Microprocessadores e Microcontroladores (27146)

Plataformas & Sistemas

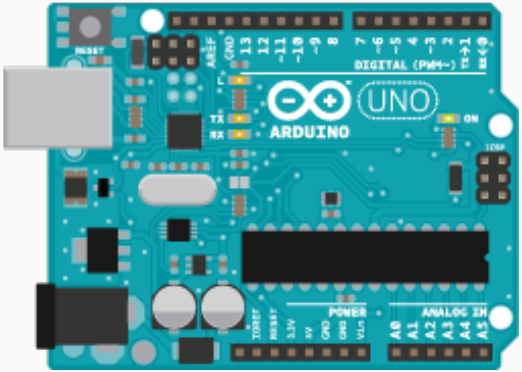
Prof. Ricardo Menotti (menotti@ufscar.br)

Atualizado em: 16 de fevereiro de 2023

Departamento de Computação
Centro de Ciências Exatas e de Tecnologia
Universidade Federal de São Carlos

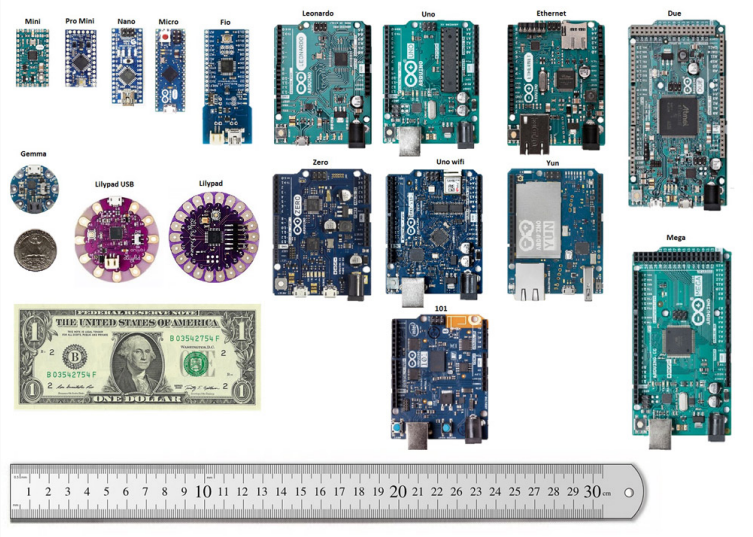
Arduino

“Arduino is an open-source electronics platform based on easy-to-use hardware and software”.

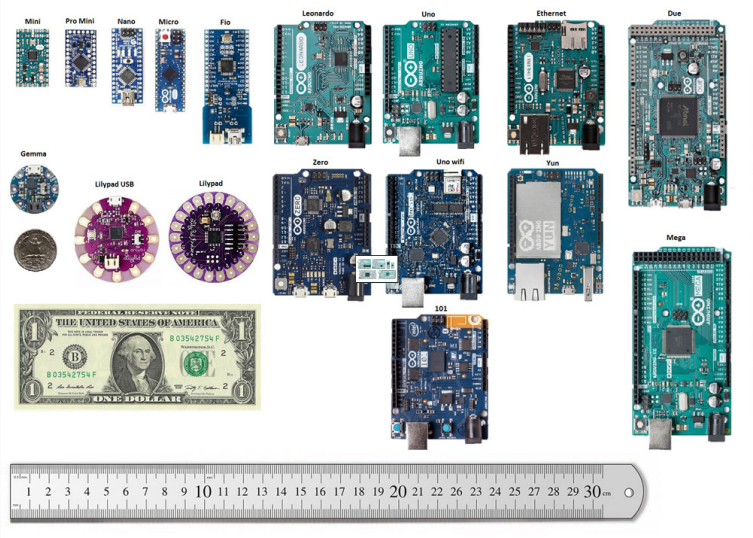


- Barato
- Multiplataforma
- Programação simples
  - Software
  - Hardware
- Software aberto
- Hardware aberto

