



Rapid Prototyping: 3D Printing

ECE 3400 10/15/18

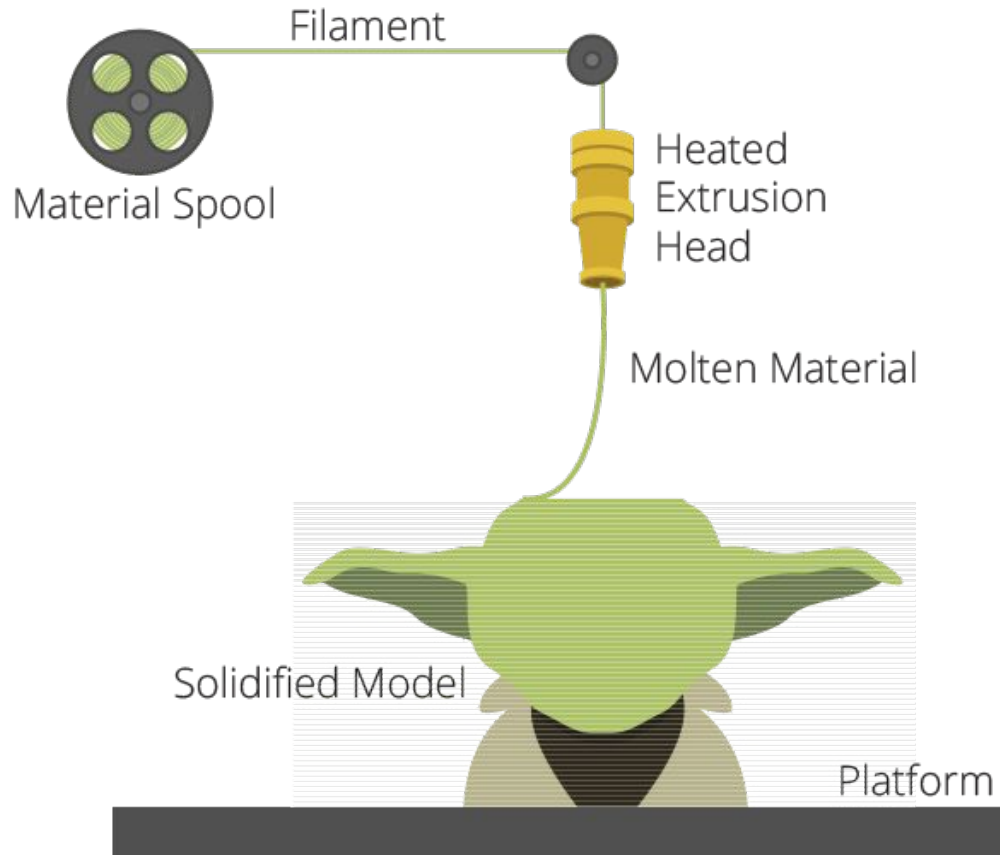


Motivation

- Fast production
- Can quickly iterate
- Produce parts not possible with traditional manufacturing
- Easy



Subtractive Manufacturing (CNC)

