

# Scratch e a cámara web

## Obxectivos

- Activar a cámara web en Raspbian
- Integrar a cámara web en proxectos feitos con Scratch
- Valorizar Scratch como ferramenta de iniciación á programación 'para todas as idades'
- Acadar o cinto amarelo do NINJA do terminal

# Scratch e a cámara web

## Contidos

- Conexión da cámara web na placa Raspberry Pi
- Uso de raspi-config para habilitar servizos en Raspbian
- Integración da cámara web no escritorio de Scratch
- Ideas de uso da cámara web con Scratch

# Scratch e a cámara web

- Scratch é un entorno de programación considerado ideal para os nenos aprenderen a programar.
- Scratch é ideal para unha primeira aproximación á programación, con independencia da idade.
- Incorpora os paradigmas de programación máis relevantes:
  - programación imperativa
  - POO
  - programación orientada a eventos
  - introdución á programación “funcional”

# Scratch e a cámara web

- Na Raspi, Scratch permítenos acceder de xeito fácil aos altavoces e á cámara web
- Podemos usar en local Scratch 1.4 e 2.0
- Podemos usar Scratch 2.0 ligados á web, accedendo ademais á comunidade de programadores

<https://scratch.mit.edu/>

- Podemos usar Scratch 3.0 ligados á web, polo de agora en versión Beta.

<https://beta.scratch.mit.edu/>

- Podemos acceder aos pins de E/S (GPIO) aínda que con algunhas limitacións.

# Scratch e a cámara web

- Para empregar a cámara web en Scratch:
  - conectar a cámara na placa Raspi (cos pins mirando cara ao conector HDMI)
  - activar a cámara para que Scratch se poda conectar
  - programar no IDE de Scratch (2.0 en local ou web)

# Scratch e a cámara web

- A cámara hai que conectala no porto que está entre os portos Ethernet e HDMI,
  - tira da peza de plástico cara arriba con decisión,
  - conecta a cámara no porto (cos pins mirando cara ao conector HDMI),
  - inserta firmemente o cabo no conector,
  - tenta non doblar o cabo,
  - preme na peza de plástico, para asegurar a conexión.