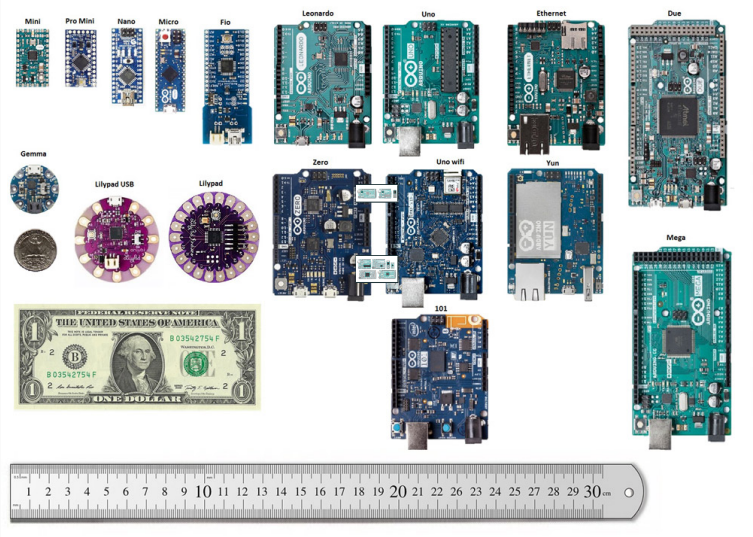
Como escolher?



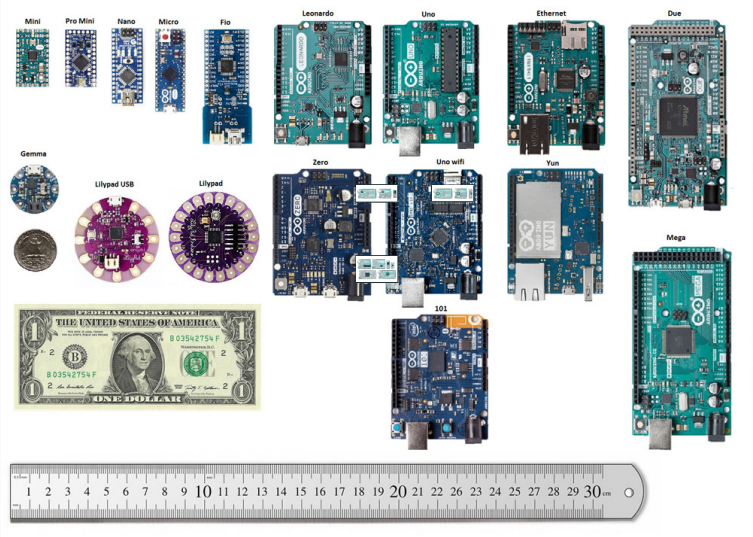
Como escolher?



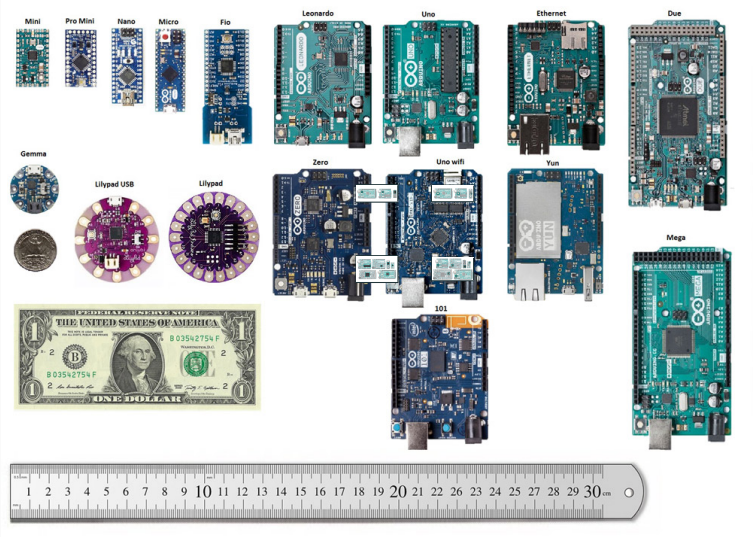
Como escolher?



