

HLCS



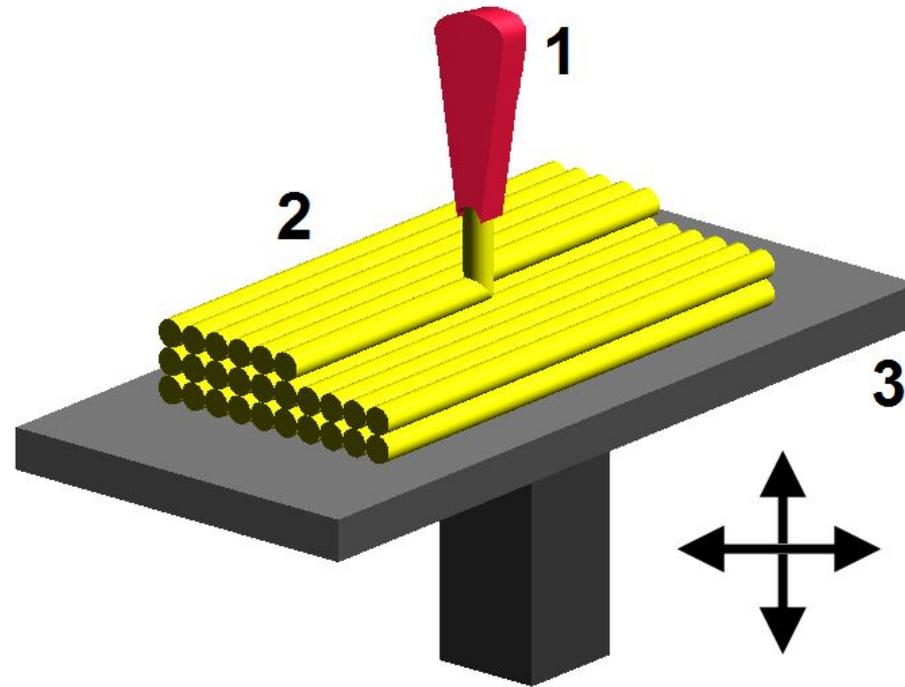
HACKLAB COSENZA

CENTRO DI RICERCA SU
TECNOLOGIA ED INNOVAZIONE

ASSOCIAZIONE CULTURALE HACKLAB COSENZA

**Prototipazione rapida e
stampa 3D con hardware e
software open source**

Estrusione (FDM - FFF)



Sistema di progettazione e sperimentazione di prototipi a basso costo

Sistema layer su layer

Decadenza dei brevetti e open source hw/sw

Progetto Reprap

Replicating **R**apid **P**rototyper

Progetto completamente open source

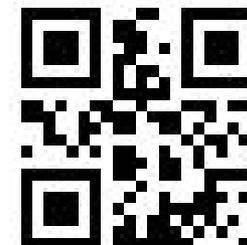
<http://www.nextdayreprap.co.uk/>

Community

<http://reprap.org/>

<http://reprap.org/wiki/RepRap/it>

<http://forums.reprap.org/>



Reprap Prusa 3D P

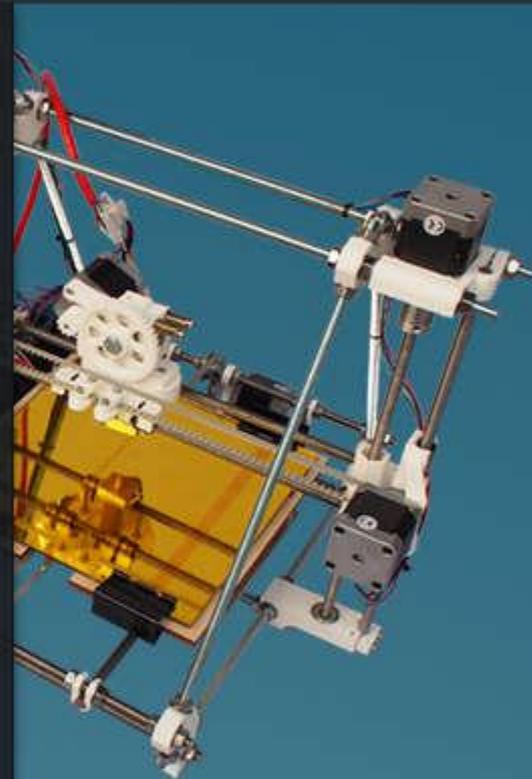
RAMPS 1.4 Elec
LM8UU Bearing
Machined Coupl
Laser Cut Build
XLAluminum Pu

Special Intro
Only £499



Prusa Mendel Build Manual Contents

- 1.0 Bill of Materials – Prusa Mendel Build Manual
- 2.0 Frame Assembly – Reprap Prusa Mendel Build Manual
- 3.0 Y Axis Assembly – Reprap Prusa Mendel Build Manual
- 4.0 X and Z Axis Assembly – Reprap Prusa Mendel Build Manual
- 5.0 Y Carriage Assembly – Reprap Prusa Mendel Build Manual
- 6.0 Motor, Belt and End Stop Assembly – Reprap Prusa Mendel Build Manual
- 7.0 Build & Heated Bed Assembly – Reprap Prusa Mendel 3D Printer Build Manual
- 8.0 Extruder and Hot End Assembly – Reprap Prusa Mendel Build Manual
- 9.0 Wiring – Reprap Prusa Mendel Build Manual
- 10.0 Computer Setup – Reprap Prusa Mendel Build Manual
- 10.1 Arduino Driver Installation – Reprap Prusa Mendel Build Manual
- 10.2 Arduino Development Environment Installation
- 10.3 Python Environment Installation – Reprap Prusa Mendel Computer Setup
- 10.4 Pronterface Installation – Reprap Prusa Mendel Computer Setup
- 10.5 Skeinforge Installation – Reprap Prusa Mendel Computer Setup Instructions
- 10.6 Software Testing – Reprap Prusa Mendel Computer Setup Instructions
- 10.7 Firmware Installation – Reprap Prusa Mendel Computer Instructions
- 10.7.3. Reprap Sprinter Firmware Variables – Reprap Prusa Mendel Computer Instructions
- 11.0 Commissioning – Reprap Prusa Mendel Build Manual
- 12.0 Maintenance of your Reprap Prusa Mendel 3D Printer
 - Hot End Maintenance – Removing Filament – Re Mounting – De Globbing



Customisable

It's a "Reprap", supports additional extruders, Bluetooth, SD Cards, Fans and more....



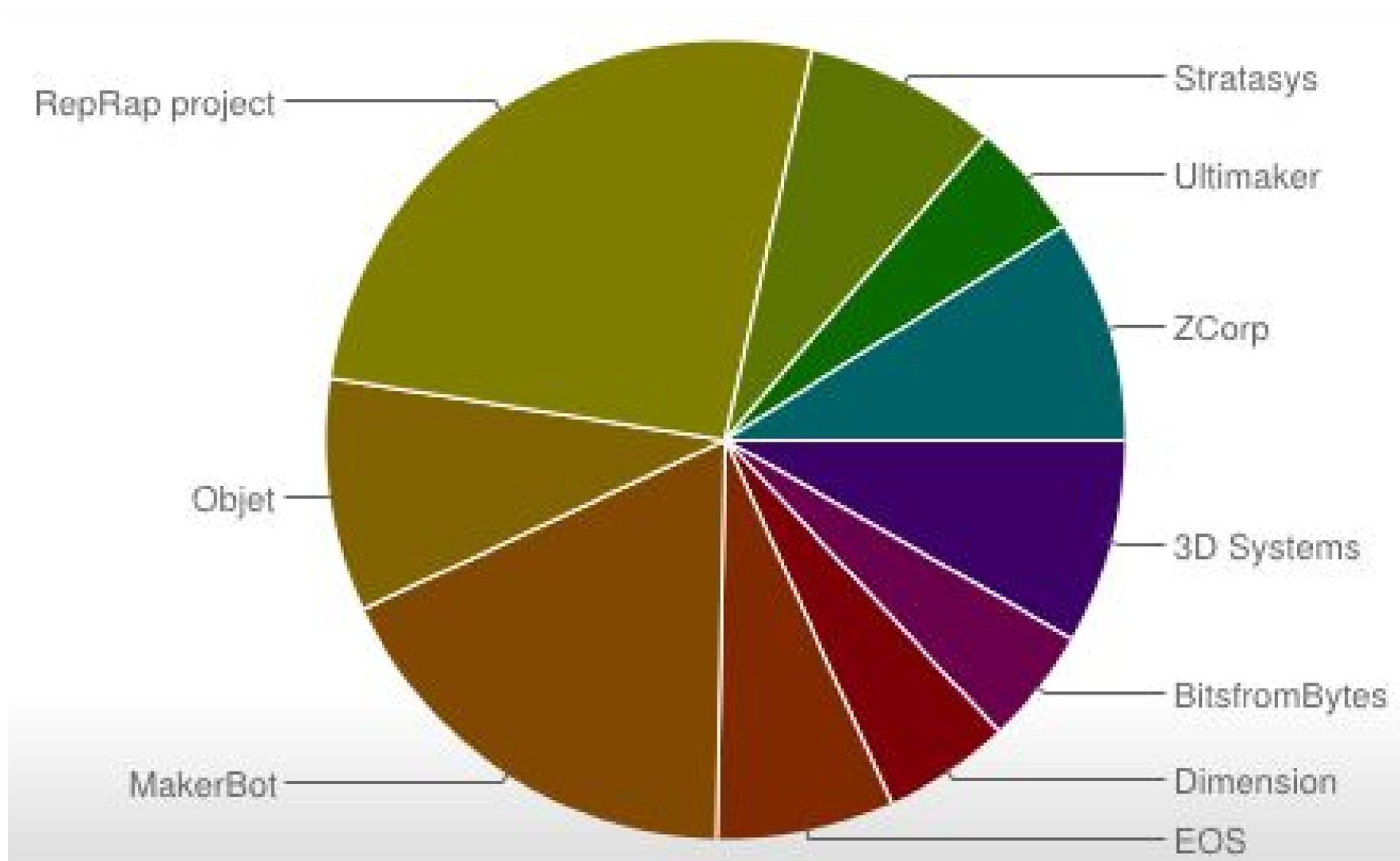
Ready to Start 3D Printing?

The fastest, easiest, and best value Prusa Mendel !

Buy Now!

Panoramica mondo Stampanti 3D

Which printers (which manufacturer) have you used?



Materiali Utilizzati

ABS - Acrilonitrile-butadiene-stirene

Comune polimero termoplastico (copolimero) derivato dallo stirene polimerizzato insieme all'acrilonitrile in presenza di polibutadiene, e perciò può essere definito come terpolimero.

Derivazione idrocarburi

Bisogna stampare con box e aspiratore dei fumi

PLA - acido polilattico, o più correttamente il **poli(acido lattico)** o polilattato, è il polimero dell'acido lattico.

