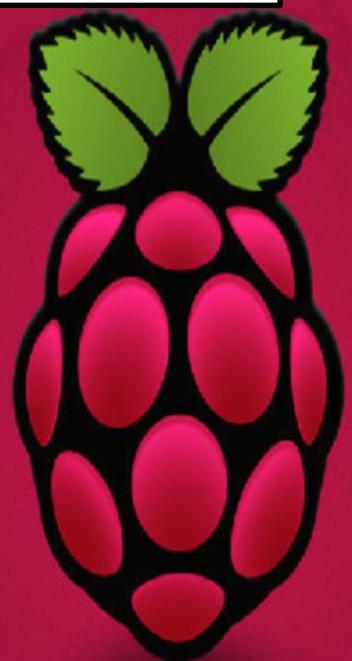
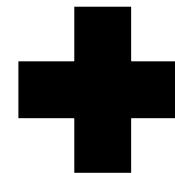


# تصميم النظم الالكترونية باستخدام لوحة Raspberry-Pi



إعداد: م. علا جزماتي

# What is Raspberry Pi ?



# What is Raspberry Pi ?





# Raspberry pi 3 Model b



Broadcom BCM2837 64 bit  
Quad core CPU at 1.2Ghz  
1GB RAM

## 40 pin extended GPIO

On-board WI-FI  
And Bluetooth 4.1

microSD card slot

DSI display port

microUSB power – needs <2.5A

Full size HDMI

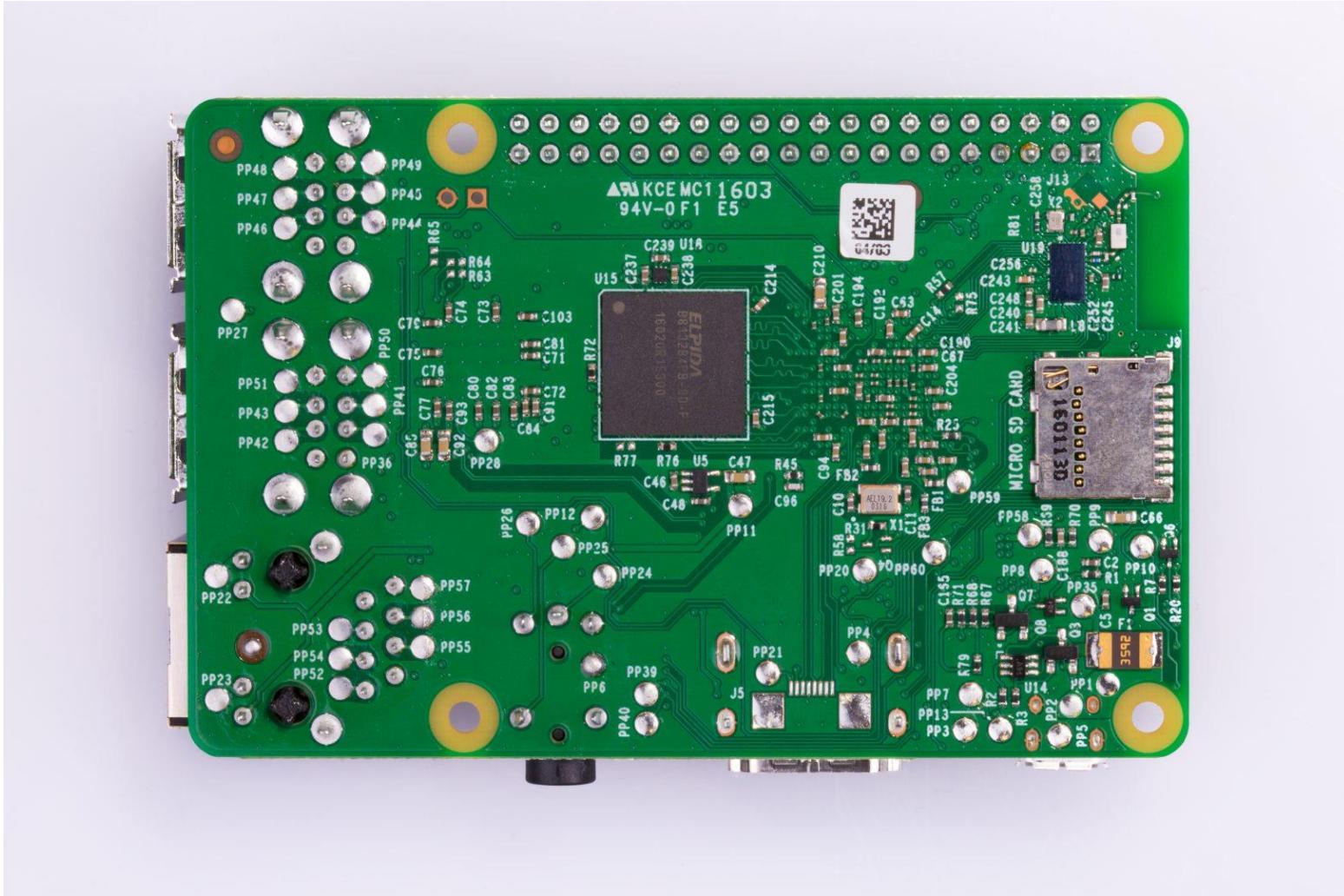
### CSI camera port

4x USB 2 ports

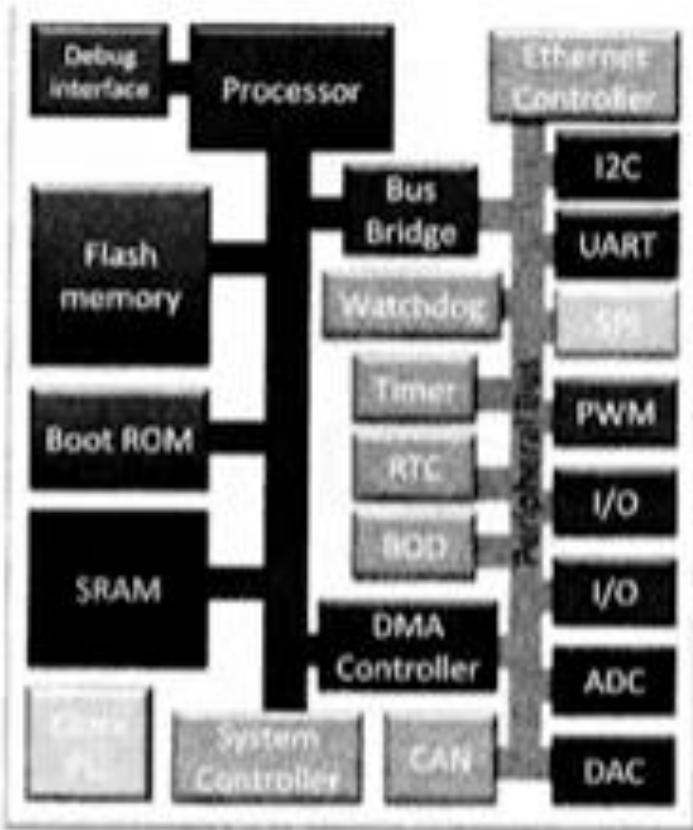
10/100 LAN



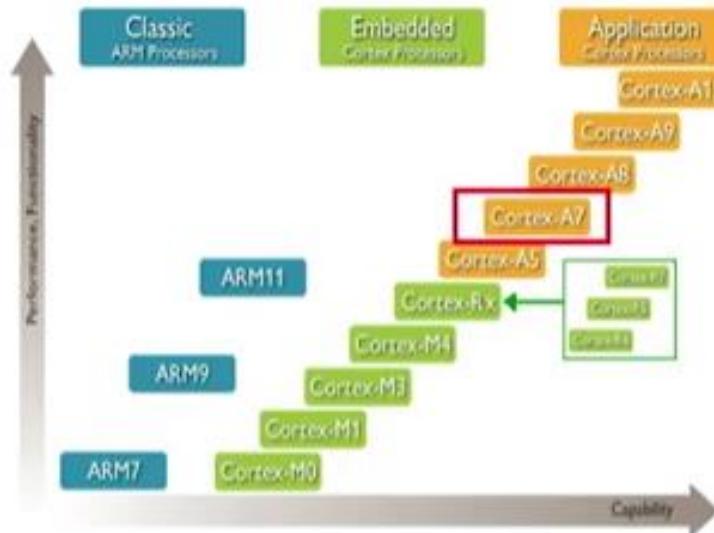
# Raspberry pi 3 Model b



# Broadcom System on Chip



## ARM Processor Family



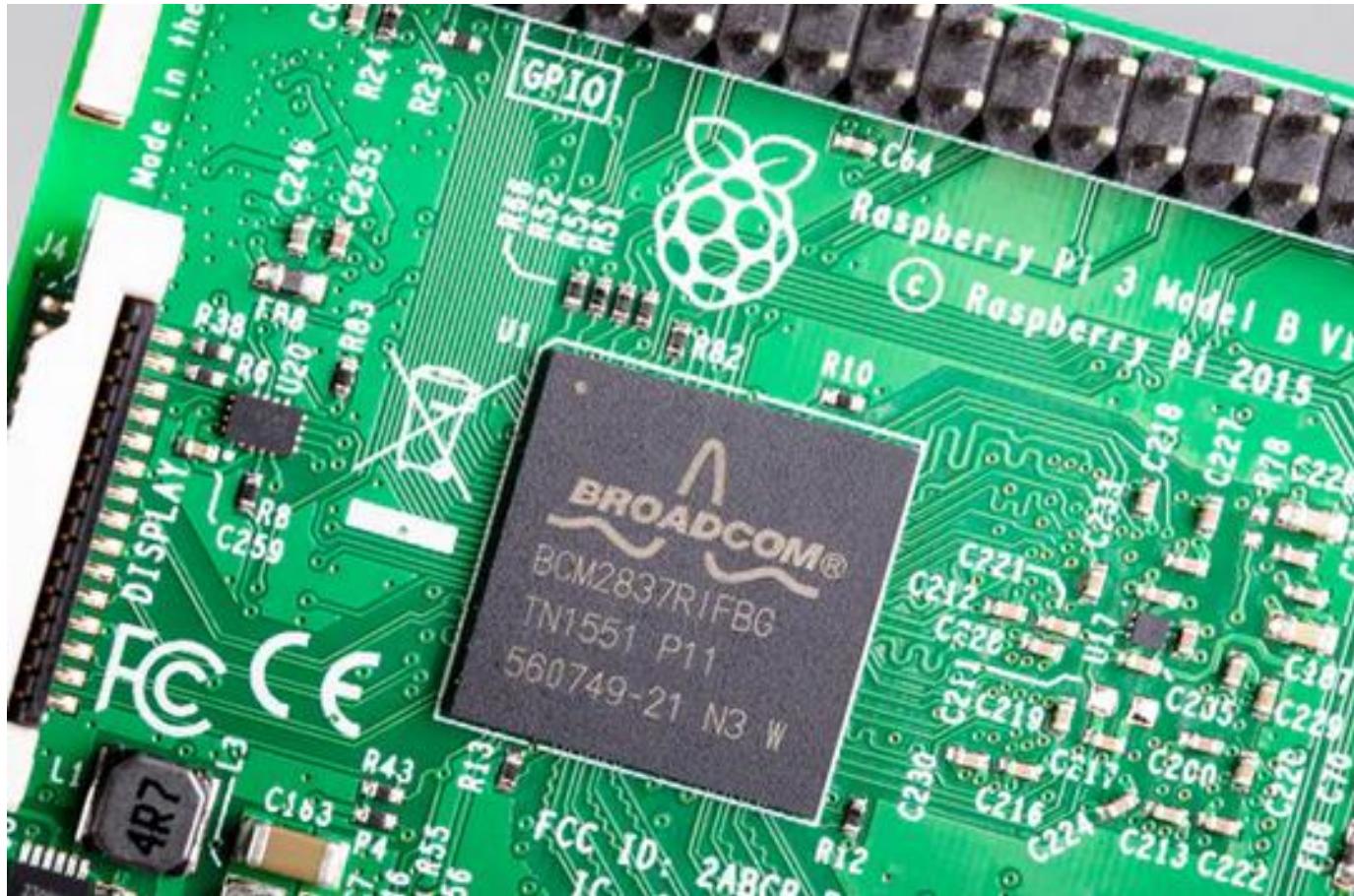
- Broadcom BCM2836 SoC ARM Cortex A7

**BCM2837**

**A8**

- Broadcom BCM2836 SoC is **ARM Cortex A7**

# **Broadcom System on Chip**



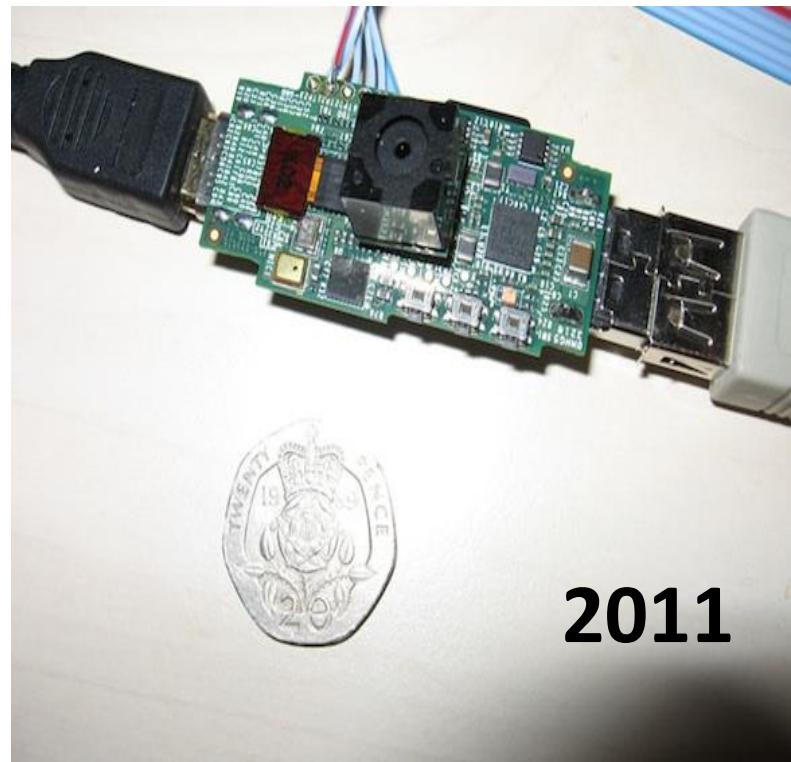
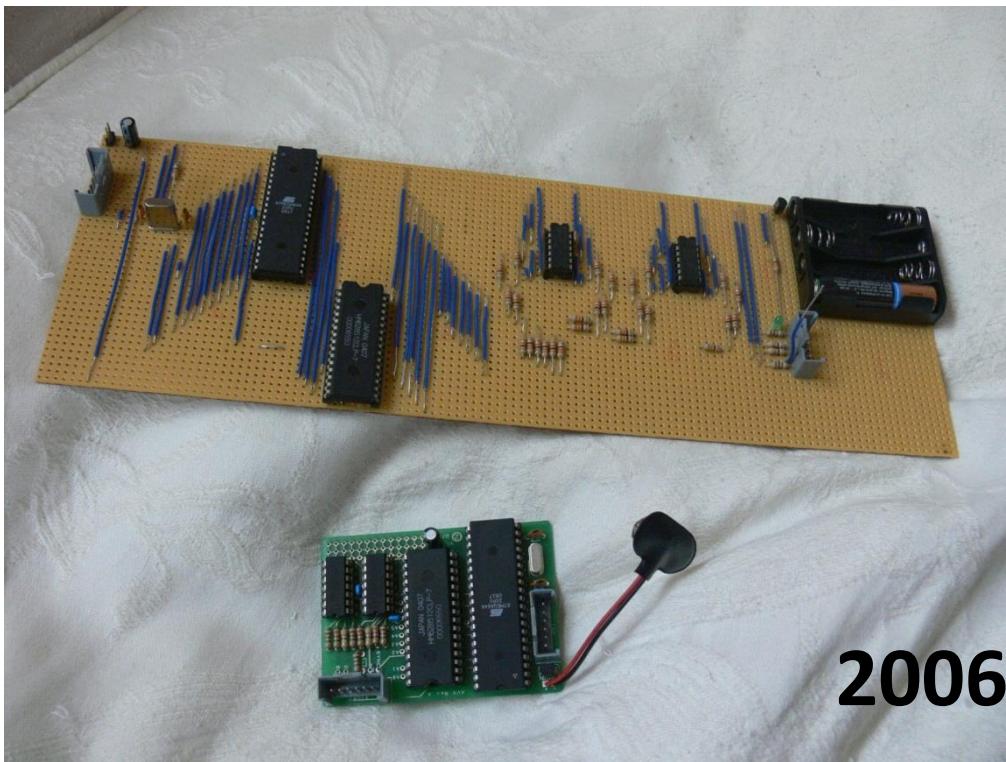
