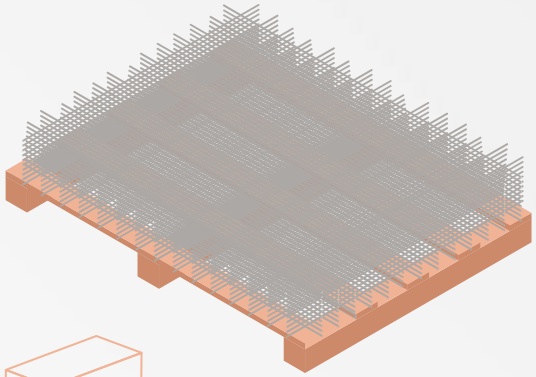
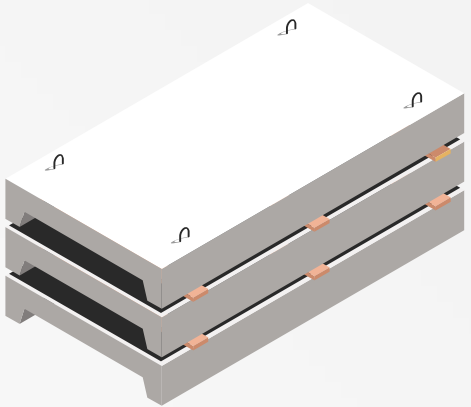
Intro to 3D Models

Dominic Maglione & Alicja Mahr





Who Are We?

Dominic Maglione

Does a bit of 3D modeling on the side...

Alicja Mahr

Our club's go-to member for 3D printing!

What We Will Be Covering

01
Intro to 3D Models
What is 3D Modeling?

02
3D Modeling Software
Popular Software & Basic Features/Functionality

03
3D Modeling Basics
Hands on Practice!

04
3D Printing Basics
Types of Printers, Materials, and File Types

01

Intro to 3D Models

So... What exactly is 3D Modeling?

What is 3D Modeling?

3D modeling is the process of creating a mathematical representation of a three-dimensional object. It is done using specialized software that allows users to manipulate edges, vertices, and polygons to create the desired shape.

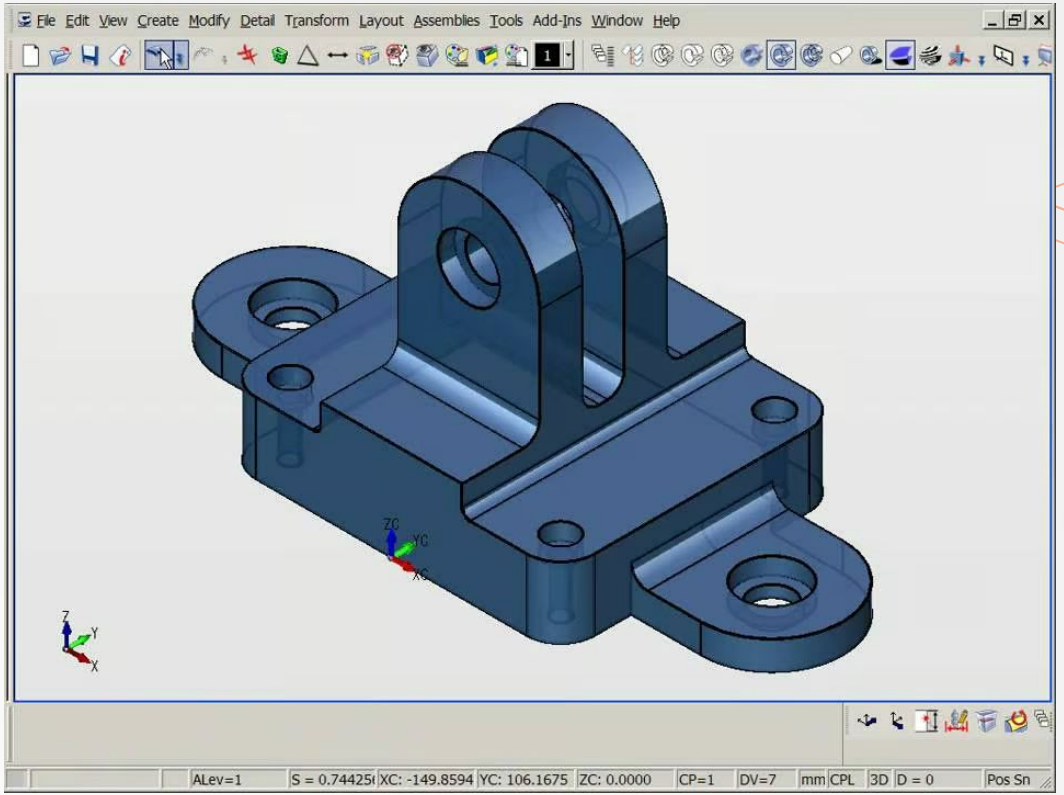
It’s often used in...

