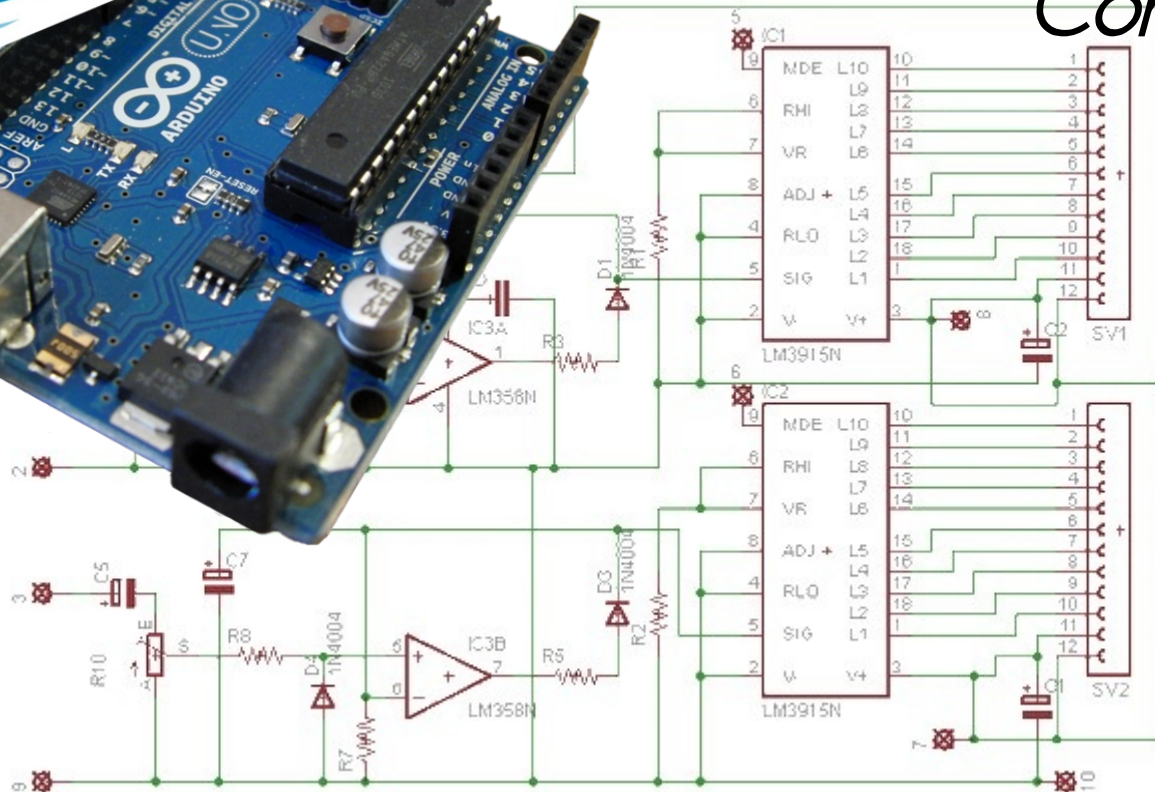
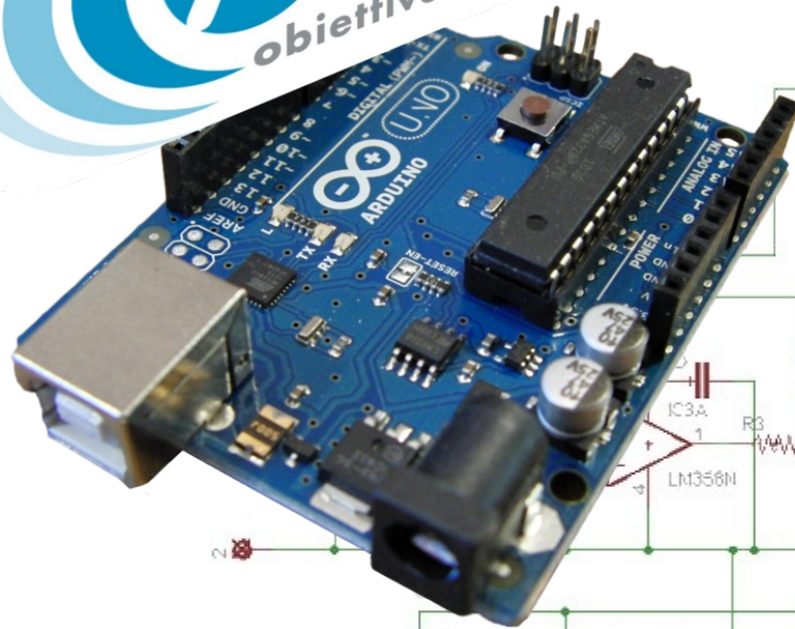


CORSO ARDUINO

Giulio Fieramosca
Stefano Panichi
Corso ASEV 2014



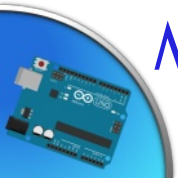
Cosa c'è dietro Arduino?



“ Pensiamo sia essenziale giocare con la tecnologia, esplorando le diverse possibilità di hardware e software – spesso senza un obiettivo ben definito.

Riutilizzare la tecnologia esistente è una delle vie migliori del fare *thinking*. Prendere giocattoli economici o vecchi oggetti inutilizzati e modificarli è la via migliore per ottenere grandi risultati ”

Massimo Banzi – Getting started with Arduino – Traduzione libera



Open Software – Open Hardware



```
6'b100111: begin // DAA
    // decimal adjust accumulator, or remove by carry any
    // results in nybbles greater than 9

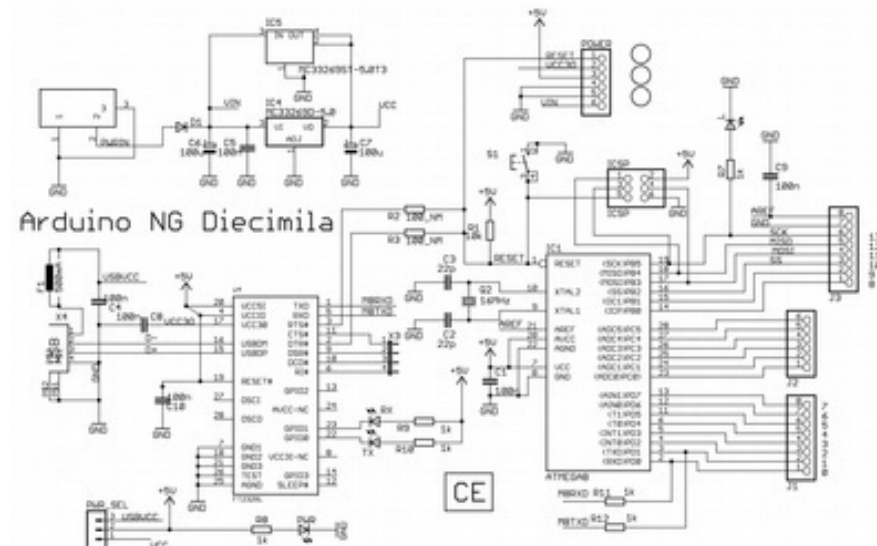
    if (regfil[reg_a][3:0] > 9 || auxcar)
        { auxcar, regfil[reg_a] } <= regfil[reg_a]+8'h06;
    state <= `cpus_daa; // finish DAA
    pc <= pc+16'h1; // Next instruction byte
end

6'b000100, 6'b001100, 6'b010100, 6'b011100, 6'b100100,
6'b101100, 6'b110100, 6'b111100, 6'b000101, 6'b001101,
6'b010101, 6'b011101, 6'b100101, 6'b101101, 6'b110101,
6'b111101: begin // INR/DCR

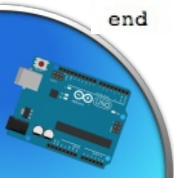
    regd <= opcode[5:3]; // get source/destination reg
    aluopra <= regfil[opcode[5:3]]; // load as alu a
    aluoprb <= 1; // load 1 as alu b
    if (opcode[0]) alusel <= `aluop_sub; // set subtract
    else alusel <= `aluop_add; // set add
    if (opcode[5:3] == `reg_m) begin

        raddrhold <= regfil[reg_h]<<8|regfil[reg_l];
        statesel <= `mac_indm; // inc/dec m
        state <= `cpus_read; // read byte

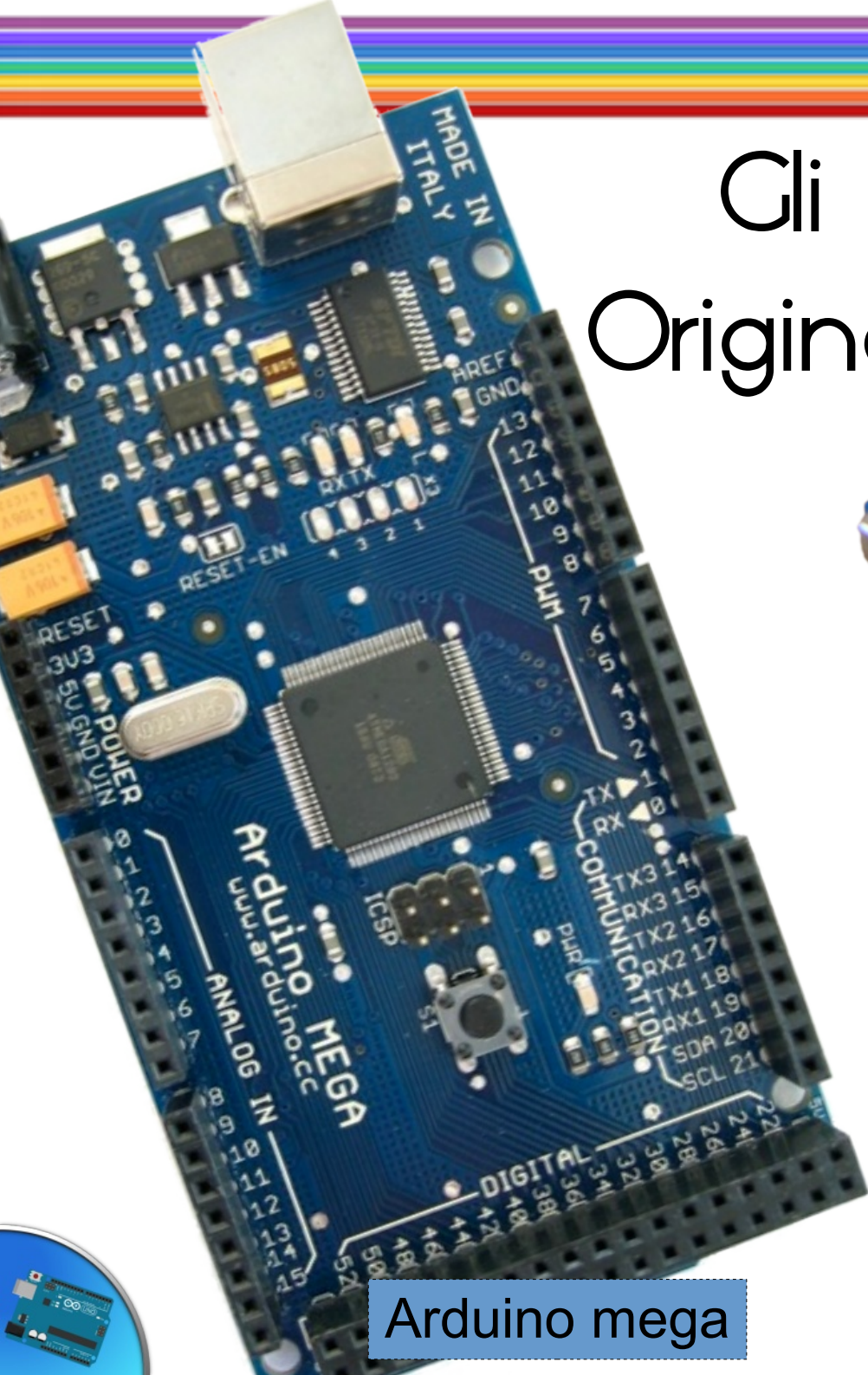
    end else state <= `cpus_indcb; // go inr/dcr cycleback
    pc <= pc+16'h1; // Next instruction byte
end
```



