

Arduino Básico

Módulo I
Introdutório

Objetivo do curso

- Apresentar o conceito de microcontroladores
- Mostrar o que é e para que serve um microcontrolador
- Aprimorar a capacidade de criatividade e desenvolvimento com o uso do Arduino

CONTEXTUALIZAÇÃO

- Microprocessadores – processador
 - PC (Personal Computer)
 - Celulares
 - Tablets
- Microcontroladores – controlador
 - Lombadas eletrônicas
 - Automóveis
 - Máquinas
 - Robos, etc

Microprocessador

- Fabricantes

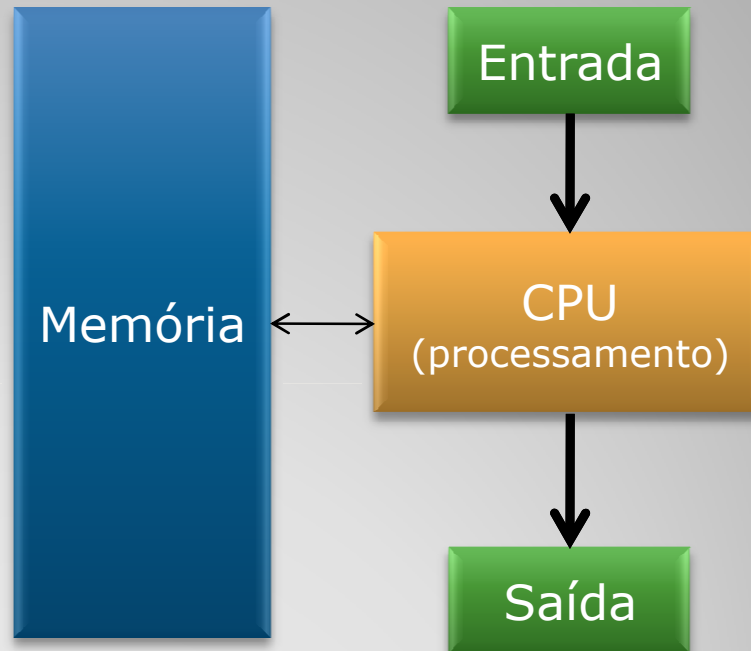
- Intel
- Atmel
- AMD

- Aplicação

- Alta performance
- Custo médio/alto

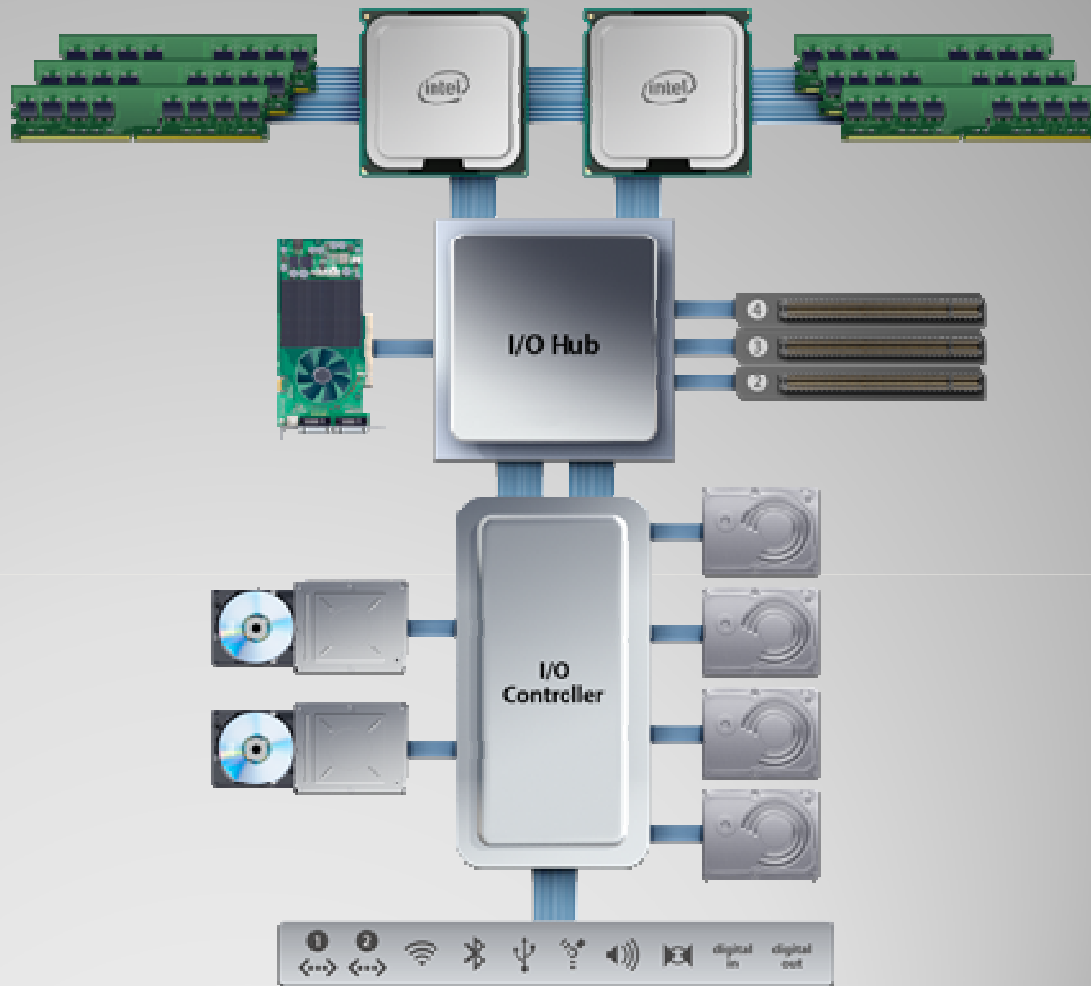
- Funcionamento

- Entrada de Dados
- Processamento < memória (Externa ao Chip)
