

3D Printing

For beginners

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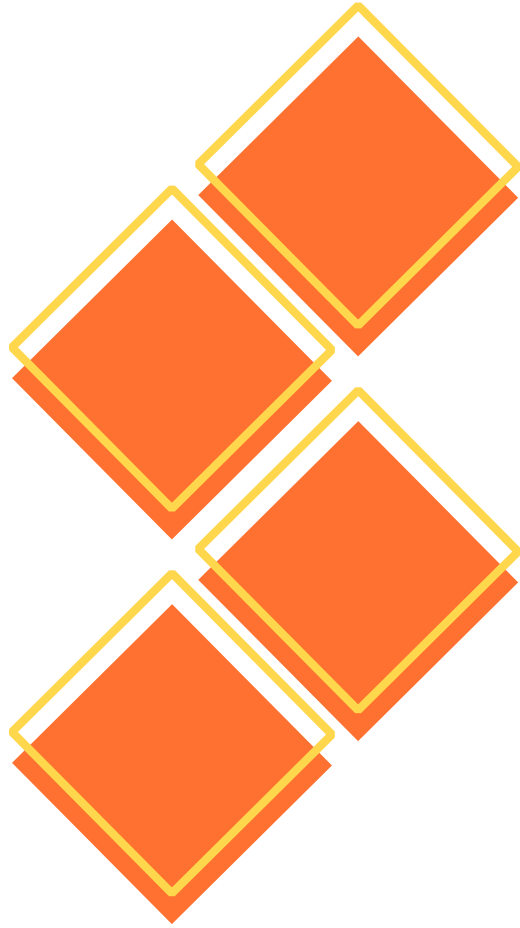
1 What to make? Models

What from? Materials 2

3 With what? Printers/features

Refinement: Tools 4

5 Problems & Hacks



1

Models Ready to print

Thangs
Thingiverse
Fiver





Printer improvements

Tool holders
Spool holders
Scraper
Feet



Games, Toys, figures

Collapsible sword
Fidget toy
LEGO
RPG figures



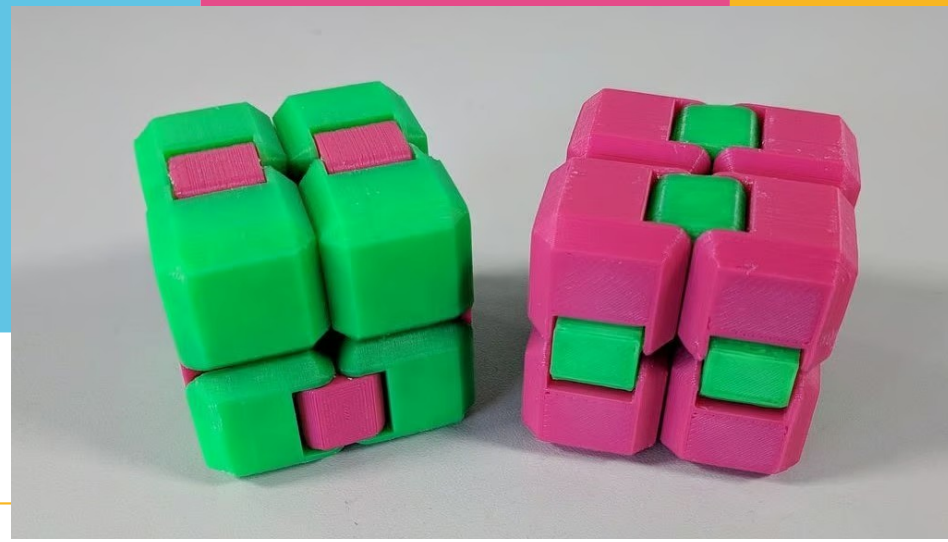
Functional / spare parts

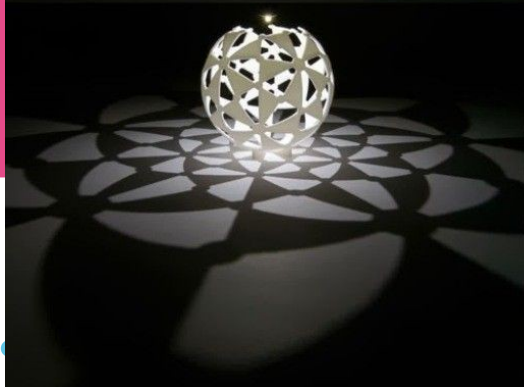
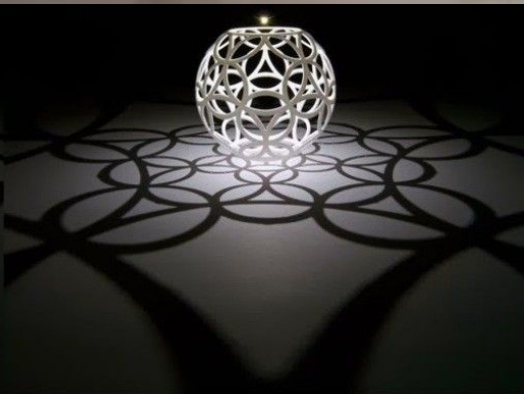
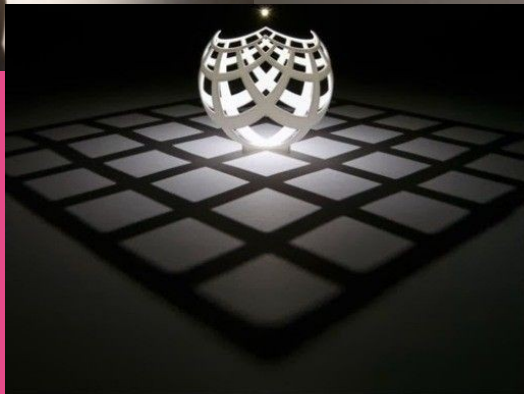
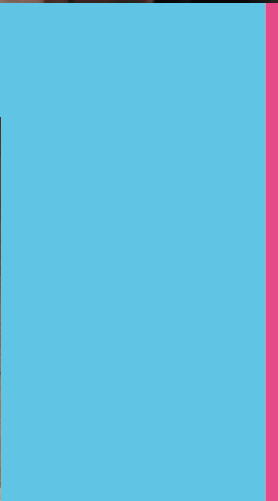
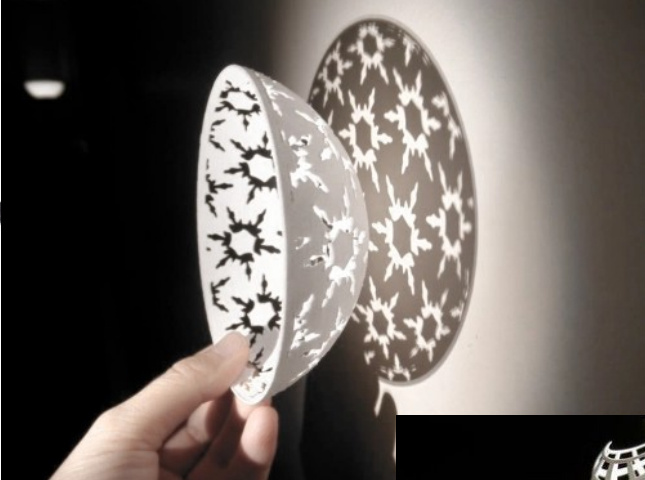
Phone case
Raspi case
Extra key
Broken parts of chairs,
fridges, tents, games