Separazione dell'amido da fibre e glutine

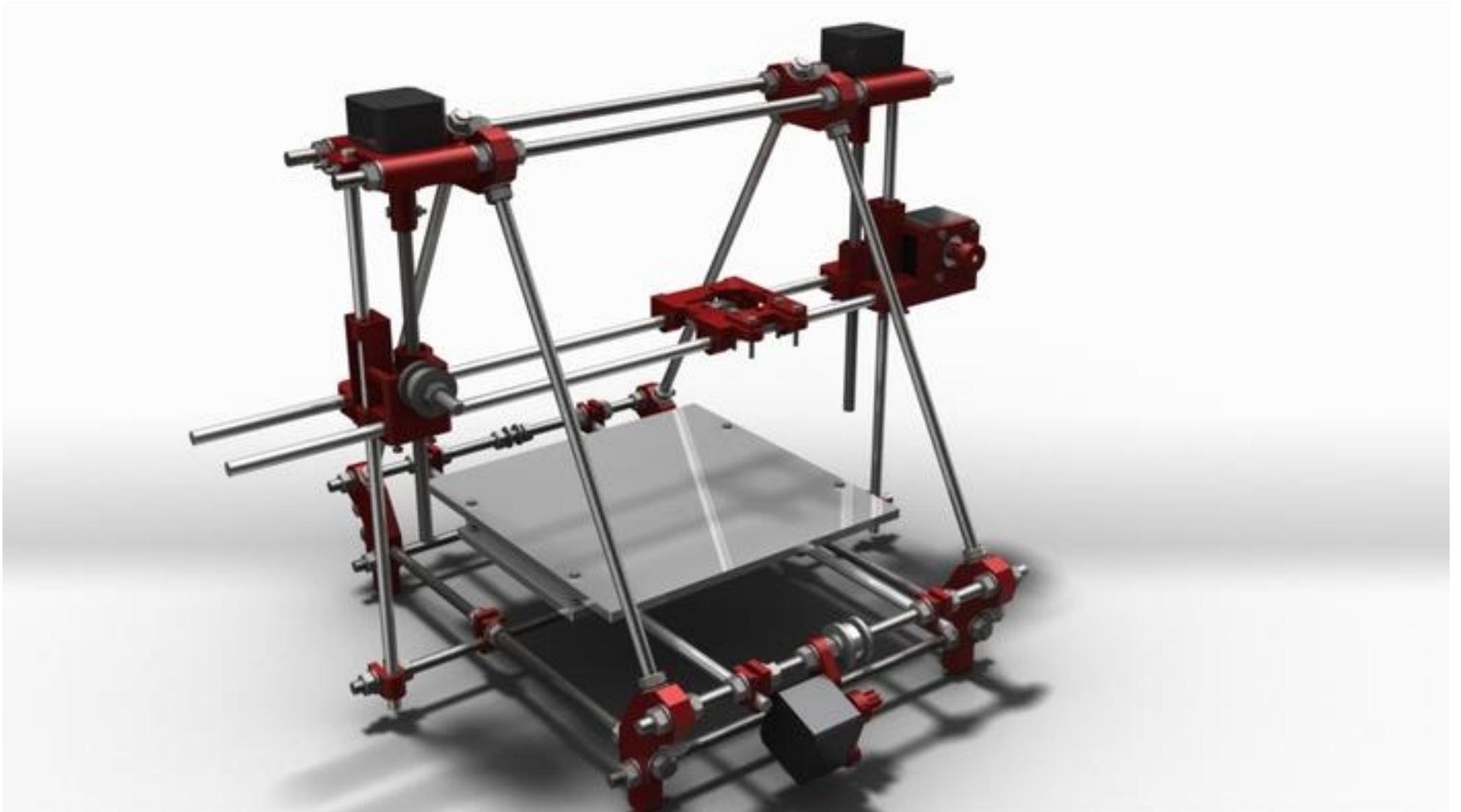
La fermentazione industriale avviene grazie a un batterio del genere *lactobacillus*.

Come materie prime si usano zucchero, melasse e siero di latte.

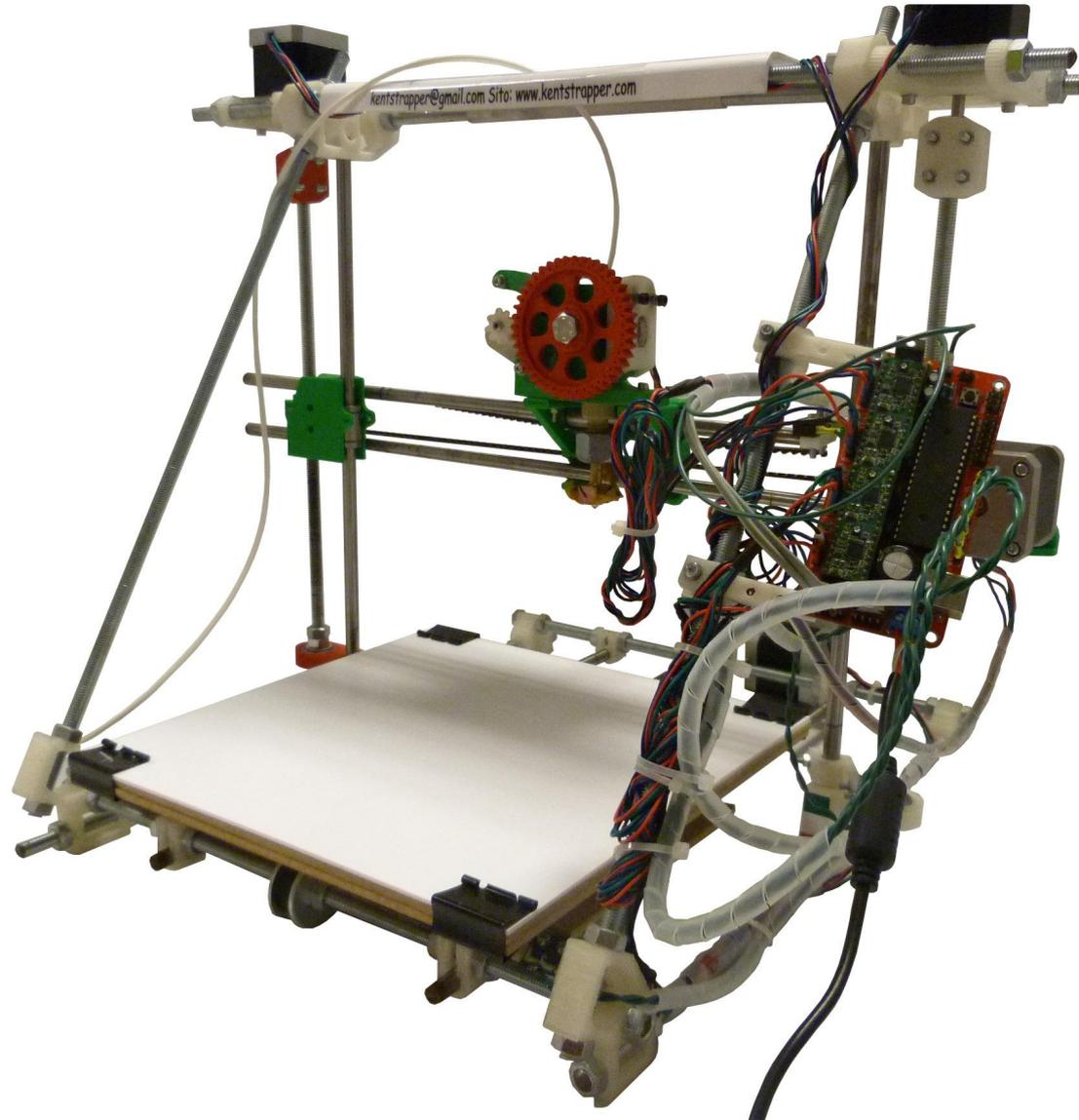
In alternativa viene utilizzato *Bacillus coagulans*.