- Product Design
- Architecture
- Video Games

And many more!

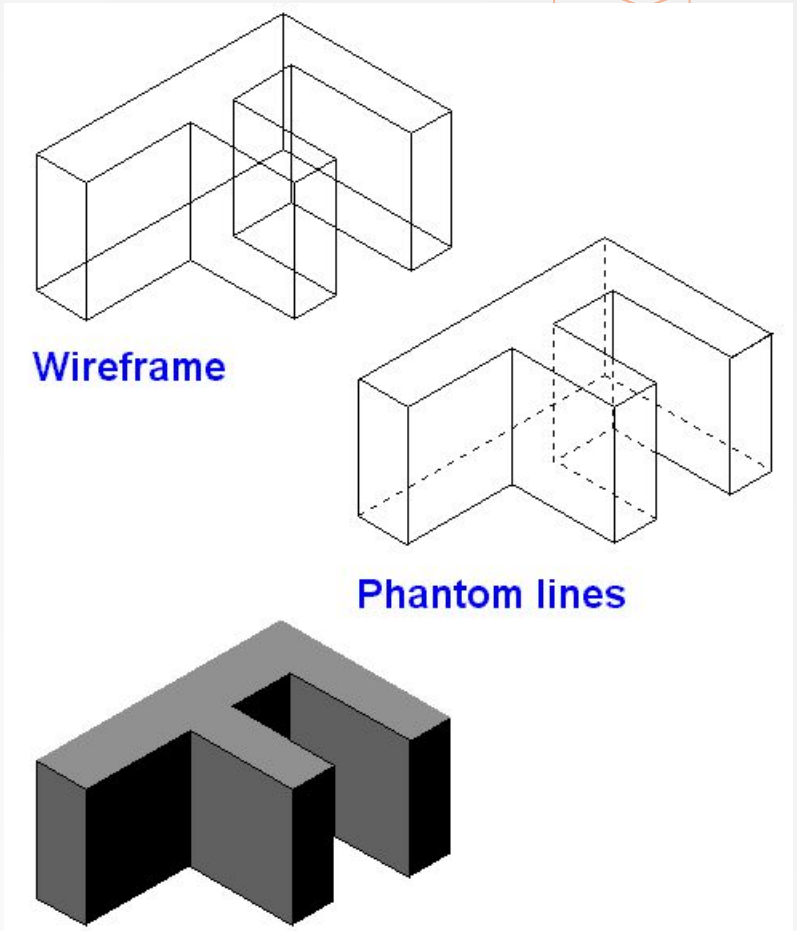
Solid Modeling

Solid models are made up of voxels, which are three-dimensional shapes that are similar to pixels.



