



deti

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Raspberry Pi 4

Xilinx Zynq 7000

Nvidia Jetson Nano

ASE - Arquitetura de Sistemas Embutidos

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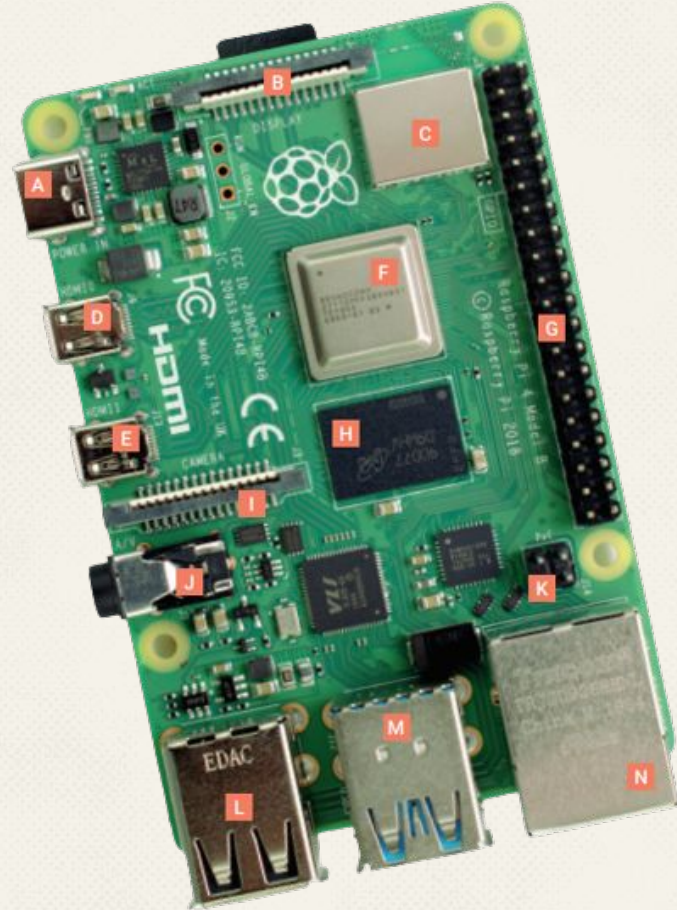
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Raspberry Pi 4

Raspberry Pi 4 is capable of doing the same as a computer. It is possible to set up an operating system, and connect wires and circuits directly to its GPIO pins.

COMPONENTS

- | | |
|------------------------------|------------------------------------|
| A USB Type-C power in | H RAM |
| B DSI display port | I CSI camera port |
| C Wireless/Bluetooth | J 3.5mm AV |
| D Micro-HDMI 0 | K PoE - Power over Ethernet |
| E Micro-HDMI 1 | L 2 USB 2.0 ports |
| F System-on-Chip | M 2 USB 3.0 ports |
| G GPIO | N Ethernet port |



Specifications

The Processor

Broadcom BCM2711, a 64-bit quad-core Arm Cortex-A72 clocked at 1.5GHz

Memory

SDRAM LPDDR4-3200 of 1GB, 2GB, 4GB or 8GB

Video and sound

2 × micro HDMI ports (up to 4Kp60 supported), 2-lane MIPI DSI display port, 2-lane MIPI CSI camera port, 4-pole stereo audio and composite video port

Connectivity

2.4 GHz and 5.0 GHz IEEE 802.11b/g/n/ac wireless LAN, Bluetooth 5.0, BLE Gigabit Ethernet, 2 × USB 3.0 ports and 2 × USB 2.0 ports

Specifications

Multimedia

H.265 (4Kp60 decode);

H.264 (1080p60 decode, 1080p30 encode);

OpenGL ES, 3.0 graphics

SD card support

Micro SD card slot for loading operating system and data storage

Input power

5V DC via USB-C connector (minimum 3A1), 5V DC via GPIO header (minimum 3A1), Power over Ethernet (PoE)

Xilinx Zynq 7000 PSoC

Xilinx Zynq 7000 PSoC family integrates the software programmability of an ARM-based processor with the hardware programmability of an FPGA, enabling key analytics and hardware acceleration while integrating CPU, DSP, ASSP, and mixed signal functionality on a single device.

