

Fatec

Jundiaí

Deputado Ary Fossen

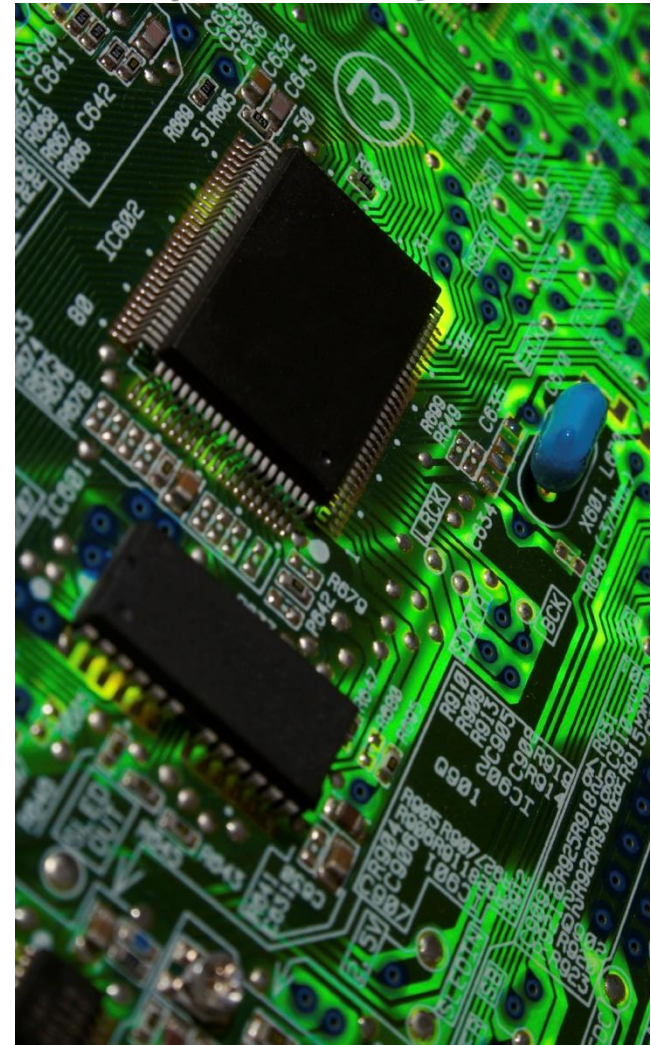
IoT com Raspberry Pi

Cláudio Luís V. Oliveira

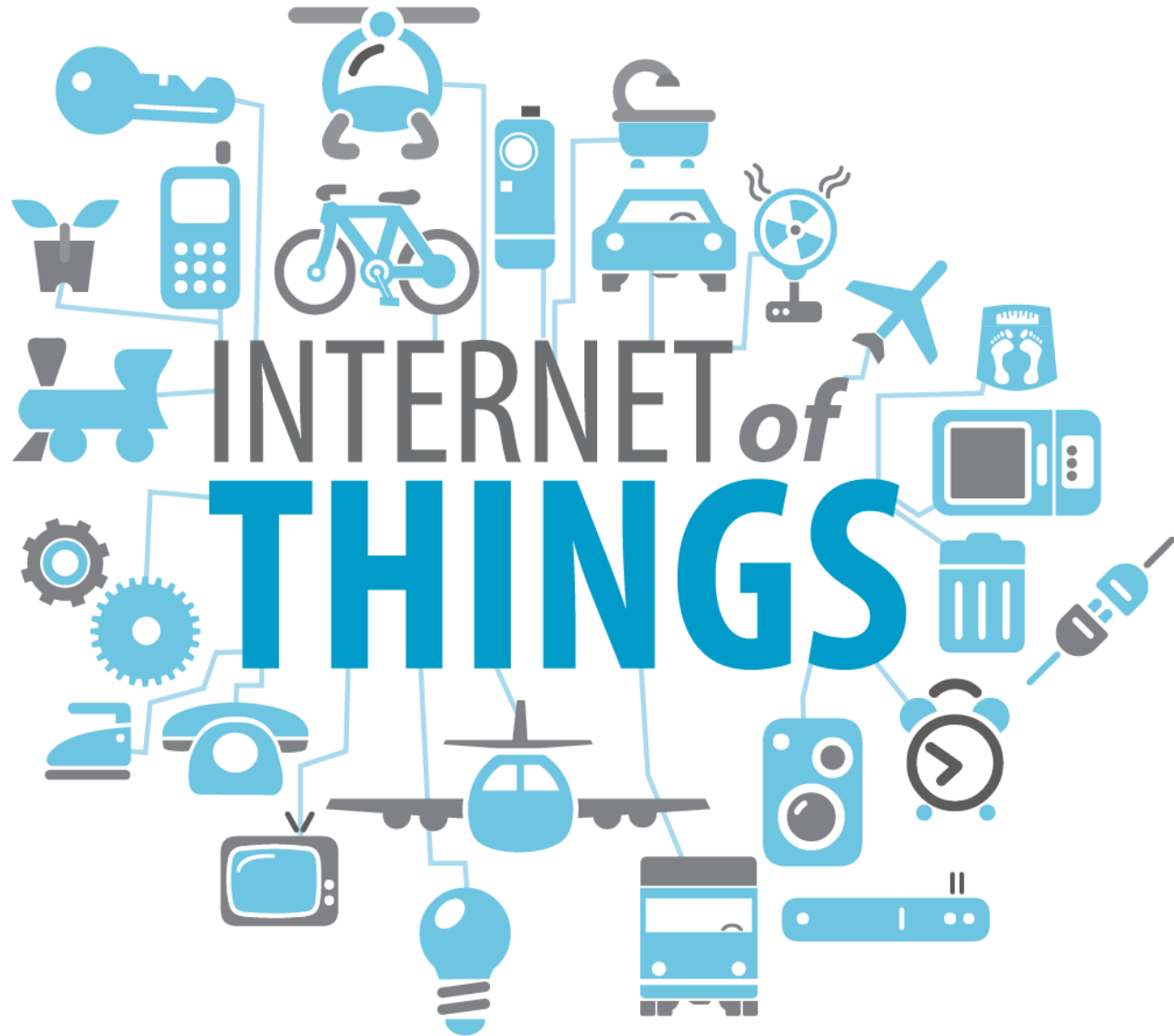
prof.claudioluis@fatec.sp.gov.br

www.profclaudio.com.br

Setembro de 2018



IoT com Raspberry Pi



IoT com Raspberry Pi

- A “Internet das Coisas” se refere a uma revolução tecnológica que tem como objetivo conectar os itens usados do dia a dia à rede mundial de computadores. Cada vez mais surgem eletrodomésticos, meios de transporte e até mesmo roupas conectadas à Internet.