Biodegradabile

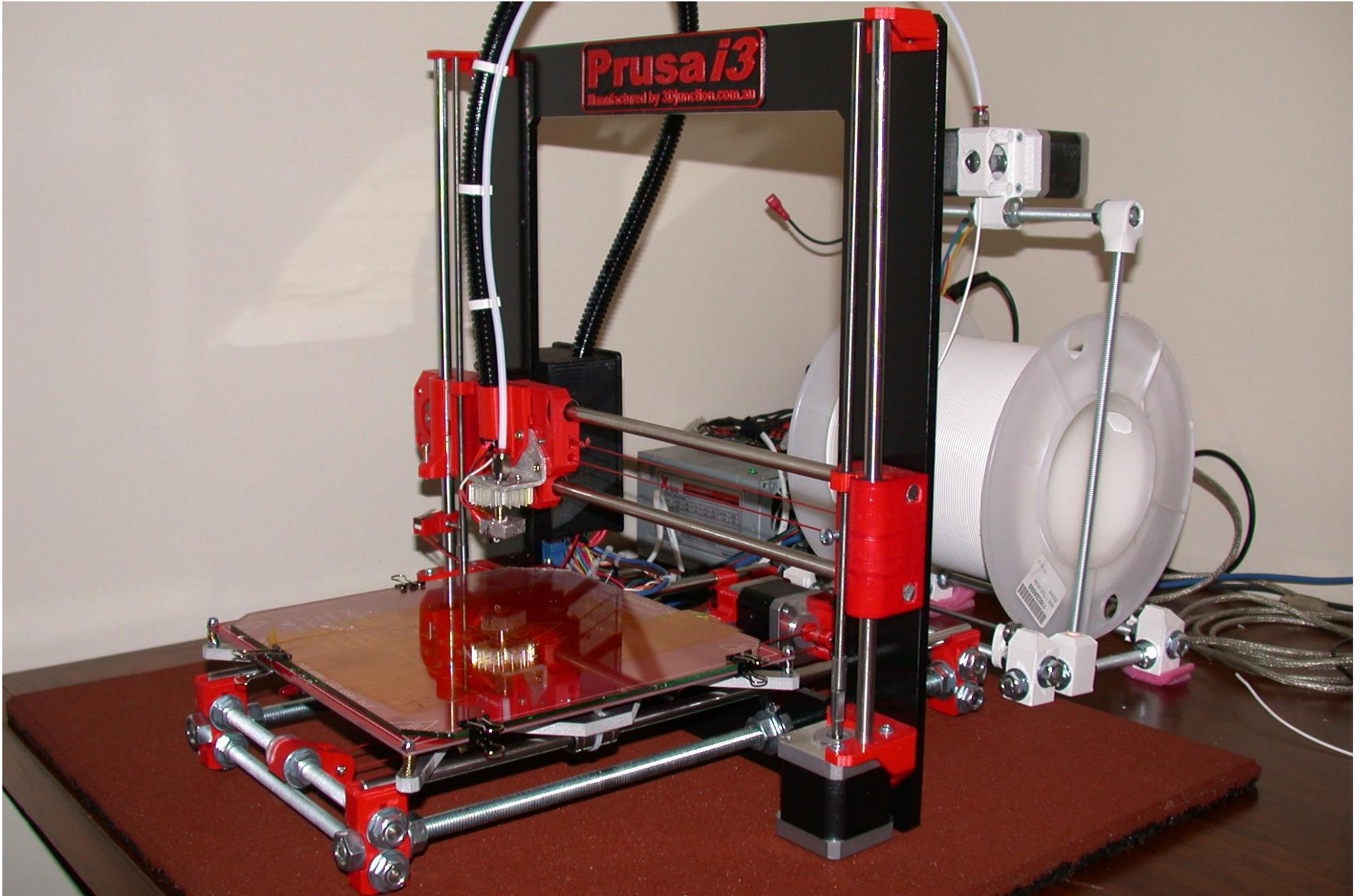
Reprap - Prusa I2



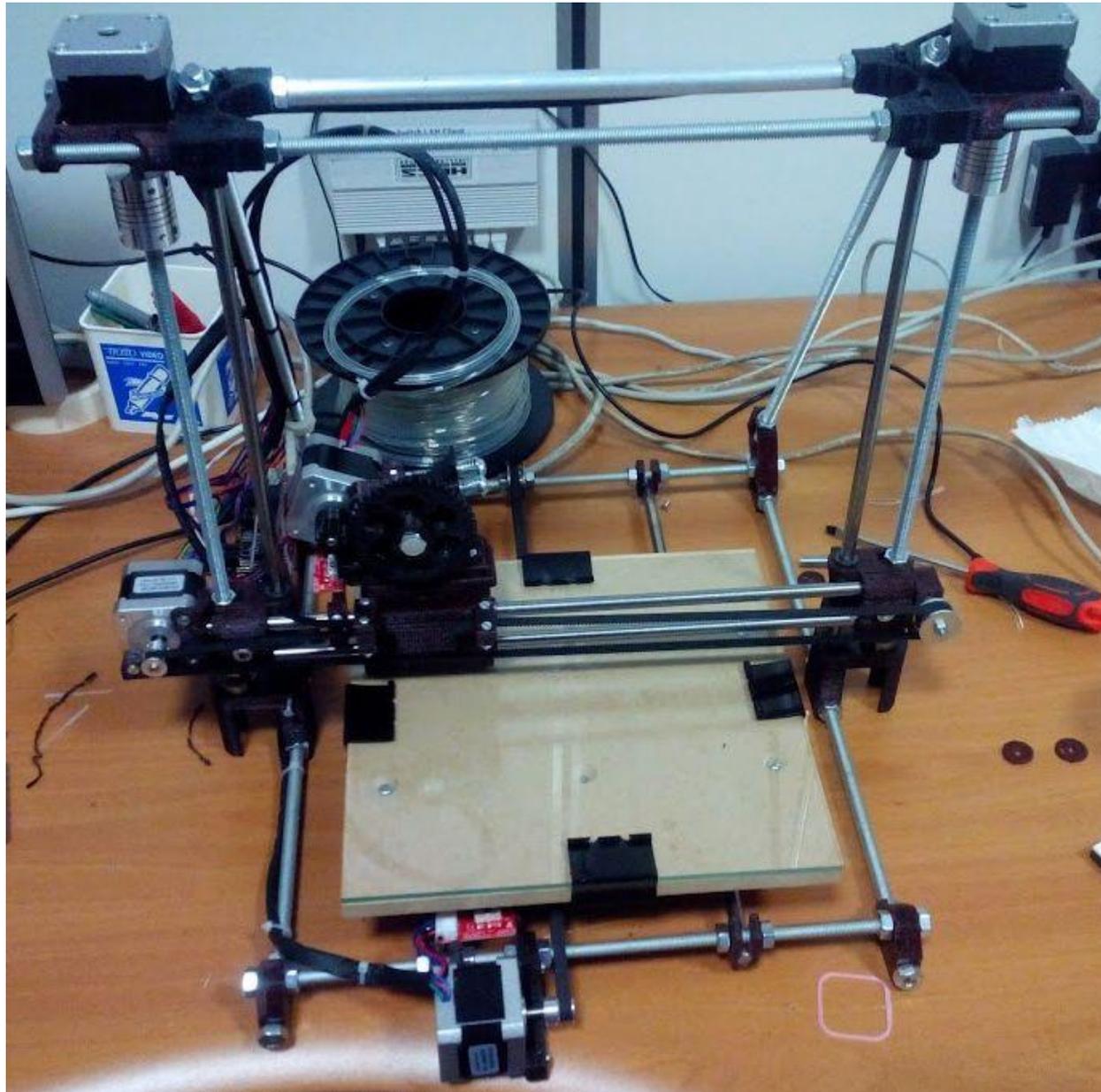
Kentstrapper - Galileo Next



Reprap - Prusa i3

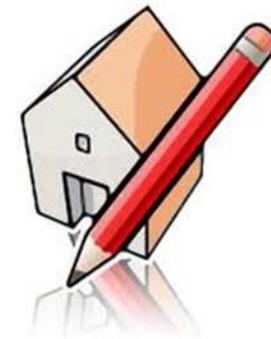
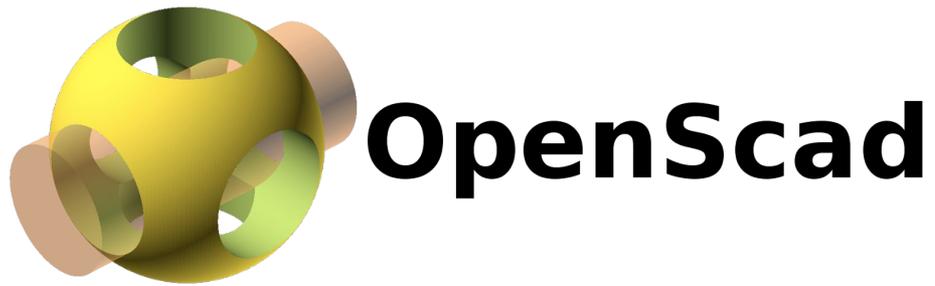


Hacklab - Pitagora (fork Galileo next)

