet of things for everyone (not just alpha geeks)?

by Carla Diana, Smart Design AUG. 18, 2013 - 12:00 PM PDT

 17 Comments    +1 

A▼ A▲

SUMMARY: *Makers and alpha geeks have found meaningful applications for the internet of things but there is still a big gap between them and the average user who doesn't want to hack. How do we design for everyone?*

 [tweet this](#)



# Smart Objects Courses at UPenn & SVA

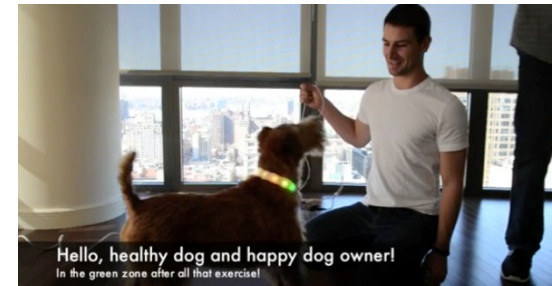
[tumblr.smartobject.com](http://tumblr.smartobject.com)



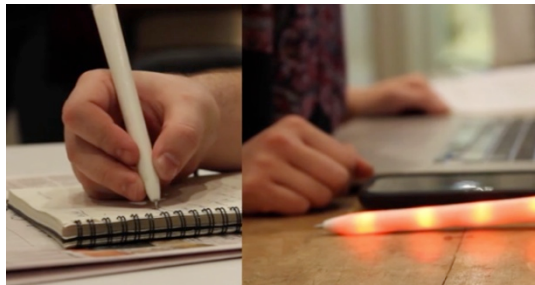
**The Cube Audio Menu**



**NOM Projected Food Service**



**Smart Dog Collar**



**Pen Pal Creative Network**



**Vice Bike Lock**



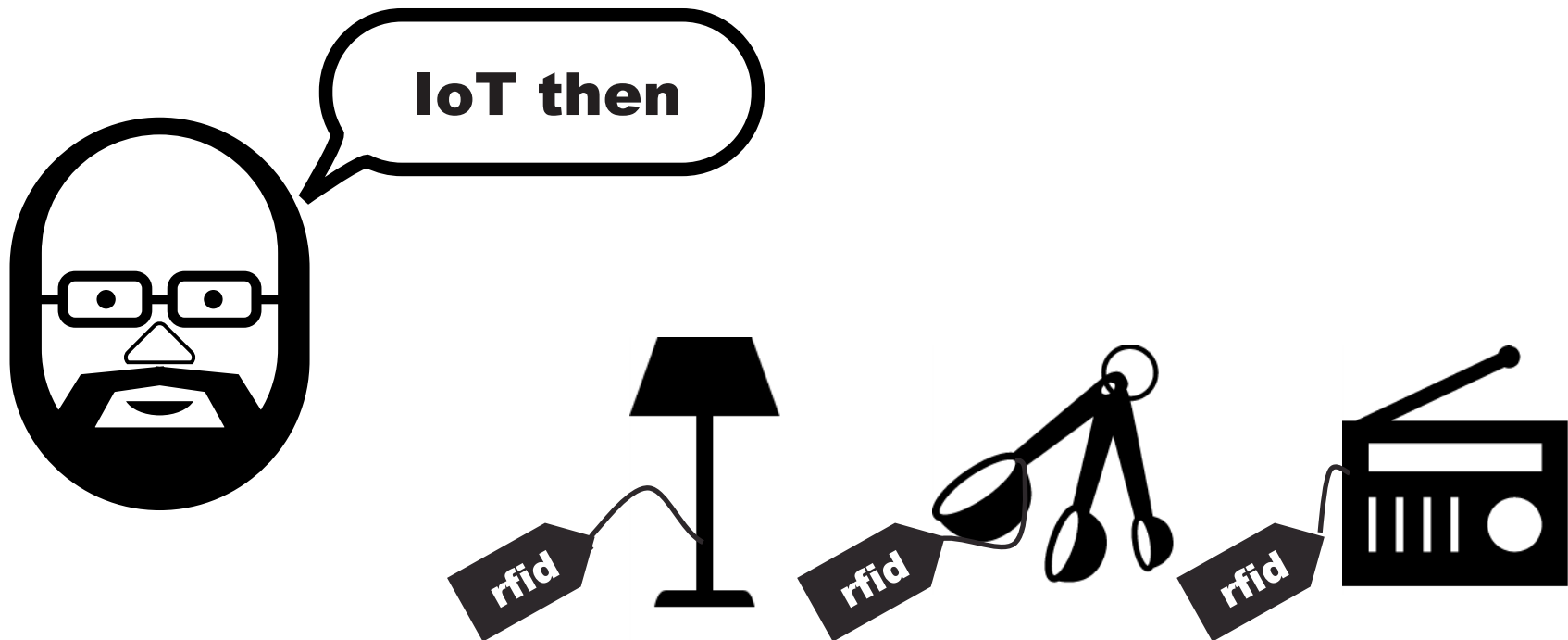
**Chicken Chase Internet Game**



**IoT: not what we expected**

# Henry Holtzman, MIT Media Lab

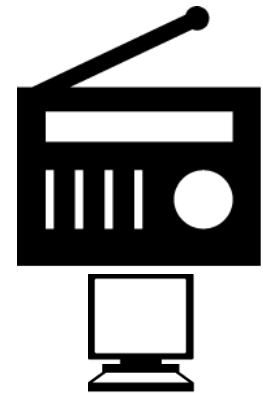
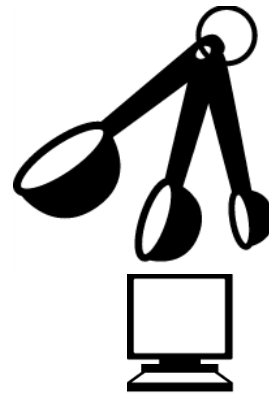
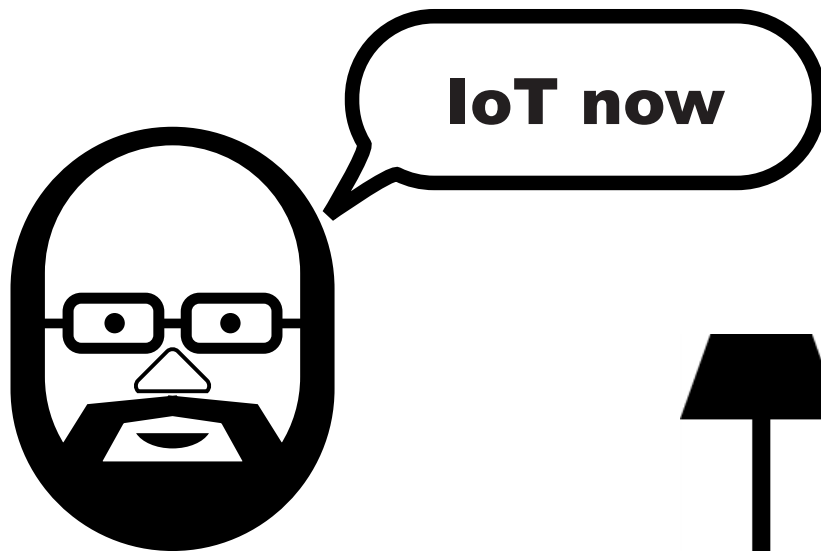
Original IoT vision was a database of tagged items that could be tracked





# Henry Holtzman, MIT Media Lab

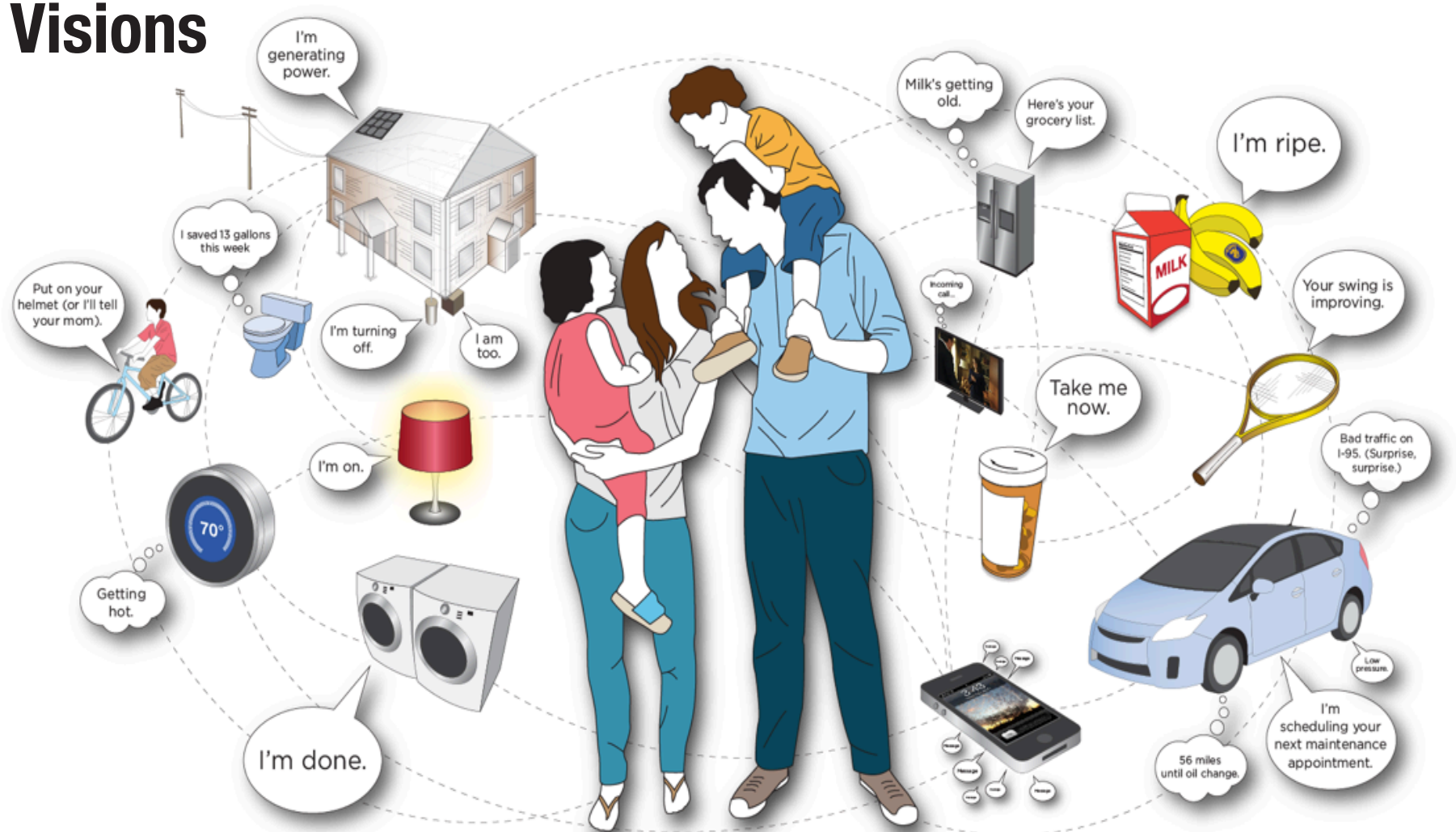
What we didn't anticipate is the many devices we would have with computing power



