

Arduino // do Open Source e Open Hardware // Alex Aquino

Software Freedom Day Natal

21 SET 2013

11h no IFRN
campus central



www.alexaquino.com

Software Freedom Day Natal // Inscrições e maiores informações:
<http://sfd.potilivre.org> // facebook.com/AlexAquino.it // twitter.com/AlexAquino_it



Alex Aquino *Computação UERN*



 @AlexAquino_it

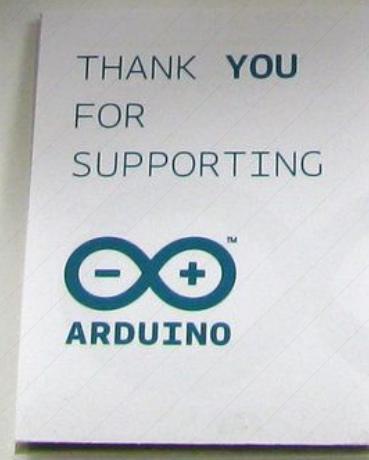
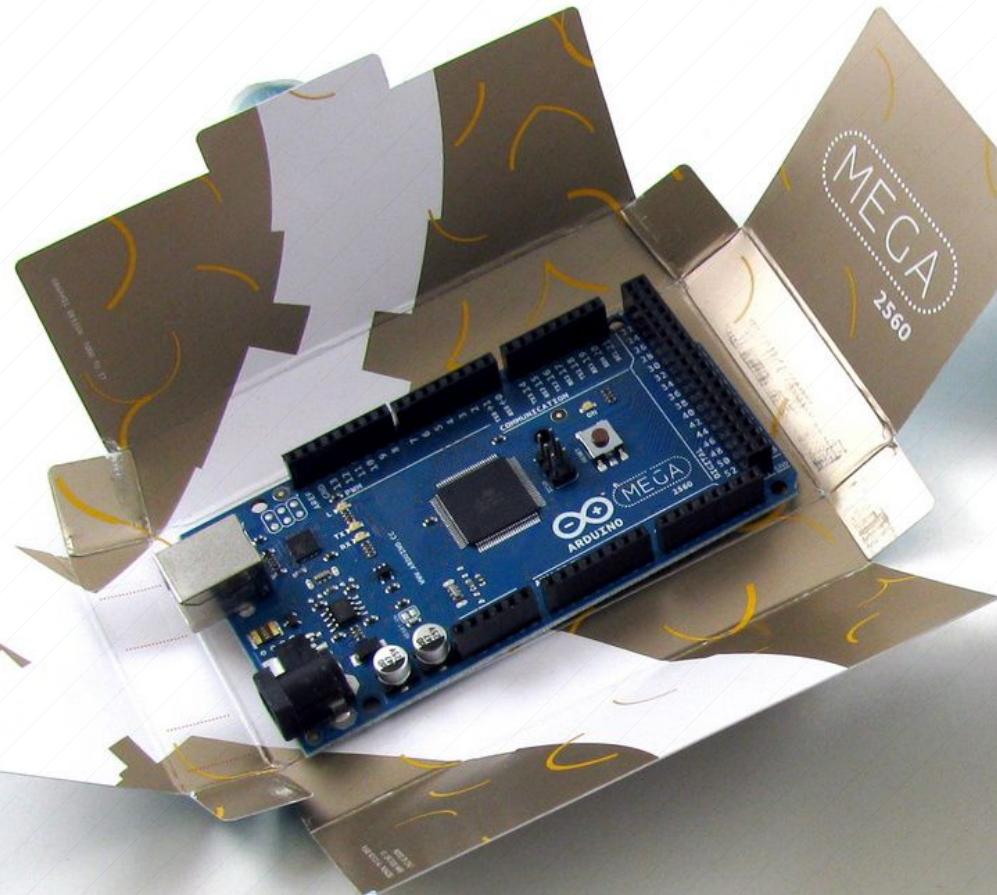
 alexaquino.it@gmail.com

 <http://www.facebook.com/AlexAquino.it>

 alexaquino.com

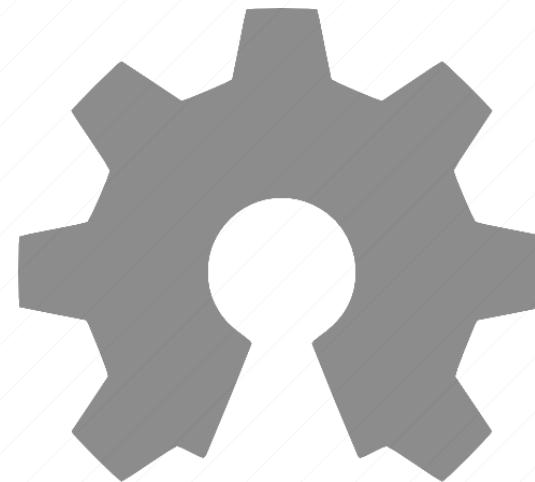


// Arduino { ? } Mais o que é?..





open source



open hardware

// Arduino { ? } A origem..



// Arduino { ? } A equipe.