- Saída de dados



Exemplo

- Computador
- Calculadora



Microcontrolador

- Fabricantes

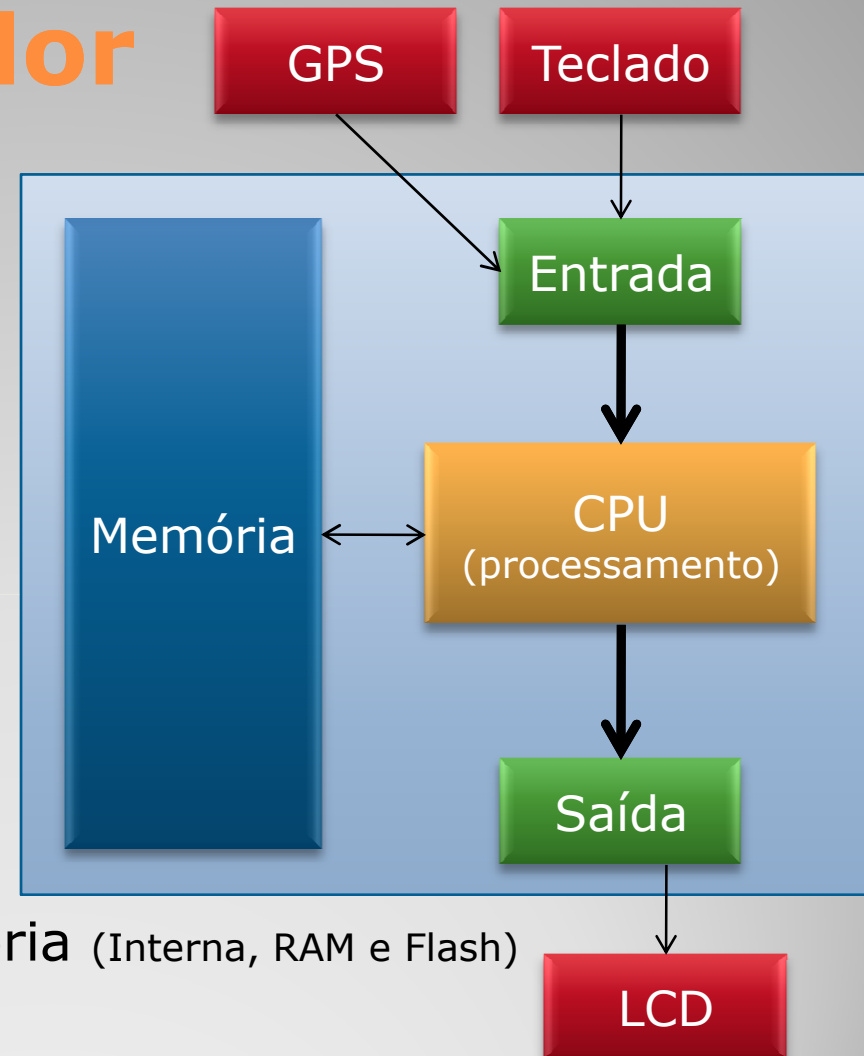
- Intel
- Atmel
- AMD

- Aplicação

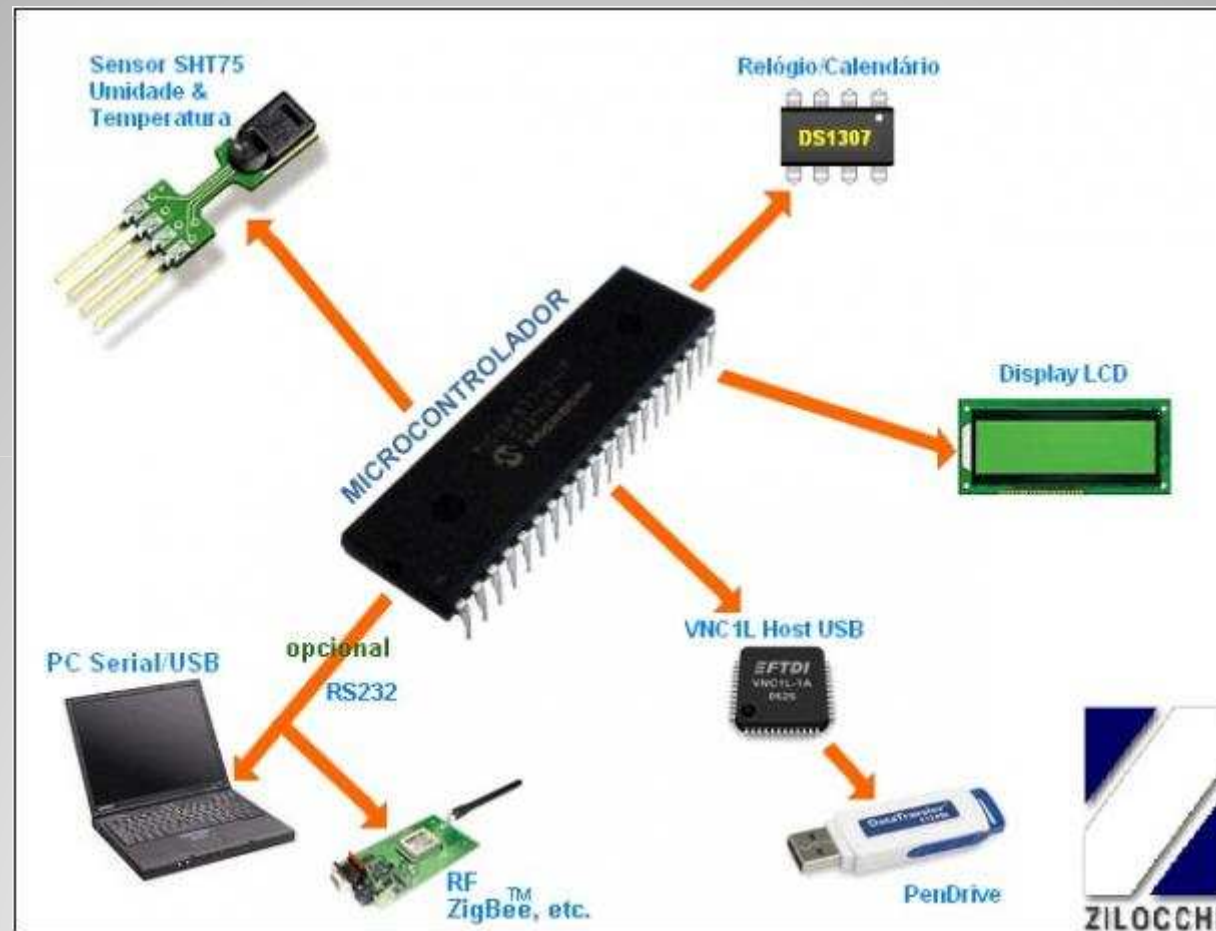
- Alta integração
- Baixo Custo

- Funcionamento

- Entrada de Dados
- Processamento < memória (Interna, RAM e Flash)
- Saída de dados



