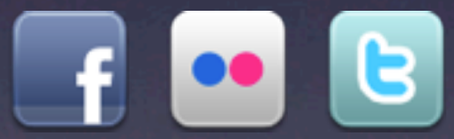
3D Printing

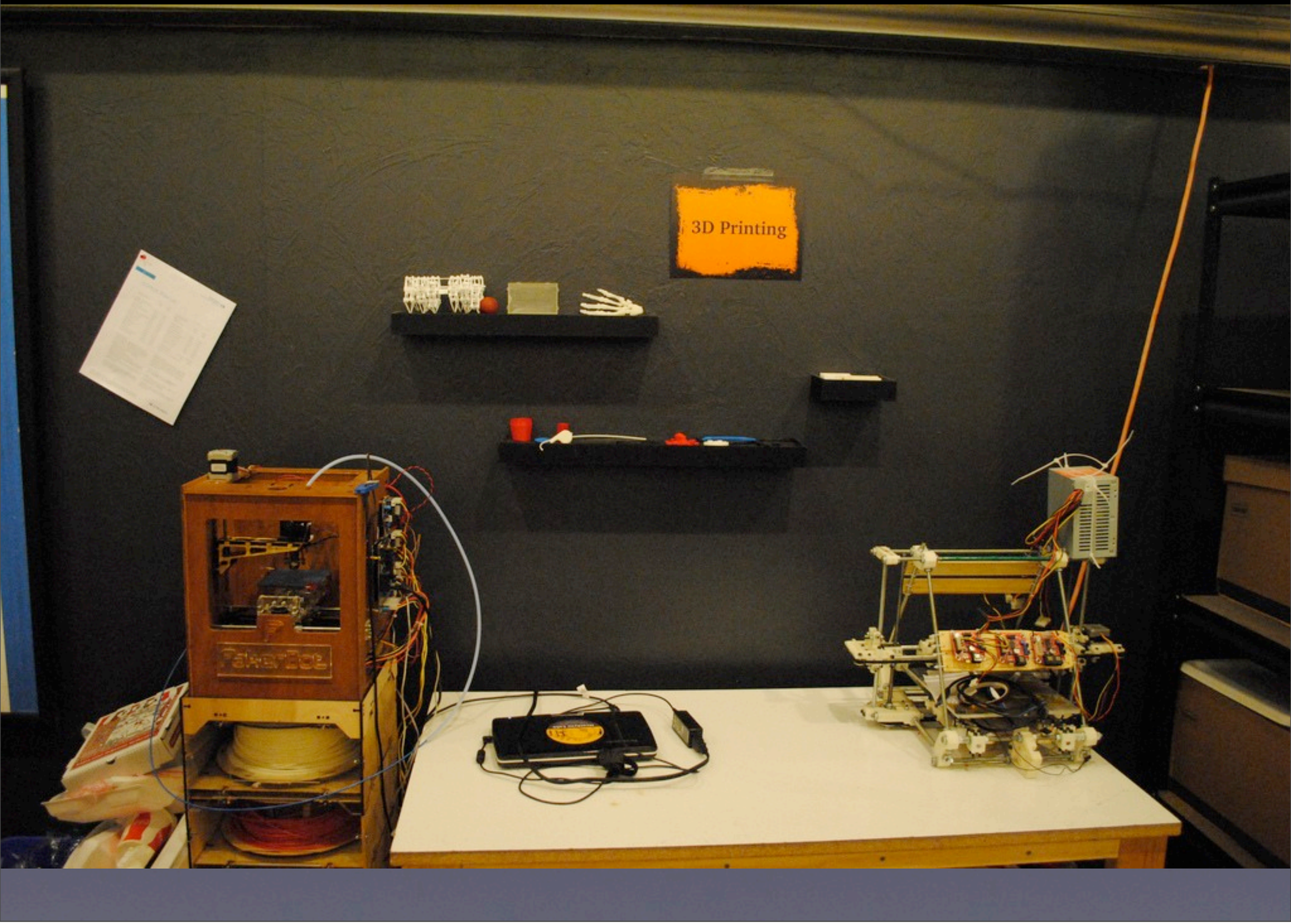
Jacob Rosenthal
Freelance embedded designer
Director HeatSync Labs