Dave Mellis
Aluno - Programador

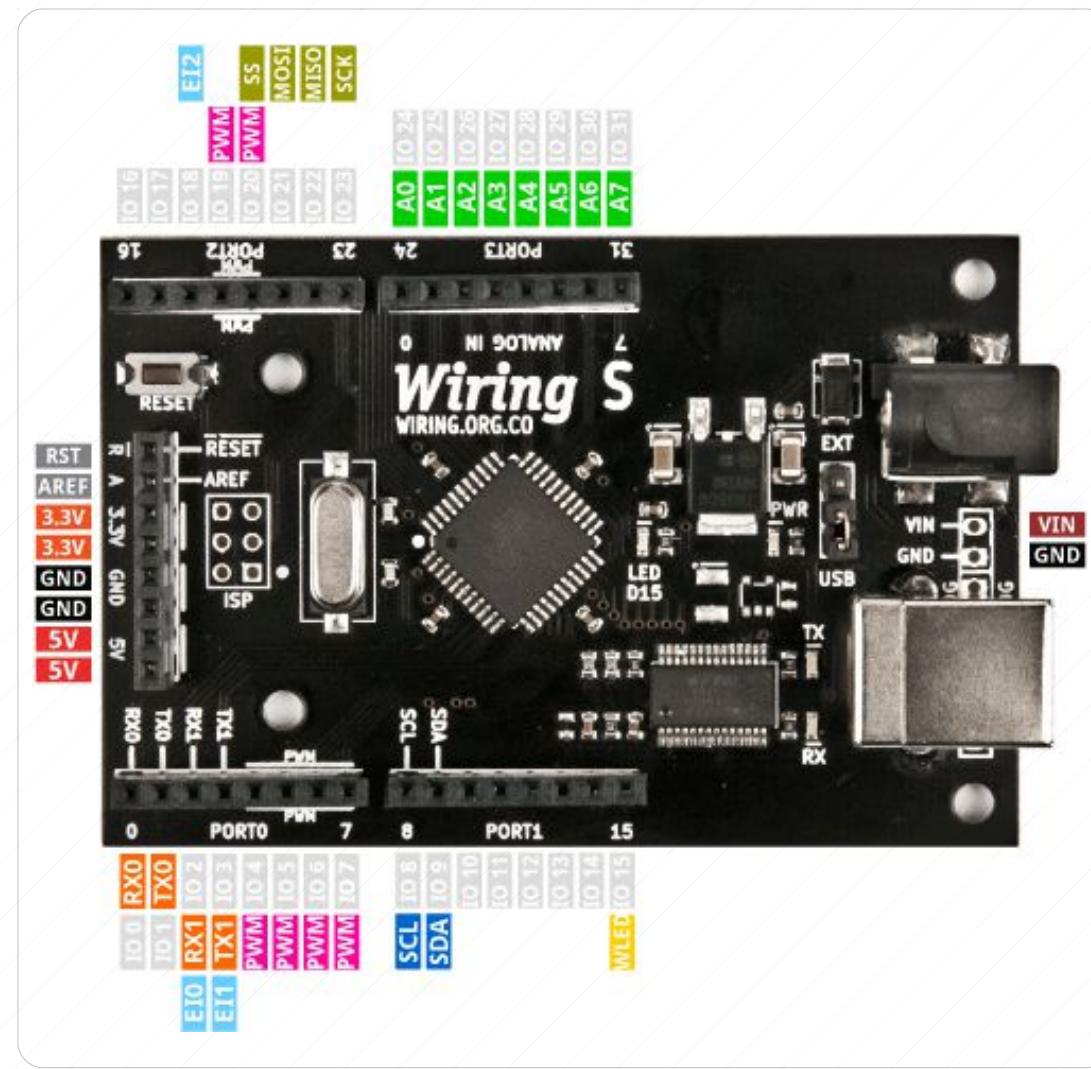
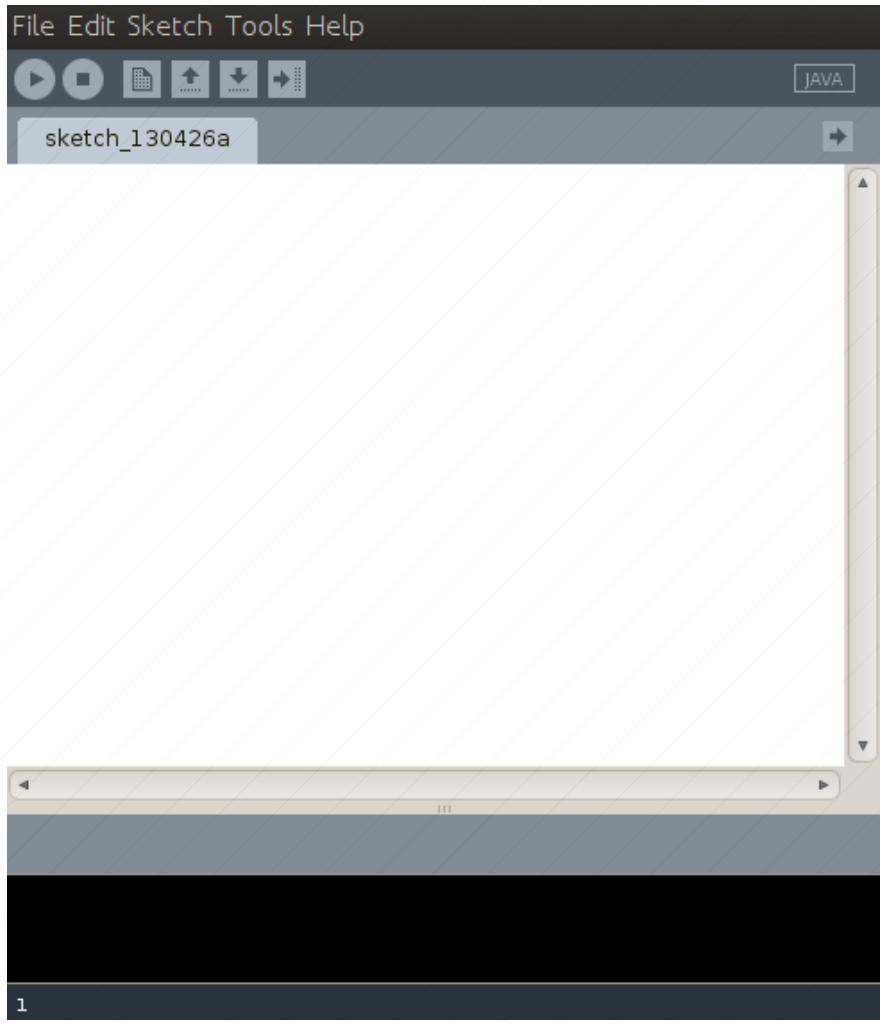
Tom Igoe
Professor - ITP

Gianluca Martino
Fabricante de CI's

David Cuartielles
Engenheiro Eletrônico

Massimo Banzi
Professor - Designer

Referências Processing | Wiring



// Arduino { ? } Por que?