Quad Core 1.2GHz Broadcom BCM2837 64bit  
CPU1GB RAM

# System on Chip vs Motherboard:



- **Upgradable**
- **Component Damage, Replace the component only**
- **More Compact**
- **Power Efficient**
- **Not Upgradable**
- **Component Damage, Replace all**

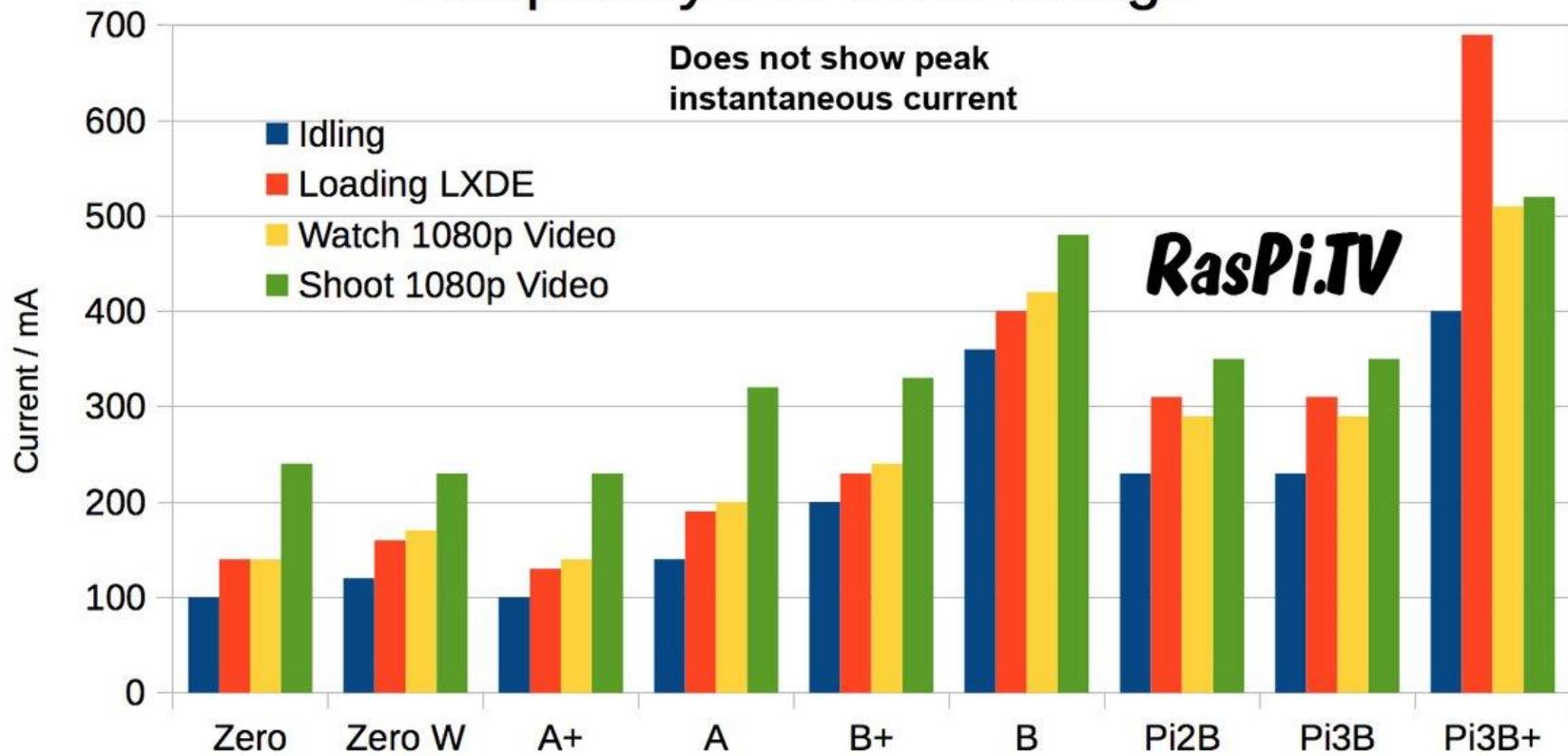
# Raspberry-pi History



# Raspberry Pi comparison

	Raspberry Pi	Raspberry Pi 2	Raspberry Pi 3	Raspberry Pi 4
Released	February 2012	February 2015	February 2016	24 June 2019
CPU	ARM1176JZF-S	ARM Cortex-A7	ARM Cortex-A53	ARM Cortex-A72
CPU speed	700MHz single core	900MHz quad core	1,200MHz quad core	1.5GHz quad core
RAM	512MB 256MB Rev 1	1GB	1GB	1GB, 2GB or 4GB
GPU	Broadcom Videocore IV	Broadcom Videocore IV	Broadcom Videocore IV	Broadcom Videocore IV
Storage	SDHC slot MicroSDHC Model A+ and B+	MicroSDHC slot	MicroSDHC slot	MicroSDHC slot
USB Ports	2 on Model B	4	4	2 x USB 2.0 2 x USB 3.0
WiFi	No built-in wifi	No built-in wifi	802.11n and Bluetooth 4.1	802.11 b/g/n/ac And Bluetooth 5.0