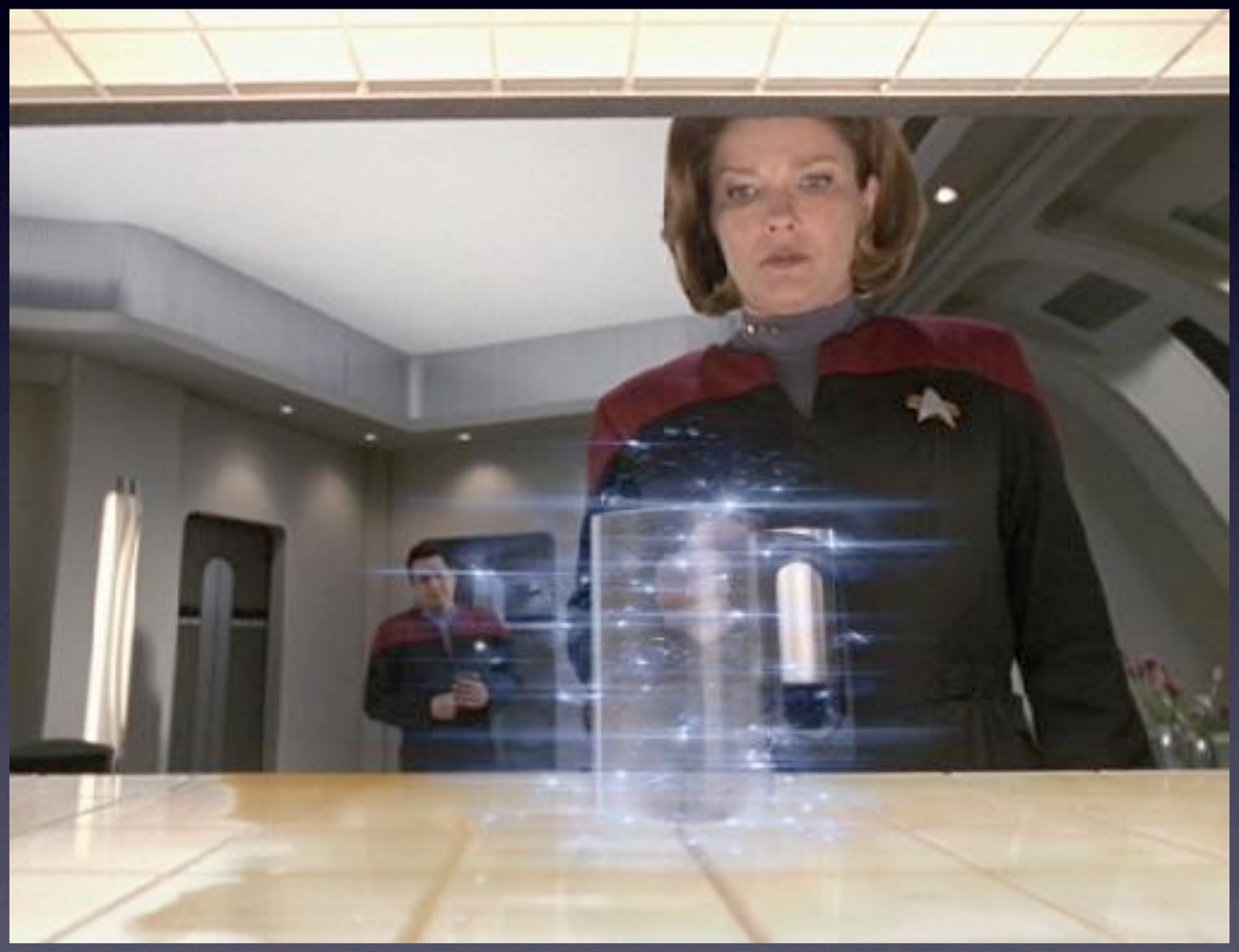
HeatSync Labs

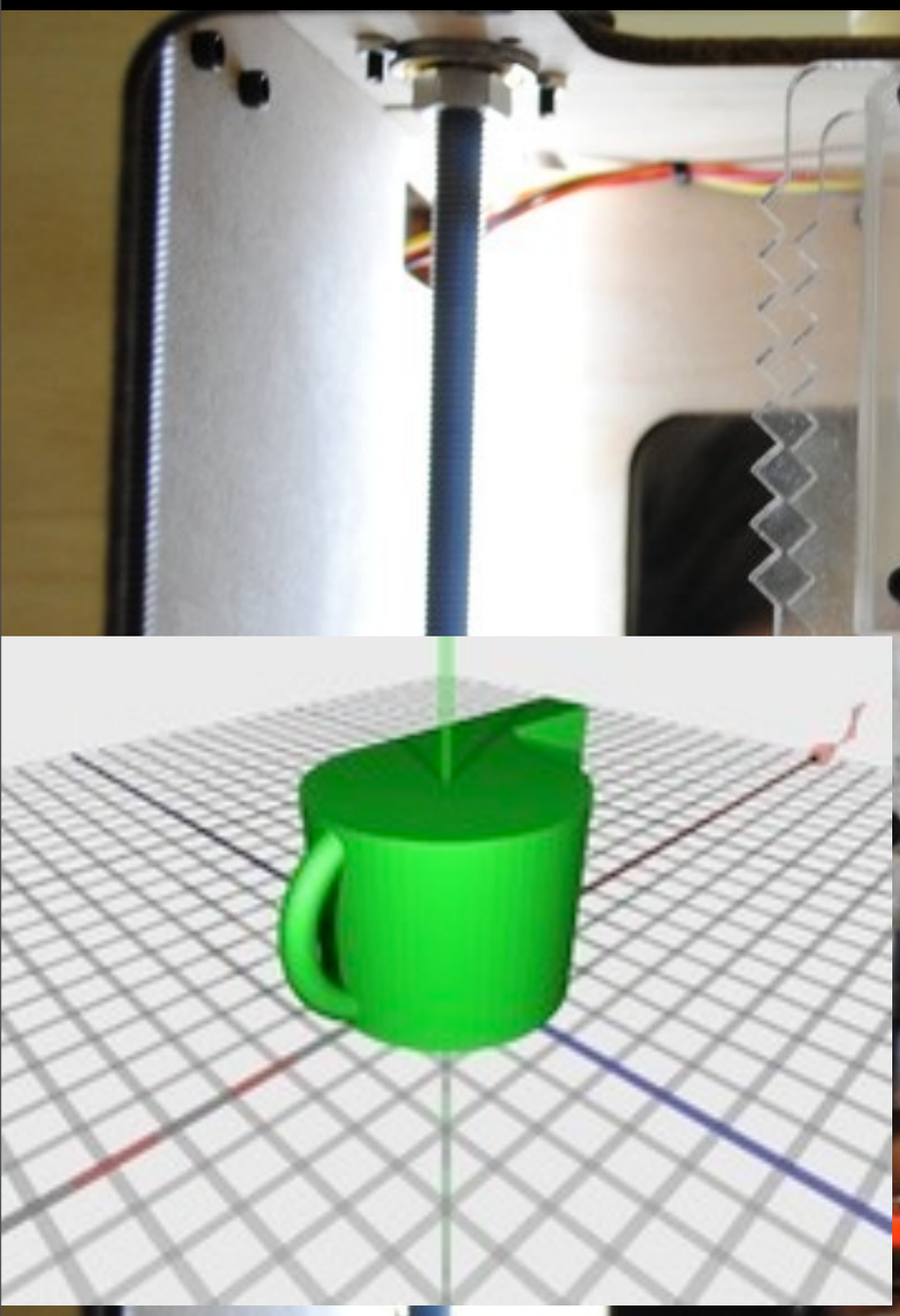
Arizona's Hacker Space { Est. 2009 }

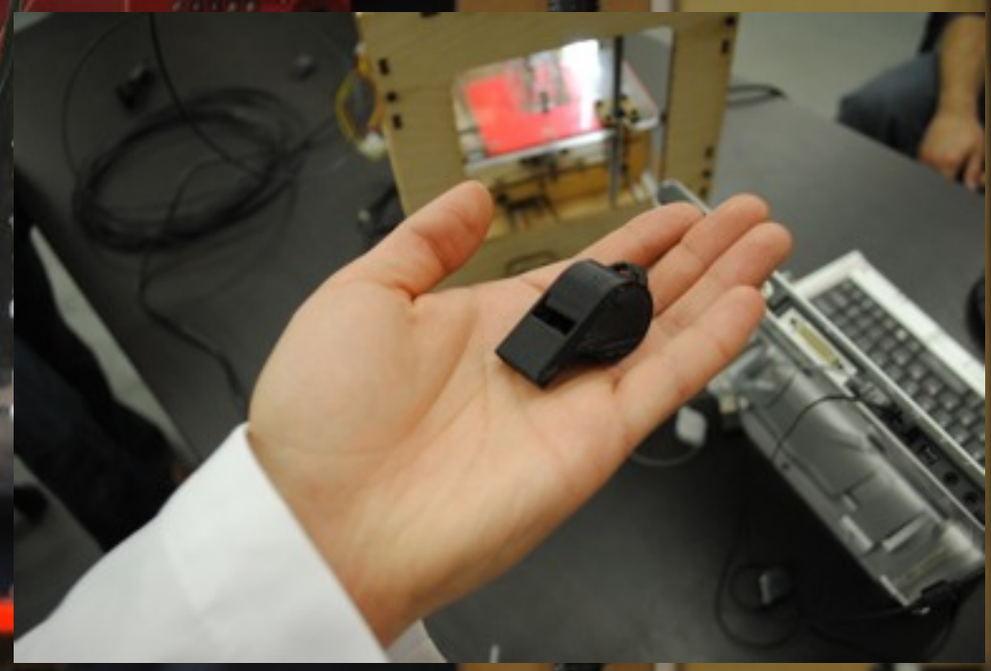


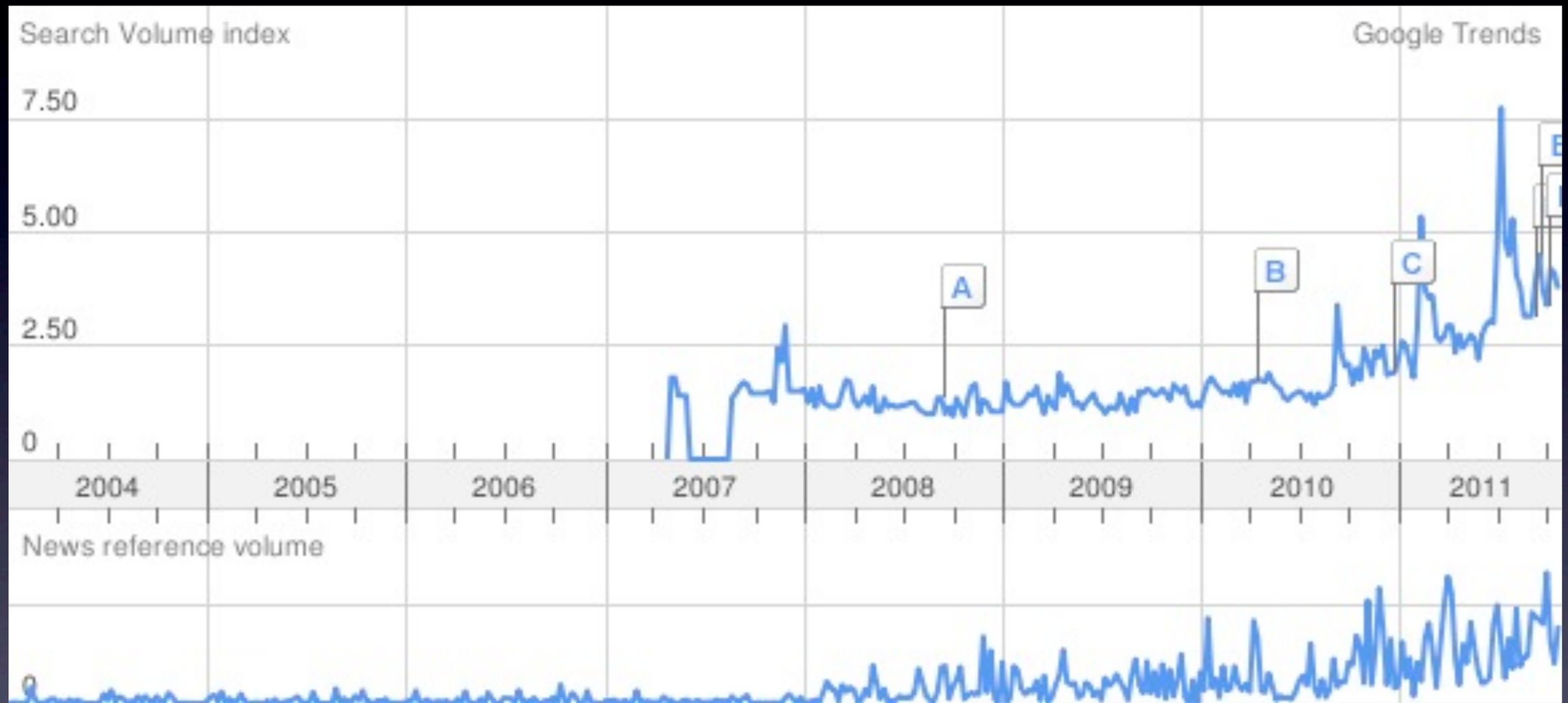

Labs
acker Space
@heatsynclabs


3D Printing





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2006