\$20
Windows, Mac, Linux

Programação em Alto Nível

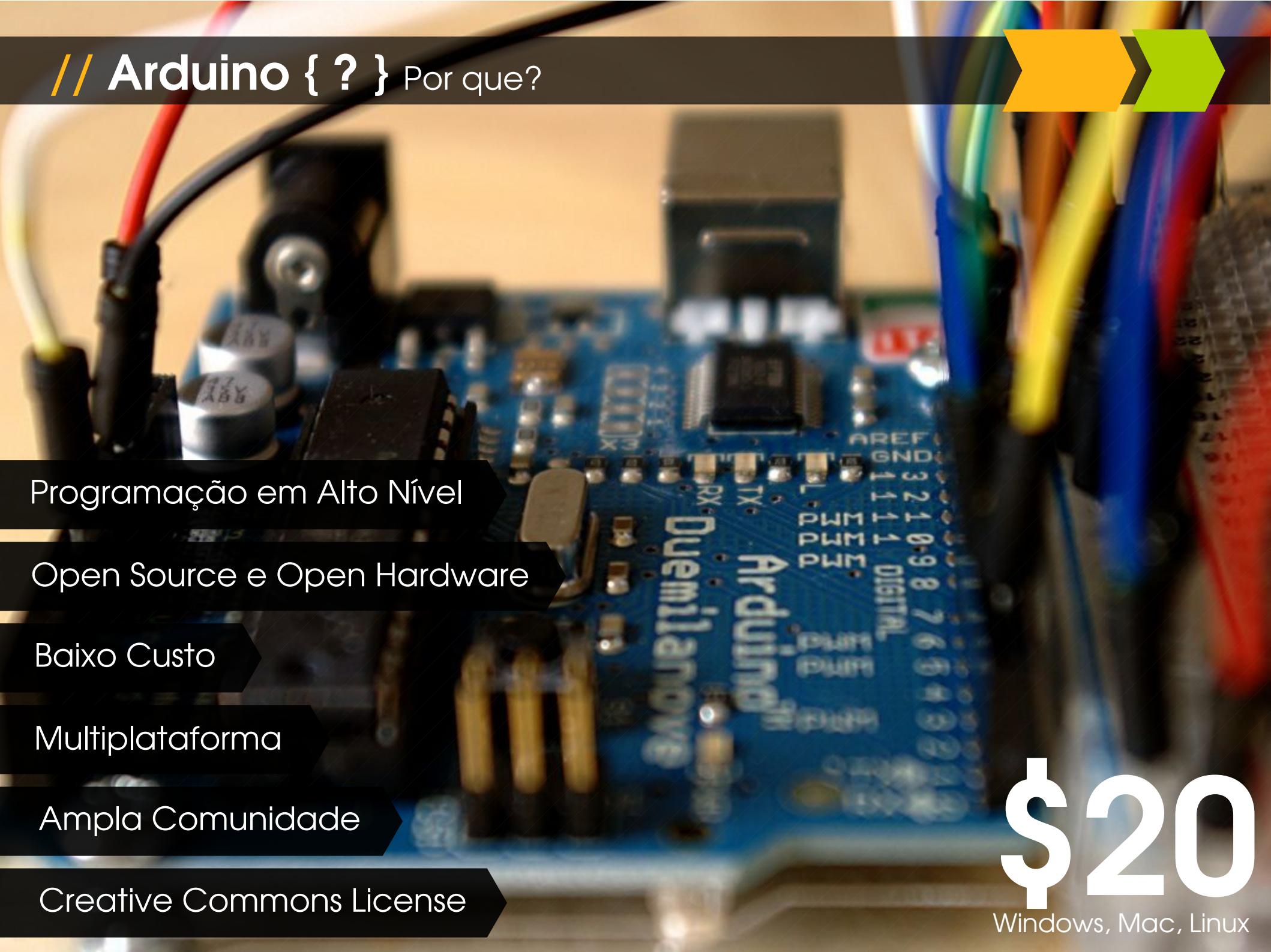
Open Source e Open Hardware

Baixo Custo

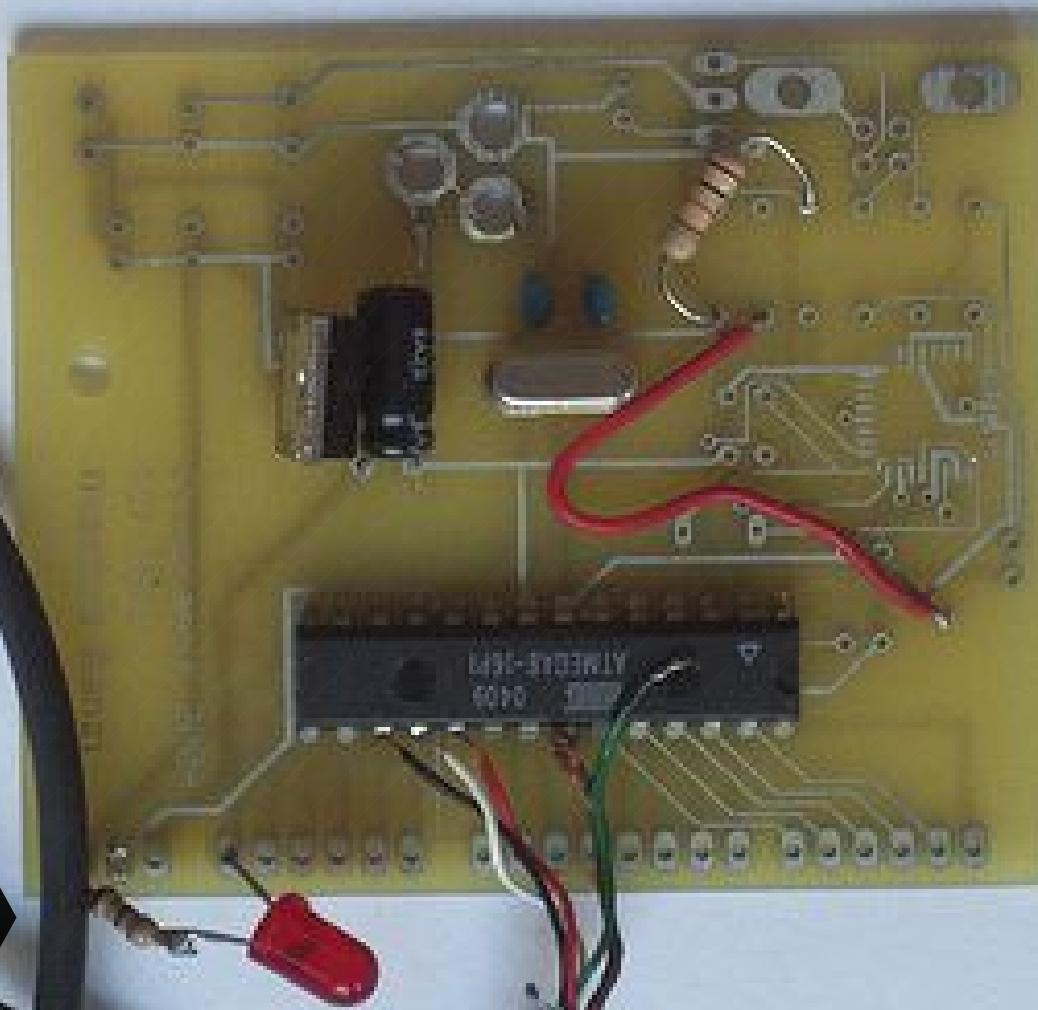
Multiplataforma

Ampla Comunidade

Creative Commons License



// Arduino { ! } O Hardware..



Primeira Versão

Arduino UNO Características



RESUMO:

Microcontrolador: **ATmega328**

Tensão de funcionamento: **5V**

Tensão de entrada: **7-12V**

Tensão de entrada (limites): **6-20V**

Pinos Digitais I/O: **14** (**6** fornece uma saída PWM)

Pinos de entrada analógica: **6**

Corrente DC por Pino I/O: **40 mA**

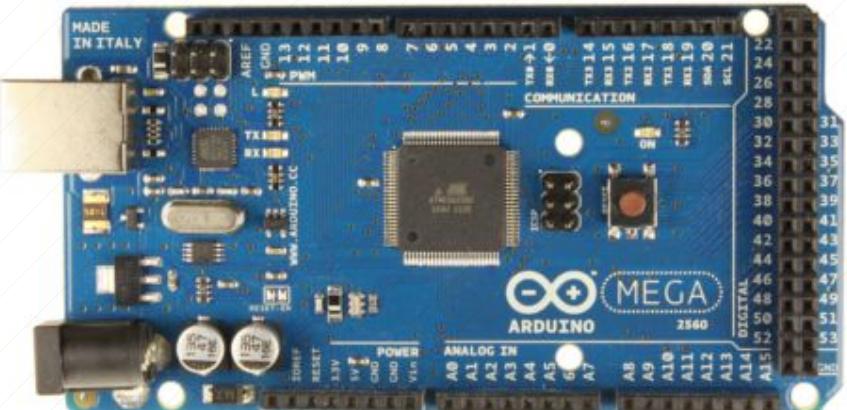
Corrente DC 3.3V por Pino: **50 mA**

Memória Flash: **32 KB** (ATmega328)

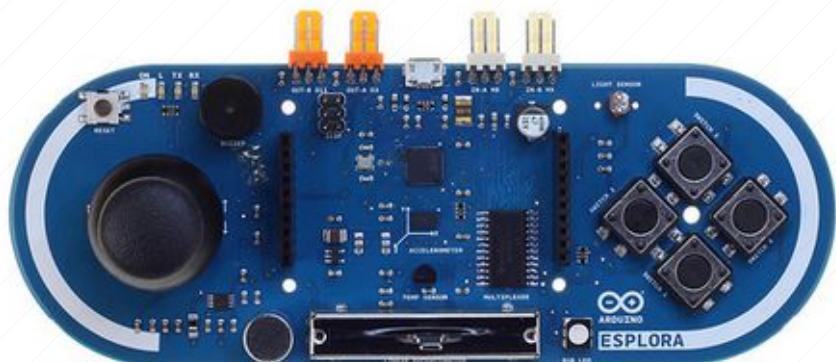
SRAM: **2 KB** (ATmega328)

