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:

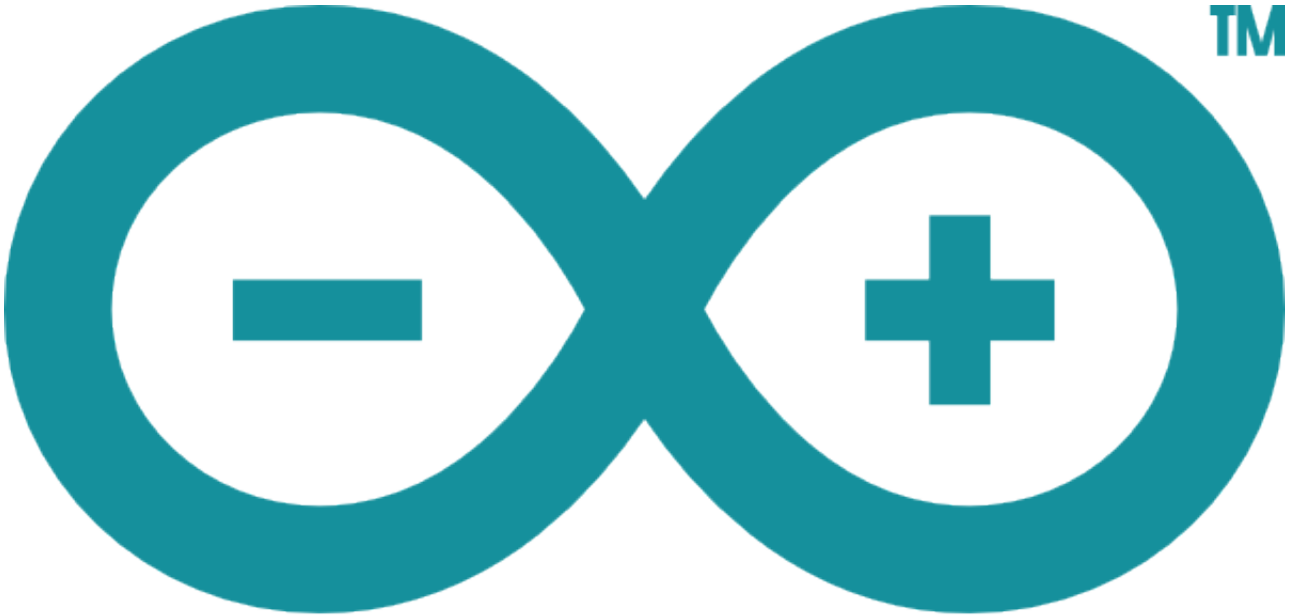
OSHW Summit in NYC was cool

… 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 ...

MEDEA
one scale one
Telefónica
ARDUINO
MALMÖ HÖGSKOLA



ARDUINO

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:

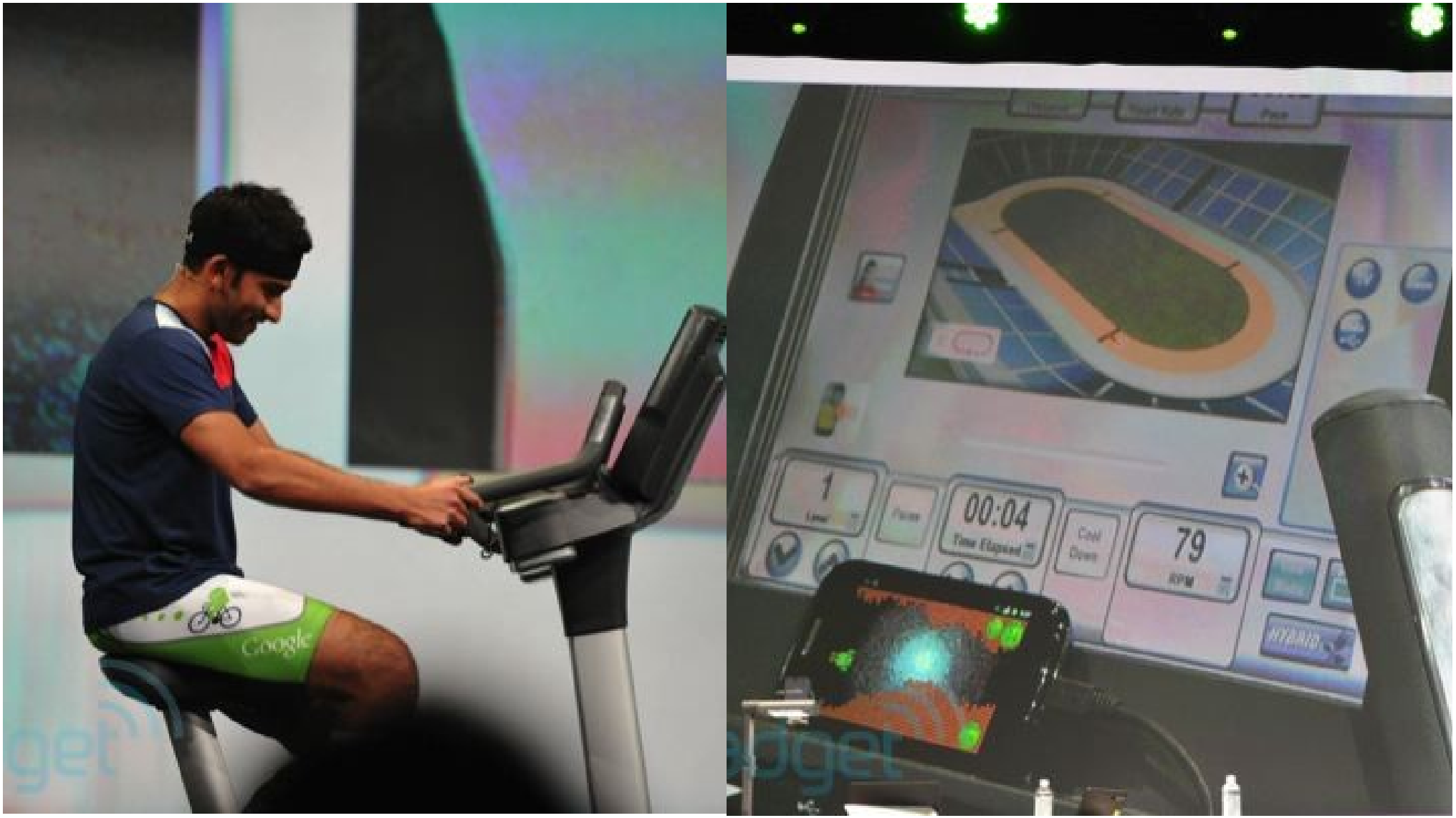
Possibility #1 *- they are connected at all times, all mighty network of objects that reports in endless streams of data*

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*



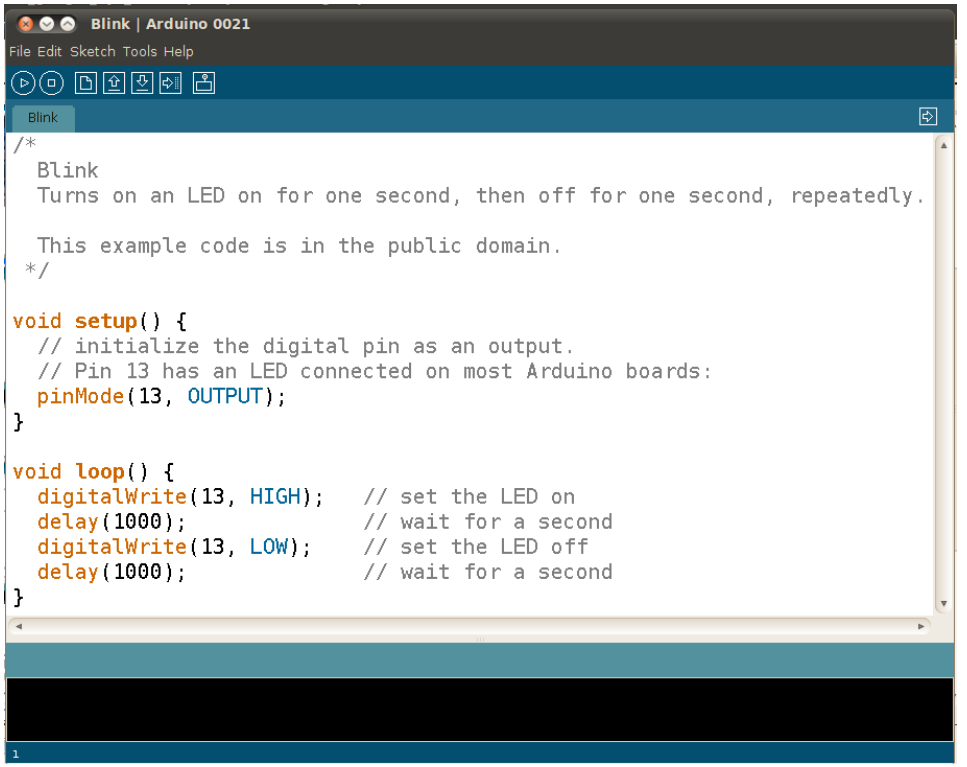
http://www.engadget.com/2011/05/10/live-from-google-i-o-2011s-opening-keynote/

