Manno, 17 maggio 2014

http://ated4kids.ch

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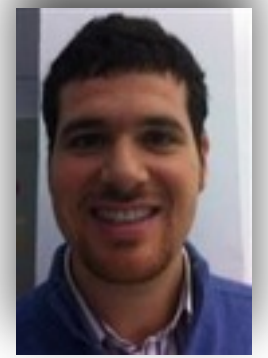
Giorgio



Celestino

Serena

Andrea

Gaspar

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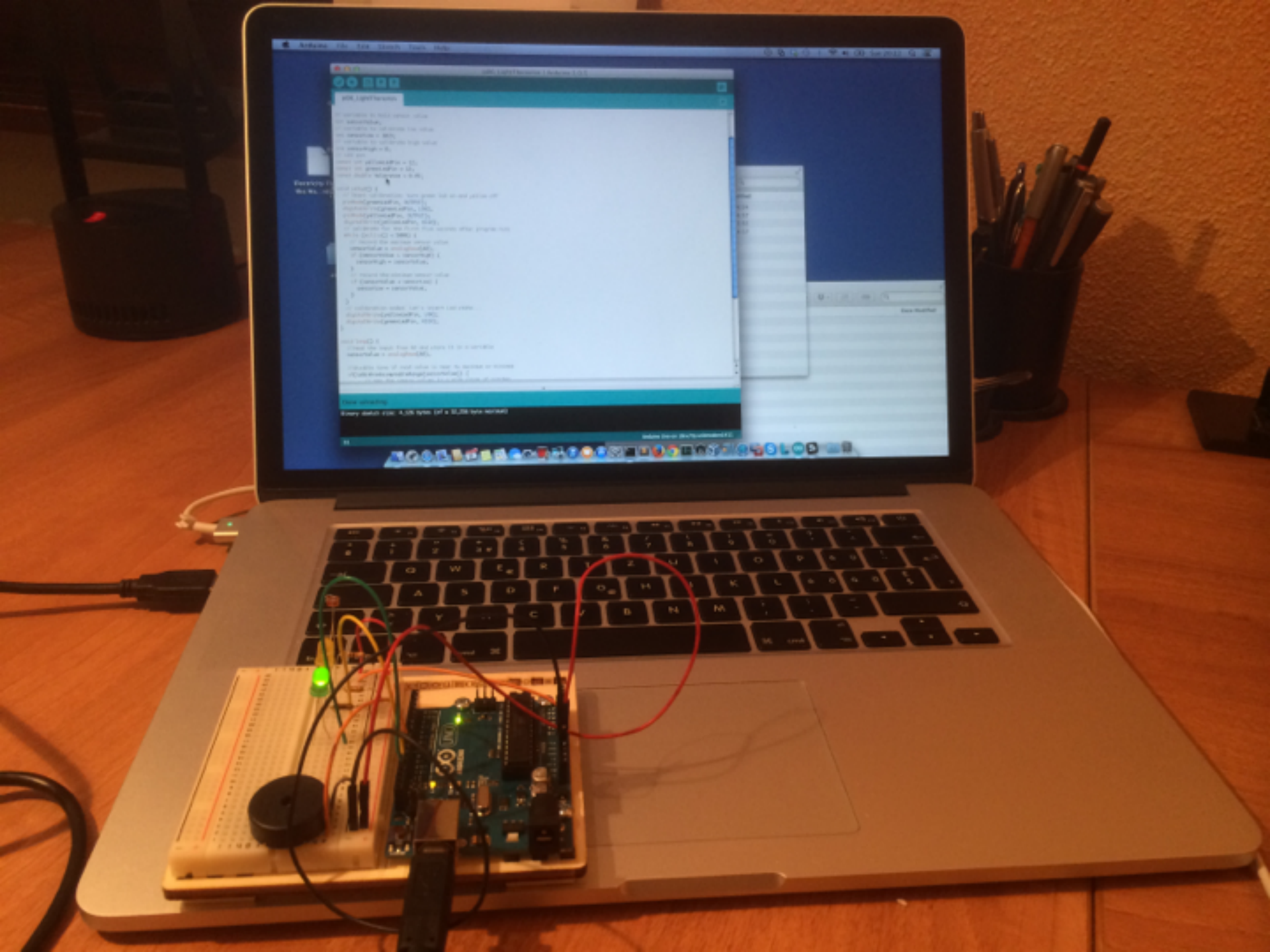

Computers sono….

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…ma non solo!

Oggi molti gli apparecchi contengono un microcontroller che esegue un programma (software).

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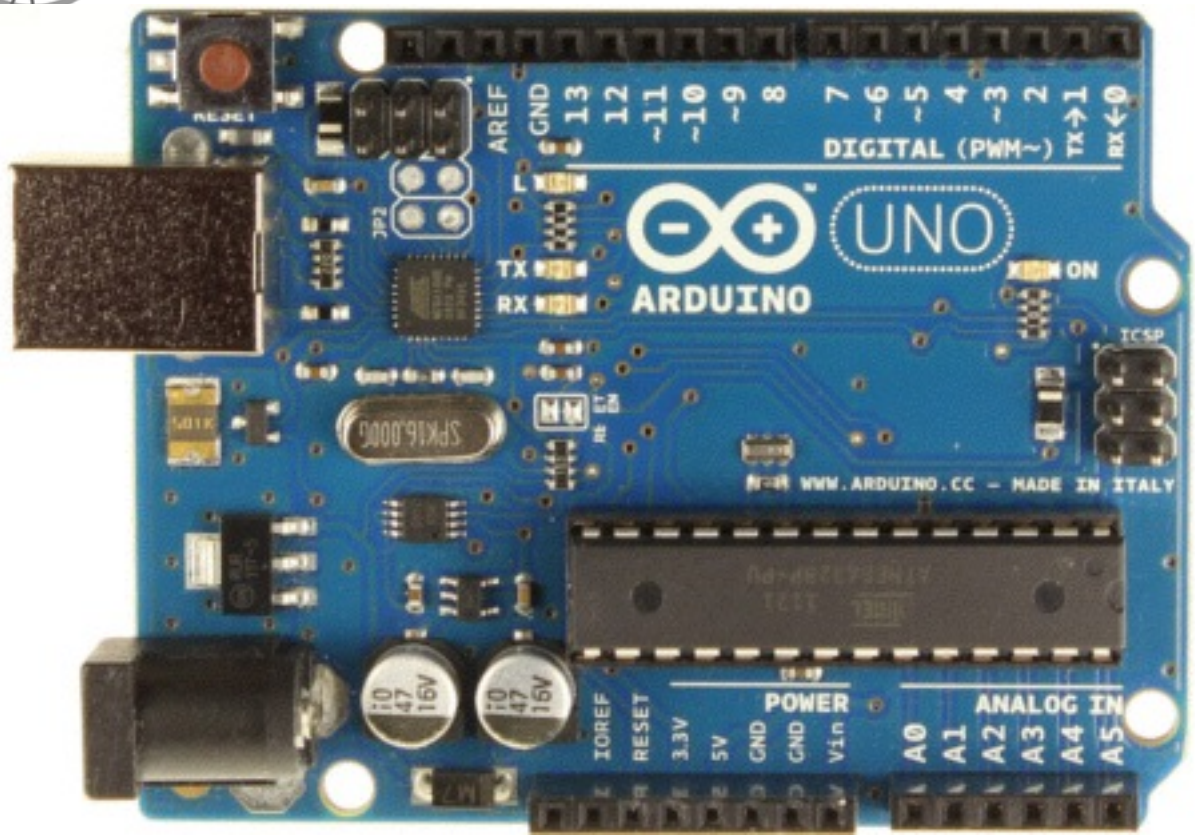
http://arduino.cc