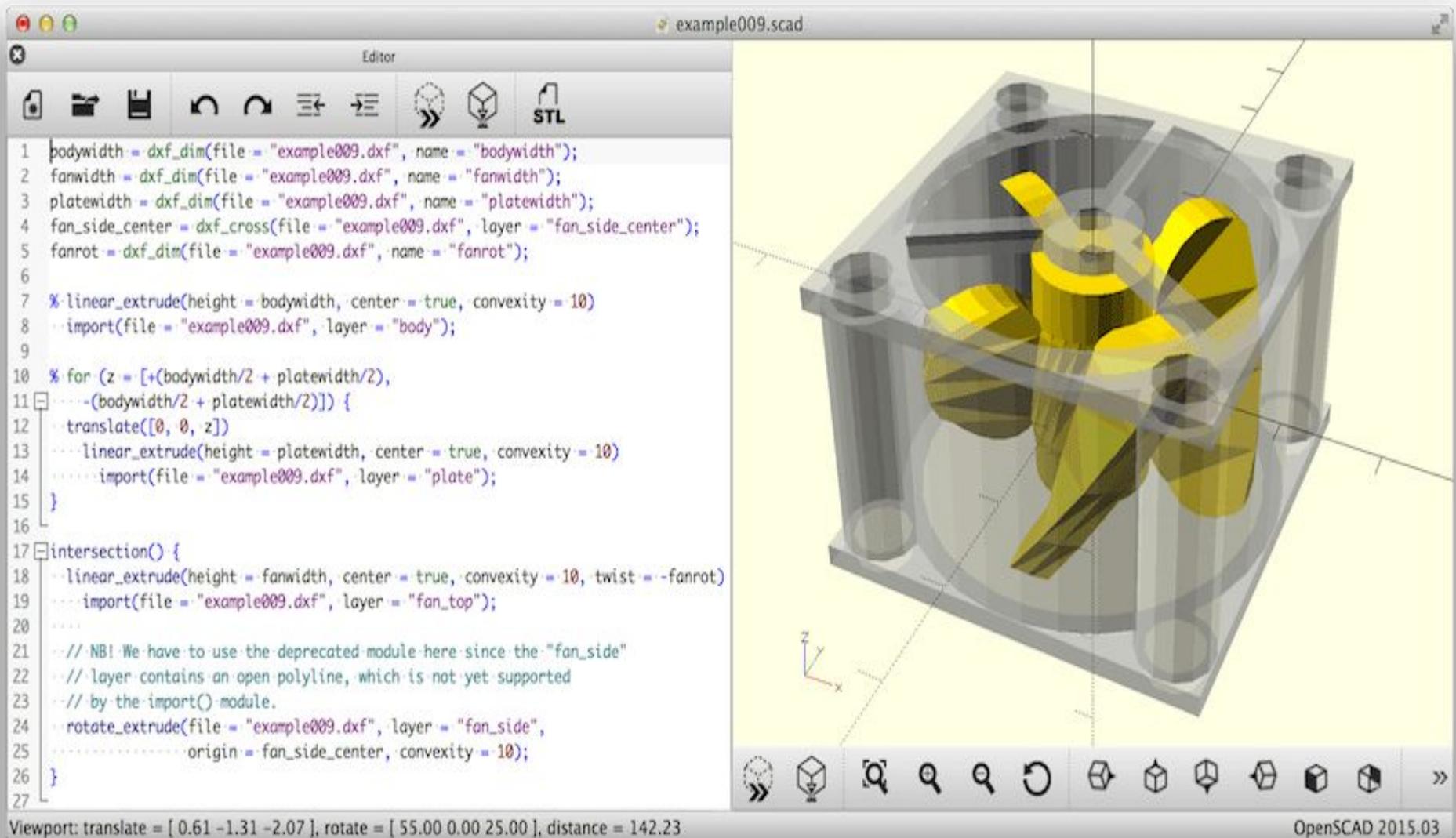


Modellazione 3D

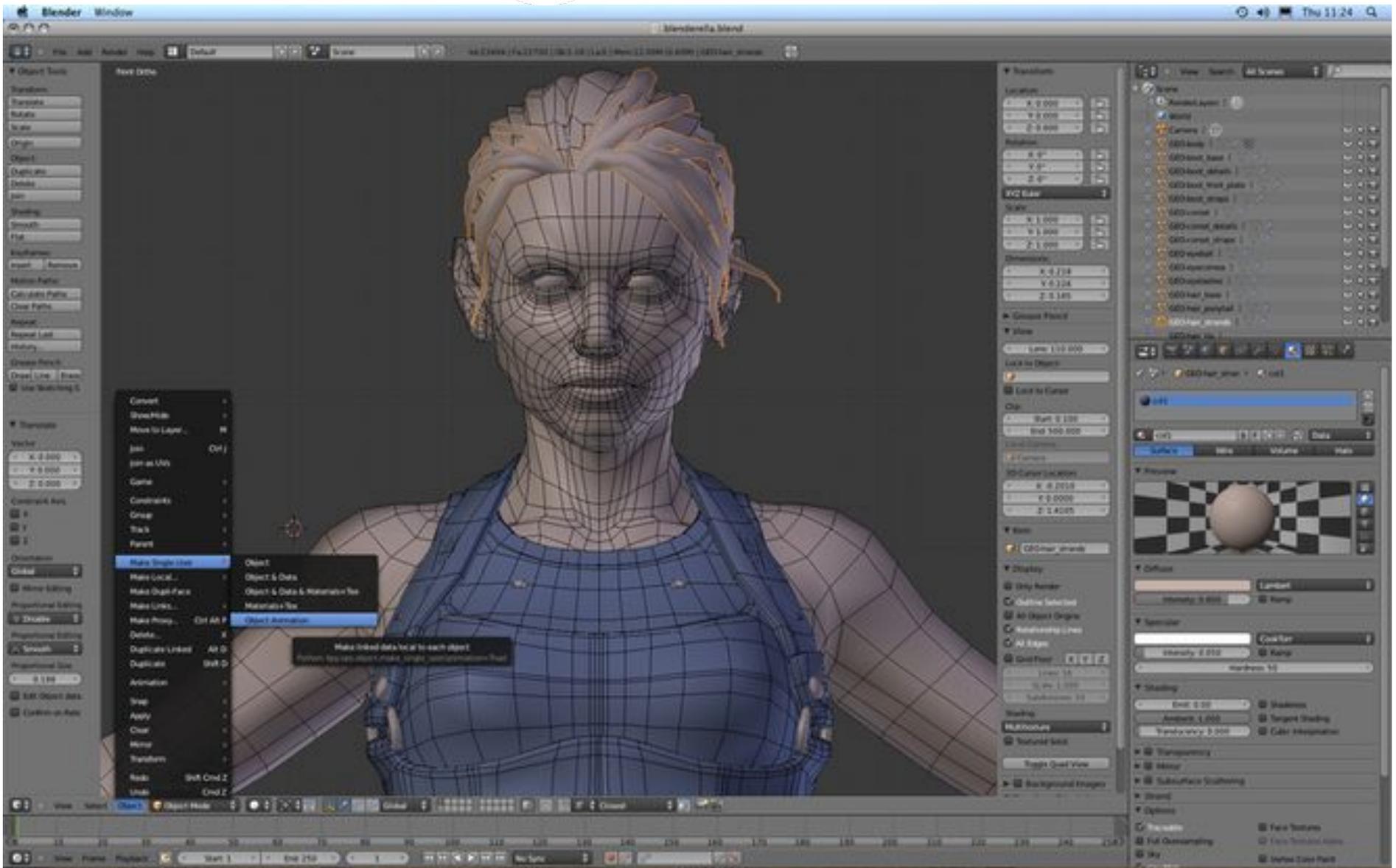
Open Source



Openscad



<http://www.openscad.org/>



<http://www.blender.org/>
<http://www.blenderlab.org/>

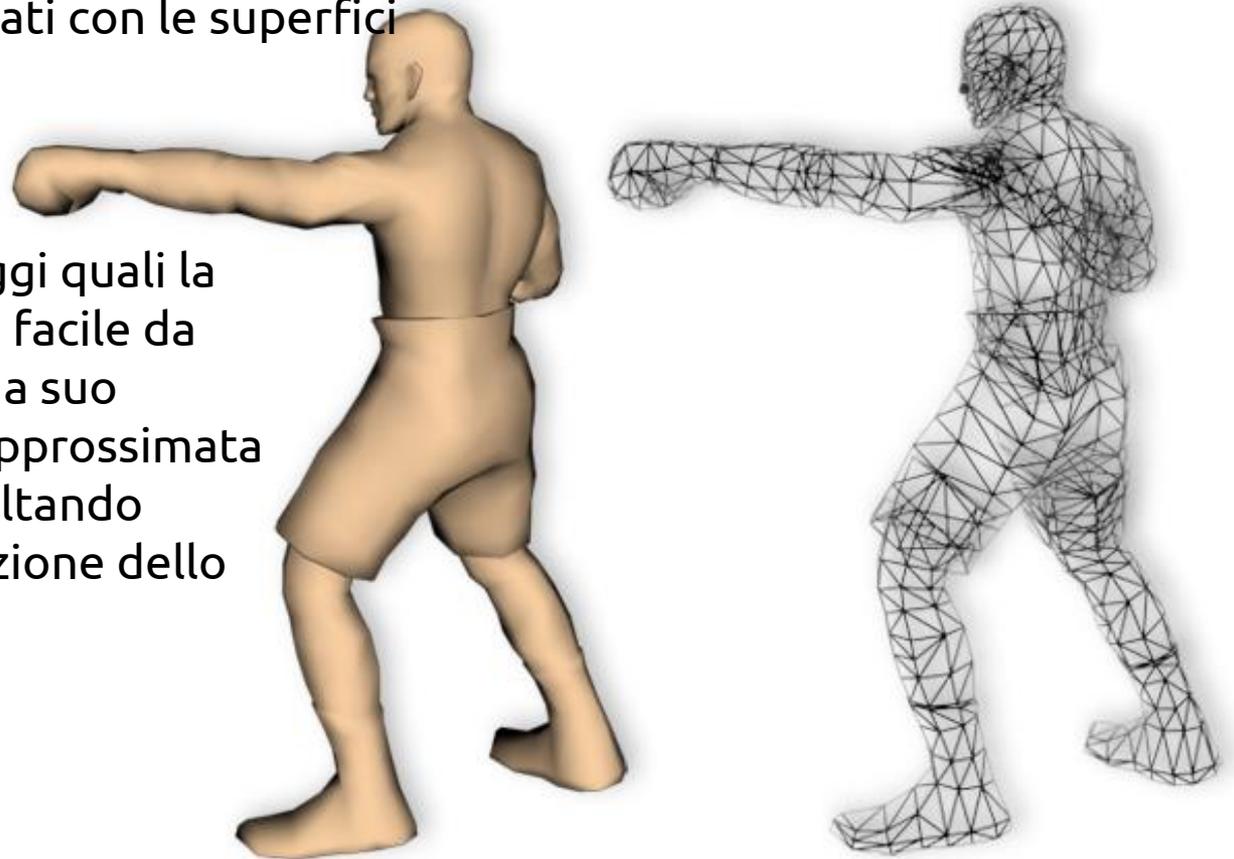
Formato file STL (Stereo Lithography Interface Format o Standard Triangulation Language)

E' un formato di file, binario o ASCII, nato per i software di stereolitografia CAD.

E' utilizzato nella prototipazione rapida (rapid prototyping) attraverso software CAD.

Questa estensione di file consente l'importazione e l'esportazione di solidi rappresentati con le superfici discretizzate in triangoli.

Il formato STL presenta dei vantaggi quali la semplicità, in quanto risulta molto facile da generare e da processare, mentre a suo sfavore presenta una geometria approssimata e la sua struttura dati, che pur risultando semplice, può presentare la ripetizione dello stesso vertice più volte.



Formato file Obj (Object)

E' il formato di file più compatibile, assieme a COLLADA.

Sviluppato dalla Wavefront Technologies.

Supporta la geometria di ogni volume o superficie indipendentemente che questi siano oggetti primitivi, poligonali.

COLLADA (Collaborative Design Activity)

E' il formato di file per l'interscambio di dati più compatibile e versatile in quanto non è nativo di uno specifico software di modellazione.

Creato in origine dalla Sony Computer Entertainment in formato XML, è oggi prodotto dalla Khronos Group.

Importa ed esporta scene con qualsiasi geometria di oggetti, texture, luci e telecamere.

Repetier - host

The screenshot displays the Repetier-Host V0.95F software interface. The main window shows a 3D visualization of a Yoda figurine (Yoda_Standing_Bank_v5.stl) in a blue environment. The interface includes a menu bar (File, Visuale, Configurazione, Temperatura, Stampante, Strumenti, Aiuto) and a toolbar with icons for connecting, loading, saving, and running. The right sidebar contains a 'Posizione oggetto' panel with a table of object properties, a 'Traslazione' (Translation) panel with X, Y, and Z coordinates, a 'Scala' (Scale) panel with X, Y, and Z scale factors, and an 'Object Analysis' panel with a table of object statistics. The bottom status bar shows 'Mostra in Log:' with buttons for Comandi, Info, Avvisi, Errori, ACK, Auto scorrimento, Resetta Log, and Copia.

Repetier-Host V0.95F - ListViewItem: Yoda_Standing_Bank_v5.stl

File Visuale Configurazione Temperatura Stampante Strumenti Aiuto

Connetti Carica Salva lavoro Avvia lavoro Ferma lavoro SD Card Mostra-nascondi Loo Mostra filamento Mostra percorso

Impostazioni stampante STOP!!!

Visualizzazione 3D | Curva Temperatura

Posizione oggetto | Slicer | G-Code Editor | Controllo manuale

Name	Mesh	Colli...
Yoda_Standing_Bank_v5.stl	✗	✓

Traslazione X 134.22 Y 141.9361 Z 0

Scala X 1 Y 1 Z 1

Ruota X 0 Y 0 Z 0

Object Analysis

Deep Analysis Original - Modified

Modificato:	No
Multipli:	No
Triangoli incrociati:	Non testato
Normali:	Non Orientato
N° Giri bordi:	64
Bordi altamente connessi:	2
Punti:	9217
Bordi:	27686
Facce:	18437
Shells:	2

Taglia oggetti

Posizione

Mostra in Log: Comandi Info Avvisi Errori ACK Auto scorrimento Resetta Log Copia

Repetier-Host V0.95F - ListViewItem: Yoda_Standing_Bank_v5.stl

File Visuale Configurazione Temperatura Stampante Strumenti Aiuto

Connetti Carica Salva lavoro Avvia lavoro Ferma lavoro SD Card Mostra-nascondi Loog Mostra filamento Mostra percorso

Impostazioni stampante STOP!!!

Visualizzazione 3D | Curva Temperatura

Posizione oggetto Slicer G-Code Editor Controllo manuale

Slice con slic3r

Ferma Slicing

Slicer: slic3r Manager

Configure

Impostazioni stampa: Simple Mode

Impostazioni stampante: Simple Mode

Filament settings:

Estrusore 1: Simple Mode

Estrusore 2: Simple Mode

Estrusore 3: Simple Mode

Sovrascrivi impostazioni Slic3r

Copia Impostazioni Stampa a Override

Abilita Supporto

Abilita Raffreddamento

Layer Height: 0.2 mm

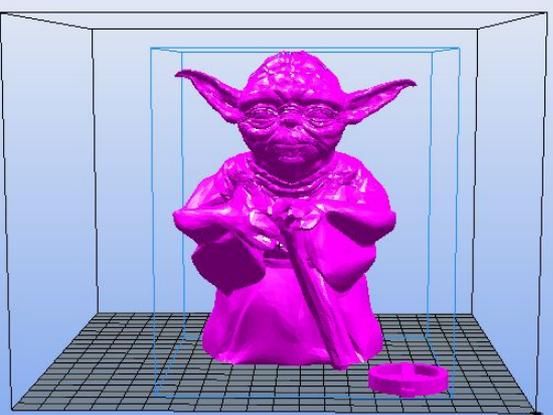
Infill Density: 20%

Infill Angle: 45°

Infill Pattern: honeycomb

Solid Infill Pattern: rectilinear

Slic3r e' un programma separato, può essere avviato separatamente. Per altre informazioni puoi visitare la seguente webpage: <http://www.slic3r.org>



Mostra in Log: Comandi Info Avvisi Errori ACK Auto scorrimento Resetta Log Copia

```

0:05:38.403 Slic3r command:/home/lipos/RepetierHost/Slic3r/slic3r.pl --load "/home/lipos/.local/share/RepetierHost/s
0:05:38.477 <Slic3r> Can't locate Moo.pm in @INC (you may need to install the Moo module) (@INC contains: /home/lipos
0:05:38.477 <Slic3r> BEGIN failed--compilation aborted at /home/lipos/RepetierHost/Slic3r/lib/Slic3r.pm line 24.
0:05:38.477 <Slic3r> Compilation failed in require at /home/lipos/RepetierHost/Slic3r/slic3r.pl line 14.
0:05:38.477 <Slic3r> BEGIN failed--compilation aborted at /home/lipos/RepetierHost/Slic3r/slic3r.pl line 14.
0:06:25.164 Slic3r command:/home/lipos/RepetierHost/Slic3r/slic3r.pl --load "/home/lipos/.local/share/RepetierHost/s
0:06:25.294 <Slic3r> Can't locate Moo.pm in @INC (you may need to install the Moo module) (@INC contains: /home/lipos
0:06:25.294 <Slic3r> BEGIN failed--compilation aborted at /home/lipos/RepetierHost/Slic3r/lib/Slic3r.pm line 24.
0:06:25.294 <Slic3r> Compilation failed in require at /home/lipos/RepetierHost/Slic3r/slic3r.pl line 14.
0:06:25.294 <Slic3r> BEGIN failed--compilation aborted at /home/lipos/RepetierHost/Slic3r/slic3r.pl line 14.
  
```

Disconnessa - Pronto 822 FPS

[i ragazzi venuti d...]

[RetroShare Revisi...]

[qBittorrent v3.1.8]

[Luigi Smiraglio (...)]

Applicazioni Posizioni Sconosciuto

Repetier-Host V0.95F - ListViewItem: Yoda_Standing_Bank_v5.stl

File Visuale Configurazione Temperatura Stampante Strumenti Aiuto

Connetti Carica Salva lavoro Avvia lavoro Ferma lavoro SD Card Mostra-nascondi Loog Mostra filamento Mostra percorso

Impostazioni stampante STOP!!!