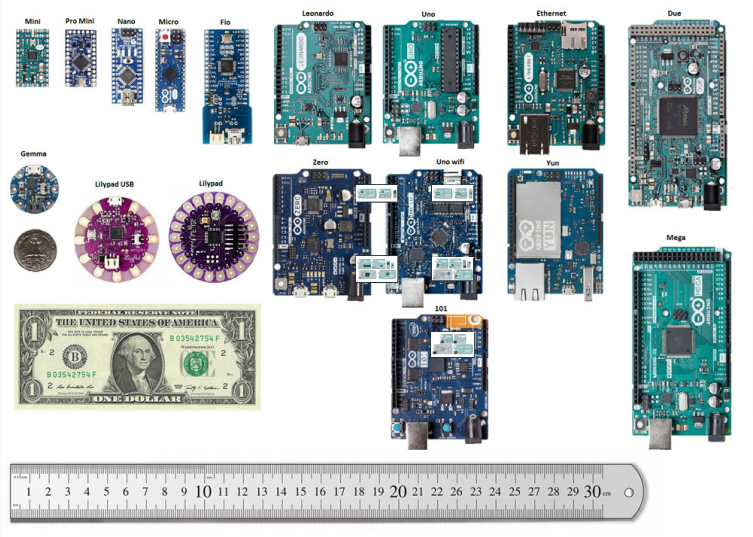
Como escolher?



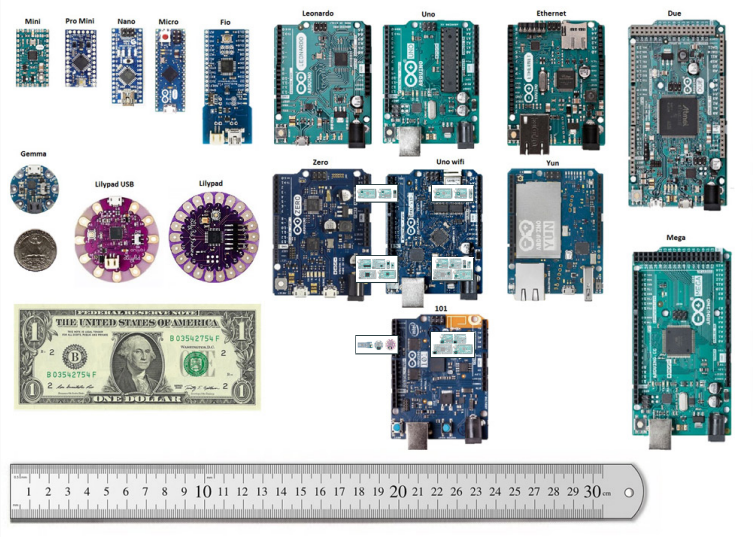
Como escolher?



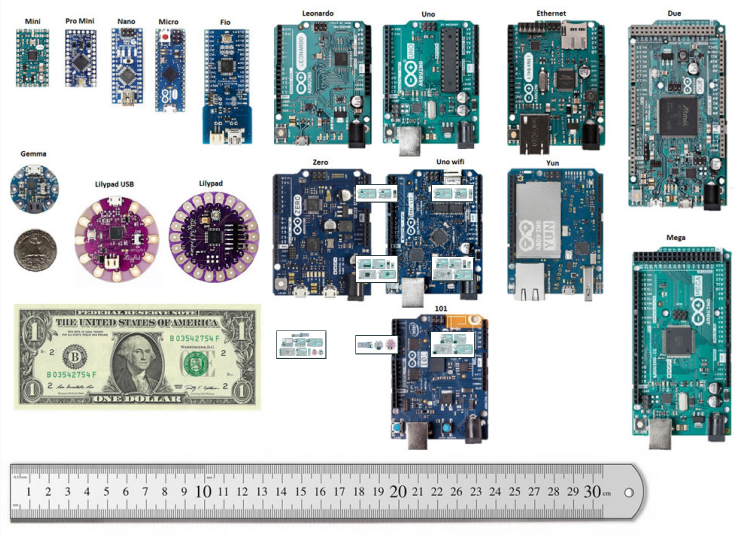
Como escolher?



