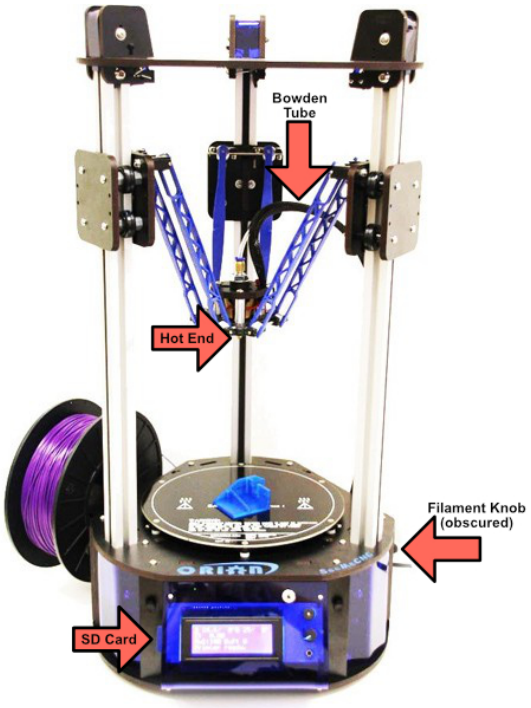
3D Printer Certification Class

Make Salt Lake

Overview

1. The Delta Orion (our printer)
2. 3 stages of digital processing
3. Safety and damage avoidance
4. Plastics (ABS, PLA) and how to switch types & colors
5. Our printer configuration files: where to get them, how to use them
6. Printing from an SD card
7. Common mistakes and how to recognize what went wrong with a print
8. Quickstart: Steps to 3D Print Something

The Delta Orion (our printer)



SeeMeCNC Orion Delta Features:

- 6" diameter and 9" tall build volume
- Prints from an SD Card (no need to keep your laptop plugged in to it while it prints)
- Hot end has a 0.5mm nozzle
- Heated bed (so you can print in ABS plastic in addition to PLA)

This is our printer (http://www.seemecnc.com/products/orion-delta-3d-printer): the SeeMeCNC Orion Delta.

The 3 stages of digital processing

1. Modeling
    - OpenSCAD (http://www.openscad.org/)
    - Moment of Inspiration 3D (http://moi3d.com/)
2. Slicing
    - Slic3r (http://slic3r.org/)
3. G-Code

Safety and damage avoidance

- Some G-Codes can smash the glass
- If something breaks, email the Make Salt Lake Google group (http://bit.ly/makeslc)

Common mistakes and how to recognize what went wrong with a print

- See the RepRap wiki's Troubleshooting Guide (http://reprap.org/wiki/Print_Troubleshooting_Pictorial_Guide)
- See also Extreme Cases (just for fun): http://twistedsifter.com/2013/08/when-3d-printing-goes-wrong/

Plastics (ABS, PLA) and how to switch types & colors

See this Comparison Chart (http://www.absplastic.eu/pla-vs-abs-plastic-pros-cons/)

- PLA: pleasant smell, made from corn, shiny, a little less sturdy than ABS
- ABS: smelly, made from oil, higher melting point, requires heated build surface, longer lifespan

Switching Filament

1. Pre-heat the hot end to ~200° Celsius:

2. Back out the current filament using the filament knob at the base of the Orion Delta
3. Once the filament is out, get the end of the new filament ready to insert in to the bowden tube
4. Press and hold the filament release lever as you feed the new filament in
5. Manually turn the filament knob at the base of the Orion delta to push the new filament in and keep going until the new color pushes out the old color and the new color shows up as a thin extruded string out of the hot end

Printing from an SD card

Having an SD Card on the 3D printer means you won't need to connect your computer all the while the 3D printer does its thing.