Genius Smart Lock

IoT com Raspberry Pi

- “Internet das coisas” permite que tudo ao nosso redor esteja interconectado.
- *Algumas coisas vão ser fantásticas no futuro. Por exemplo: eu perdi alguma coisa, a minha carteira. A carteira vai descobrir que você a perdeu e vai te mandar uma mensagem “você me perdeu aqui”* (Marcelo Zuffo, professor da USP)



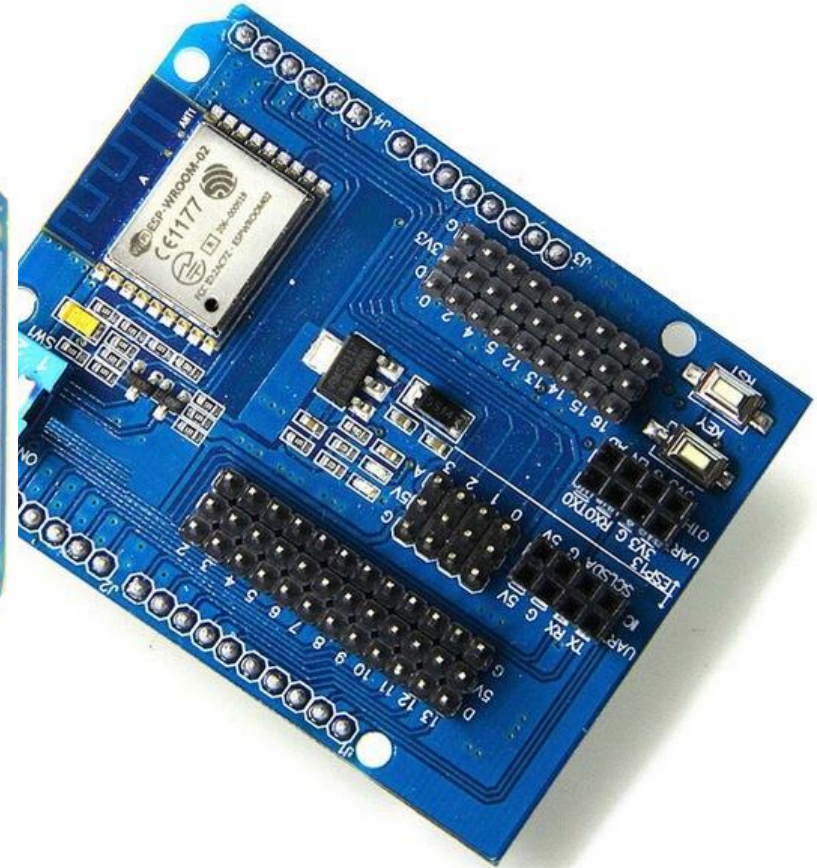
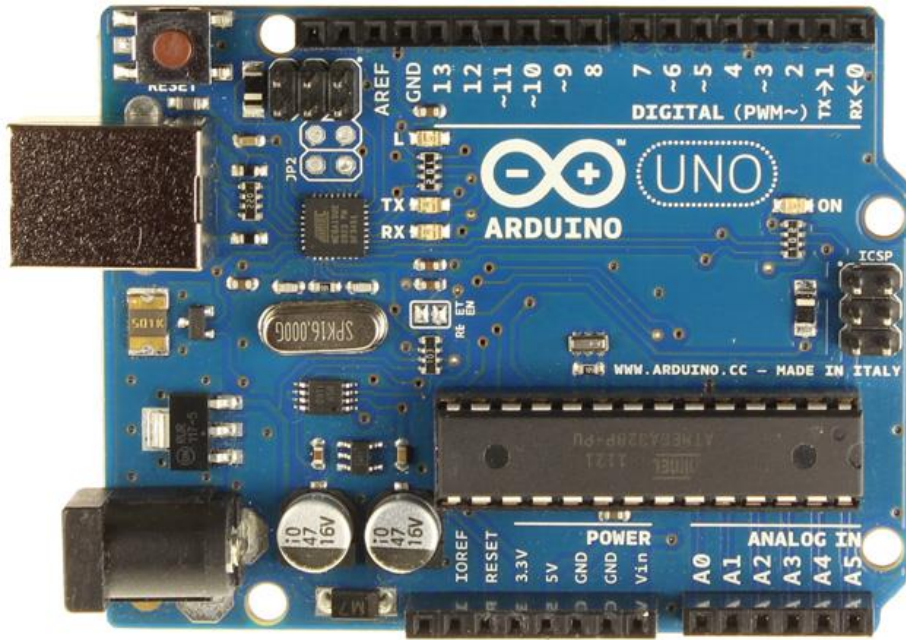
IoT com Raspberry Pi

- “Internet das Coisas”



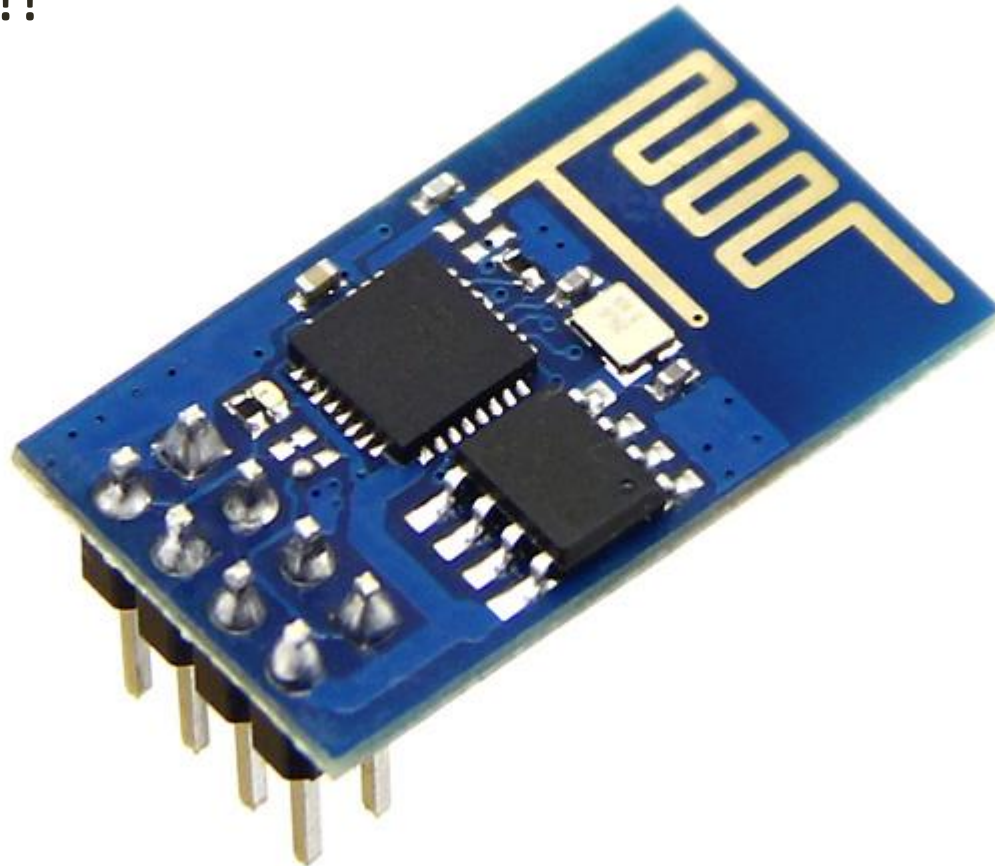
IoT com Raspberry Pi

- **Arduino + Shields**



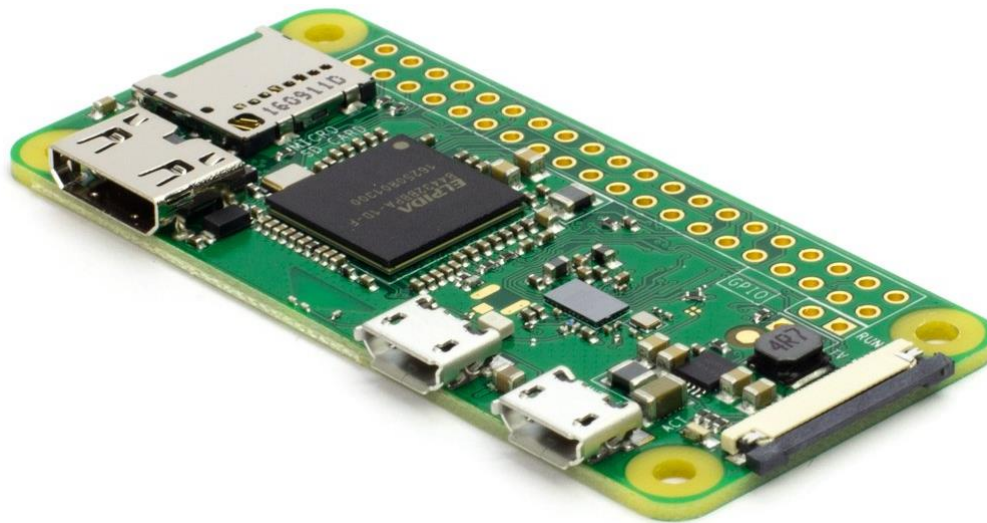
IoT com Raspberry Pi

- **ESP8266** – Módulo WiFi de US\$ 2,00 da Espressif Systems!!!