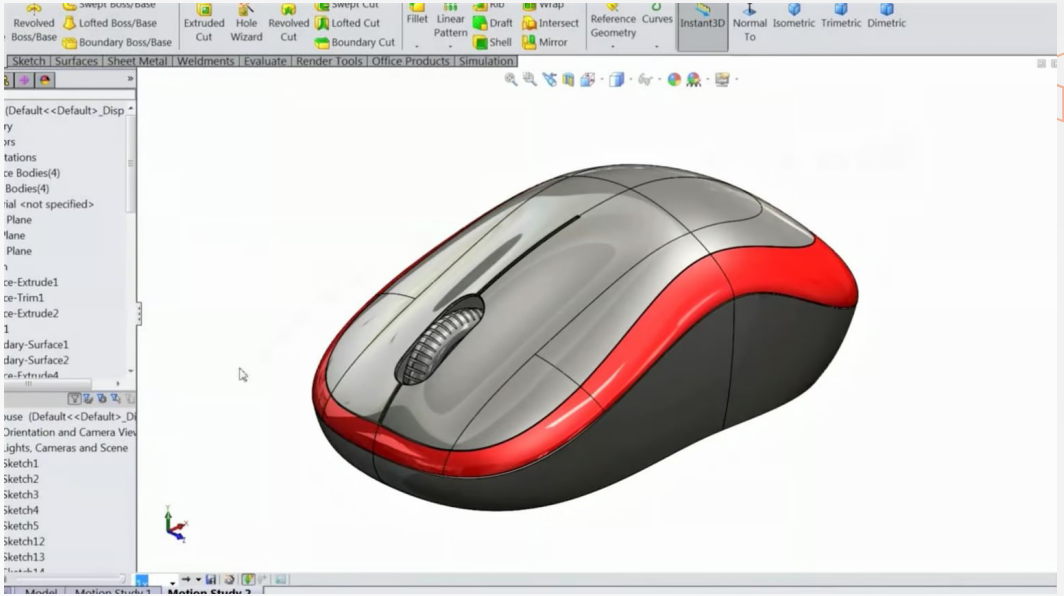
Wireframe Modeling

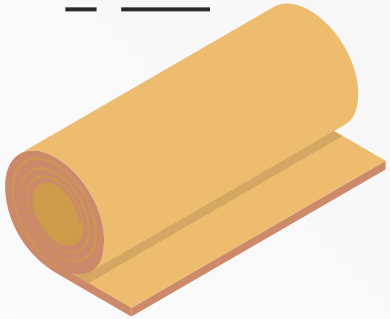
Wireframe models are made up of edges and vertices, and they do not have any surfaces or textures.



Surface Modeling

Surface models are made up of polygons, which are two-dimensional shapes that are connected together to form a three-dimensional object.



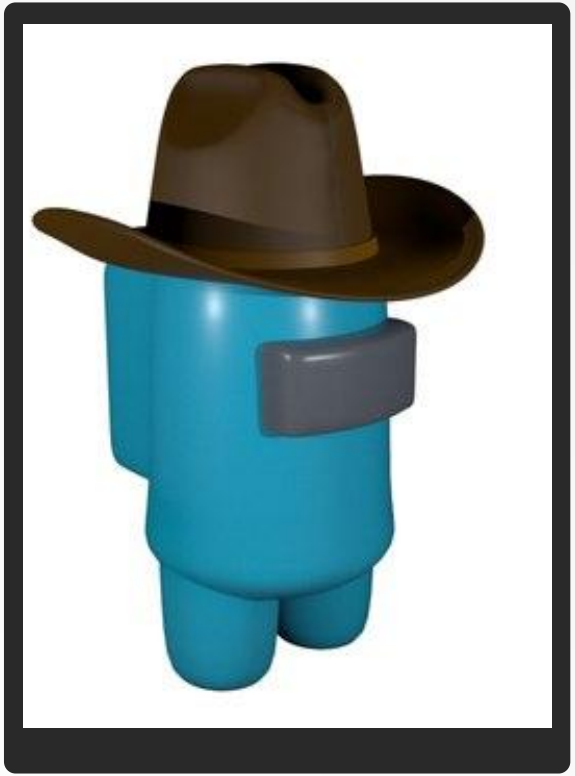


Whoa!

That’s pretty cool… but what’s all this used for?

Architecture & Engineering

3D modeling is used to create virtual models of buildings and other structures. These models can be used to visualize design ideas and to identify potential problems before construction begins.

