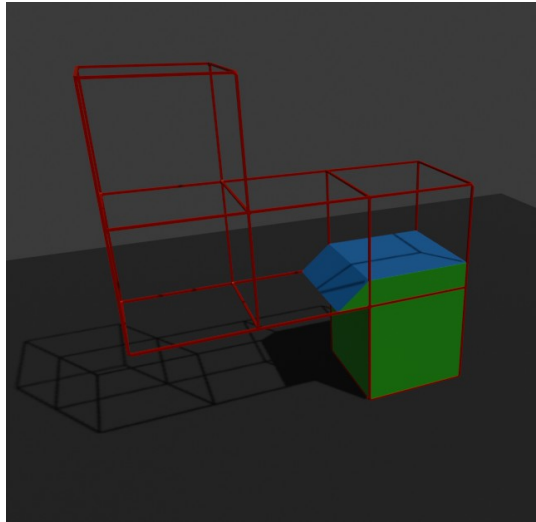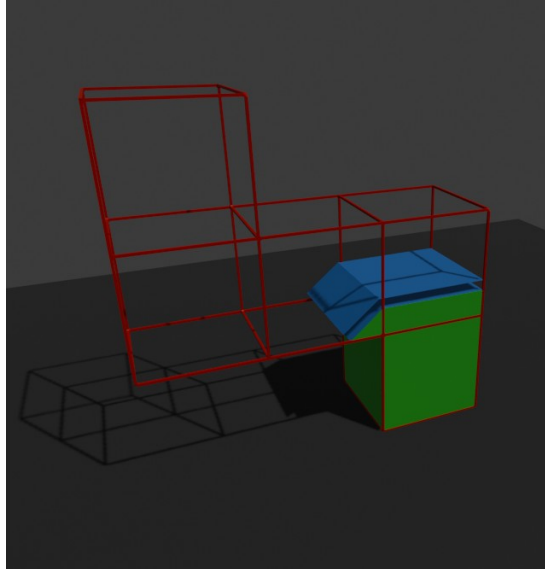# Generalized Conical Slicing for Printing Unsupported Overhangs

Given a model to print (red)
An already printed part (green)
And the previosly printed layer (blue)

Step 1:
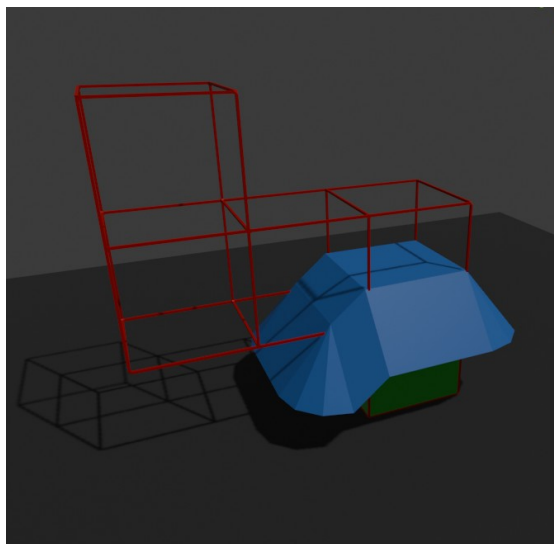Displace the previously printed layer by the layer height along it's surface normals

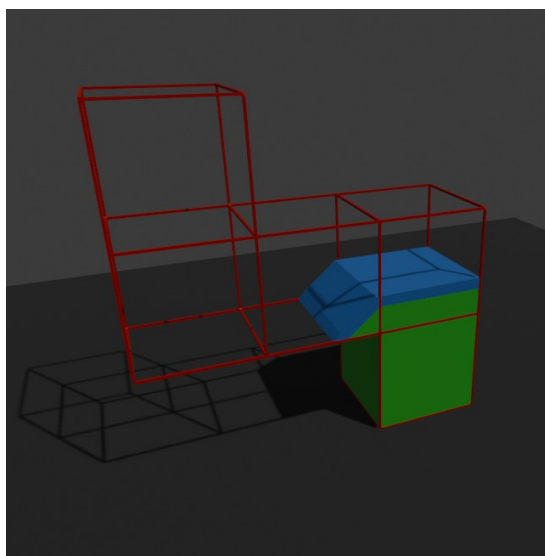You can probably apply smoothing to the surface at this point.