Velocidade do Relógio: **16 MHz**

Arduino Outras versões



Arduino MEGA



Arduino SPLORA

Microcontrolador: **ATmega2560**

Pinos Digitais I/O: **54 (15 PWM)**

Pinos de entrada analógica: **16**

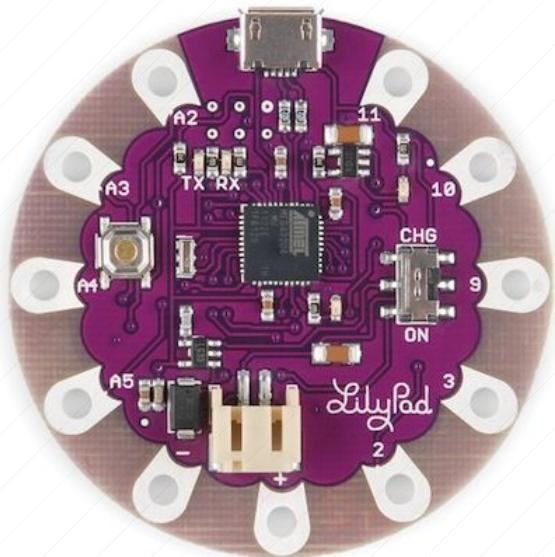
Memória Flash: **256 KB**

SRAM: **8 KB**

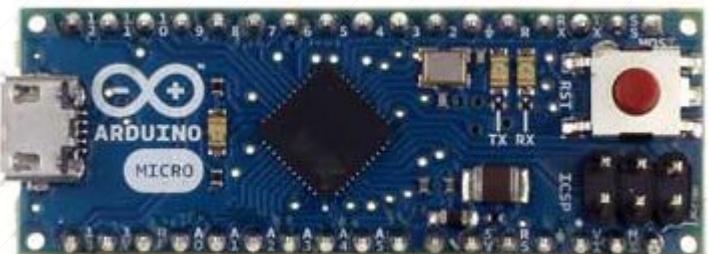
Microcontrolador: **ATmega32U4**

SRAM: **2,5 KB**

Arduino Outras versões



Arduino LILYPAD USB



Arduino MICRO

Microcontrolador: ATmega32U4

Tensão de funcionamento: 3.3V

Tensão de entrada: 3.8V-5V

Canais Digitais I/O: 9

Canais PWM: 4

Canais de entrada analógica: 4

SRAM: 2,5 KB

Velocidade do Relógio: 8 MHz

Microcontrolador: ATmega32U4

Canais Digitais I/O: 20

Canais PWM: 7

Canais de entrada analógica: 12

SRAM: 2,5 KB

Arduino Outras versões



Arduino ROBOT

[CONTROL BOARD]

Microcontrolador: ATmega32U4

Tensão de funcionamento: 5V

Tensão de entrada: 5V

Canais Digitais I/O: 5

Canais PWM: 6

Canais de entrada analógica: 4/8(Multiplex)

SRAM: 2,5 KB

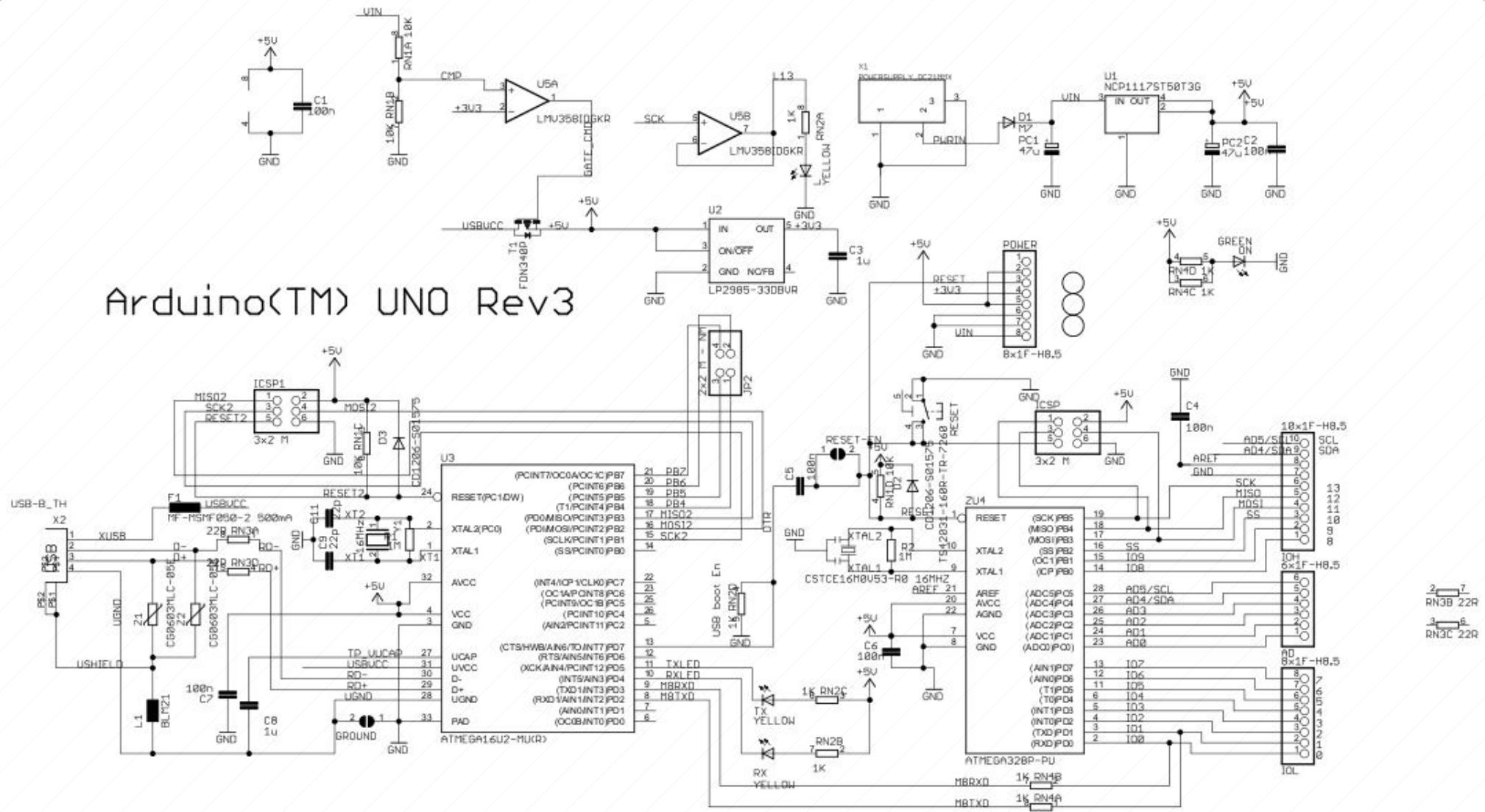
Velocidade do Relógio: 16 MHz

[MOTOR BOARD]

...