**The perfect storm:**  
**robotics**  
**affordable sensors**  
**object tagging**  
**wireless communications**  
**broadband**



# Visions



The New York Times

# Sunday Review

| The Opinion Pages

OPINION

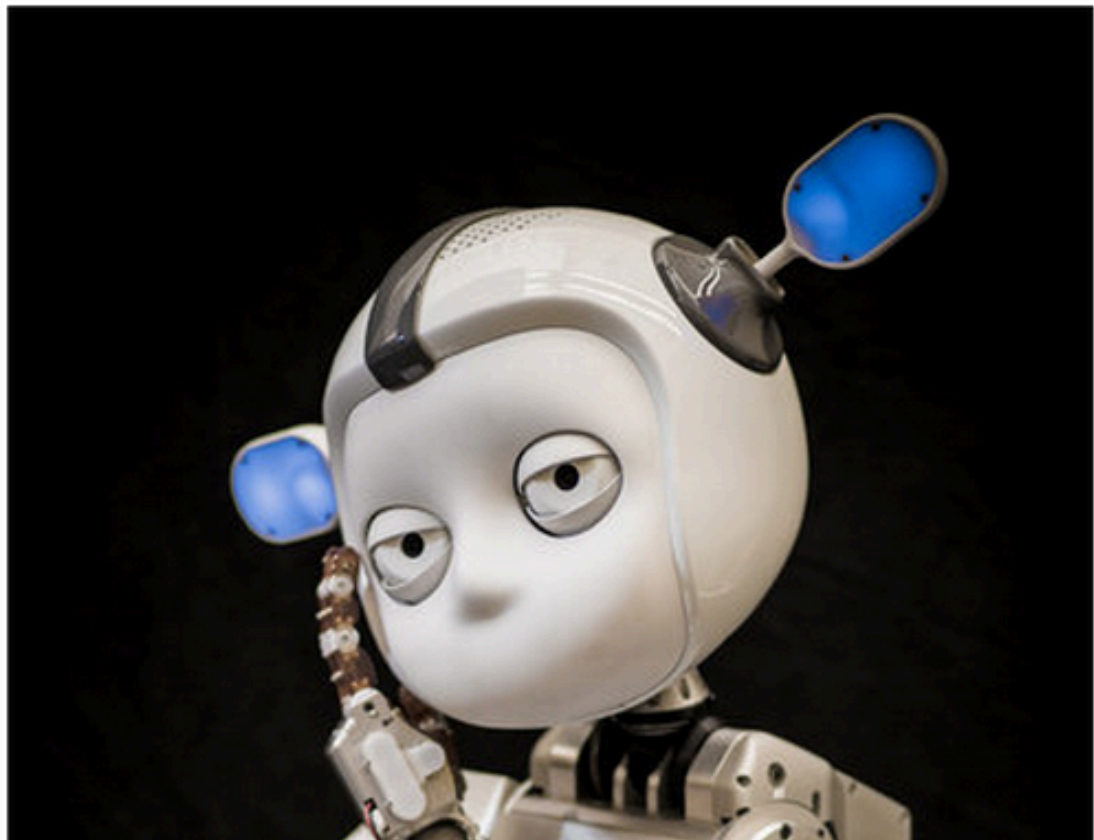
## Talking, Walking Objects

By CARLA DIANA

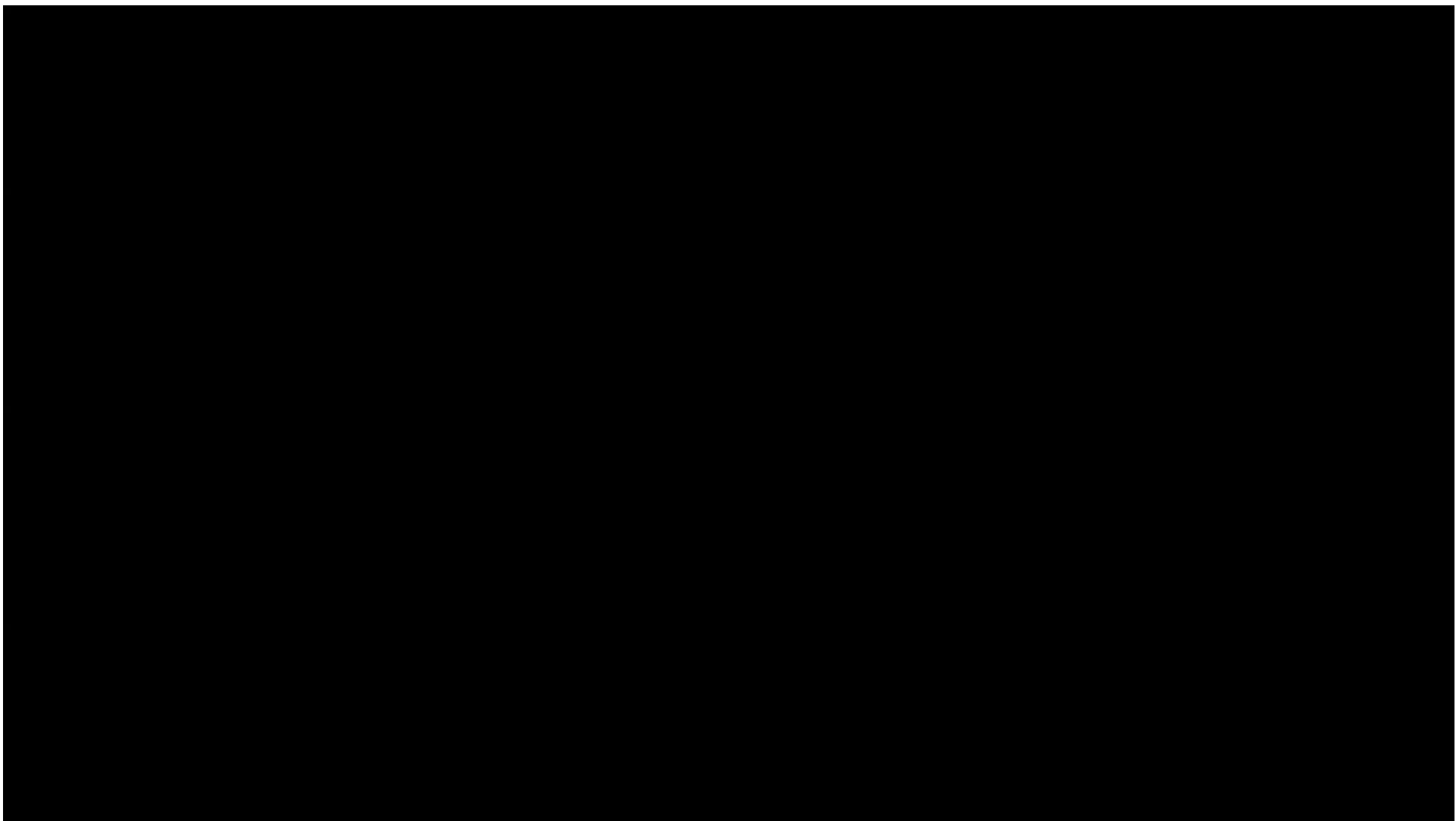
The future is rich with sensor-based, animated devices to give us affirmation, coach us and just plain keep us company. [Comment](#)

• [Video: A Day in the Near Future](#)

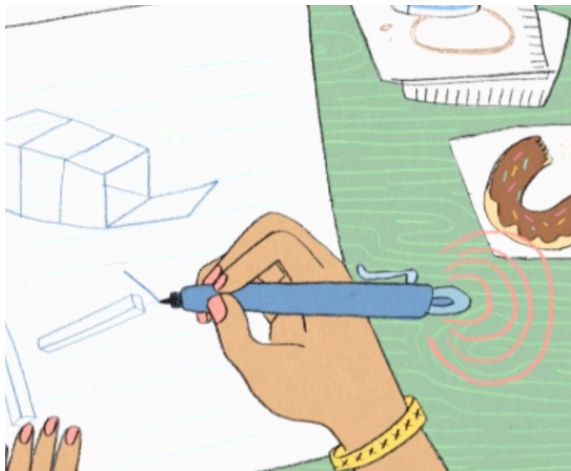
silly video







# Visions becoming reality



**Paying attention to mavericks:  
throwing spaghetti at the wall**



## Output: Talk to the Internet

You can tell Twine to speak in a variety of ways.