Decorative

Vases
Cups
Lamp shade

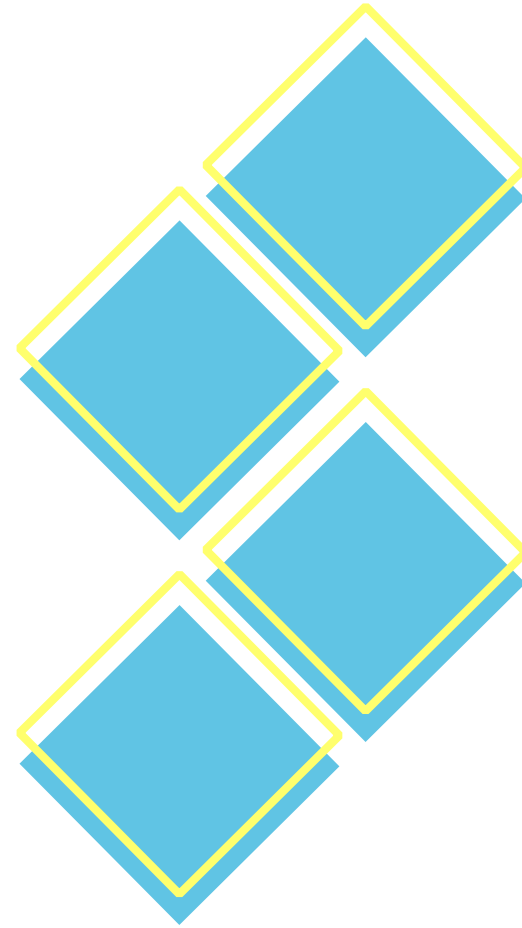


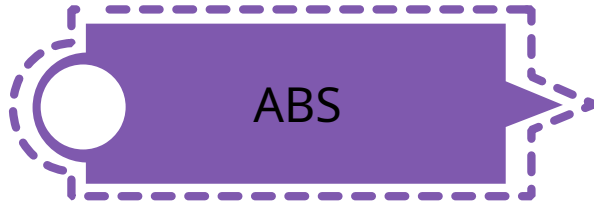




Materials

What to make your prints from?





Acrylnitril-Butadien-Styrol

Legacy. LEGO. Toxic fumes, shrinkage
Impact strength, stiff, light, cheap
180°



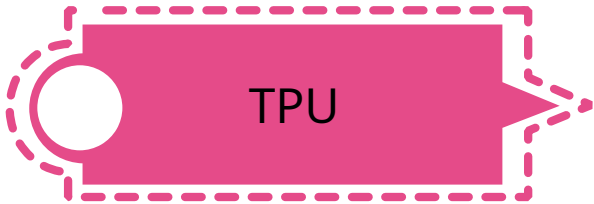
Polylactic acid

Bio: Made from starch/sugar
200°, most popular plastic, easy to use, fast
annealable → heat resistance



PET glycol

Glycol makes PET amorphous → 240°
Elastic, stable, adhesion, transparency
instead of 260° → PTFE limit 250°