IoT com Raspberry Pi

- **Raspberry Pi** – Computador de US\$ 35,00 do tamanho de um cartão de crédito!



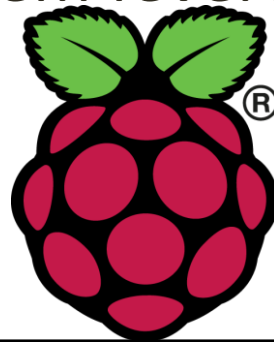
Raspberry Pi Zero W

IoT com Raspberry Pi

- **Raspberry Pi** - Desenvolvido no Reino Unido, pela Raspberry Pi Foundation.

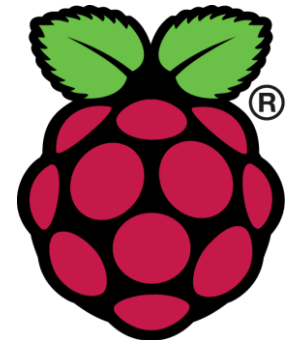
<https://www.raspberrypi.org/>

- O principal objetivo é promover o ensino de Ciência da Computação básica em escolas, inclusão e empoderamento social.
- O primeiro modelo (Raspberry Pi 1) começou a ser vendido por \$35 em fevereiro de 2012!



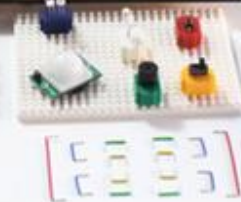
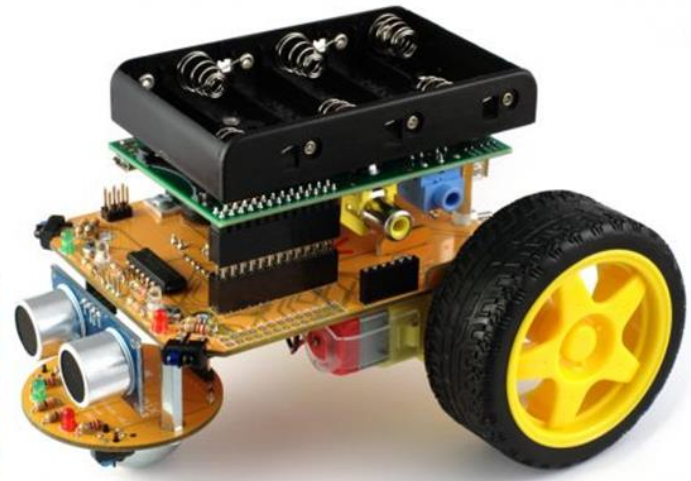
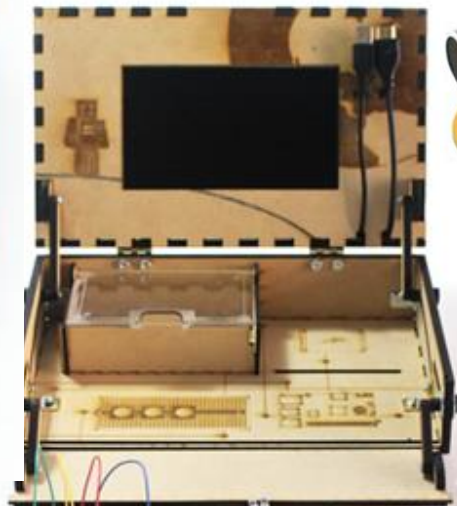
IoT com Raspberry Pi

- **Raspberry Pi** - Baixo custo, multiplataforma e fácil aprendizagem.
- O Raspian, SO padrão, possui muitas ferramentas intuitivas.
- Fácil utilização para projetos de **Internet das Coisas**.
- Escalável.
- Pode ser usado por iniciantes e até usuários avançados em programação e/ou eletrônica.



IoT com Raspberry Pi

- **Raspberry Pi** – Infinitas possibilidades de projetos e aplicações.



IoT com Raspberry Pi

- **Raspberry Pi** – Infinitas possibilidades de projetos e aplicações.