- [Pebble smartwatch](#)
- Twitter
- Email
- Text messaging — [available for most carriers](#)
- Configurable HTTP Request



## CARLA'S TWINE

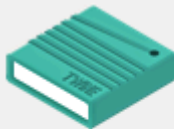
temperature  
**71 °F**



moisture  
**dry**



orientation  
**top**



Last report: 62 seconds ago / external power

I'm going to update less often to save power.

Start talking fast

## New ruleset

What does your ruleset do?

[edit](#)

#1

### WHEN

temperature

falls below

60

°F

OPTIONS

+ Add a condition

Plug in a sensor to use it.

### THEN

text message

Twine says it's too cold for Roo in the apartment. It's below 60 now.

71 left

to 7184734881

country United States

carrier AT&T Wireless

Test SMS

AND

If you have a Sensordrone, you can run apps like these.





Ninja blocks

# KAROTZ

YOUR SMART RABBIT



Appz



Support



Lab



Ztore



My Account

## Karotz, your smart companion

## Evolve

Hundred of free applications available:  
keep eyes on your home while away, listen  
to music, and stay in touch with your friends



**Karotz Smart Rabbit**



## The Dream of Intelligent Robot Friends

Learning about smart objects from the Karotz Internet-connected toy rabbit thing

CARLA DIANA | MAR 26 2014, 9:26 AM ET

227

Share

139

Tweet

62

+1

7

Share

More ▾



Karotz

Karotz Smart Rabbit

SMART DESIGN

Karotz is an Internet-enabled console in the shape of an abstracted rabbit. One

@carladiana\_

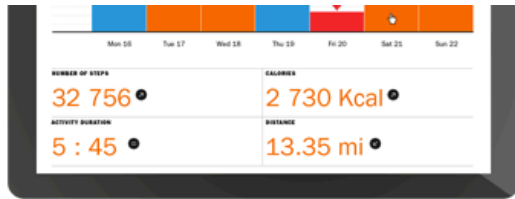
# mother.

The care you need, the care you want

Sense Mother is at the head of a family of small connected sensors that blend into your daily life to make it serene, healthy and pleasurable.

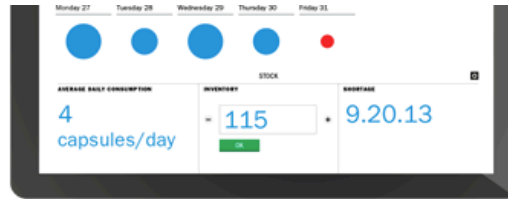


**Mother and “cookies”**



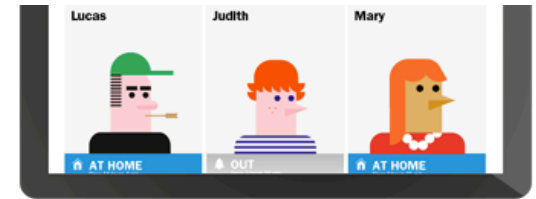
### Walk

Are you active enough to stay fit? Monitor the number of steps you make, the distances you walk, the calories you burn.



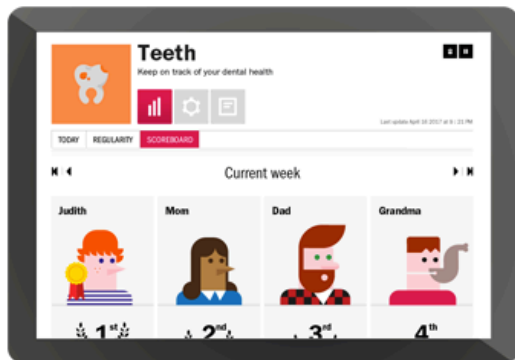
### Espresso

How many espresso coffees do you brew? Do you drink too many of them in the evening? Get notified before you run out of capsules.



### Presence

Is there anybody home right now? Automatically lower your thermostat when nobody's there.



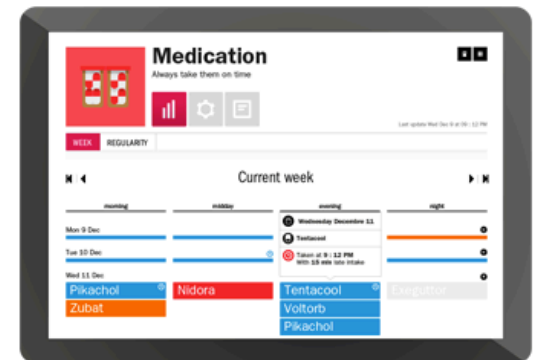
### Teeth

Do you really brush your teeth better than your children? Accept the challenge and maybe they will set the example.



### Intrusion

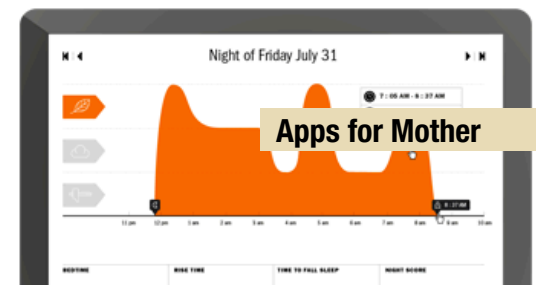
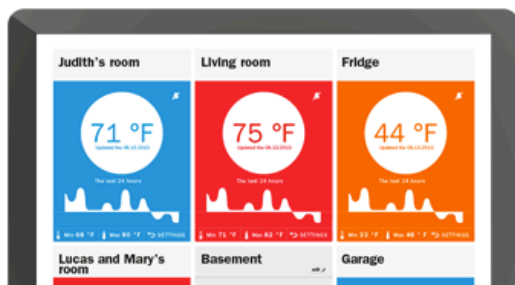
Monitor access to your home. Get an alert when unusual activity is detected when you are away.



### Medication

Always take your medication on time. Receive a notification if you forget. Monitor the regularity of your intake.

