

# Arduino e a Internet das Coisas

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*FISL13*

# Agenda

- Arduino
- Internet das Coisas
- Arduino + Internet

# Arduino

HW e SW livre

Comunidade

Simples

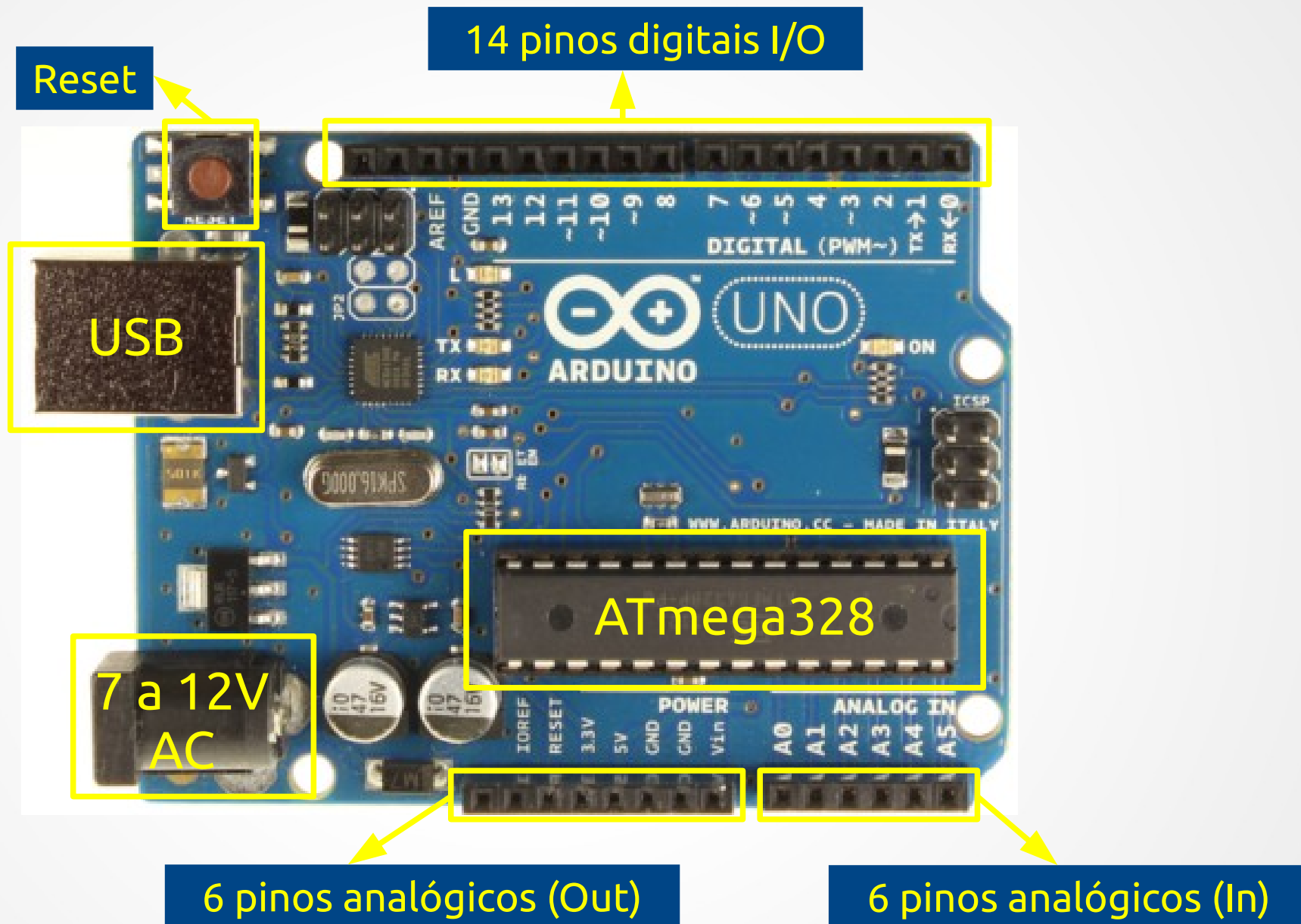
Baixo custo

Dispositivos Interativos



[www.arduino.cc](http://www.arduino.cc)