Step 2:
Minnowsky Sum with a cone of your hotends "safe" angle

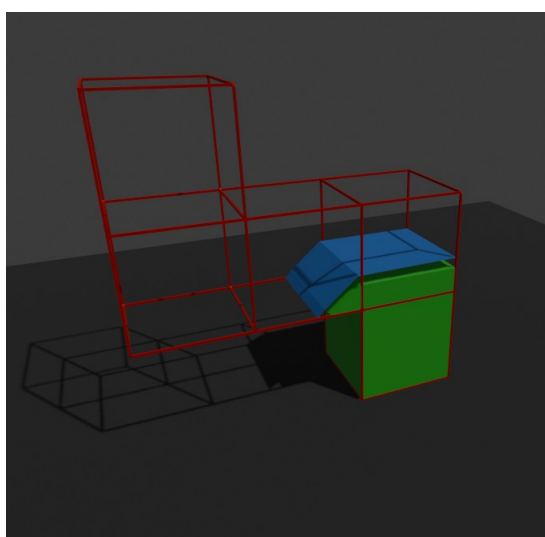

Step 3:
Clamp to model bounds and subtract already printed parts.

This is the volume that you have to fill with plastic


Step 4:
Take the top surface

This is the "surface" that the tip of the extruder travels along.

Results:
- Seems to work OK.
- Has issues with really thin layers as it tries to get the top surface exactly in line with the model.