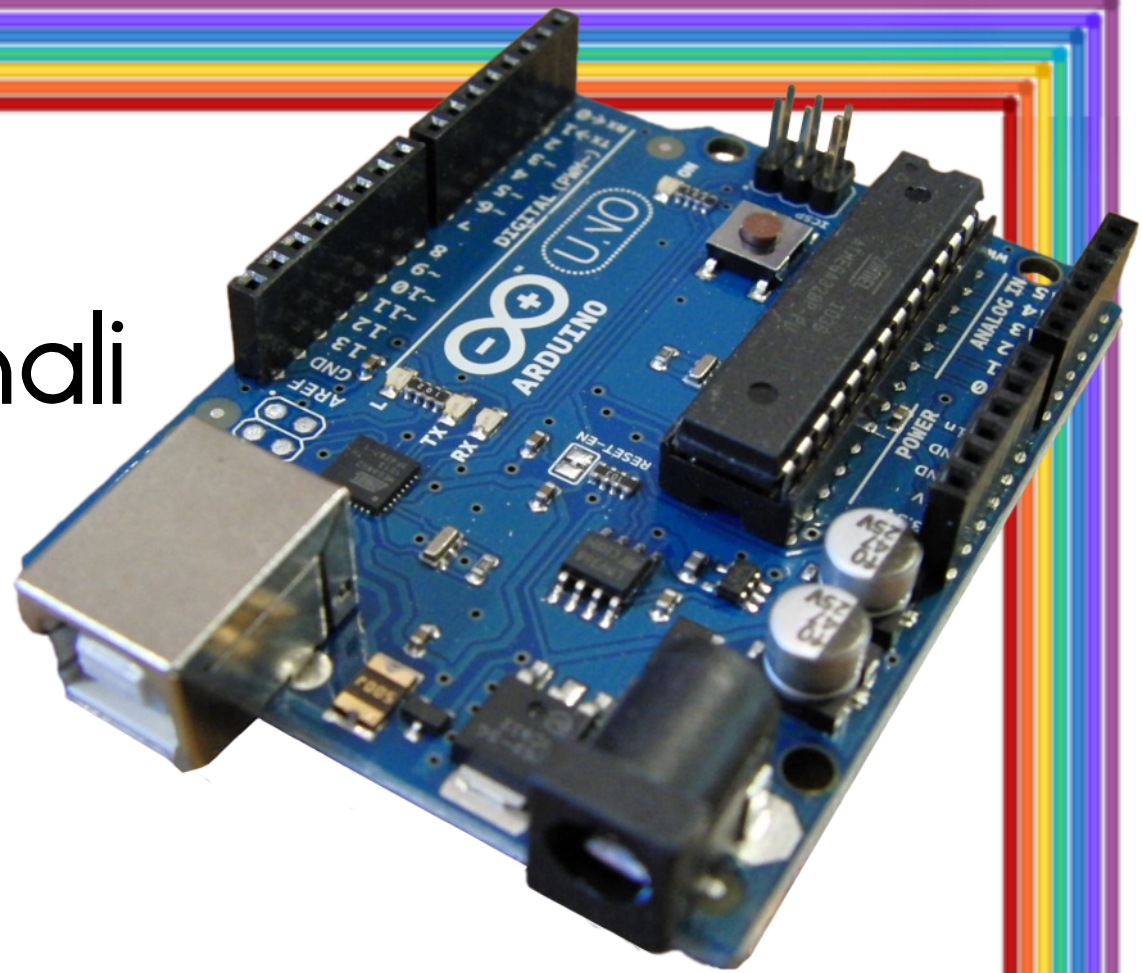
open hardware



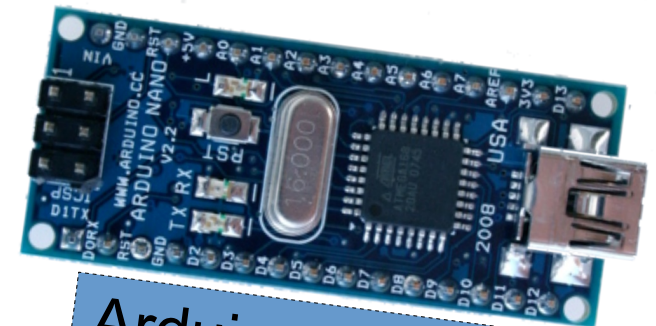
Gli Originali



Arduino mega

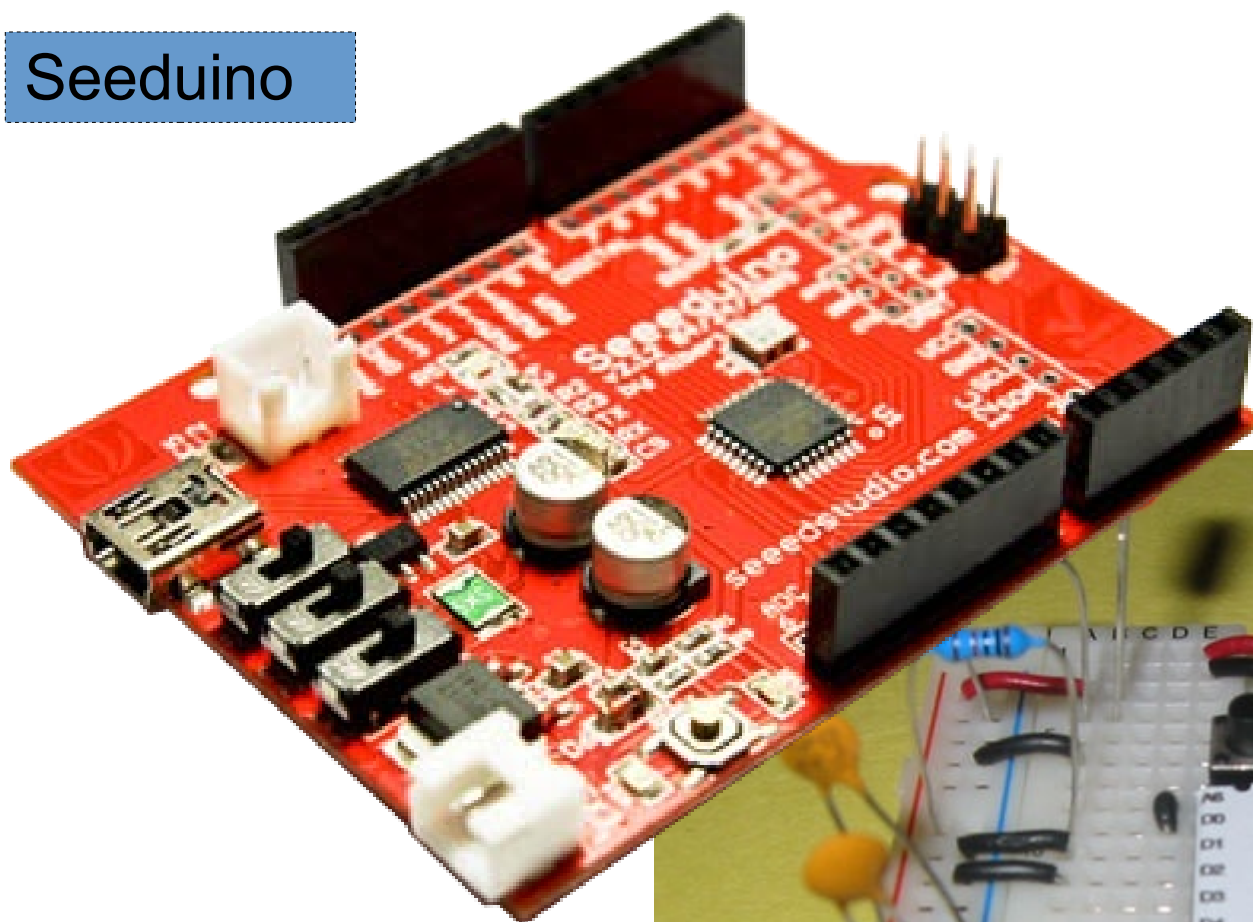


Arduino UNO



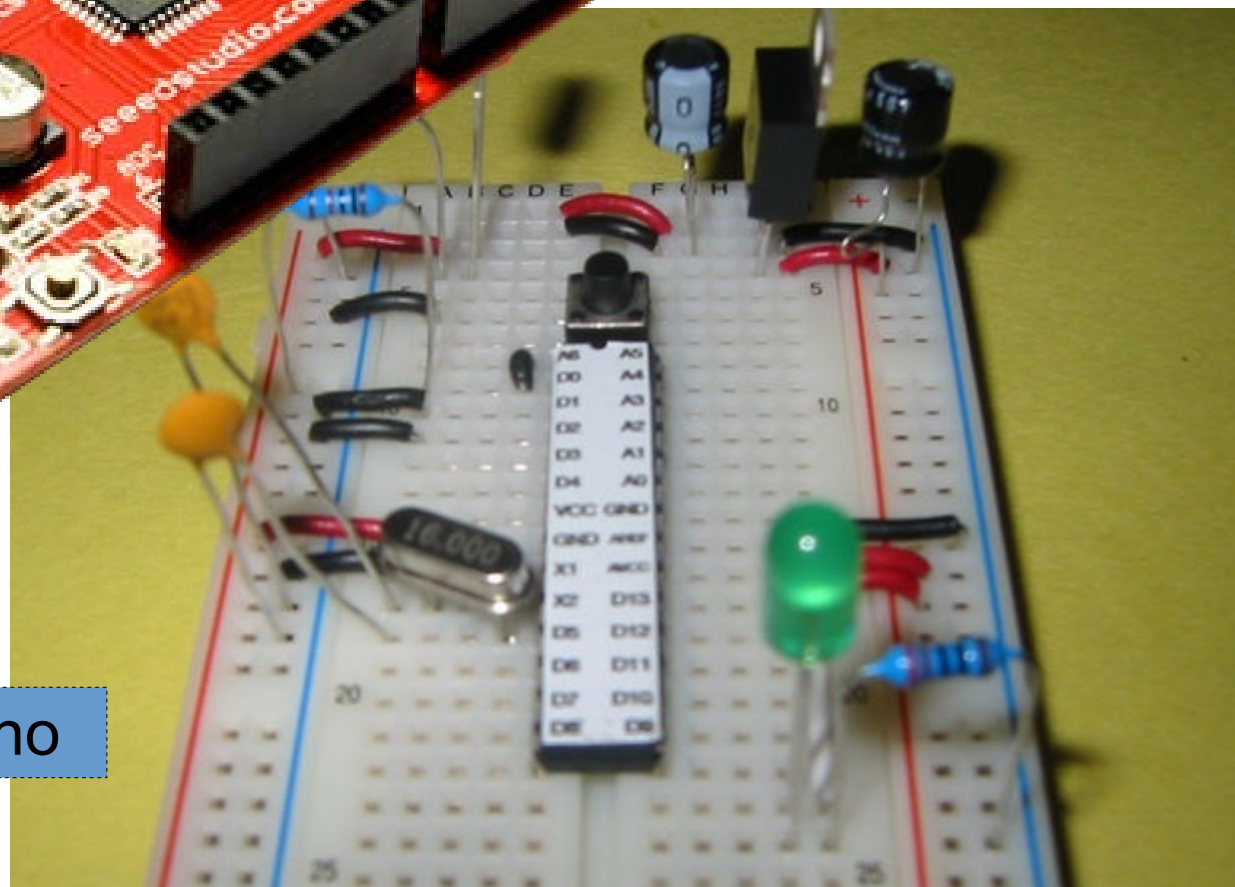
Arduino nano

Seeduino

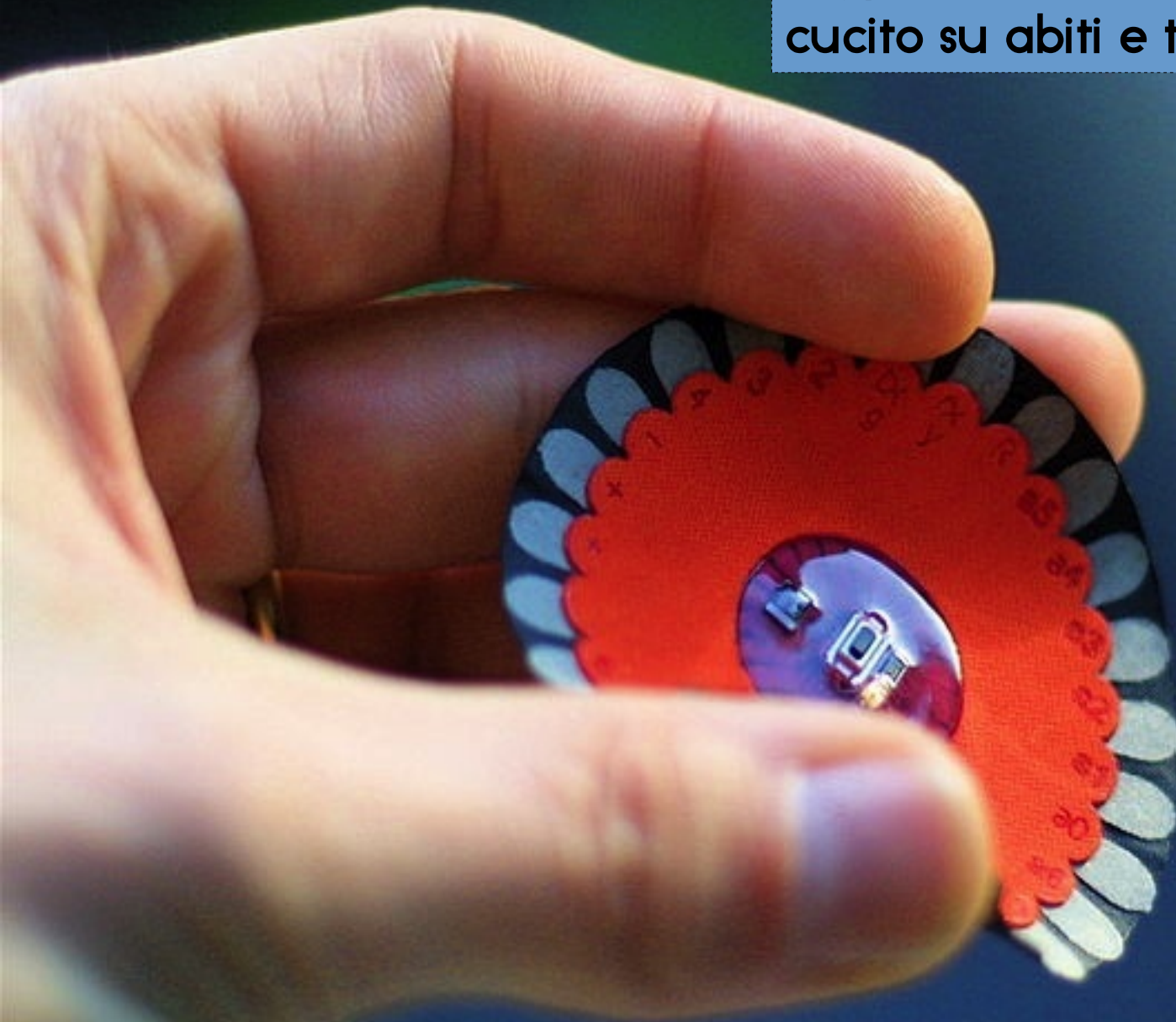


Cloni

BreadBoard Arduino



