3D printing for topology

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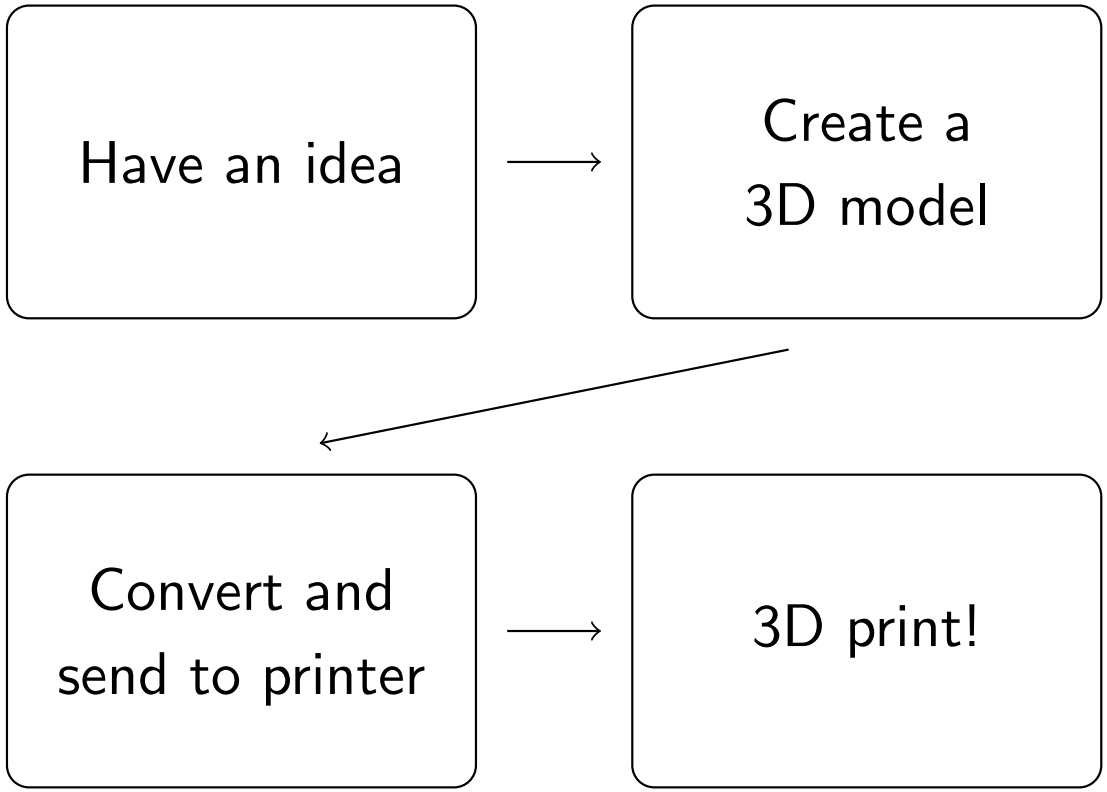
Outline

What we will cover in this talk:

- The whole process to 3D print.
- Overview of 3D modeling software
- Converting .stl files to .gcode
- My list of suggested 3D printers
- Example models and prints.

The whole process



3D modeling software

I can do very little to help you get ideas. So lets go over some 3D modeling programs.

- **Tinkercad** - Run in web browser, very basic, free
- **Blender** - High end rendering and can be used for video, free
- **OpenSCAD** - Completely code based, free
- **Mathematica** - Not free, but we probably all have it
- **Rhino** - Very not free, but very polished and excellent tools

3D modeling software

Disclaimer: Every program has a learning curve. Don't expect to produce amazing models without putting in time.

But there is hope! Everyone struggles with these programs at first so there are an abundance of tutorials online for each one.

Go find them. Ask me if you have very specific math and 3D modeling questions.

So you have a model... Now what?

Most of these programs will save in a specific file type for that program. But we need a file that all 3D printers take in.

Usually, this is called a STereoLithography file with extension .stl

.stl files are piecewise linear approximations of any model you draw which means we turn them into little triangles.

All the 3D modeling programs I mentioned can export .stl files.

.stl to .gcode

But this still isn't what the printers read. We need a file to direct the motors of the printer.

This process is called *slicing*.

Cura, a free program, is the standard program for converting .stl files to .gcode.