Order



Apps for Mother

# Get a Safer and Smarter Home in the Palm of Your Hand

FREE SHIPPING  
on ALL U.S. Orders!  
Now Shipping to Canada\*

Buy for \$299 >

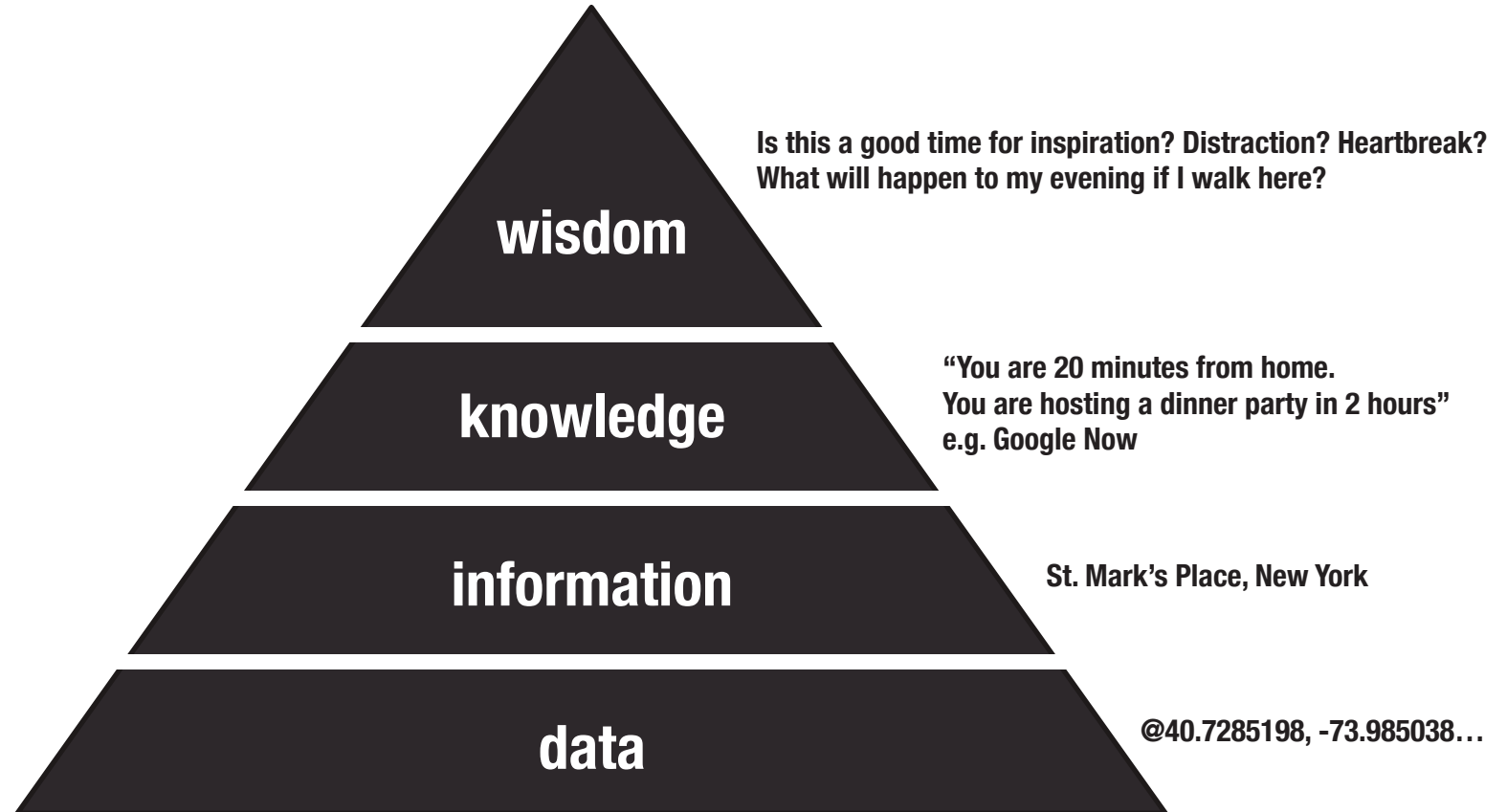


SmartThings Kits



**Where do we find meaning?**

# Hierarchy of meaning

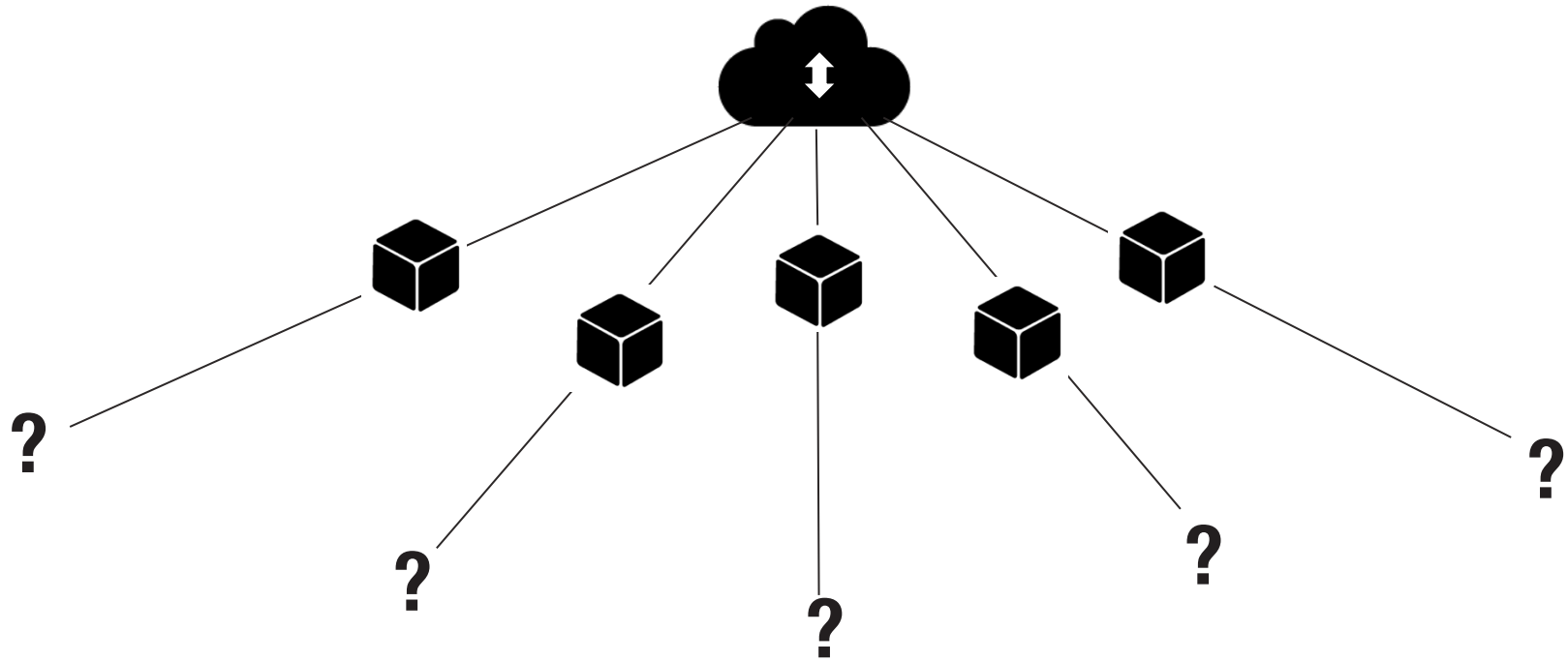


# Objects can give us knowledge, we do the rest

The Naturally Slim Plan highlights all the social, emotional and cultural reasons we eat past the point of being full. Placing the fork down after every bite is one technique to help you reflect on why and how you are eating, and a smart fork can be a tool to assist you.



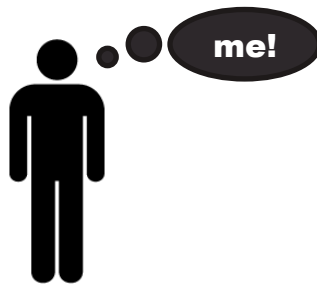
# Turning things into knowing





# Knowing about...

myself



others

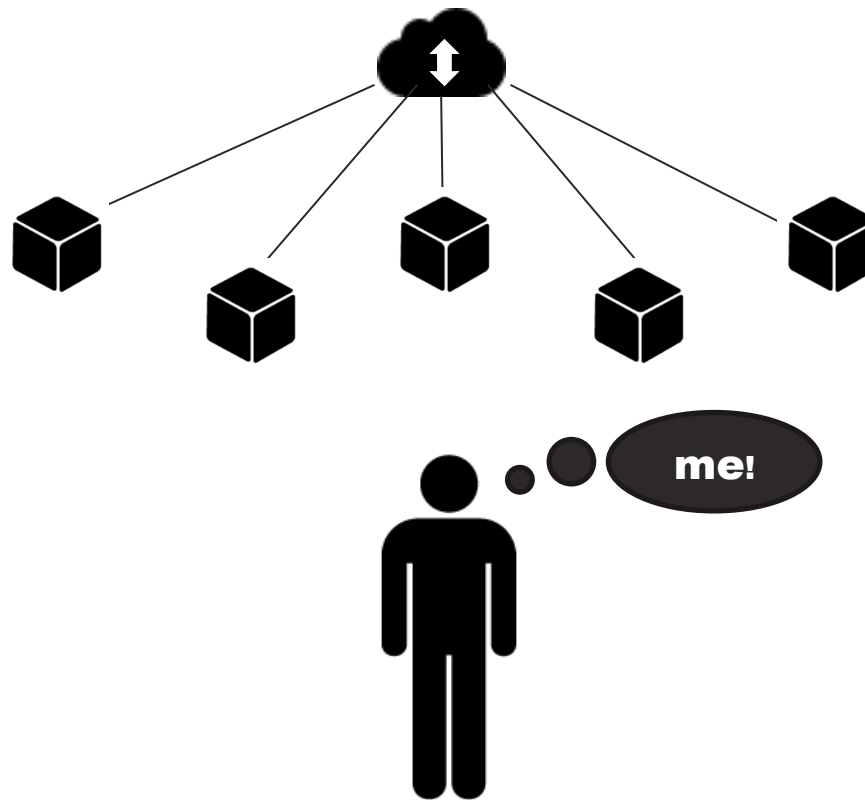


the world



# About myself

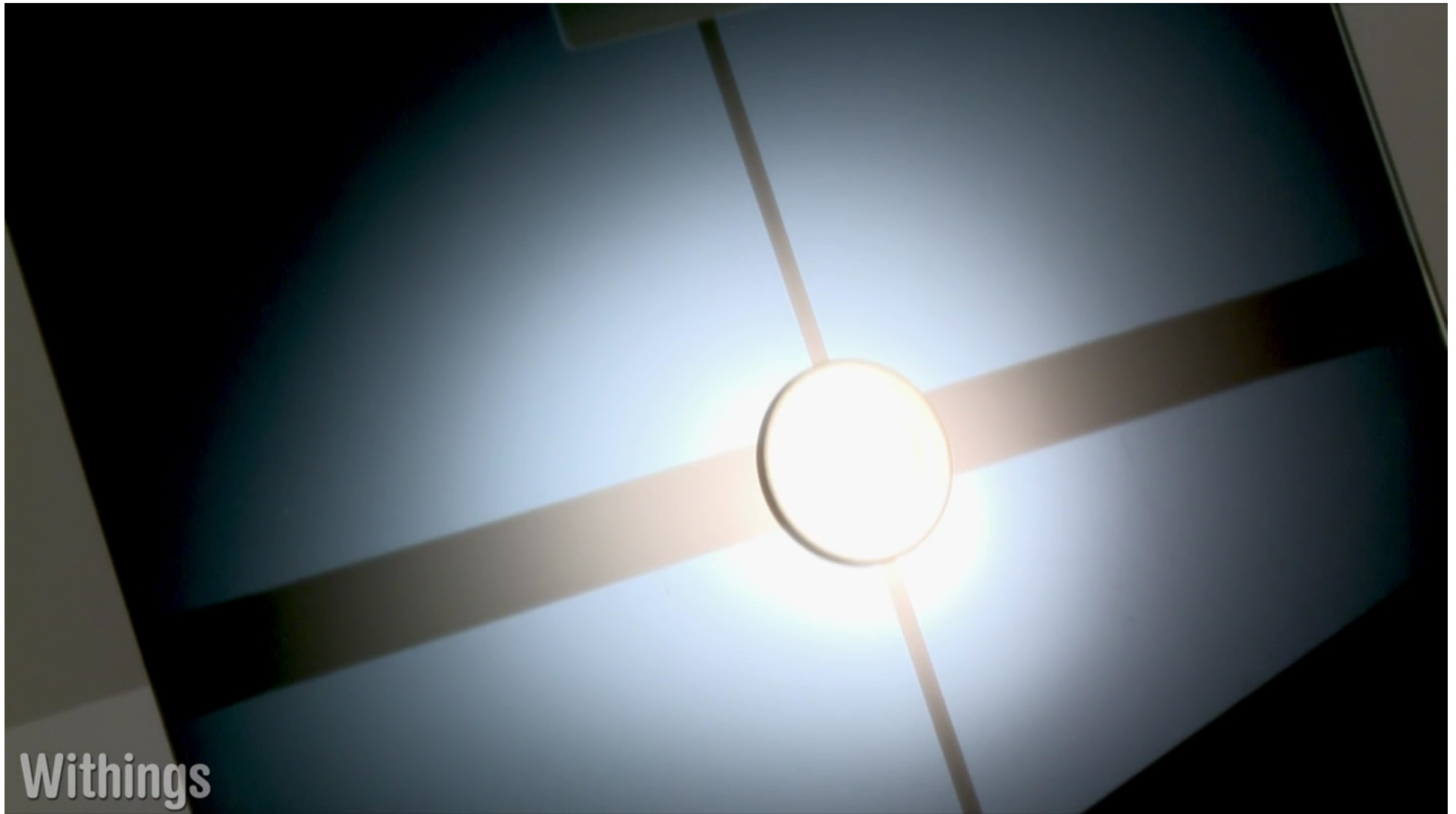
**Training**  
**Self control**  
**Mindfulness**  
**Behavior change**  
**Identity**