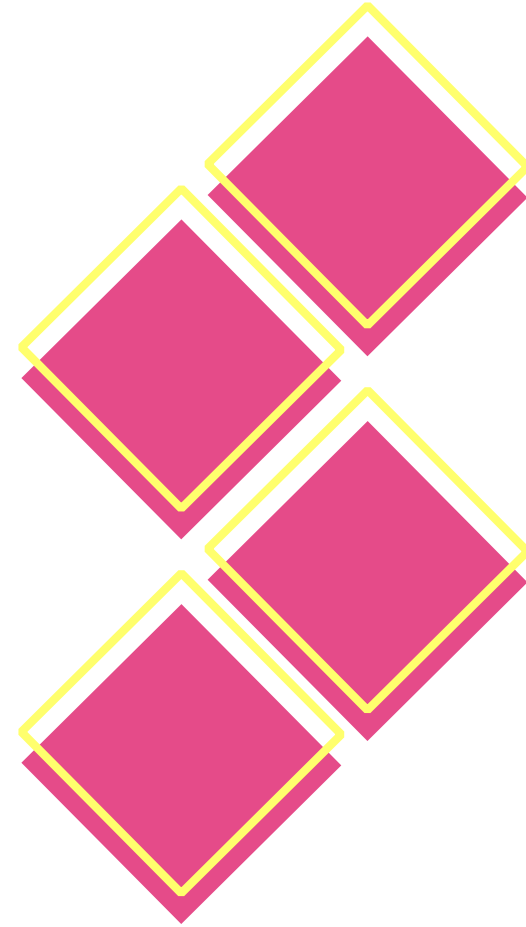
Thermoplastic Urethane

Rubber, elastic, phone cases, tires, adult
toys. Print slow, direct drive

3

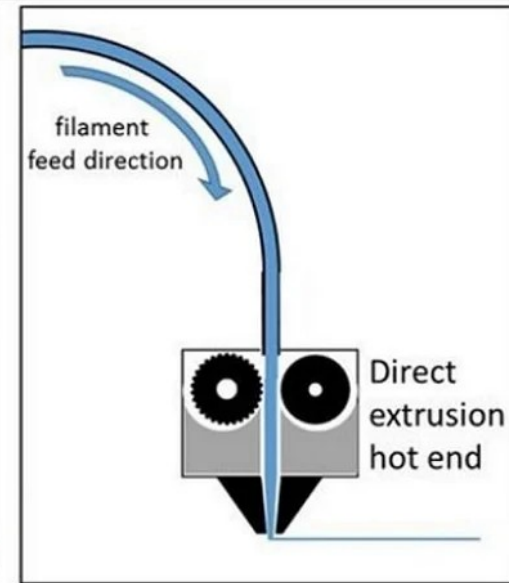
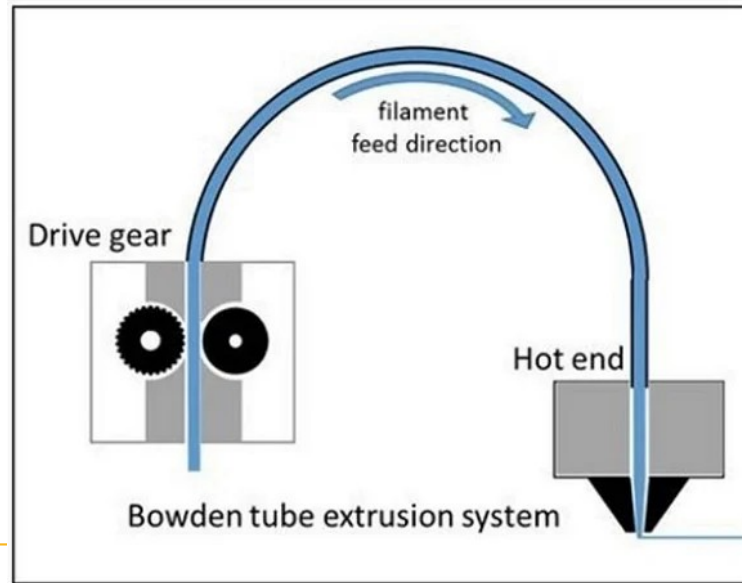
Printers/ features

Kinds of printers, standard features



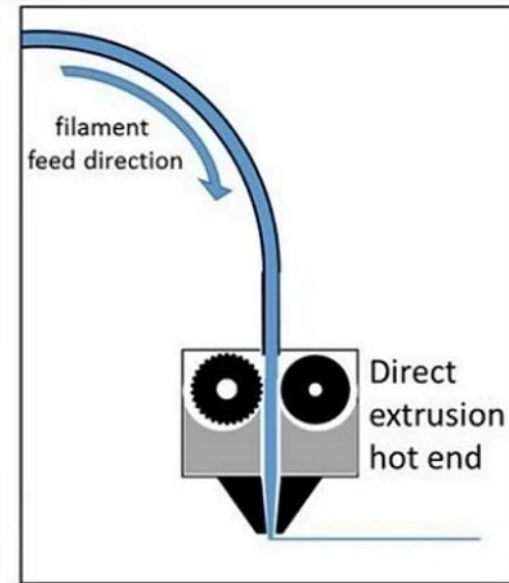
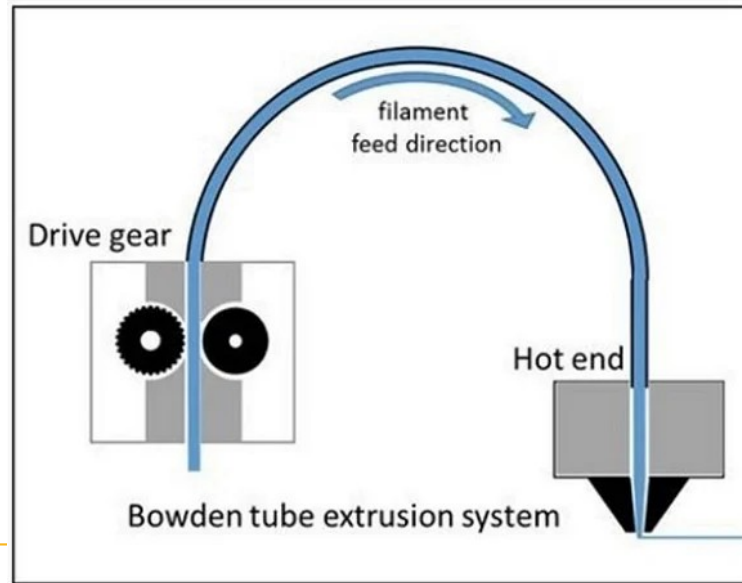
Printer features