# Arduino - HW

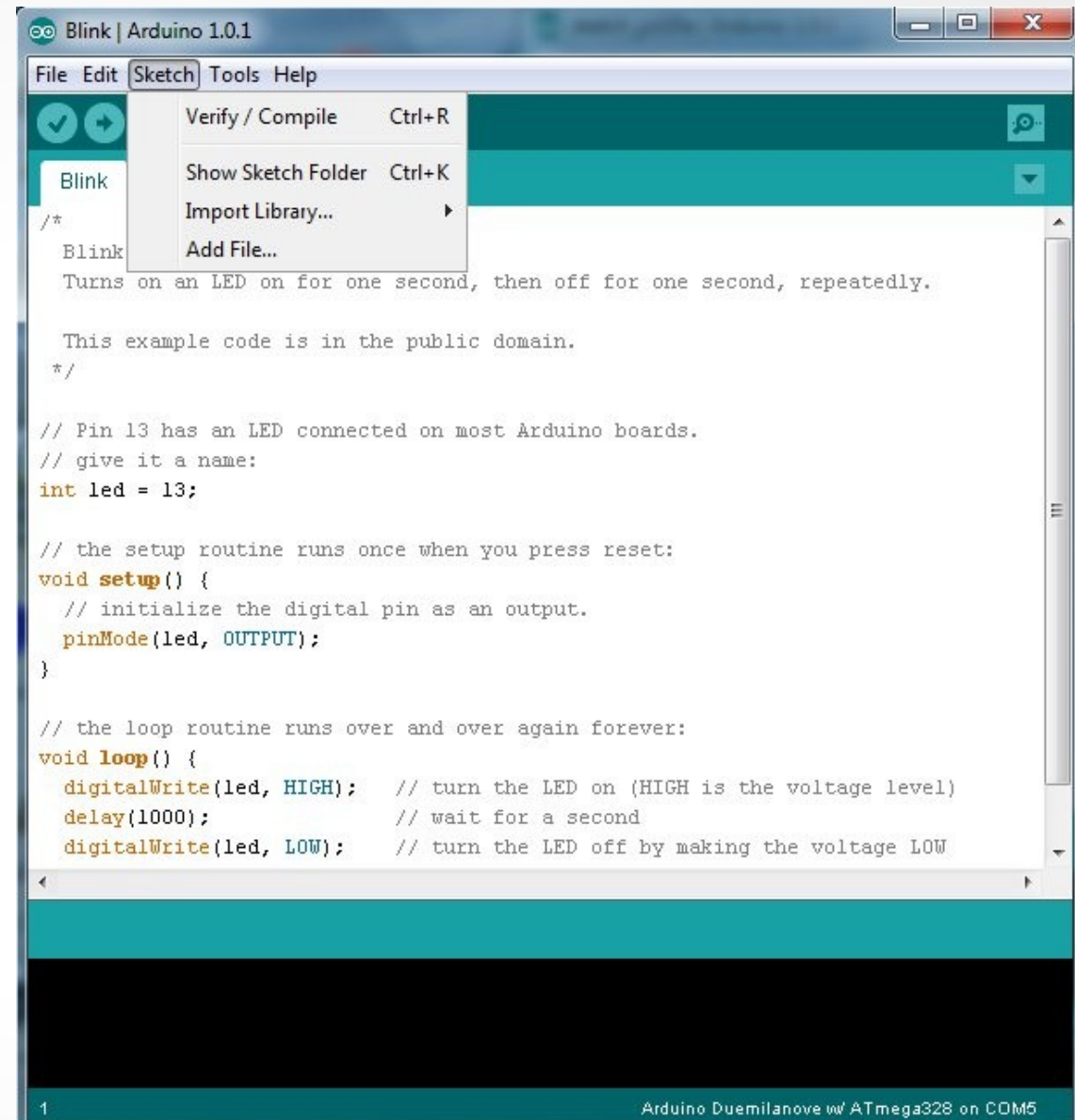


# Arduino - SW

IDE multiplataforma

Sketches

Wiring



Arduino e a Internet das Coisas

# Sketch

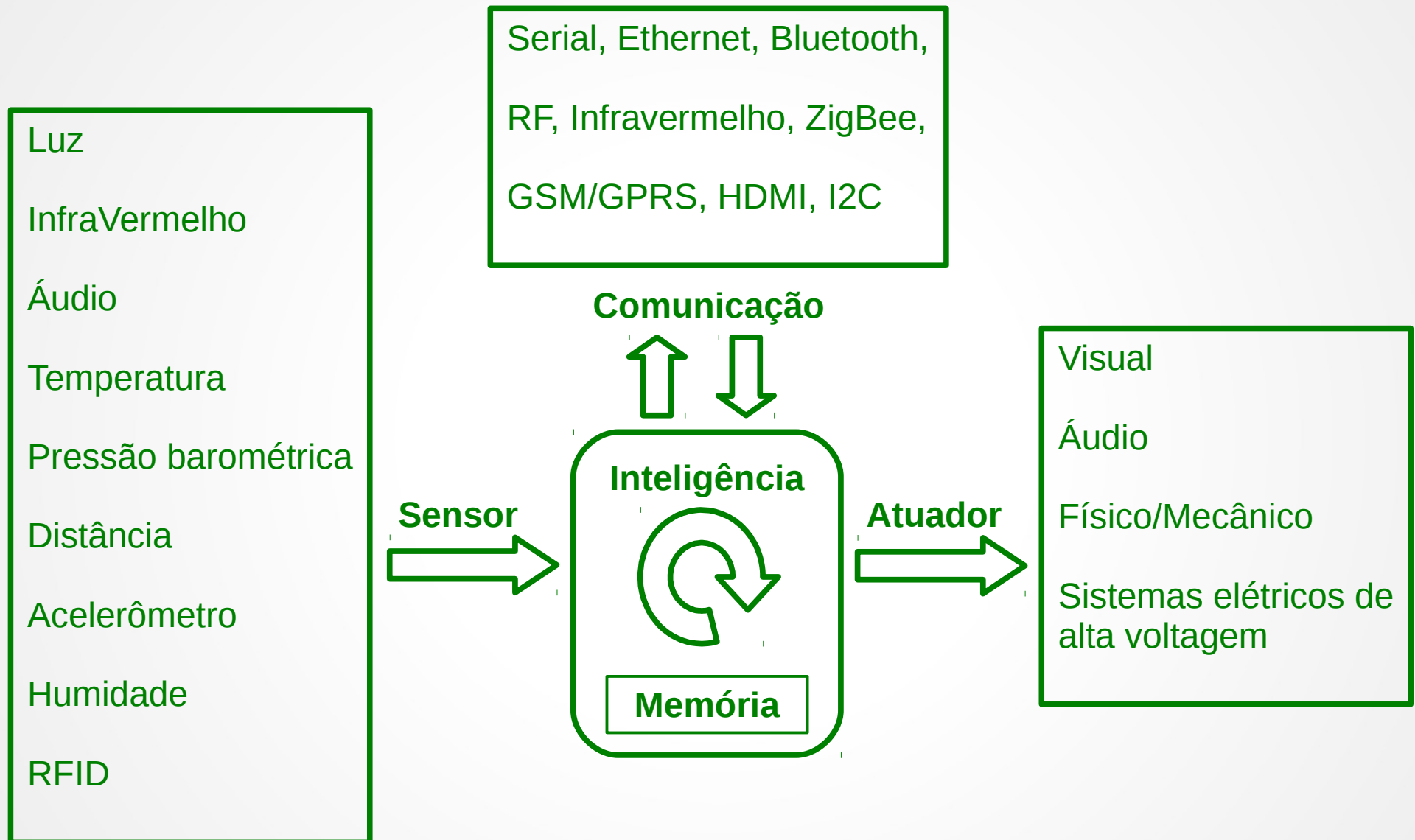
```
//Declaração de bibliotecas
#include <Client.h>
#include <Ethernet.h>
#include <Server.h>