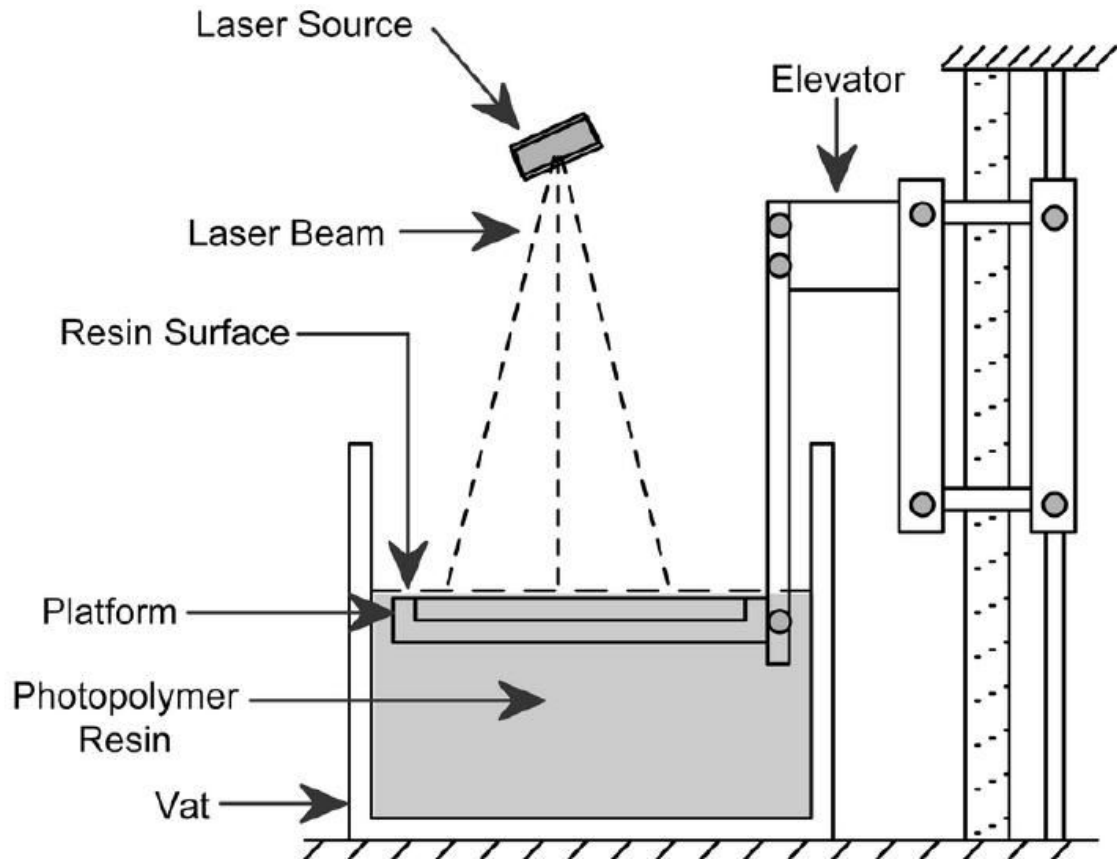


Additive Printing

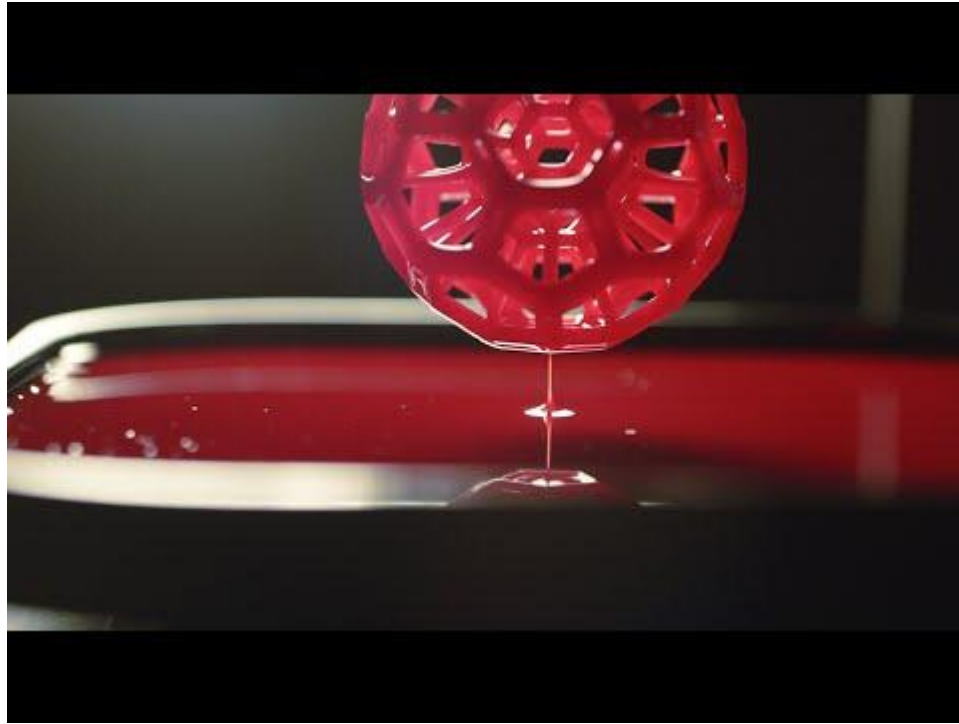


Materials

- PLA (polylactic acid)
 - Safer? Made from sugarcane/cornstarch - Smoother
 - Easier to use - less risk of warping, better sticking to print bed
- ABS (Acrylonitrile Butadiene Styrene)
 - Oil based, melts at higher temps - Stronger!
 - Needs heated bed to prevent warping
- Others:
 - PETG, metals, resins