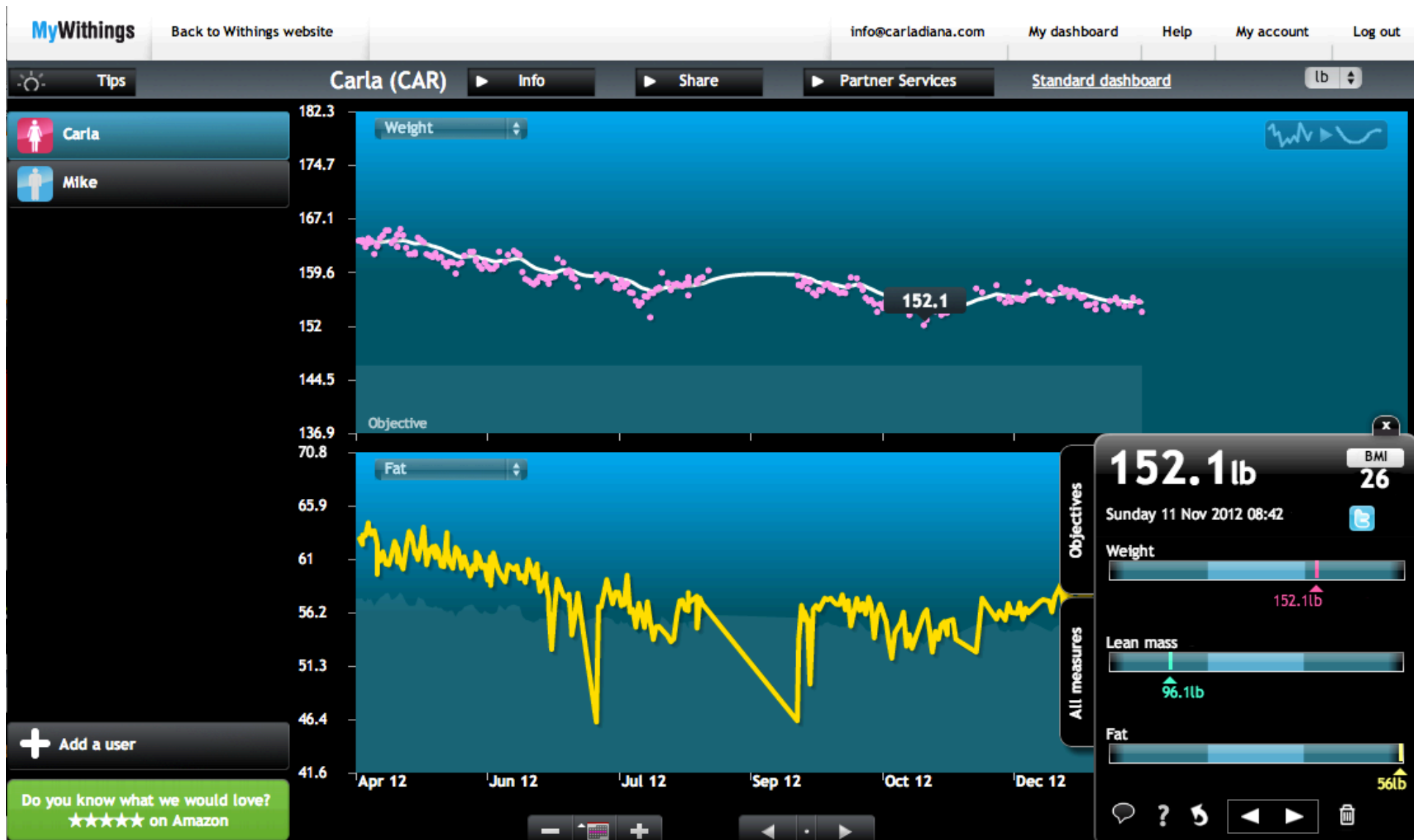


# The quantified self



Fitbit







**Self control**

*FASTSPOT MINI-FRIDGE*



Twine user

# Mindfulness

TWINE COMMUNITY

Discussions

Activity

Sign In

## Using Twine to address my absent-mindedness

At home



**Dave Owen**

December 2012

I only rarely park inside my garage, or ride my scooter which is stored therein. Since it isn't a habit, I occasionally drive (or ride) away, only realizing miles down the road that I can't remember if I closed my garage door.

So, with the help of a blue glitter pipe cleaner (I have kids, and you make use of what you have around) through the casing hole, I've strapped my Twine to the inside of the garage door. When I open or close the door, Twine notifies me to let me know I've opened/closed it, so no more worrying all day or turning around to double-check.

There have been issues; T-Mobile texts aren't reliable (not very useful getting the closure message at midnight when I closed it at 9am), so I've switched to email, and this morning I got an extra "close" email without watching "open" one, even though I didn't open the garage. On the whole, though, it's