//Declaração de variáveis globais
int i=0;
float x=1.23;

void setup() {
//instrução 1;
//instrução 2;
}

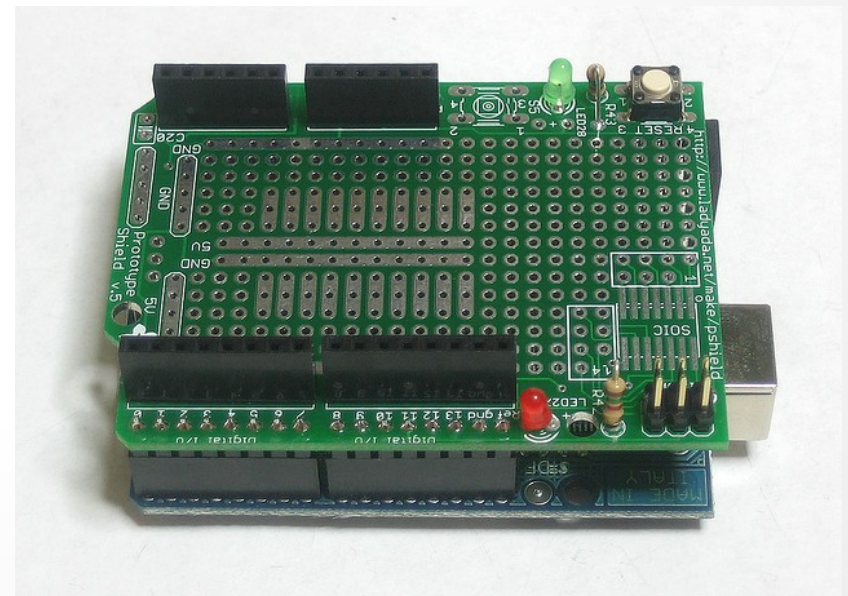
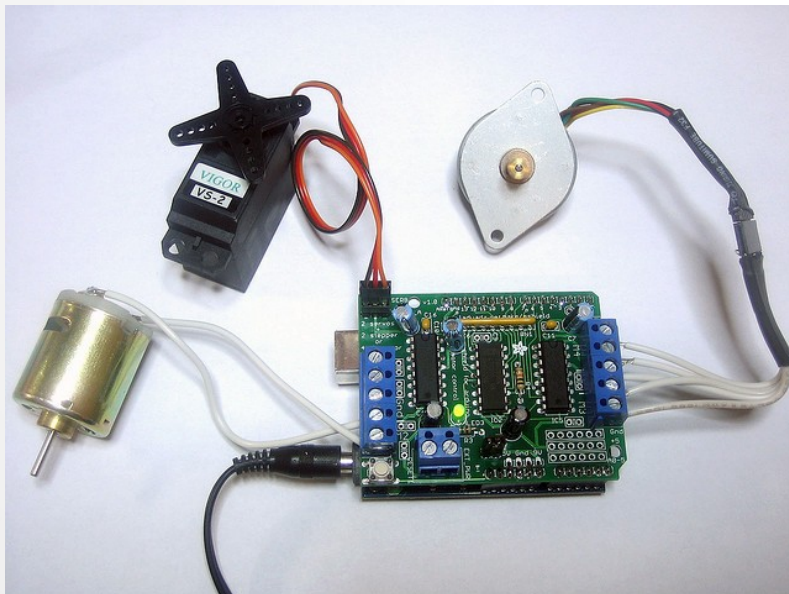
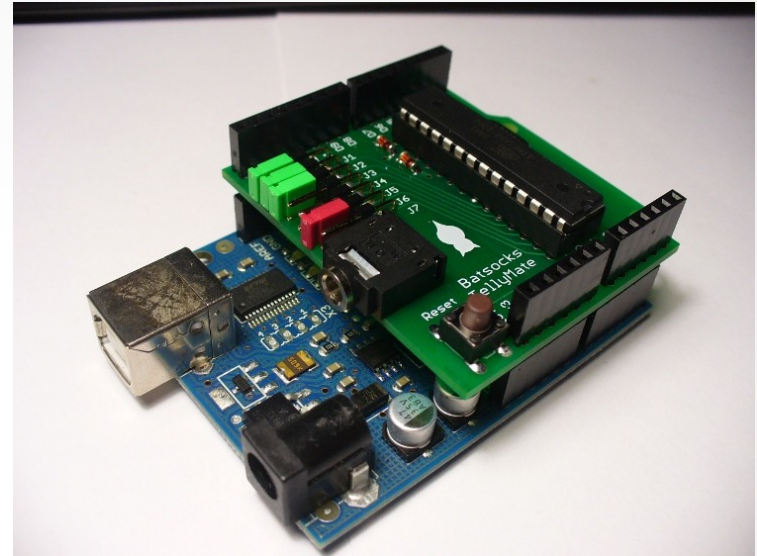
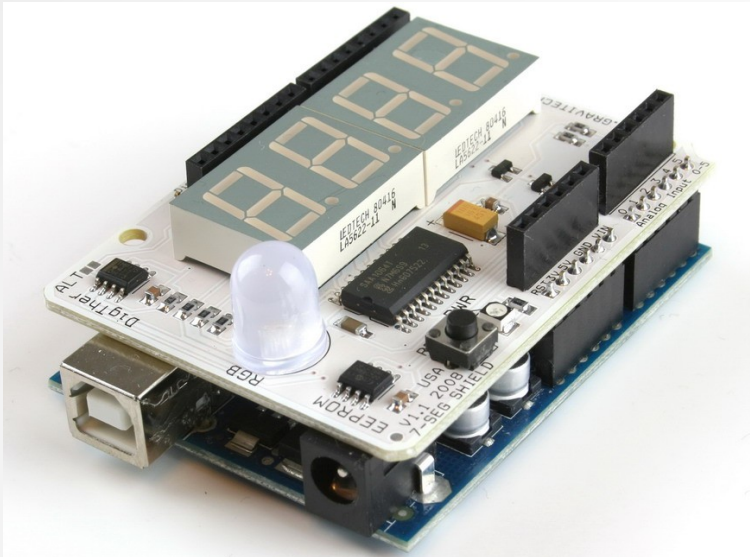
void loop() {
//instrução 3;
//instrução 4;
}
```