Massimo Banzi

http://it.wikipedia.org/wiki/Open_Source

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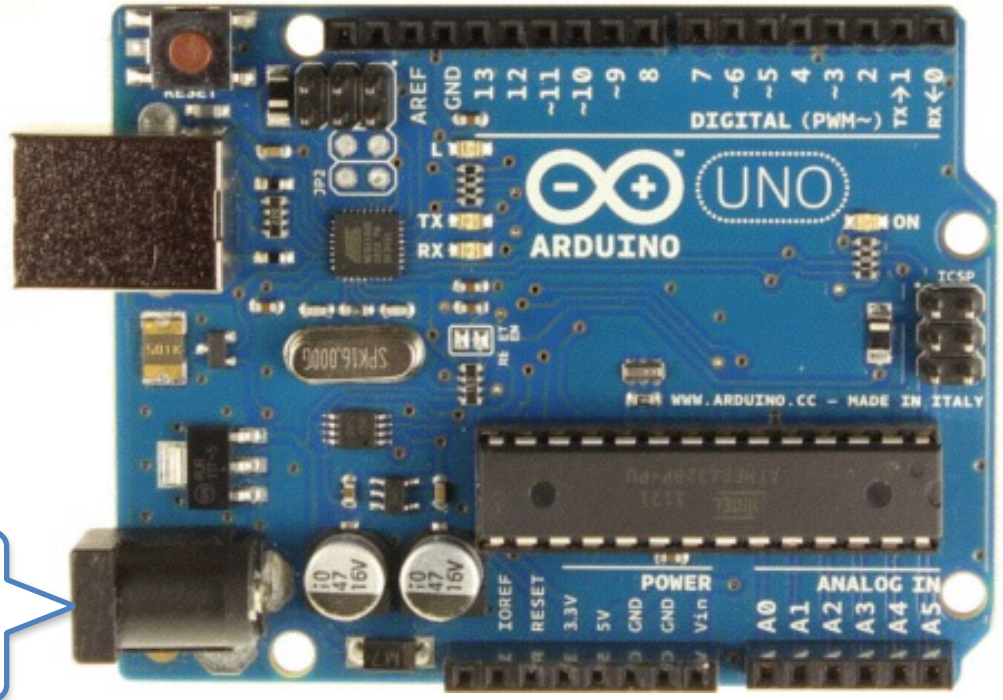

Alimentazione sistema

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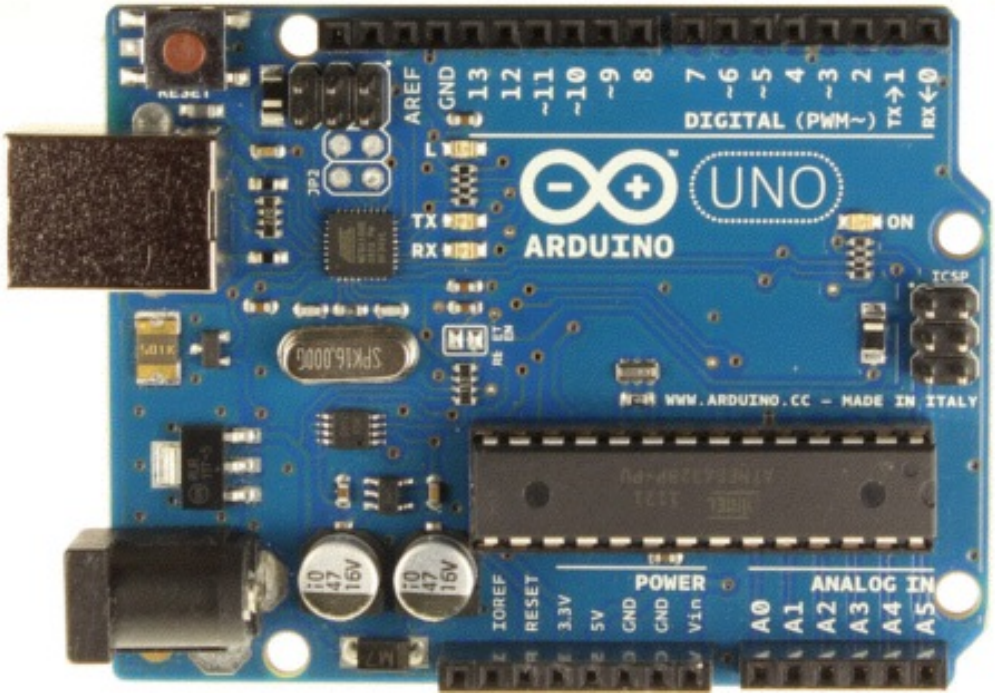

Alimentazione componenti

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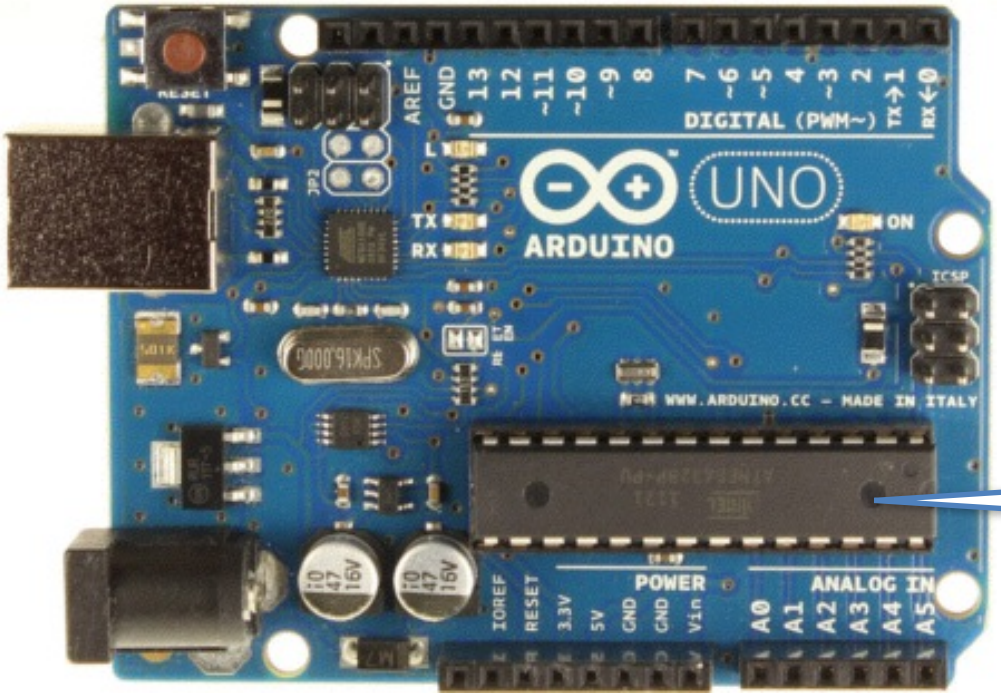
DIGITAL (PWM~)
UNO
ARDUINO
ON
ICSP
WWW.ARDUINO.CC – MADE IN ITALY
POWER
ANALOG IN
Microcontroller

