Disclaimer:

do NOT try to make the things you’ll see in the show without help from an adult, ask a professor, a senior fellow or your granddad

do NOT use this for medical applications, do not lick batteries, do not put your wet fingers into power-plugs, not swallow parts, wires are not candy...
Just a quick note:

*OSHW Summit in NYC was cool*

... but one week later *OSHWCON in Madrid gathered over 600 people and nobody knows about it ...*

... *remember that really cool things are happening here as well ;-)*
Presentation brought to you by ...
2005 → *We were asking ourselves ...*

**But how can we bring the digital world to interact with the physical one? Which tools are available?**
2011 → the Internet of Things brings up the question:

But how can we bring the digital world to interact with the physical one? Which tools are available?
2011 → more specifically:

What is best in terms of OS for developing embedded systems?

Until things happen, how can we quickly prototype new devices and services?
Universe of connected objects:

**Possibility #1** - they are connected at all times, all mighty network of objects that reports in endless streams of data

**Possibility #2** - they are connected when we are there, it is as if a part of the network was dormant until we show up
Possibility #1: *Quake Detector, Sebastian (14) Chile*

https://twitter.com/#!/alarmasismos
Possibility #2: Connected Gym as seen at Google IO

http://www.engadget.com/2011/05/10/live-from-google-i-o-2011s-opening-keynote/
Challenges for the growth of the IoT:

1) design tools

2) current subscription and roaming models

3) configuration UIs → less PC, more mobile
Community
Arduino Boards Out There

*Just the oficial ones*

![Graph showing the growth of Arduino boards sold from 2005 to 2011. The graph includes an estimate (red line) and units sold (blue line).]
And this adds up to ...

314.461 units

between Sept 2005 and Aug 2011
How open is open for Arduino?

1) software IDE is GPL (inherited)

2) core is GPL (inherited)

3) hardware blueprints are CC 3.0 SA

4) documentation is CC 3.0 SA
Examples:

1) *quick wireless pico network*

2) *ping machine*

3) *wire connected accessory*
**Microcontroller**
- ADK: ATmega2560
- EtherCAT: ATmega328
- Leonardo: ATmega32U4
- Arduino DUE: Atmel SAM3U4E ARM Cortex M3

**Clock**
- ADK: 16 MHz
- EtherCAT: 16 MHz
- Leonardo: 16 MHz
- Arduino DUE: 96 MHz

**Flash Memory**
- ADK: 256 KB
- EtherCAT: 32 KB
- Leonardo: 32 KB
- Arduino DUE: 256 KB

**SRAM**
- ADK: 8 KB
- EtherCAT: 2 KB
- Leonardo: 3.3 KB
- Arduino DUE: 50 KB

**Digital I/O Pins**
- ADK: 54
- EtherCAT: 14 (10)
- Leonardo: 14
- Arduino DUE: 54

**Analog Pins**
- ADK: 16
- EtherCAT: 6
- Leonardo: 6
- Arduino DUE: 16 (12bit)

**NEW PRODUCTS**
- **Android ADK**
  - Develop your own<br>android accessory!

**Arduino Robot System**
- Look for us at<br>Maker Faire<br>2011/New York

**WiFi**
- Avr32 co-processor with fully open-source firmware
- H&D wifi module
- Easy to upgrade firmware
- Fully Hackable!

**TinkerKit**
- Breadboard-free electronic prototyping
- 30+ different modules
- Easy to use instructions & tutorials!

**Arduino Robot System**
- Arduino based dual platform robot
- Multiprocessor
- TinkerKit-compatible
- Program your own behaviours!