- Bowden tube vs direct drive
 - Speed of head



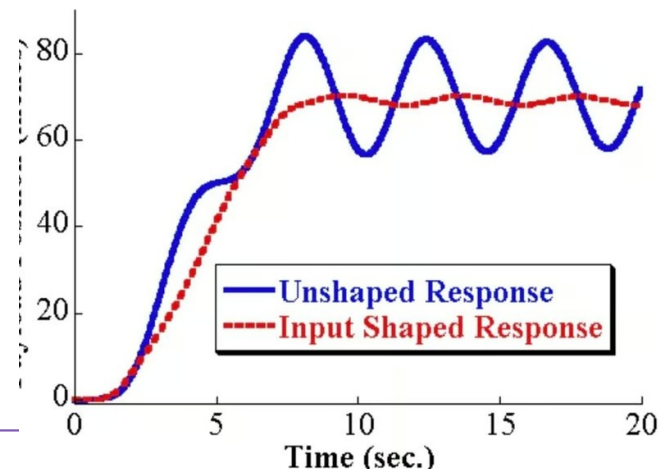
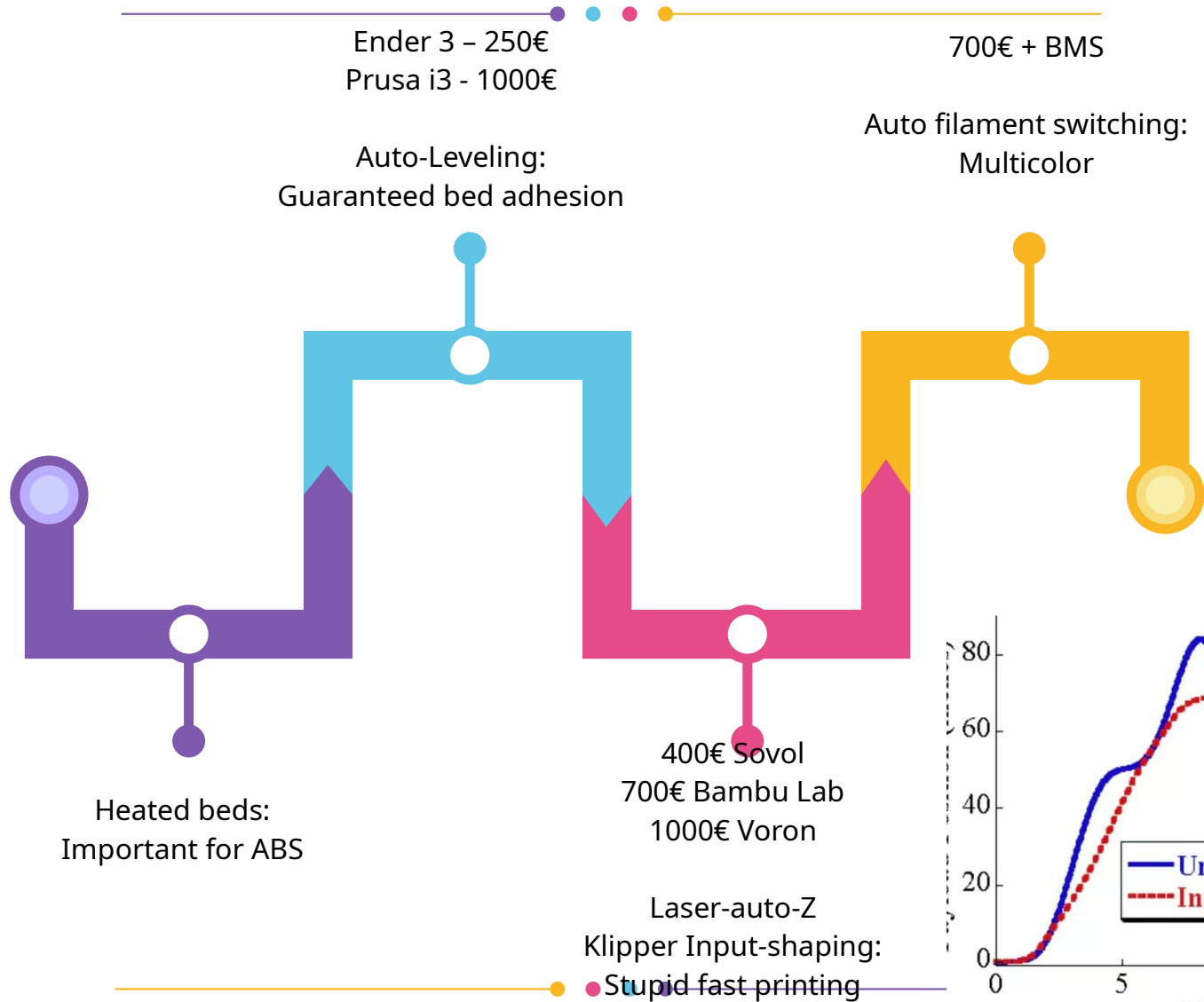
Printer features

- Bowden tube vs direct drive
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Cartesian / CoreXY / Delta