Visualizzazione 3D | Curva Temperatura

Posizione oggetto Slicer G-Code Editor Controllo manuale

Disconnessa

G-Code: Invia

Y=0.00 Z=0.00

X=0.00

+Y -X +X -Y -Z

Power Stop Motori Posizione

Moltiplicatore velocità

Feedrate: 100

Flowrate: 100

Estrusore

Temperatura estrusore

Estrusore 1 200°C / 200

Velocità [mm/min] 100

Estrudi [mm] 10

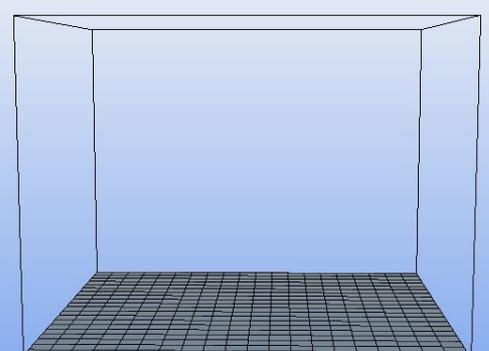
Piatto di stampa

Temperatura piatto di stampa

Temp. 200°C / 55

Ventola

Ventola Output 50.2%



Mostra in Log: Comandi Info Avvisi Errori ACK Auto scorrimento Resetta Log Copia

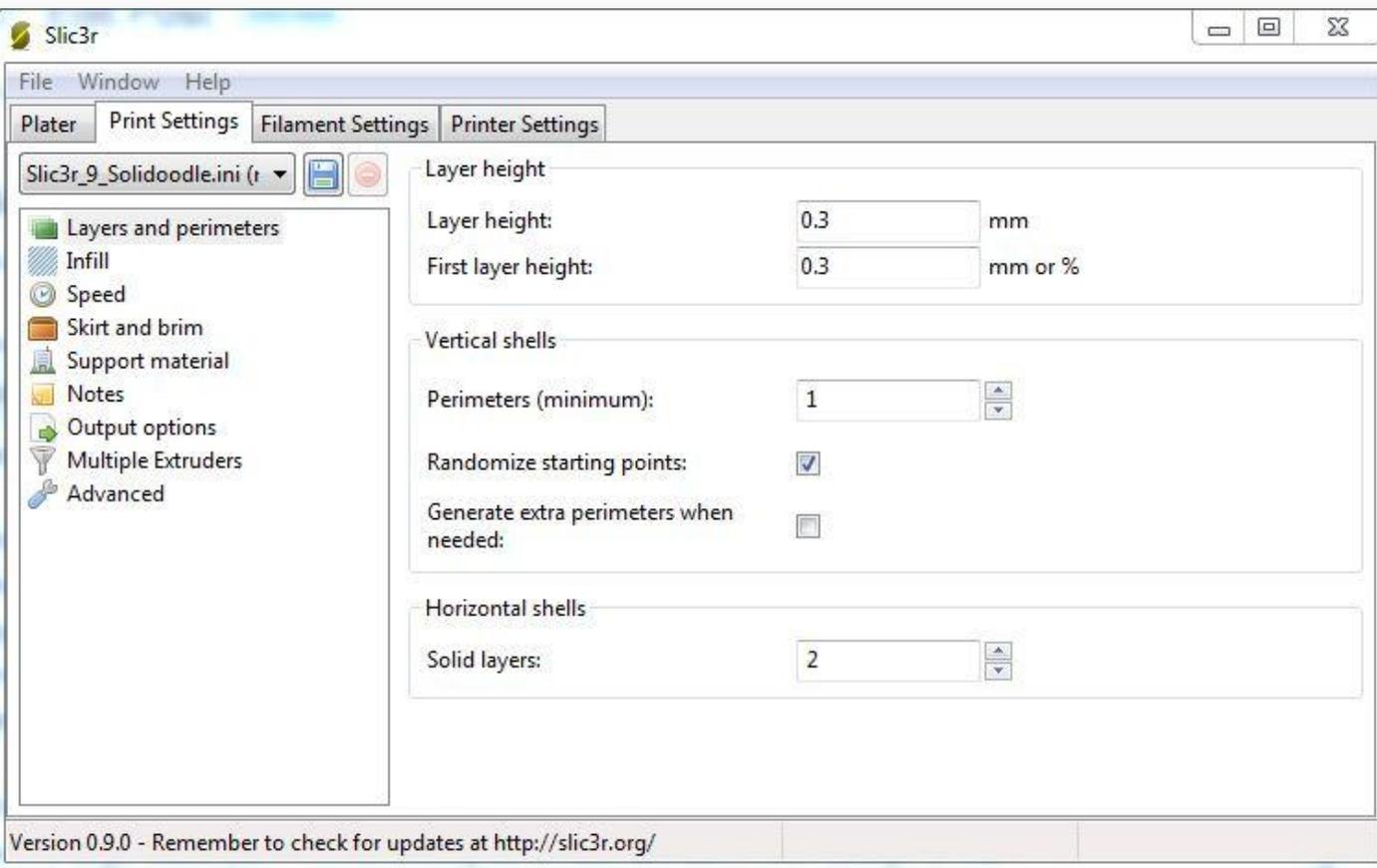


Slic3r

G-code generator for 3D printers

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About



Primary author:

◦ **Alessandro Ranellucci**

You can contact me at alessandro@unterwelt.it (but see the [Support](#) page first) or find me on the #slic3r channel in [FreeNode IRC](#) as Sound. Also follow me on Twitter ([@alessandroranel](https://twitter.com/alessandroranel))

Several contributors have been helping in development:

◦ **Henrik Brix Andersen**
(brix)

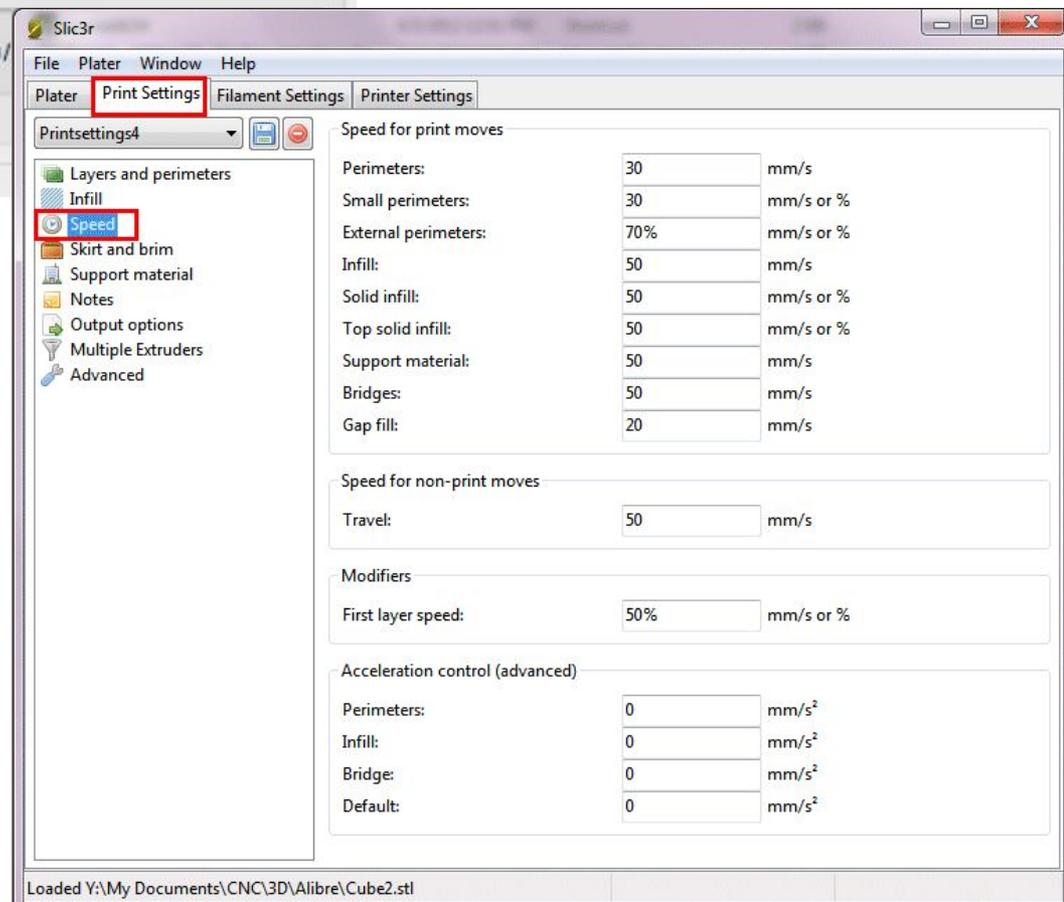
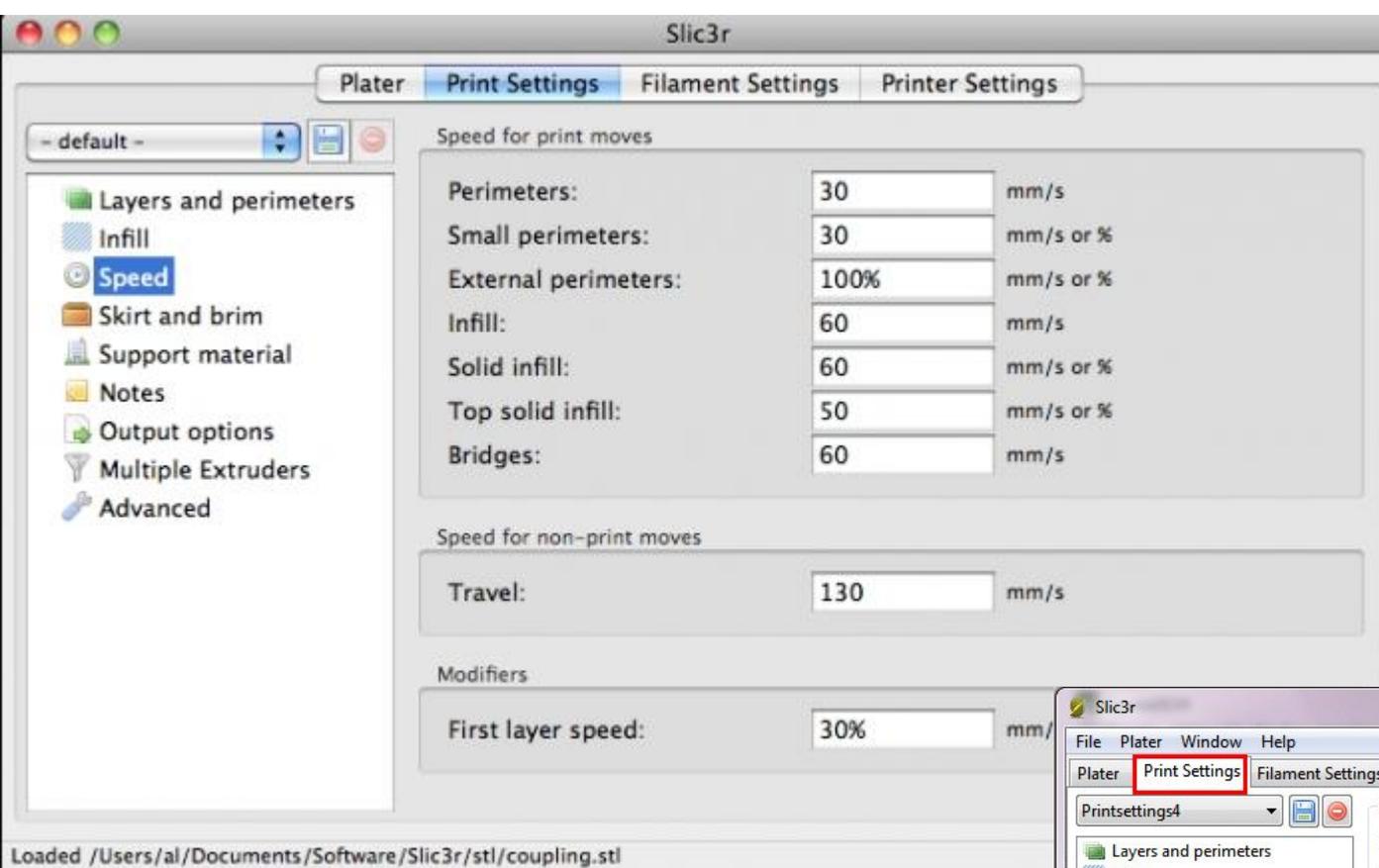
◦ **Nicolas Dandrimont**
(olasd)

◦ **Mark Hindness**
(zqk/beanz)

◦ **Mike Sheldrake**
(mesheldrake)

Also, community plays a big role in testing and providing feedback.

<http://slic3r.org/>



G-code

Prima lavoro Mostra/nascondi Loos Mostra filamento Nascondi percorso Impostazioni stampante Easy Mode STOP II