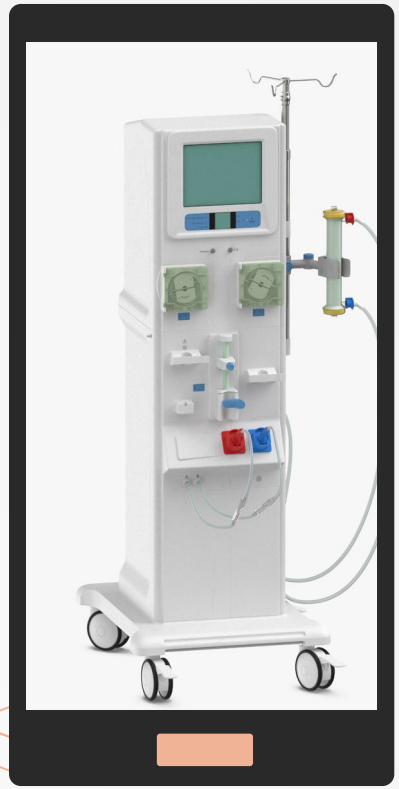


Video Games & Animation

3D modeling is used to create the characters, objects, and environments in video games and animated films. This is a highly creative and technical field that requires a strong understanding of 3D modeling software.

Medical Imaging & Simulation

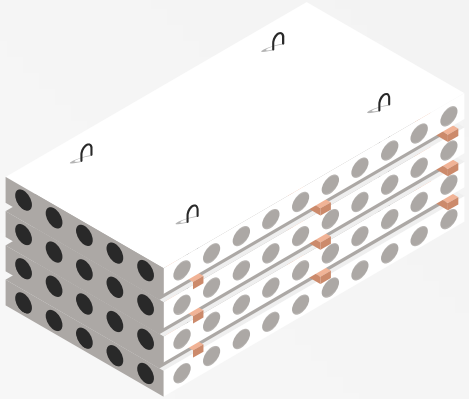
3D modeling is used to create images of the human body from medical scans, such as X-rays and MRI scans. These images can be used to diagnose medical conditions and to plan for surgery. 3D modeling is also used to create simulations of medical procedures, which can help to train surgeons and other medical professionals.



02

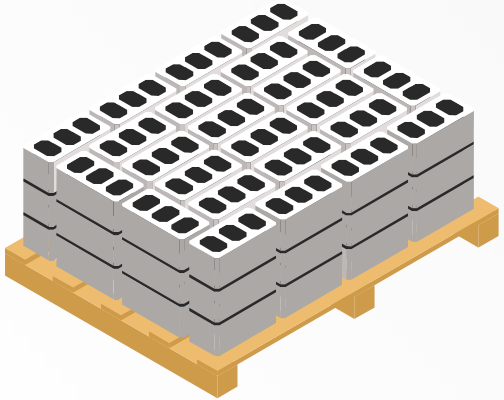
3D Modeling Software

Because clay is a thing of the past!



$10.38 Billion

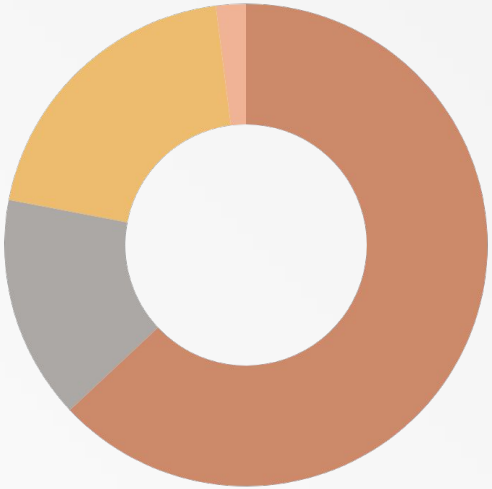
Size of the Global 3D CAD Software Market!