# Sensores, Atuadores e Comunicação





# Shields





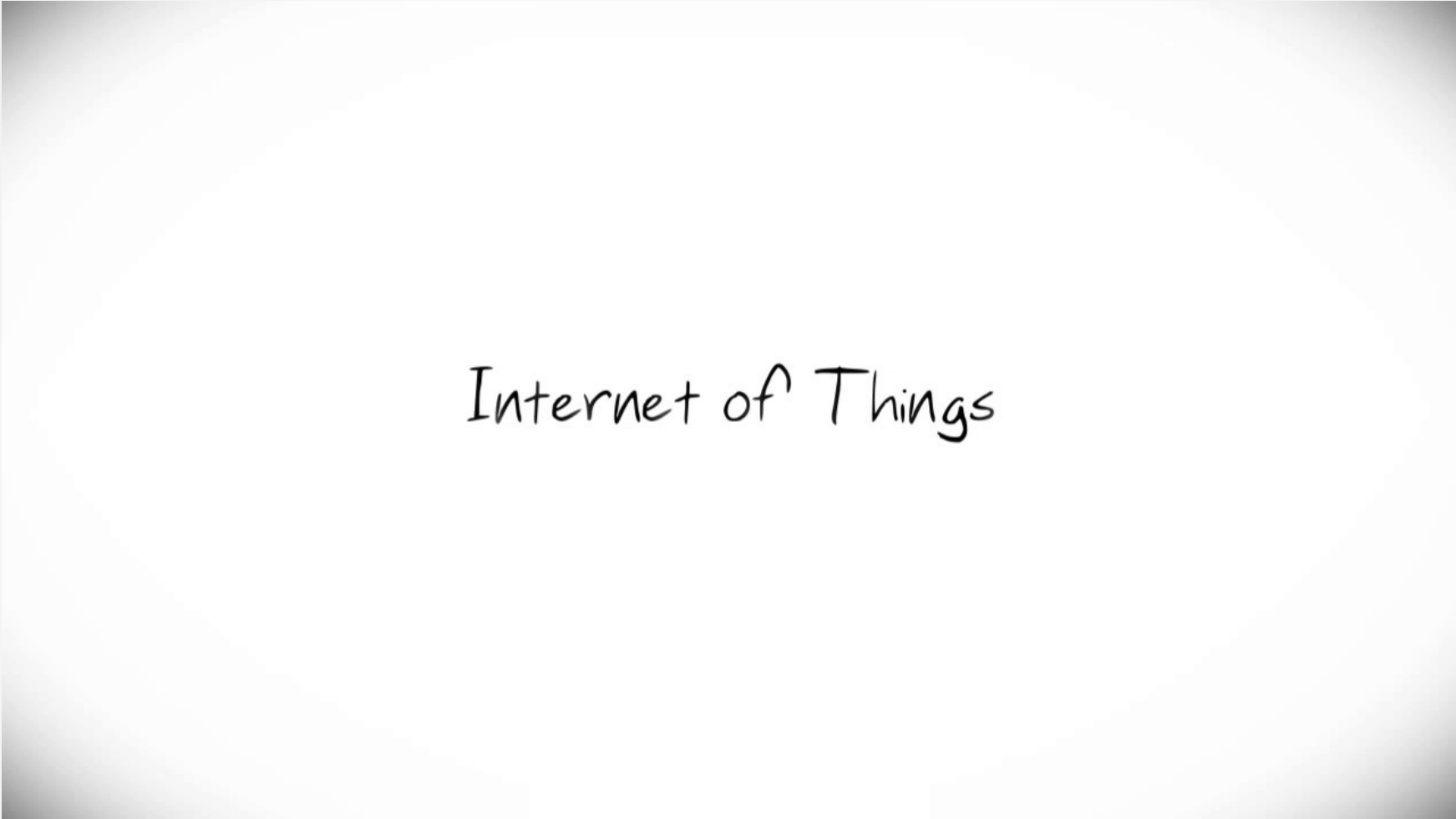
# Demo

**Make:**  
makezine.com



Arduino e a Internet das Coisas

# Internet das Coisas



Internet of Things

<http://www.youtube.com/watch?v=qhFWbZ5OqQM>

# Internet das Coisas

2008

Mais coisas do que pessoas conectadas

2010

5 bilhões de objetos

2011

Se esgotaram os 4.294.967.296 endereços IPv4

IPv6 : Multiplica em 80 trilhões

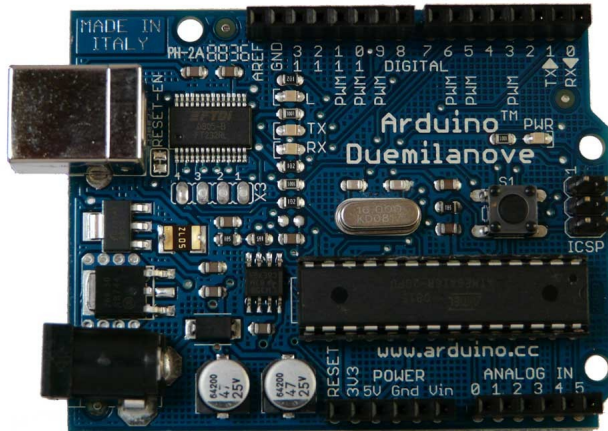
340.282.366.920.938.463.463.374.607.431.768.211.456