Lilypad: arduino modificato per essere cucito su abiti e tessuti in genere





Applicazione di LilyPad su un tessuto



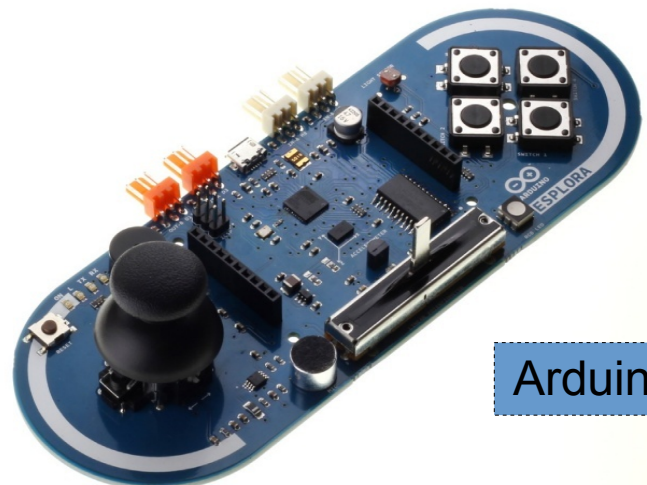
Arduino Robot



Arduino Leonardo



Arduino Yun

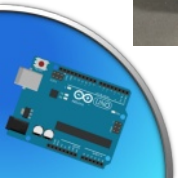
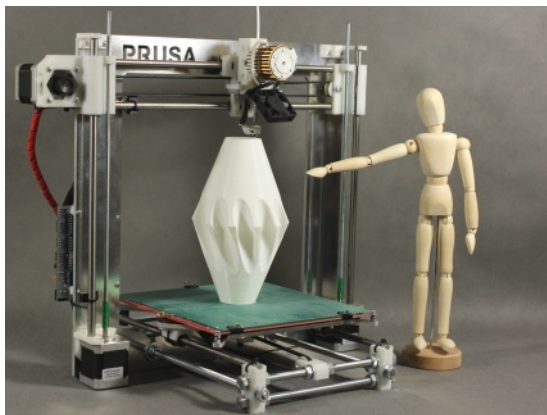
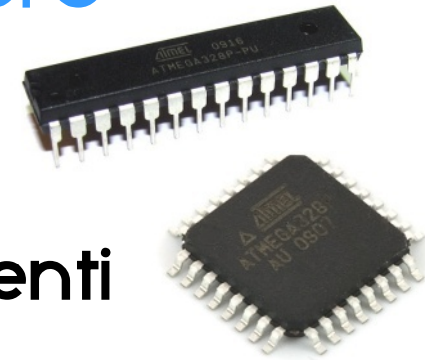


Arduino Esplora