Posizione oggetto | Slicer | Anteprima | Controllo manuale | SD Card |

Anteprima Editor G-Code |

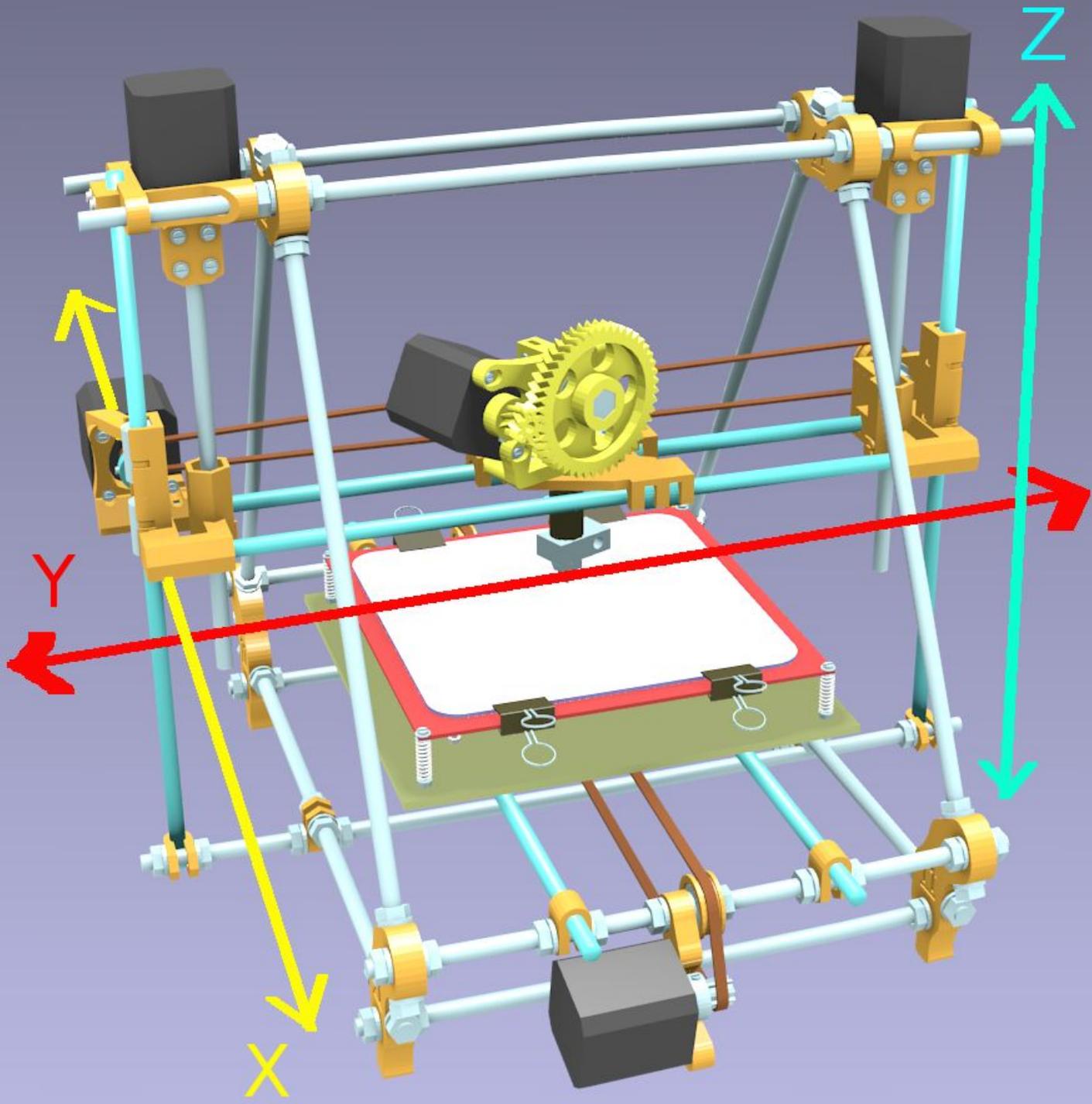
G-Code

```
1 ; generated by Slic3r 1.1.5 on 2014-10-24 at 22:56:01
2
3 ; perimeters extrusion width = 0.40mm
4 ; infill extrusion width = 0.42mm
5 ; solid infill extrusion width = 0.42mm
6 ; top infill extrusion width = 0.42mm
7
8 G21 ; set units to millimeters
9 M107
10 M104 S208 ; set temperature
11 G28 ; home all axes
12 G1 Z5 F5000 ; lift nozzle
13 M109 S208 ; wait for temperature to be reached
14 G90 ; use absolute coordinates
15 G92 E0
16 M82 ; use absolute distances for extrusion
17 G1 Z0.400 F7800.000
18 G1 F1800.000 E-1.00000
19 G92 E0
20 G1 X72.039 Y71.505 F7800.000
21 G1 E1.00000 F1800.000
22 G1 X72.863 Y70.735 E1.02551 F1080.000
23 G1 X76.487 Y67.741 E1.13191
24 G1 X77.007 Y67.370 E1.14639
25 G1 X77.413 Y67.100 E1.15741
26 G1 X81.431 Y64.668 E1.26373
27 G1 X82.444 Y64.167 E1.28931
28 G1 X86.769 Y62.347 E1.39554
```

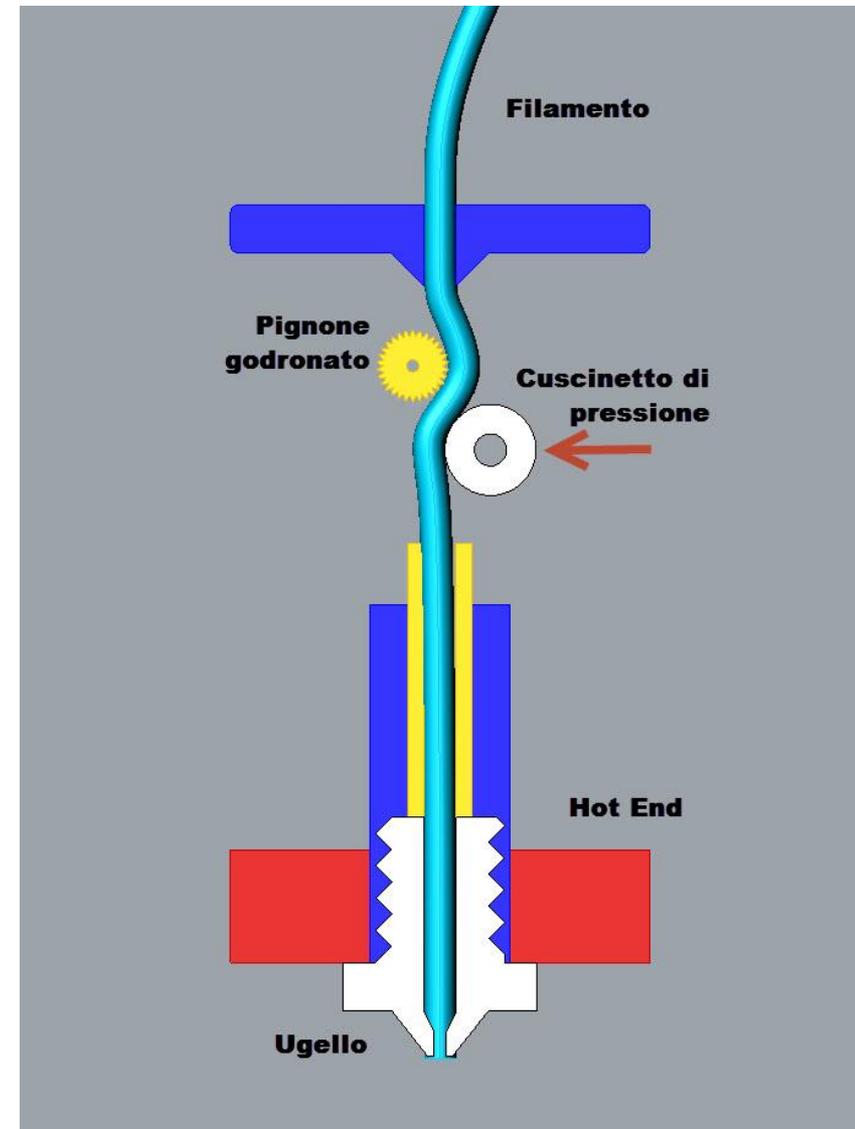
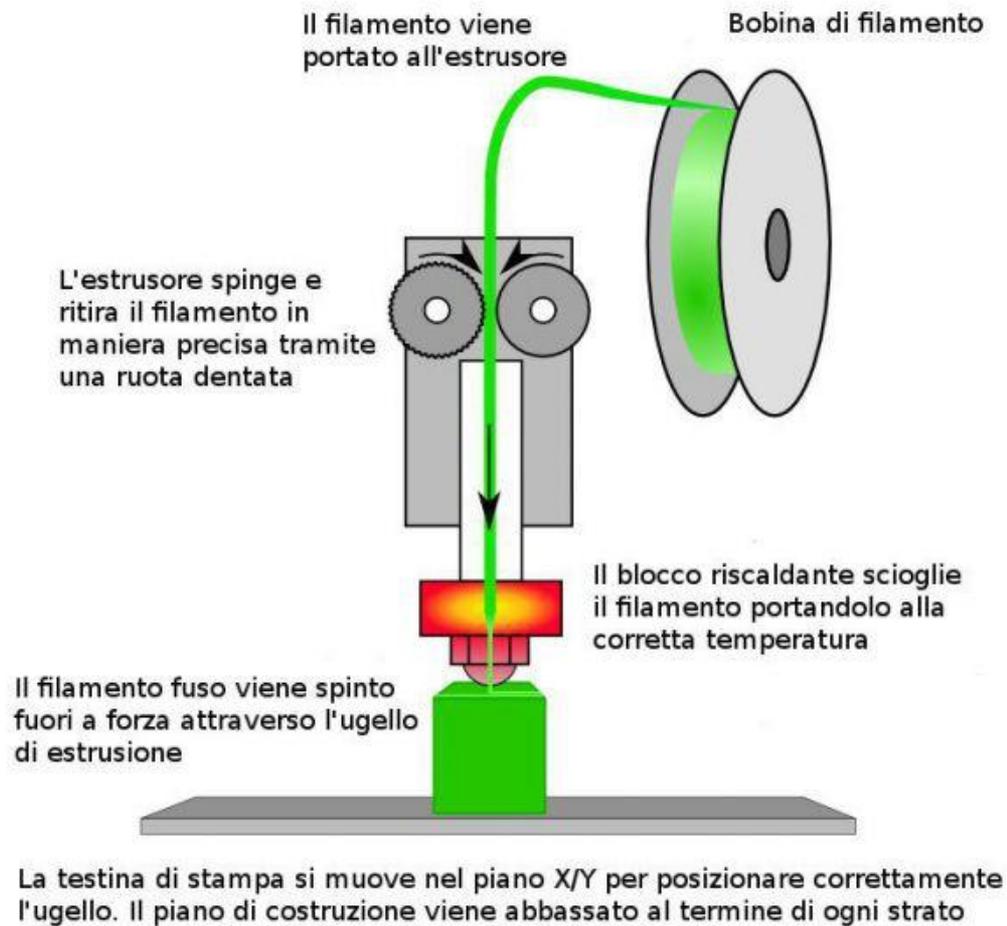
Visualizzazione | Aiuto |

- Vedi codice completo
- Vedi Singolo Layer
- Vedi Intervallo Layer

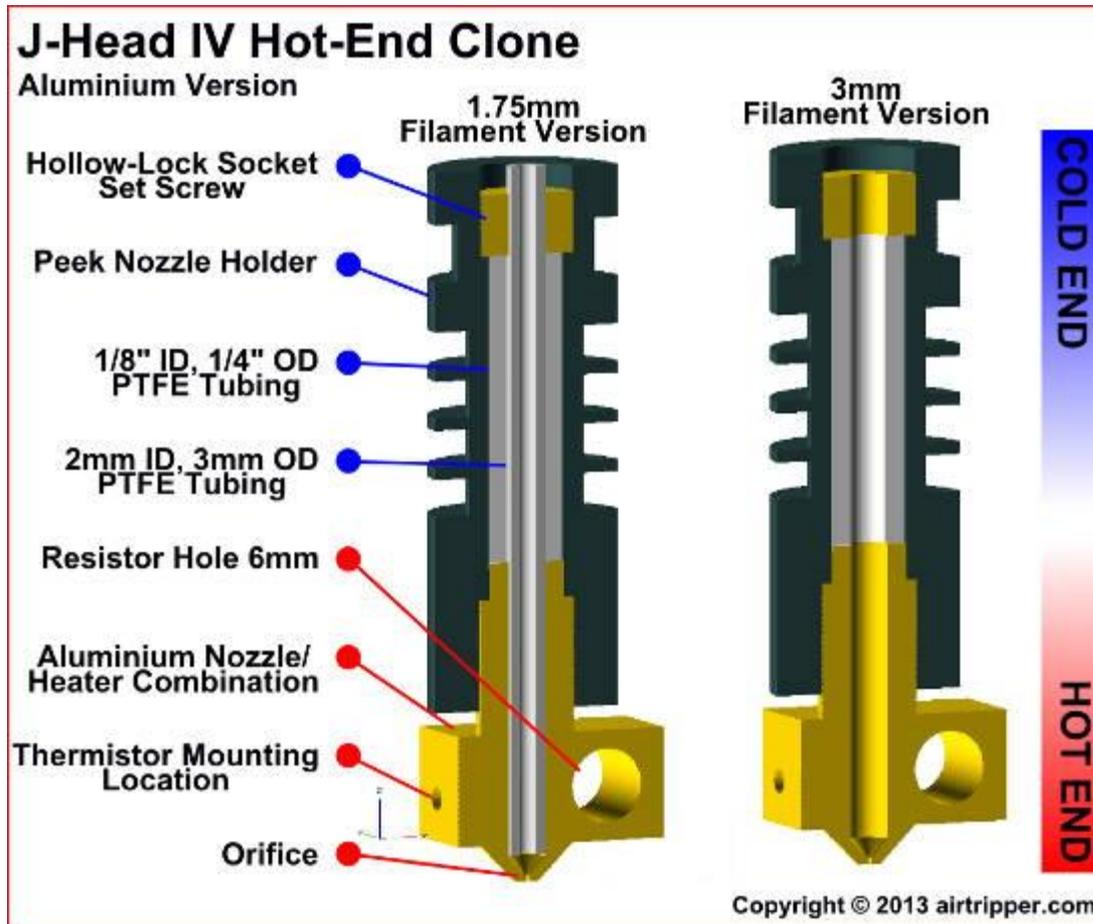
R1 C1 Inserisci Layer 0 Estrusore 0 Tempo di stampa: 37m:26s