# Raspberry Pi Power Usage

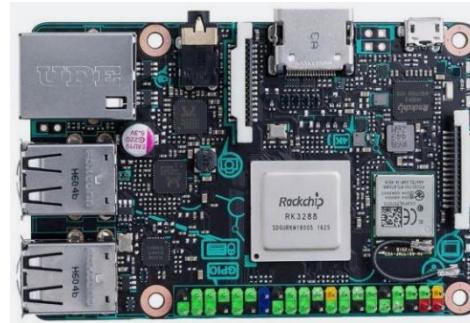


	Zero	Zero W	A+	A	B+	B	Pi2B	Pi3B	Pi3B+
	/mA	/mA	/mA	/mA	/mA	/mA	/mA	/mA	/mA
<b>Idling</b>	100	120	100	140	200	360	230	230	400
<b>Loading LXDE</b>	140	160	130	190	230	400	310	310	690
<b>Watch 1080p Video</b>	140	170	140	200	240	420	290	290	510
<b>Shoot 1080p Video</b>	240	230	230	320	330	480	350	350	520

# Open source cheap Embedded Systems



**ASUS90MB0QY1-M0EAY0 Tinker**



Banana Pi - A Highend Single-Board Computer

**The Banana Pi**



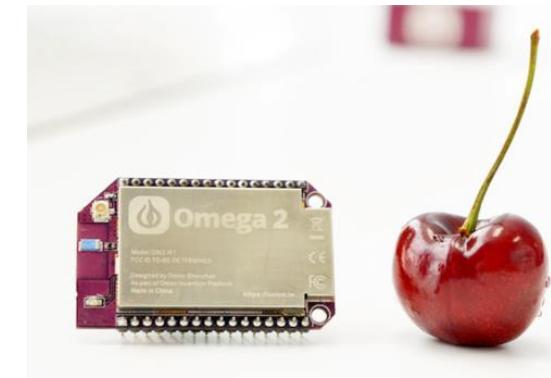
Orange pi 2



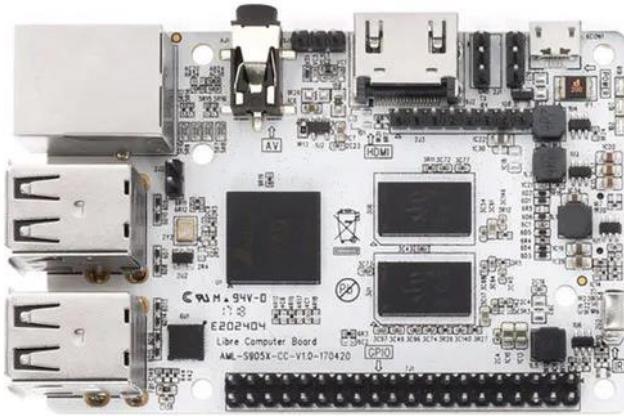
**INTEL® GALILEO BOARD**



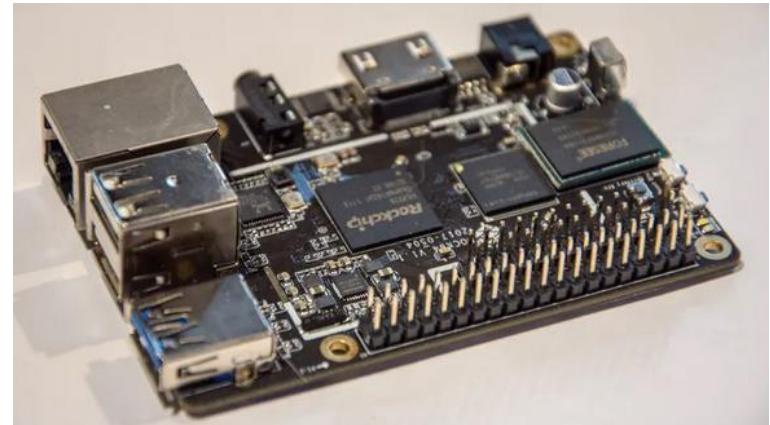
Omega2: \$5 Linux Computer with Wi-Fi, Made for IoT



# Open source cheap Embedded Systems



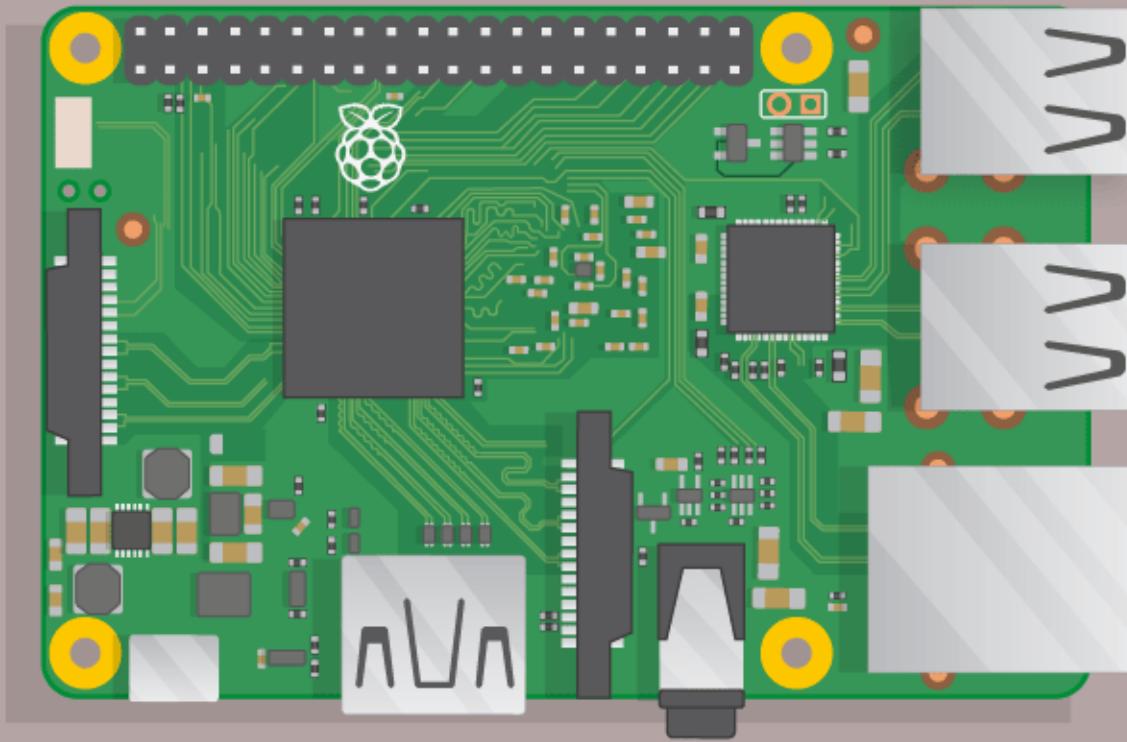
**Le Potato**



**ROCK Pi**



**NVIDIA Jetson Nano**



# Raspberry Pi - Setup

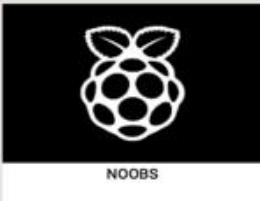
# First Boot Up

Screenshot of the raspberrypi.org website showing the 'DOWNLOADS' section.

The page header includes the Raspberry Pi logo, navigation links for BLOG, DOWNLOADS, COMMUNITY, HELP, FORUMS, EDUCATION, and a search bar. A 'Shop' link is also present.

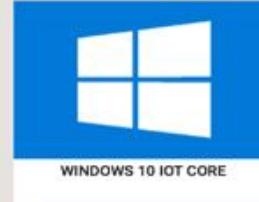
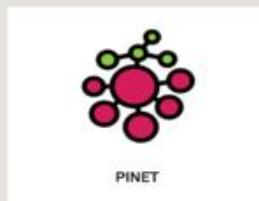
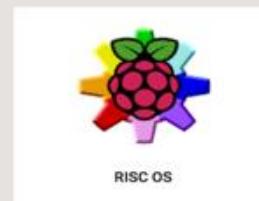
## DOWNLOADS

Raspbian is the Foundation's official supported Operating System. Download it here, or use NOOBS, our easy installer for Raspbian and more.

 NOOBS  RASPBIAN

### THIRD PARTY OPERATING SYSTEM IMAGES

Third party images are also available:

 UBUNTU MATE	 SNAPPY UBUNTU CORE	 WINDOWS 10 IOT CORE	 OSMC
 LIBREELEC	 PINET	 RISC OS	 WEATHER STATION



# First Boot Up



RASPBIAN  
Debian Wheezy

Embedded Linux

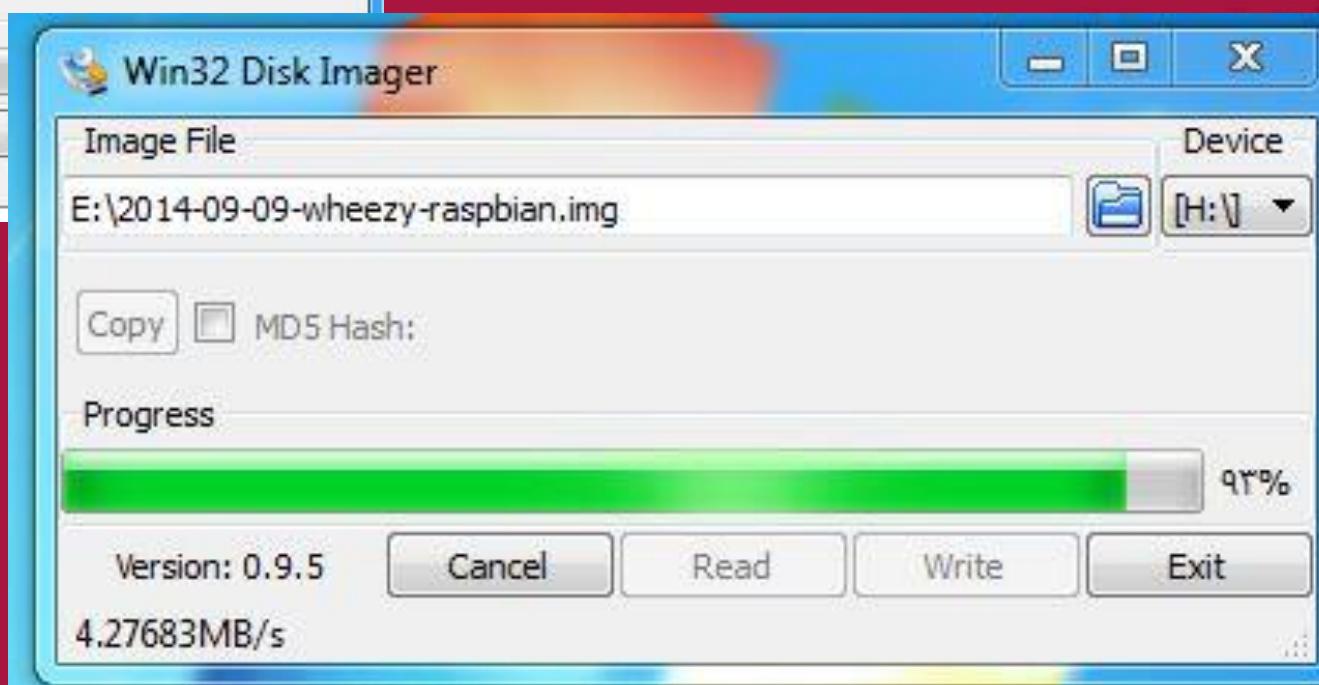
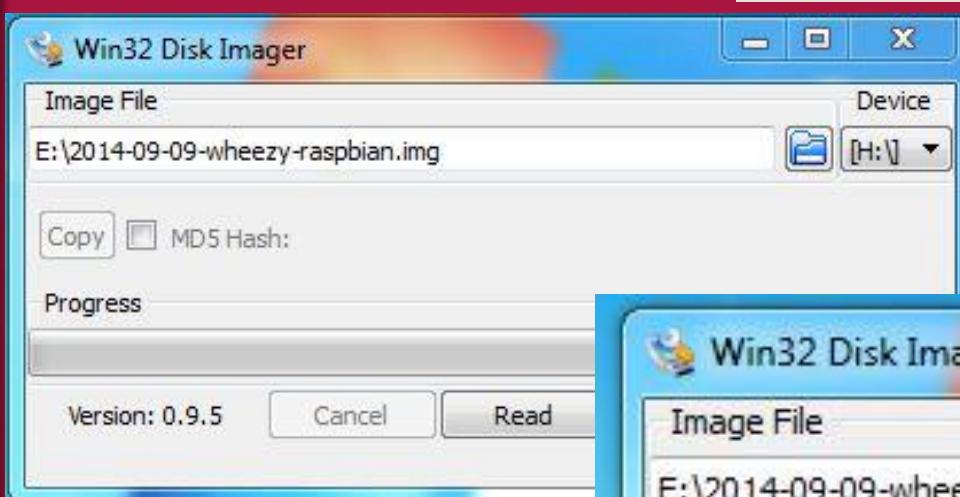
Version: December 2014

Release date: 2014-12-24

[More info +](#)

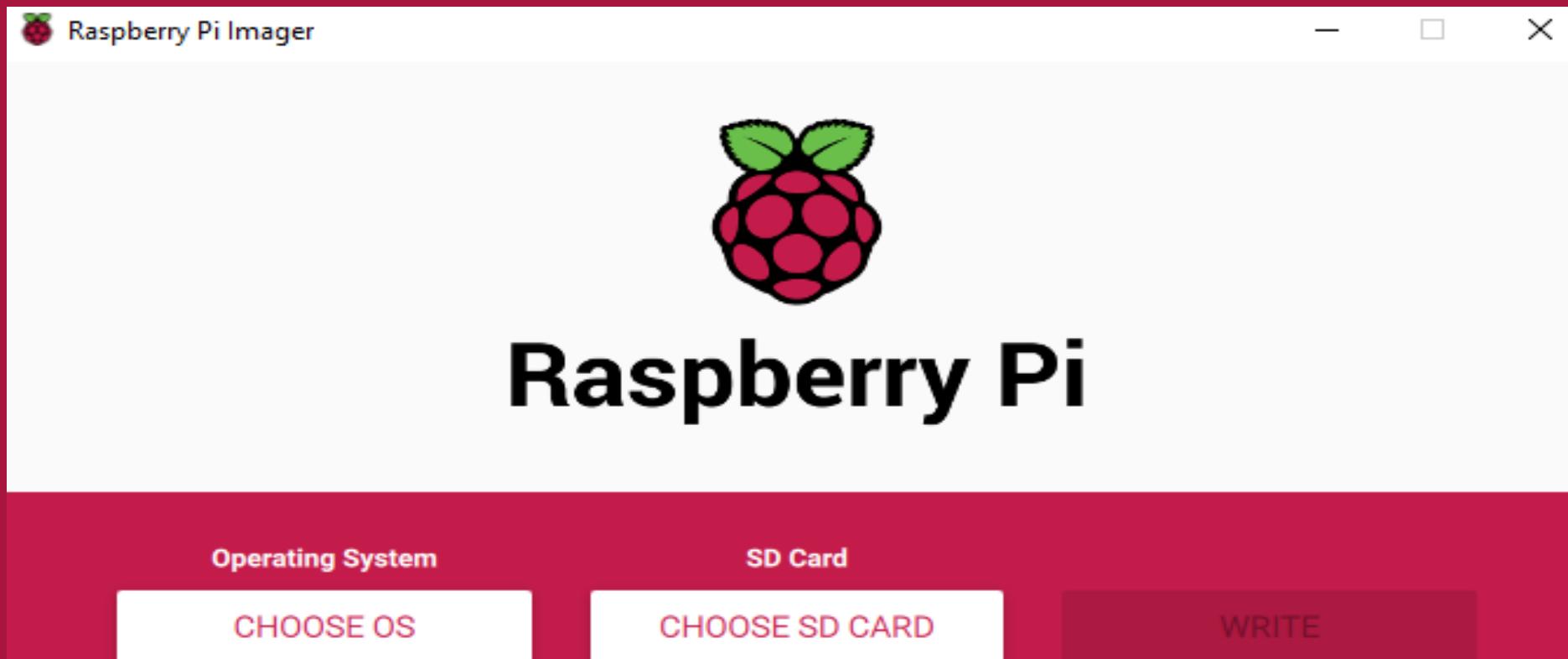
Download Torrent

Download ZIP

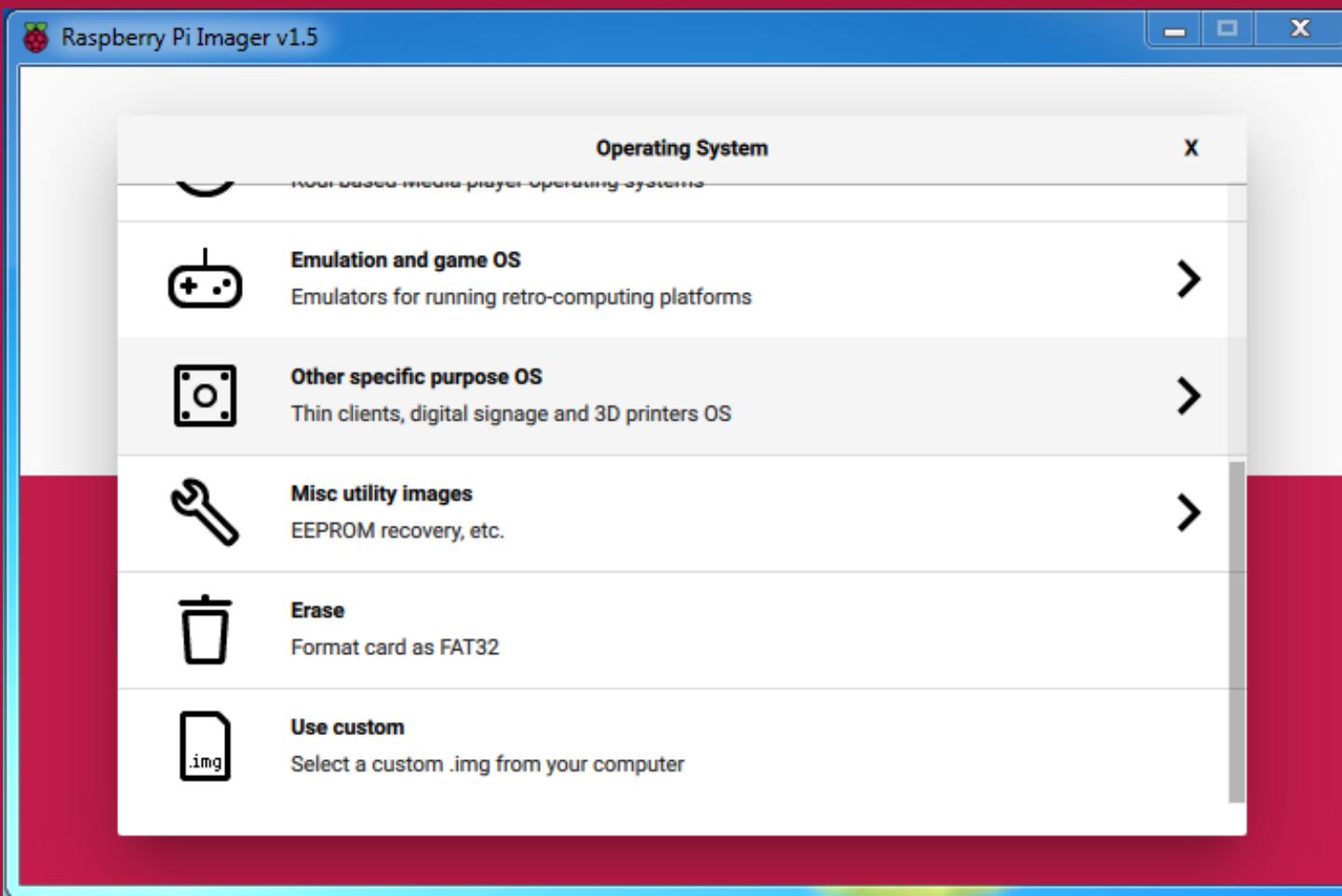


# First Boot Up

هناك أداة جديدة لتنصيب النظام على بطاقة الذاكرة وهي :  
تمتلك مميزات عديدة منها التحميل المباشر عبر  
الانترنت وإمكانية مسح النظام بشكل كامل