# Internet das Coisas





# Internet das Coisas



Arduino e a Internet das Coisas

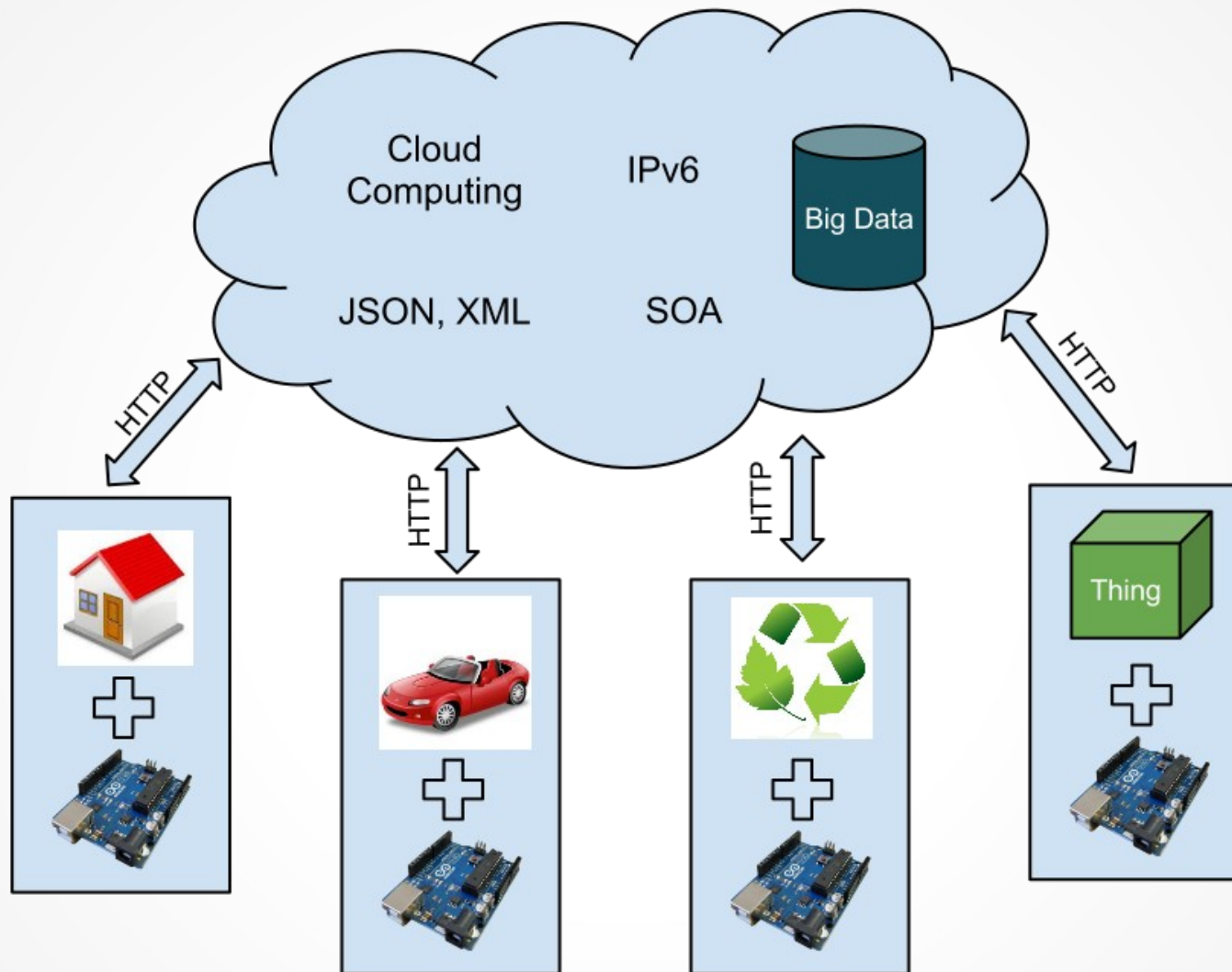


# Arduino + Internet

## Ethernet Shield



# Arduino + Internet



# Arduino + Internet

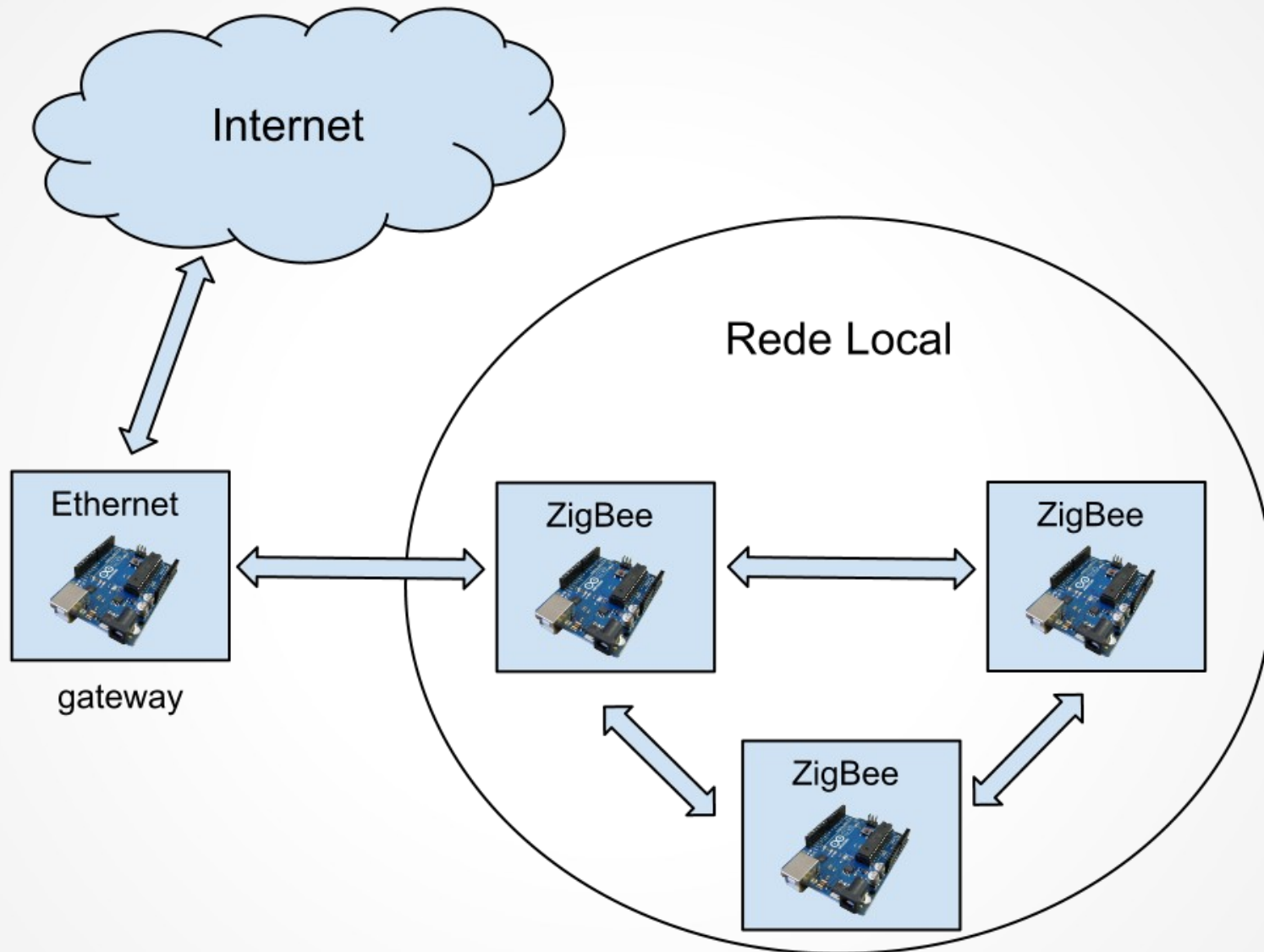
Ethernet



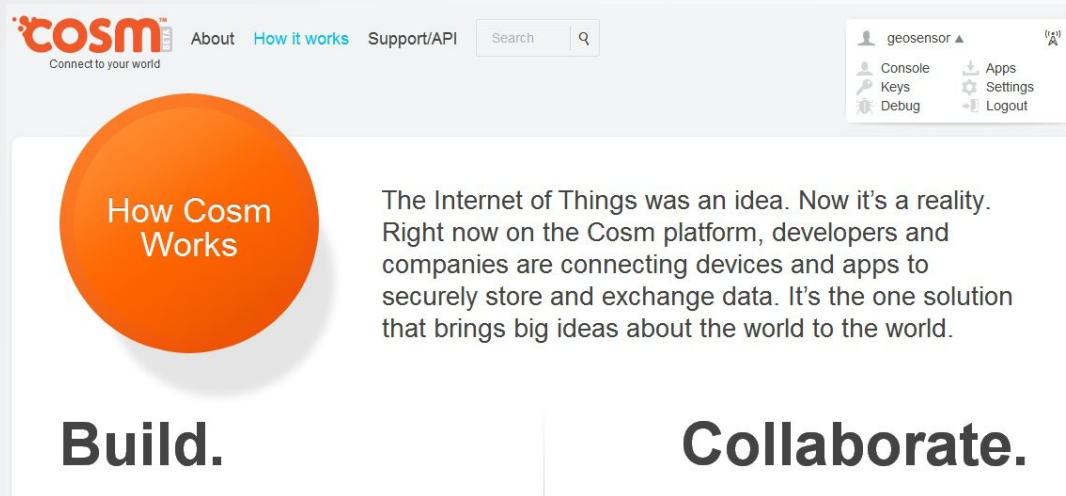
ZigBee



# Arduino + Internet



# Arduino + Internet



The screenshot shows the Cosm website. At the top left is the 'cosm' logo with the tagline 'Connect to your world'. Navigation links include 'About', 'How it works', and 'Support/API'. A search bar is present. On the right, a user menu for 'geosensor' lists 'Console', 'Keys', 'Debug', 'Apps', 'Settings', and 'Logout'. The main content area features an orange circle with the text 'How Cosm Works' and a paragraph: 'The Internet of Things was an idea. Now it's a reality. Right now on the