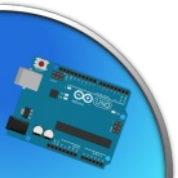
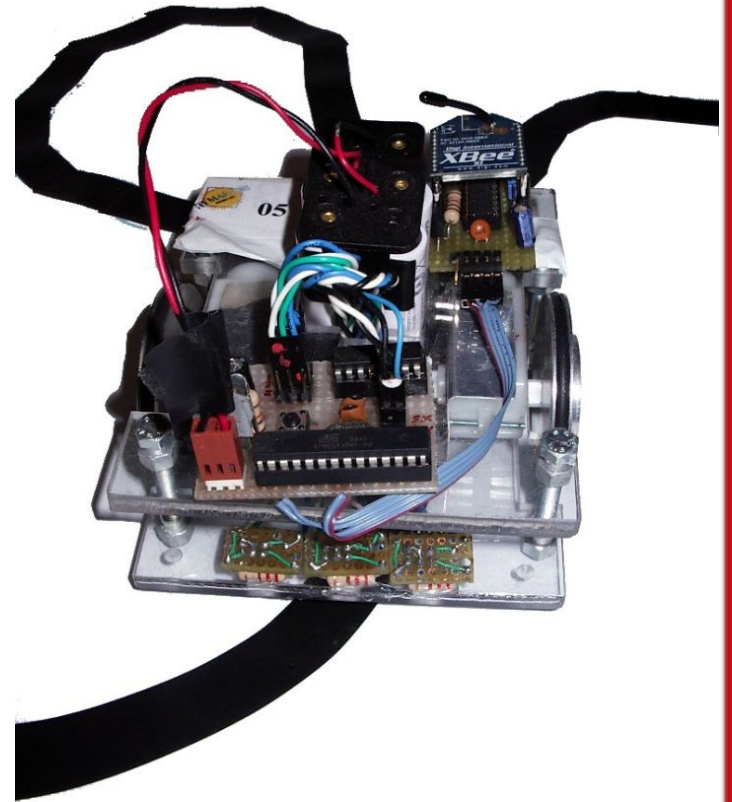
Cos'è un microcontrollore

Componente elettronico **programmabile** che consente di sviluppare dispositivi **intelligenti** a basso costo.

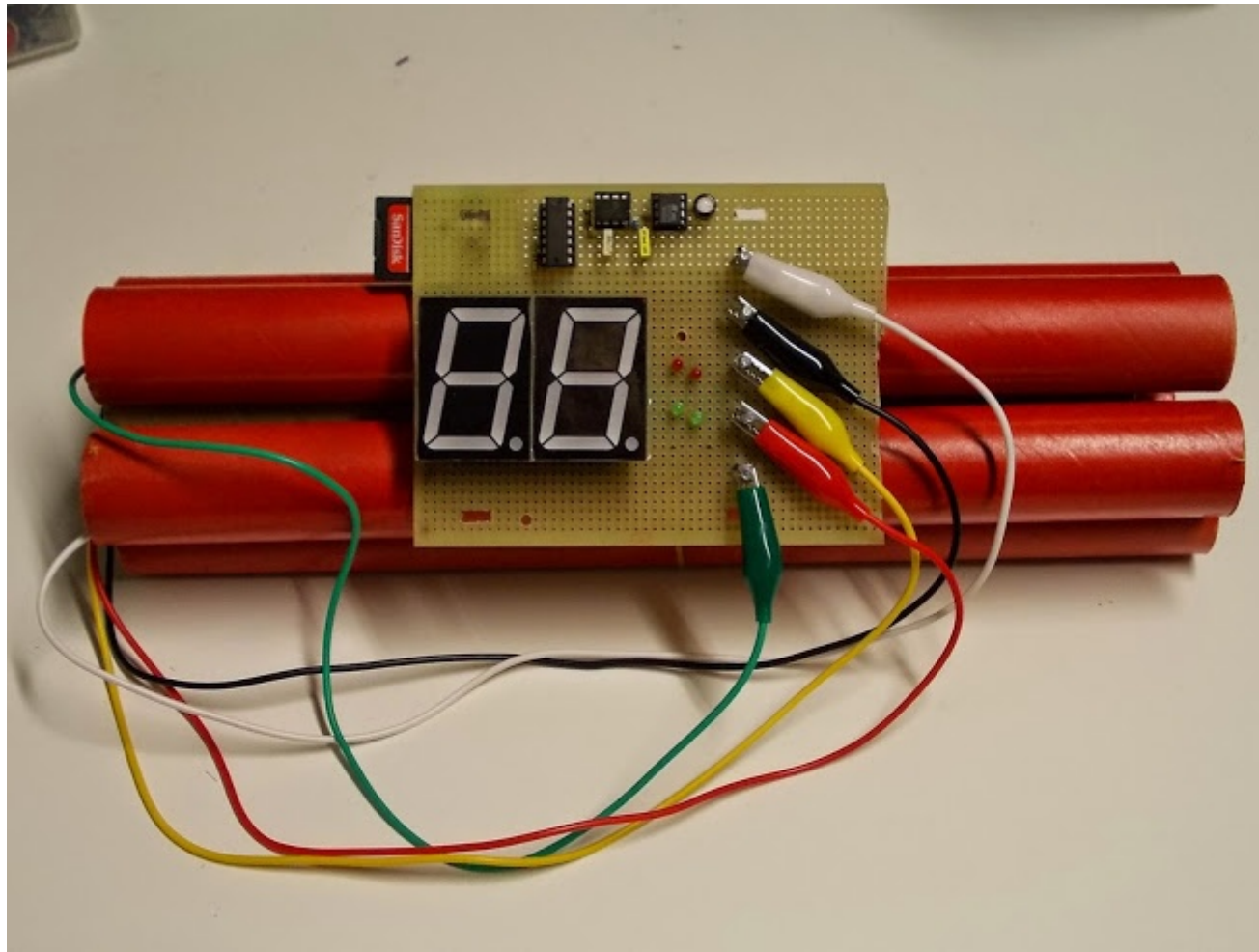
È un piccolo **computer**, con velocità e memoria ridotta, quindi consumi inferiori