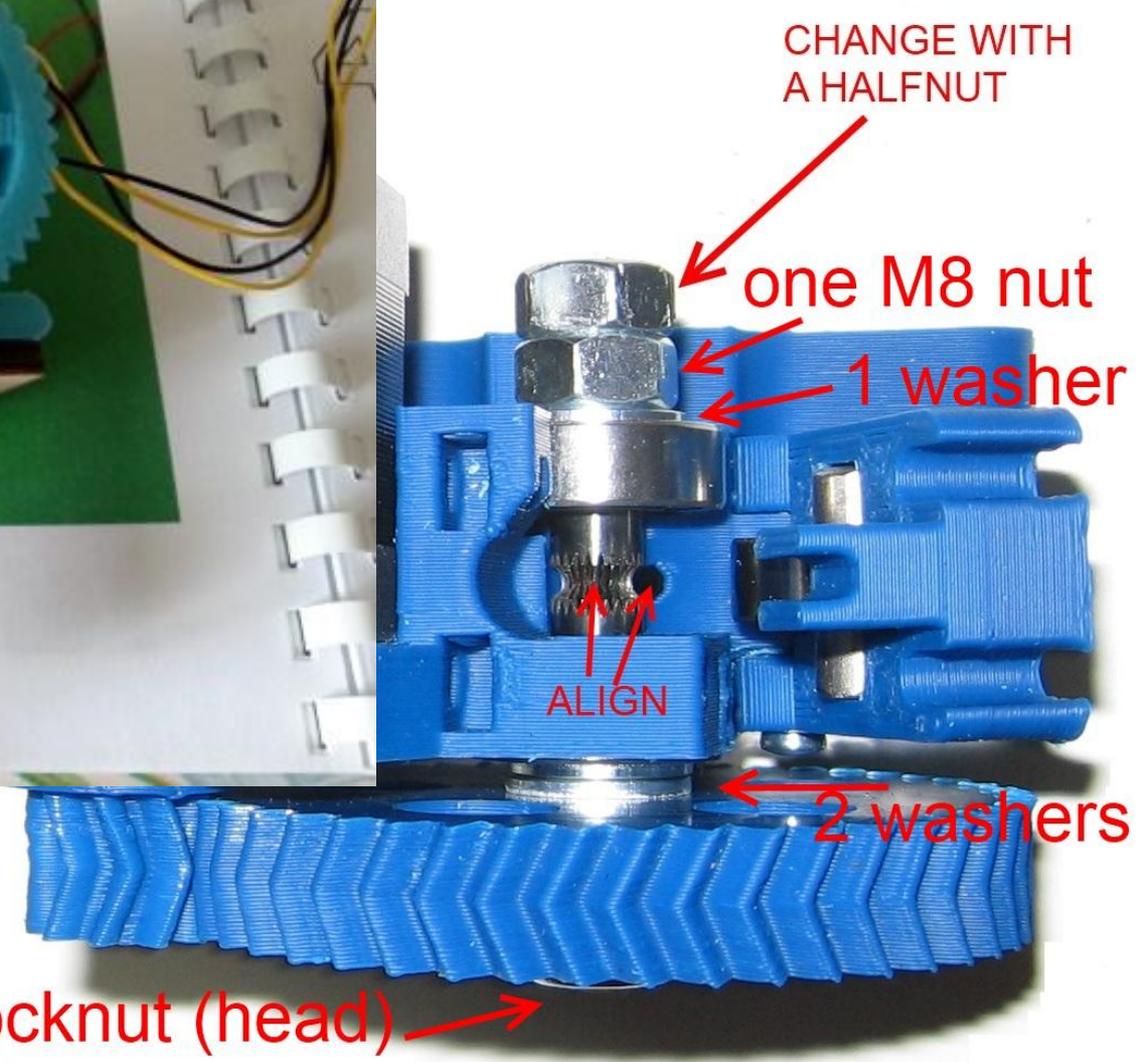
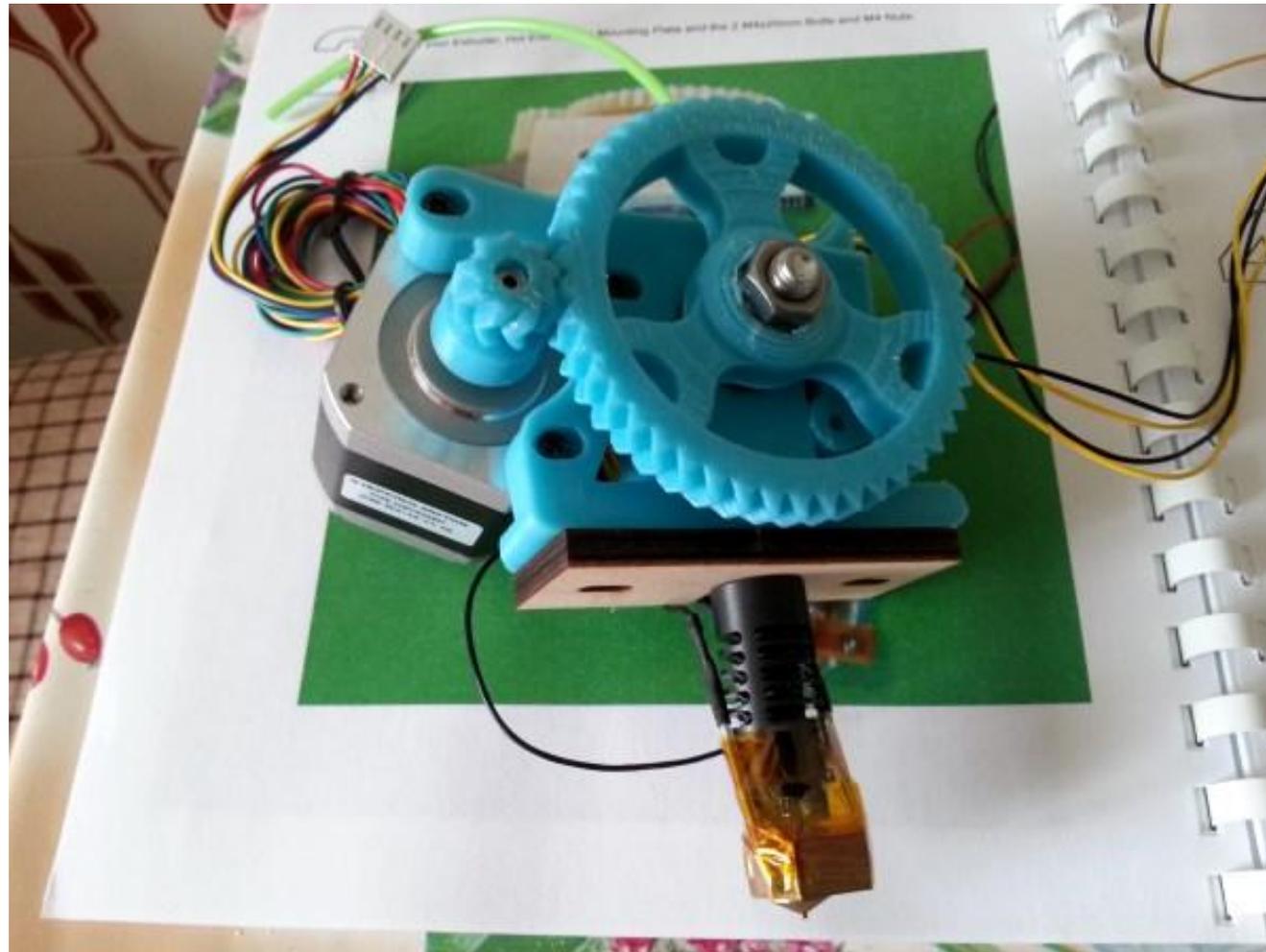
Funzionamento Stampante 3D