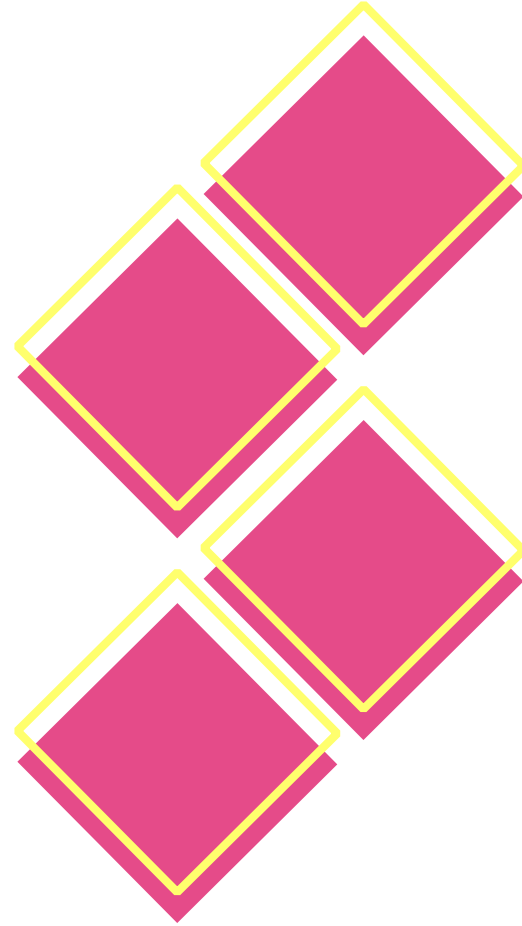


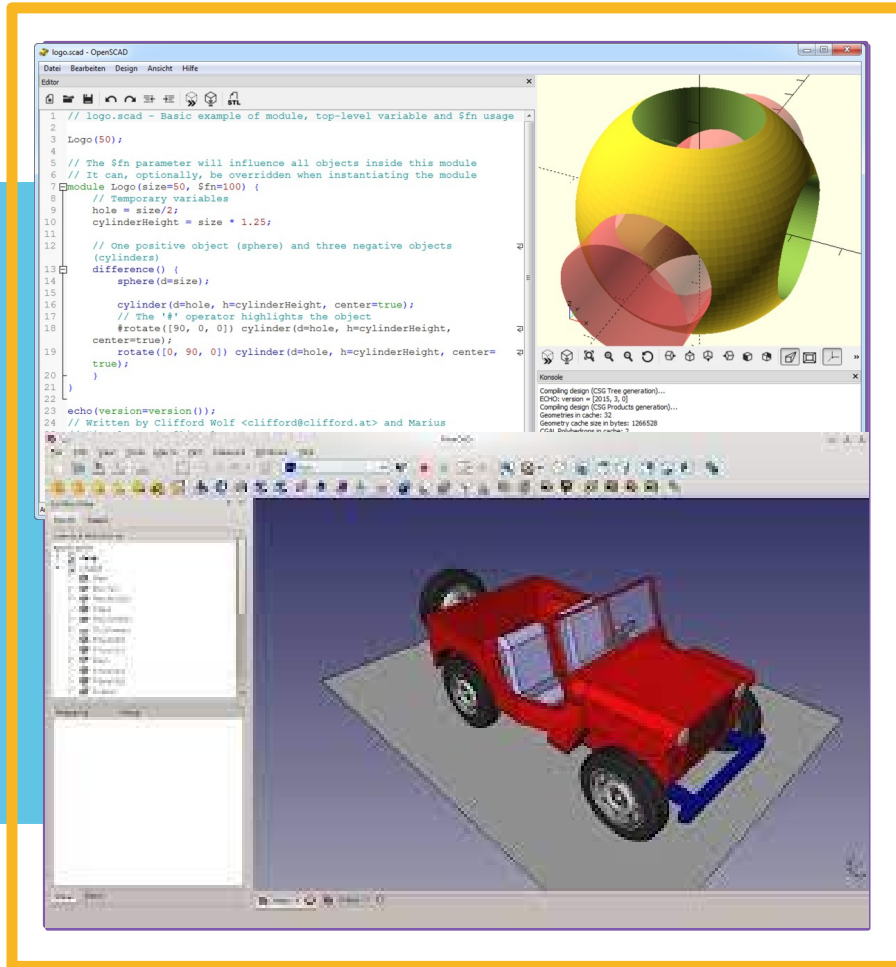




Software Tools

Kinds of printers, standard features





3D Design

OpenSCAD – Model as code

Blender – For game devs –