Alcuni progetti



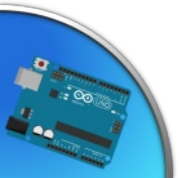
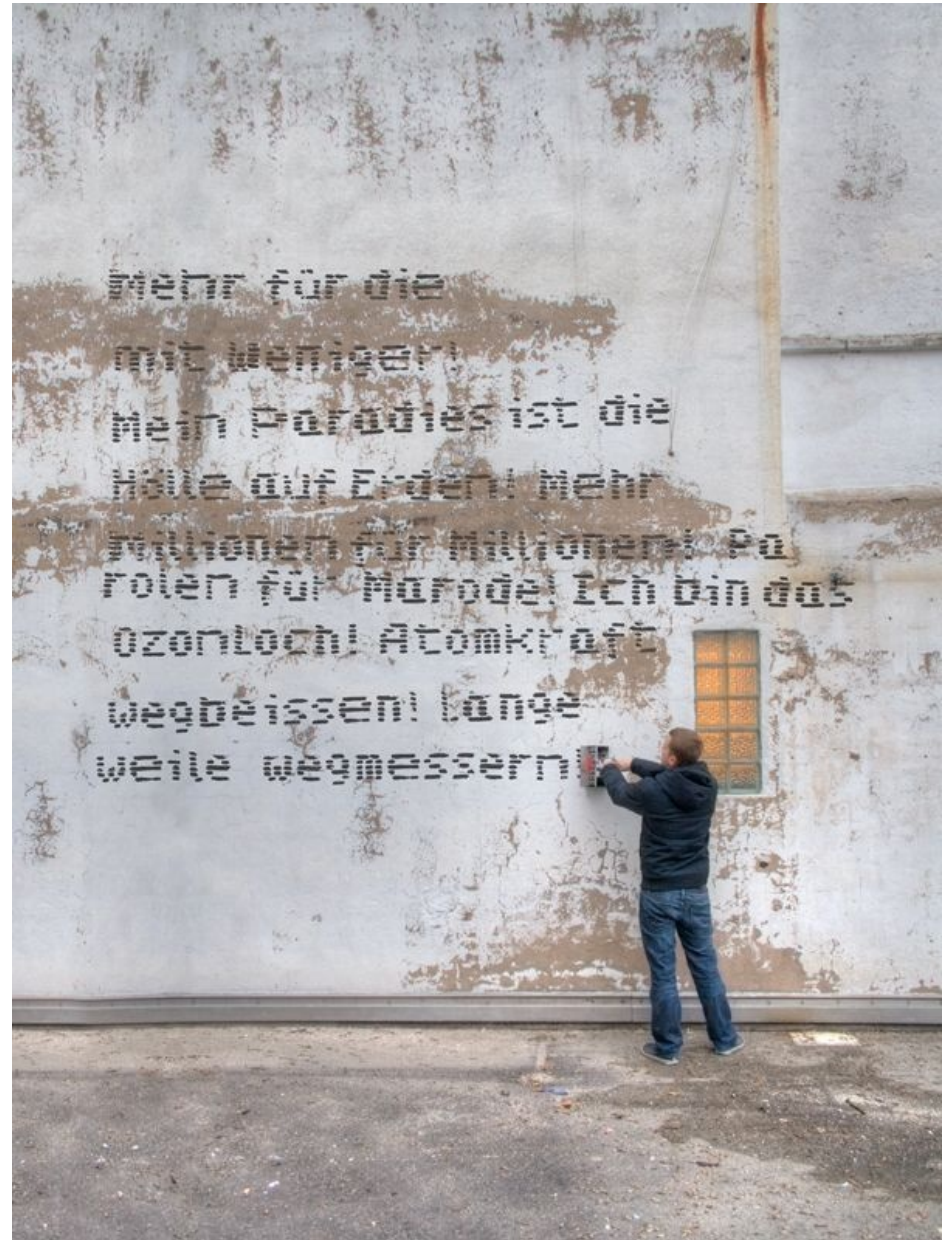
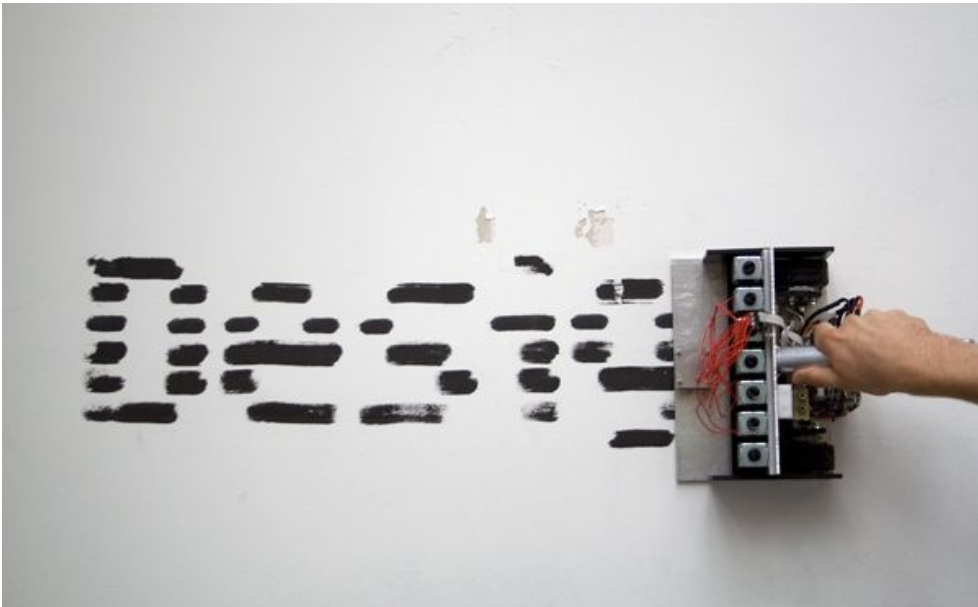
Bombermind



Occhiali da mosca cieca



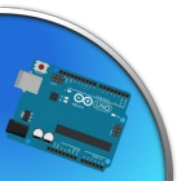
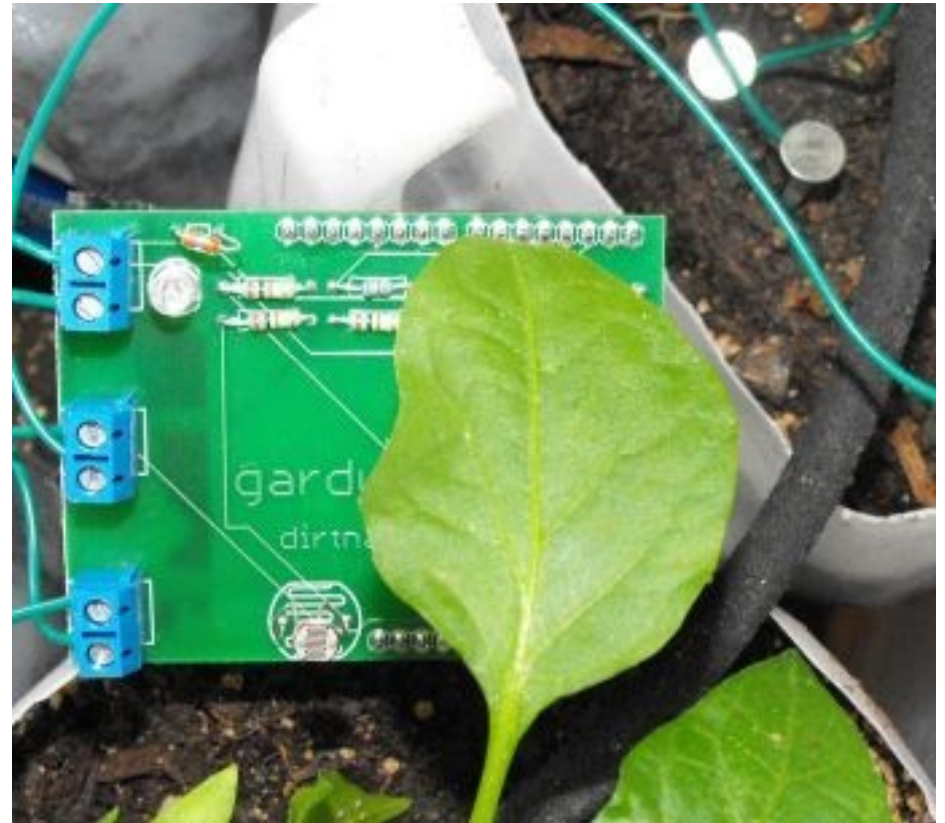
TXT Bomber