2007
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2010
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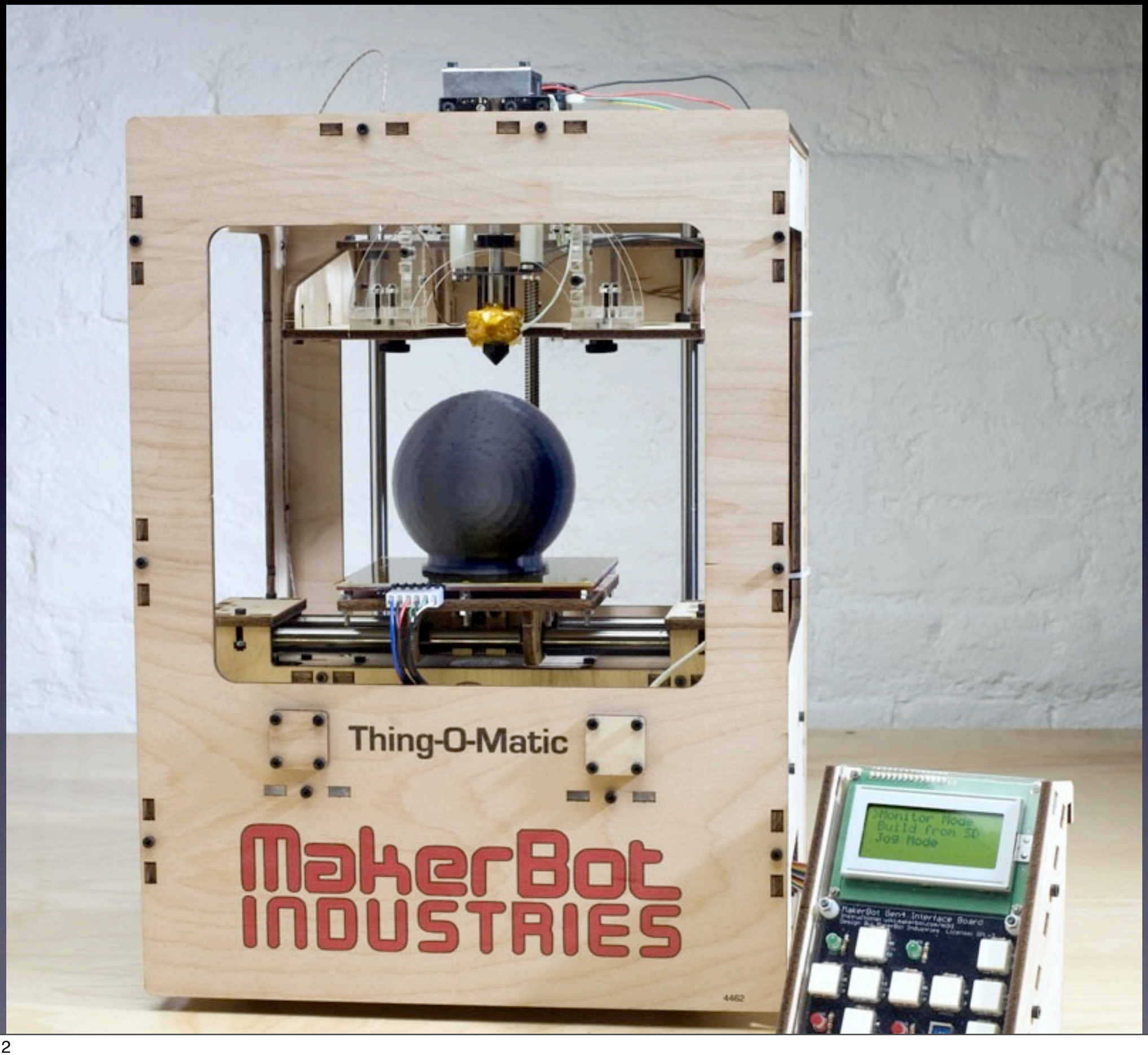
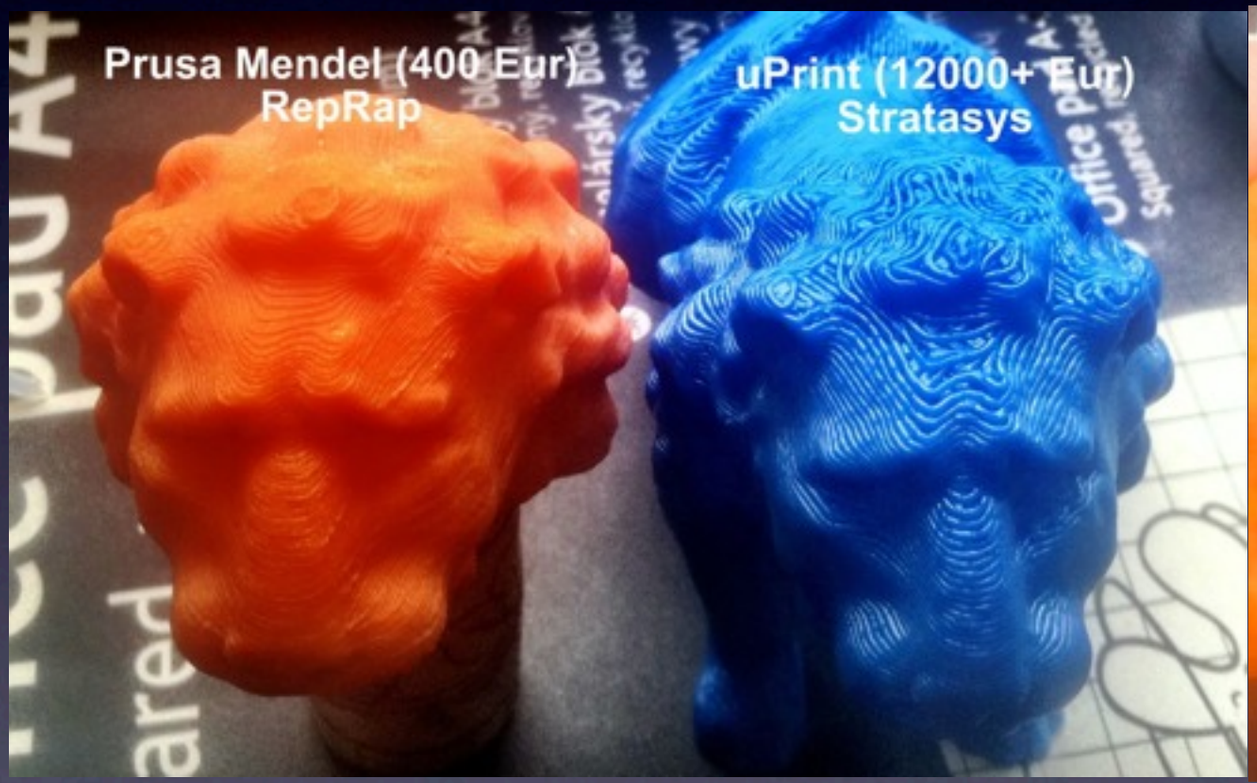
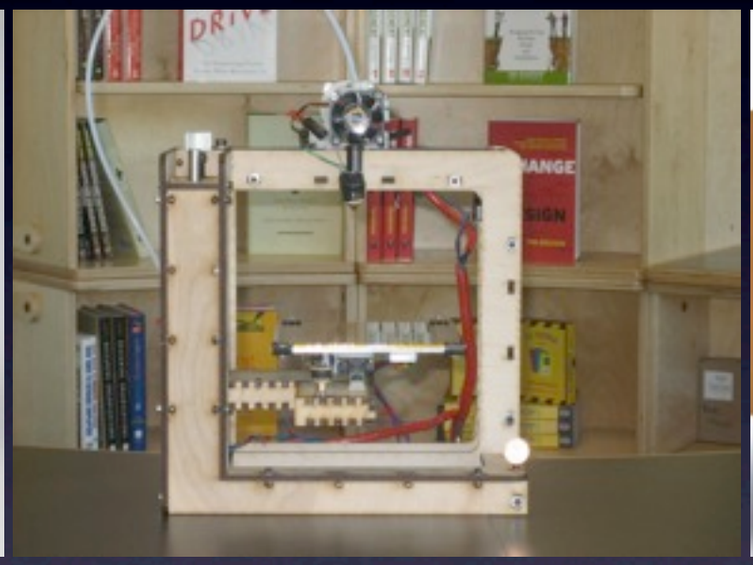
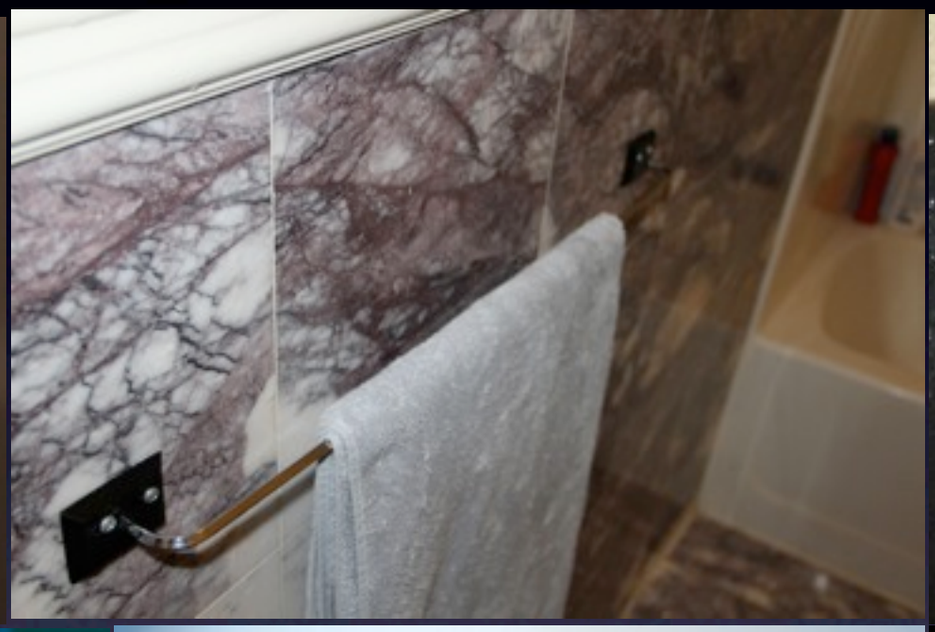