Also, **Slic3r** is another common program you might want to use.

But some printers come with proprietary software that does this.

Now Print!

Ready to finally print. You need a printer.

Here is my list, based on price, quality, and value.

1. **Fabrikator Mini** - $179, small print area, backordered from Europe
2. **Wanhao Duplicator I3 V2** - $400, much larger print area
3. **Flashforge Creator Pro** - $1100 More reliable, fancier extruder
4. **Makergear M2** - $1825 Best hobbyist model on the market right now

Now Print!

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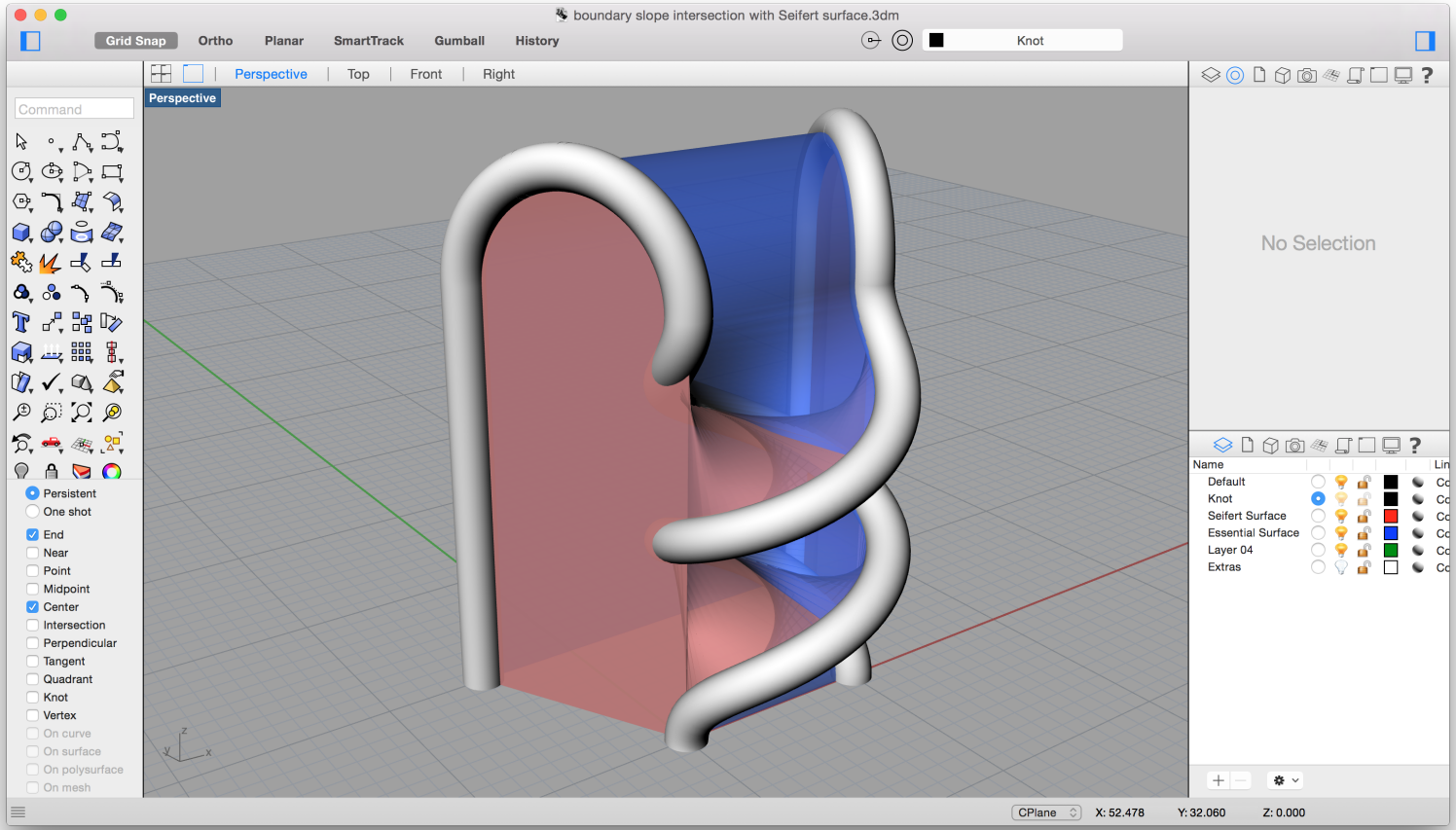
Movie of a 3D printer working.