Microcontroladores



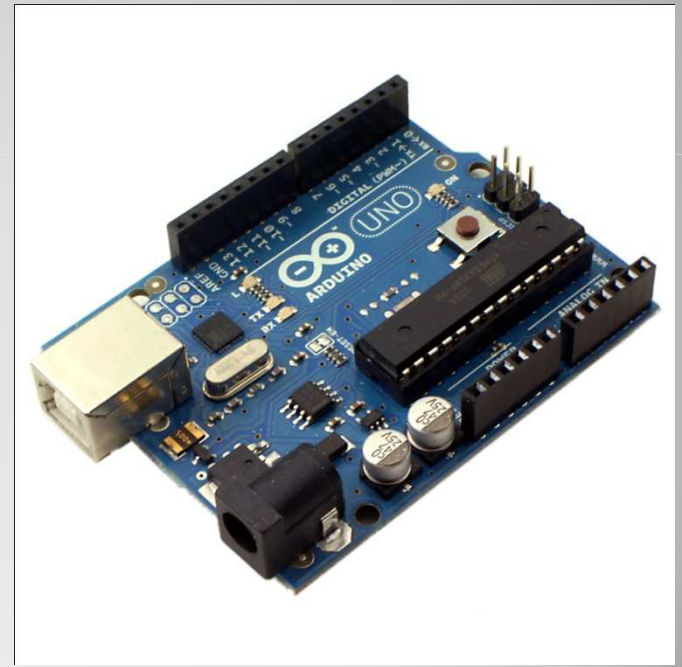
Exemplo

- CD Players
- Automóveis
- Máquinas
- Robótica



Arduino

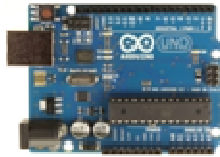
- Surgiu na Itália em 2005
- Placa + Microcontrolador
- Plataforma de código aberto
- Fácil uso (USB), não necessita de conhecimentos profundos de eletrônica
- Usado por artistas, designers, hobbistas, entusiastas, entre outros



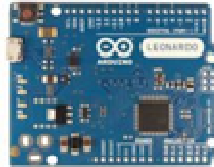
INTRODUÇÃO

- Independente do PC
- Programação semelhante ao C/C++
- Pode ser alimentado com 5V, 9V ou 12V (via USB, baterias ou fontes externas)

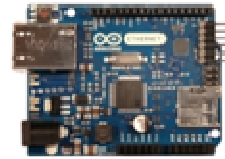
MODELOS DE PLACAS



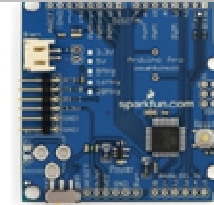
Arduino Uno



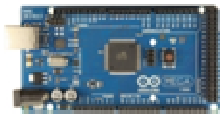
Arduino Leonardo



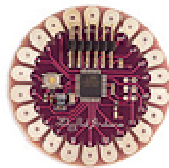
Arduino Ethernet



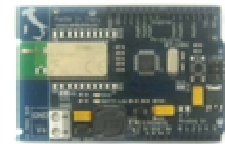
Arduino Pro



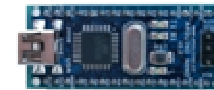
Arduino Mega 2560



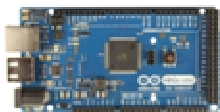
Arduino LilyPad



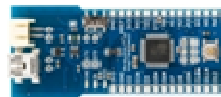
Arduino BT



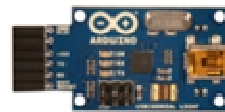
Arduino Nano



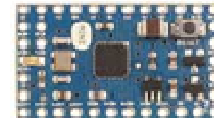
Arduino Mega ADK



Arduino Fio



USB/Serial Light Adapter



Arduino Mini

<http://arduino.cc/en/Main/Products>

COMPONENTES

- MEMÓRIA
 - FLASH, EEPROM E RAM (USADAS PARA PROGRAMAS, BOOTLOADER E MEMÓRIA DE TRABALHO)
- COMUNICAÇÃO (SERIAL/USB)
- IOs
 - Digital
 - Teclado, chaves, etc
 - Analógico
 - Joystick, umidade, temperatura, pressão, etc