Thing-O-Matic
MakerBot
INDUSTRIES
4462
>Monitor Mode
Build from SD
Jog Mode
MakerBot Gen4 Interface Board


Prusa Mendel (400 Eur)
RepRap
uPrint (12000+ Eur)
Stratasys

Coming to your living room






FRONT
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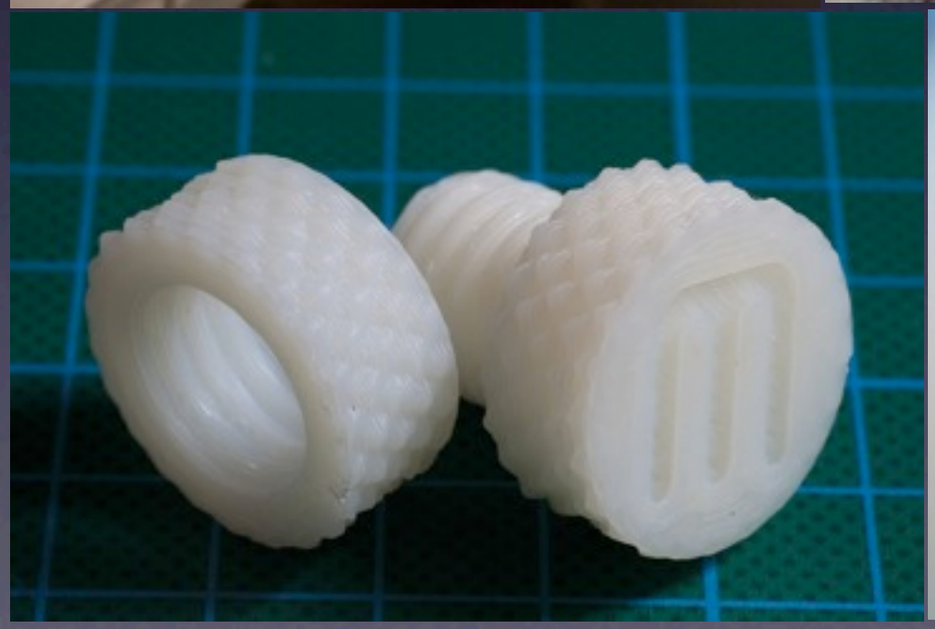
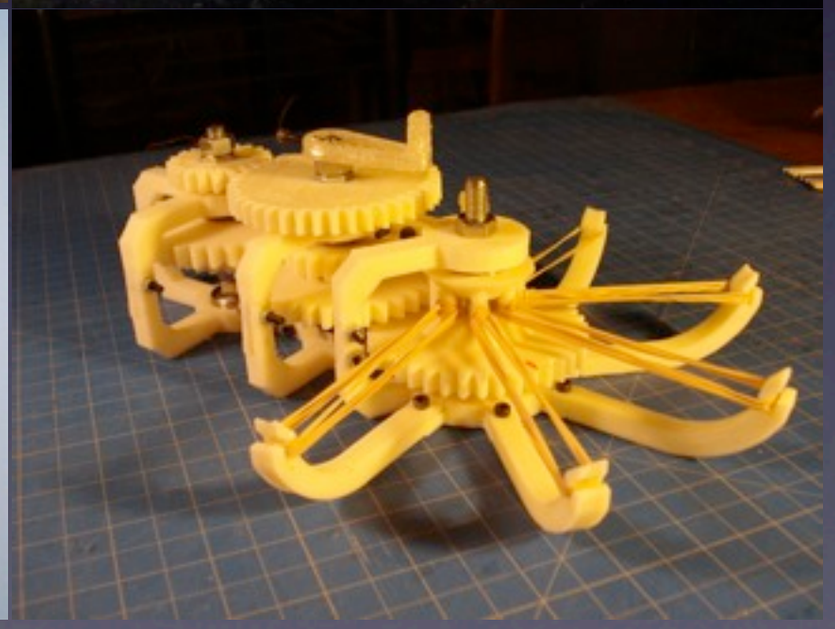
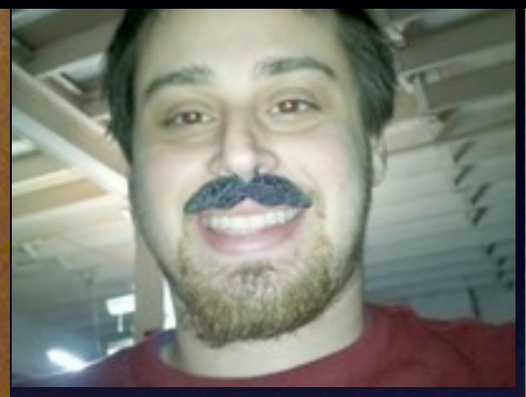
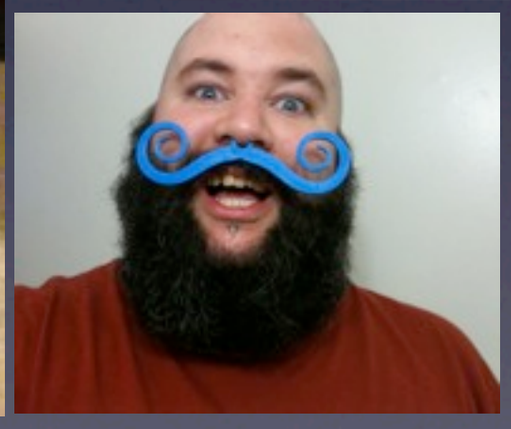