# Mindfulness



Adheretech

# Behavior change



Mavia System

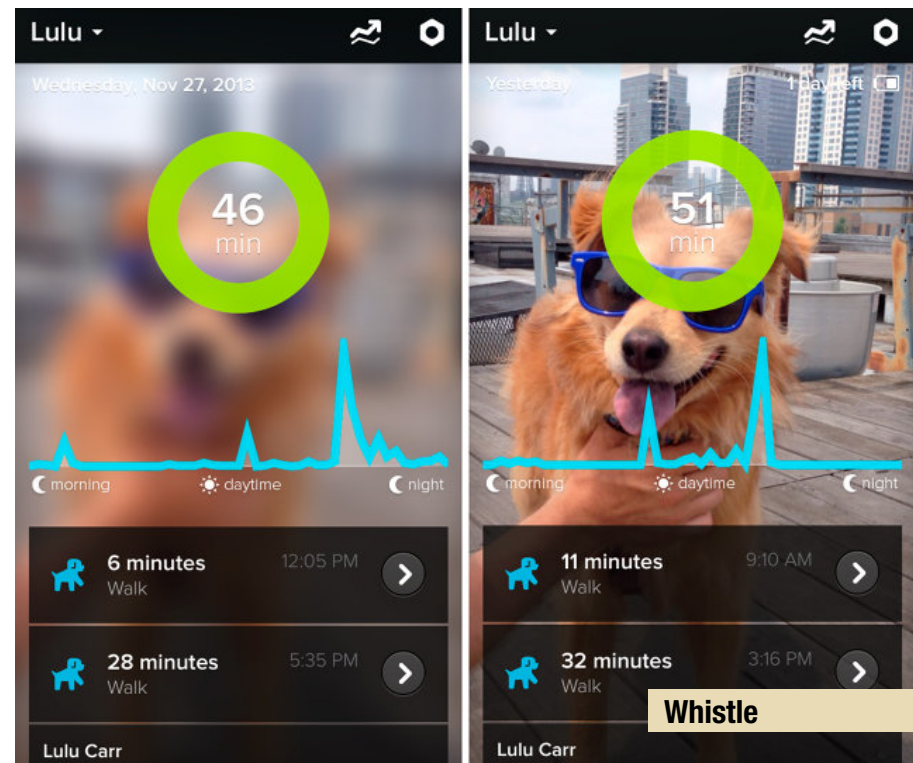
# Identity



Nike Fuel Band

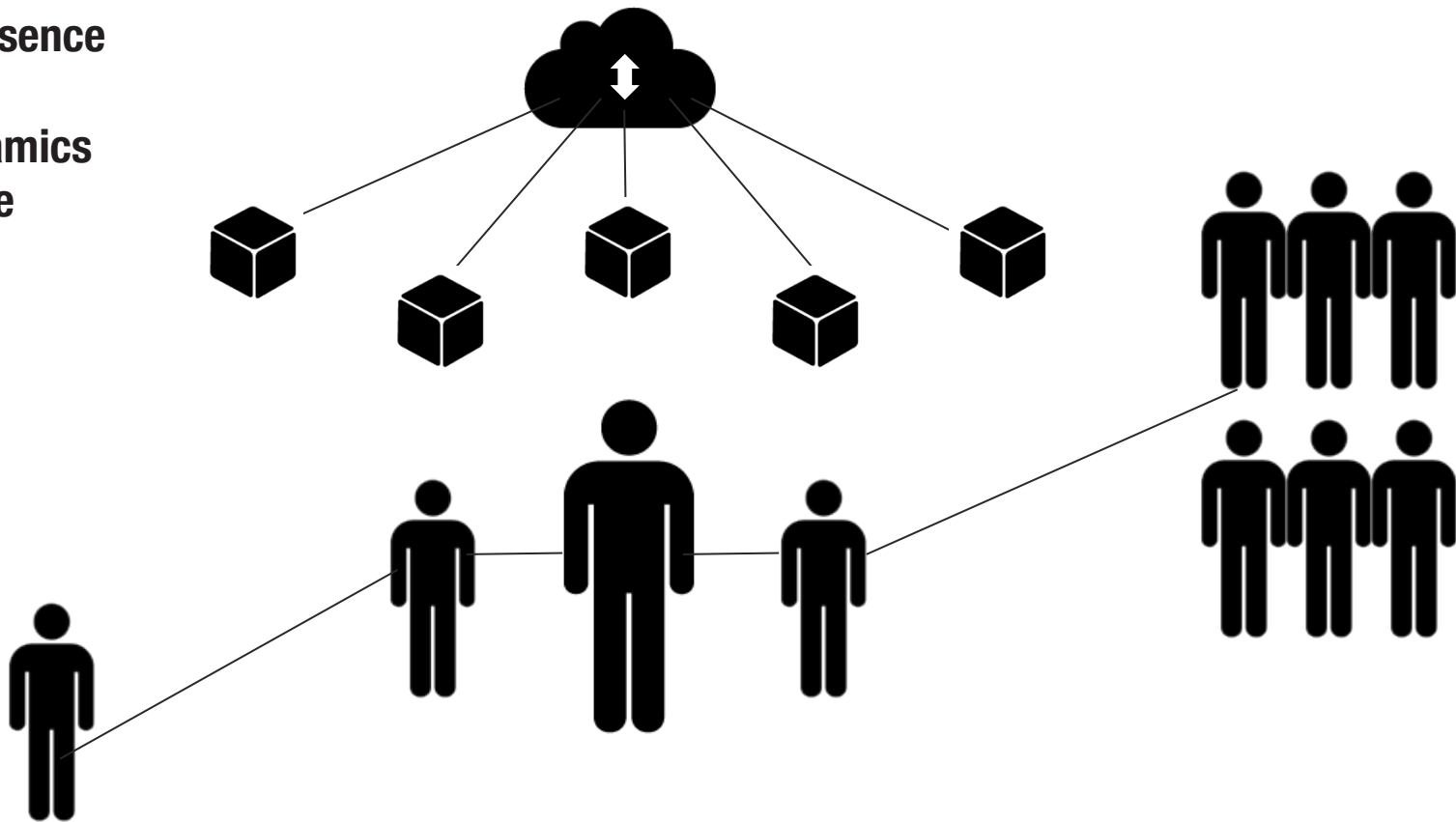


# The quantified pet/ plant/ possession



# About others

Virtual presence  
Sharing  
Team dynamics  
Health care



# Sharing



Camera. Reborn.



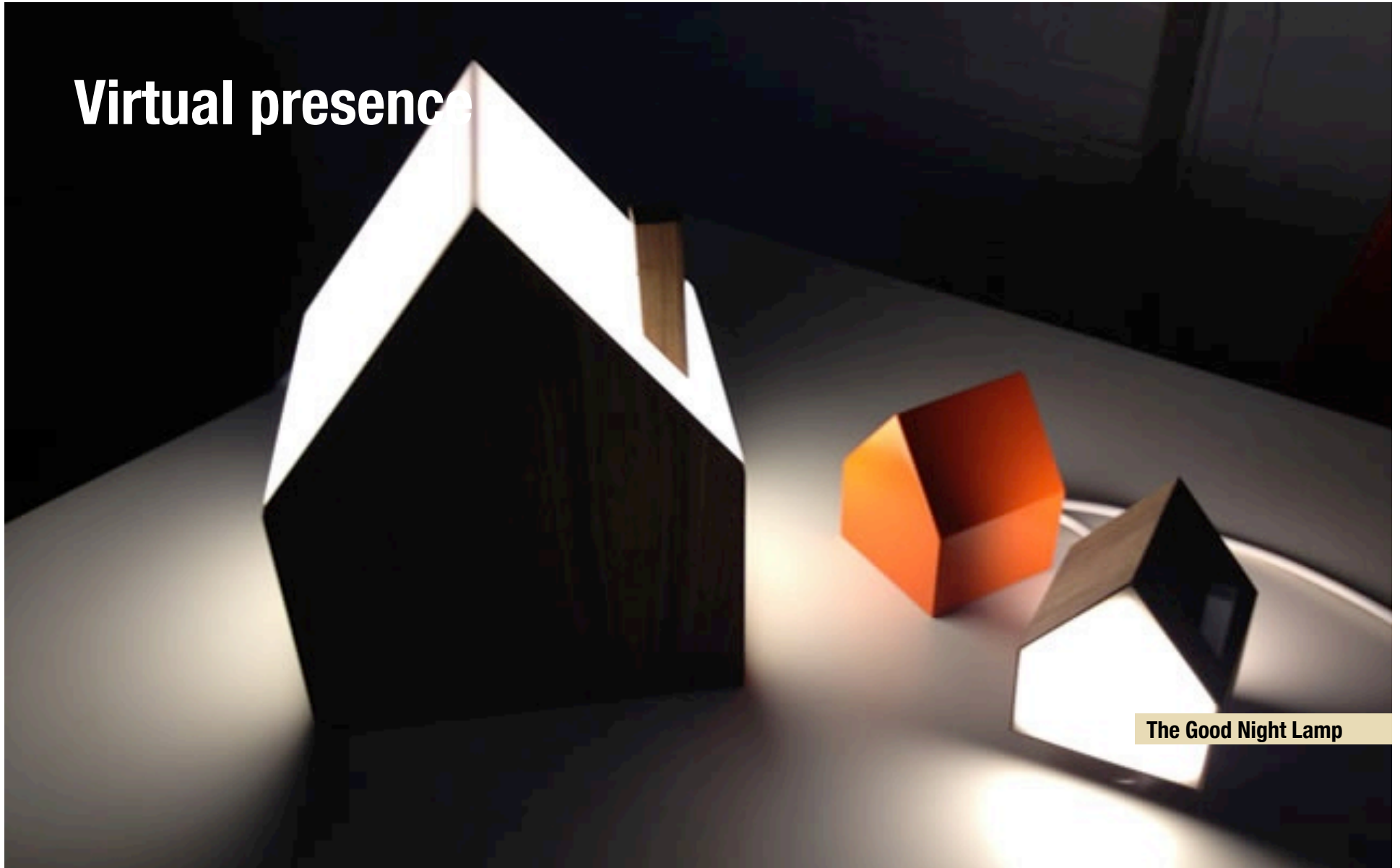
**Samsung Galaxy**

SMART DESIGN

UX London May 30, 2014

@carladiana\_

**Virtual presence**



**The Good Night Lamp**





# Team dynamics



SMART DESIGN

# Health care



Vitality Glow Caps

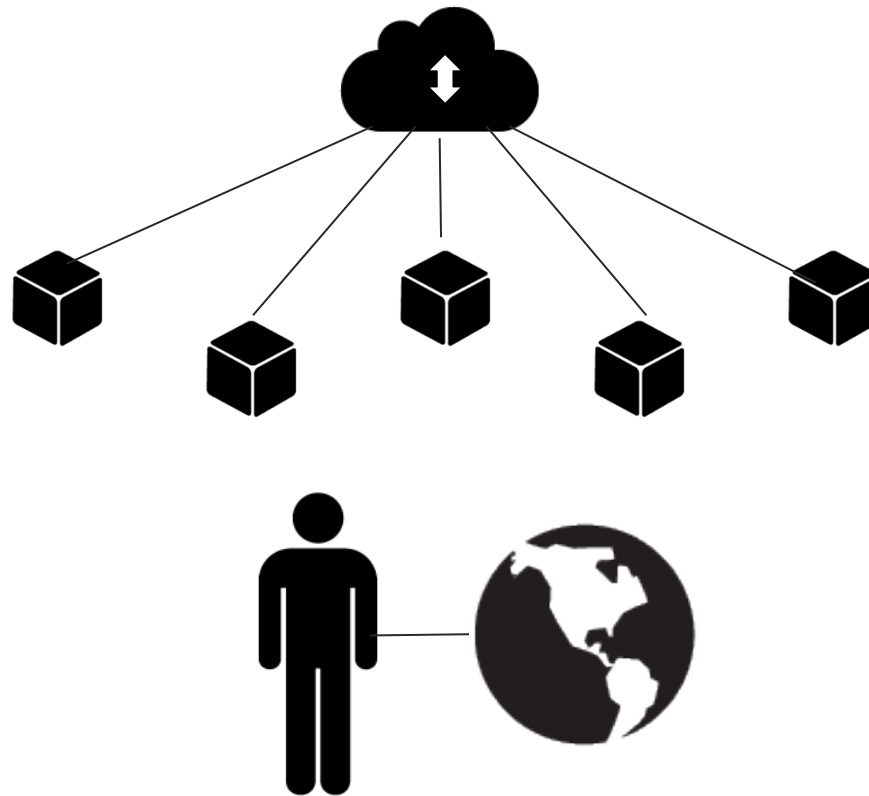
# Aging in place



Lively

# About our surroundings

**Exposing the Invisible**  
**Remote monitoring and control**  
**Accessing the inaccessible**  
**Microscopic/macroscopic**