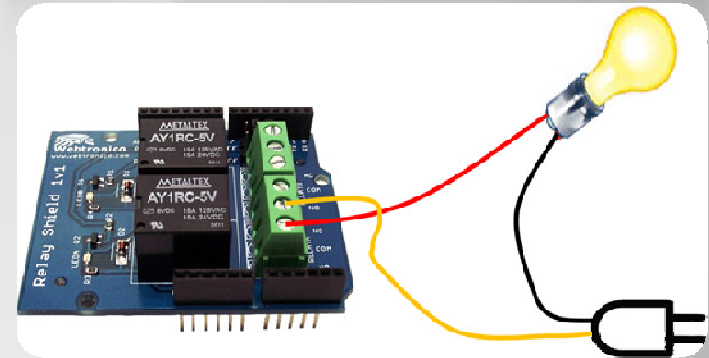
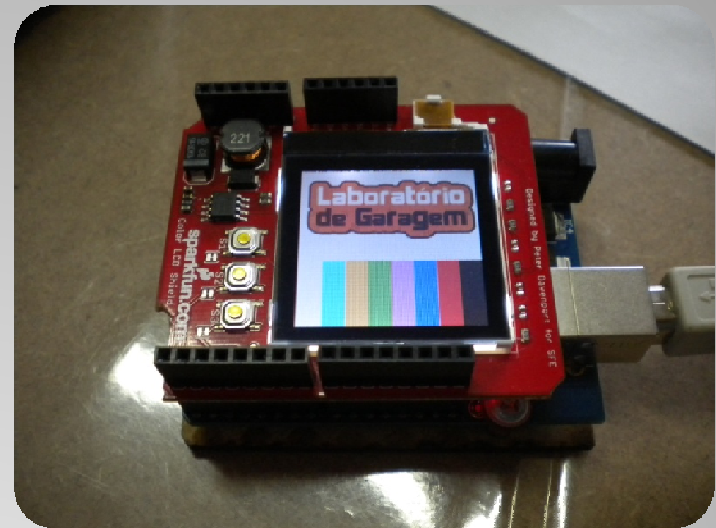
SHIELDS

- Básicos
 - Expansão de IOs (Digital e Analógico)
 - Ethernet
 - SD Card



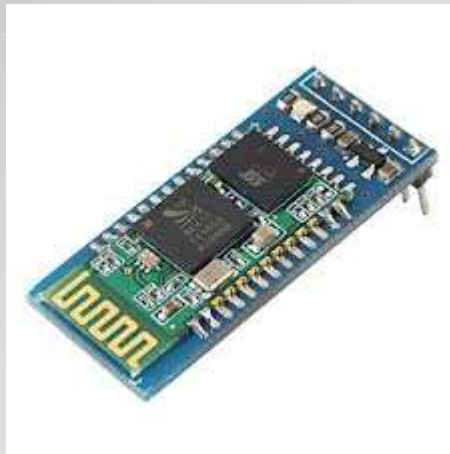
SHIELDS

- Entradas e Saídas
 - LCD
 - Touch
 - Acionamento de Reles



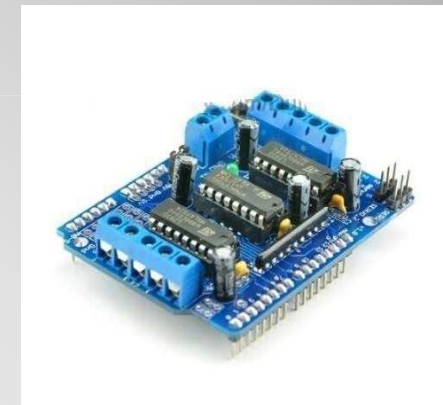
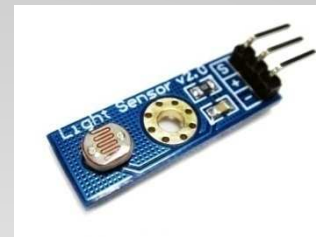
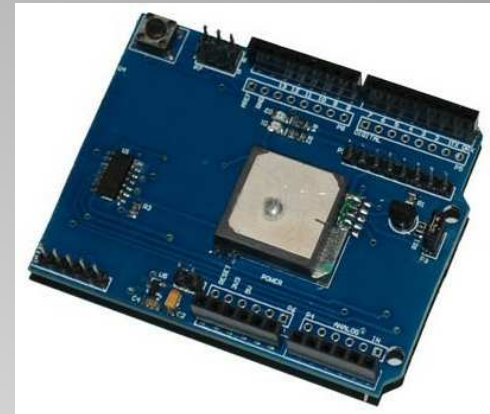
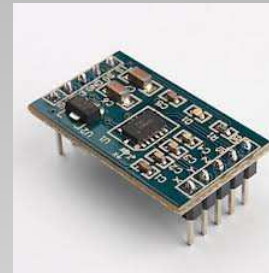
SHIELDS