consequences

- everyone is a maker!
- personalized EVERYTHING
- make things impossible with other manufacturing methods
- end of scarcity?

controversies

controversies

- IP Infringement

controversies

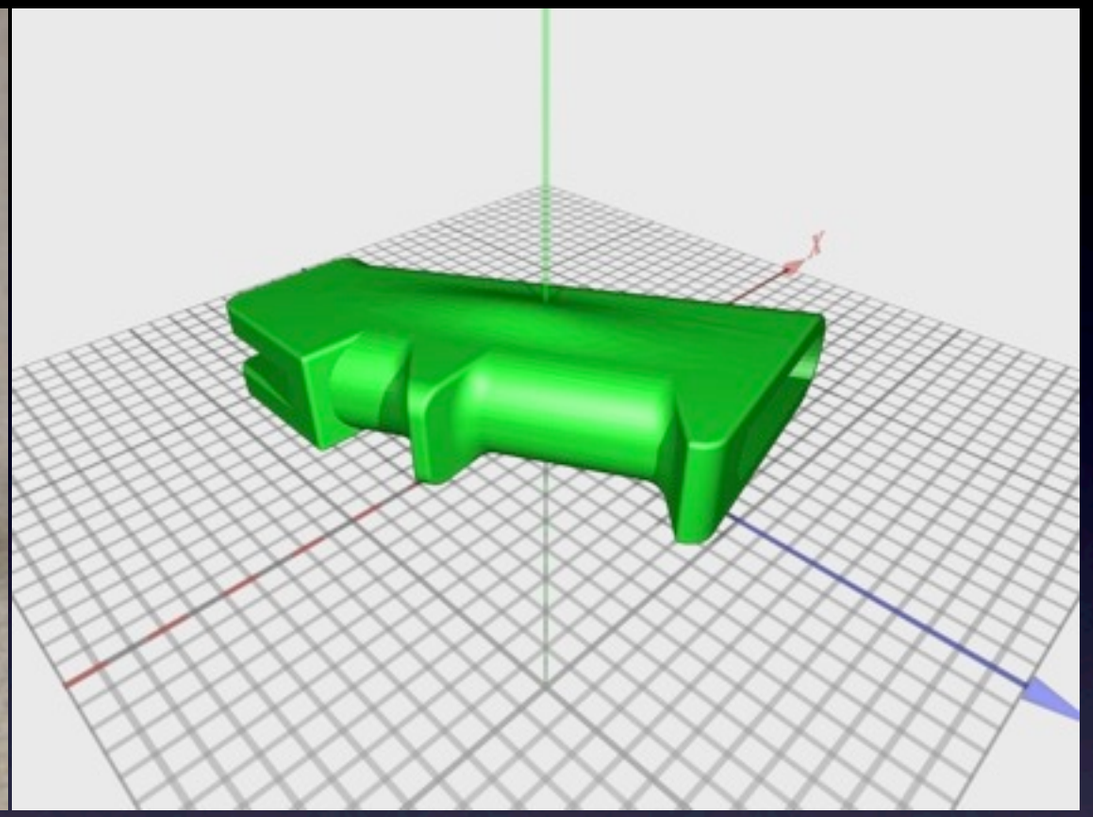
- IP Infringement
- weapons

controversies

- IP Infringement
- weapons
- sex

controversies

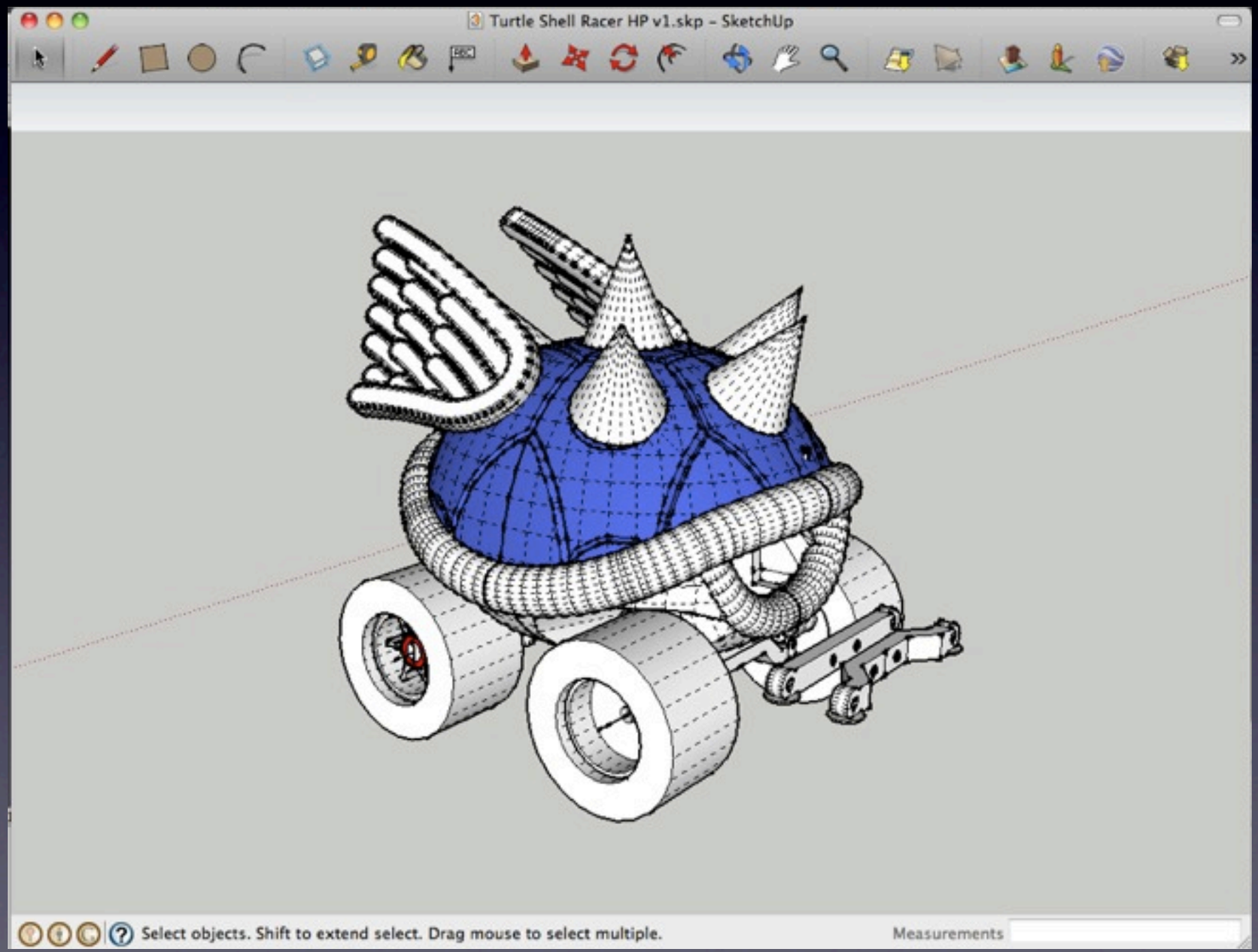
- IP Infringement
- weapons
- sex
- drug paraphernalia



lets go!