# First Boot Up



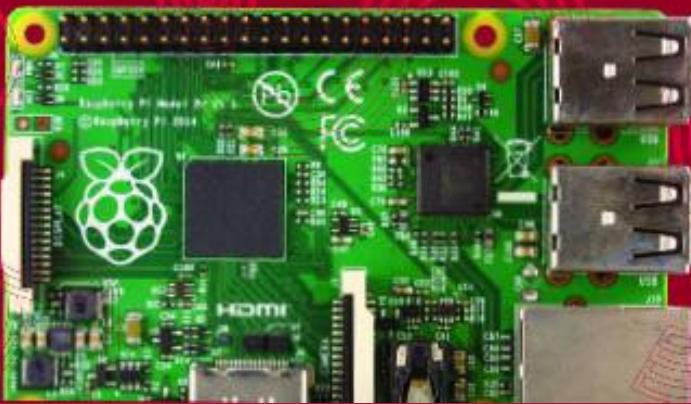
# Raspberry Pi - Setup



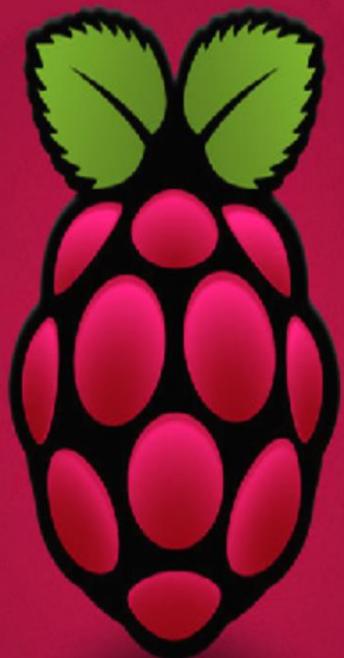


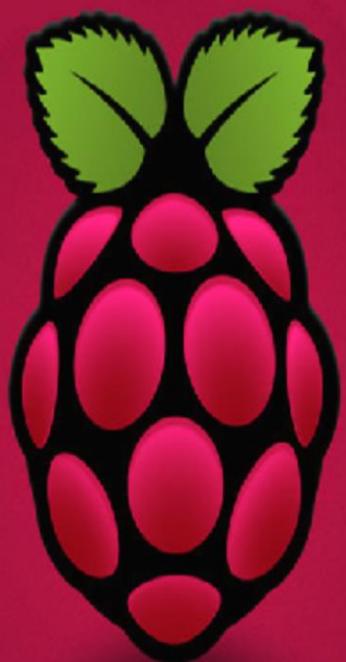
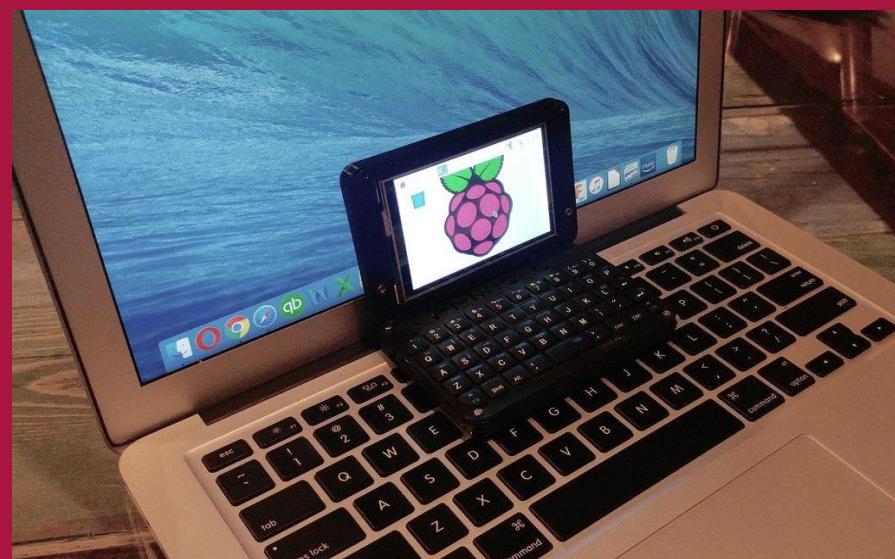
تطبيقات

# Raspberry Pi



• جهاز حاسب تقليدي









- مشاريع تحكم الكترونية واستخدام هذه اللوحة كبديل متطور عن المتحكمات المصغرة.

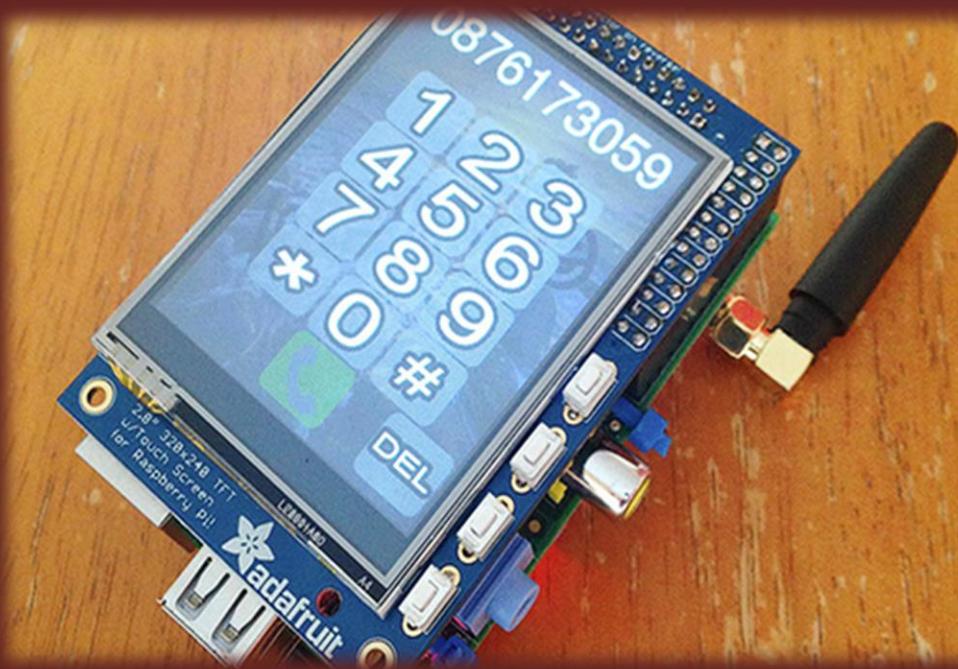


Raspberry Pi Wall Mounted Google Calendar –  
On Instructables

## PiPad: Tablet Using Raspberry Pi

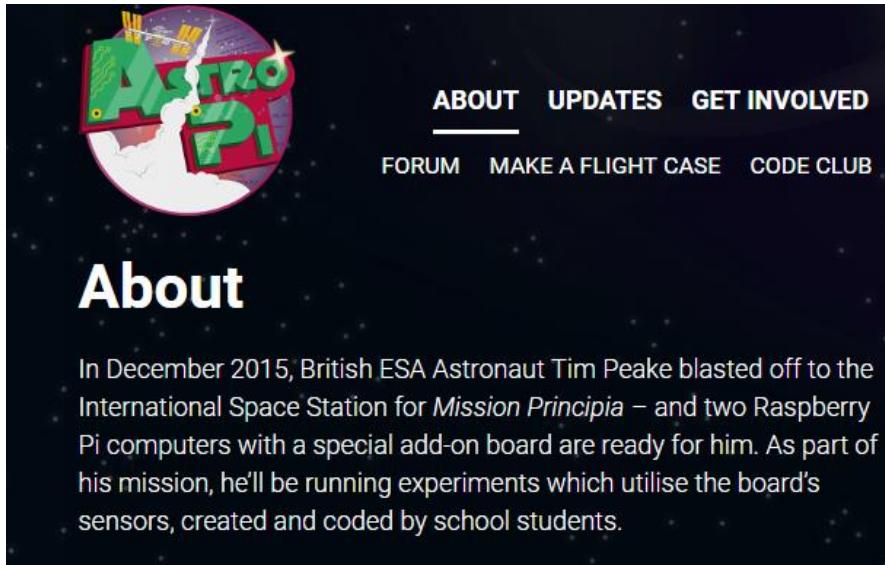


## PiPhone : Using Raspberry Pi





## الاقمار الصناعية بالalonine (weather balloon) ✓



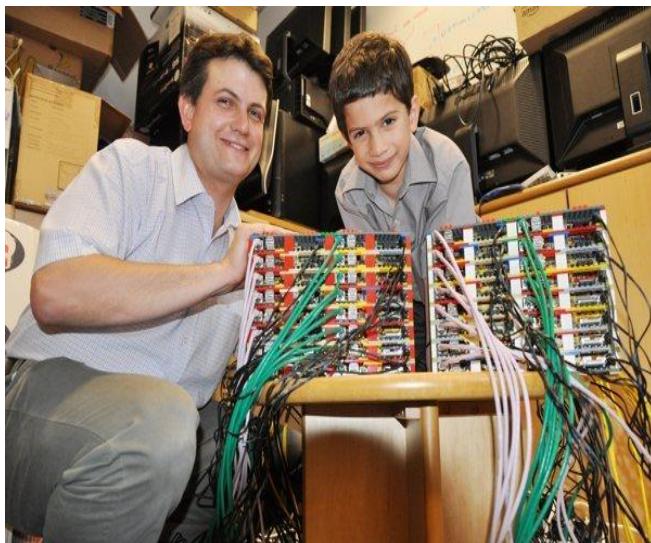
The screenshot shows the Astro Pi website's 'About' page. At the top left is the Astro Pi logo featuring a white rocket ship with the word 'ASTRO' above it and 'PI' below it, set against a dark background with stars. To the right of the logo are navigation links: 'ABOUT' (which is underlined), 'UPDATES', 'GET INVOLVED', 'FORUM', 'MAKE A FLIGHT CASE', and 'CODE CLUB'. Below these links is a large, bold 'About' heading. Underneath the heading is a paragraph of text: 'In December 2015, British ESA Astronaut Tim Peake blasted off to the International Space Station for *Mission Principia* – and two Raspberry Pi computers with a special add-on board are ready for him. As part of his mission, he'll be running experiments which utilise the board's sensors, created and coded by school students.'

<https://astro-pi.org/about/>



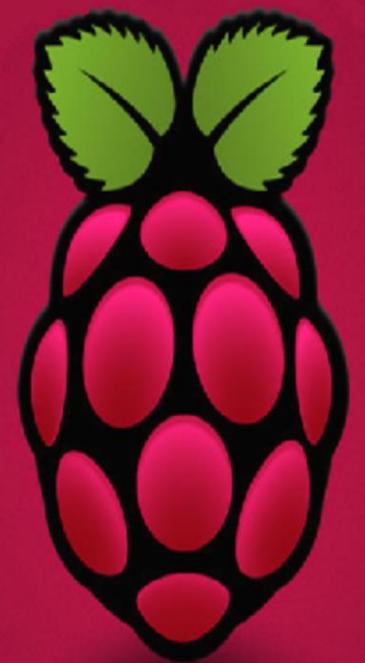
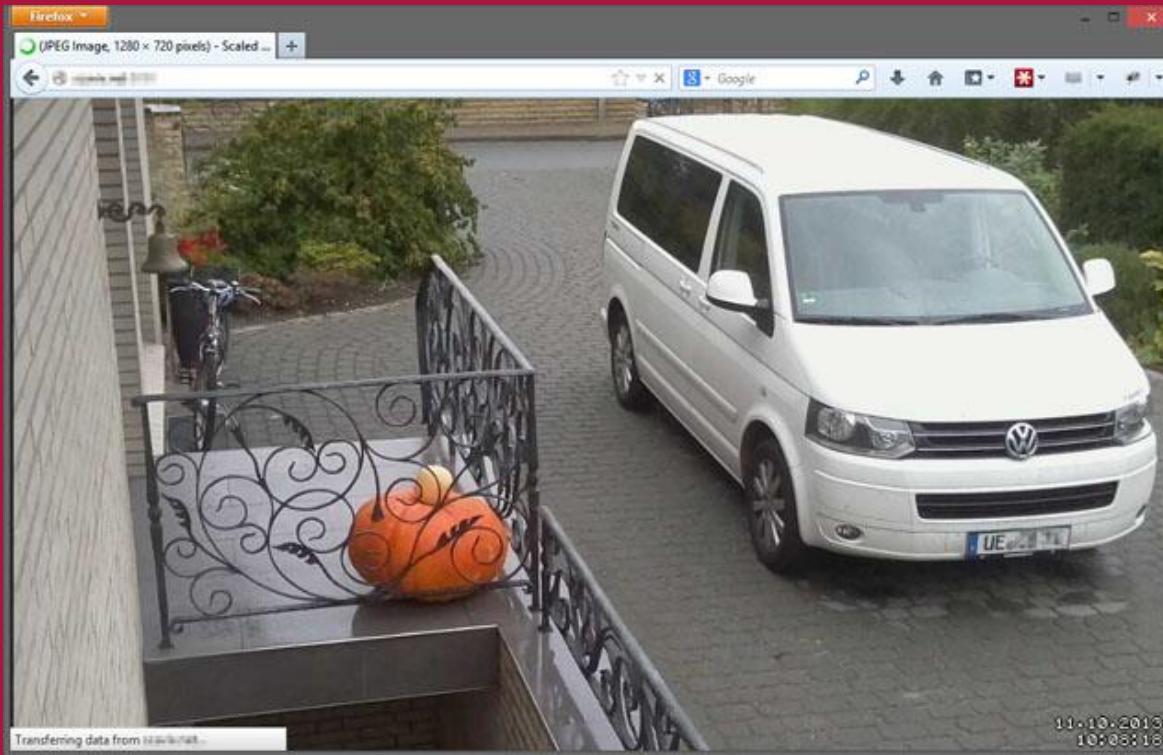
## الحواسيب الشائكة Supercomputers ✓