Garduino



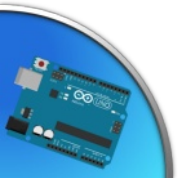
Prendersi cura delle
proprie piante...
con Arduino

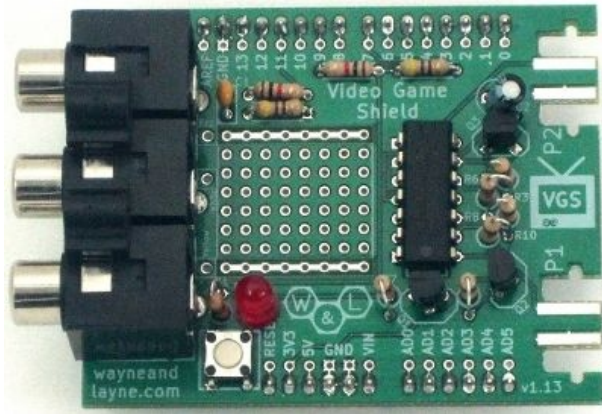




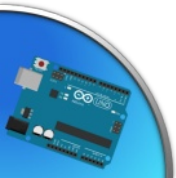
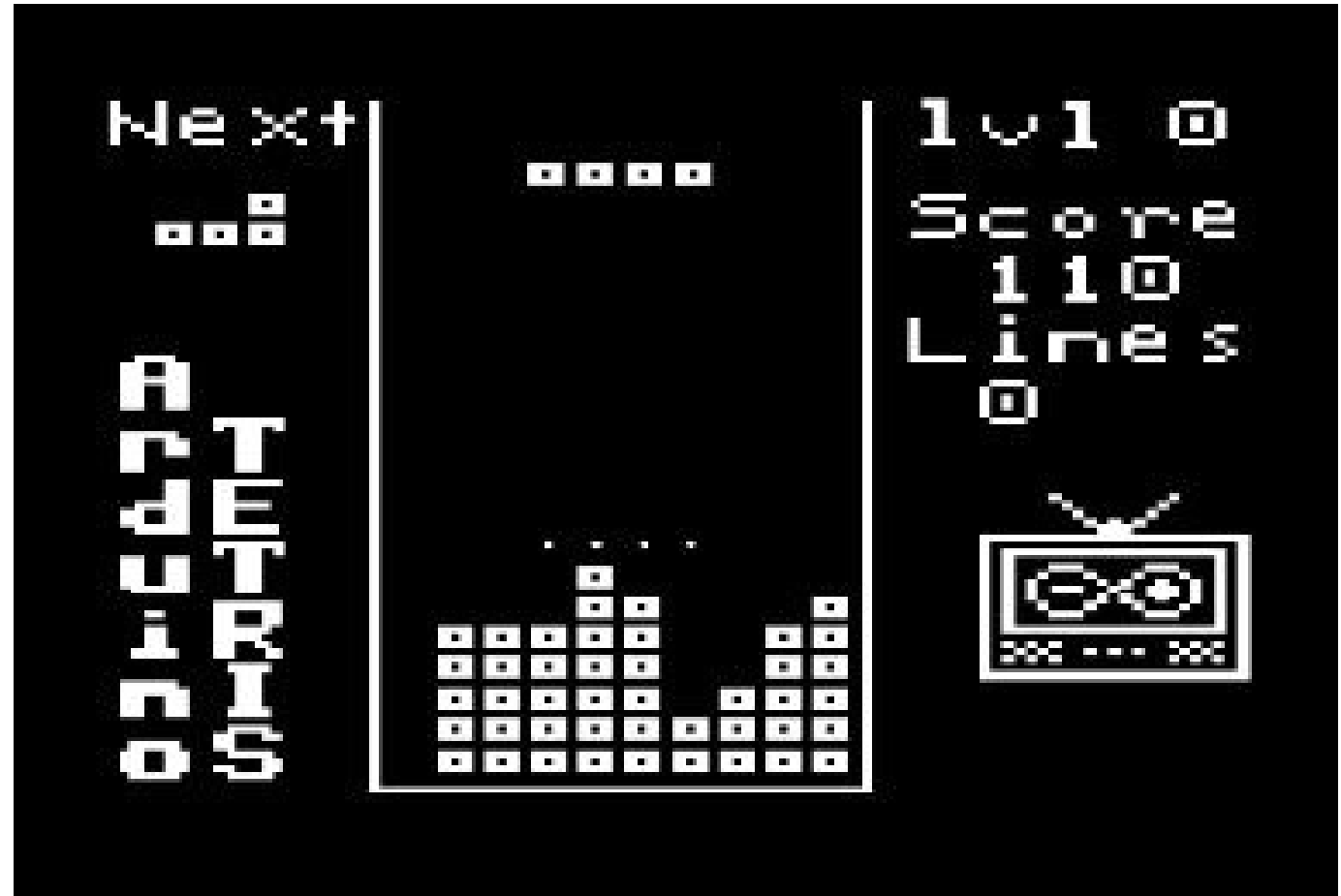
basilgotchi

grow it, enjoy it





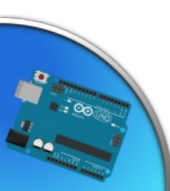
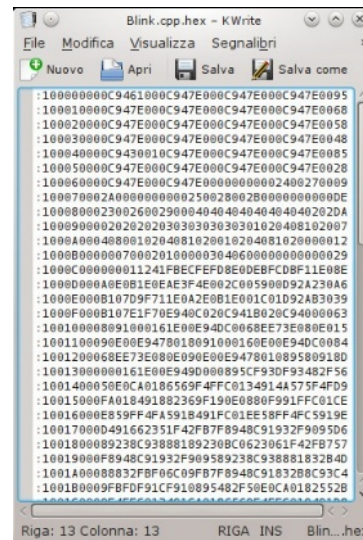
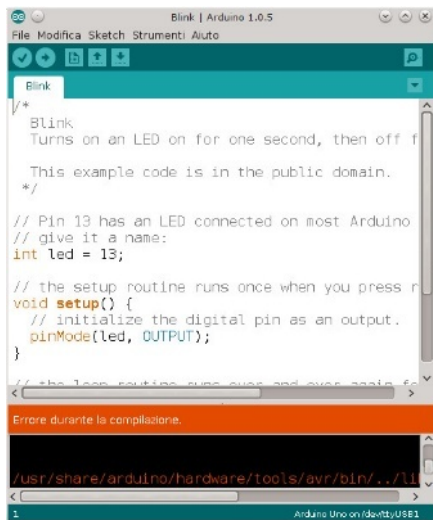
Tetris in tv



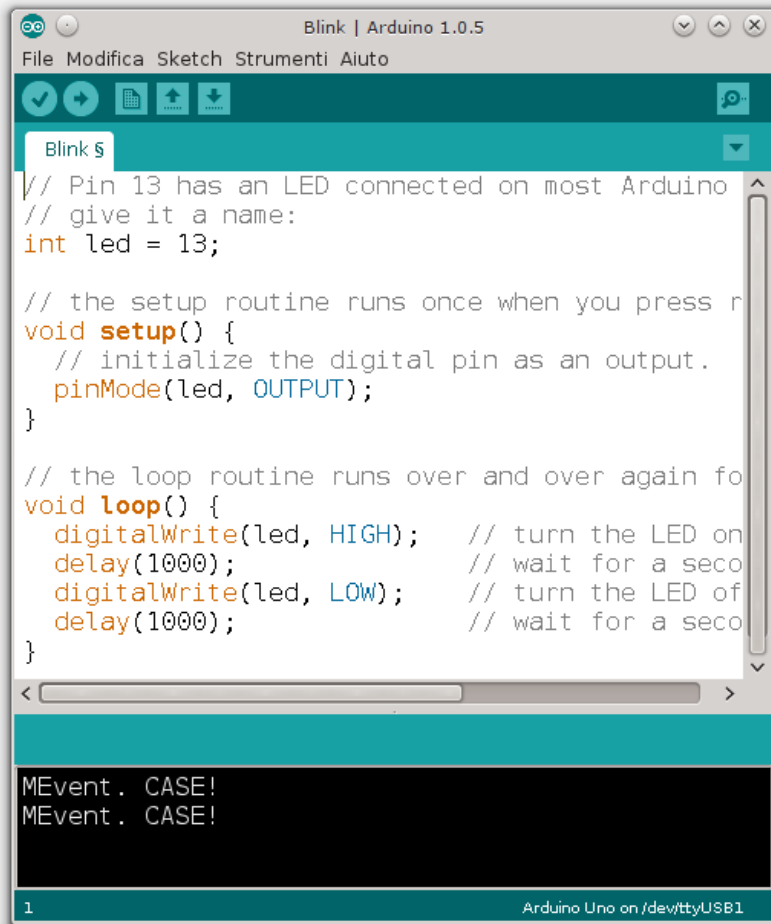
Come si usa?