# Exposing the invisible



Ambient Umbrella



# Exposing the invisible



**Lapka Blocks** (emf, humidity, nitrates)

# Exposing the invisible



**Cube Sensors** (VOC, temp, humidity, light, noise)



# Remote monitoring



Canary



# Remote control



Philips Hue



# Remote control and monitoring



Nest Thermostat



# Remote control



Belkin Wemo

# Remote monitoring



SMART DESIG

@carladiana\_



# Microscopic/Macroscopic



DIY Geiger Counter

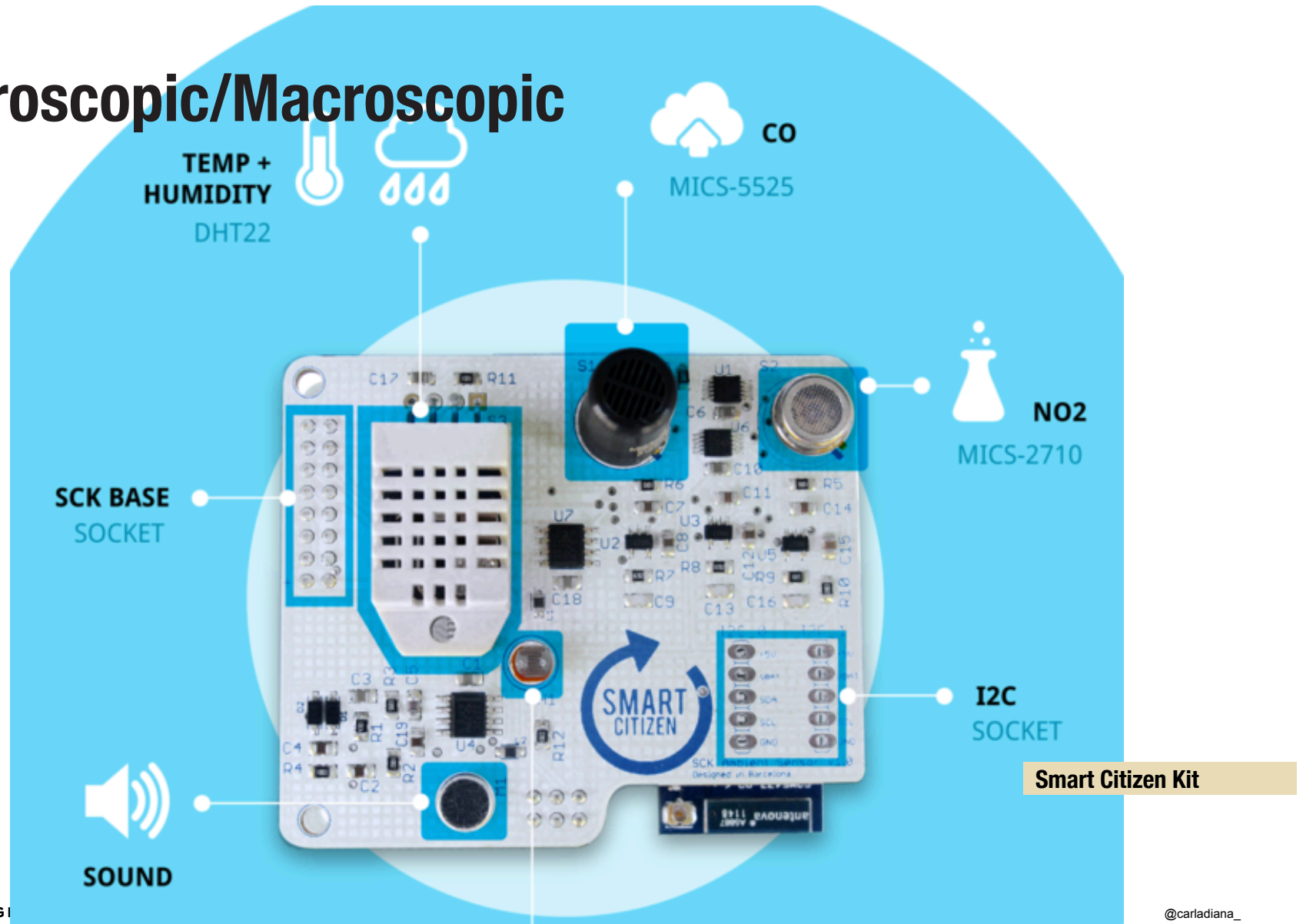


**Microscopic/Macroscopic**



**Air Quality Egg**

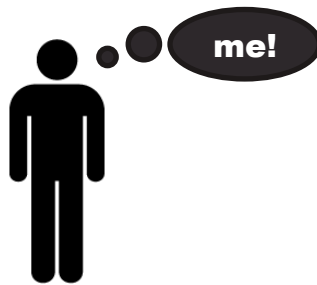
# Microscopic/Macroscopic





# Knowing...

## myself



**Self control**  
**Mindfulness**  
**Training**  
**Behavior change**  
**Identity**

## others



**Virtual presence**  
**Sharing**  
**Team dynamics**  
**Health care**

## the world



**Remote monitoring/control**  
**Accessing the inaccessible**  
**Exposing the invisible**  
**Macroscopic/microscopic**

**A blank slate moment**

# Becoming part of everyday life

**Products have to be “about” something:** flexible platforms like NinjaBlocks and Twine are amazing for developers but most people need a clear sense of purpose and need

**Data must be truly meaningful, compelling and fairly complete:** fitness trackers are great for runners and walkers, but what about cyclists and skaters?

**Information should come from multiple sources:** my Withings scale and data tracking is helpful, but not enough. Jawbone recently partnered with Whistle and Automatic to integrate data.

**Products must be easy to set up and install, giving us feedback in a human language:** with most new wireless products, we are still a long way from plug and play

**Vigilance and privacy must be balanced:** keeping a constant eye on your home is valuable, but design should provide feedback regarding what is being watched, when

**Power requirements are extremely challenging:** dealing with cords and batteries detracts from the experience.

**Methods:**  
**trying it out and making it happen**

# Hacking what's out there







### NEWSLETTER SIGN UP

Your Email Address...

Your email address will never be shared with third parties

**Submit**

## Connect your Robots. Reap the benefits™

User Name

.....

☐ Remember me next time

**LOG IN**

**SIGN UP**

[Forgot Your Password?](#)

[Learn More](#)

### 50 Billion Connected Devices by 2020, How Many Robots?

### NOW AVAILABLE



#### MyRobots Connect

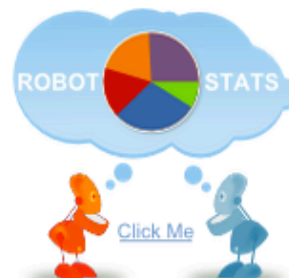
Serial-to-Ethernet gateway to get your robots connected right away.

Only USD \$77.55

**ORDER NOW**

### CONNECTED ROBOTS

Public: 576 Private: 140 Secret: ???



- [OldMan](#): LEGO MindSto...
- [Rushay](#): iRobot Roomb...
- [My little ...](#): Arduino
- [jplrob](#): DFRobotShop ...
- [kiran](#): Custom Robot

[VIEW ALL](#)

### FOLLOW US



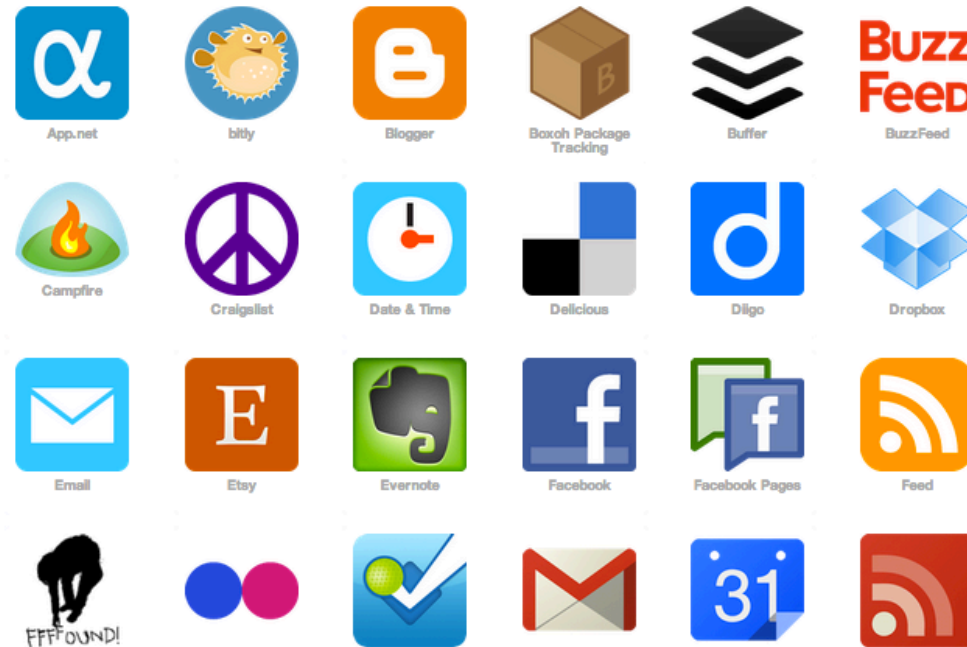
### SHARE IT

[Tweet](#) 41 [+1](#) 41 [Share](#) 43

# ifthisthenthat

## Choose Trigger Channel step 1 of 7

Showing Channels that provide at least one Trigger. [View all Channels](#)



## Explore



### Add Event to Google Calendar from Evernote

Use the title of an Evernote note to create an event in Google Calendar.

Use This Zap!



### Add Card to Trello from Email

Send email to Zapier mailbox to create new card in Trello.

Use This Zap!



### Save Gmail Emails to Evernote

Automatically send Gmail emails to Evernote as notes.

Use This Zap!



### Add Note to Evernote for Google Calendar Events

Use This Zap!