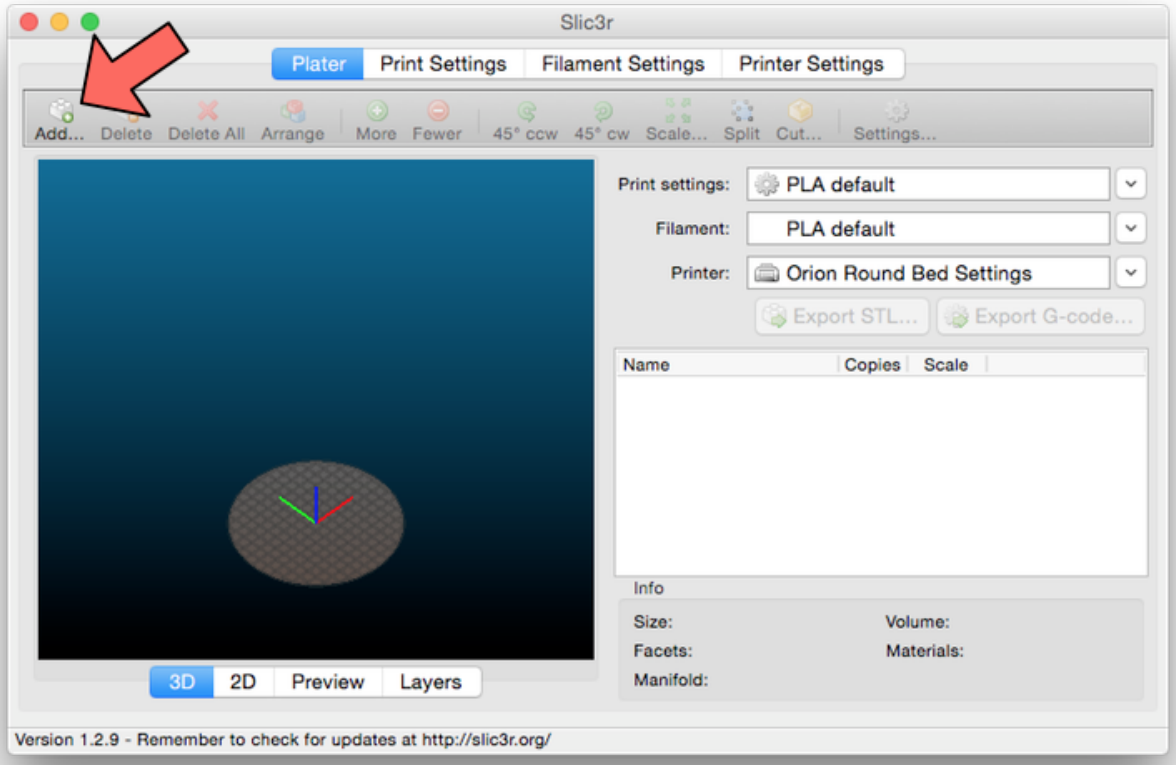
- Copy files to your own folder on the public use SD Card(s)
- Insert the SD Card with the front of the card facing **away** from you
- Using the panel knob, select the folder & file you'd like to print

Our printer configuration files: where to get them, how to use them

- See Videos and Useful Links from our local Jesse Gomez (https://makesaltlake.org/tools/#rescue-tab-3d-printers)
- See slic3r settings (https://github.com/luxnovalabs/orion-printer-settings)

Quickstart: Steps to 3D Print Something

1. Create a 3D model (see 3 Stages for software suggestions) and export it as an STL file (e.g. *mypart.stl*)
2. Open Slic3r and load your part onto the plater by clicking "Add..." or dragging the STL file to Slic3r:



3. Using the *Print Settings* drop-down, choose the speed/quality of your print
4. Using the *Filament* drop-down, choose the type of plastic (PLA or ABS) that you'll be using for this print
5. (the *Printer* drop-down menu should always be "Orion Round Bed Settings")
6. Select "Export G-code" and save the gcode file to the SD Card (in your own folder)
7. Turn on the Orion Delta 3D Printer
8. [Optional] Switch filament type and/or color (see Plastics for directions)
9. Insert the SD Card (see SD Card for instructions) into the Orion Delta
10. Select your file, and it will print (it may take some time to warm up--you can watch the temperature rise to the target temperature on the status panel)