Compilazione

Caricamento



Programmare arduino



```
Blink | Arduino 1.0.5
File Modifica Sketch Strumenti Aiuto
Blink $
// Pin 13 has an LED connected on most Arduino
// give it a name:
int led = 13;

// the setup routine runs once when you press r
void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}

// the loop routine runs over and over again fo
void loop() {
  digitalWrite(led, HIGH); // turn the LED on
  delay(1000); // wait for a seco
  digitalWrite(led, LOW); // turn the LED of
  delay(1000); // wait for a seco
}

MEvent. CASE!
MEvent. CASE!

1 Arduino Uno on /dev/ttyUSB1
```

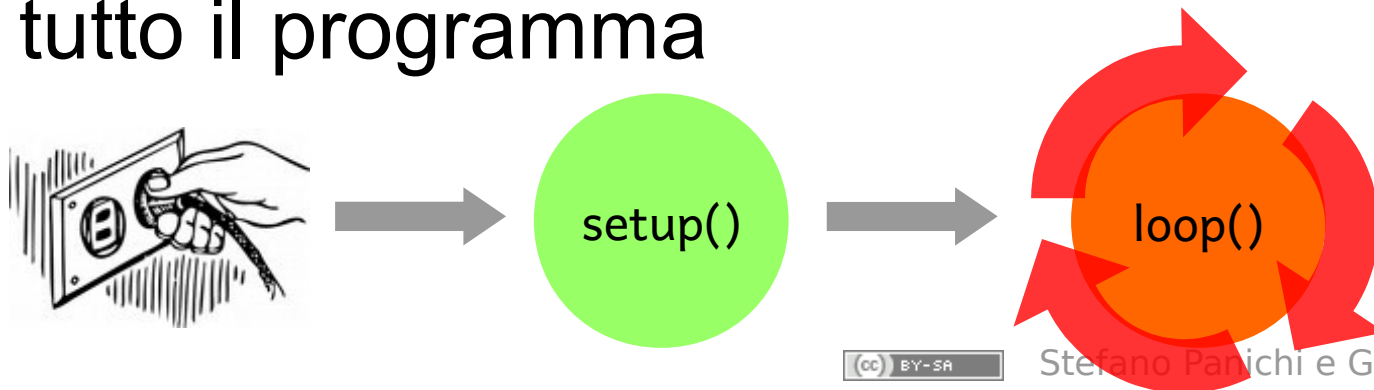
Arduino ha un suo ambiente di sviluppo **gratuito** e **multiplatforma** scaricabile da internet

- ✓ per verificare la correttezza del listato e compilarlo
- 📄 per creare un nuovo file
- 📁 per aprirne uno
- ⬇️ per salvarlo
- ➡️ per caricarlo sulla scheda

C++ su arduino

```
void setup() {  
    //istruzioni eseguite solo la prima volta  
}  
void loop() {  
    //istruzioni eseguite finché il micro è  
    //alimentato  
}
```

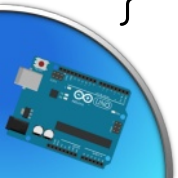
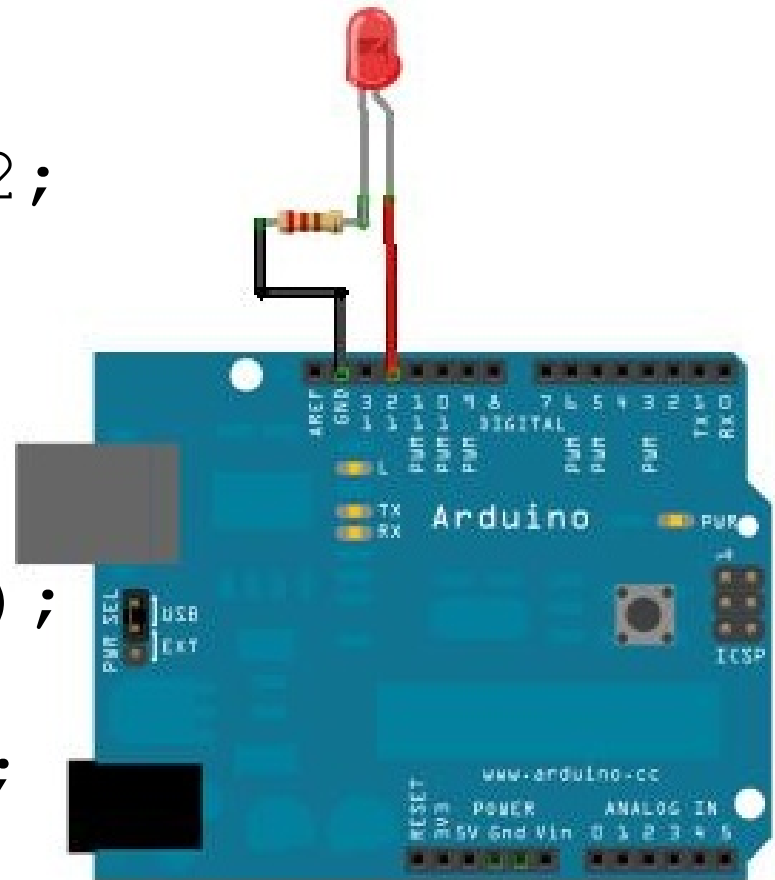
- Queste due funzioni devono essere sempre presenti nel listato, sono il punto di partenza di tutto il programma



Far lampeggiare un led

Helloblink.ino

```
const short int led = 12;  
void setup() {  
    pinMode(led, OUTPUT);  
}  
void loop() {  
    digitalWrite(led, HIGH);  
    delay(500);  
    digitalWrite(led, LOW);  
    delay(500);  
}
```



Siti utili – arduino.cc

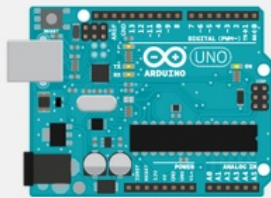


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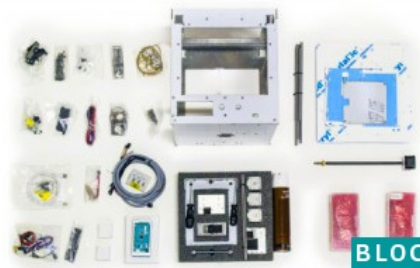
ARDUINO
ATHEART



Designed for makers and
companies wanting to make

their products easily

store.arduino.cc/product/A000008



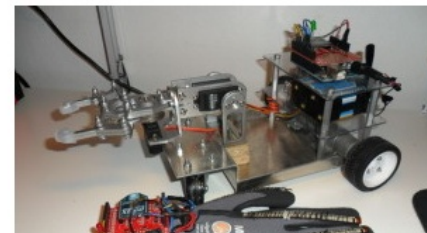
BLOG

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MAKESHIFT



Intel IoT



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Fix & Repair



HALLOWEEN

Arduino-Based Blue Box (Phone Phreaking) by WeakNetLabs



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9 Steps

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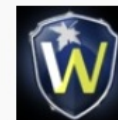


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WeakNetLabs

Douglas Berdeaux

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Bio: Me? Oh, I like bunny rabbits with floppy ears and chestnut fur.