- Comunicação sem fio
 - Wifi
 - Bluetooth



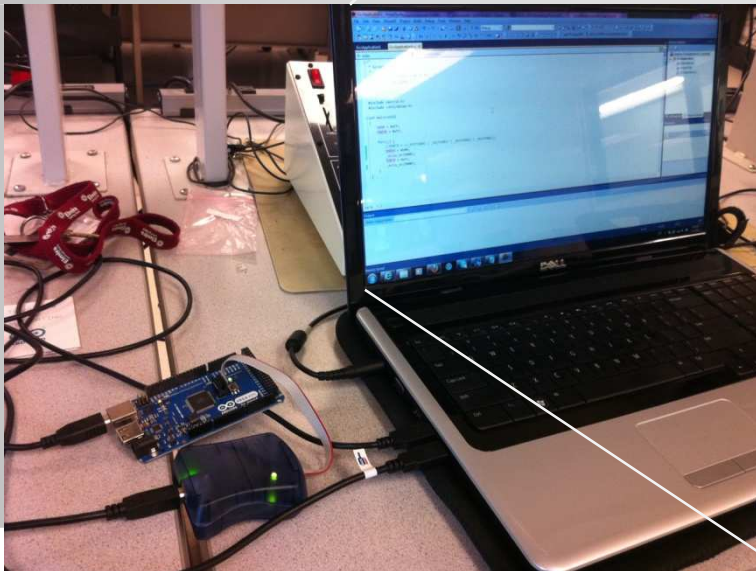
OUTROS SHIELDS

- GPS
- Acelerômetro
- Luxímetro
- Controle motor DC
- Sensor ultra som
- Joystick



AMBIENTES DE DESENVOLVIMENTO

- INTERFACE DE DESENVOLVIMENTO
 - GRATUITO
- CONEXÃO E COMUNICAÇÃO
- OPERAÇÃO E PROGRAMAÇÃO



```
Arduino - 0003 Alpha

led_blink

/* Blinking LED
 * -----
 * turns on and off a light emitting diode(LED) connected to a digital
 * pin, in intervals of 2 seconds. Ideally we use pin 13 on the Arduino
 * board because it has a resistor attached to it, needing only an LED
 *
 * Created 1 June 2005
 * Copyright 2005 DojoDave <http://www.0j0.org>
 * http://arduino.berlios.de
 *
 * based on an original by H. Barragan for the Wiring i/o board
 */

int ledPin = 13;           // LED connected to digital pin 13

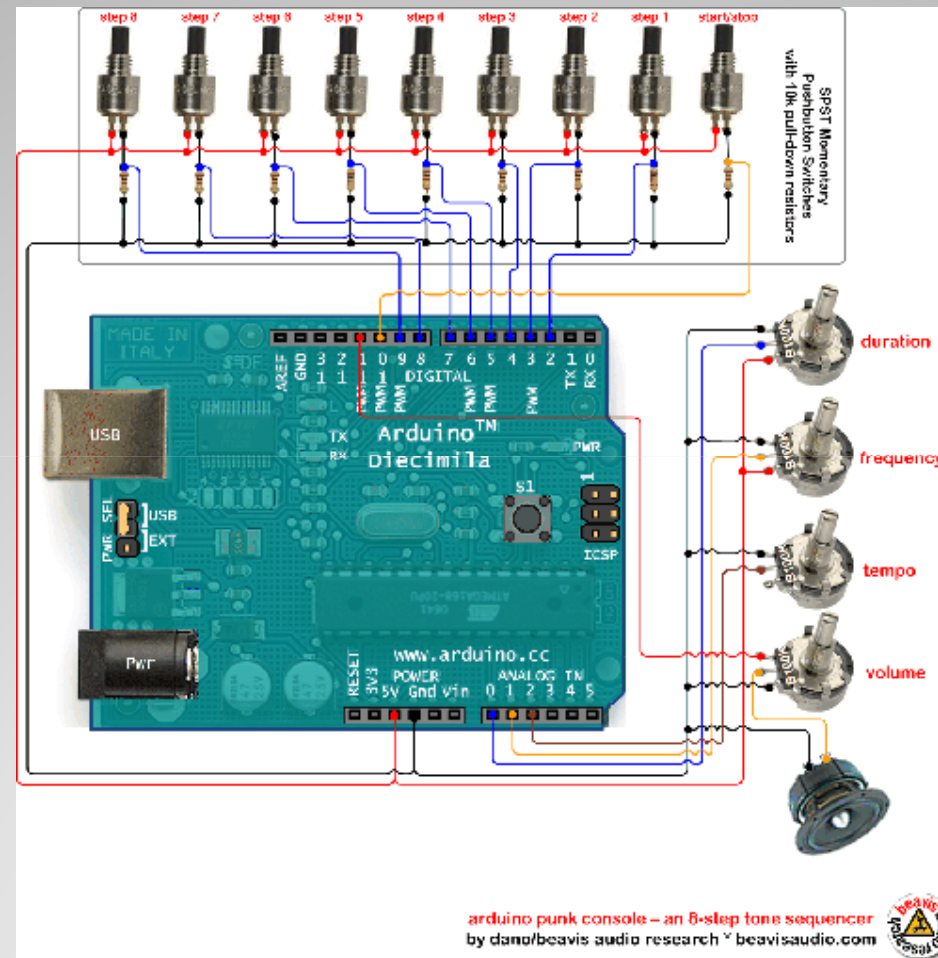
void setup()
{
  pinMode(ledPin, OUTPUT); // sets the digital pin as output
}

void loop()
{
  digitalWrite(ledPin, HIGH); // sets the LED on
  delay(1000);                // waits for a second
  digitalWrite(ledPin, LOW);  // sets the LED off
  delay(1000);                // waits for a second
}
```