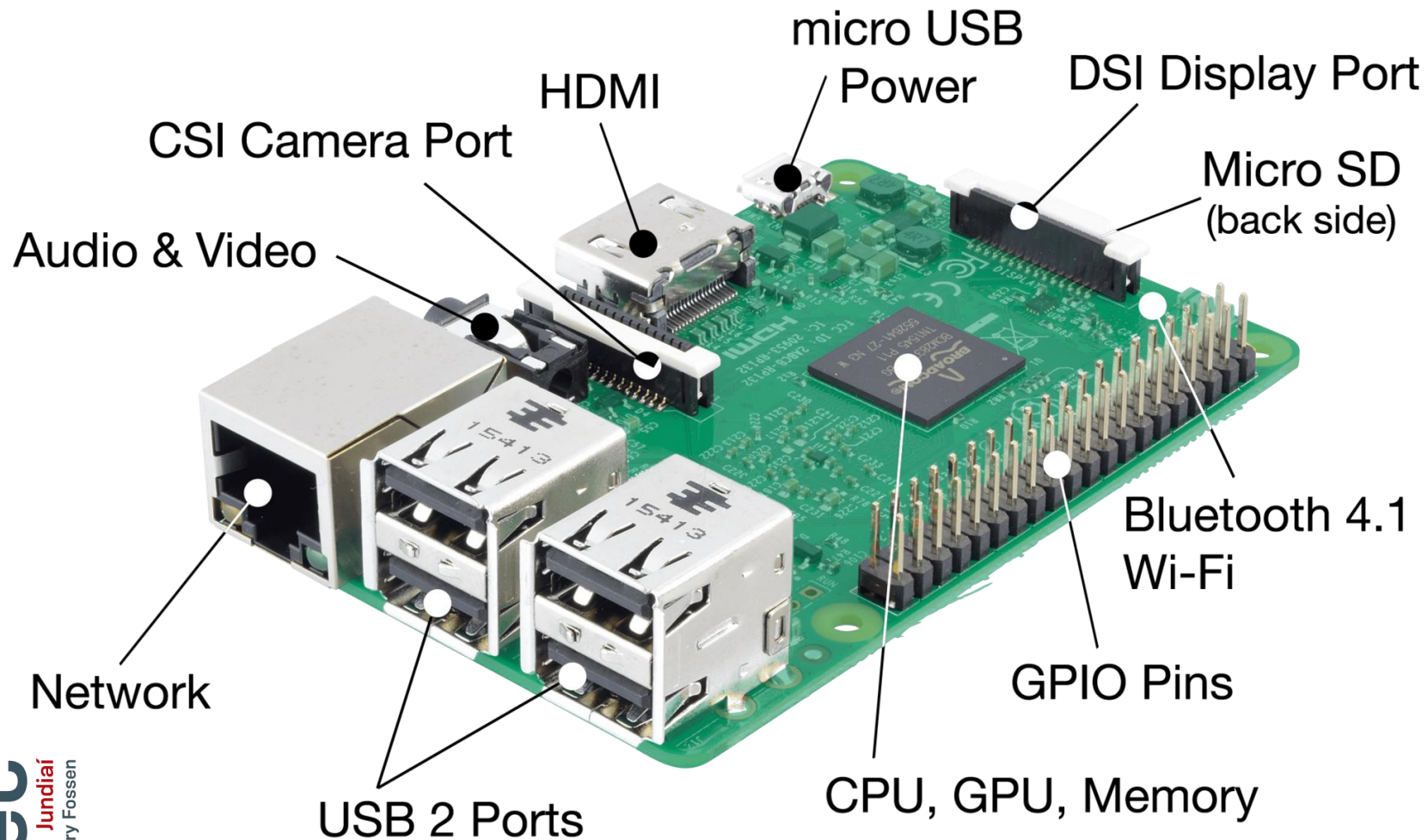


IoT com Raspberry Pi

- **Raspberry Pi** - Atualmente há 7 modelos disponíveis!
- Atualmente, o Raspberry Pi 3 B é o mais popular:
Processador 1.2GHz 64-bit quad-core ARMv8 CPU, 1 GB de RAM, Bluetooth 4.1.



IoT com Raspberry Pi



Raspberry Pi 3 B

Fonte: <https://teekle.co.za/wp-content/uploads/2018/05/106-raspberry-pi-3-b-2.png>

IoT com Raspberry Pi

- **Raspberry Pi - Sistemas Operacionais.**

<https://www.raspberrypi.org/downloads/>

DOWNLOADS

Raspbian is our official operating system for **all** models of the Raspberry Pi. Download it here, or use **NOOBS**, our easy installer for Raspbian and more.



NOOBS



RASPBIAN

IoT com Raspberry Pi

- **Raspberry Pi – Sistemas Operacionais.**

<https://www.raspberrypi.org/downloads/>

Third Party Operating System Images

Third party operating system images for Raspberry Pi are also available:



UBUNTU MATE



SNAPPY UBUNTU CORE



WINDOWS 10 IOT CORE



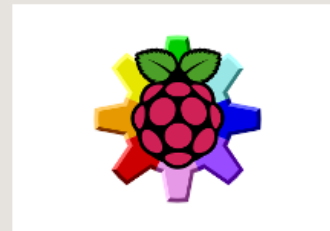
OSMC



LIBREELEC



PINET



RISC OS



WEATHER STATION



source.jpg

IoT com Raspberry Pi

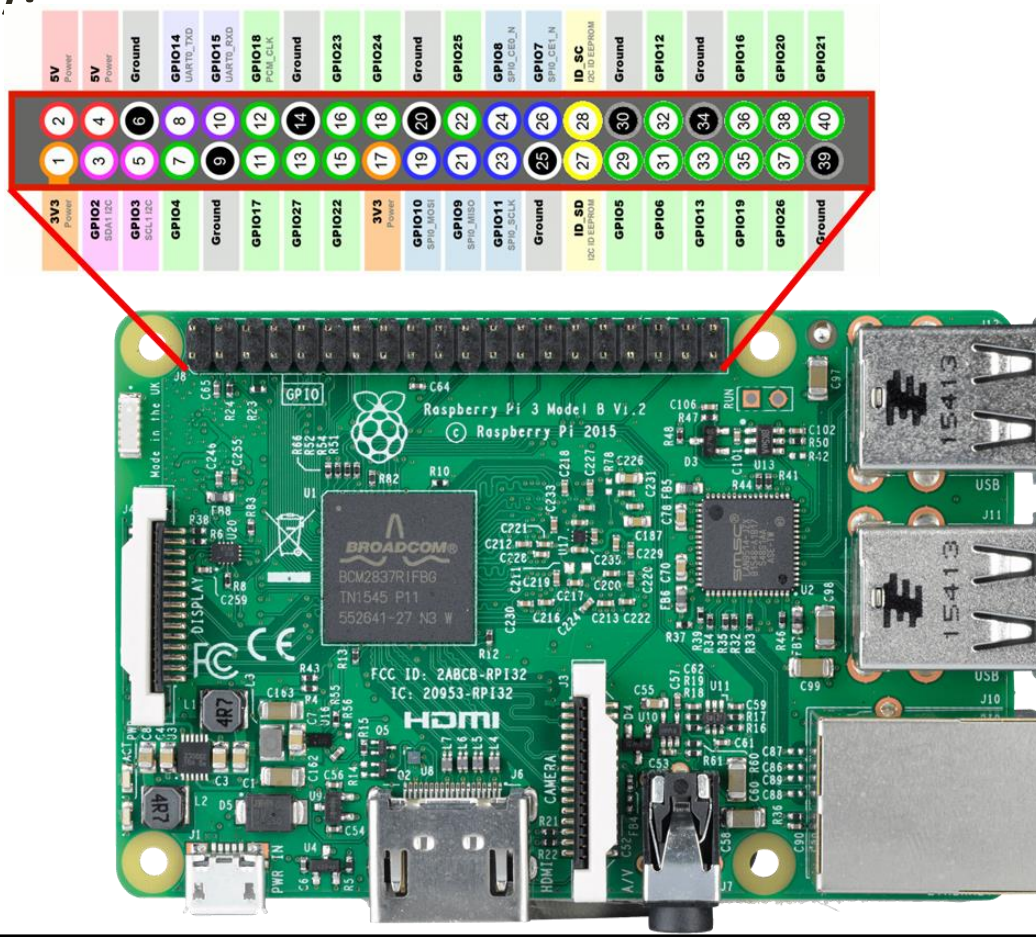
- **Raspberry Pi** – Recursos para Programação.
- Scratch
- C/C++
- Java
- Ruby
- Python

```
def filter_user(self, user):  
    """  
    Returns a QuerySet of connections for user.  
    """  
    set1 = self.filter(from_user=user).select_related(depth=1)  
    set2 = self.filter(to_user=user).select_related(depth=1)  
    return set1 | set2  
  
def are_connected(self, user1, user2):  
    if self.filter(from_user=user1, to_user=user2).count() > 0:  
        return True  
    if self.filter(from_user=user2, to_user=user1).count() > 0:  
        return True  
    return False  
  
def remove(self, user1, user2):  
    """  
    Deletes proper object regardless of the order of users in an  
    """  
    connection = self.filter(from_user=user1, to_user=user2)  
    if not connection:
```




IoT com Raspberry Pi

- **Raspberry Pi – General Purpose Input Output (GPIO).**





source.jpg

IoT com Raspberry Pi

- Raspberry Pi.