What good is this to topology?

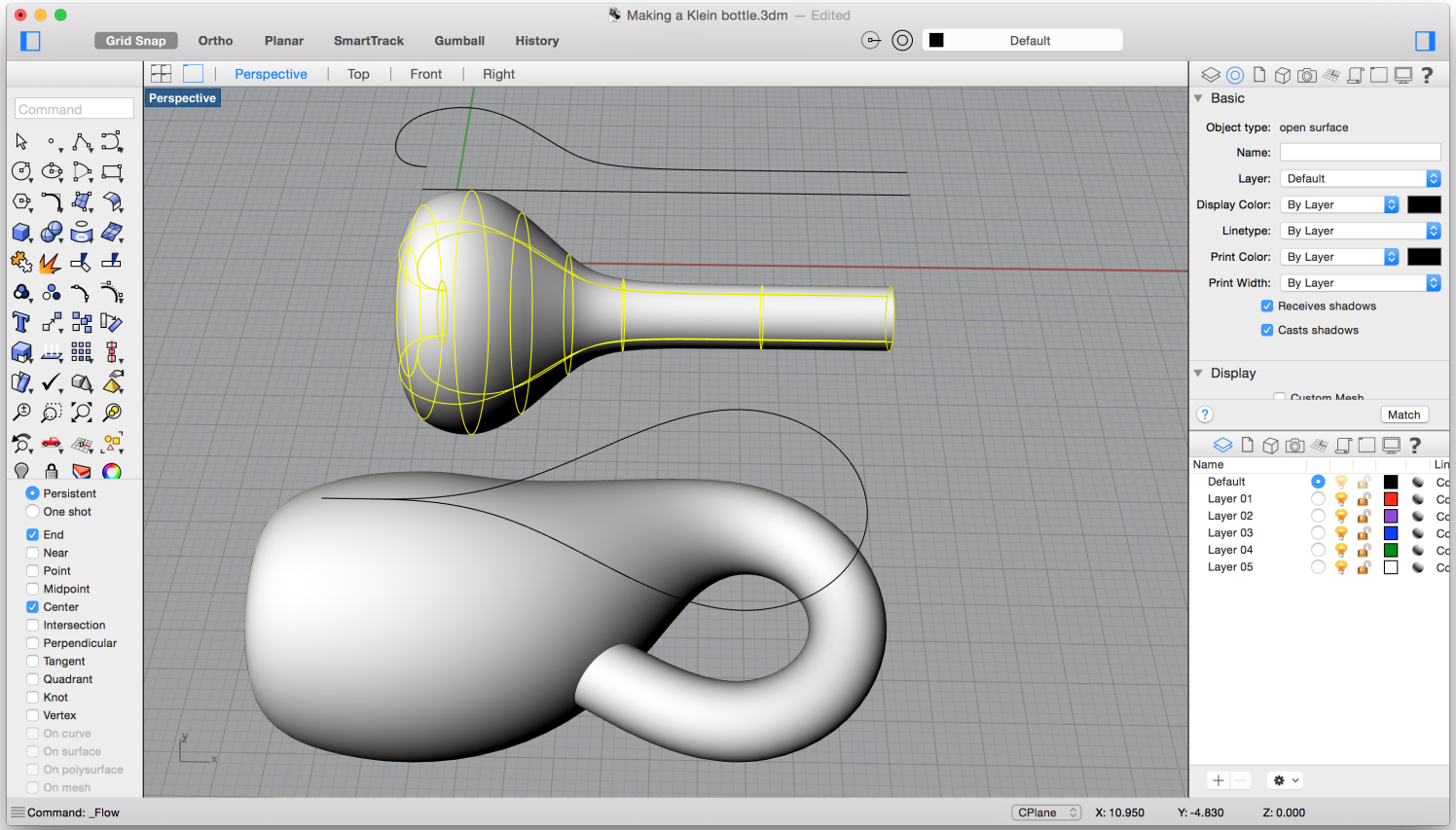
Question: So what? Why isn't this just a little fad that will fade away?

Answer: Cause this!

What good is this to topology?



What good is this to topology?



Thank you!