Stereolithography printing

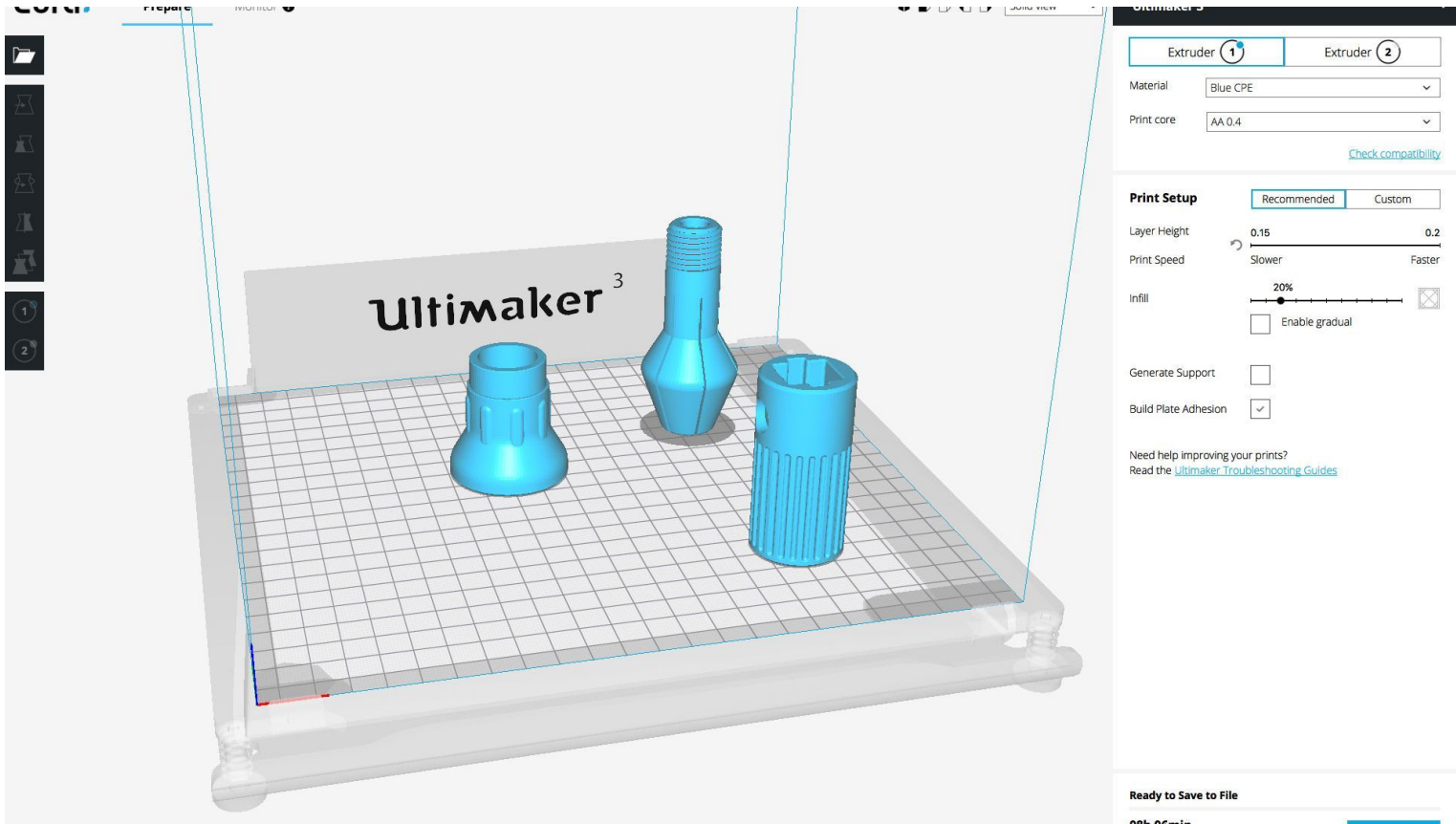


The future!!!

Workflow

- CAD
- STL file (stereolithography)
- Slicer
- Gcode