Sensores

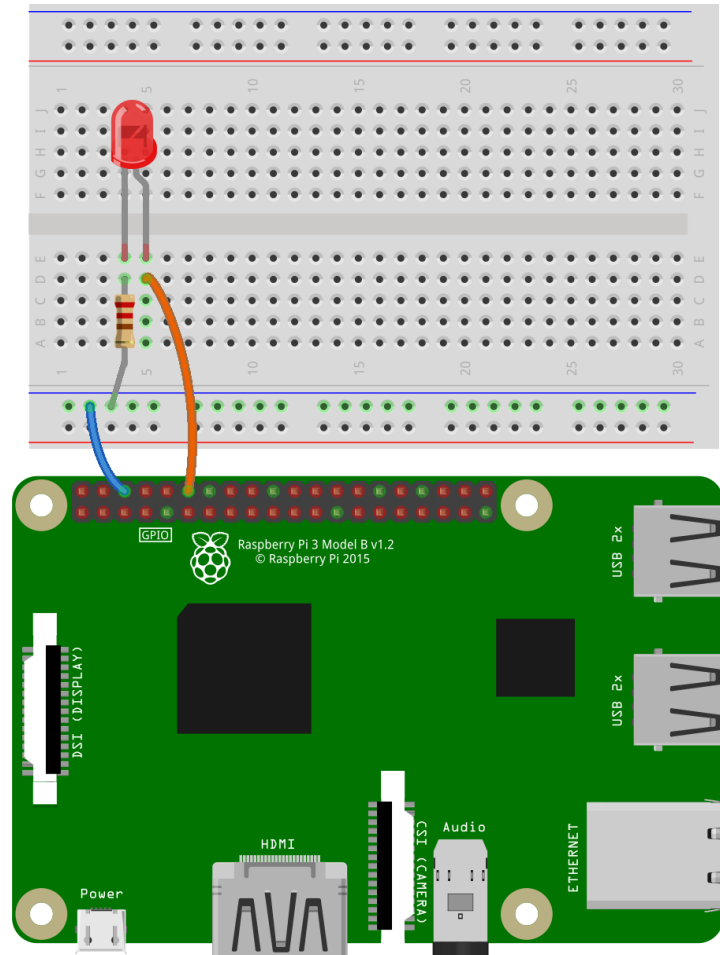
+

Atuadores



IoT com Raspberry Pi

- **Raspberry Pi – Blink.**



IoT com Raspberry Pi

```
import RPi.GPIO as GPIO
```

```
import time
```

```
LED = 12
```

```
GPIO.setwarnings(False)
```

```
GPIO.setmode(GPIO.BOARD)
```

```
GPIO.setup(LED, GPIO.OUT)
```

```
while True:
```

```
    GPIO.output(LED, 1)
```

```
    time.sleep(0.5)
```

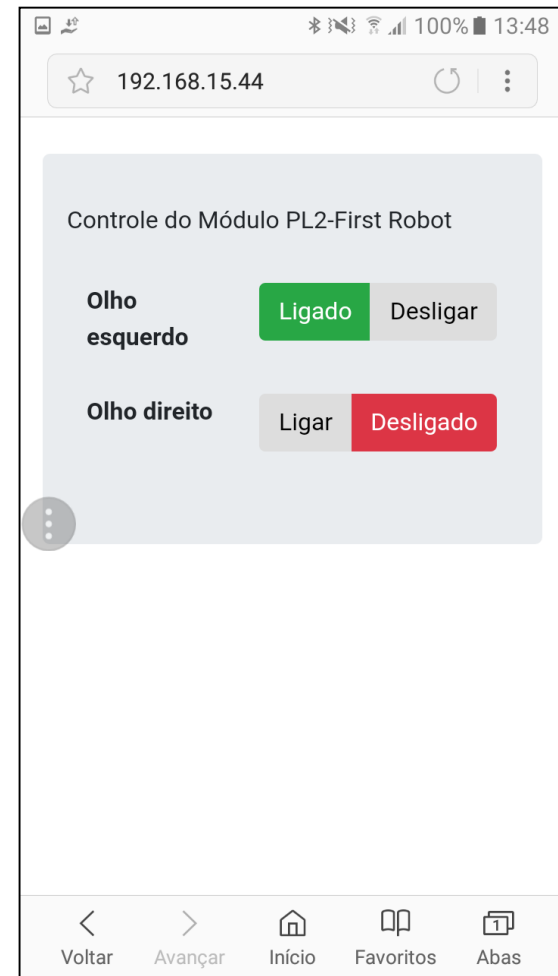
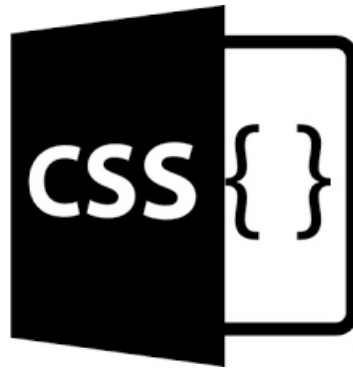
```
    GPIO.output(LED, 0)
```

```
    time.sleep(0.5)
```



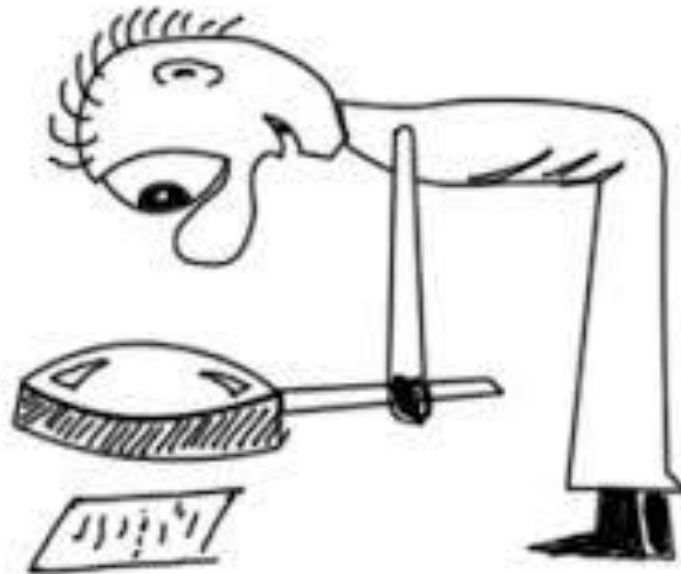
IoT com Raspberry Pi

- Raspberry Pi – Servidor Web.