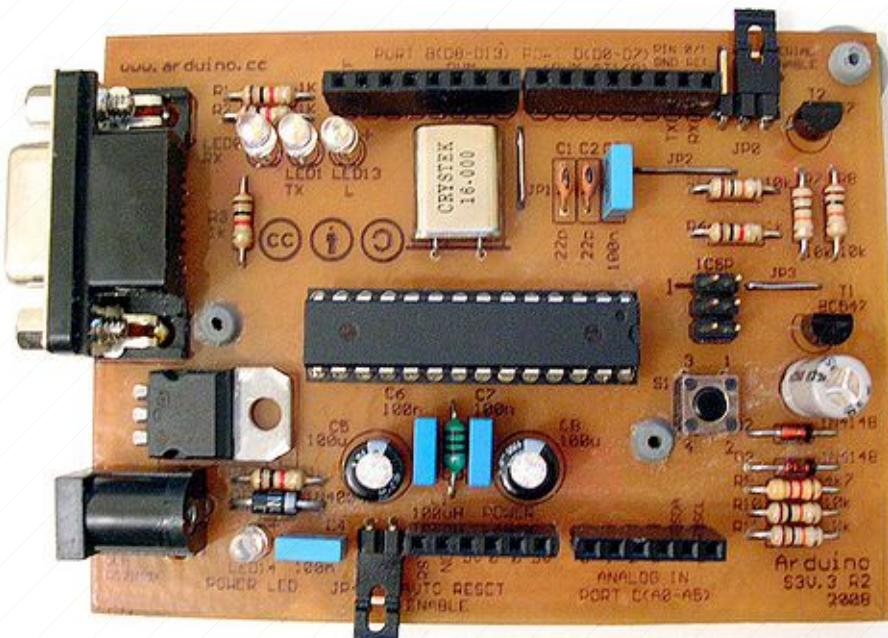
// Arduino { ! } Versões

Arduino Esquema elétrico

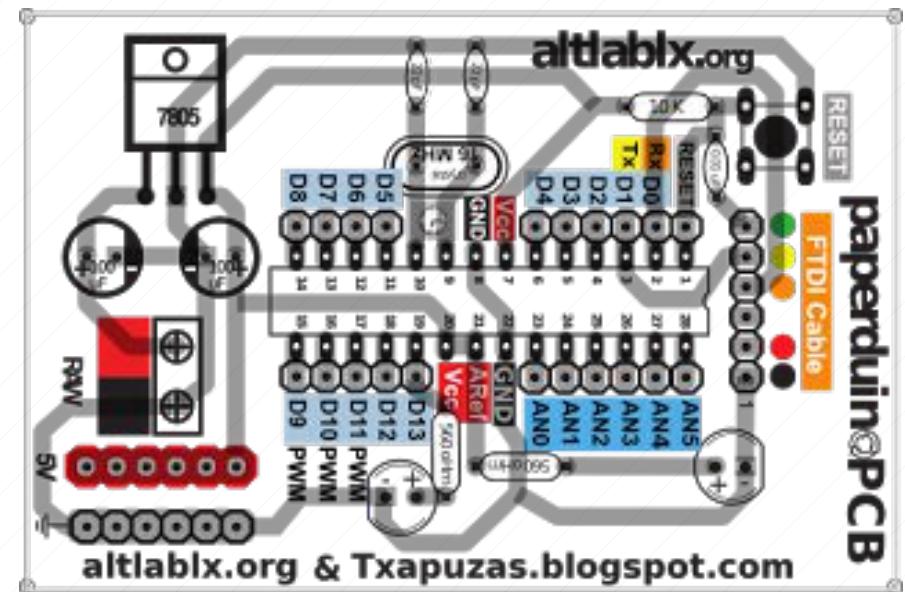


// Arduino { ! } Versões

Arduino Versões compatíveis



Arduino Severino



Arduino Paperduino

// Arduino { ! } Versões



Google ADK

// Arduino { ! } Versões



Google ADK

// Arduino { ! } Versões



Netduino plus

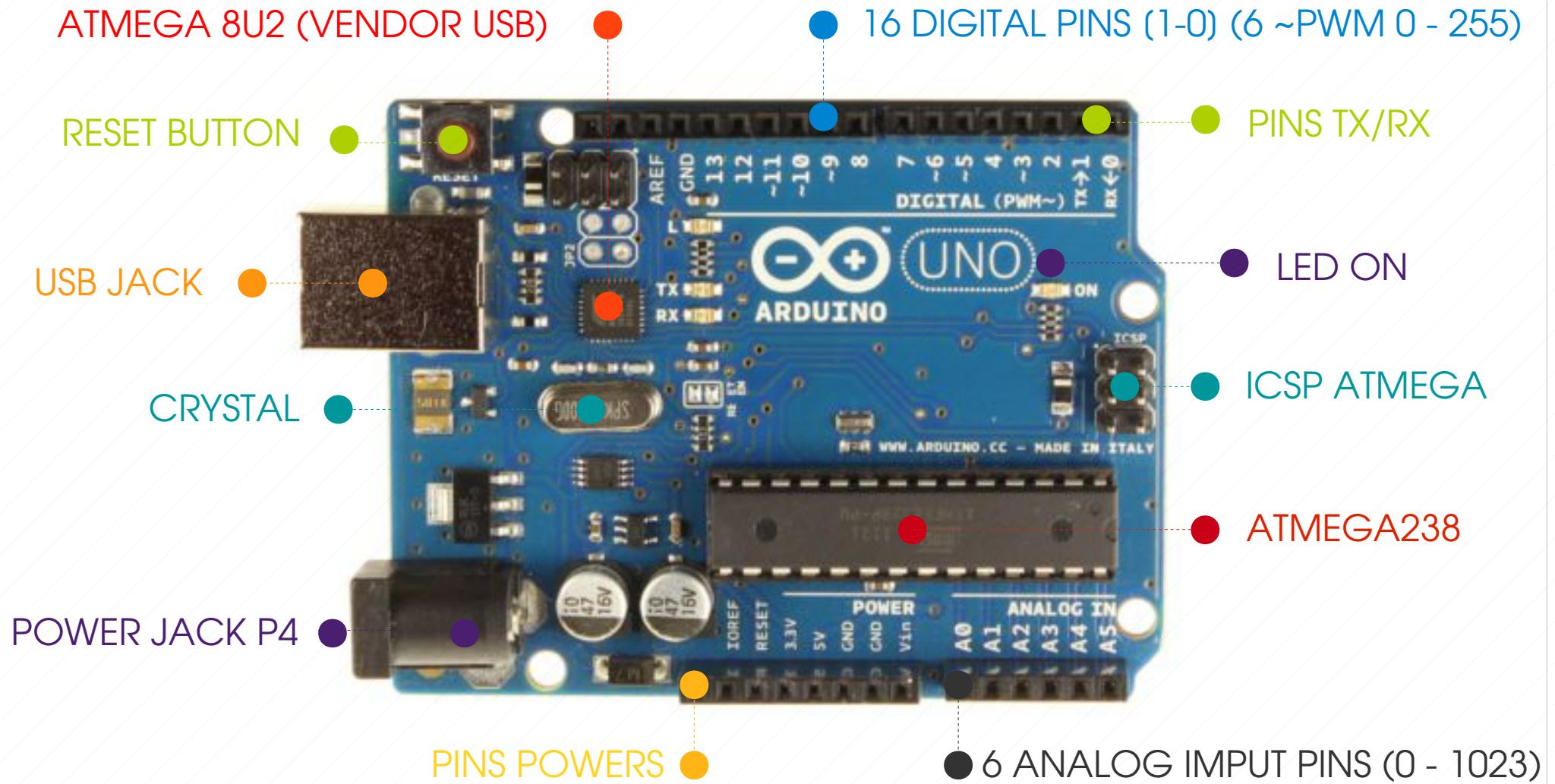
Windows

A fatal exception 0E has occurred at 0028:C0011E36 in VXD UMM(01) + 00010E36. The current application will be terminated.

- * Press any key to terminate the current application.**
- * Press CTRL+ALT+DEL again to restart your computer. You will lose any unsaved information in all your applications.**

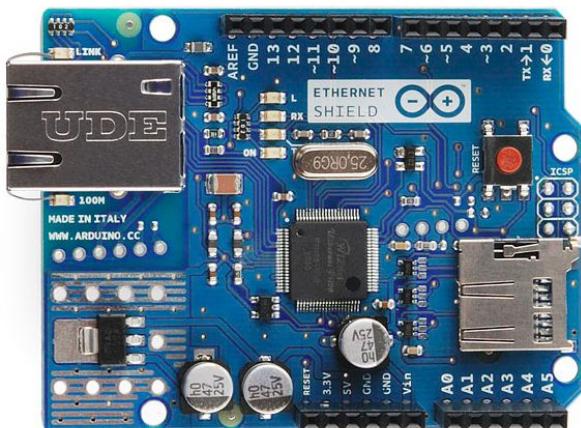
Press any key to continue _

Arduino Configuração (UNO Rev. 3)