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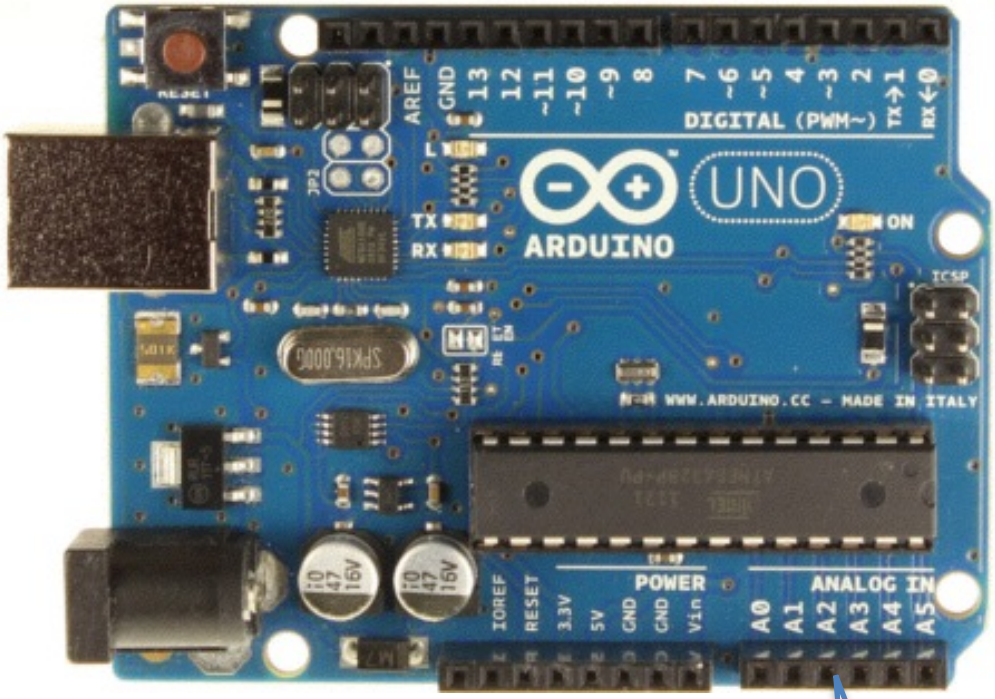

Entrate (Input) analogiche

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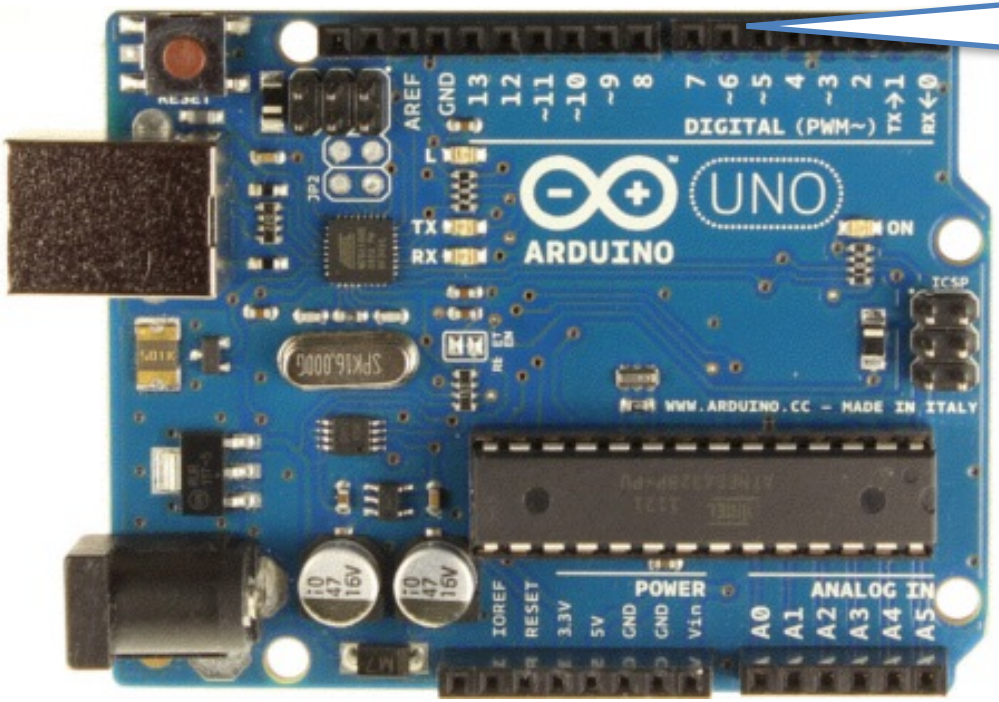

Entrate (Input) e uscite (Output) digitali

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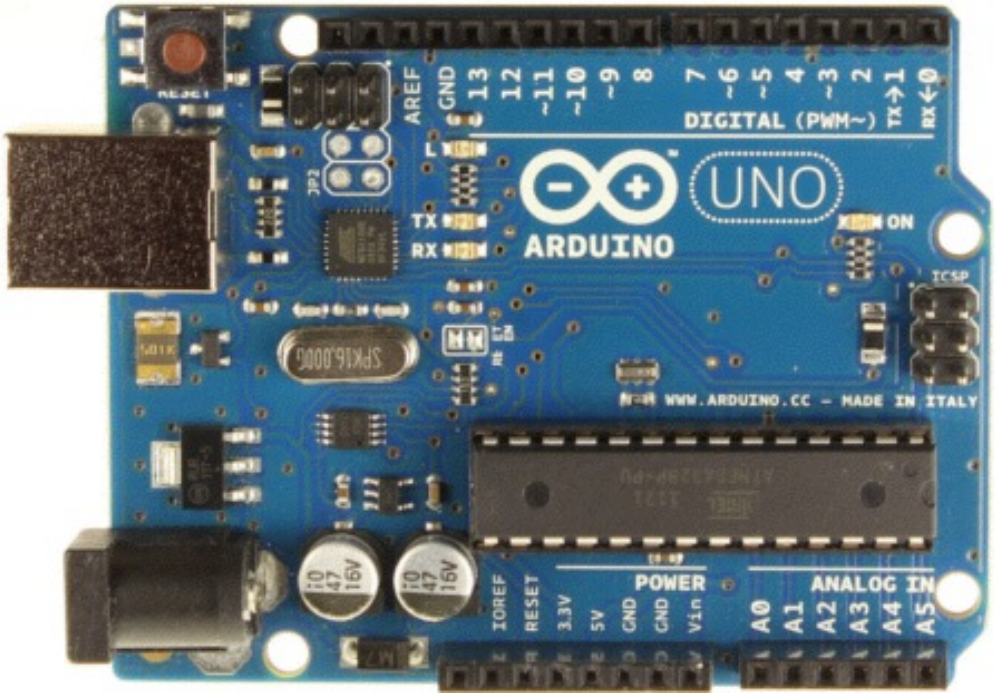
USB