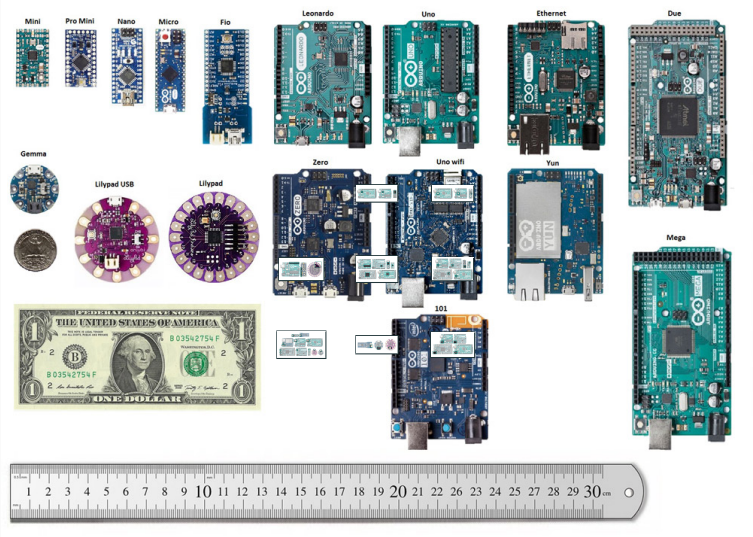
Como escolher?



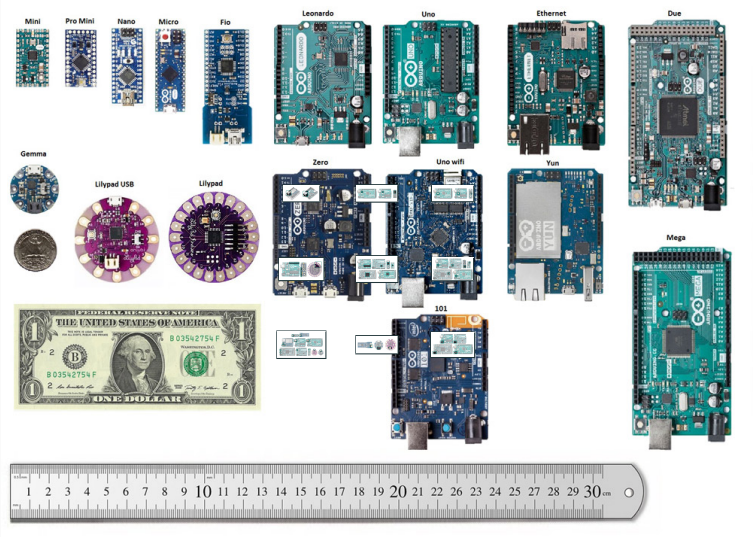
Como escolher?



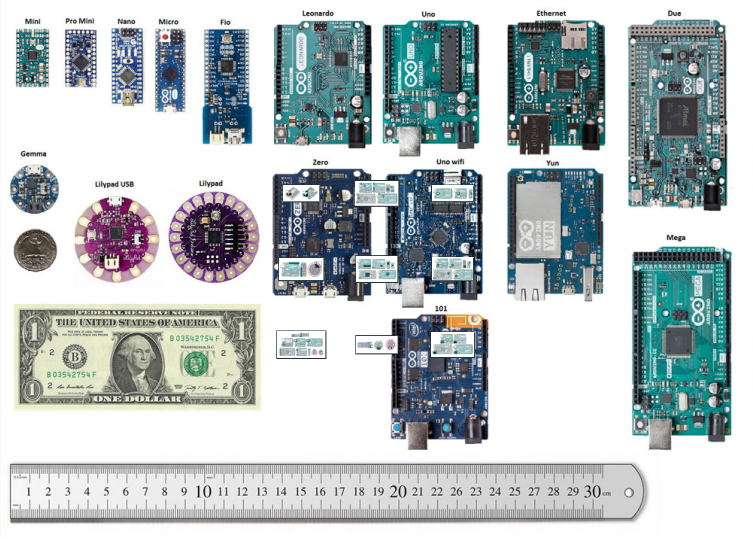
Como escolher?



Como escolher?



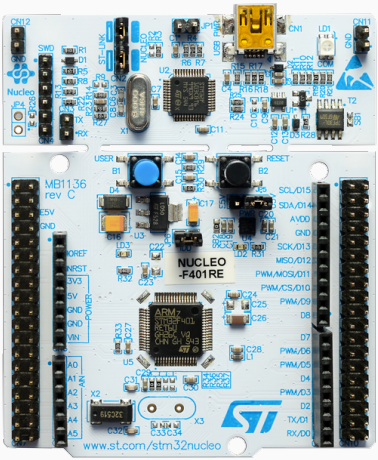
Como escolher?