IoT com Raspberry Pi

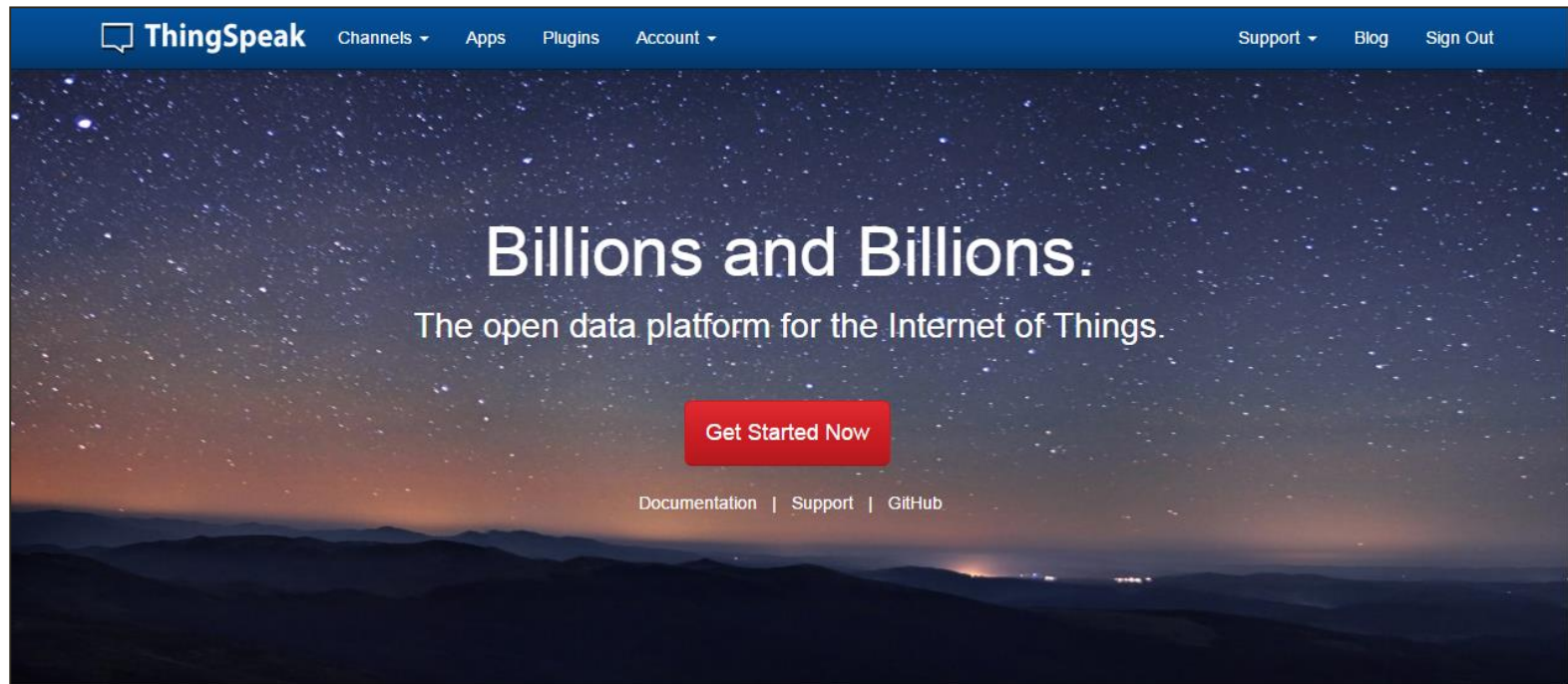
- **Raspberry Pi** – Servidor Web.