Projetos

- Automação Industrial
- Automação Comercial
- Automação Residencial
- Hobbies

Gerador de Tons



<http://www.beavisaudio.com/projects/digital/ArduinoPunkConsole/>

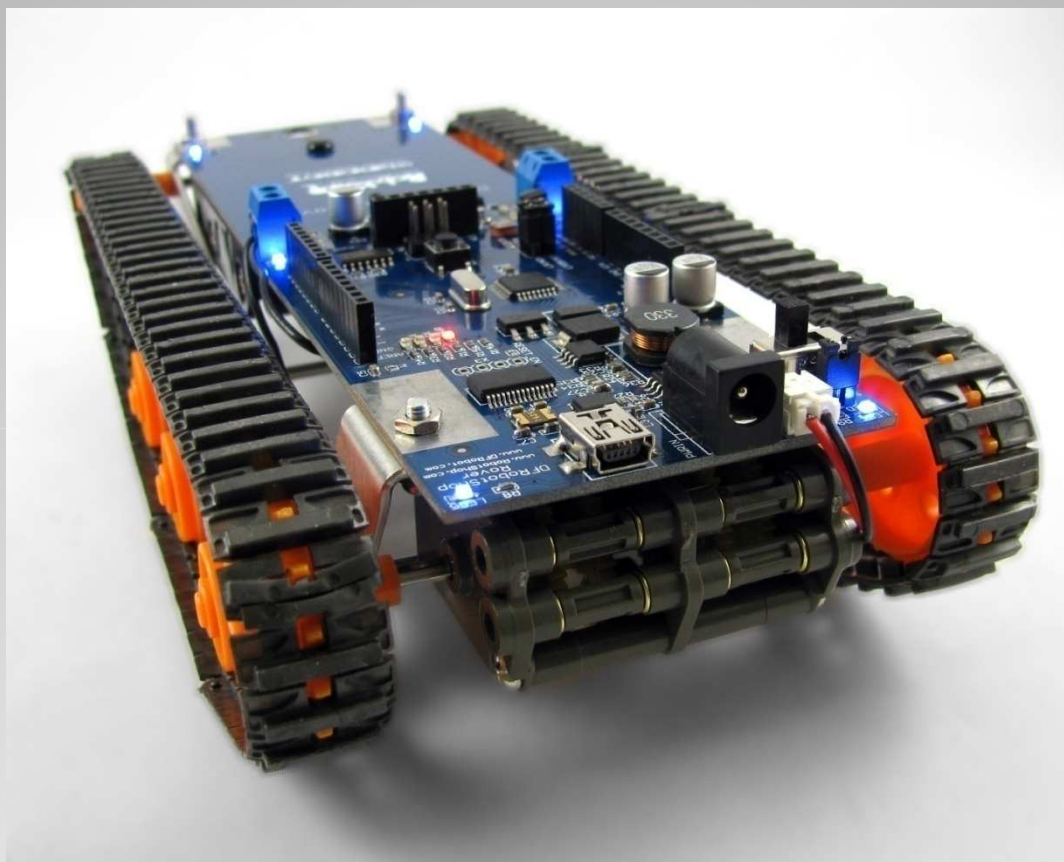
Estação Meteorológica



Vestido de slides



Robótica

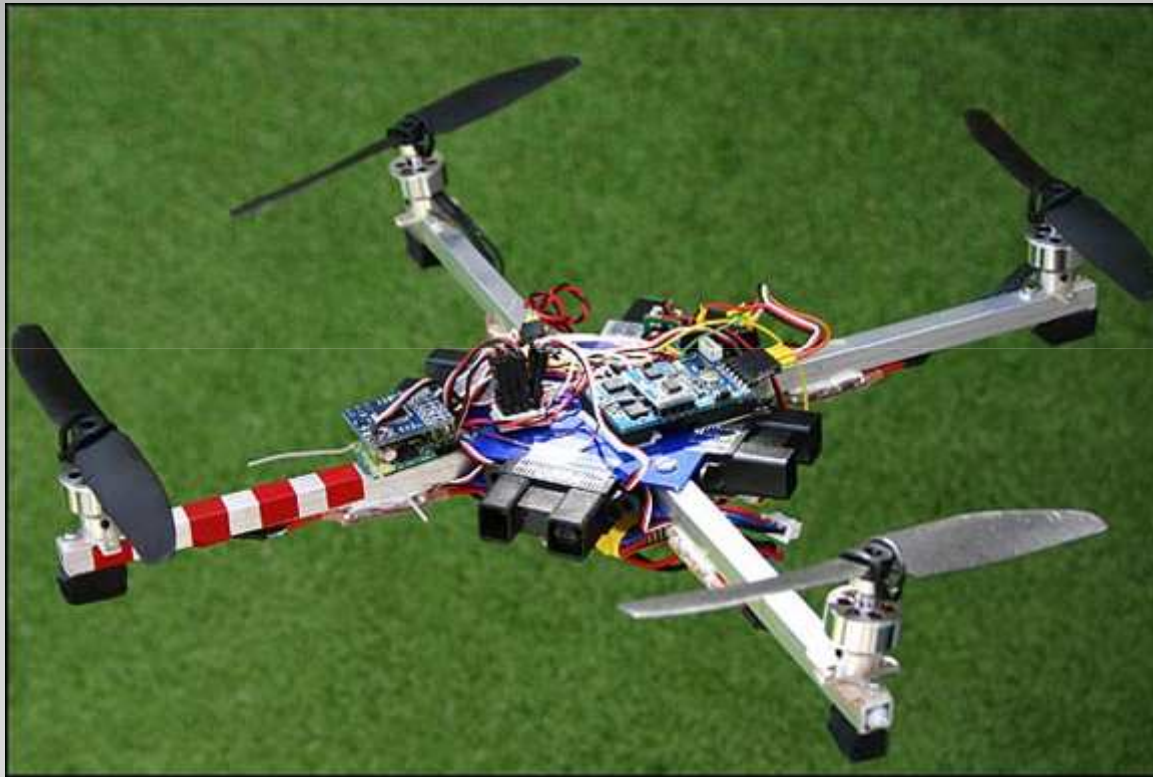