- get a model
- print it
- iterate a bunch

sketchup

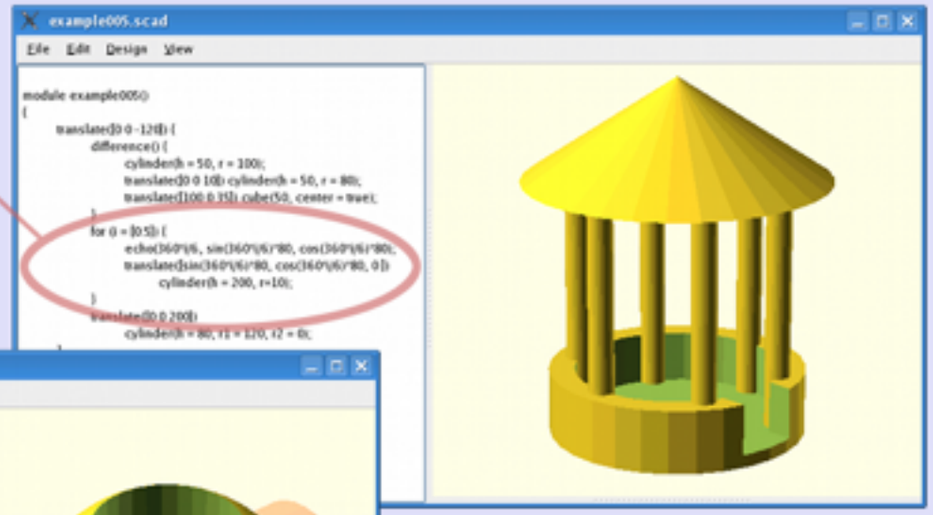

Turtle Shell Racer HP v1.skp - SketchUp
Select objects. Shift to extend select. Drag mouse to select multiple.
Measurements

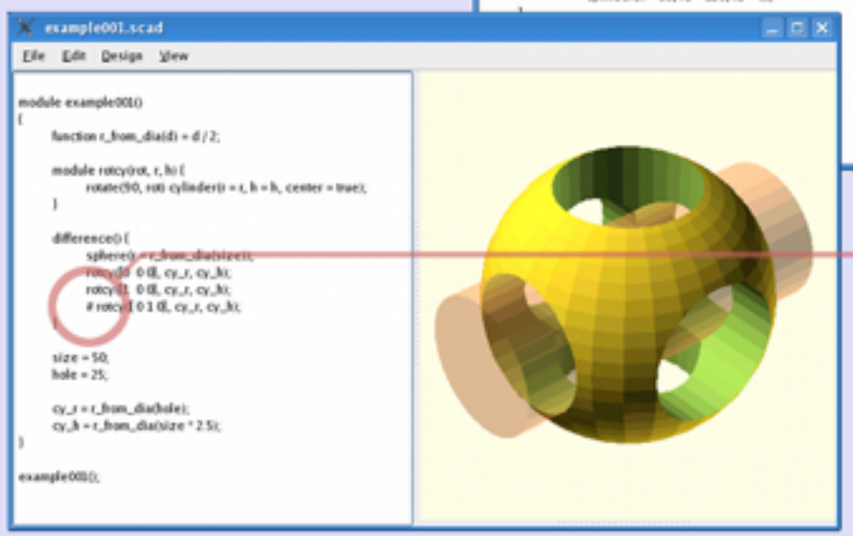
openscad

Pure 3D CSG Flow Examples with OpenSCAD

With OpenSCAD it is possible to construct complex 3D objects by combining 3D primitives such as spheres, cylinders, cones and cubes using the CSG operations (aka boolean operations) to unions, differences and intersections. Advanced control constructs such as submodules, loops and conditions and the use of arithmetical expressions easy the design of larger 3D objects. Special statements (such as the '#' modifier for highlighting a subtree of the design) support the engineer with the creation of more complex designs.

for() loop for creating the pillars in the model. The echo() statement is used to create debug output. In this example trigonometry is used to calculate the pillar positions, but it would also have been possible to use the simpler rotate() statement.