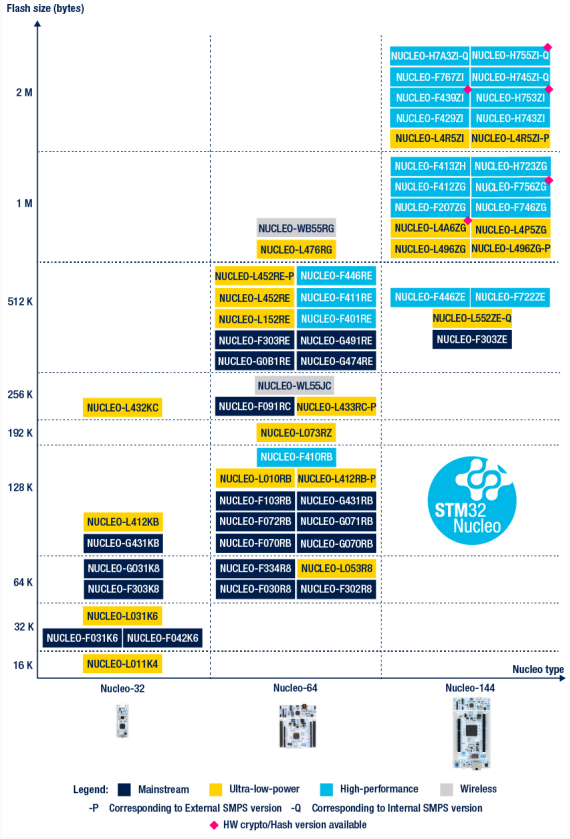
Arduino MEGA 2560

- 54 digital input/output pins
  - 15 can be used as PWM outputs
- 16 analog inputs
- 4 UARTs (serial)
- 16 MHz crystal oscillator
- USB connection
- power jack
- ICSP header
- reset button.

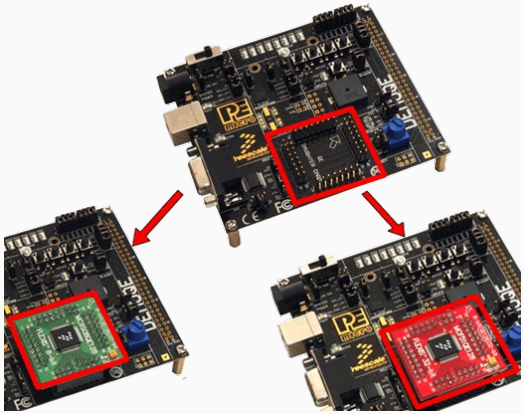
STM32 Nucleo



- Arm Cortex-M4 100 MHz
  - DSP
  - FPU
- Expansão:
  - Arduino
  - ST morpho
- IDEs:
  - IAR EWARM
  - Keil MDK-ARM
  - mbed
  - GCC/LLVM-based
- ST-Link debugger/programmer