Cosm platform, developers and companies are connecting devices and apps to securely store and exchange data. It's the one solution that brings big ideas about the world to the world.' Below this, the words 'Build.' and 'Collaborate.' are displayed in large, bold, black text.

[cosm.com](http://cosm.com)



[evrythng.net](http://evrythng.net)



[www.thingspeak.com](http://www.thingspeak.com)



[nimbits.com](http://nimbits.com)



[paraimpu.crs4.it](http://paraimpu.crs4.it)



# Exemplos



## Alarma Sismos

@AlarmaSismos

*Avisa sobre posibles sismos segundos antes de ser percibidos en Chile. Creado por @sebasak.*

Chile

Seguindo

49 TWEETS

1 SEGUINDO

294.883 SEGUIDORES



# Exemplos

KickBee

Chutes do bebê para  
o twitter



<http://kickbee.net>

# Exemplos

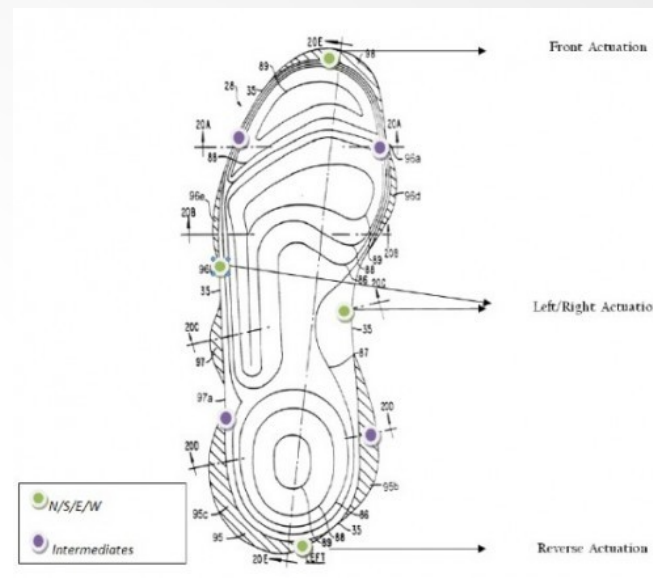
Calçados para cegos  
Le Chal (Take me there)