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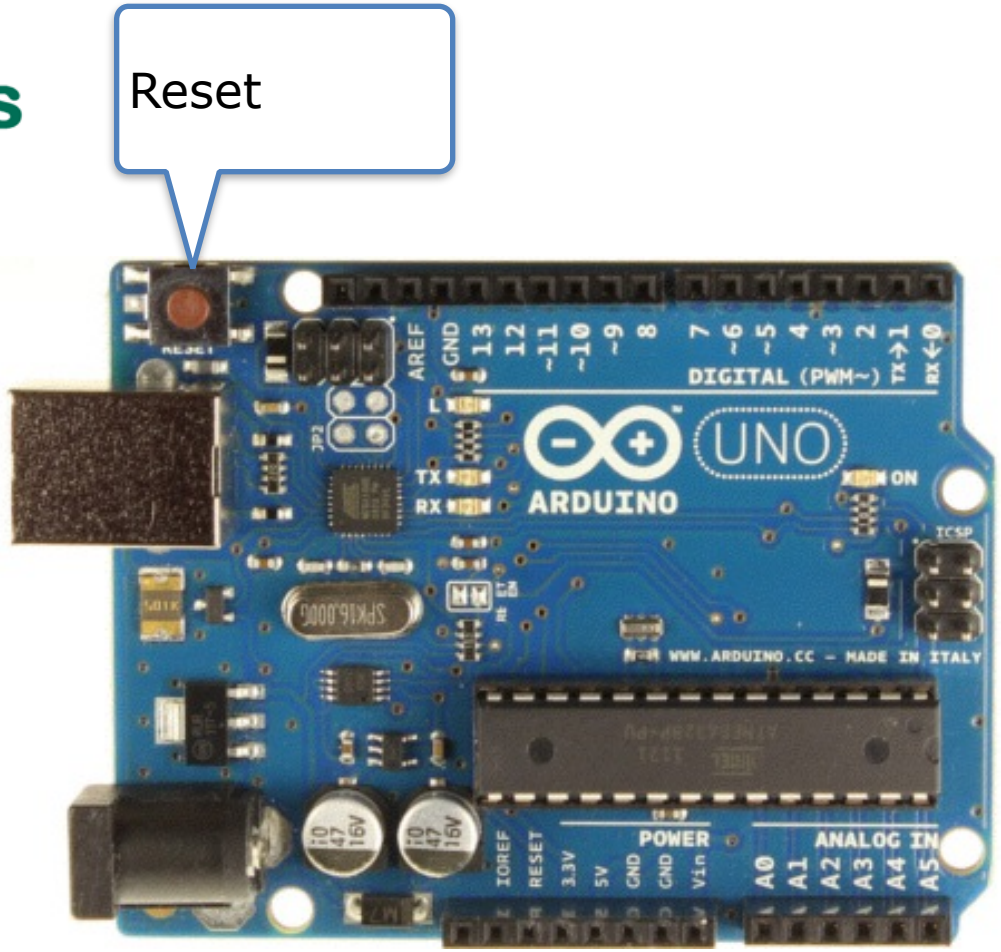
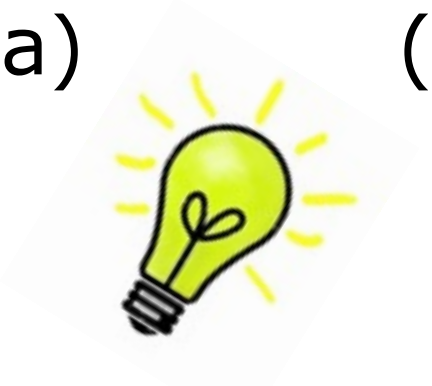

Reset
DIGITAL (PWM~)
UNO
ARDUINO
ON
ICSP
WWW.ARDUINO.CC – MADE IN ITALY
POWER
ANALOG IN

CC BY NC SA

+

+

Sensori (Input) + Software (Logica) + Attuatori (Output)



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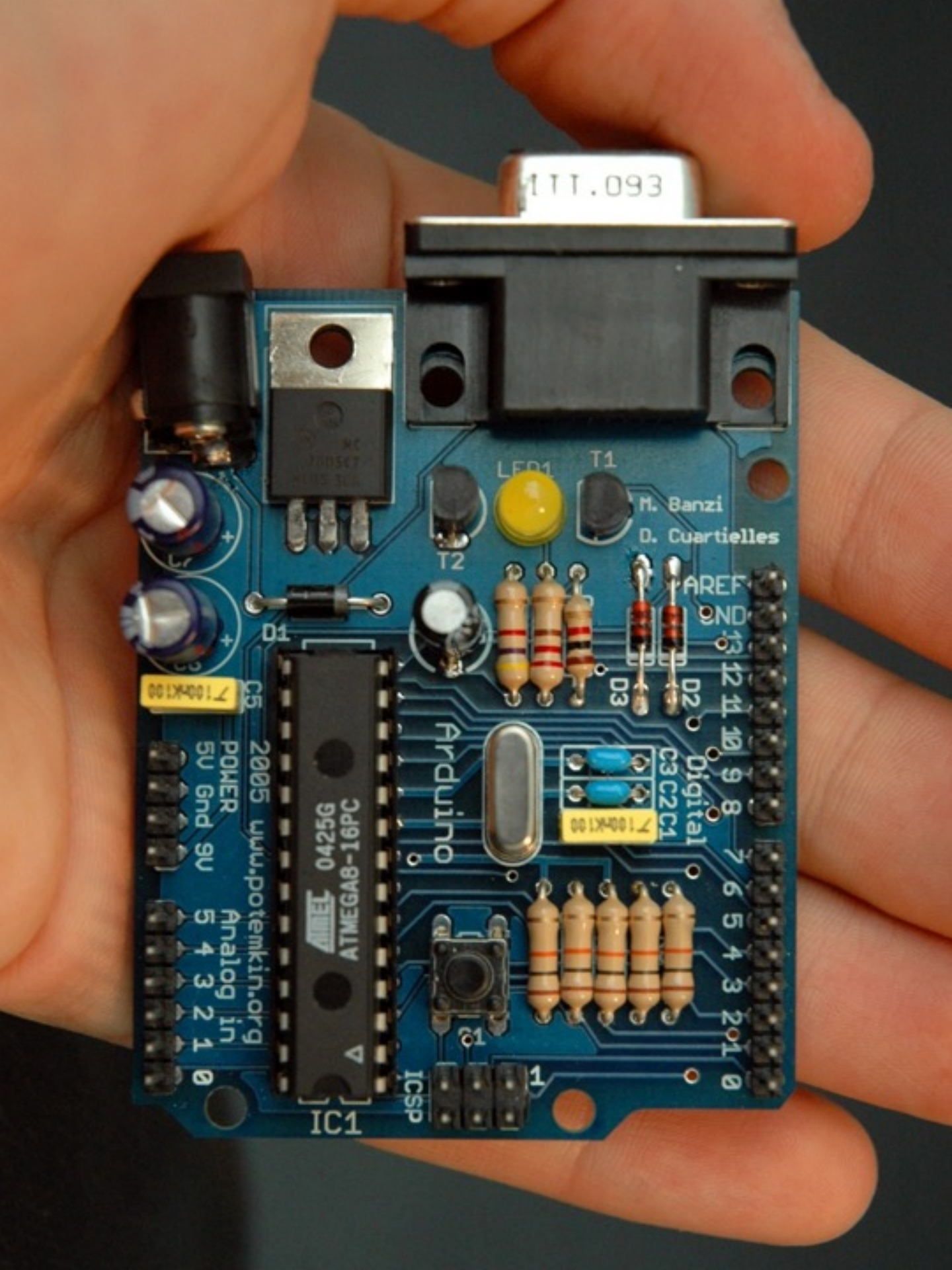
111.093
LED1
T1
T2
M. Banzi
D. Cuartielles
AREF
GND
13 12 11 10 9 8
7 6 5 4 3 2 1 0
D1
D2
D3
C5
C3 C2 C1
Arduino
2005 www.potemkin.org
POWER
5V Gnd 9V
Analog in
5 4 3 2 1 0
ATMEGA8-16PC
0425G
IC1
ICSP
1