IoT com Raspberry Pi

- **ThingSpeak**

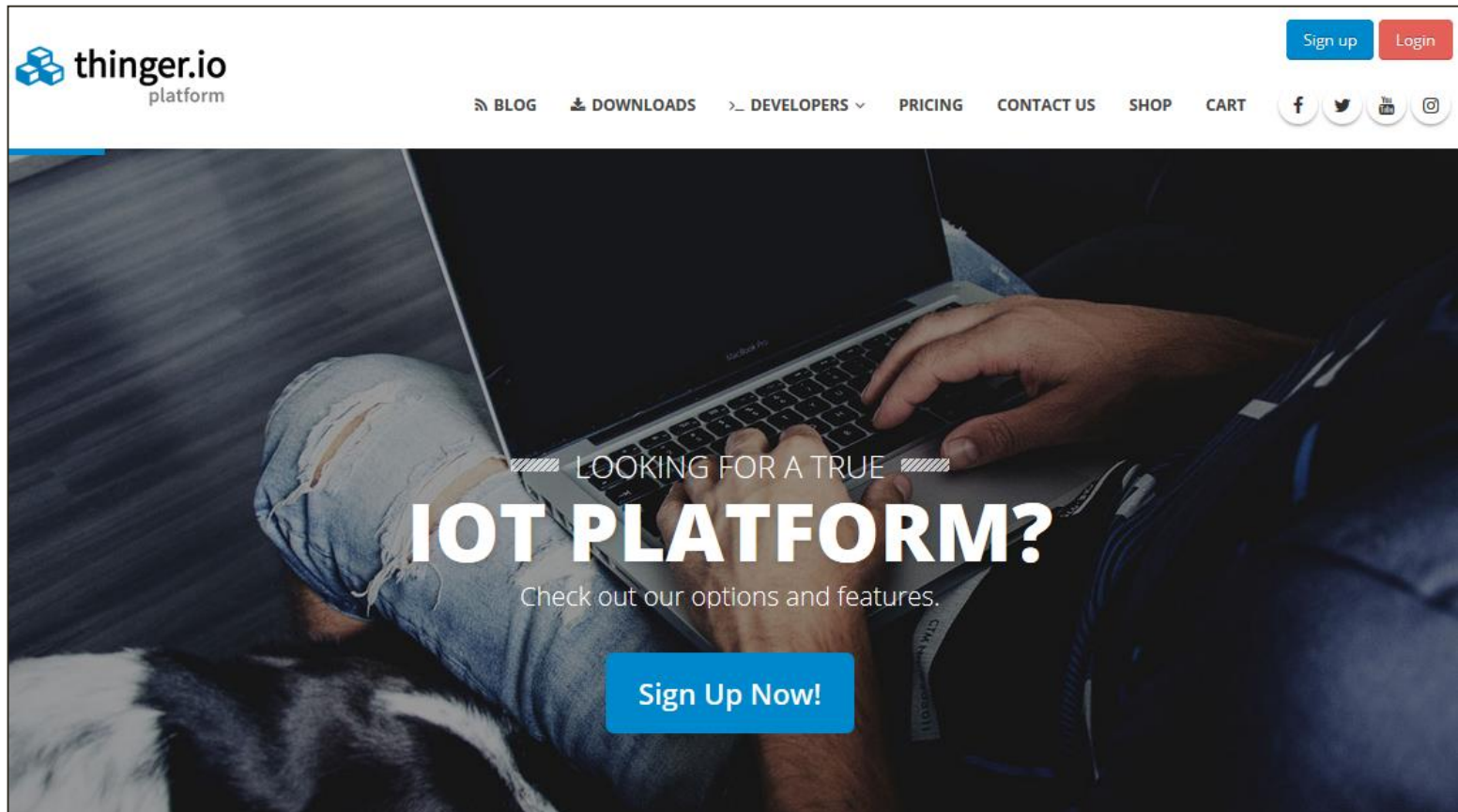
<https://thingspeak.com/>



IoT com Raspberry Pi

- **Thinger.io**

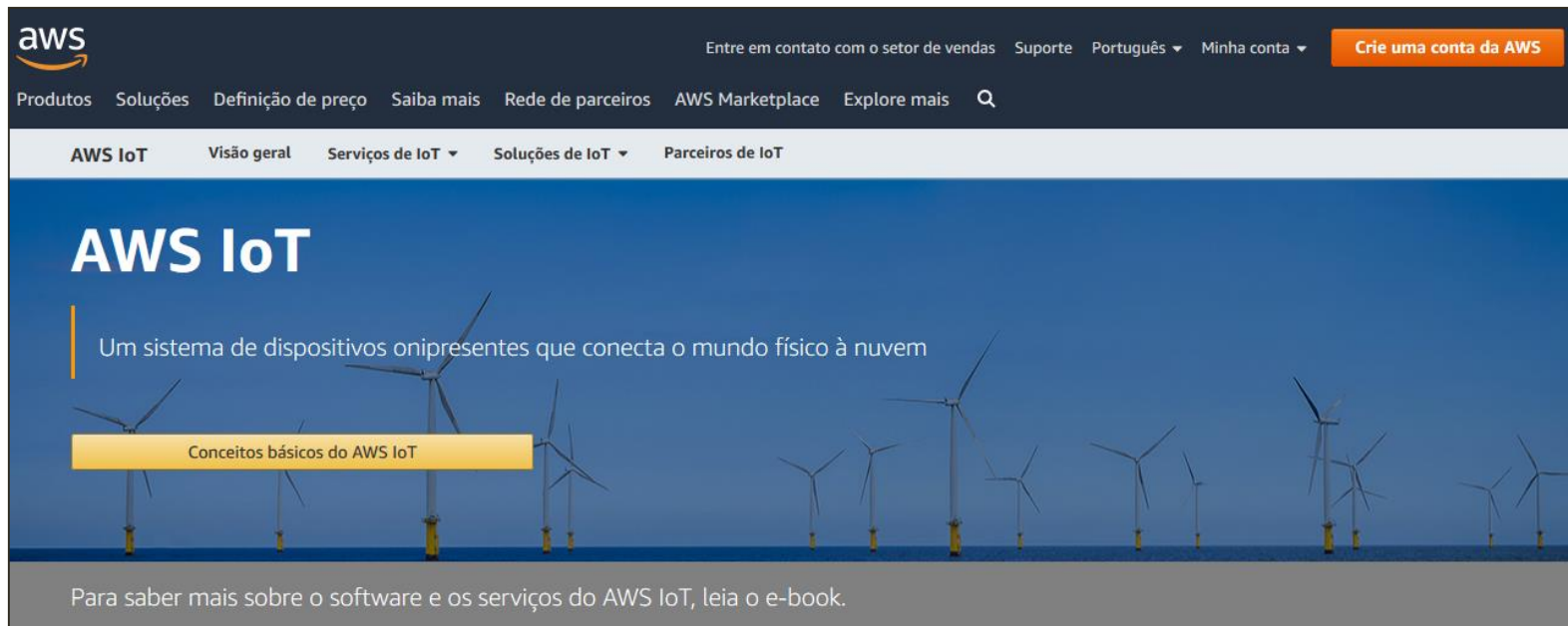
<https://thinger.io/>



IoT com Raspberry Pi

- **Amazon AWS IoT**

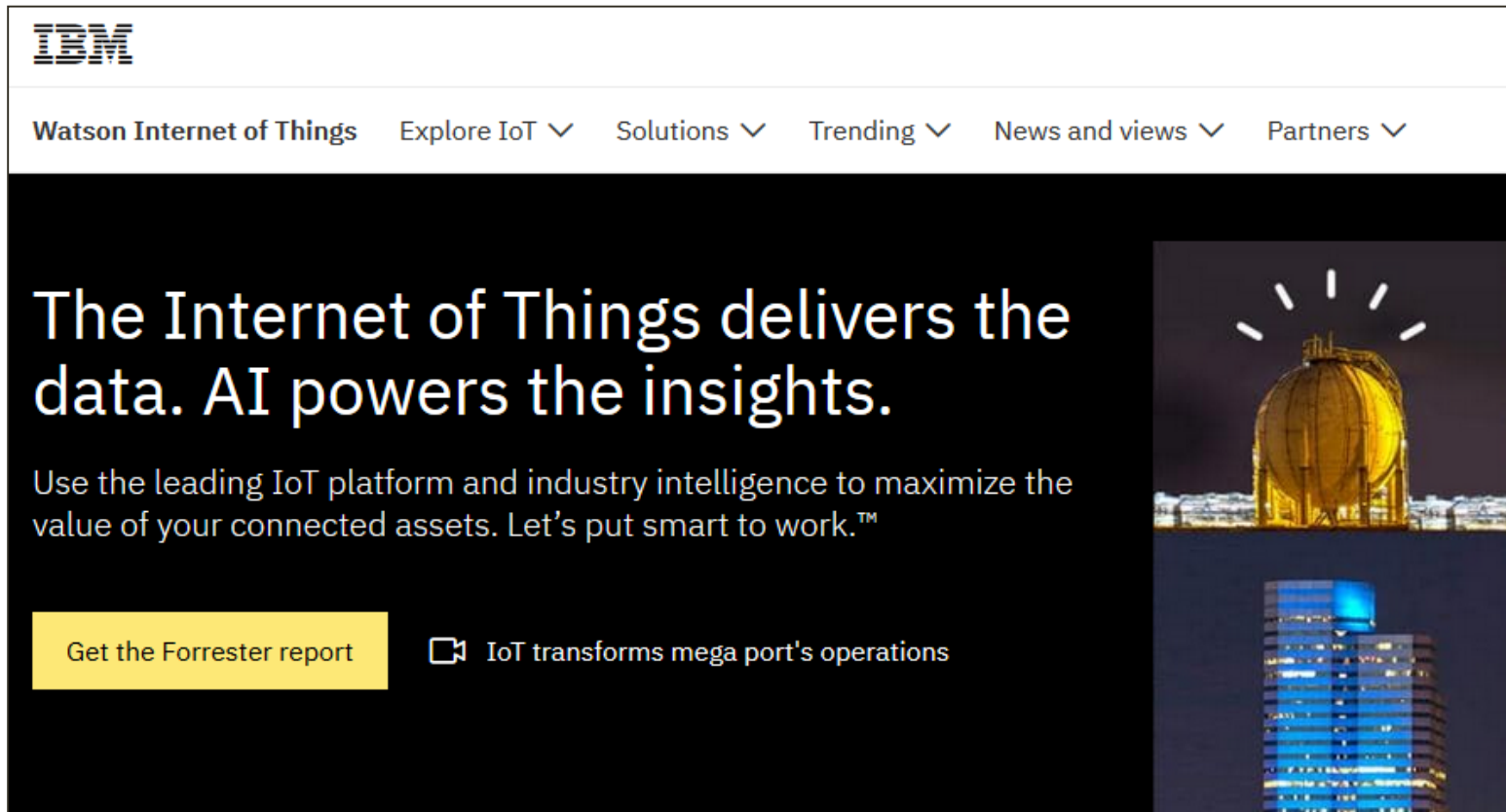
<https://aws.amazon.com/pt/iot/>



IoT com Raspberry Pi

- **Watson Internet of Things**

<https://www.ibm.com/internet-of-things>



IBM

Watson Internet of Things Explore IoT Solutions Trending News and views Partners

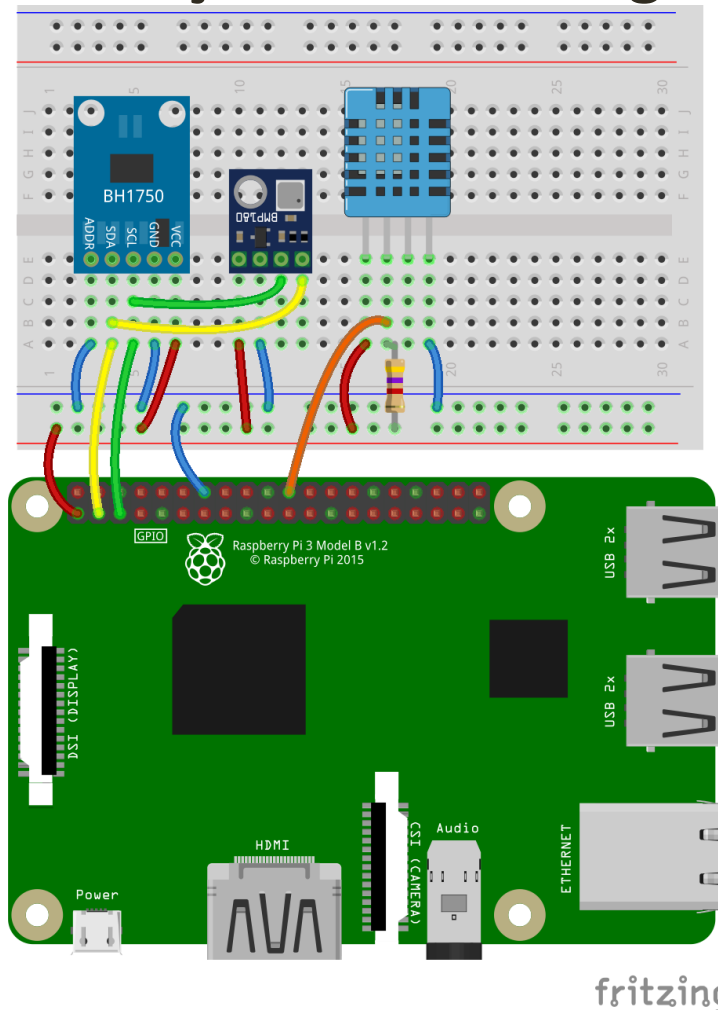
The Internet of Things delivers the data. AI powers the insights.