3D plugin

FreeCAD, TinkerCAD

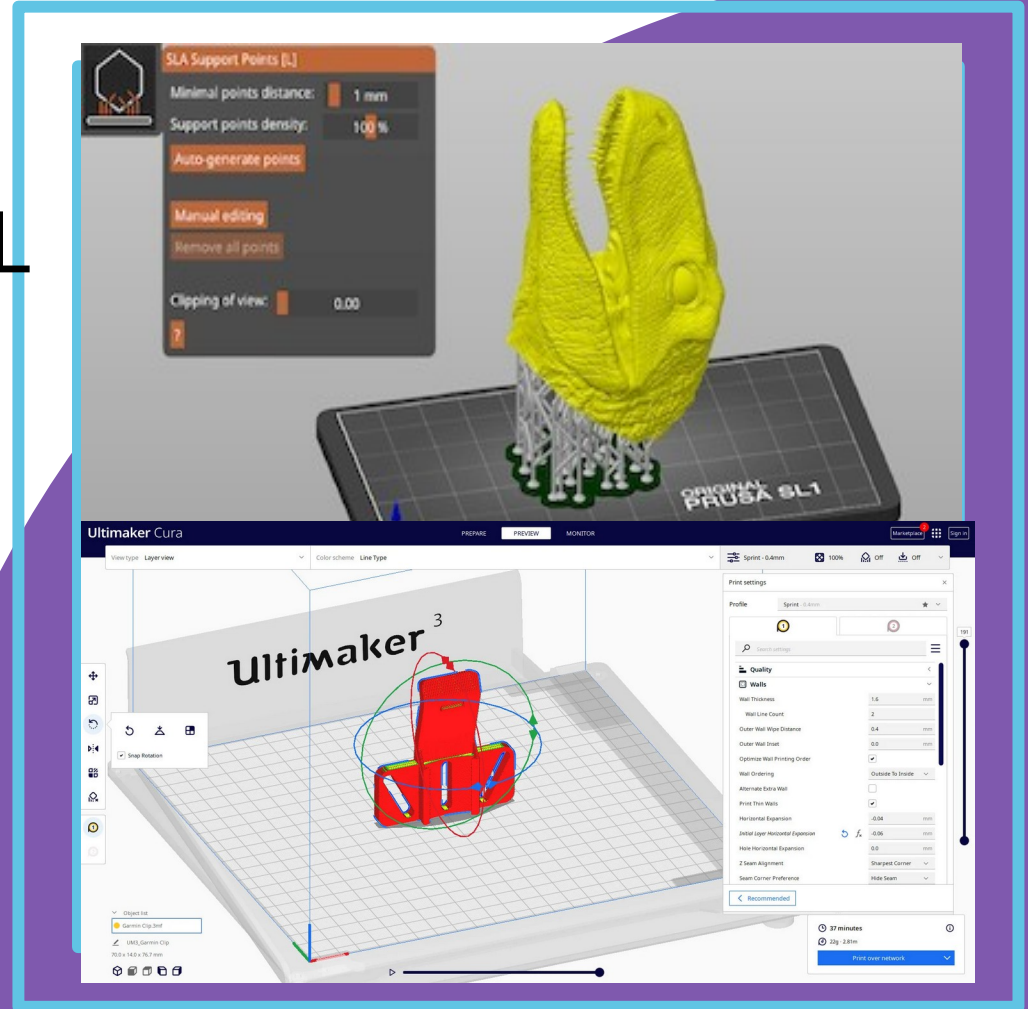
Work by: Muhammad Aria

Slicer → 3D model to STL

PrusaSlicer

Cura (Ultimaker)

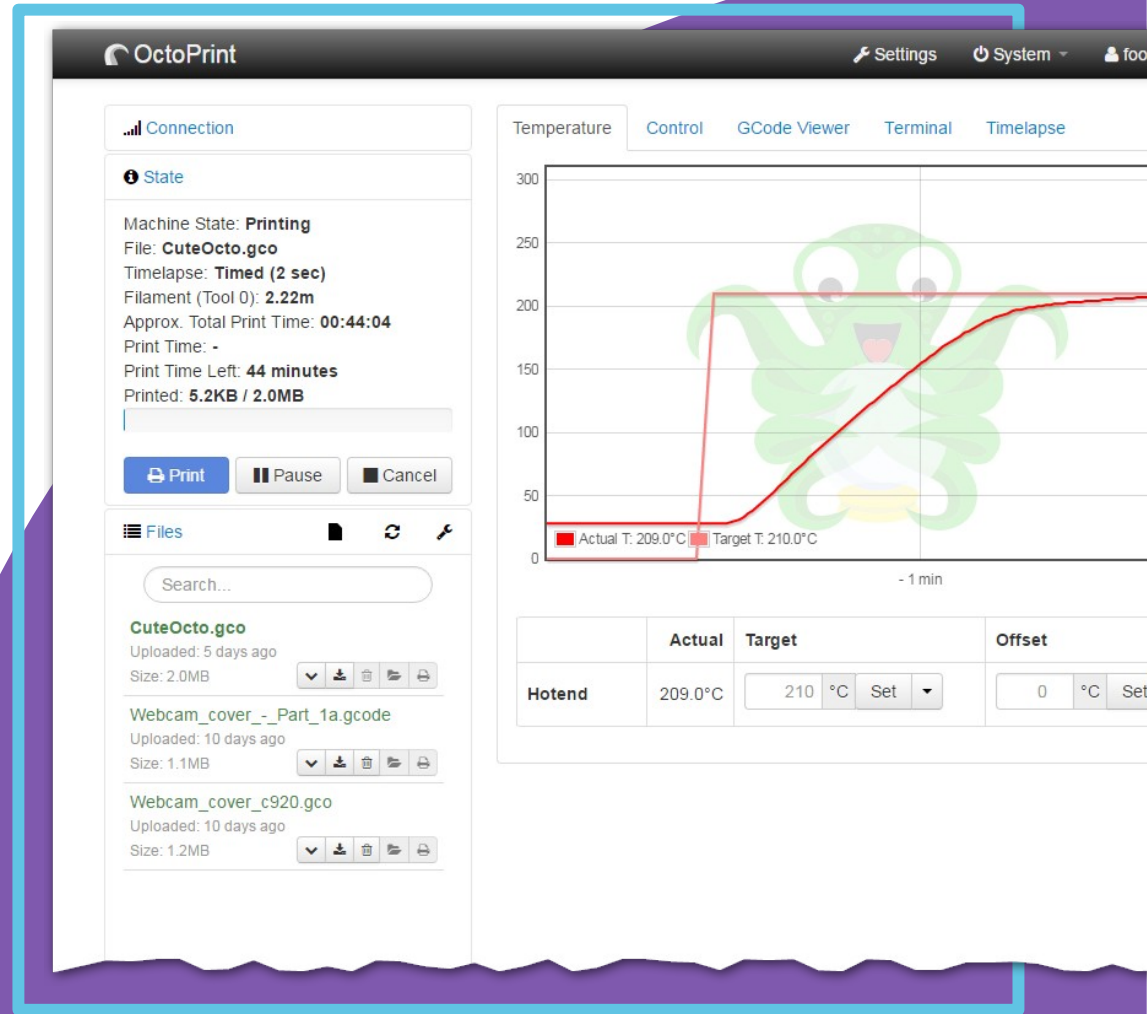
Orcaslicer (Bambu)