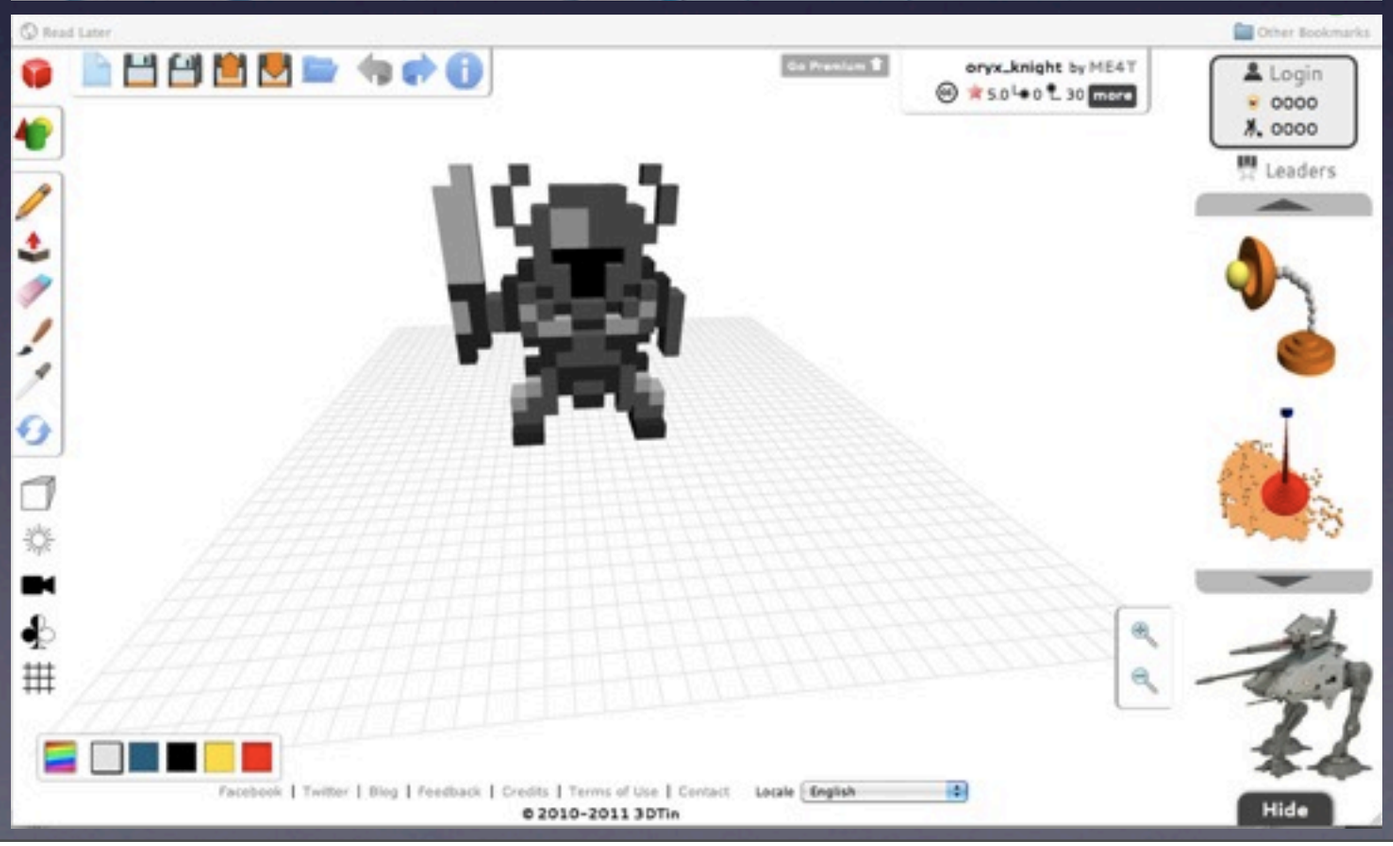




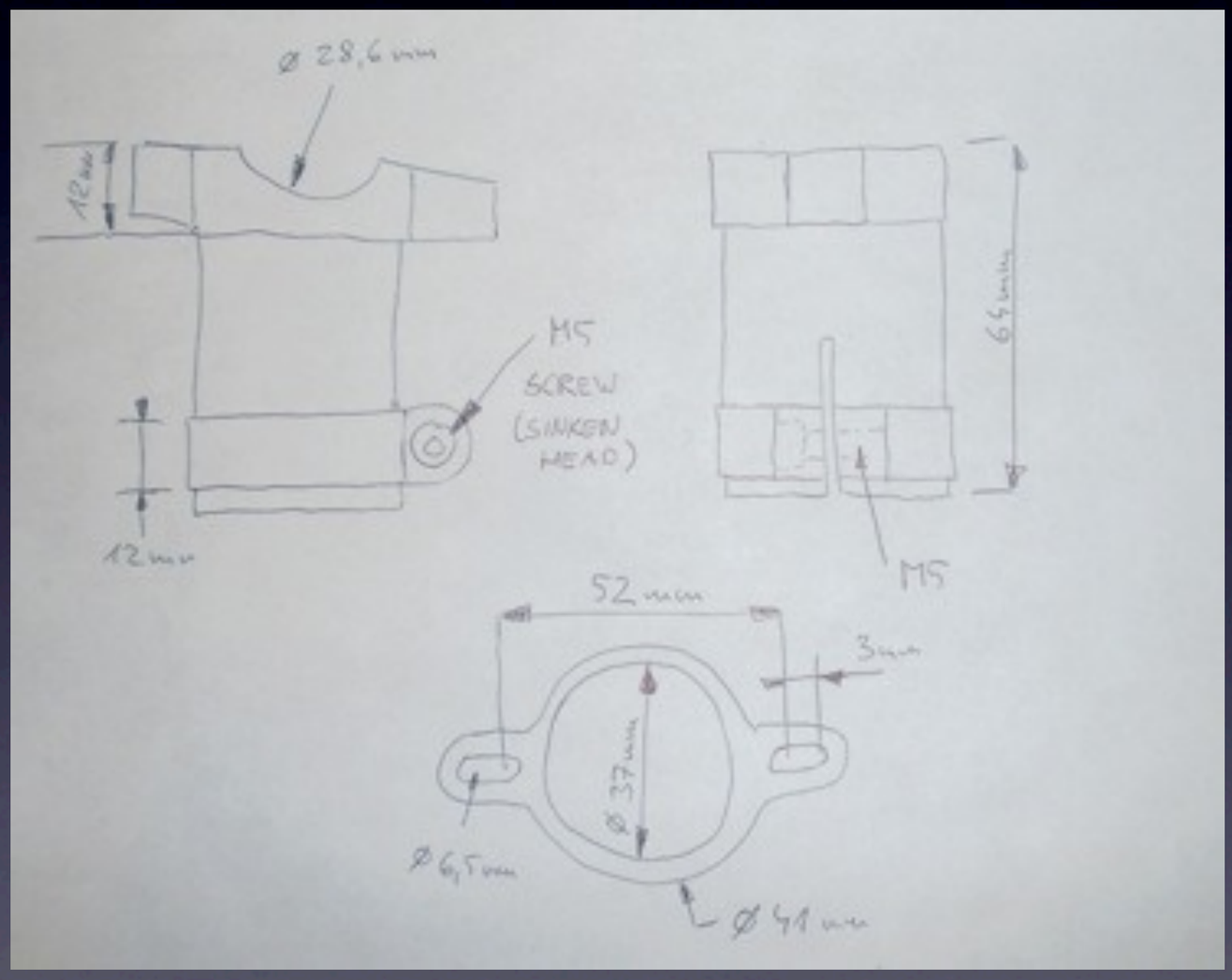
The # modifier can be used to debug designs. A subtree marked with that modifier is drawn in transparent pink in the design preview in addition to the normal rendering process. In this case that subtree is a cylinder that is subtracted from the design and would normally be invisible.