1. **Cablaggio elettronico (hardware)**
2. Programmazione (software)
3. Trasferimento del software sull'Arduino e verifica del funzionamento

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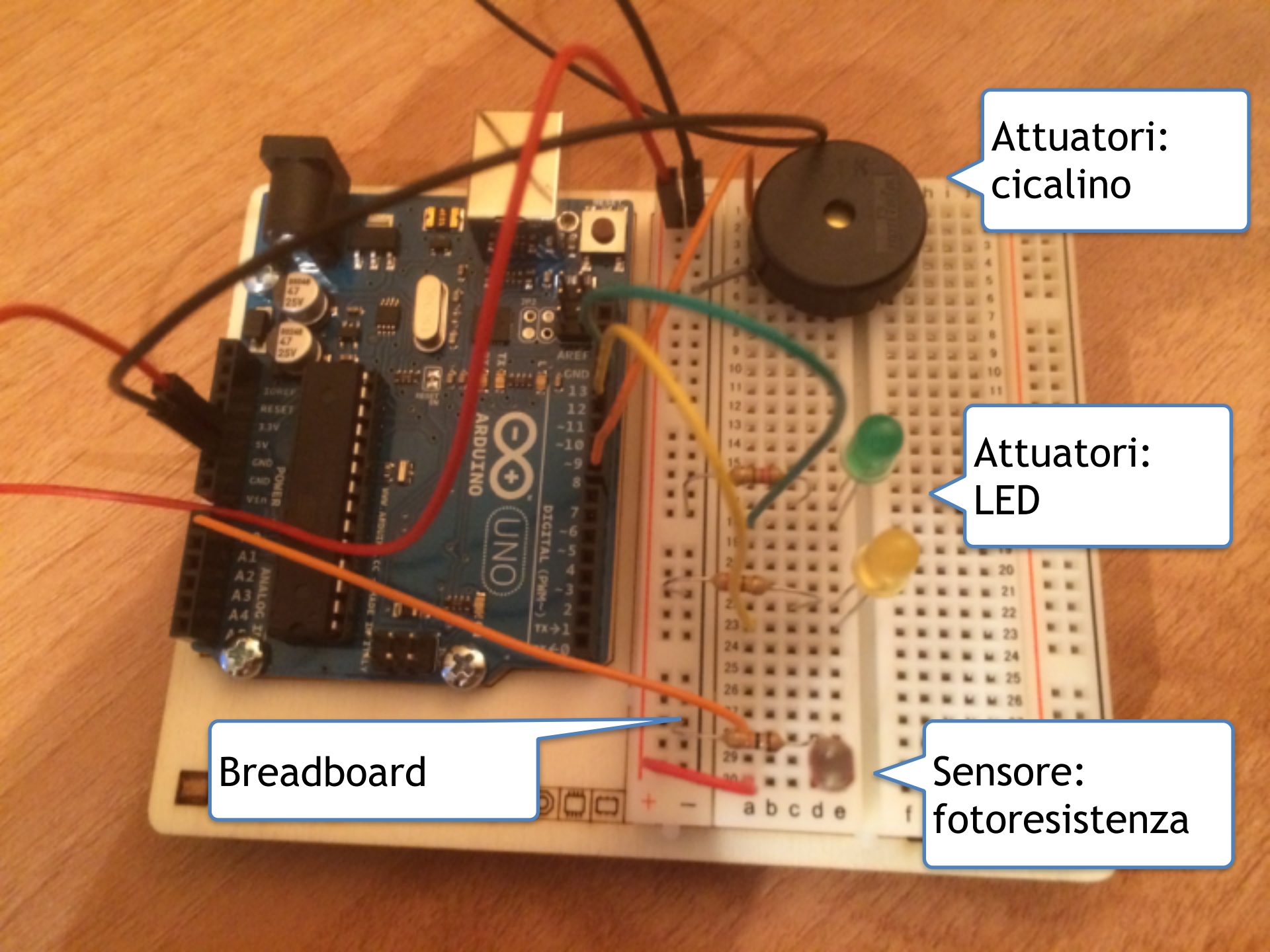
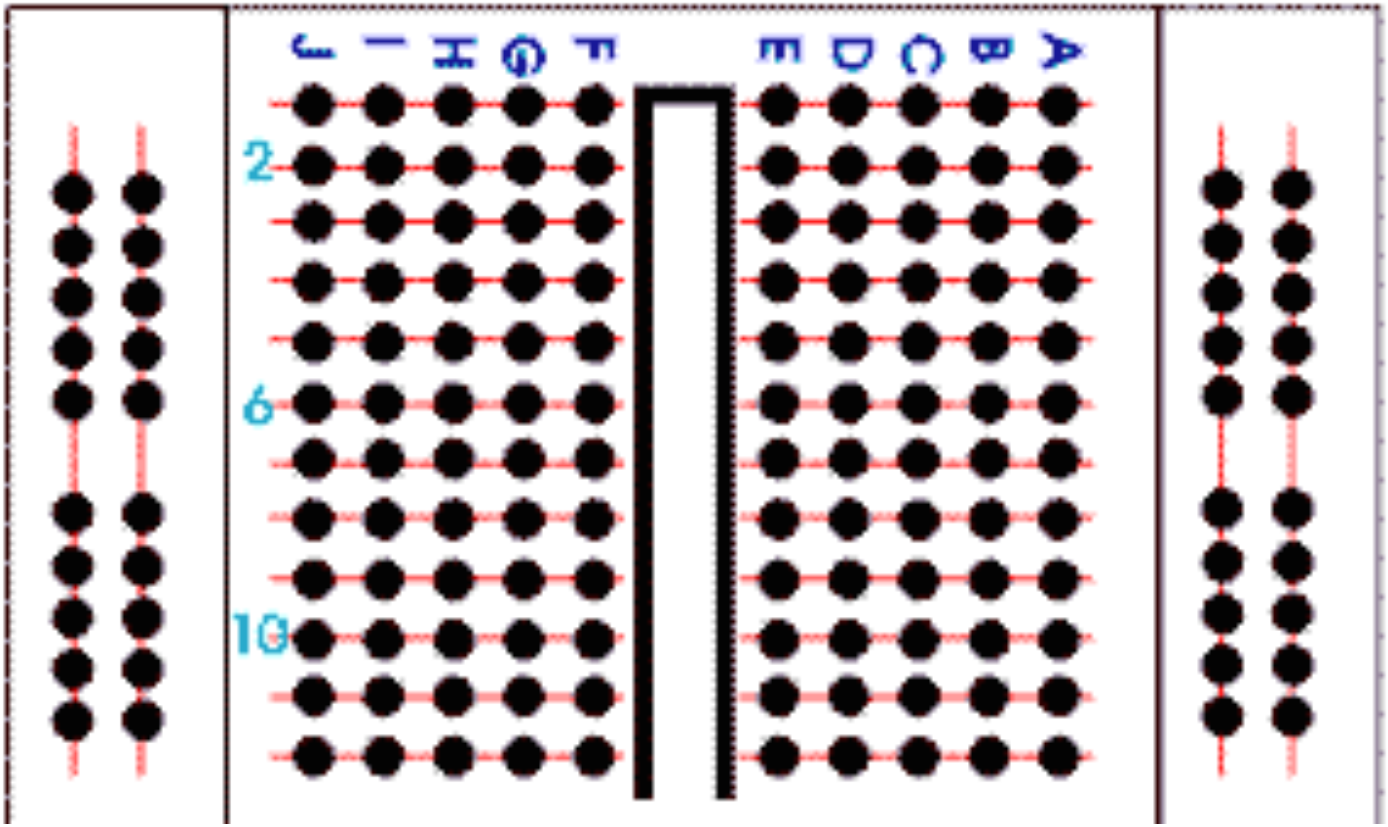