Work by: Falia Vicky

OctoPrint || SDCard

Transfer .3mf commands to printer

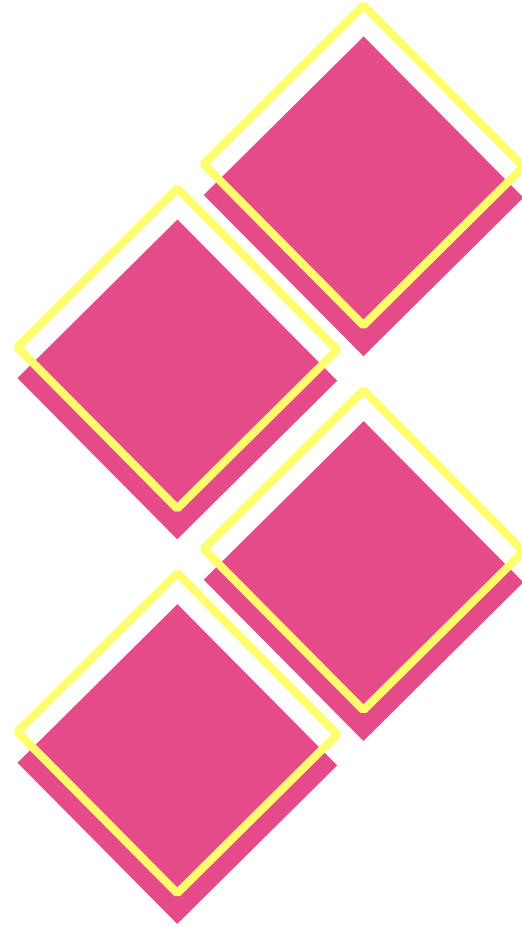


Work by: Falia Vicky



Hardware Tools

Kinds of printers, standard features



Extra tools

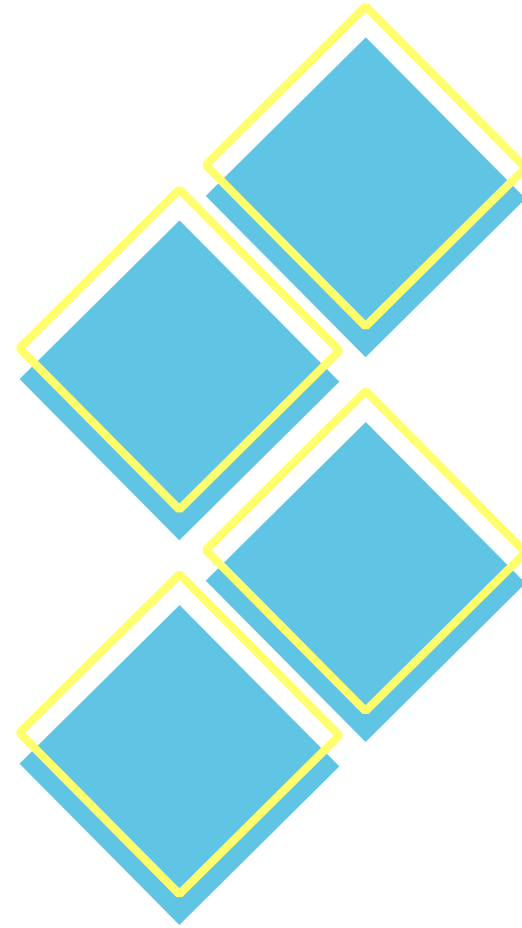
- Sticky spray | Tape | Glue Stick
- Deburring tool (Entgraten) / lighter / torch
- Merge: Soldering iron | solvent | 3Doodler
- Screws + Nuts
- Paint, Primer, PU Lack, Sanding paper



5

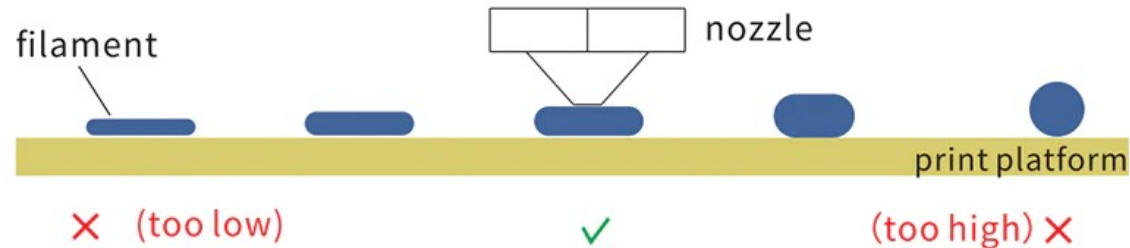
Problems & hacks

Kinds of printers, standard features

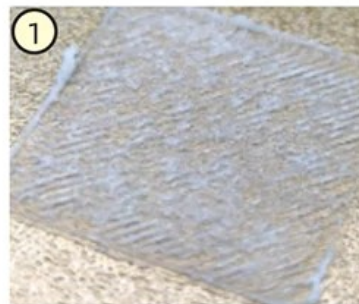


Standard problems: Adhesion

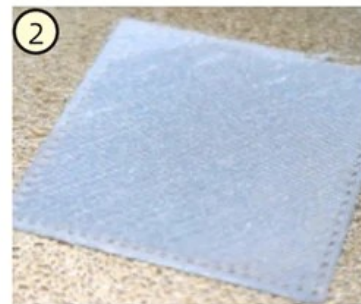
- Too little: Adjust Z distance
- Watch your 0th layer



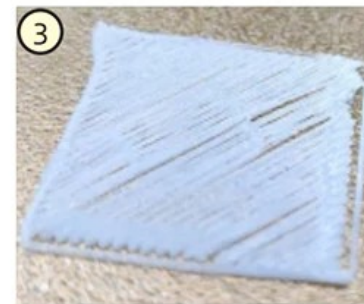
- Too much:
 - Spray / Tape / Glue
 - Freezer



(too low)



(perfect)



(too high)