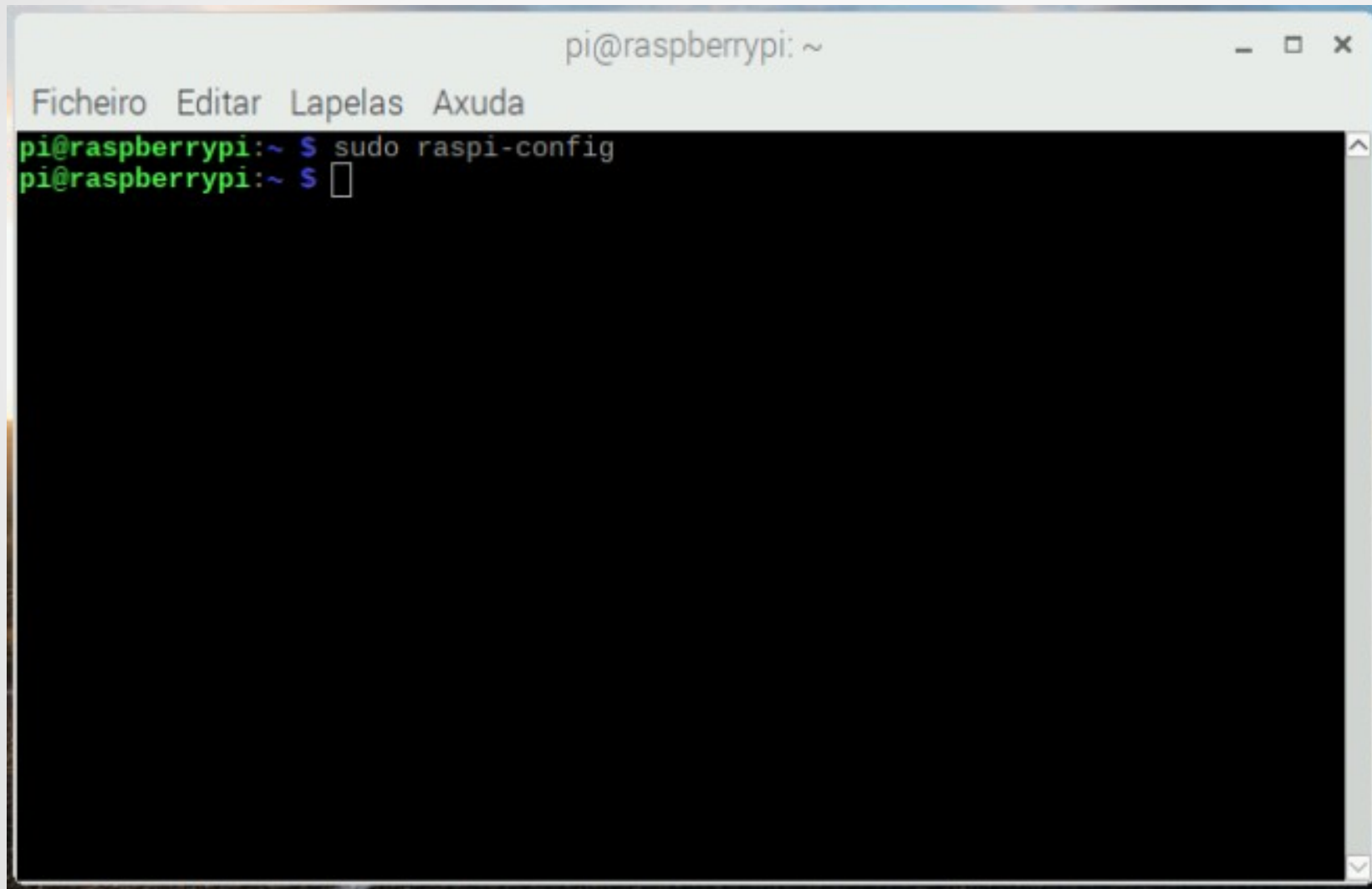
# Scratch e a cámara web



Conexión

# Scratch e a cámara web

## Activación



```
pi@raspberrypi: ~  
Ficheiro  Editar  Lapelas  Axuda  
pi@raspberrypi:~ $ sudo raspi-config  
pi@raspberrypi:~ $
```

# Scratch e a cámara web

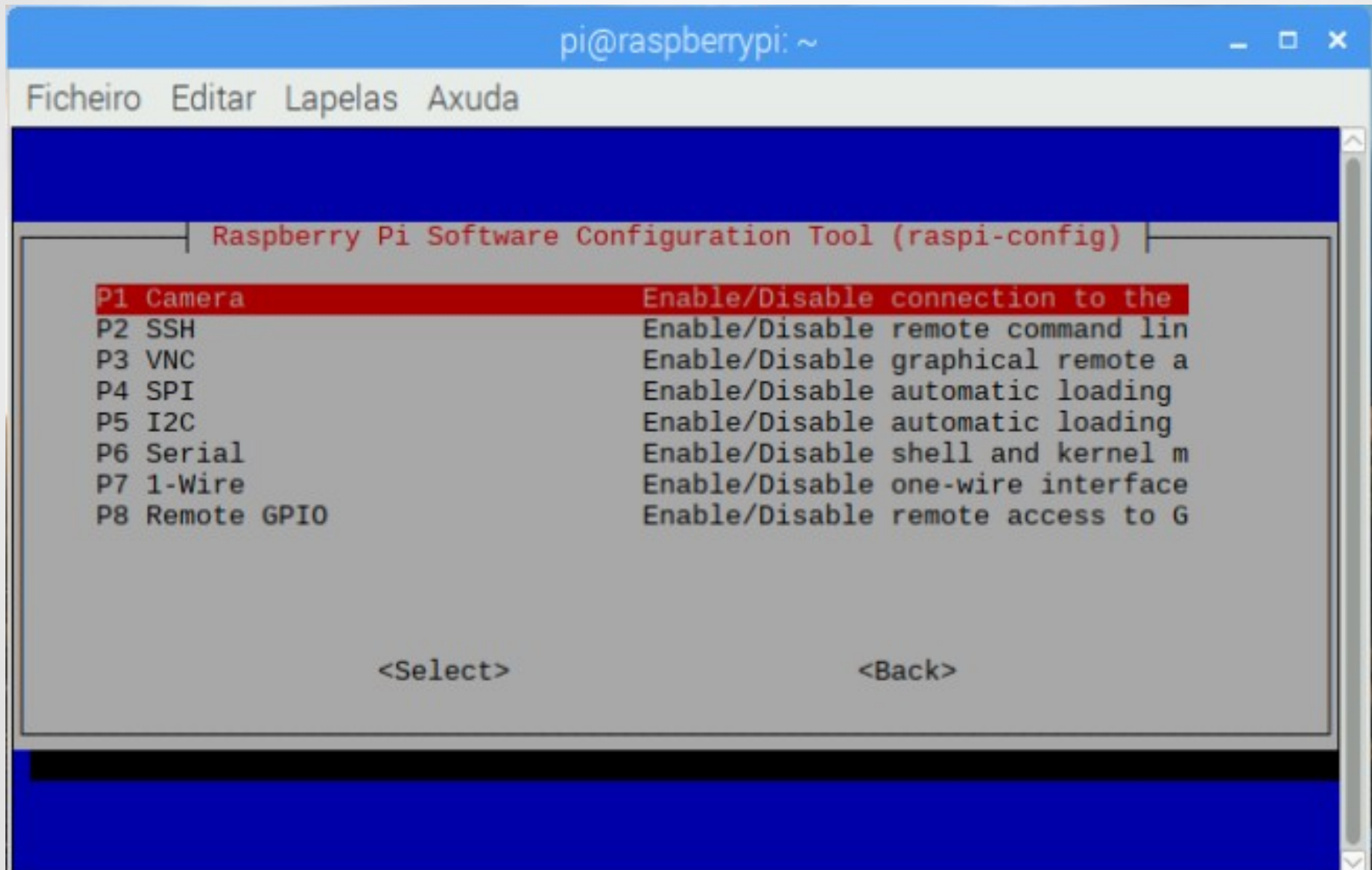
## Activación

```
pi@raspberrypi: ~
Ficheiro  Editar  Lapelas  Axuda
Raspberry Pi 3 Model B Rev 1.2
Raspberry Pi Software Configuration Tool (raspi-config)
1 Change User Password      Change password for the current u
2 Network Options           Configure network settings
3 Boot Options               Configure options for start-up
4 Localisation Options       Set up language and regional sett
5 Interfacing Options        Configure connections to peripher
6 Overclock                  Configure overclocking for your P
7 Advanced Options           Configure advanced settings
8 Update                     Update this tool to the latest ve
9 About raspi-config         Information about this configurat

<Select>                    <Finish>
```

