



BE BOLD. Shape the Future.
College of Engineering
Aggie Innovation Space

Intro to 3D Printing

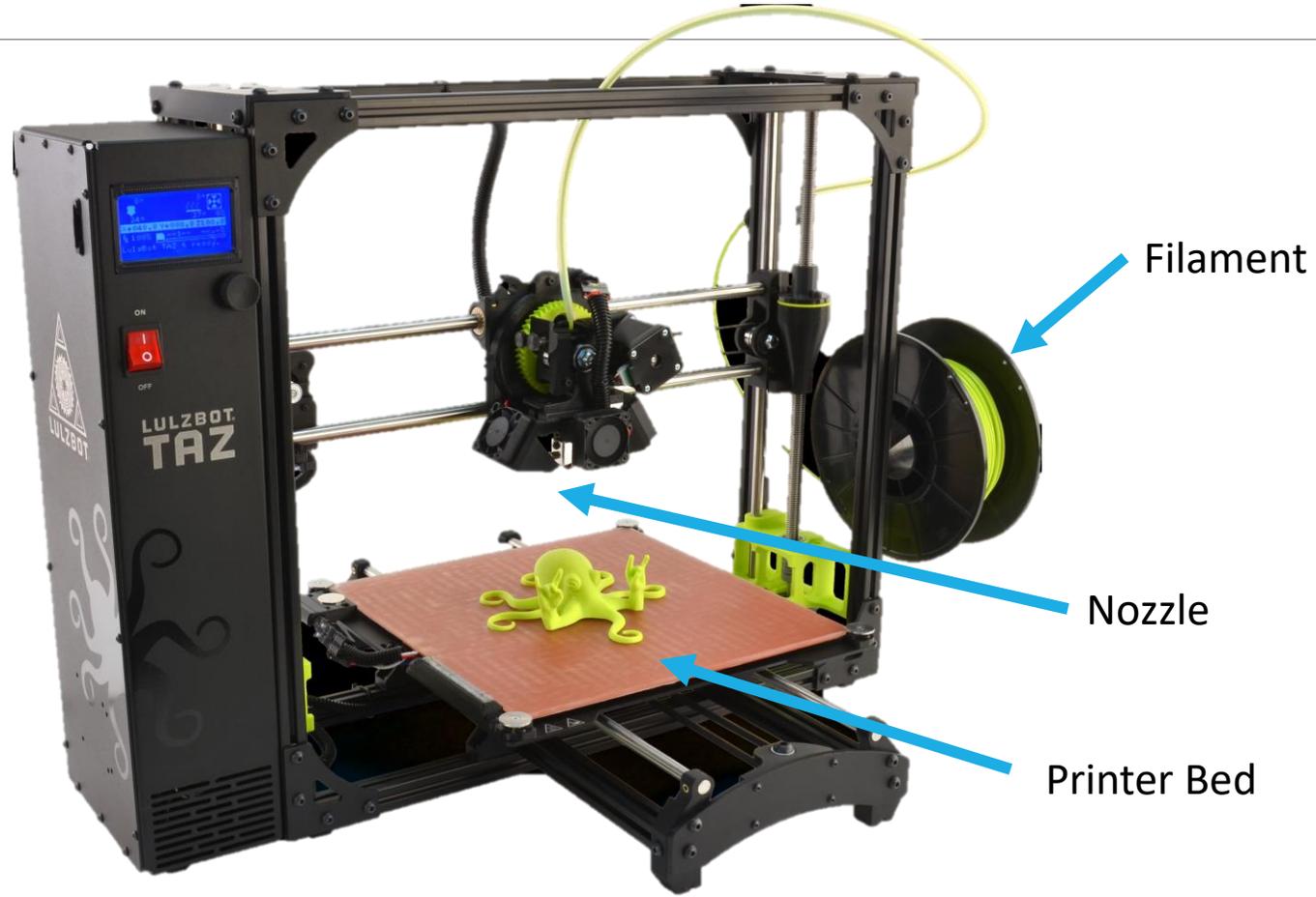
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WHAT IS IT?

- 3-D printing is additive manufacturing with (usually) low strength thermoplastics
- Taking a 3-D design/sketch and adding layer by layer of some material to create a physical model
- It has been around for 30 years and is increasing in popularity, mostly in the consumer space

HOW DOES IT WORK



Filament

Nozzle

Printer Bed

- FDM
Fused
Deposition
Modeling

PRINTERS



MATERIAL

- PLA
- ABS
- Resin
- Nylon
- ASA
- PEEK
- Polycarbonate
- Carbon Fiber



PROCESS- 3D MODEL

- Model in SolidWorks, Fusion360, etc.
- *Things to keep in mind*
 - Tolerance: Design your models to have a spacing of .225 mm (.008 in) for tight slide fits
 - Add chamfers/fillets to edge where parts slide into one another
 - If you need exact diameters for holes- you can drill it out afterwards
 - Can a 3D printer do this? (no box within a box)