Attuatori:
cicalino
Attuatori:
LED
Breadboard
Sensore:
fotoresistenza



Breadboard

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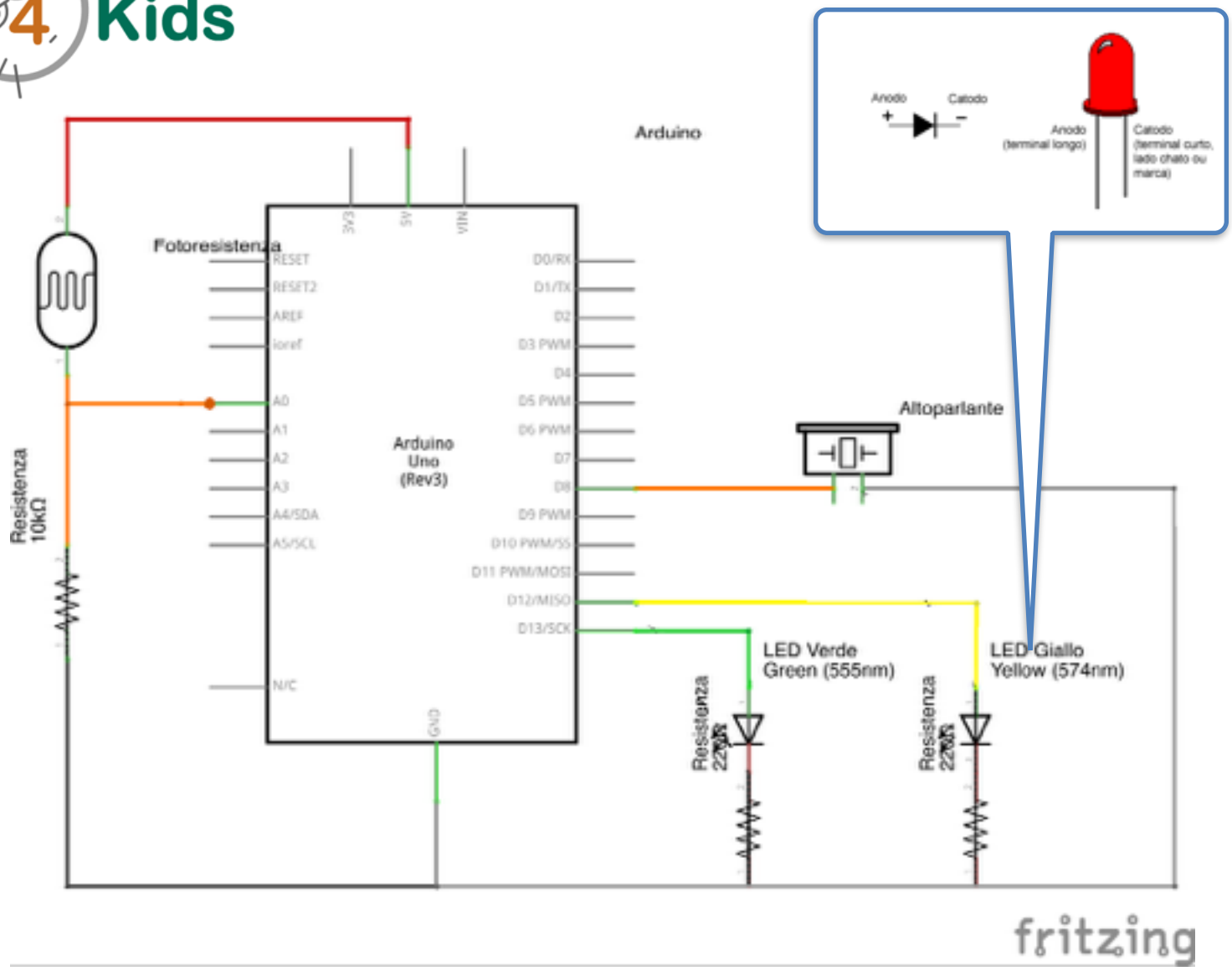
Arduino
Anodo
Catodo
Anodo (terminal longo)
Catodo (terminal curto, lado chato ou marca)
Fotoresistenza
Resistenza 10kΩ
Arduino Uno (Rev3)
Altoparlante
LED Verde Green (555nm)
LED Giallo Yellow (574nm)
Resistenza 220Ω
Resistenza 220Ω
fritzing