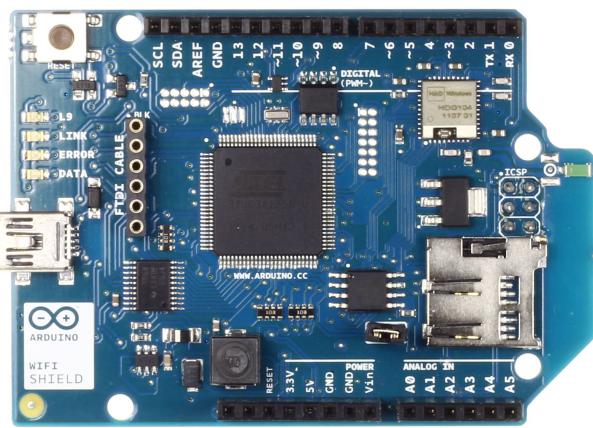


// Arduino { ! } Possibilidades

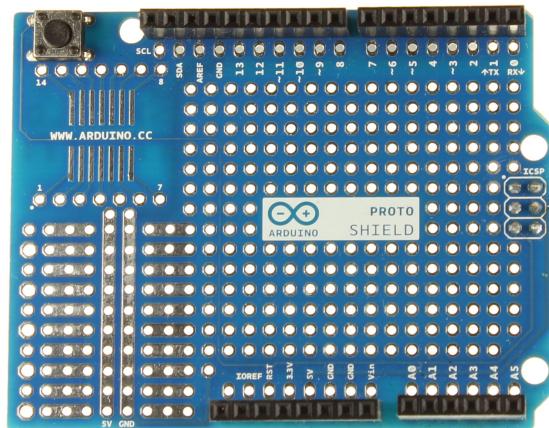
Arduino | Shilds



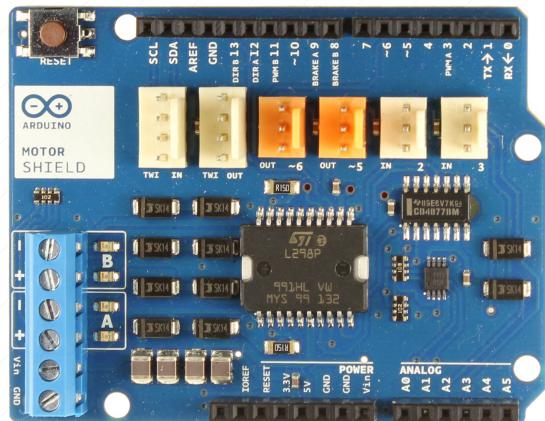
Ethernet Shild



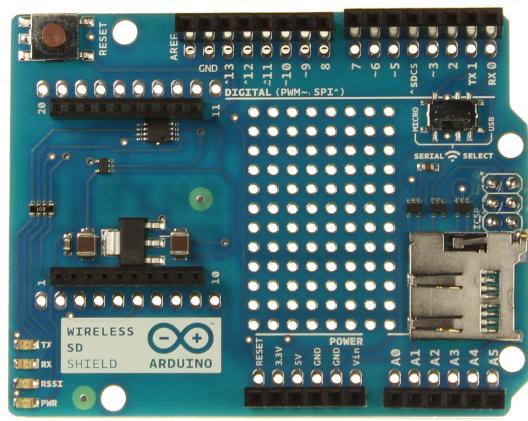
Wifi Shild



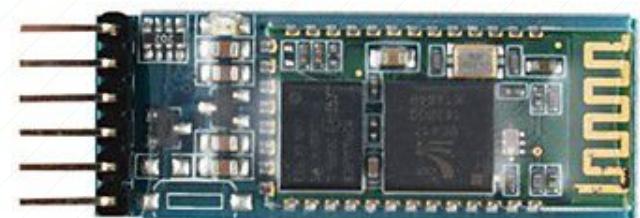
Proto Shild



Motor Shild



Wireless Shild



Módulo Bleutooth

Arduino | Sensores

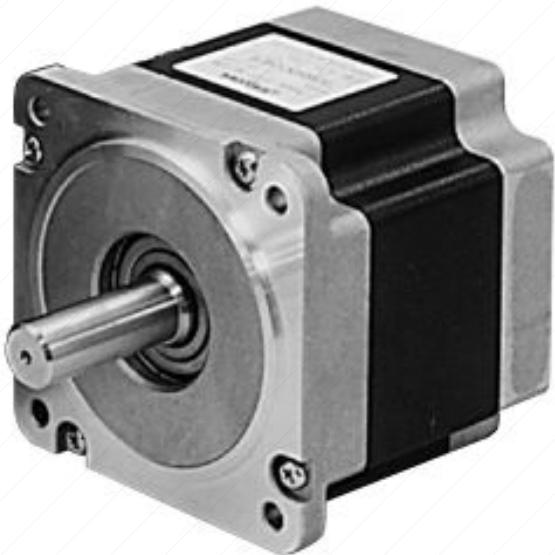


Mais Comuns



Possibilidades

Arduino | Atuadores

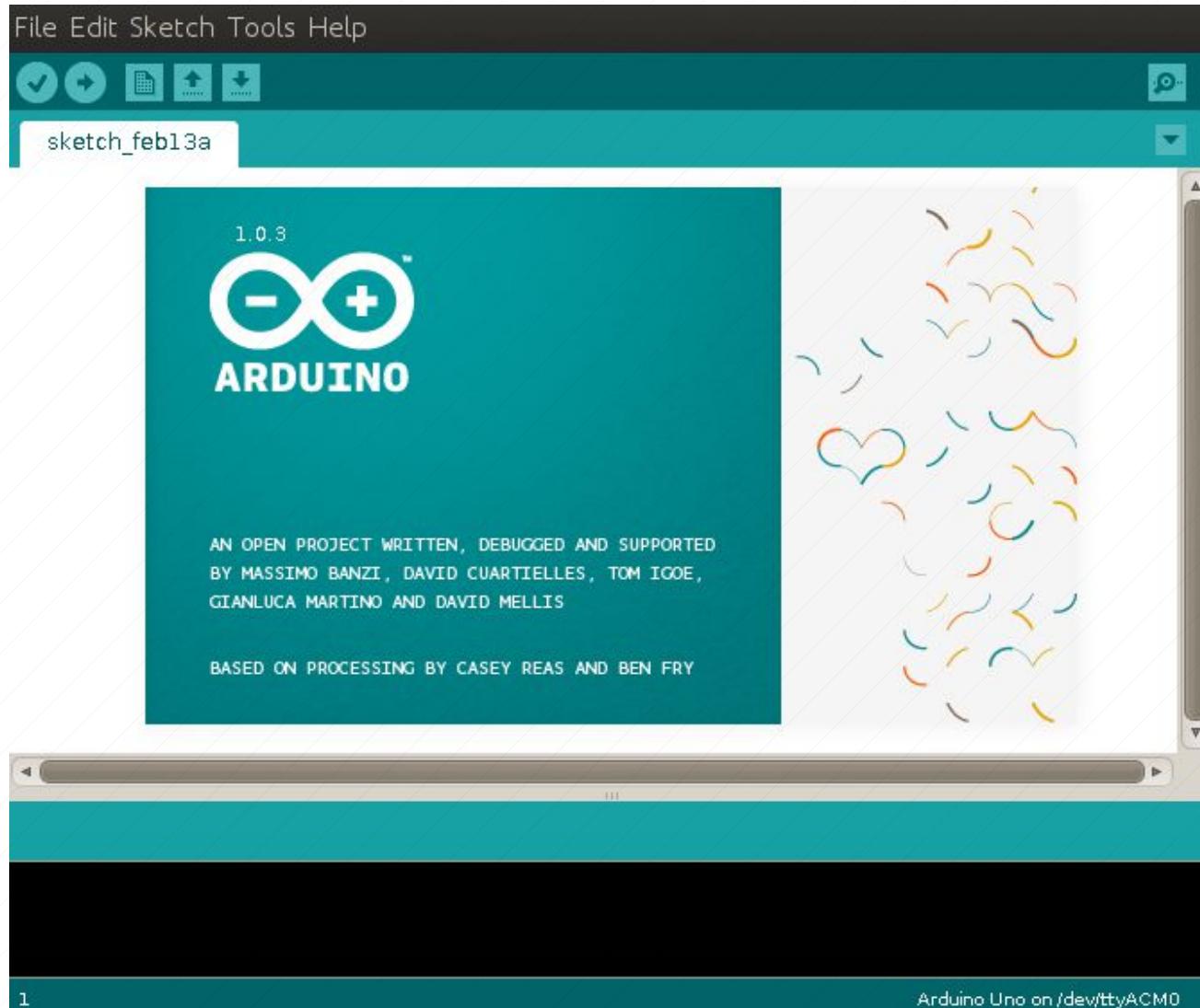


Mais Comuns



Possibilidades

Arduino | Ambiente de Desenvolvimento



● Barra de Tarefas

● Verify

● Upload

● New

● Open

● Save

● Serial Monitor

● Área de Status

Arduino Primeiro Sketch (Hello World)