Desenvolvido por Anirudh Sharma

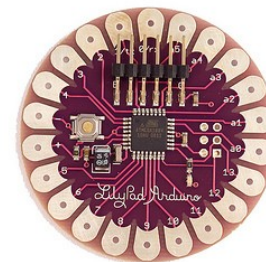
Arduino LilyPad

Sensores de proximidade

Cálculo de rota e localização em tempo real utilizando Google Maps e o GPS de um smartphone Android



[medicarduino.net](http://medicarduino.net)



# Exemplos

## Tweet-a-Pot



[www.instructables.com/id/Tweet-a-Pot-Twitter-Enabled-Coffee-Pot/](http://www.instructables.com/id/Tweet-a-Pot-Twitter-Enabled-Coffee-Pot/)

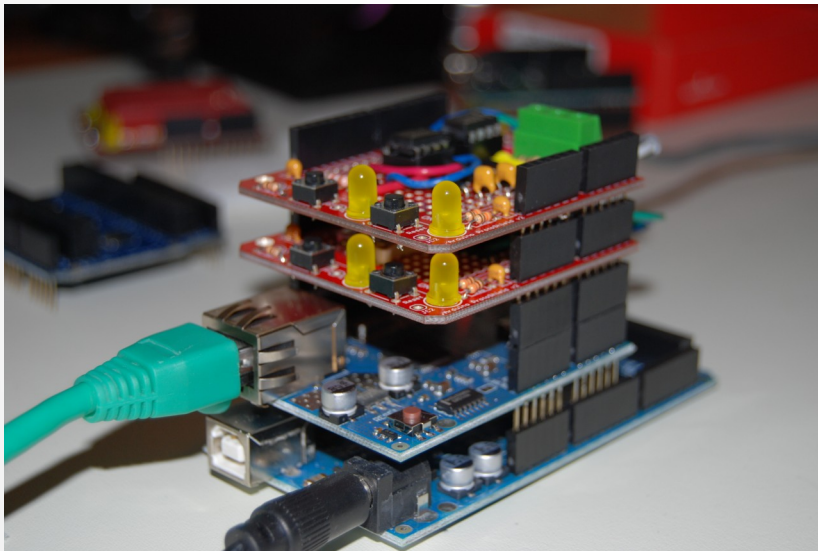


# Exemplos

## Arduino Power Meter Reader (APMR)

Conexão RS485 para leitura de medidores digitais.

Envia as leituras para a internet através de um web service RESTful.