SMART DESIGN

January 29, 2013

76

SMART DESIGN

UX London May 30, 2014

@carliadiana\_



# ThingSpeak

[HOME](#)[CHANNELS](#)[APPS](#)[FEATURES](#)[Community](#)[Documentation](#)[Sign In](#)[Sign Up](#)

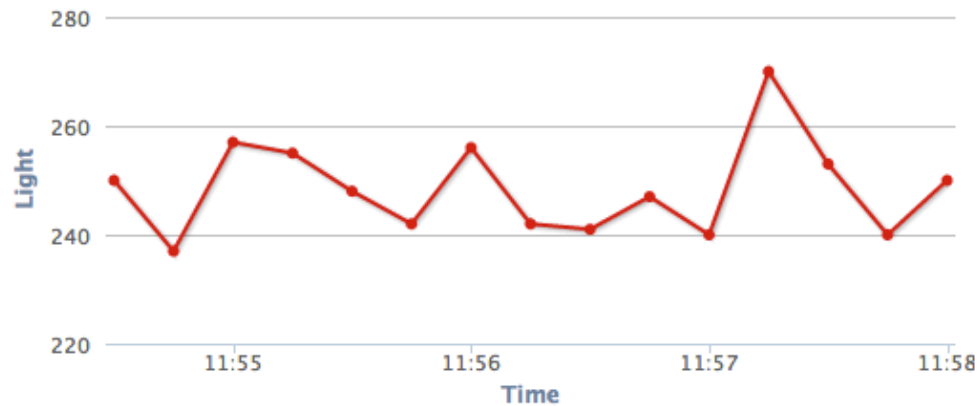
create your  
Internet of Things  
application with

# ThingSpeak

[ an open application platform  
designed to enable meaningful  
connections between things  
and people ]



Dynamic Light Levels



ThingSpeak.com

You left your lights on  
2 minutes ago



Light level was 89%  
in your room.



dweet.io

Play Lock a Thing

Share your thing —  
like it ain't no thang.

Try It Now

(Hint: For BIG fun, try it on your smartphone or tablet)

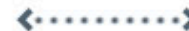
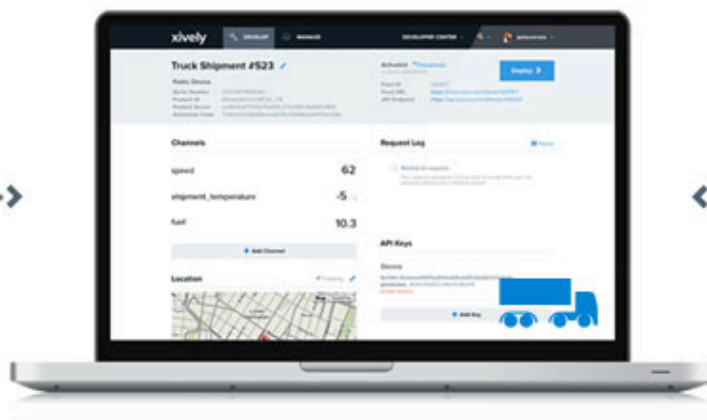
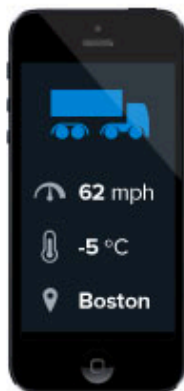


Ridiculously simple messaging  
for the Internet of Things.

Fast, free and ridiculously simple— it's like Twitter  
for social machines.



## Integrate your application and services with your connected object



Customer CRM  
Services

**Build connected apps  
for anything and  
everything**

**Design, build and debug your connected  
product with full control.**

Using the **Xively Developer Workbench**, you can get

**Integrate and leverage  
your own backend  
services**

freeboard

+ ADD PANE

DATASOURCES

Sensors	12:26:33 AM	↺	🗑
Weather	12:58:23 AM	↺	🗑
Clock	12:58:26 AM	↺	🗑

ADD


CURRENT TIME

+ 🔧 🗑

12:58:26 AM

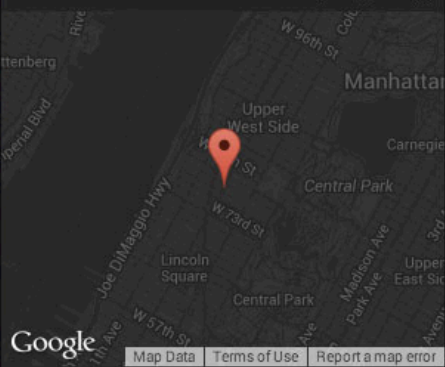
WEB CAM

+ 🔧 🗑



MAP

+ 🔧 🗑



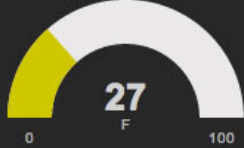
Google

Map Data Terms of Use Report a map error

LOCAL CONDITIONS

+ 🔧 🗑

Outside Temp




27 F

MOTION DETECTION

+ 🔧 🗑

X Accelerometer

2



freeboard

REMOTE PROPERTY MONITOR

🗑 FULLSCREEN

👤 SHARE

🔄 CLONE

# How Breakout Works

## Physical Input:

Buttons/switches  
Analog sensors  
Digital sensors  
etc...



**I/O Board**

## Physical Output:

Leds  
Servos  
DC Motors  
etc...



**Web Apps**



**Mobile Web Apps**

## / CLIENTS

### testbutton

testbutton

boolean	buttonPress	<input checked="" type="radio"/>
number	currentColor	<input type="radio"/>
string	currentMessage	<input type="radio"/>

### testsignage

testsignage

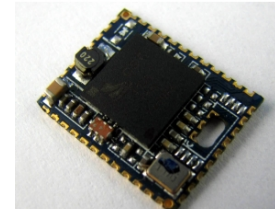
boolean	signageOn	<input type="radio"/>
number	currentColor	<input type="radio"/>
string	currentText	<input type="radio"/>

## / PUBLISHERS

## / SUBSCRIBERS

<input type="radio"/> partyMode	boolean
<input type="radio"/> color	number
<input type="radio"/> text	string

<input checked="" type="radio"/> signageOn	boolean
<input type="radio"/> color	number
<input type="radio"/> text	string



**3G**  
**Lowest friction**

**WiFi**  
**In a home, office (not moving)**



**Bridge**

**Tethered (USB, headphone)**

**BLE**

**ZigBee, Zwave**

**RF**

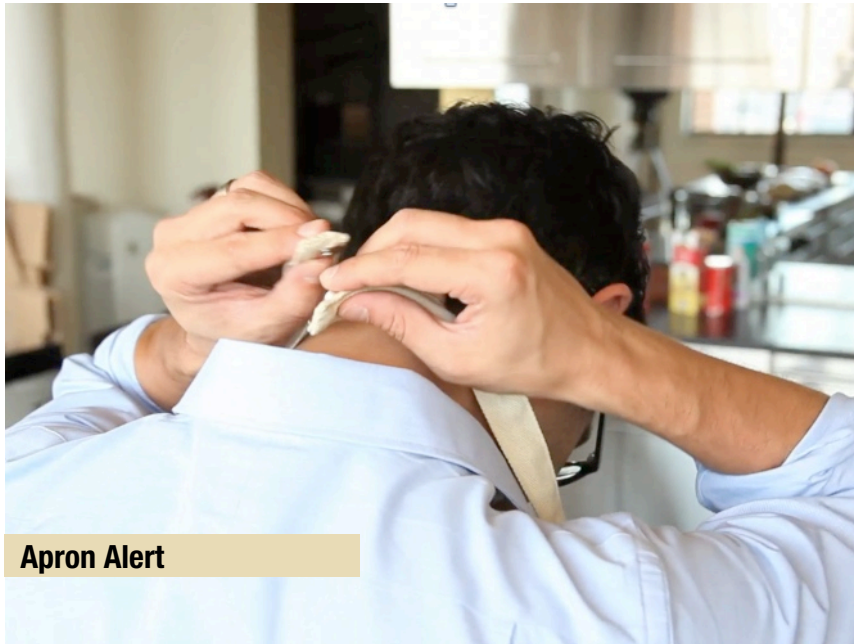
**NFC (trusted network)**

**RFID**

**Something fun**



# Experiments in the lab



# Experiments in the lab



What's Up Smart



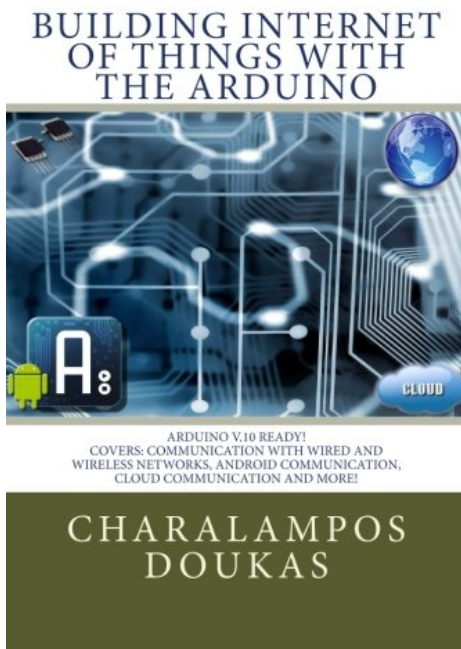


# Apron Alert!

# **Resources**

---

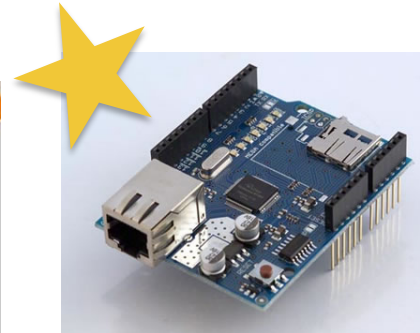
# Tech resources: [smartinteractionlab.com](http://smartinteractionlab.com)



Building Internet of Things With Arduino



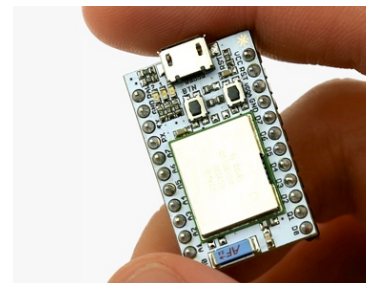
Designing the Internet of Things



Arduino ethernet shield/  
wifi shield



Nanode



Spark Core



Electric Imp



# Say Hello!

---

@carladiana\_  
smartinteractionlab.com

carla.diana@smartdesignworldwide.com