**Supercomputer using Raspberry Pi (64 Processors, 1 TB of Memory)**



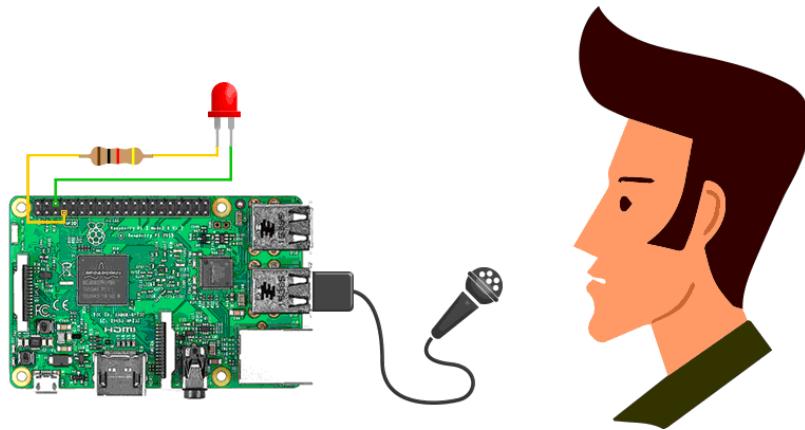


Low Cost HD Surveillance Camera

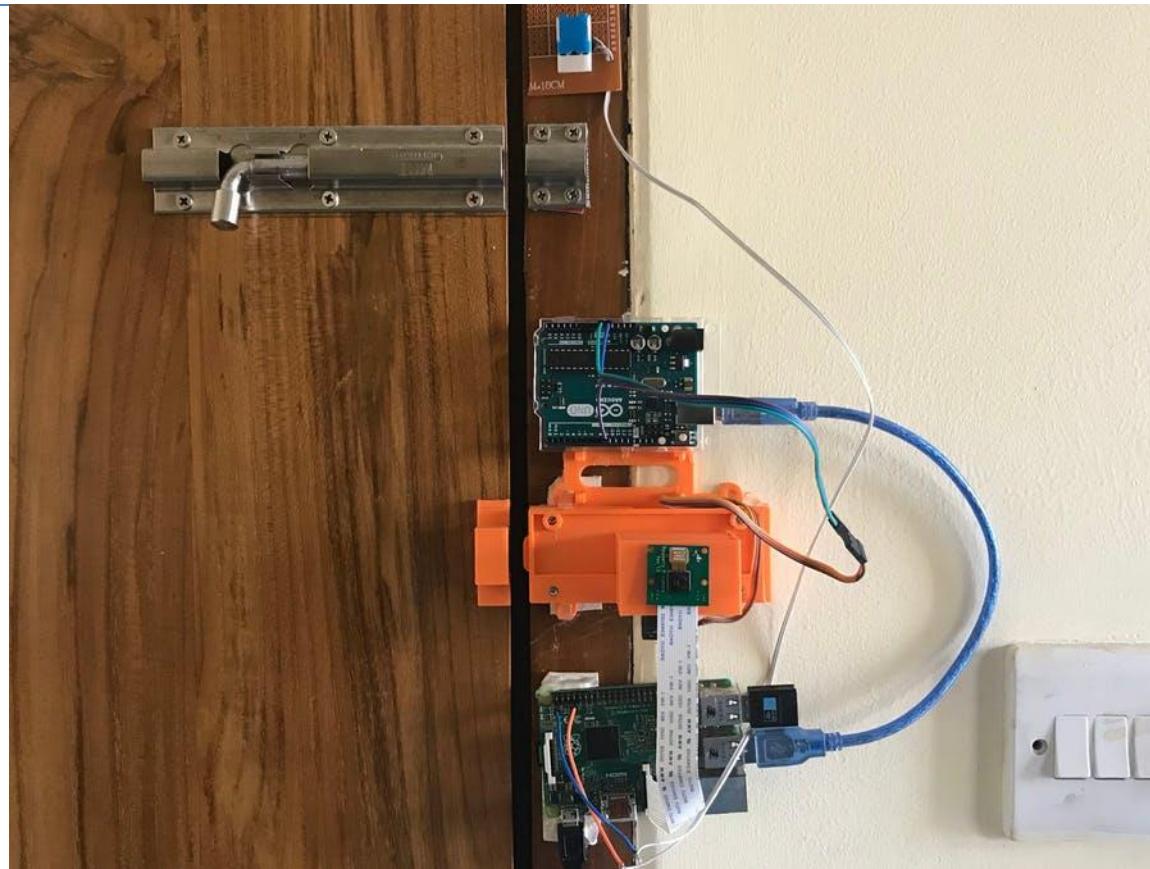


# تطبيقات باستخدام RPi Zero





تطبيقات التعرف على  
السمات الأساسية كالصوت  
والصورة

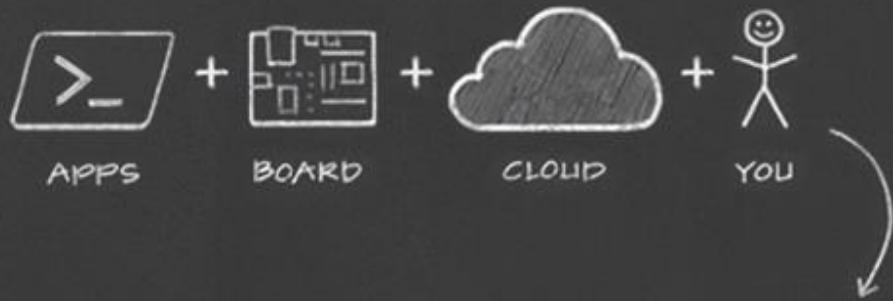


# تطبيقات باستخدام نظام تشغيل W10

## Windows Developer Program for IoT

We're bringing Windows to  
a new class of small devices.

*What will you make?*



Announcing Windows 10 for Raspberry Pi 2 →



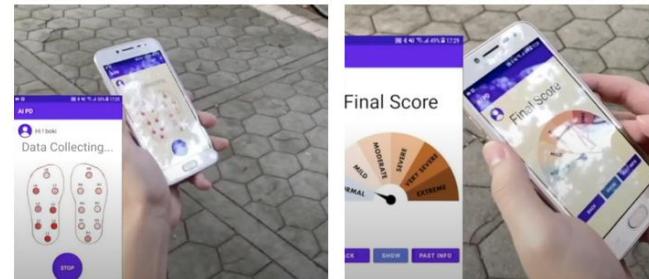
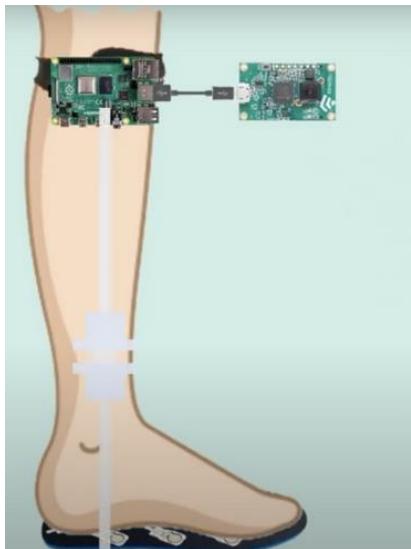
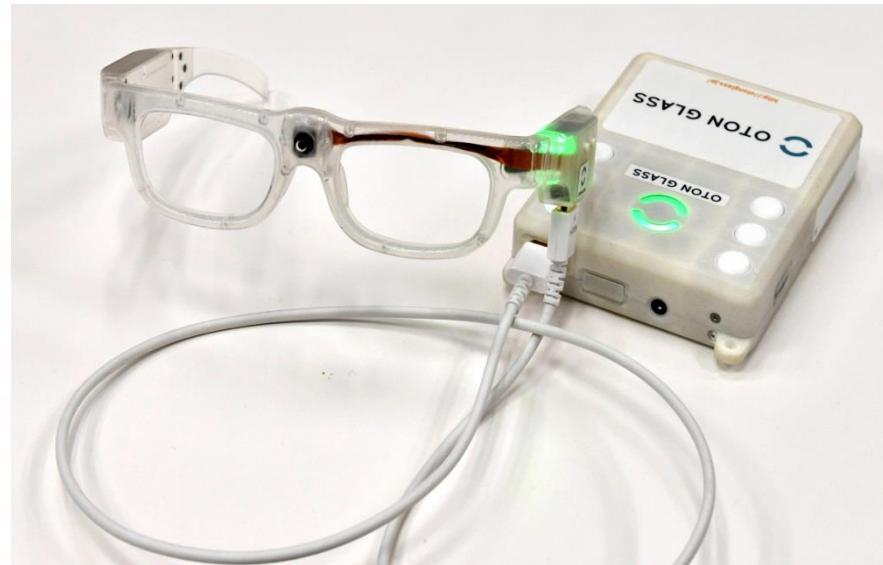
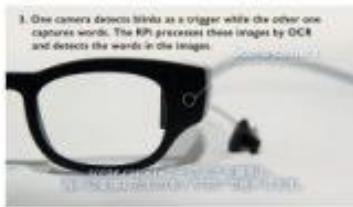
Windows 10



# تطبيقات أنظمة المساعدة الطبية

## OTON GLASS changes words to sound

The glasses have two small cameras and an earpiece. The camera captures pictures of words that user wants the read and reads the word to the user via the earpiece.