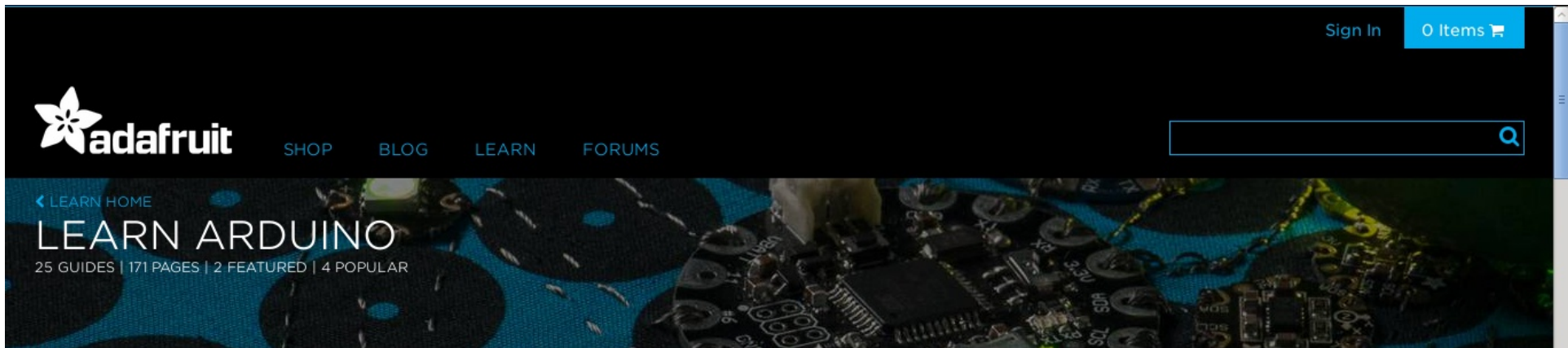
More by WeakNetLabs



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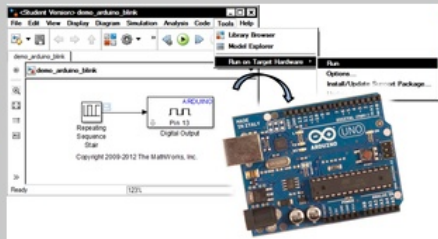


NEW GUIDE

Wireless Game Show Poppers for the Classroom!

Pro Trinket + Hacked Duo Pop Game = Game Show Fun!

Ever wanted to create your own game show environment. Hack a Duo Pop Game infrared (IR) receiver so you can create your own game show system using wireless poppers with a PC or Mac computer. This modification allows the IR receiver to interface with both PC and Mac game show software via the USB. This project leverages lessons learned from previous tutorials at adafruit.com involving 1) IR decoding and 2) the virtual USB library. This



Set up and Blink - Simulink with Arduino

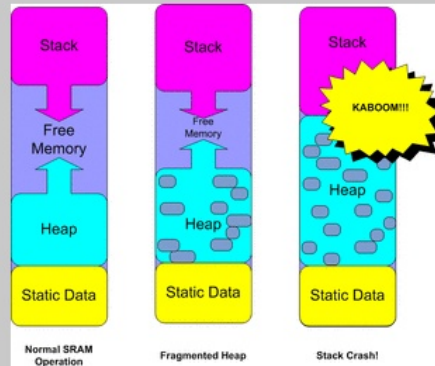
How to use Simulink to program your Arduino

Step-by-step instructions on how to set up and use Simulink to program your Arduino Uno to blink an LED. This is a first tutorial in a series on using Simulink with Arduino Uno.



ANUJA APTE

FEATURED



Memories of an Arduino

How to get the most from your Arduino Memory

As your Arduino projects get more sophisticated, they tend to grow to the point where memory limitations can become a problem. This guide explains the different types of Arduino memory and how to use them most effectively.



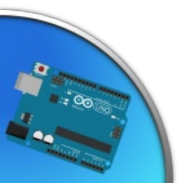
Adafruit Proto Shield for Arduino

Arduino Prototyping

This is a design for an open-source prototyping shield for Arduino NG/Diecimila. It has tons of cool features, to make prototyping on your Arduino easy.



LADY ADA



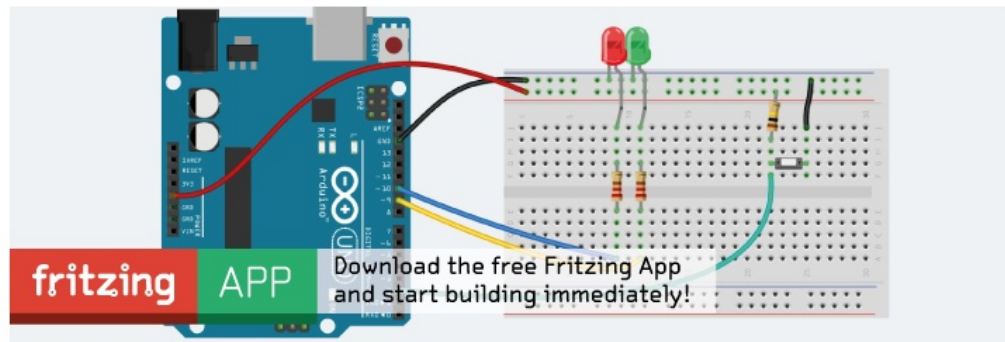
Siti utili – fritzing.com

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Fritzing is an **open-source hardware initiative** that makes electronics accessible as a creative material for anyone. We offer a software tool, a community website and services in the spirit of **Processing** and **Arduino**, fostering a creative ecosystem that allows users to **document** their prototypes, **share** them with others, **teach** electronics in a classroom, and layout and **manufacture** professional pcbs.

Download and Start

Download our **latest version 0.9.0b** released on July 14, 2014 and start right away.

Get a Creator Kit

Just got into interactive electronics and still need the basic tools? We created an "all-you-need-to-get-going" **Fritzing Creator Kit** with the Arduino UNO.



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ELETTRONICA PROGRAMMAZIONE LINUX GUIDE INFO LINKS

Elettronica e Arduino

Progetti

- Salva-corti-circuiti
- Robot line-follower robot che segue un percorso tracciato su una superficie piana
- Floppy musicali
- Mastermind in a box semplice gioco di logica con un display LCD e quattro bottoni
- Lampadino lampada da notte RGB
- Rumorinfondo physical computing e sound design

Tutorial e slides

- Motori DC
- Installare l'IDE Arduino
- Elettronica open Source
- Introduzione ad Arduino
- Led e pulsanti
- Sensori analogici e comunicazione con il computer
- PWM e motori

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Il corso: programma

05/11/2014 Basi di elettronica e programmazione

12/11/2014 Pulsanti, sensori analogici e seriale

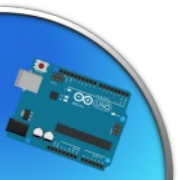
19/11/2014 Pwm, led dimming e controllo motori

26/11/2014 Display led, shift register, display lcd

03/12/2014 Sensori digitali e shields

10/12/2014 Generare suoni e musica

Le lezioni si svolgeranno ogni mercoledì, dalle ore 18,30 alle ore 21,30, nella sede ASEV



Il corso: istruzioni per l'iscrizione

- Per iscriversi, collegarsi al sito ASEV alla pagina relativa al corso;
- Il costo, comprensivo dei materiali, è di € 160



Corso di elettronica con Arduino™

Corso teorico/pratico sull'utilizzo della Piattaforma Open Source Arduino

SETTORE: > [INFOPRO](#)

SCADENZA ISCRIZIONI: 03/11/2014

POSTI DISPONIBILI: 5

DURATA IN ORE: 18

PERIODO: 05/11/2014 - 10/12/2014

Date di svolgimento

Una prima lezione introduttiva, aperta a tutti, poi 6 incontri da 3 ore ciascuno.

Workshop gratuito il 29 ottobre 2014 in orario 18.30 – 20.00

Corso: 5 novembre – 10 dicembre 2014

Le lezioni si terranno il mercoledì in orario 18.30 – 21.30

[Scarica il calendario delle lezioni](#)

MODALITÀ DI ISCRIZIONE: Sarà possibile iscriversi: durante il workshop del 29 ottobre, utilizzare la procedura on line sul sito www.asev.it, oppure presso la segreteria di ASEV, Lun – Ven 9.00 – 18.00.

Quota d'iscrizione : € 160,00

Iscrizione

Per effettuare l'iscrizione

- [Procedi all'iscrizione on-line](#)

Oppure

- [Scarica il modulo di iscrizione](#)

Obiettivi

Il programma del corso, dopo la prima lezione introduttiva, prevede approfondimenti finalizzati all'approfondimento delle funzioni hardware e software di ARDUINO. Per creare i tuoi oggetti, automatizzare la propria casa o semplicemente dare sfogo alla propria creatività.

Programma:

Introduzione ad Arduino ed esempi; basi di elettronica e programmazione; pulsanti, sensori analogici e seriale; Pwm, led dimming e controllo motori; display led, shift register, display lcd; sensori digitali e shields; generare suoni e musica.

Thank you for attention



Stefano Panichi



Giulio Fieramosca



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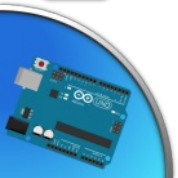
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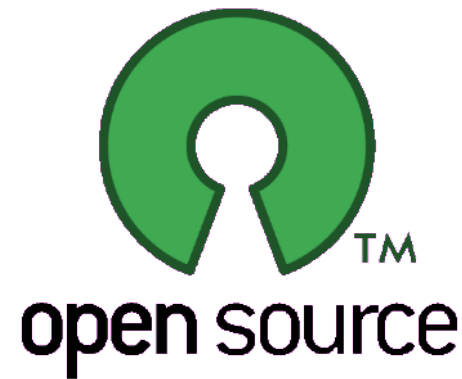
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