- Printer

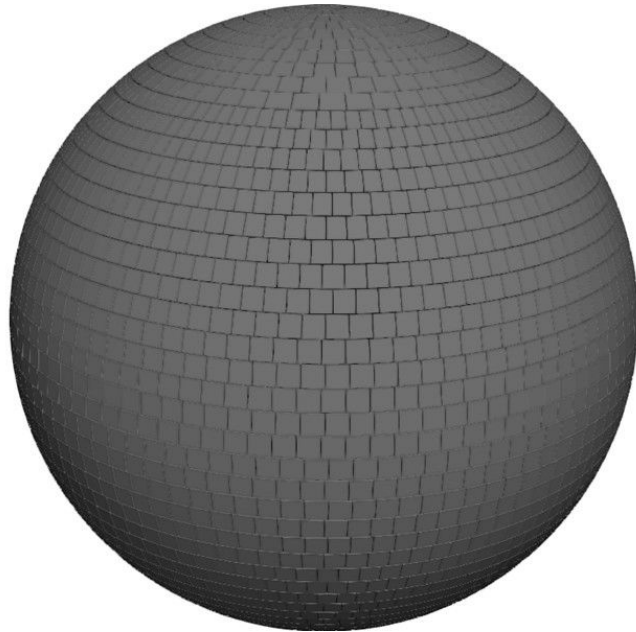




Cura

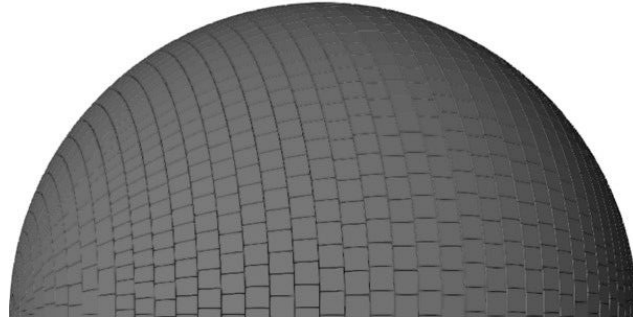
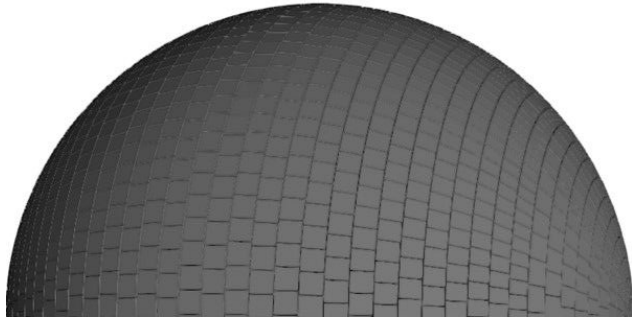