The screenshot shows the Arduino IDE interface. The menu bar includes File, Edit, Sketch, Tools, and Help. Below the menu is a toolbar with icons for upload, refresh, and other functions. The central workspace displays the following code:

```
File Edit Sketch Tools Help
sketch_feb13a

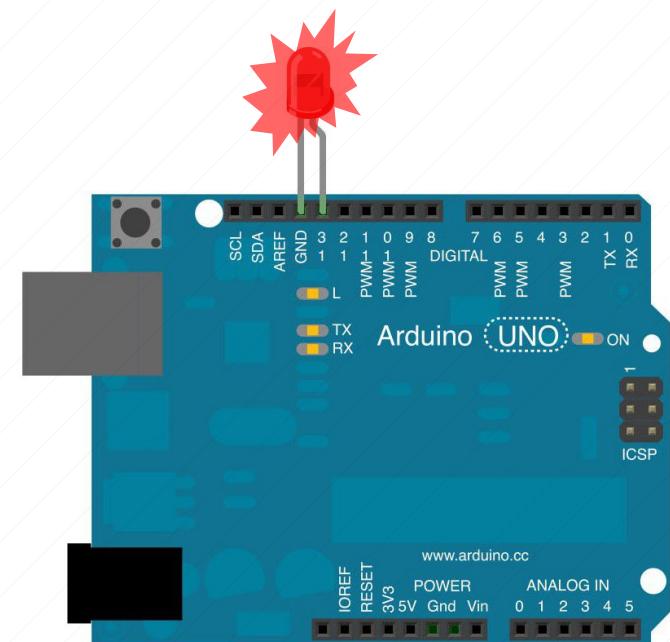
int led = 13;

void setup() {
  pinMode(led, OUTPUT);
}

void loop() {
  digitalWrite(led, HIGH);
  delay(1000);

  digitalWrite(led, LOW);
  delay(1000);
}
```

The status bar at the bottom indicates "Arduino Uno on /dev/ttyACM0".

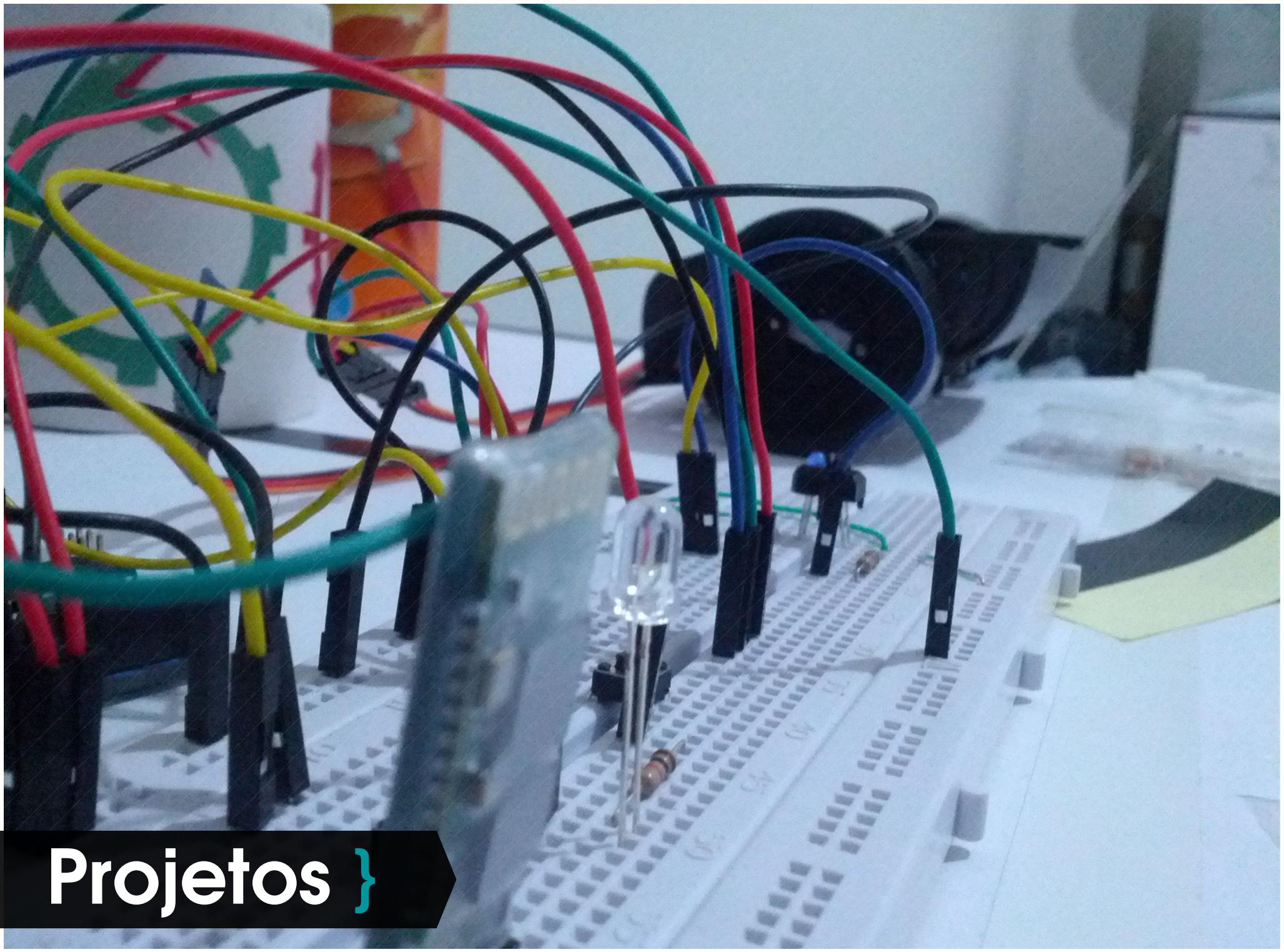


// Arduino { ? } Onde e o que comprar?