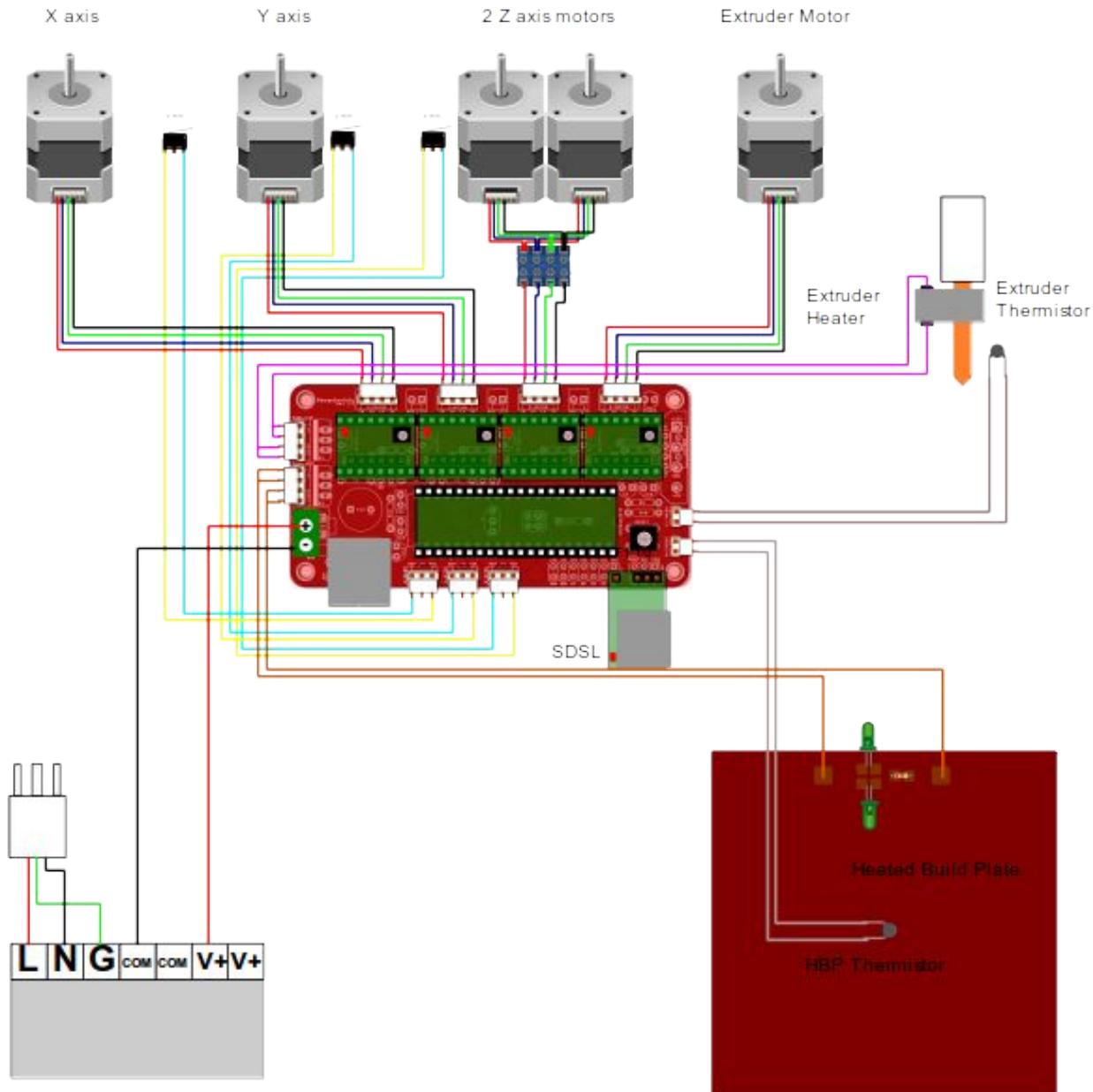
Hotend



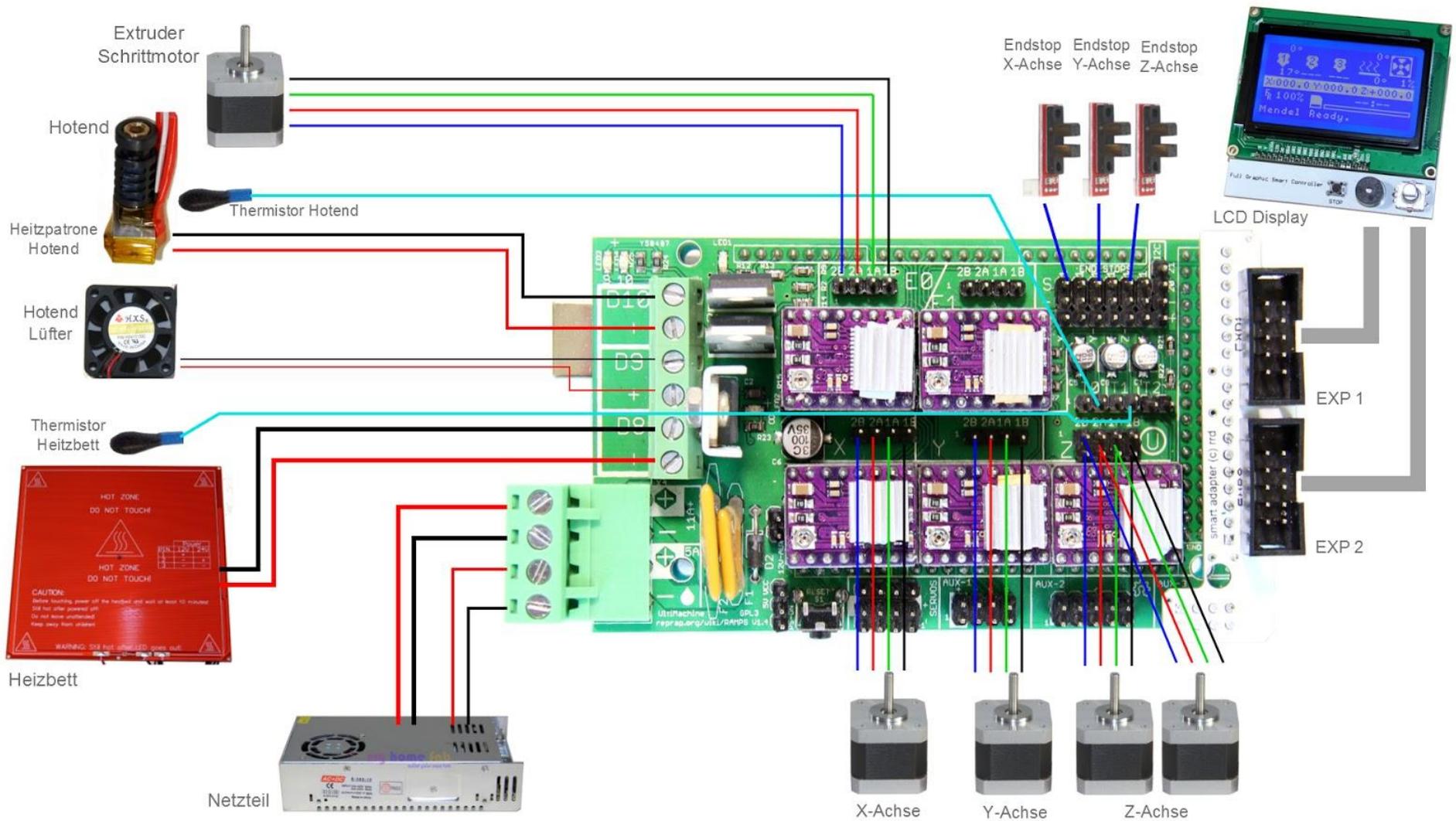
Blocco Estrusore



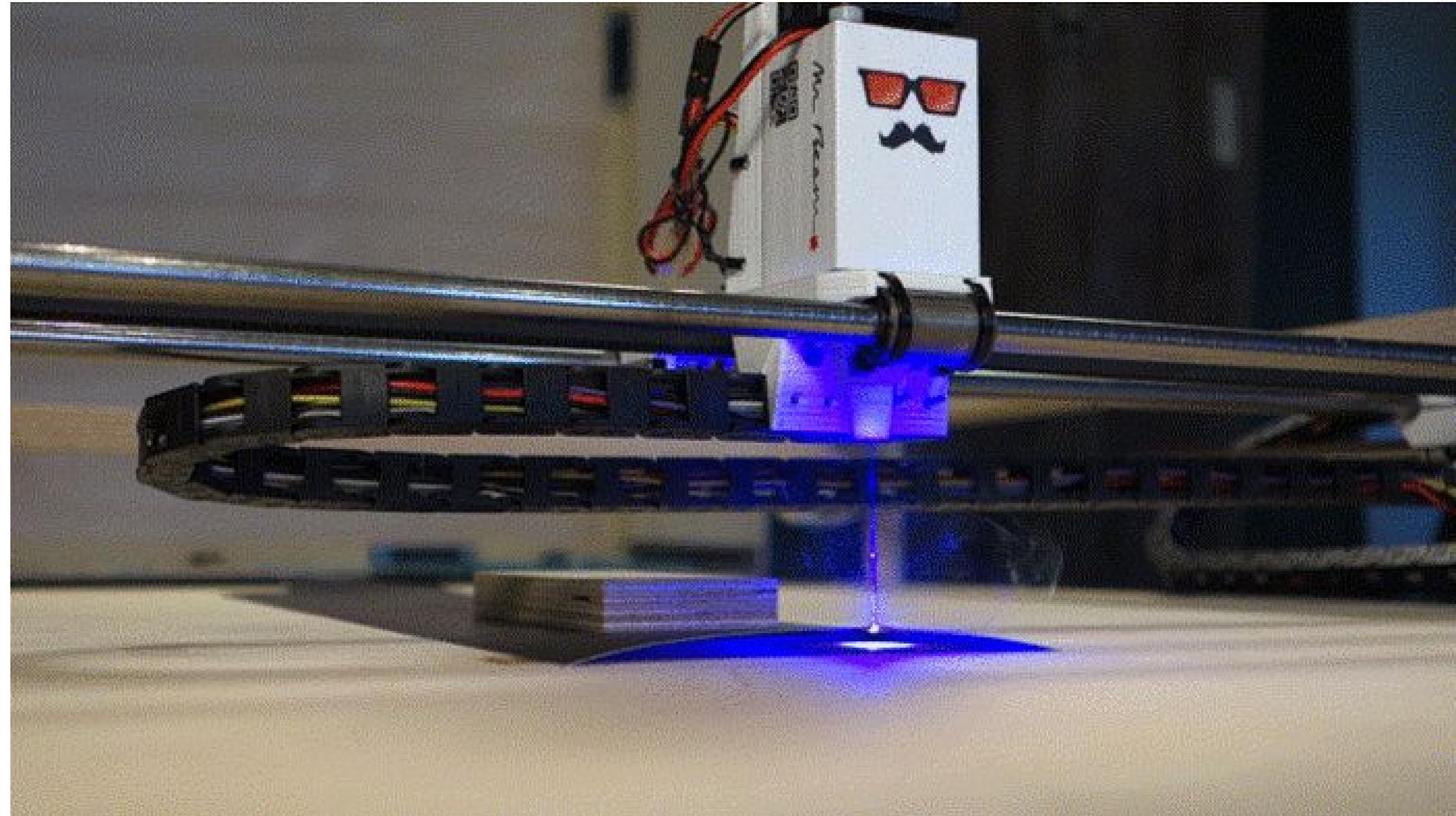
Sanguinololu 1.2 Wiring Schematic



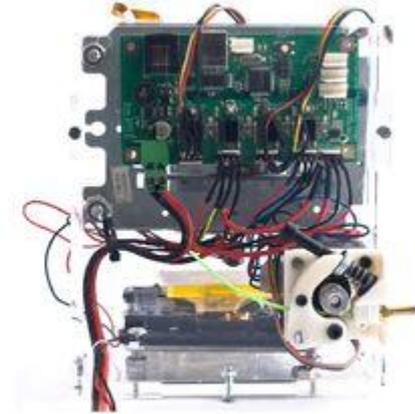
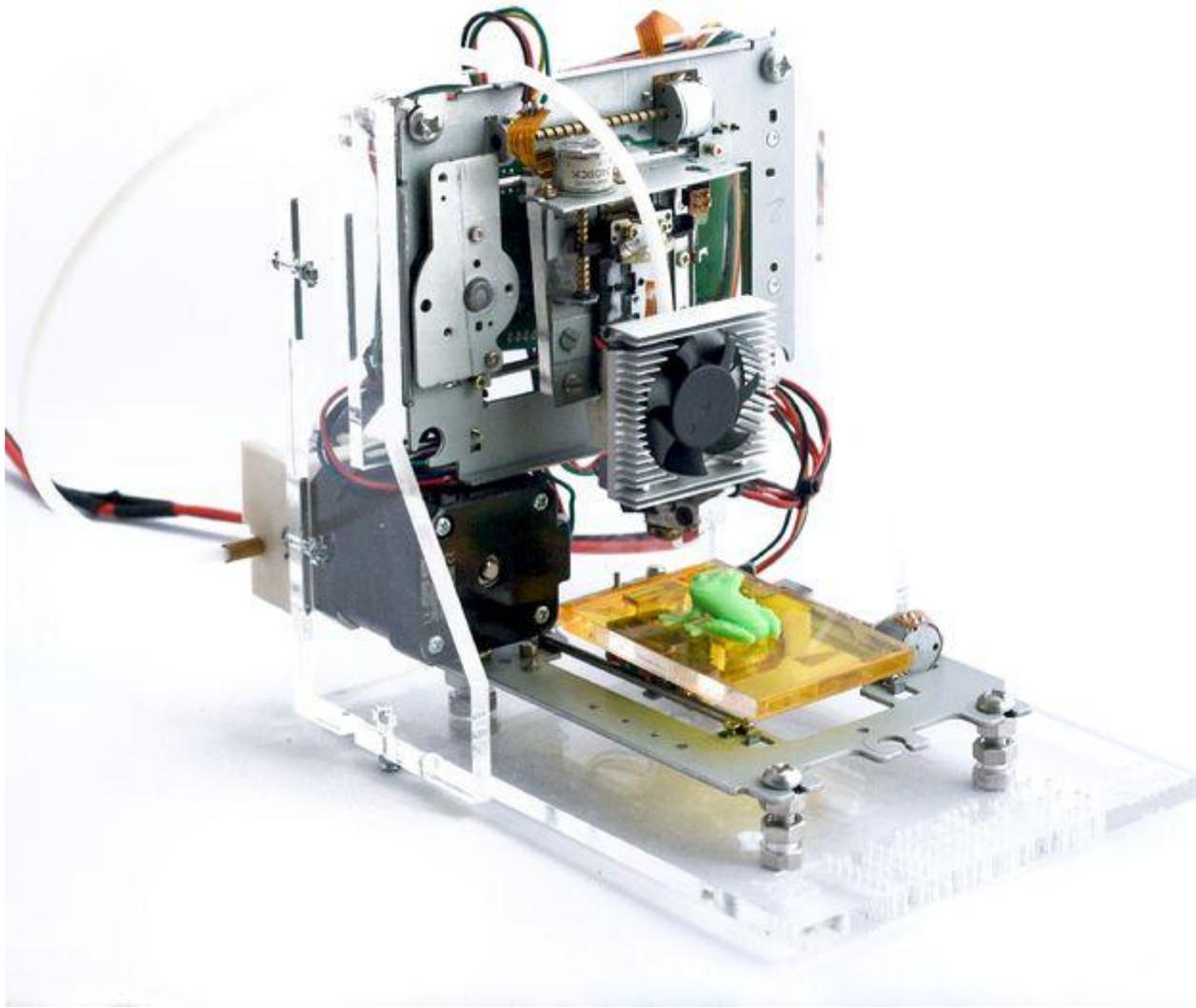
Arduino Mega 2560 + Ramps 1.4



Laser Engraver



EWaste



Pcb Milling





Grazie per l'attenzione

Venite a visitarci ogni martedì dalle 19:00 laboratorio Sinope cubo 22b Unical