# Scratch e a cámara web

## Activación



The image shows a terminal window on a Raspberry Pi. The window title is "pi@raspberrypi: ~". The menu bar includes "Ficheiro", "Editar", "Lapelas", and "Axuda". The main content is the "Raspberry Pi Software Configuration Tool (raspi-config)" interface. It lists several options, with "P1 Camera" highlighted in red. The description for "P1 Camera" is "Enable/Disable connection to the". Other options include "P2 SSH", "P3 VNC", "P4 SPI", "P5 I2C", "P6 Serial", "P7 1-Wire", and "P8 Remote GPIO". At the bottom, there are two buttons: "<Select>" and "<Back>".

```
pi@raspberrypi: ~
Ficheiro  Editar  Lapelas  Axuda

Raspberry Pi Software Configuration Tool (raspi-config)

P1 Camera      Enable/Disable connection to the
P2 SSH        Enable/Disable remote command lin
P3 VNC        Enable/Disable graphical remote a
P4 SPI        Enable/Disable automatic loading
P5 I2C        Enable/Disable automatic loading
P6 Serial     Enable/Disable shell and kernel m
P7 1-Wire     Enable/Disable one-wire interface
P8 Remote GPIO Enable/Disable remote access to G

<Select>      <Back>
```

# Programar Scratch coa cámara web

The image shows a remote viewer window titled "pi's X desktop (raspberrypi:1) (1) - Remote Viewer". Inside the window, the Scratch 2 application is running. The interface includes a menu bar (File, View, Send key, Help), a toolbar, and a main workspace. The workspace contains a Scratch cat sprite and a script with several video-related blocks: "movimento do video en esta figura", "video acceso", "fixar transparencia de video a", "cronómetro", "reiniciar cronómetro", "posición x de Cat1", "minuto xusto agora", and "dias desde o 2000". A dialog box titled "Adobe Flash Player Settings" is overlaid on the workspace, with the text: "Camera and Microphone Access local is requesting access to your camera and microphone. If you click Allow, you may be recorded." The dialog has "Allow" and "Deny" buttons. The bottom of the Scratch interface shows the "Figurass" panel with a "Nova figura:" field and a "Video ace" checkbox.