Arduino Starter Kit | www.arduino.cc

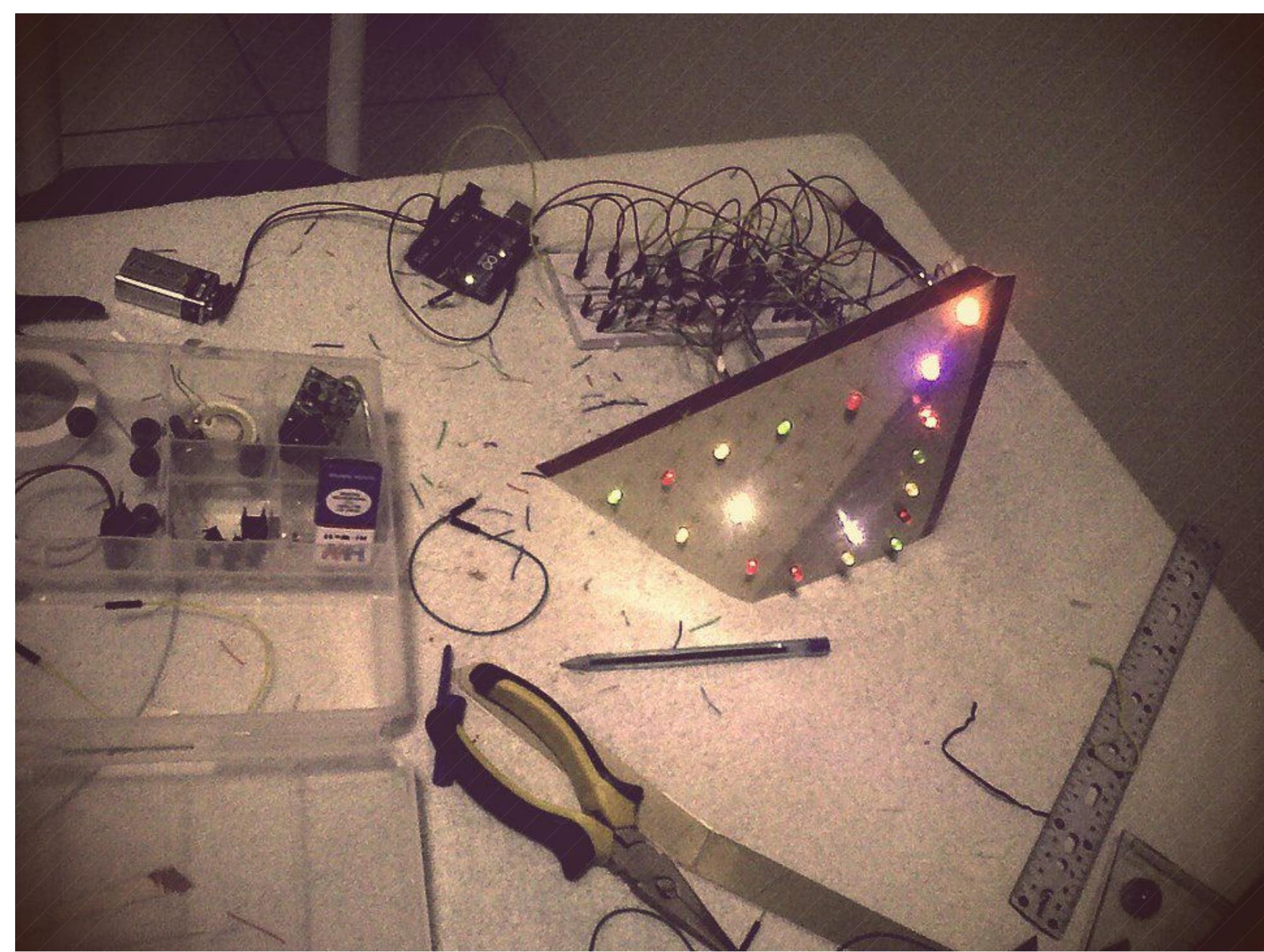
\$119.68



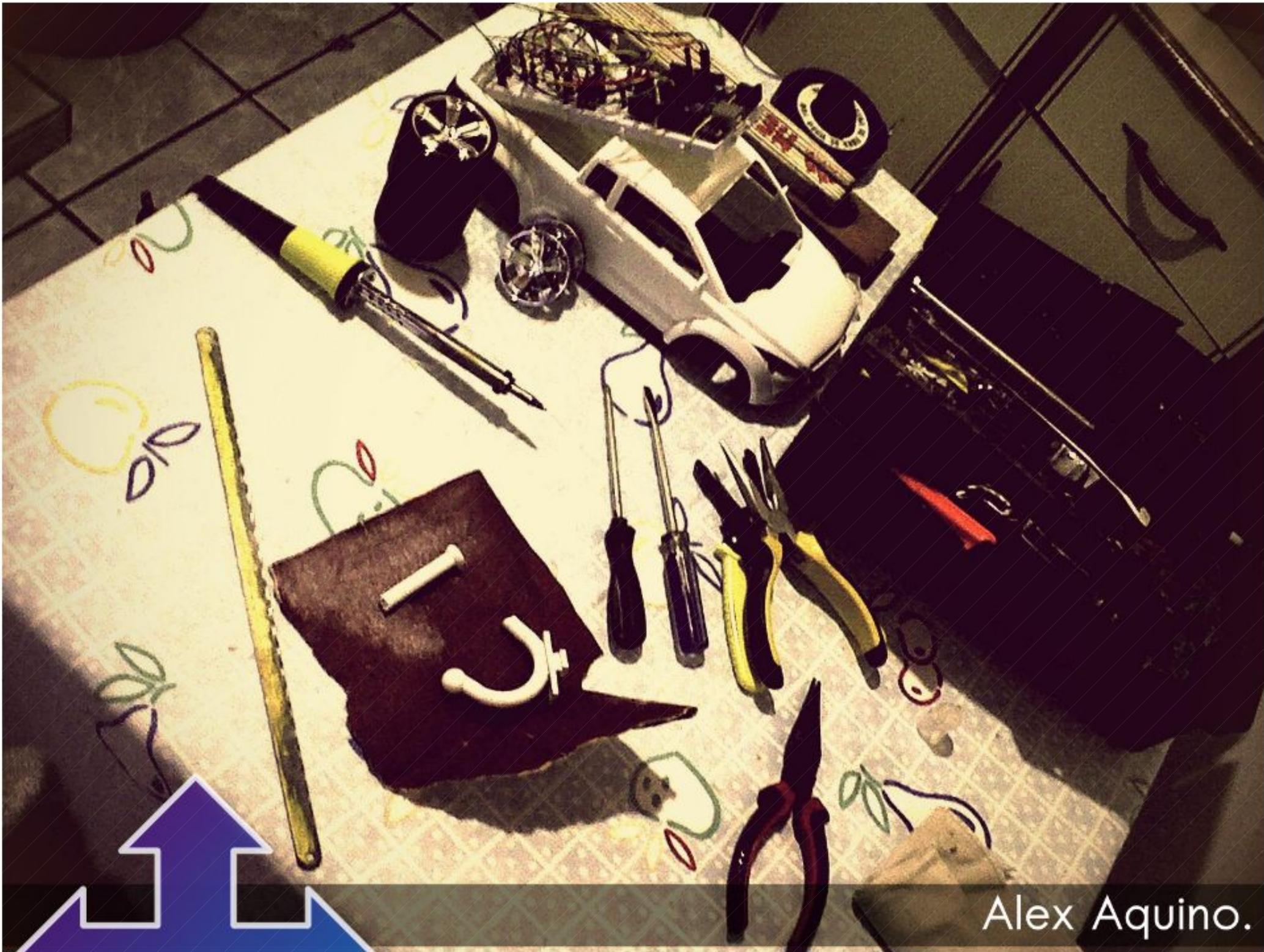
Projetos }

Arduino + Criatividade + ...









Alex Aquino.

OBRIGADO!



MARS ONE APPLICANT

<http://applicants.mars-one.com/profile/92e77461-2526-41c3-afb4-0430685d783c>



LINKS IMPORTANTES

Arduino Onde Comprar

→ NO BRASIL

[ROBOCORE]

<http://www.robocore.net>

[MULTilogica]

<http://multilogica-shop.com>

→ NO EXTERIOR

[DFROBOT]

<http://www.dfrobot.com>

[SPARKFUN]

<http://www.sparkfun.com>

Arduino Links Importantes

[ALEX AQUINO BLOG/WEBSITE]

<http://alexaquino.com>

[ARDUINO - PÁGINA OFICIAL]

<http://arduino.cc>

<http://arduino.cc/en/Tutorial>

http://arduino.cc/en/uploads/Main/Arduino_Uno_Rev3-schematic.pdf

[SHIELDLIST]

<http://shieldlist.org>

[WIRING]

<http://www.wiring.org.co>

[PROCESSING]

<http://processing.org>