  -> And other sub-layer details. Any top surface becomes part of a print plane.
- Some minor geometry issues in this implementation (blender geometry nodes)
- Really slow due to lots of geometry boolean operations
- Layer lines everywhere – on the top etc
- The same layer can be at vastly different heights – possible collisions. Particularly if multiple bed contact points
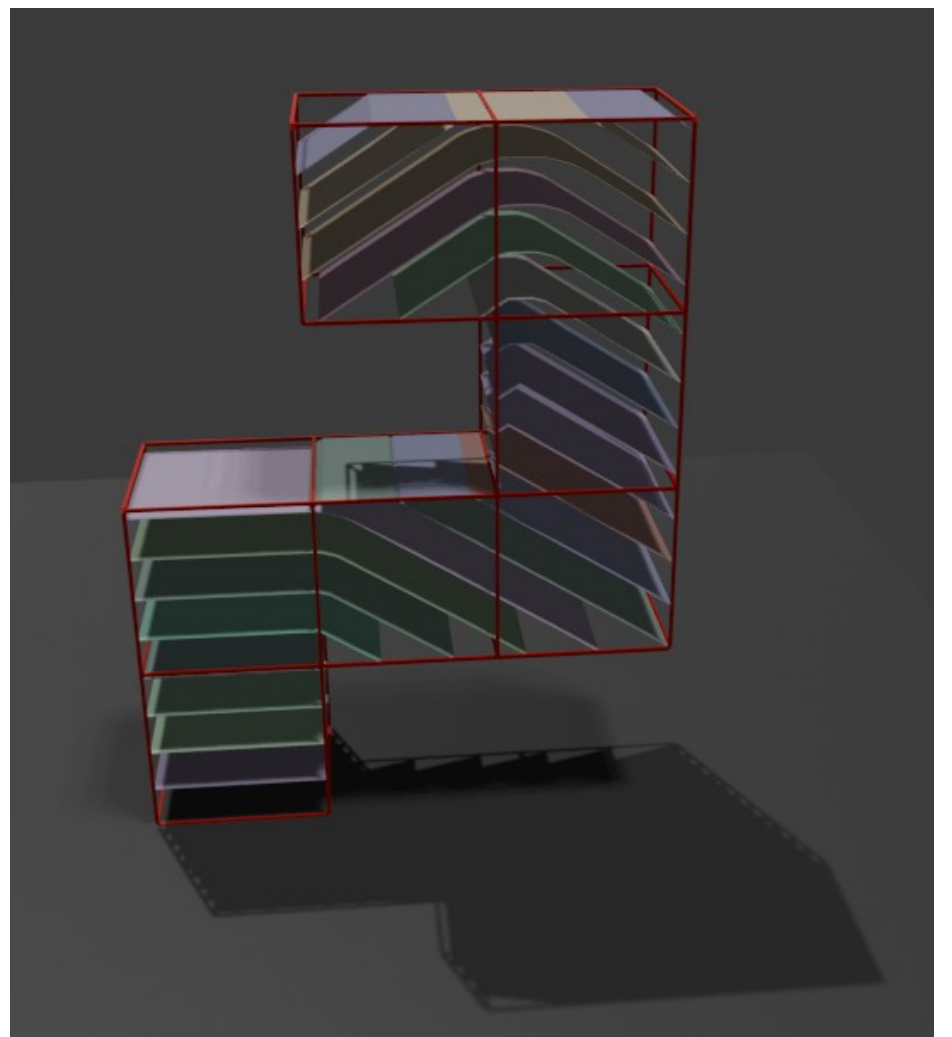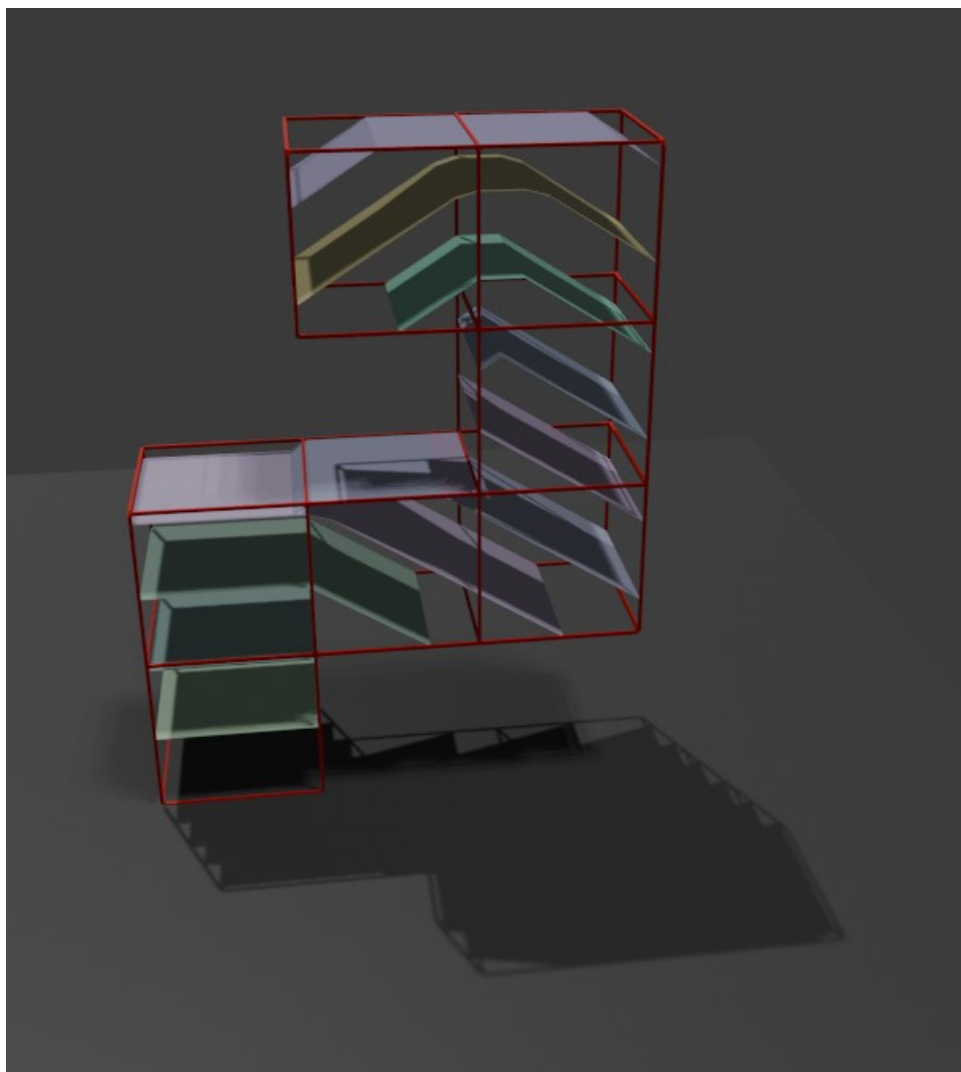