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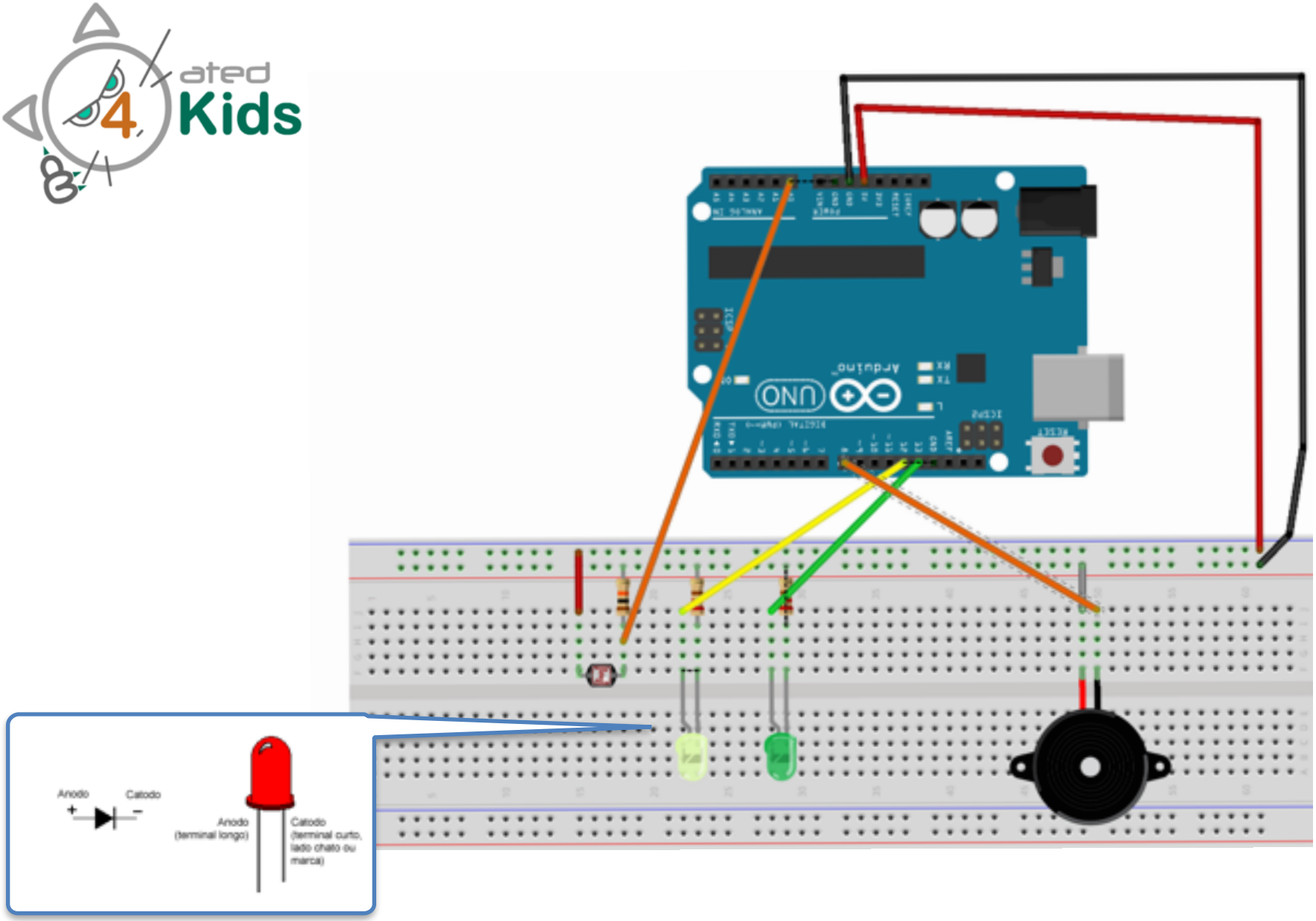
Anodo
Catodo
Anodo
(terminal longo)
Catodo
(terminal curto,
lado chato ou
marca)

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1. Cablaggio elettronico (hardware)

2. Programmazione (software)

3. Trasferimento del software sull'Arduino e verifica del funzionamento

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```
void setup() {
  // Inizio della calibrazione, avvisa con i LED
  pinMode(PIN_LED_VERDE, OUTPUT);
  digitalWrite(PIN_LED_VERDE, LOW);
  pinMode(PIN_LED_GIALLO, OUTPUT);
  digitalWrite(PIN_LED_GIALLO, HIGH);
  // calibra per i primi 5 secondi....
  while (millis() < 5000) {
    // registra valore massimo del sensore
    valoreSensore = analogRead(A0);
    if (valoreSensore > valoreAltoDelSensore) {
      valoreAltoDelSensore = valoreSensore;
    }
    // registra valore minimo del sensore
    if (valoreSensore < valoreBassoDelSensore) {
      valoreBassoDelSensore = valoreSensore;
    }
  }
  // calibrazione terminata...
  digitalWrite(PIN_LED_GIALLO, LOW);
  digitalWrite(PIN_LED_VERDE, HIGH);
}
```


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```
void loop() {
  //Leggi il valore del sensore
  valoreSensore = analogRead(A0);

  //spegni il suono se il valore letto e'
  //vicino al valore minimo o massimo
  if(siTrovaInUnIntervalloAccettabile(valoreSensore)) {
        // mappa il valore letto
        int x = map(valoreSensore, valoreBassoDelSensore,
            valoreAltoDelSensore, 50, 4000);
        // emetti un suono per 20 ms, PIN 8
        tone(8, x, 20);
  }

  // aspetta un momento
  delay(10);
}
```