# Programar Scratch coa cámara web

The image shows a remote view of a Raspberry Pi desktop. The window title is "pi's X desktop (raspberrypi:1) (1) - Remote Viewer". The desktop environment includes a menu bar with "File", "View", "Send key", and "Help". The taskbar shows icons for a terminal, a file manager, and the Scratch 2 application. The Scratch 2 window is the central focus, displaying the Scratch programming environment. The stage area shows a cat sprite named "Cat1" at coordinates (0, 0). The script area contains several code blocks: a "vídeo" block set to "apagado", a "movimento" block set to "do vídeo en esta figura", and a "fixar transparencia de vídeo a 50 %" block. The sidebar on the left includes a "Figurass" panel with a cat sprite icon and a "Nova figura:" section with icons for adding a new figure or background. The bottom right corner of the Scratch window shows a small cat icon with coordinates "x: 0 y: 0".

# Programar Scratch coa cámara web

The image shows a Raspberry Pi desktop environment accessed via Remote Viewer. The window title is "pi's X desktop (raspberrypi:1) (1) - Remote Viewer". The desktop has a taskbar with icons for the Raspberry Pi logo, a globe, a folder, a terminal, and the Scratch 2 application. The Scratch 2 application is open, displaying the following components:

- Stage:** A grey stage with the Scratch Cat sprite (Cat1) in the center. The coordinates are shown as x: 240 y: 44.
- Block Palette:** A sidebar on the left with categories: Movimento, Apariencia, Son, Lapis, Datos, Eventos, Control, Sensores, Operadores, and Máis Bloques.
- Script Area:** A workspace on the right containing several blue Scratch blocks:
  - A "vídeo" block with a dropdown menu showing options: "aceso", "apagado", "aceso", and "aceso e dado a volta".
  - A "movimento" block with a dropdown menu showing "do vídeo en" and "esta figura".
  - A "fixar transparencia de vídeo a" block with a value of "50 %".
- Sprite Area:** A panel at the bottom left showing the "Figurass" section with a "Nova figura:" label and a "Cat1" sprite.

# Programar Scratch coa cámara web

The image shows a Raspberry Pi desktop environment accessed via Remote Viewer. The window title is "pi's X desktop (raspberrypi:1) (1) - Remote Viewer". The desktop features a top bar with system icons (Bluetooth, Wi-Fi, volume, battery at 45%, and time 00:23) and a taskbar with the Scratch 2 application icon. The Scratch 2 interface is open, displaying a stage with a cat sprite. The 'Scripts' panel on the left shows a 'when green flag clicked' event block. The 'video' block is set to 'aceso' (on). The 'movimiento do video en esta figura' block is set to 'movemento' and 'dirección'. Below that, there is a 'fixar transparencia de video a 50 %' block. The 'Sprites' panel shows 'Cat1' as the selected sprite. The 'Scripts' panel also shows a 'preguntar What's your name? e ag' block with a 'resposta' block below it. The 'Sprites' panel shows 'Cat1' as the selected sprite. The 'Scripts' panel also shows a 'tecla espazo premida?' block with a 'botón esquerdo no rato premido' block below it. The 'Scripts' panel also shows a 'rate x' and 'rate y' block. The 'Scripts' panel also shows a 'volume do son' block. The 'Scripts' panel also shows a 'movimiento do video en es' block. The 'Scripts' panel also shows a 'cronómetro' block with a 'reiniciar cronómetro' block below it. The 'Scripts' panel also shows a 'posición x de Cat1' block. The 'Scripts' panel also shows a 'minuto xusto agora' block with a 'dias dende o 2000' block below it. The 'Scripts' panel also shows a 'nome de usuario' block.

# Programar Scratch coa cámara web

The image shows a Scratch 2 program running on a Raspberry Pi desktop environment. The window title is "pi's X desktop (raspberrypi:1) (1) - Remote Viewer". The Scratch 2 interface is visible, with the cat character "Cat1" on the stage. The video camera is active, showing a blurred background. The script for the video camera is as follows:

```
ao premer  
ir a x: -175 y: 107  
apuntar cara á dirección 90  
fixar estilo de rotación esquerda-dereita  
vídeo aceso  
fixar transparencia de vídeo a 50 %  
para sempre  
si [movimento do vídeo en esta figura > 10] entón  
    apuntar cara á dirección [dirección do vídeo en esta figura]  
    mover 10 pasos  
    rebotar se toca un bordo  
    seguinte vestimenta
```

# Programar Scratch coa cámara web

- Que posibilidades ten o emprego da cámara web?
  - Algúns exemplos
- Podería empregarse para detectar paso a través dun lugar ou incluso entrada/saída dun local, empregando 'arrays de sensores'