PROCESS – SLICING SOFTWARE

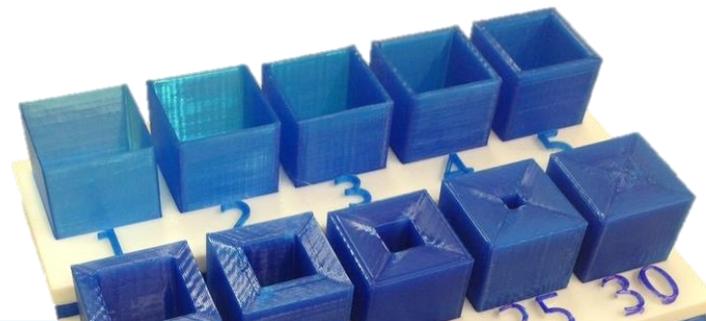
- Save model as .stl, bring it into slicing software
 - Turns your 3D model into something the 3D printer can read and print

- Infill 12% 30% 50%

- Layers

- Supports

- Shells



PROCESS - PRINT

What material to use?

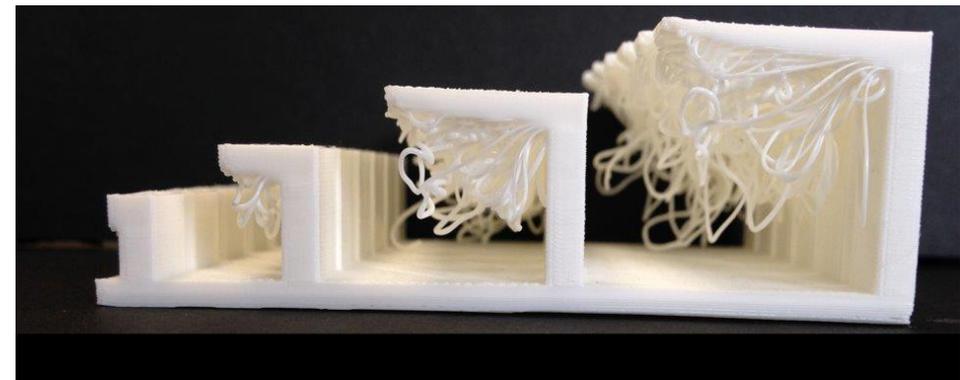
- Properties: Weight, flex, strength

What printer to use?

- Dimensions
- Accuracy/Detail
- Material

Time?

- Depends on size, infill, etc..



AIS

- Bring your .stl file
- EC1, Room 210B
- Open Monday-Friday
- Printing is free for all Capstone projects
- <https://ais.nmsu.edu>
- Advanced 3D Printing workshop this next Wednesday



Aggie Innovation Space 3-D Printing Capabilities

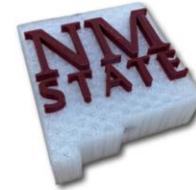


FUSION 3

Build: 14in. X 14in. X 12.4in.

Layer Thickness:
0.0007in. - 0.01in.

Filament type (1.75mm):
PLA, ABS, Polycarbonate
Carbon Fiber, ASA

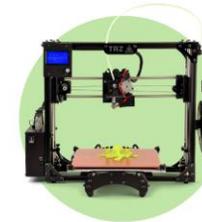


LULZBOT Mini

Build: 6in. X 6in. X 6.2in.

Layer Thickness:
0.002in. - 0.02in.

Filament type (2.85mm):
PLA, ABS, Polycarbonate
xGen, Nylon, ASA



LULZBOT Taz 5

Build: 11.7in. x 10.8in. x 9.8in.

Layer Thickness:
0.003in. - 0.0138in.

Filament type (2.85mm):
PLA, ABS, Polycarbonate
xGen, Nylon, ASA



Ultimaker 3

Build: 8.5in. X 8.5in. X 7.2in.

Layer Thickness:
0.0008in - 0.008 in

Filament type (2.85mm):
PLA, ABS, CPE
xGen, Nylon, ASA



OBJET 30 Pro

Build: 11.5in. x 7.5in. x 5.8in.

Layer Thickness:
0.0006in - 0.001 in

Filament type: Resin

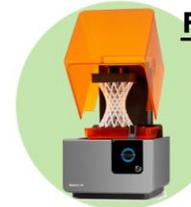


FORMLABS Form 2

Build: 5.7in. X 5.7in. X 6.9in.

Layer Thickness:
0.001in. - 0.012 in.

Filament type: Resin



SLS Powder Printer

MFG Pro 230 xS

Build: 9in. X 9in. X 9in.

Layer Thickness:
0.004in - 0.014 in

Filament type:
Nylon PA 12



Industrial High-Performance

Thermoplastic Printer

AON 3D

Build: 18in. X 18in. X 25in.

Layer Thickness:
0.001in - 0.014 in

Filament type (1.75mm):

PEEK, ULTEM, PEKK
Polycarbonate, Nylon