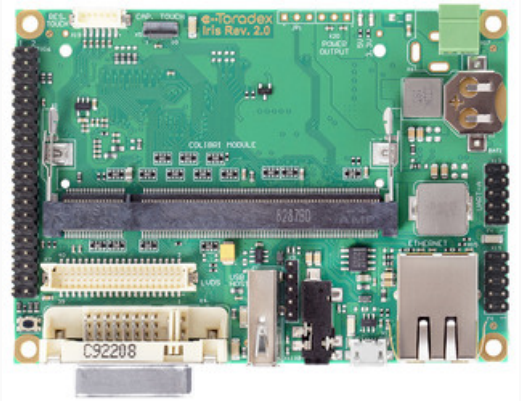

Flash size (bytes)
2 M
1 M
512 K
256 K
192 K
128 K
64 K
32 K
16 K
NUCLEO-H7A3ZI-Q
NUCLEO-H755ZI-Q
NUCLEO-F767ZI
NUCLEO-H745ZI-Q
NUCLEO-F439ZI
NUCLEO-H753ZI
NUCLEO-F429ZI
NUCLEO-H743ZI
NUCLEO-L4R5ZI
NUCLEO-L4R5ZI-P
NUCLEO-F413ZH
NUCLEO-H723ZG
NUCLEO-F412ZG
NUCLEO-F756ZG
NUCLEO-F207ZG
NUCLEO-F746ZG
NUCLEO-WB55RG
NUCLEO-L4A6ZG
NUCLEO-L4P5ZG
NUCLEO-L476RG
NUCLEO-L496ZG
NUCLEO-L496ZG-P
NUCLEO-L452RE-P
NUCLEO-F446RE
NUCLEO-L452RE
NUCLEO-F411RE
NUCLEO-F446ZE
NUCLEO-F722ZE
NUCLEO-L152RE
NUCLEO-F401RE
NUCLEO-L552ZE-Q
NUCLEO-F303RE
NUCLEO-G491RE
NUCLEO-F303ZE
NUCLEO-G0B1RE
NUCLEO-G474RE
NUCLEO-WL55JC
NUCLEO-L432KC
NUCLEO-F091RC
NUCLEO-L433RC-P
NUCLEO-L073RZ
NUCLEO-F410RB
NUCLEO-L010RB
NUCLEO-L412RB-P
NUCLEO-F103RB
NUCLEO-G431RB
NUCLEO-L412KB
NUCLEO-F072RB
NUCLEO-G071RB
NUCLEO-G431KB
NUCLEO-F070RB
NUCLEO-G070RB
NUCLEO-G031K8
NUCLEO-F334R8
NUCLEO-L053R8
NUCLEO-F303K8
NUCLEO-F030R8
NUCLEO-F302R8
NUCLEO-L031K6
NUCLEO-F031K6
NUCLEO-F042K6
NUCLEO-L011K4
STM32 Nucleo
Nucleo type
Nucleo-32
Nucleo-64
Nucleo-144
Legend: Mainstream Ultra-low-power High-performance Wireless
-P Corresponding to External SMPS version -Q Corresponding to Internal SMPS version
HW crypto/Hash version available

DEMOQE128



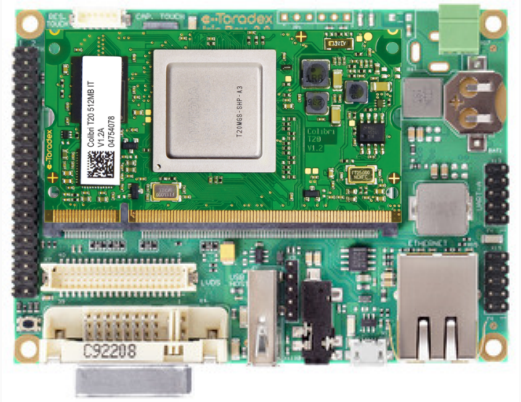
- MCUs intercambiáveis
  - 20 MHZ HCS08 (8-bits)
  - 50 MHz ColdFire V1 (32-bits)
- 2 AAA battery cells
- 3-axis Accelerometer
- Eight user LEDs
- Four user push buttons
- One Piezzo buzzer
- 10K Ohm POT

Toradex: Iris + Colibri T20



- Iris Carrier Board
  - Audio
  - Vídeo
  - Ethernet
  - I/O

Toradex: Iris + Colibri T20



- Iris Carrier Board
  - Audio
  - Vídeo
  - Ethernet
  - I/O
- Colibri T20
  - NVIDIA® Tegra™ 2
    - 2x Arm Cortex™-A9 1GHz
    - NVIDIA GeForce GPU
  - 256MB DDR2
  - 512MB Flash

Para saber mais...

- BYOD[1]
- Arduino
  - Fundamentos
  - Linguagem
  - Datasheet
  - AVR ISA
  - Como escolher?
- ESP 32
- STM32 Nucleo Boards
- Raspberry Pi 4
- Raspberry Pi Pico
- DEMOQE128[2]
- Intel Edison Compute Module IoT[2]
- Intel Galileo[2]
- Toradex
  - Iris Carrier Board
  - Colibri T20[2]

[1] Altamente recomendado
[2] Depreciado (ou quase)

Referências

- Manuais dos fabricantes (slide anterior)
- Arduino Buying Guide: How to Choose the Right Arduino For Your Project