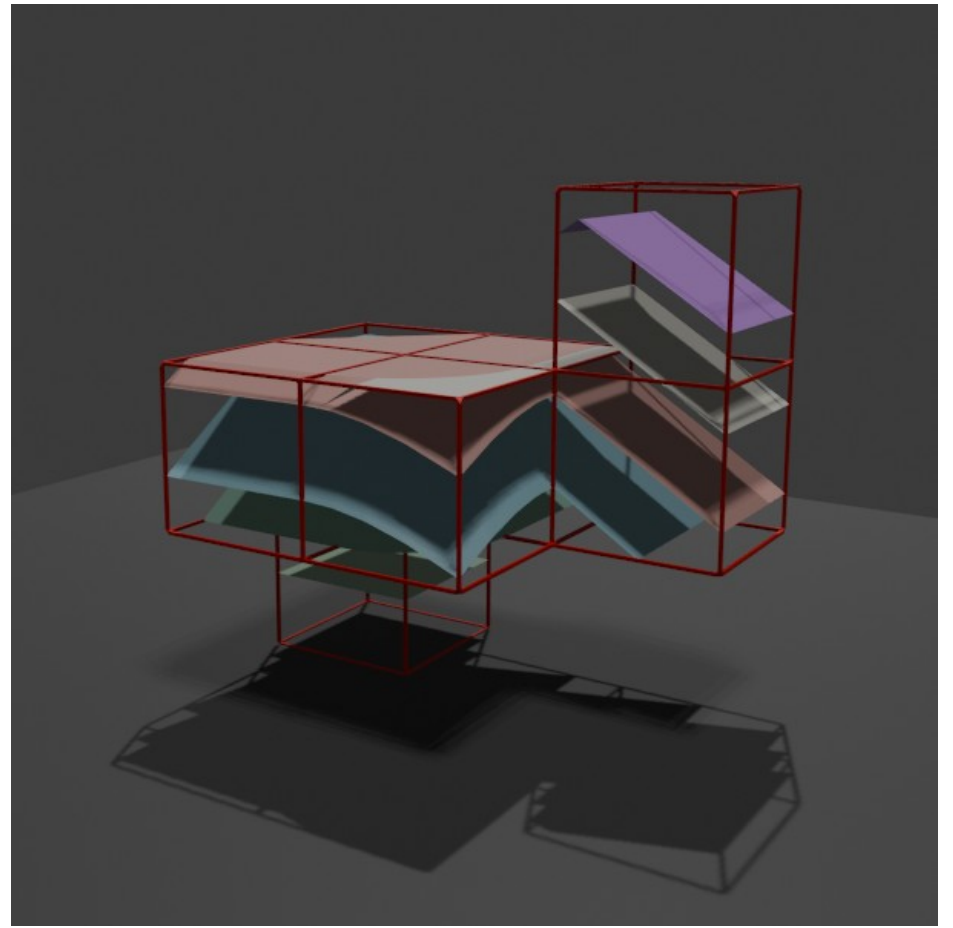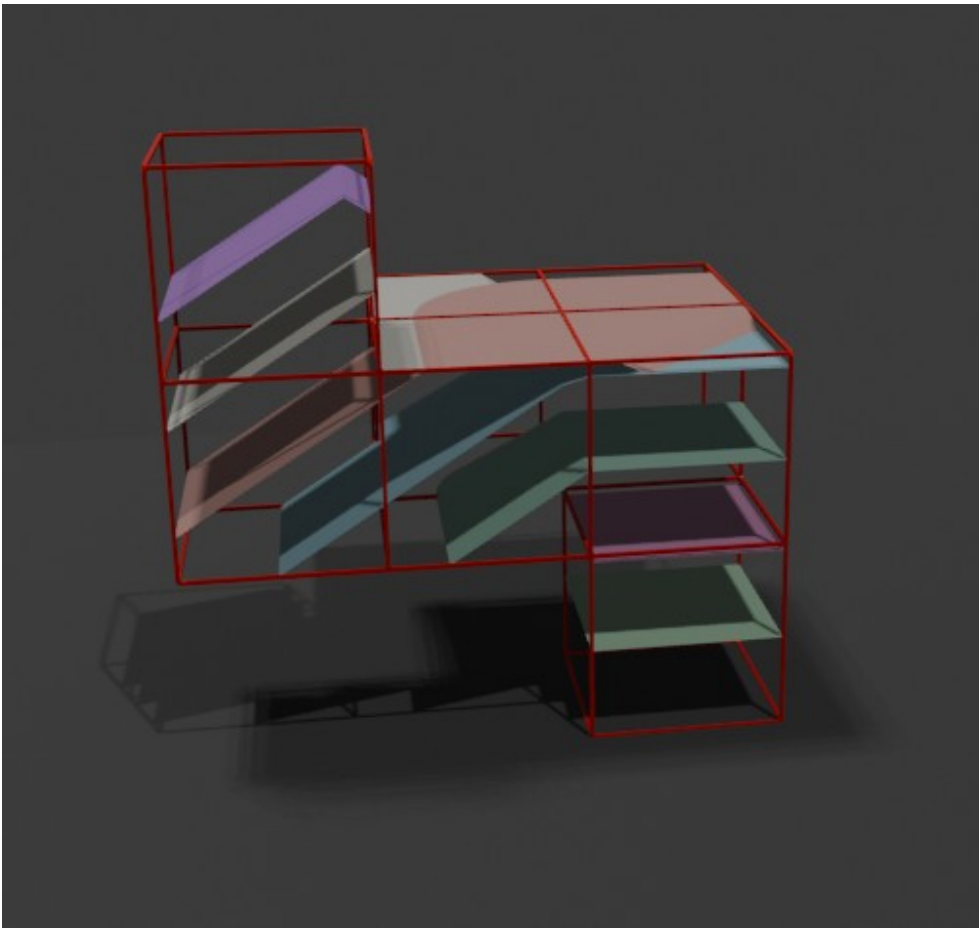
TODO:
- Generate and print a model somehow, probably manually generate slices/contours for these planes
- Find a faster implementation. It feels like there is possibly a non-iterative approach using voroni to determine print "slice" normal? Or some sort of fluid wave-propagation stuff.?
- Reconvergence at different layer heights if multiple points on print bed