

An Introduction to 3D Printing

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What you will know from this lecture?

- History
- Mindmap for 3D printing
- Closing Remarks

AIM of this lecture: Quick introduction to 3D printing and walk through “3D Gence One” printer

History

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- In his patent, he defined stereolithography as “a method and apparatus for making solid objects by successively printing thin layers of the ultraviolet curable material one on top of the other”.
- Established the foundation, today known as “Additive Manufacturing” (AM) or “3D printing”



Figure: The SLA-1, the first commercially available 3D printer, image taken from <https://www.3dsystems.com/our-story>

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RepRap (**Replicating rapid** prototyper) open source project launched by a senior lecturer in mechanical engineering Dr Adrian Bowyer at the University of Bath, England

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RepRap 1.0 “Darwin” successfully 3D printed over 18% of its own components. **TECHNOLOGICAL BOOM!**

Advantage and Disadvantages of 3D Printing

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I want you to know its advantages and disadvantages by yourself :)

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- ▶ Reverse engineering can also be done to generate a digital model via 3D scanning

Model in STL format

- ▶ Convert your CAD model into a STL (stereolithography) file format
- ▶ STL model can be found in online repositories like [thingiverse.com](https://www.thingiverse.com), grabcad.com, pinshape.com and so on.

STL model analysis and repair (in-case)

- ▶ In case any errors within the STL file.
- ▶ Typical errors could be like missing triangles, non connected edges and so on
- ▶ Use software for STL model manipulations like Meshlab.net, Autodesk Netfabb etc.
- ▶ If there are no errors, then some object corrections like sizing, density, geometry changes could be made.

Slicing STL model

- ▶ Import into a slicer program which converts it into G-code
- ▶ G-code is a numerical control (NC) programming language which is a base language for 3D printer firmware, used in computer-aided manufacturing (CAM) to control automated machine tools like 3D printers.

Setup the 3D printer and Proceed to print

- ▶ Setup varies from printers of different companies.
- ▶ Go through the 3D printer manual

Now, we will quickly go through “3D Gence One” printer manual.

Any questions?

Thank You For Listening!
I Invite You To Ask Any Questions You May Have...