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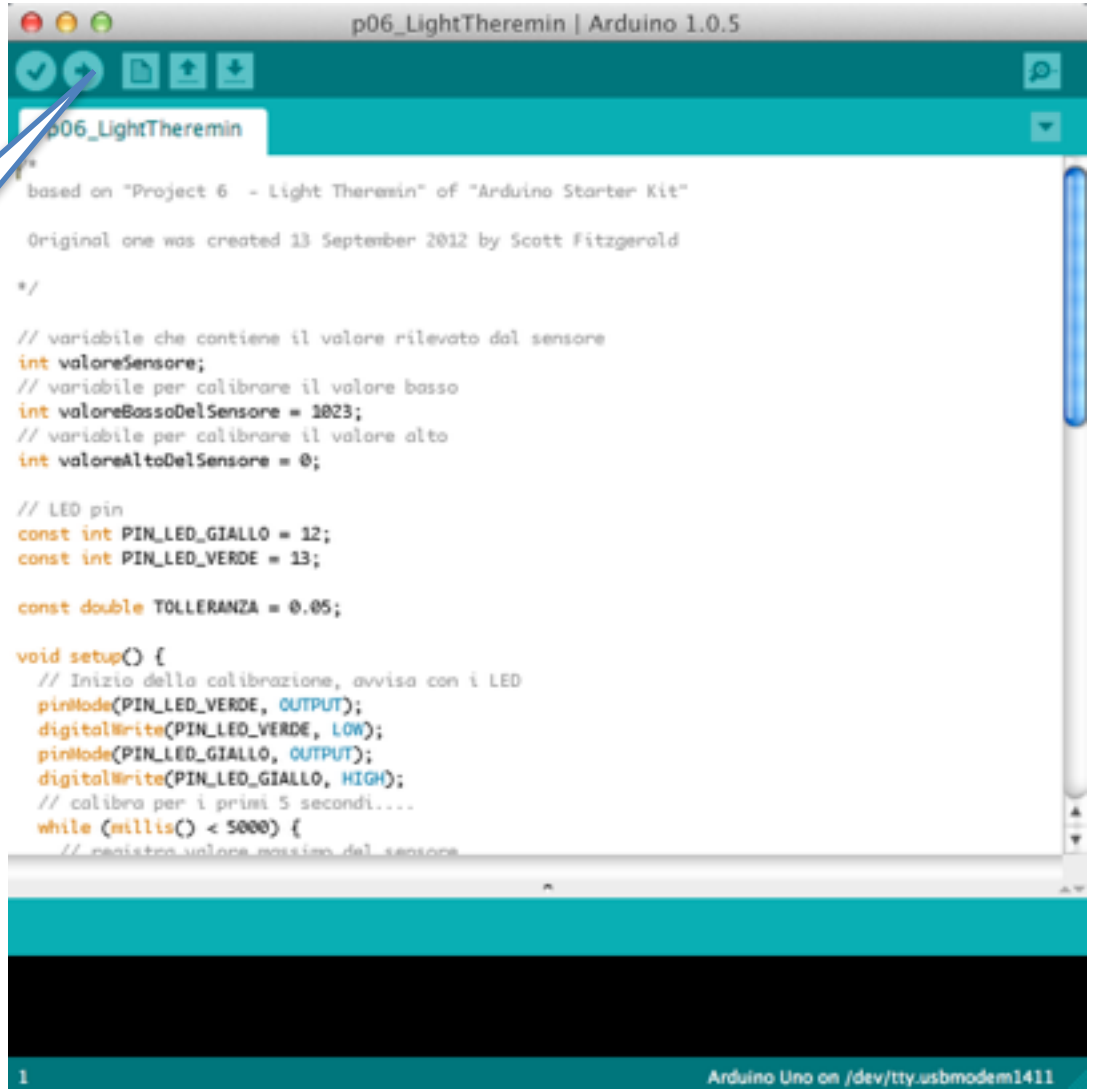
1. Cablaggio elettronico (hardware)

2. Programmazione (software)

3. **Trasferimento del software sull'Arduino e verifica del funzionamento**

Verifica e carica il software su Arduino tramite USB



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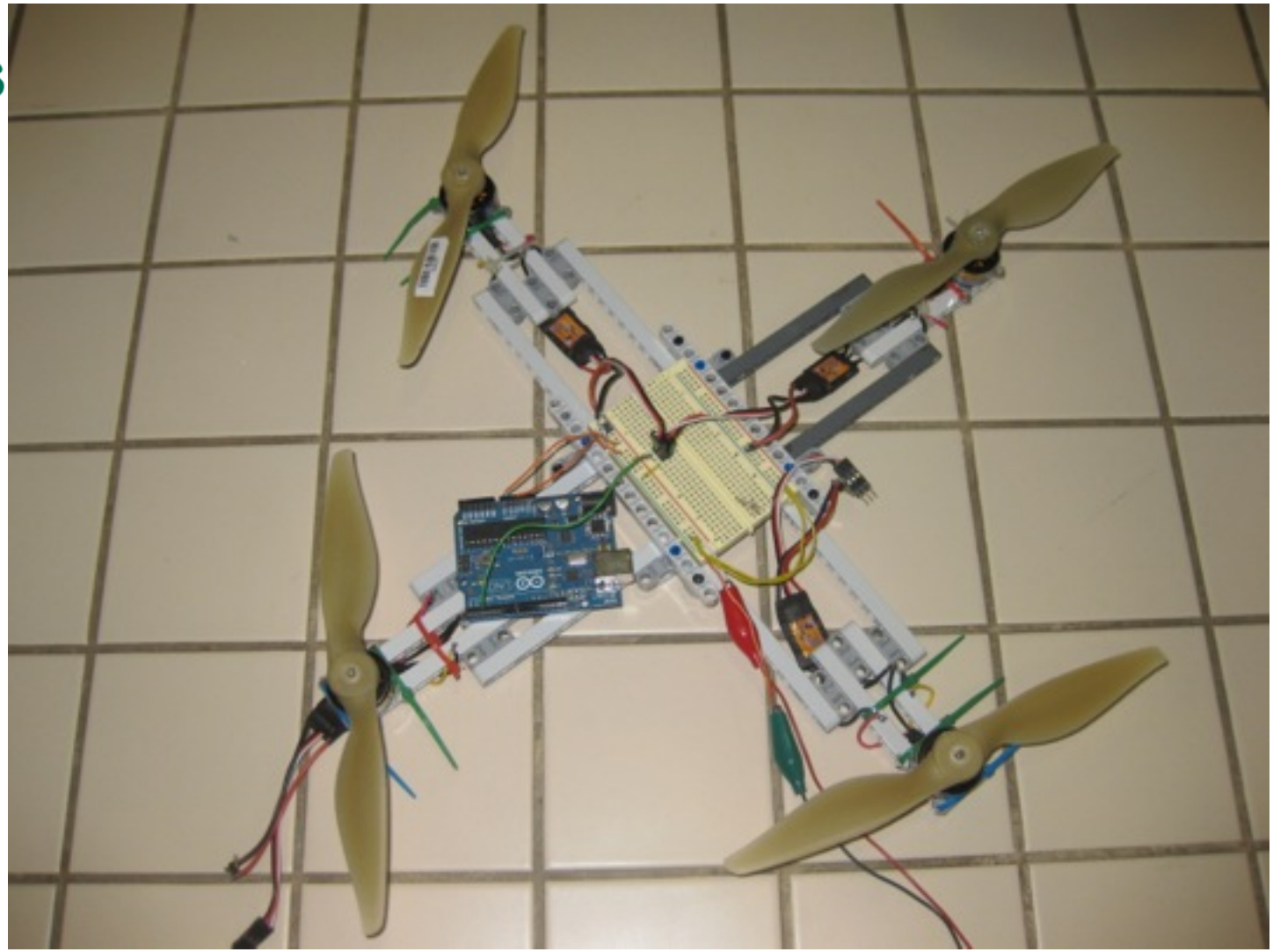

http://dexterindustries.com/blog/2012/03/02/quadrotor-lego-and-arduino/

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http://arduino.cc

http://fablab.supsi.ch/

http://fritzing.org

http://s4a.cat (Scratch per Arduino)