Market Segmentation

2%
Healthcare

20%
Manufacturing



63%
AEC
(Architecture, Engineering & Construction)

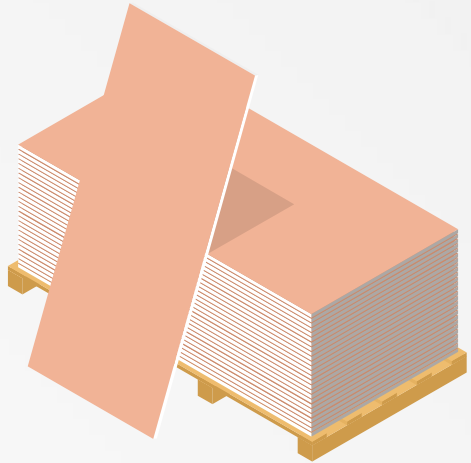
15%
Automotive

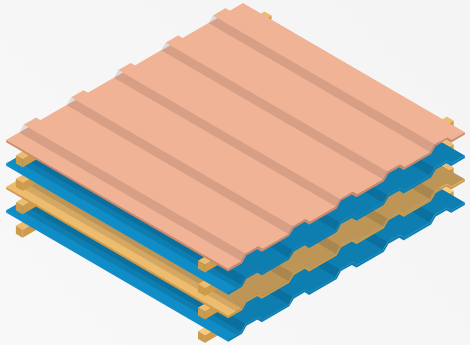
*This diagram is for visual aid only and does not reflect actual market segmentation.

Popular 3D Modeling Software

Fusion 360	Fusion 360 is the first and only integrated cloud CAD, CAM, CAE, and PCB software platform of its kind
SOLIDWORKS	Extremely powerful software that shortens product development time, reduces costs, and improves quality.
Blender	A free and open-source 3D computer graphics software tool set used for creating animated films, visual effects, etc.
Autodesk Maya	Create expansive worlds, complex characters, and dazzling effects with this 3D animation and visual effects software.

But we won't be using those...





03

3D Modeling Basics

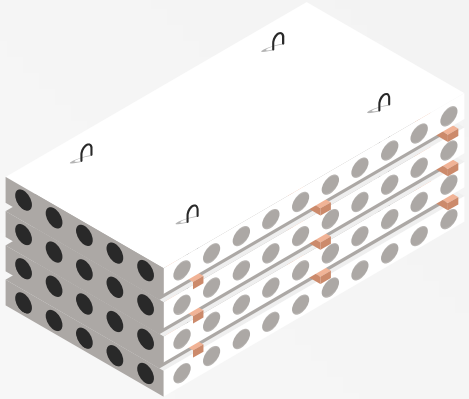
Let’s get our hands dirty!

TIN
KER
CAD
AUTODESK
Tinkercad

04

3D Printing Basics

Now what you've all been waiting for!



Types of 3D Printing

FDM	SLA	SLS
• Filament • Coordinates • Heated Extruder	• Resin • Images • UV Panel	• Plastic Powder • Coordinates • Laser
Used for basic PoCs and simple prototyping	Used for functional prototyping, tools, molds, and patterns	Used for functional prototyping and end-user products

Materials

ABS

Pain in the ass
Strongest

PETG

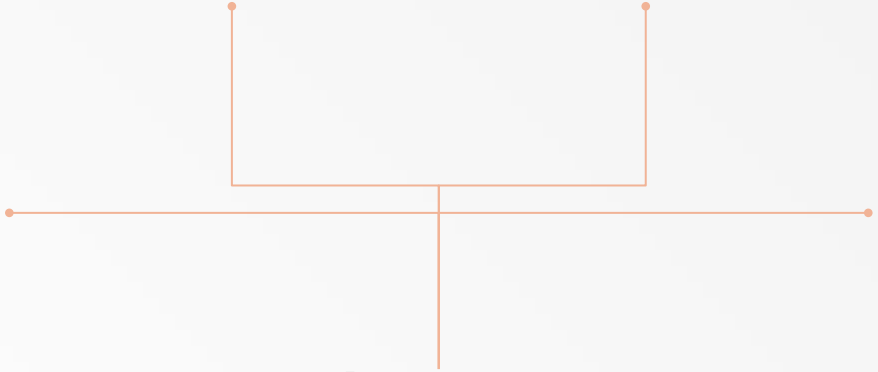
Middle Ground
Recyclable

PLA

Simple to print
Minimal Warping

TPU

Flexible
Unique to Print



Filaments

Slicer Settings

Infill Pct
Ranges from 0-100%; Determines how solid your part is.
15% for non-functional parts, 30-40% for functional