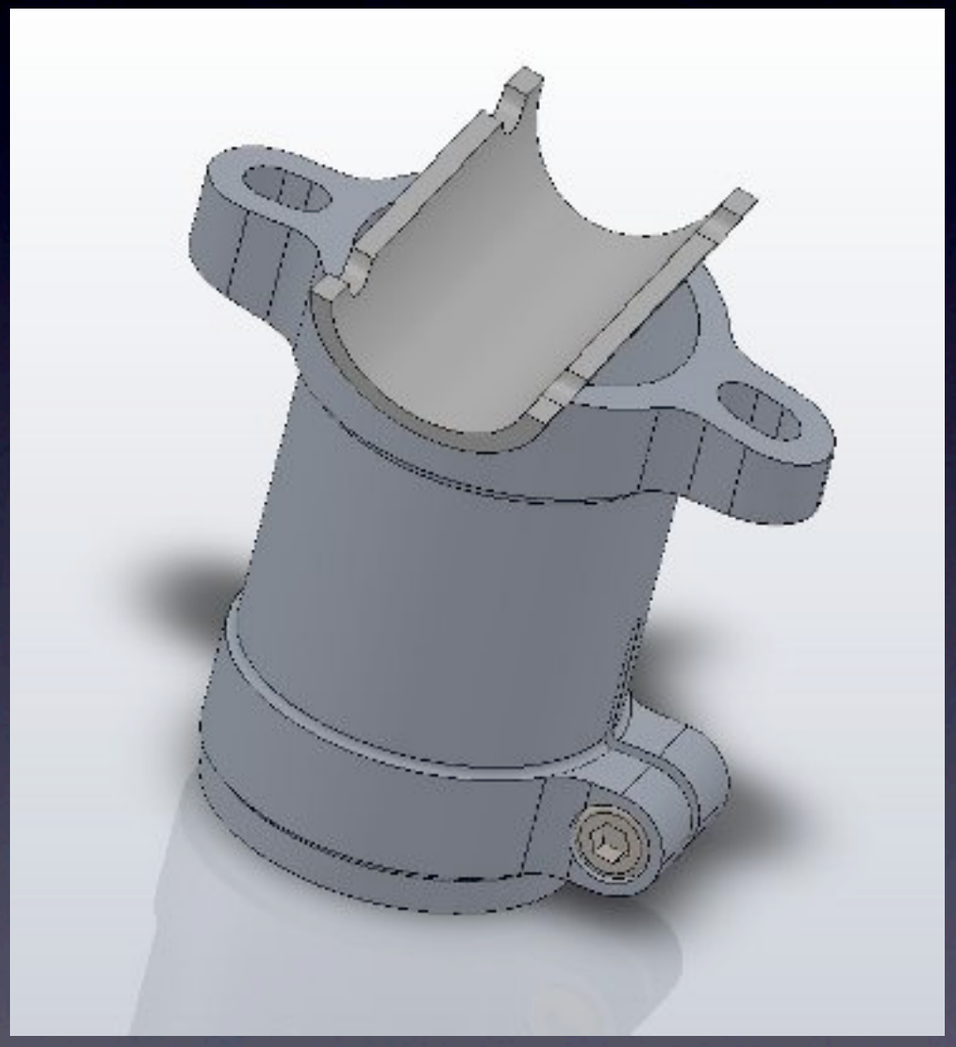
http://openscad.org

tinkercad / 3dtin



i.materialise
sketch to 3d





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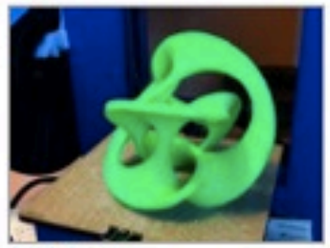
3D Knot
By: benalish 42 minutes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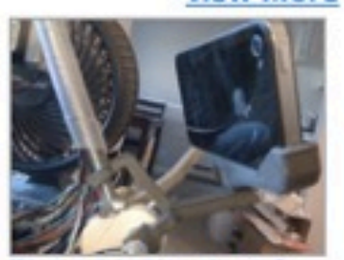
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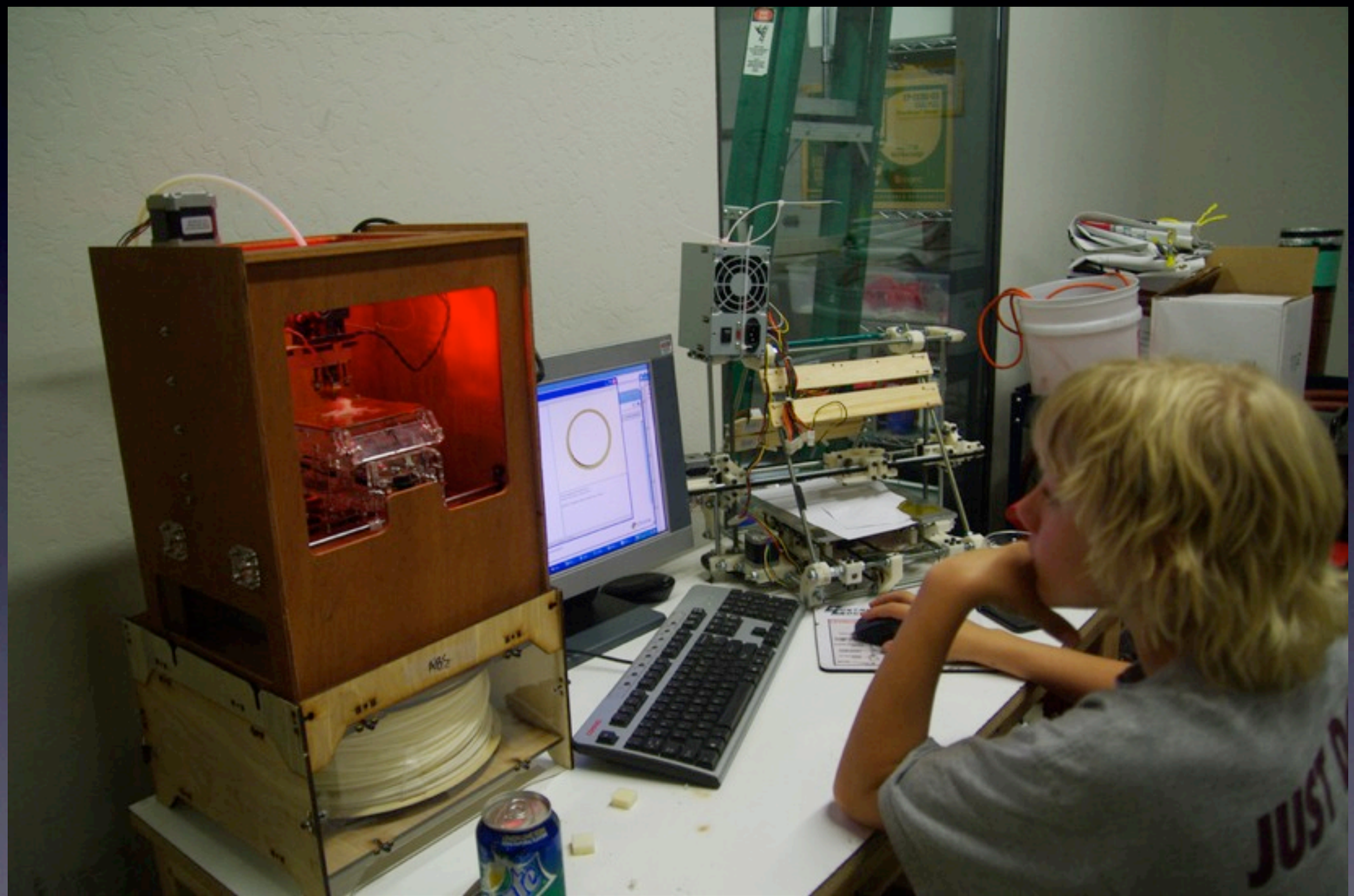
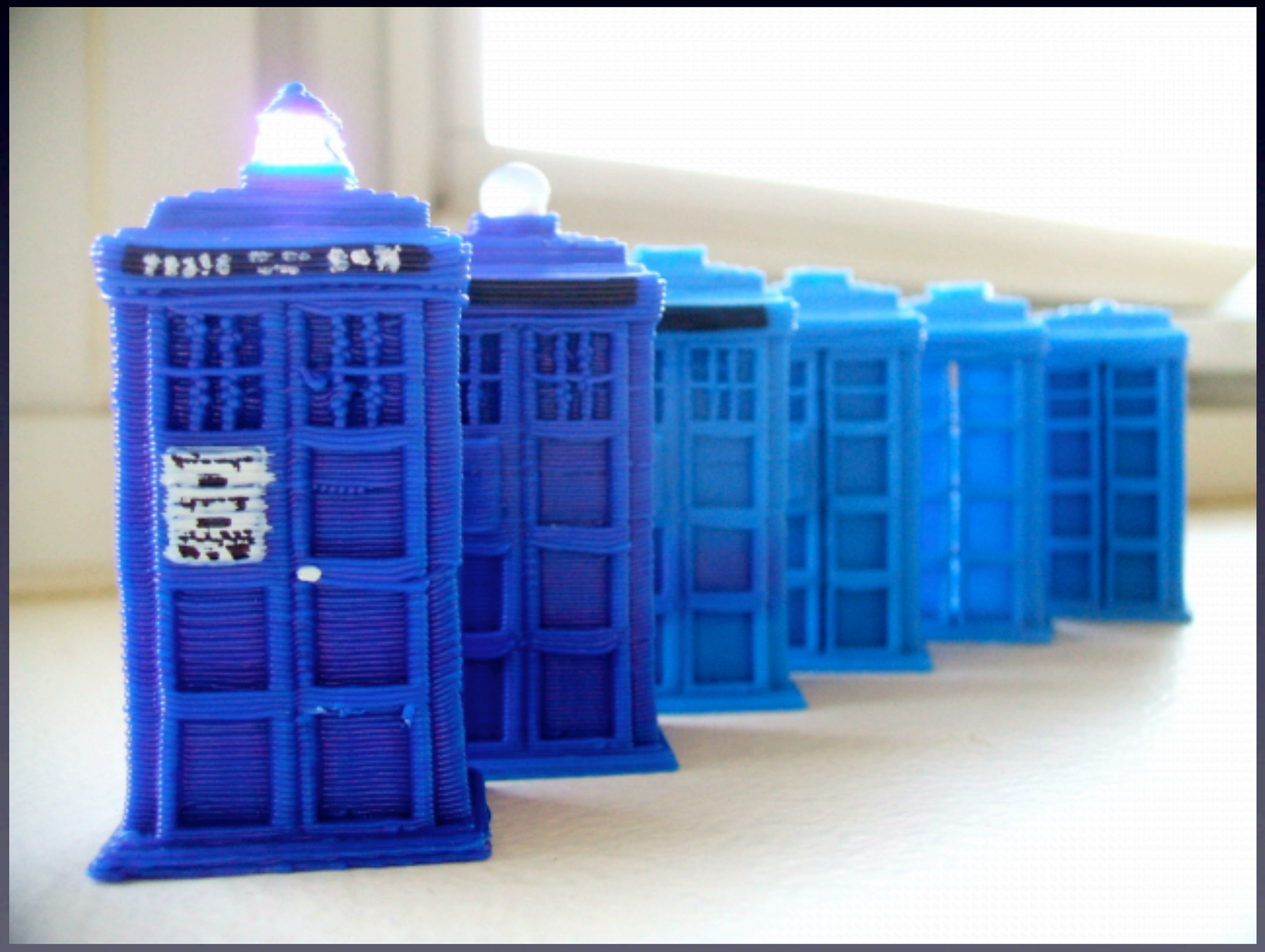


iterate



be a part of the future!

- Third Wednesday @heatsynclabs
- Or any M-F 7p-10p @heatsynclabs
- reprap.tumblr.com is my 3d printing blog

links

- Industry blog - Fabaloo.com
- Legal issues - http://www.publicknowledge.org/files/docs/3DPrintingPaperPublicKnowledge.pdf It will be awesome if they don't screw it up
- Buy a kit! - makerbot.com

discussion