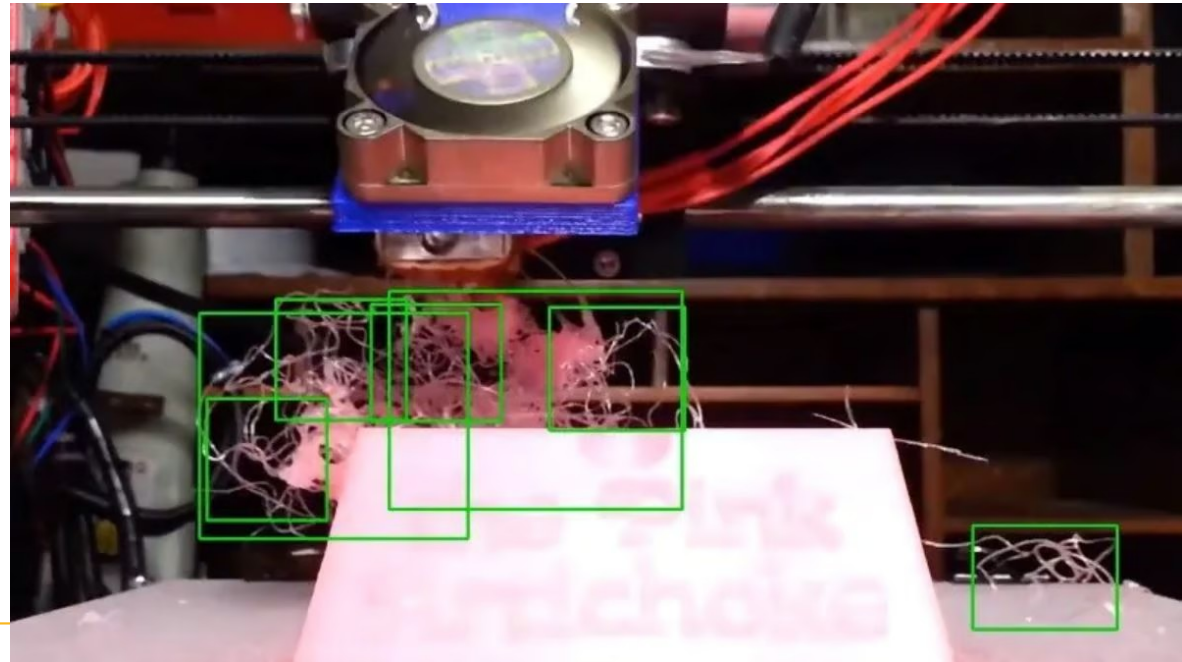
Standard problems: Spaghetti

- His palms are sweaty
- Knees weak
- Arms are heavy
- Vomit on my sweater already
- Moms spaghetti



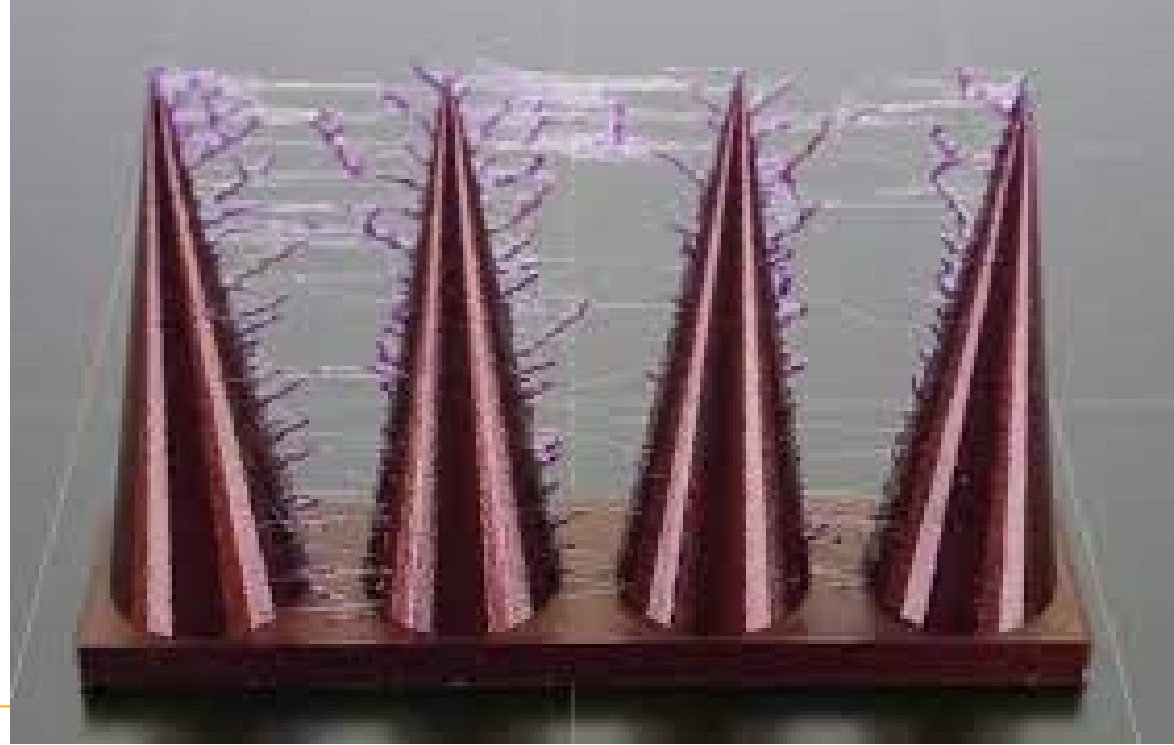
Standard problems: Spaghetti

- Spaghetti detective:
 - Free OctoPrint AI plugin
 - Made for raspi
- Watch your print
 - Don't touch
- Slower & Hotter



Stringing

- Filament too wet:
 - Food dehumidifier, pro dryer, geddo: box + heated bed
- Slicer setting:
 - Avoid crossing perimeter
 - Slower
 - More retraction
- Direct drive



“Problem”: Printer is too slow

Bigger Nozzle:

- 0.4 → 0.6 is 225% more area
- Higher layer height → $150\% * 225\% = 300\%$
- Overextruding via software
 - Potentially harder on extruder
- Speed filament, CHT nozzle





THANK YOU