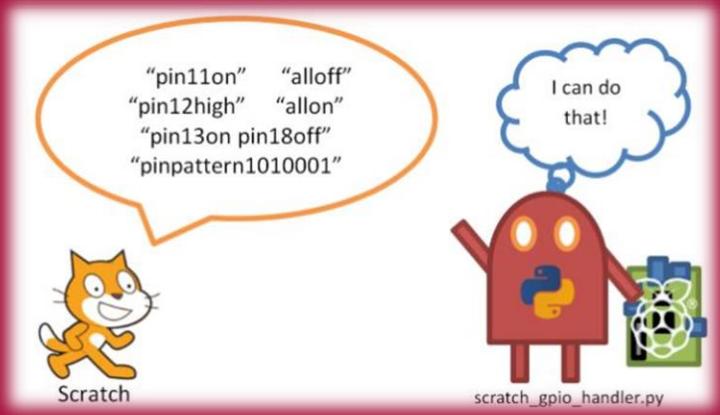


## Foot pressure sensors detect Parkinson's disease

## A wheelchair controlled by eye movements



# تطبيقات تعليمية

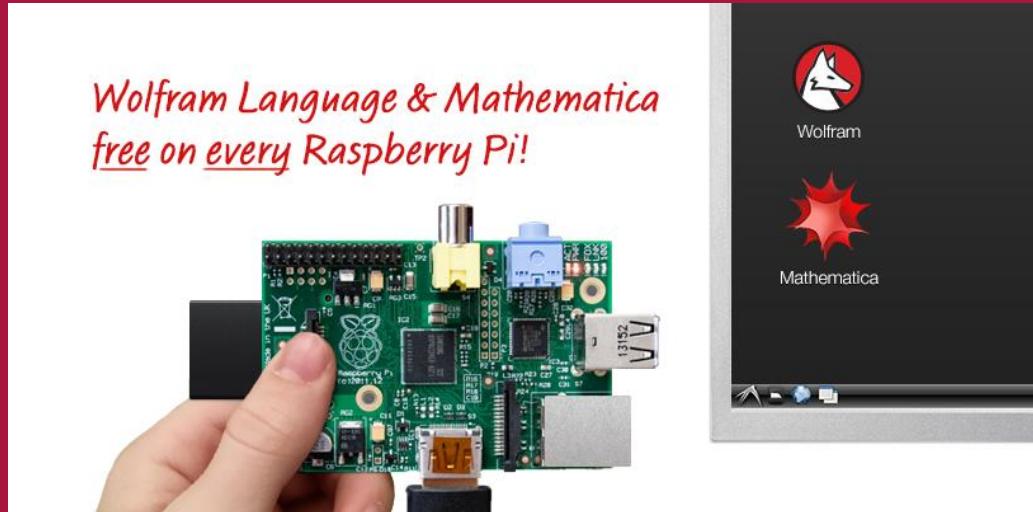


Sonic Pi  
Audible Computing.

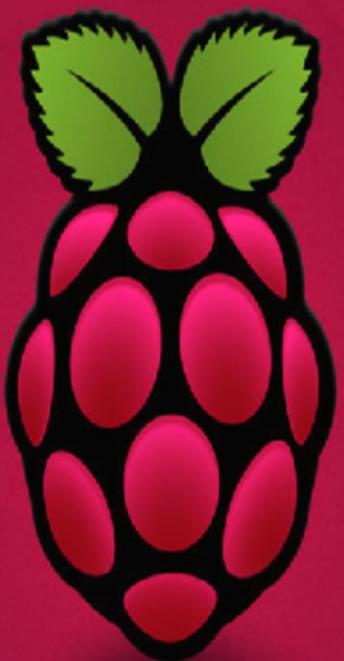
A free [sound synthesiser](#) for [live coding](#) designed to support [computing](#) and [music](#) lessons within schools.

Use [code](#) to compose and [perform](#) in classical and contemporary styles ranging from [Canons](#) to [Dubstep](#).

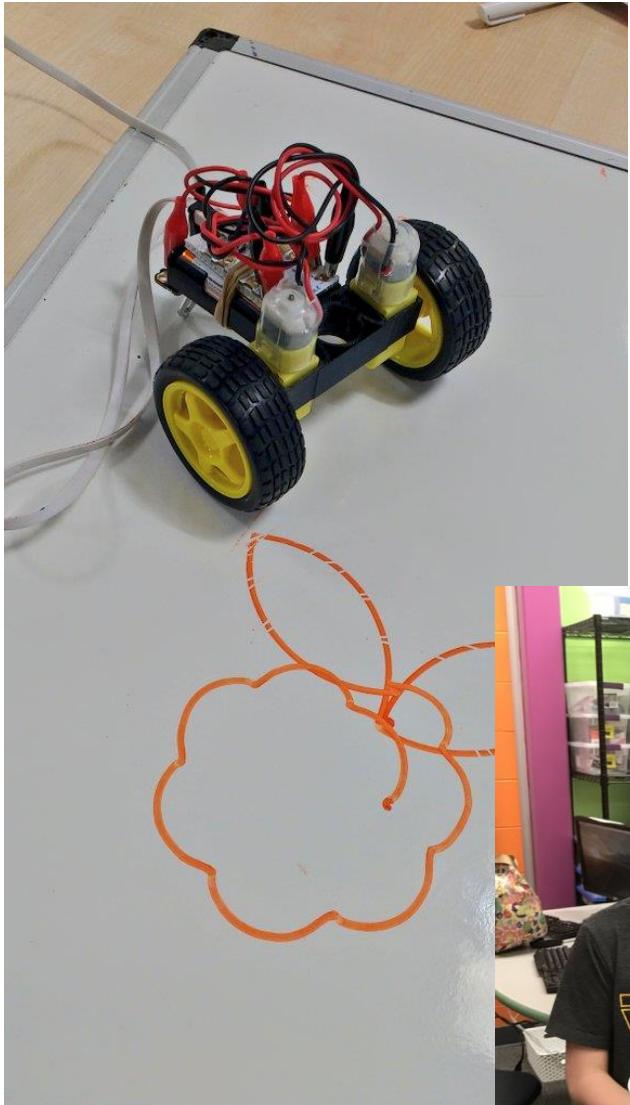
Brought to you by [Sam Aaron](#) and the Sonic Pi Core Team,  
v2.3.0 is available free for:



# Raspberry Pi - Learning



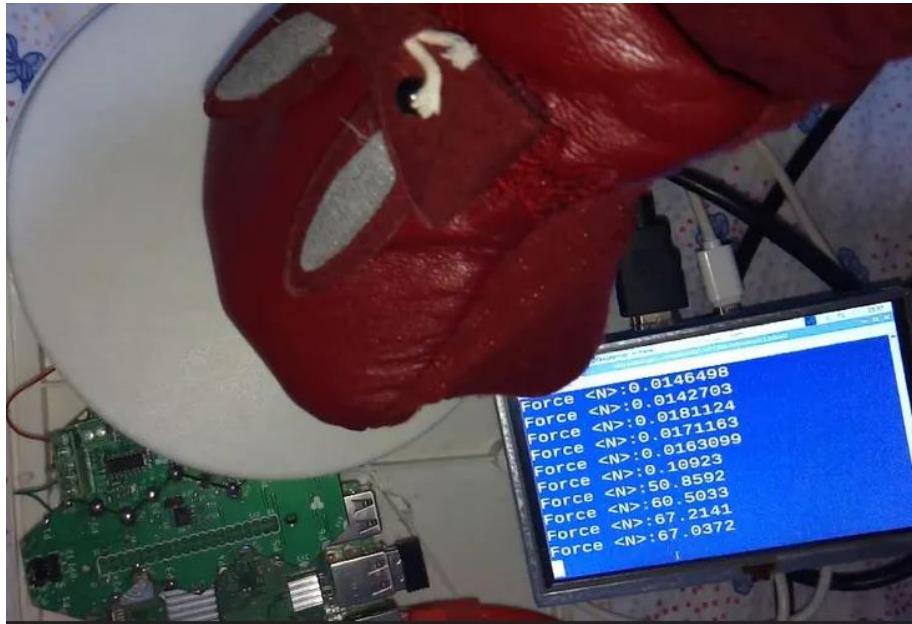
# تطبيقات روبوتية



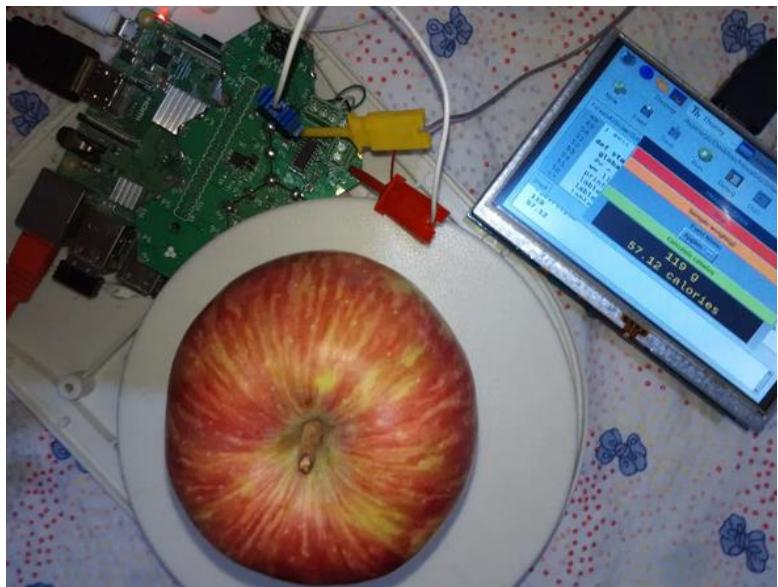
Pi Cat



# تطبيقات باستخدام الحساسات



```
Force <N>: 0.0146498  
Force <N>: 0.0142703  
Force <N>: 0.0181124  
Force <N>: 0.0171163  
Force <N>: 0.0163099  
Force <N>: 0.10923  
Force <N>: 50.8592  
Force <N>: 60.5033  
Force <N>: 67.2141  
Force <N>: 67.0372
```