<http://eco-sustain.org/projects/apmr/>



# Exemplos

## Automação Residencial



### *jHome Automation: visão geral*



<http://www.eletronlivre.com.br/jhome>

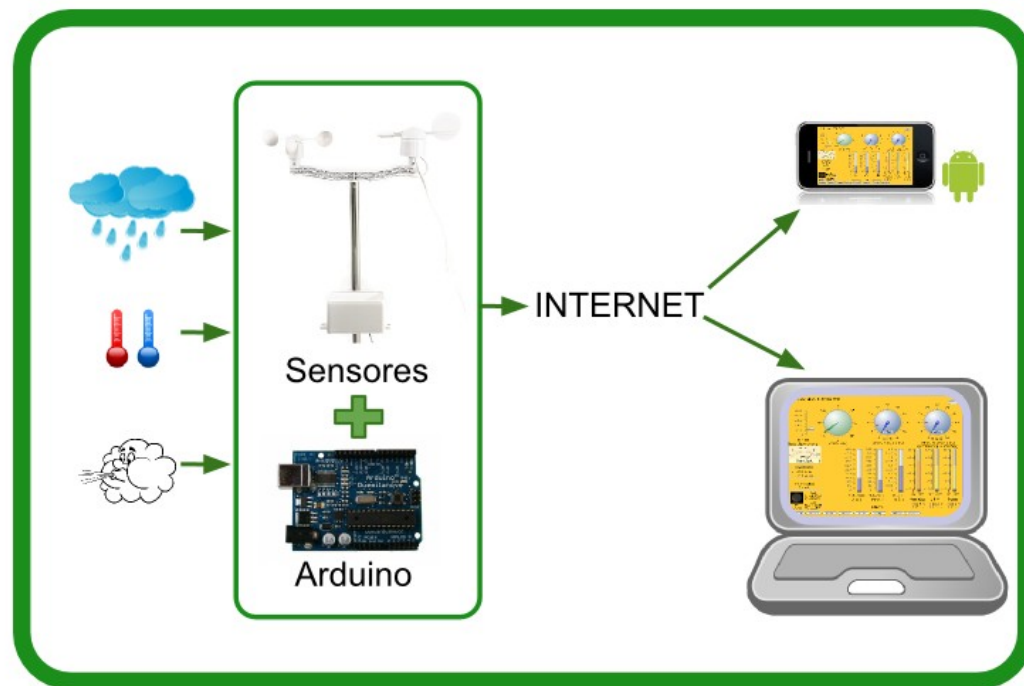
# Exemplos

## GeoSensor

Sensores de  
vento, chuva e  
temperatura

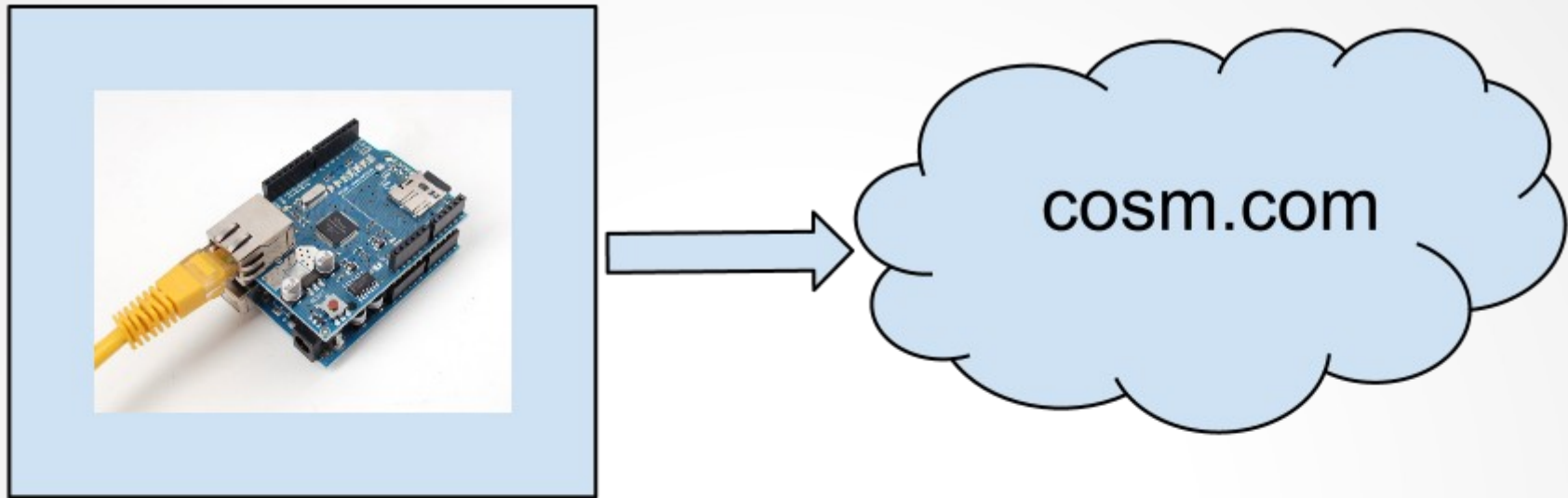
Sistema de alerta  
para enchentes e  
deslizamentos

Crowdfunding



[www.geosensor.net.br](http://www.geosensor.net.br)

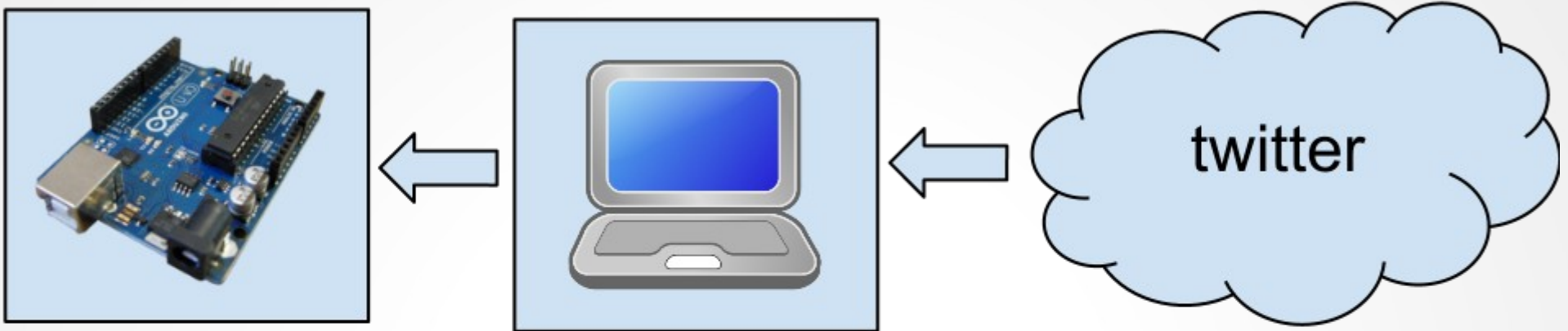
# Demo



Arduino + Ethernet Shield + LDR

Sketch com biblioteca Ethernet

# Demo



Computador como gateway

Skech Firmata

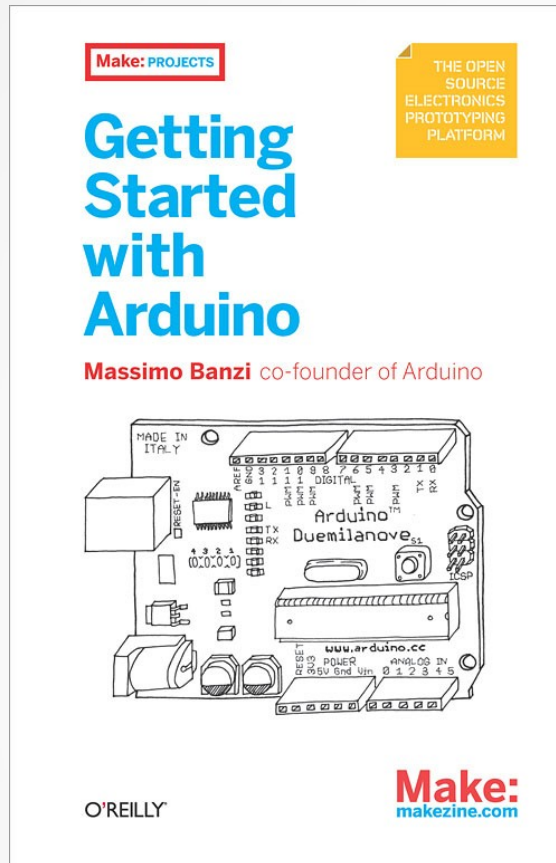
Acionamento de lâmpada pelo twitter

# Links

- <http://arduino.cc> (blog e playground)
- <http://www.instructables.com>
- <http://www.ladyada.net/learn/arduino>
- <http://blog.makezine.com/arduino>
- <http://www.buildinginternetofthings.com>



# Livros



# Arduino e a Internet das Coisas

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[@hcclavallo](#)

[blog.hugolavallo.com](http://blog.hugolavallo.com)