COMPONENTS

1 Ethernet port

2 HDMI output port

3 HDMI input port

4 ZYNQ Processor

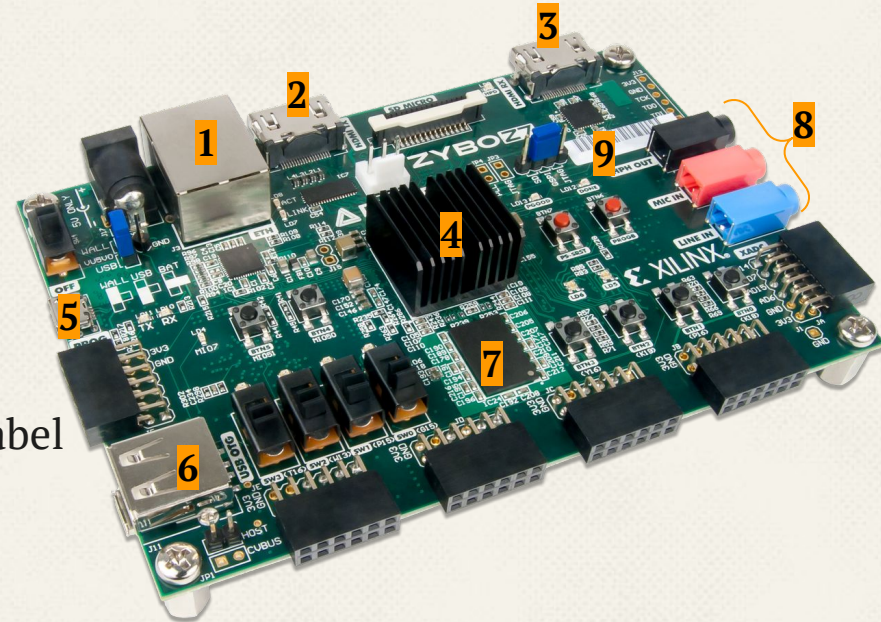
5 USB JTAG/UART port

6 USB 2.0

7 DDR3L Memory

8 Audio codec ports

9 Unique MAC address label



Specifications

ZYNQ Processor

667 MHz dual-core Cortex-A9 processor

DDR3L memory controller with 8 DMA channels and 4 High Performance AXI3 Slave ports

High-bandwidth peripheral controllers: 1G Ethernet, USB 2.0, SDIO

Low-bandwidth peripheral controllers: SPI, UART, CAN, I2C

Programmable from JTAG, Quad-SPI flash, and microSD card

Programmable logic equivalent to Artix-7 FPGA

Memory

1 GB DDR3L with 32-bit bus at 1066 MHz

16 MB Quad-SPI Flash with factory programmed 128-bit random number and 48-bit globally unique EUI-48/64™ compatible identifier microSD slot

Specifications

Power

Powered from USB or any 5V external power source

Audio and Video

Pcam camera connector with MIPI CSI-2 support; HDMI sink port (input) with/without* CEC; HDMI source port (output) with CEC; Audio codec with stereo headphone, stereo line-in, and microphone jacks

Switches, Push-buttons, and LEDs

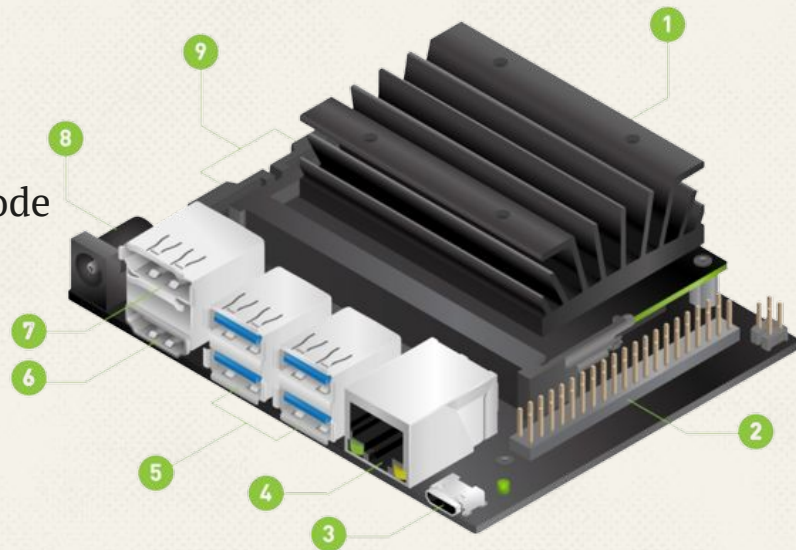
6 push-buttons, 4 slide switches, 5 LEDs and 2 RGB LEDs

Nvidia Jetson Nano

NVIDIA Jetson Nano is a small, powerful computer that lets you run multiple neural networks in parallel for applications like image classification, object detection, segmentation, and speech processing.

COMPONENTS

- 1** microSD card slot for main storage
- 2** 40-pin expansion header
- 3** Micro-USB port for 5V power input, or for Device Mode
- 4** Gigabit Ethernet port
- 5** 4 USB 3.0 ports
- 6** HDMI output port
- 7** DisplayPort connector
- 8** DC Barrel jack for 5V power input
- 9** MIPI CSI-2 camera connectors



Specifications

| | |
|---------------------|--|
| GPU | 128-core Maxwell |
| CPU | Quad-core ARM A57 at 1.43 GHz |
| Memory | 4 GB 64-bit LPDDR4 25.6 GB/s |
| Storage | microSD |
| Video Encode | 4K at 30 4x 1080p at 30 9x 720p at 30 (H.264/H.265) |
| Video Decode | 4K at 60 2x 4K at 30 8x 1080p at 30 18x 720p at 30 (H.264/H.265) |
| Camera | 2x MIPI CSI-2 DPHY lanes |
| Connectivity | Gigabit Ethernet |
| Display | HDMI and display port |
| USB | 4x USB 3.0, USB 2.0 Micro-B |
| Others | Low-bandwidth peripheral controllers: I2C, I2S, SPI, UART |

Comparison



Raspberry Pi 4



Xilinx Zynq 7000



Nvidia Jetson Nano

Performance (Ethernet)

- 943 Mbps
- 1000 Mbps
- 8 to 73 times faster than Raspberry Pi 4

Power Consumption

- 3.8 W to 4.0 W
- More power consumption-12.5W
- 0.5W to 1.25W

Timing

- Does not include a Real Time Clock module
- Has Real Time Clock
- Has Real Time Clock

Price

- Lower cost
- Higher cost
- Higher than Raspberry Pi 4, lower than Xilinx Zynq 7000

Size

- Bigger than Nvidia Jetson Nano and Smaller than Xilinx Zynq 7000
- Biggest
- Smallest