Jogando Super Nintendo no Android com controle original

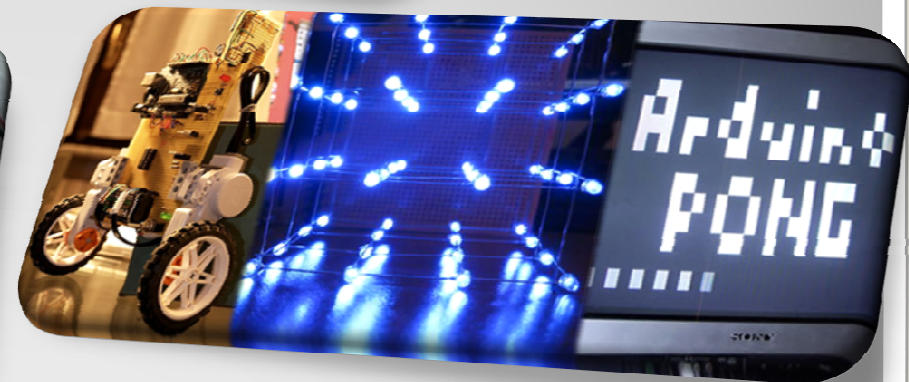


<http://blog.bsoares.com.br/tag/arduino>

Quadricóptero



40 projetos com Arduino



<http://hacknmod.com/hack/top-40-arduino-projects-of-the-web/>
<http://www.andrepollux.com.br/processing-arduino/>

Outros Projetos