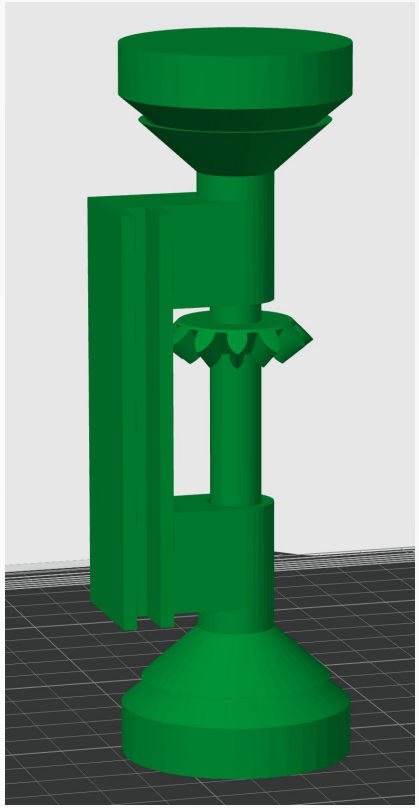
Infill Type
Shape that the infill inside the model takes.
Models: Rectilinear; Functional: Gyroid; Flexible: Cross

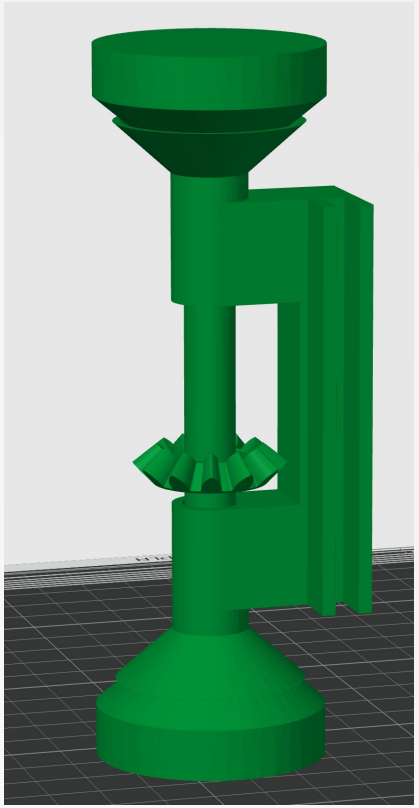
Adhesion
Method of ensuring the print stays attached to the bed
Skirt, Brim, and Raft are the primary options

Layer Height
The “detail” of the print; Reduces how visible the individual layers are at the cost of print time

Wall Count
The number of solid vertical layers on the outside of the print; More increases strength at the cost of filament

What's the Problem?





So you want to print on the BUILDS printers...

Don't use them on your own

The printers not fun toys for you to print whatever you want at will. They can break easily and require experience to use properly.
Failure to abide by this will result in repercussions.

Respect the queue

To ensure every student gets their parts printed in a timely fashion, queue jumps and favours are not tolerated. Account for this when putting in your request

Use common sense

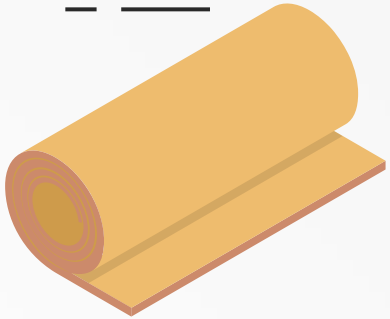
We will not print weapons, sex toys, or any other objects that are otherwise objectionable. **We reserve the right to reject prints for any reason.**

Where to find pre-made models

https://www.thingiverse.com/

How to submit a print request

https://builds.cc/3D-printer



Fin!

That’s all folks… Thanks for coming!