Design constraints



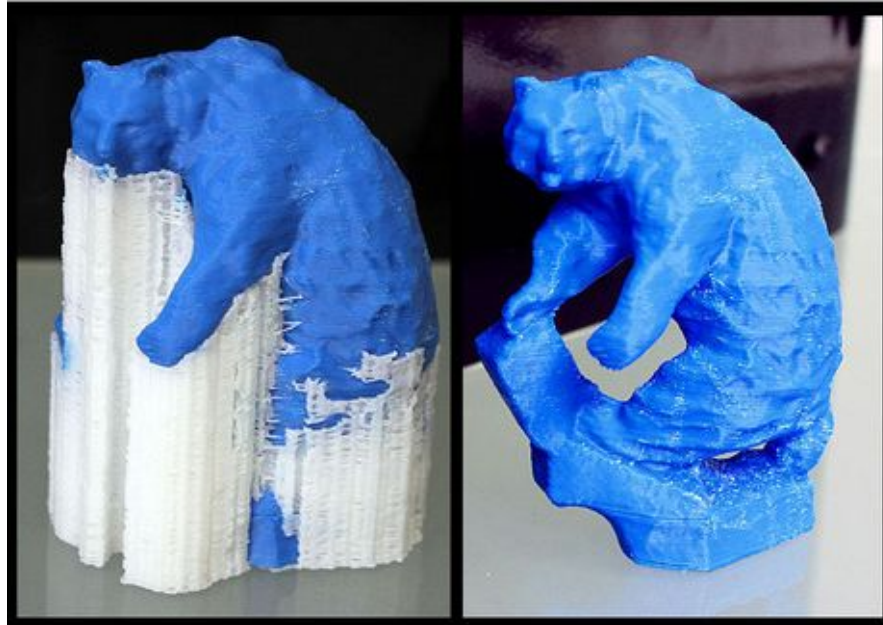


Design Constraints



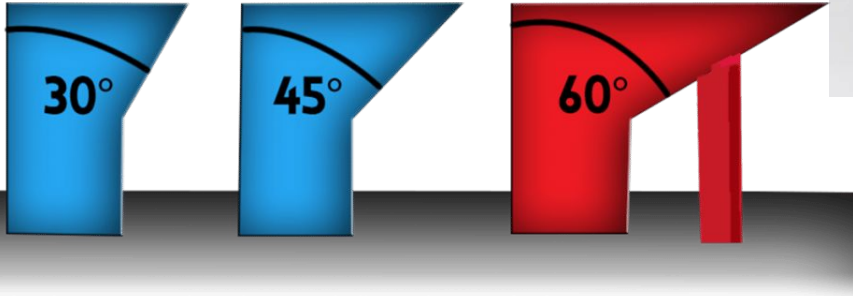


Design Constraints





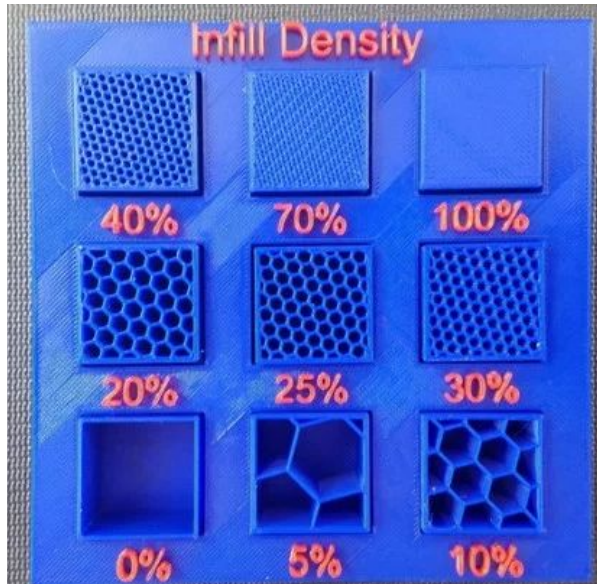
Design Constraints



Build Plate Adhesion



Infill & Layer Height





Resources

- CAD:
 - Autocad, Solidworks, Blender, Sketchup, TinkerCAD, etc.
- Slicers:
 - Cura, 3D Slicer
- Designs:
 - Thingiverse