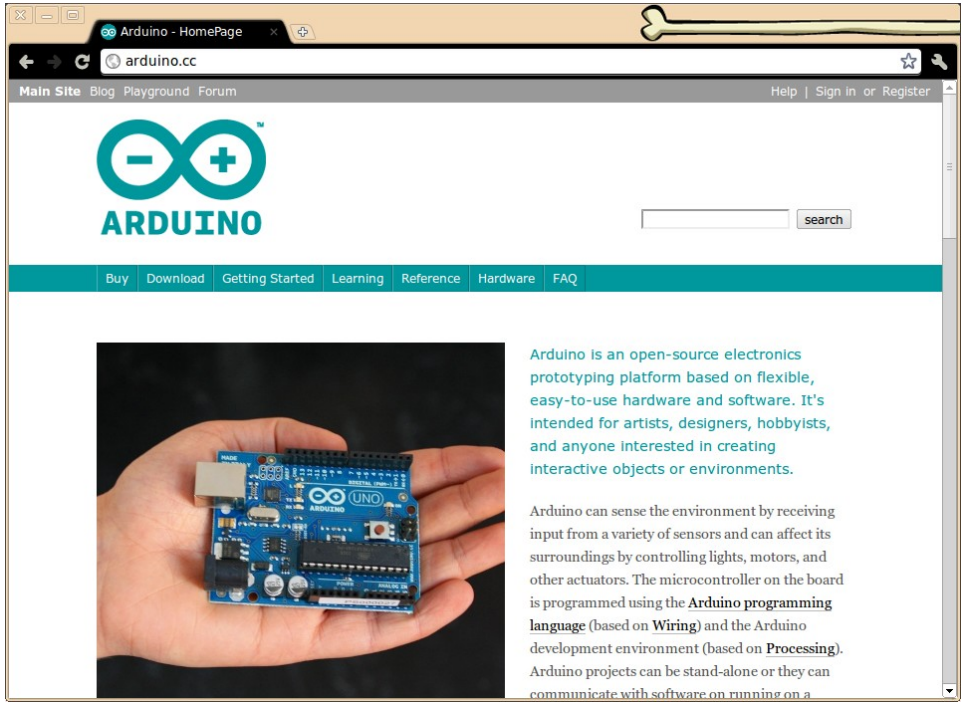
Challenges for the growth of the IoT:

1) design tools

2) current subscription and roaming models

3) configuration UIs → less PC, more mobile



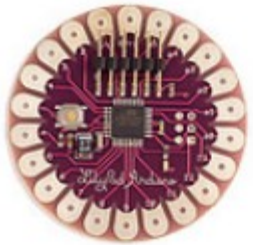


Community

ARDUINO™

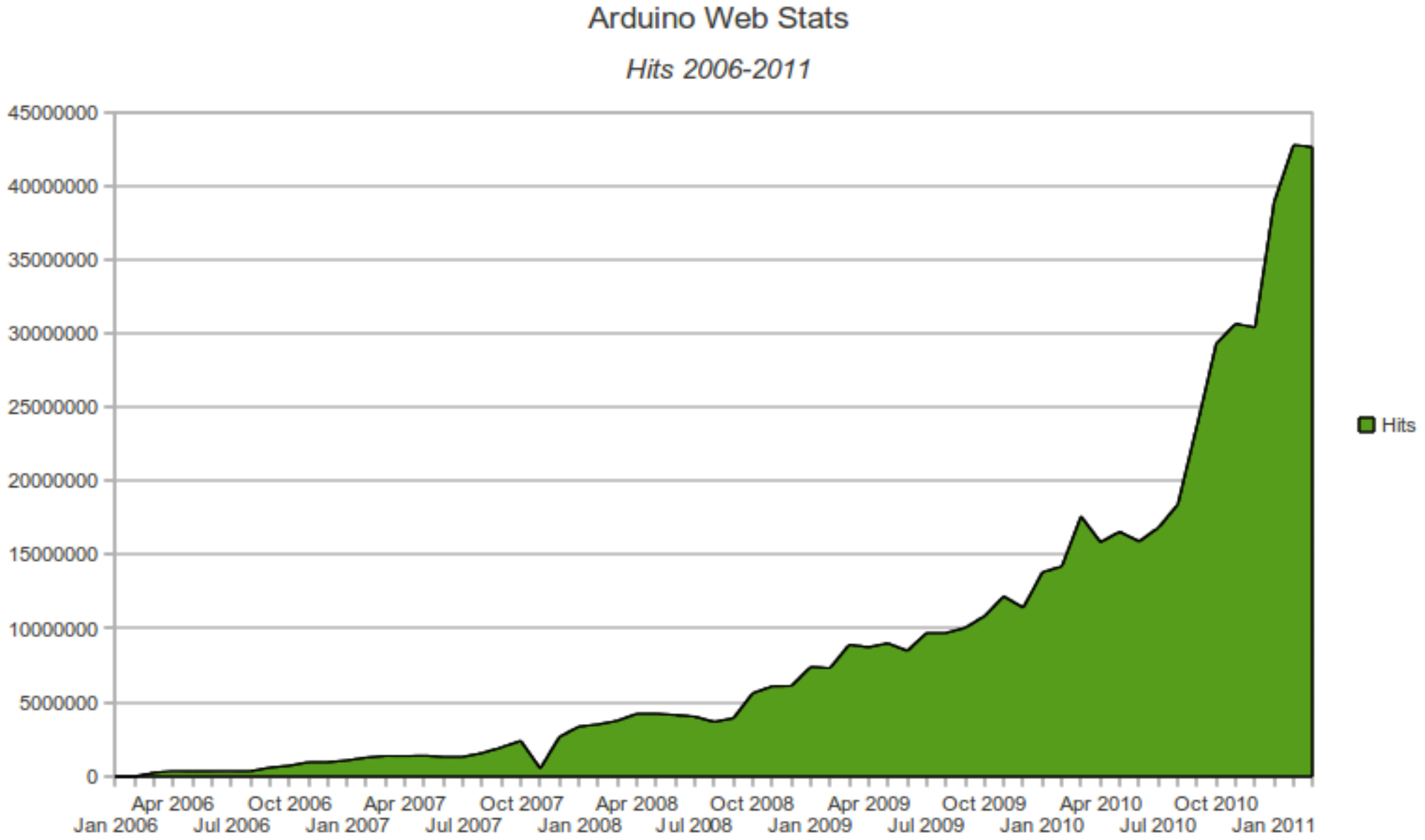
UNO

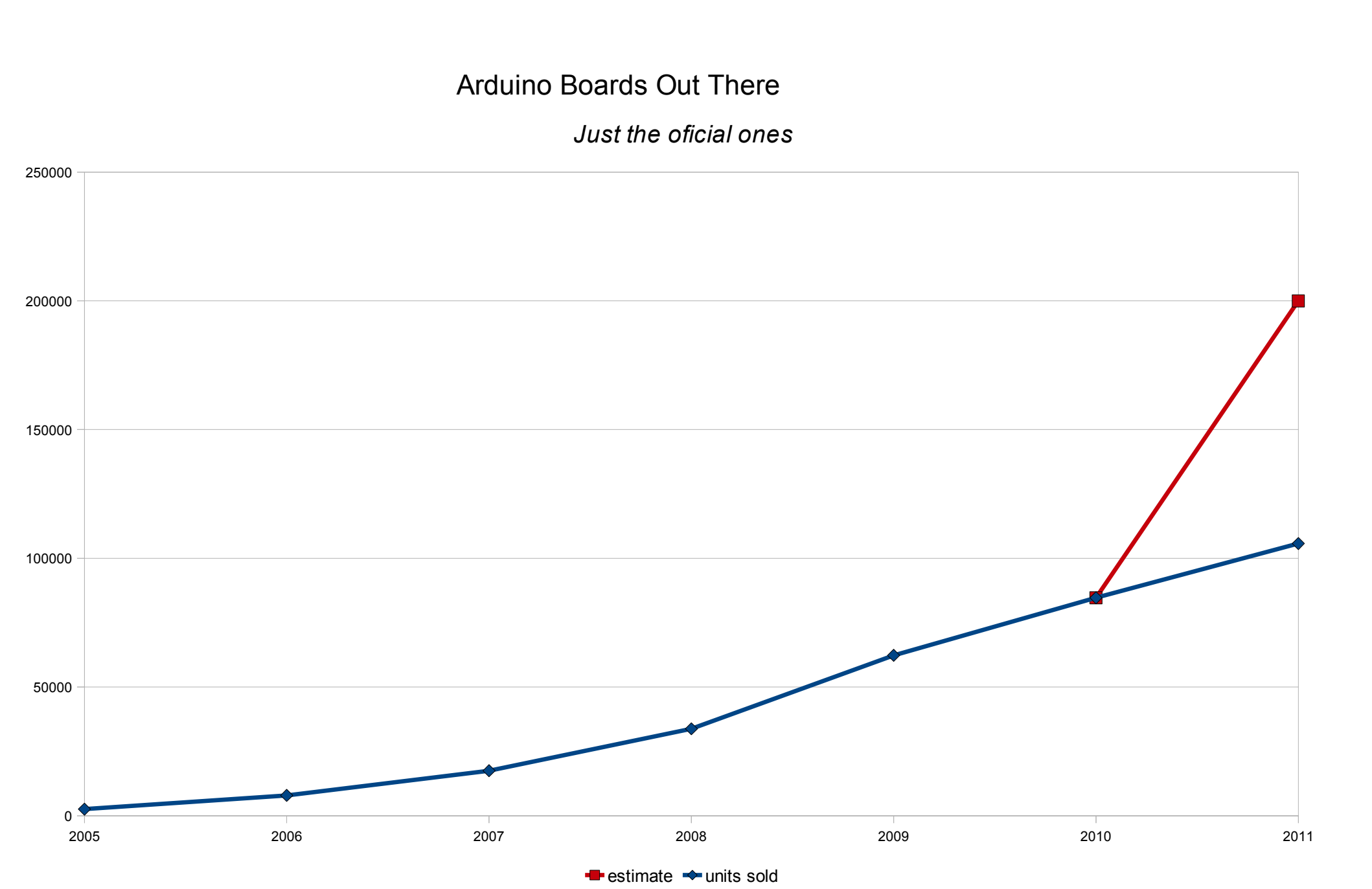
MEGA



XBee

tinkerit

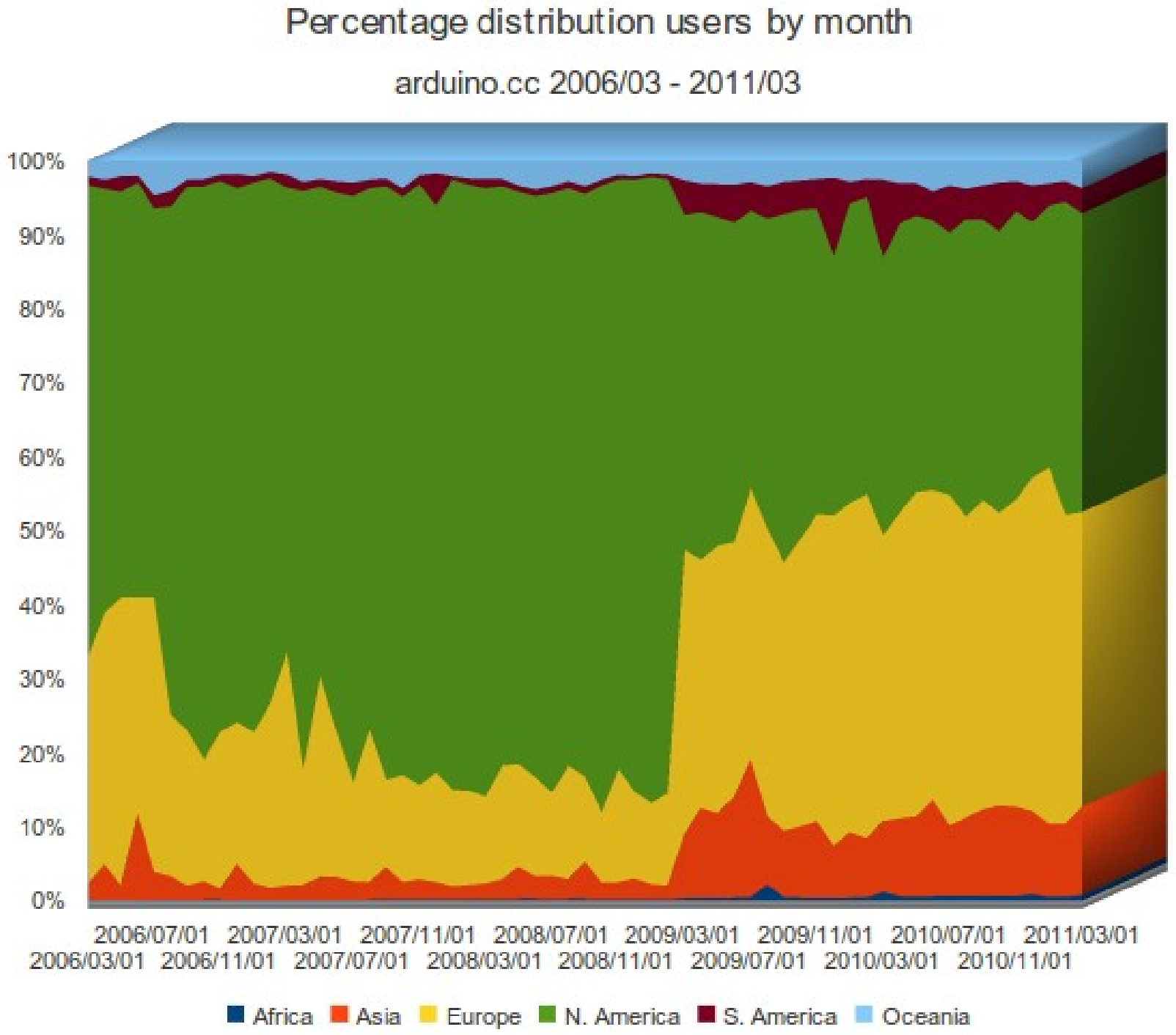

Arduino Web Stats
Hits 2006-2011
45000000
40000000
35000000
30000000
25000000
20000000
15000000
10000000
5000000
0
Hits
Jan 2006
Apr 2006
Jul 2006
Oct 2006
Jan 2007
Apr 2007
Jul 2007
Oct 2007
Jan 2008
Apr 2008
Jul 2008
Oct 2008
Jan 2009
Apr 2009
Jul 2009
Oct 2009
Jan 2010
Apr 2010
Jul 2010
Oct 2010
Jan 2011


Arduino Boards Out There
Just the oficial ones
250000
200000
150000
100000
50000
0
2005
2006
2007
2008
2009
2010
2011
estimate
units sold

And this adds up to ...

314.461 units

between Sept 2005 and Aug 2011


Percentage distribution users by month
arduino.cc 2006/03 - 2011/03
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2006/07/01
2007/03/01
2007/11/01
2008/07/01
2009/03/01
2009/11/01
2010/07/01
2011/03/01
2006/03/01
2006/11/01
2007/07/01
2008/03/01
2008/11/01
2009/07/01
2010/03/01
2010/11/01
Africa
Asia
Europe
N. America
S. America
Oceania