Use the leading IoT platform and industry intelligence to maximize the value of your connected assets. Let's put smart to work.™

[Get the Forrester report](#) [IoT transforms mega port's operations](#)

IoT com Raspberry Pi

- **Raspberry Pi – Estação Meteorológica.**



IoT com Raspberry Pi

- **Raspberry Pi – Estação Meteorológica.**

ThingSpeak™ Canais ▾ Aplicações Comunidade Support ▾ How to Buy Account ▾ Sair

New Channel

Nome

Descrição

Campo 1

Campo 2

Campo 3

Campo 4

Campo 5

Campo 6

Campo 7

Ajuda

Channels store all the data that a ThingSpeak application collects. Each channel includes eight fields that can hold any type of data, plus three fields for location data and one for status data. Once you collect data in a channel, you can use ThingSpeak apps to analyze and visualize it.

Channel Settings

- **Channel Name:** Enter a unique name for the ThingSpeak channel.
- **Description:** Enter a description of the ThingSpeak channel.
- **Field#:** Check the box to enable the field, and enter a field name. Each ThingSpeak channel can have up to 8 fields.
- **Metadata:** Enter information about channel data, including JSON, XML, or CSV data.
- **Tags:** Enter keywords that identify the channel. Separate tags with commas.
- **Latitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the latitude of the city of London is 51.5072.
- **Longitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the longitude of the city of London is -0.1275.
- **Elevation:** Specify the position of the sensor or thing that collects data in meters. For example, the elevation of the city of London is 35.052.
- **Link to External Site:** If you have a website that contains information about your

IoT com Raspberry Pi

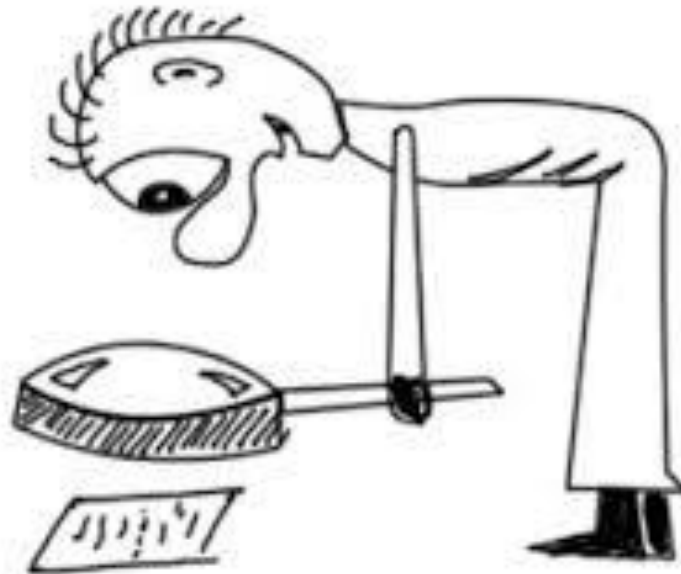
- **Raspberry Pi** – Estação Meteorológica.

#Envio para a ThingSpeak

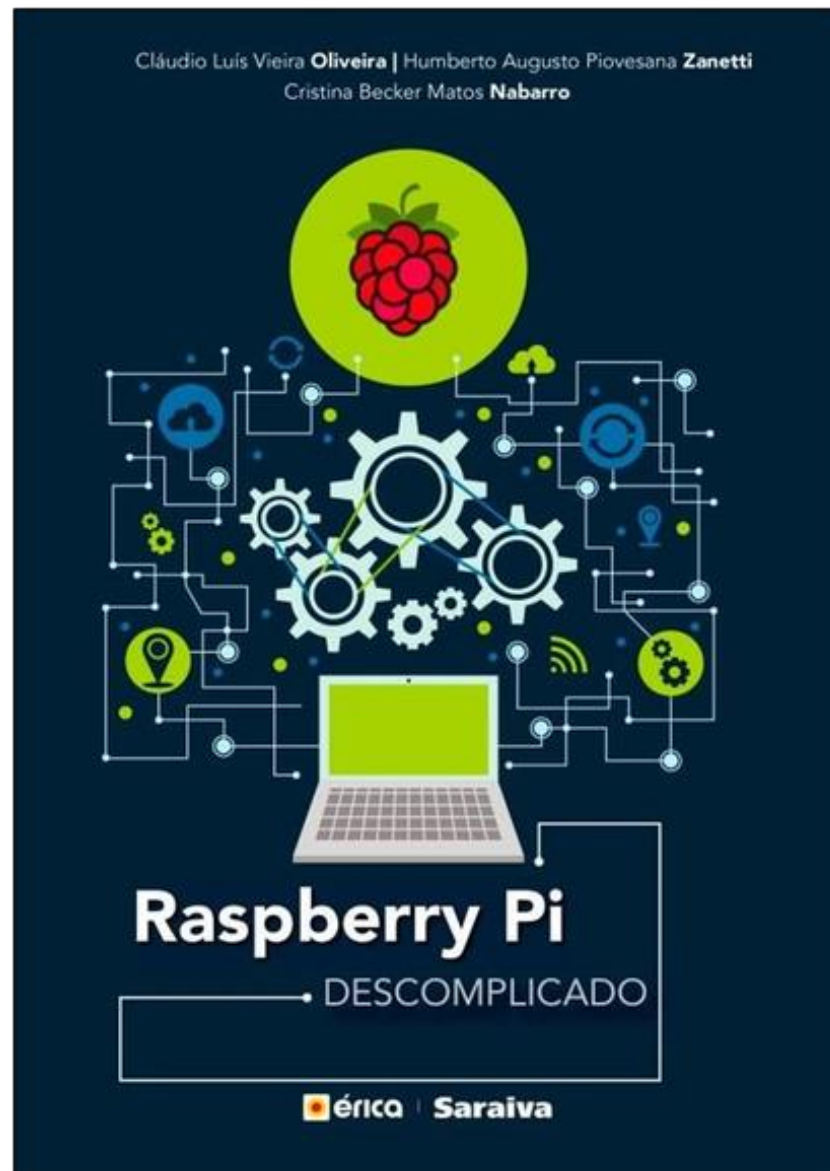
```
resposta = urllib2.urlopen(URL +  
"&field1=%s&field2=%s&field3=%s&field4=%s&fi  
eld5=%s" % (temp, umid, pressao, alt, luz))  
print (resposta.read())  
resposta.close()
```

IoT com Raspberry Pi

- **Raspberry Pi** – Estação Meteorológica.



IoT com Raspberry Pi



IoT com Raspberry Pi



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prof.claudioluis@fatec.sp.gov.br

www.profclaudio.com.br