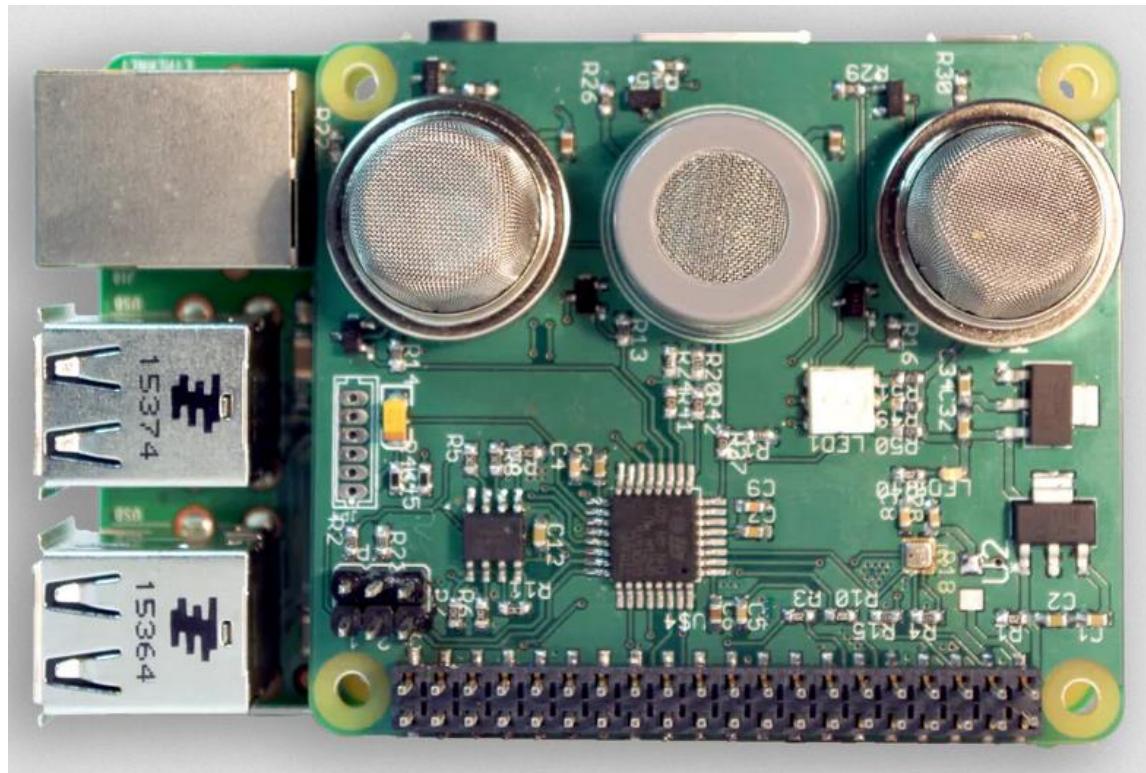


57.12 CALORIES



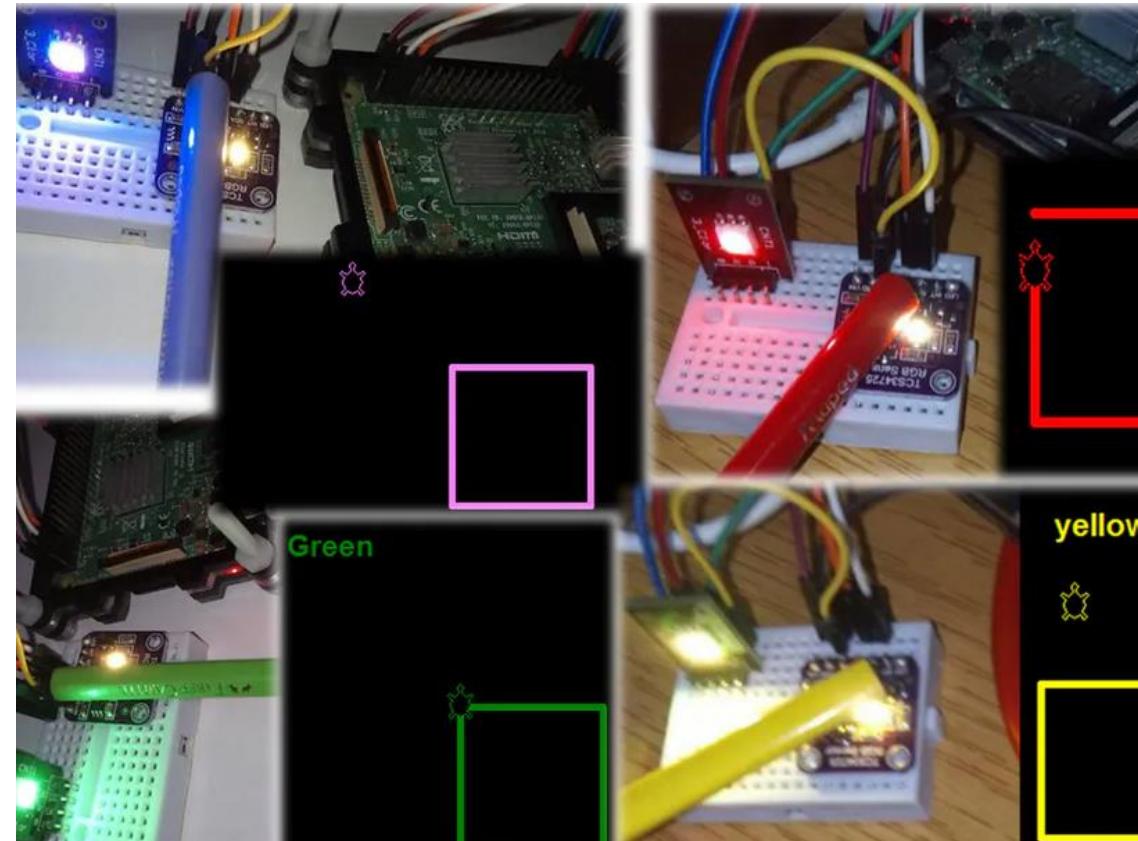
# تطبيقات باستخدام الحساسات

حساسات الغاز

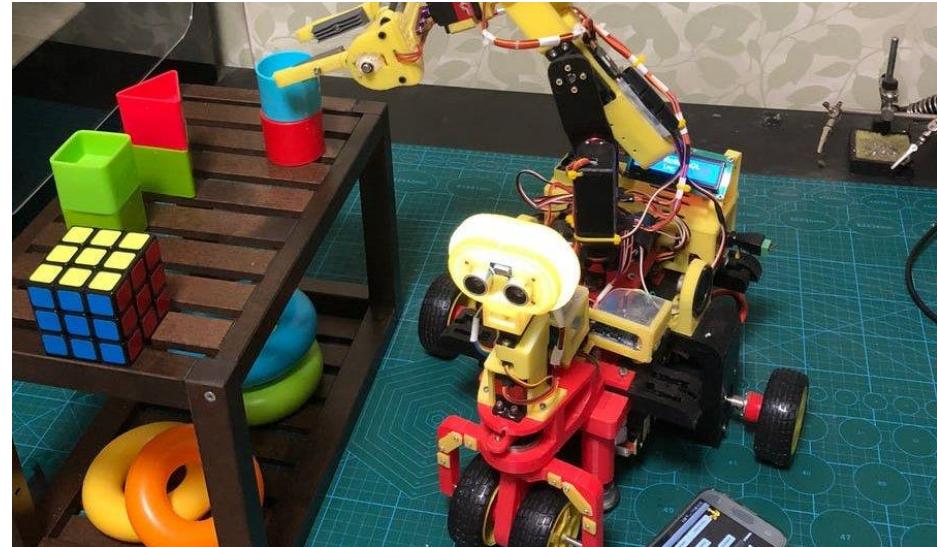
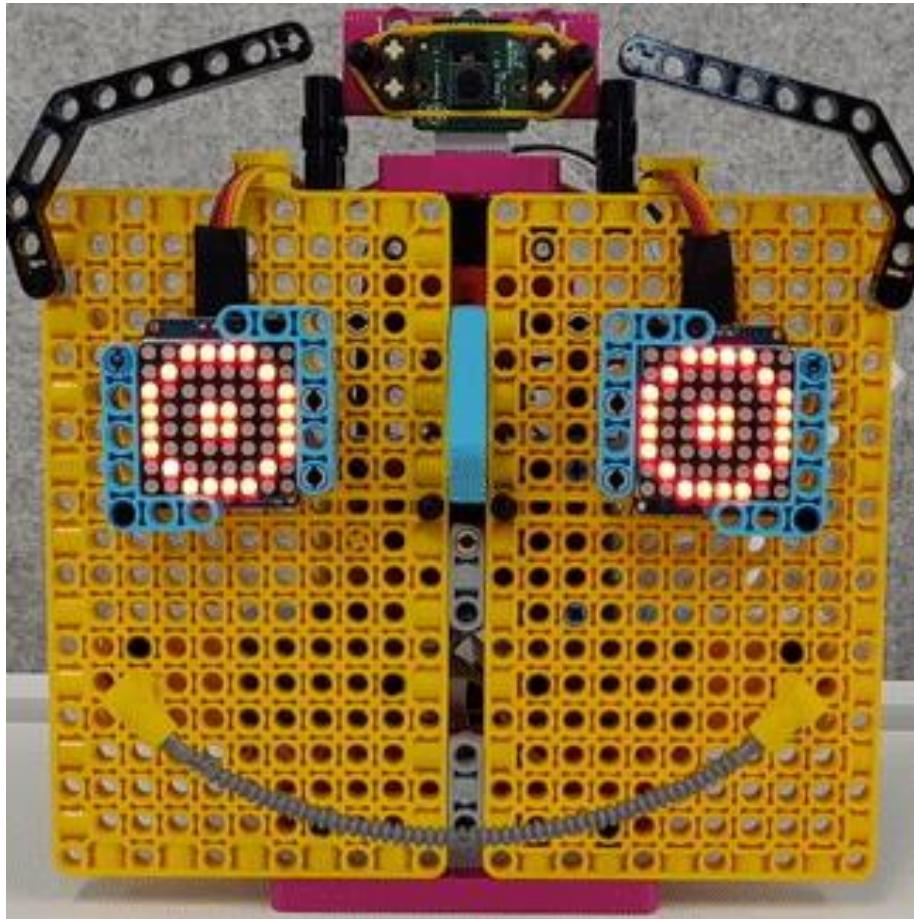


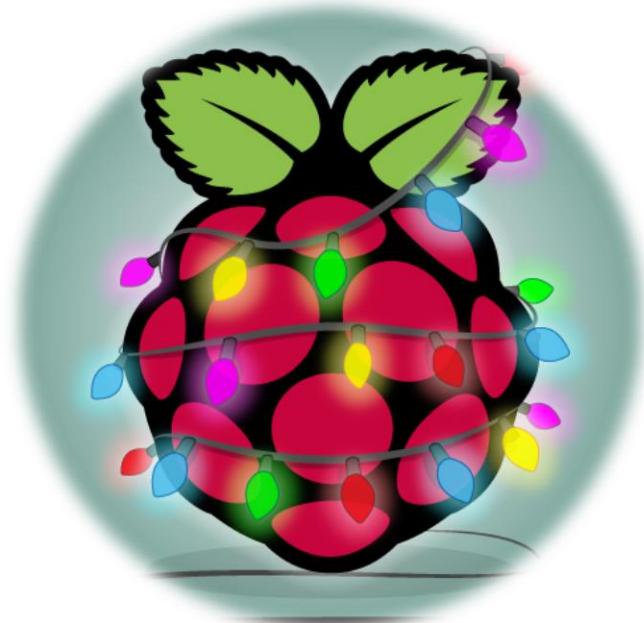
# تطبيقات باستخدام الحساسات

حساس الألوان



# تطبيقات باستخدام خوارزميات معالجة الصورة





**Thank You**

**Aula Jazmati**