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

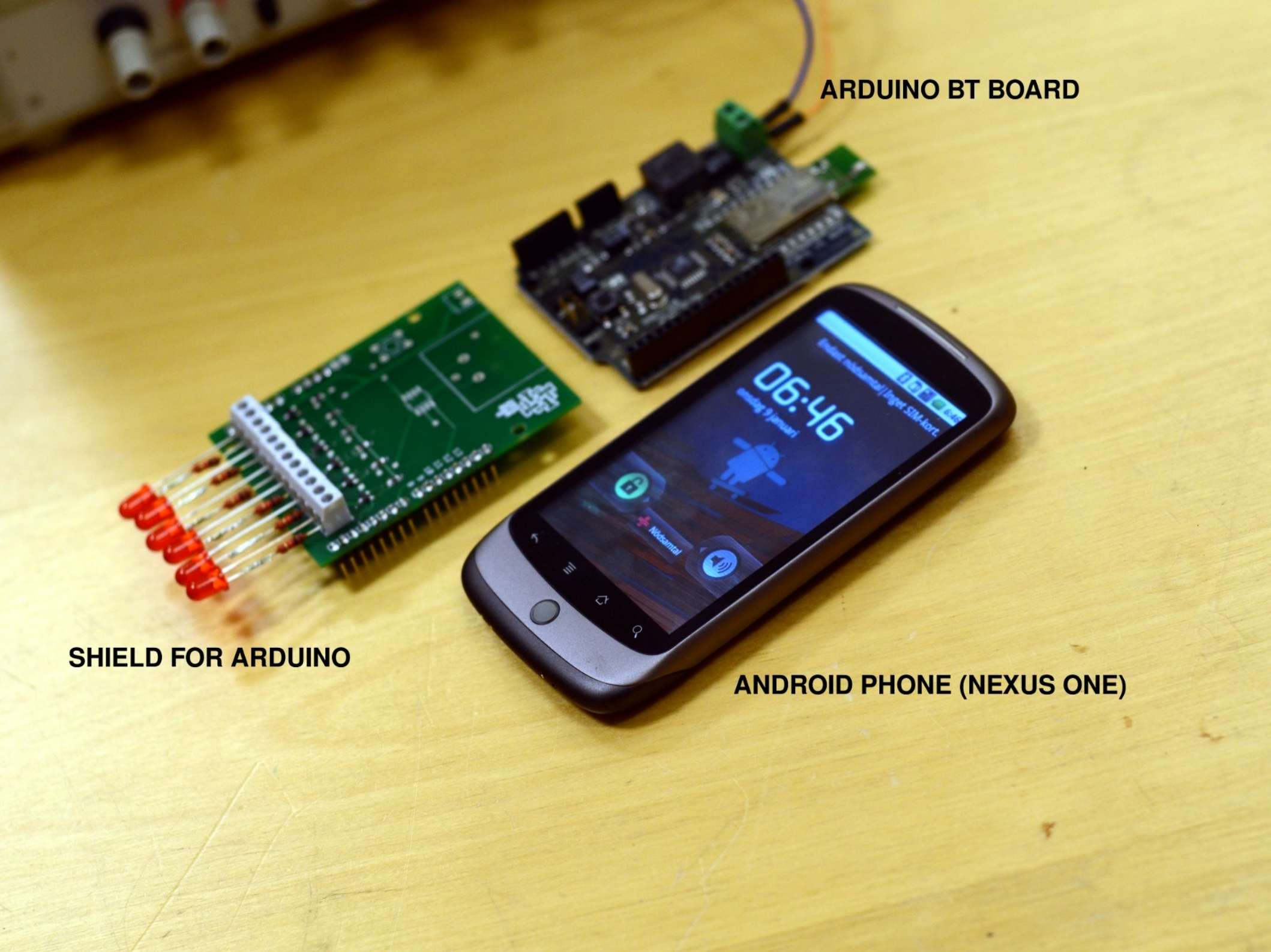
4) documentation is CC 3.0 SA

Examples:

1) quick wireless pico network

2) ping machine

3) wire connected accessory


ARDUINO BT BOARD
SHIELD FOR ARDUINO
ANDROID PHONE (NEXUS ONE)
06:46

ÅTERLÄMNAS TILL
KITS
PONSAB
040-93 55 90
CABLES

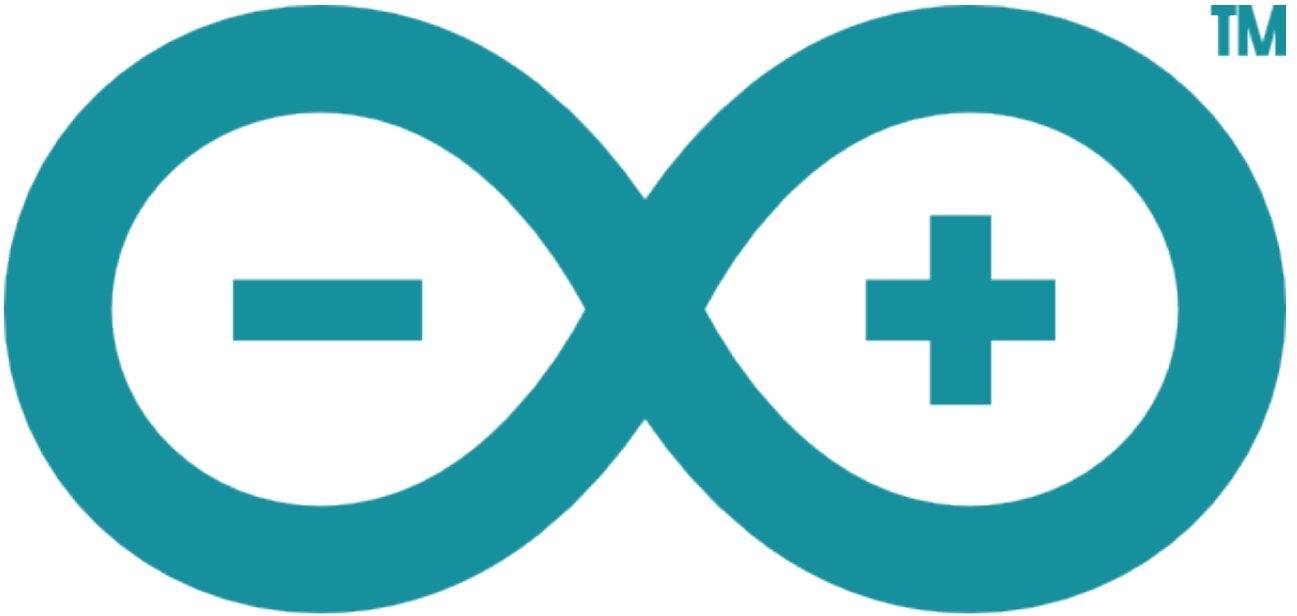
Telefónica

Telefónica
Investigación y Desarrollo

WWW.ARDUINO.CC
AREF
GND
13
12
11
10
9
8
7
6
5
4
3
2
TX0 1
RX0 0
TX3 14
RX3 15
TX2 16
RX2 17
TX1 18
RX1 19
SDA 20
SCL 21
PWM
COMMUNICATION
RESET-EN
3.3V
5V
GND
GND
Vin
ANALOG IN
A0
A1
A2
A3
A4
A5
6
A7
A8
A9
A10
A11
A12
A13
A14
A15
ICSP
RESET
ON
ARDUINO
MEGA ADK
fox Android™
DEVELOPER EDITION
DIGITAL
SCK
MISO
48
46
44
42
40
38
36
34
32
30
28
26
24
22

RELAY 2
NC
COM
NO
NC
COM
NO
RELAY 1
SERVOS
NOTE: EACH RELAY
24VDC 1A MAX
RESET
K2
K1
AREF
GND
13
12
11
10
9
8
Reset
+3V3
+5V
GND
GND
+Vin
Temp
Light
LED1
LED2
LED3
7
6
5
4
3
2
TX0-1
RX0-0
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
Tx3 14
Rx3 15
Tx2 16
Rx2 17
Tx1 18
Rx1 19
SDA 20
SCL 21
Google
ANDROID
Accessory
Demo Shield

FISKERIET
FISKERIET
FISKERIET



ARDUINO

ARDUINO™

	ADK	Ethernet	Leonardo	Arduino DUE
Microcontroller	ATmega2560	ATmega328	ATmega32U4	Atmel SAM3U4E ARM Cortex M3
Clock	16 MHz	16 MHz	16 MHz	96 MHz
Flash Memory	256 KB	32 KB	32 KB	256 KB
SRAM	8 KB	2 KB	3.3 KB	50 KB
Digital I/O Pins	54	14 (10)	14	54
Analog Pins	16	6	6	16 (12bit)
	Android ADK Compatible USB Host **Develop your own android accessory!**	Wiznet W5100 Ethernet interface Optional PoE Module **Bring your project online!**	Onboard USB controller **Build your own USB devices!**	Onboard dual-channel DAC **Bringing 32 bit power to Arduino!**

NEW PRODUCTS

Wifi	TinkerKit	Arduino Robot System
Avr32 co-processor with fully open-source firmware	Breadboard-free electronic prototyping	Arduino based dual platform robot
H&D wifi module	30+ different modules	Multiprocessor
Easy to upgrade firmware **Fully Hackable!**	**Easy to use instructions & tutorials!**	TinkerKit-compatible **Program your own behaviours!**

Look for us at Maker Faire 2011/New York

www.arduino.cc