# 3D Printer

Introduction

A 3d printer is an additive manufacturing technique where 3D objects and parts are made by the addition of multiple layers of material. It can also be called as rapid prototyping. It is a mechanized method where 3D objects are quickly made as per the required size machine connected to a computer containing blueprints of any object. The additive method may differ with the subtractive process, where the material is removed from a block by sculpting or drilling. The main reason to use 3d printer is for 90% of material utilization, increase product life, lighter and stronger. 3D printing is efficiently utilized in various fields such as aerospace, automobile, medical, construction and in manufacturing of many household products.

Block Diagram

Functional Block Diagram for the 3D printer
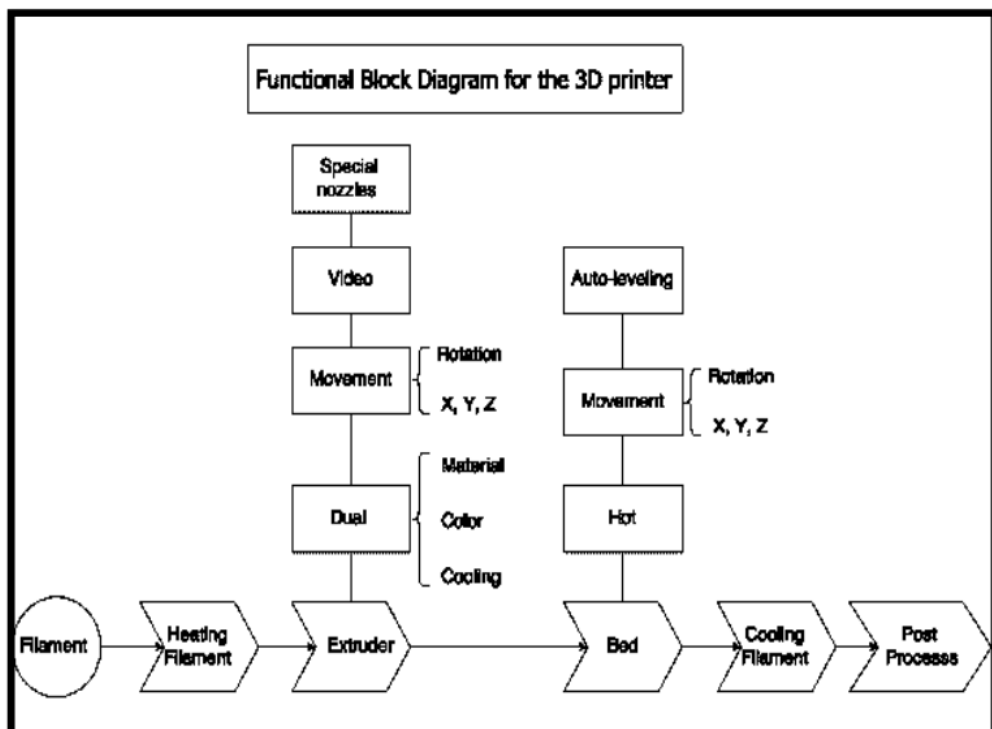
Component

HARDWARE

1 CONTROLLER

2 STEPPER MOTORS

3 ENDSTOPS

4 HEATED BED

5 STEPPER DRIVES

6 LCD CONTROLLER

7 THERMISTER

8 END STOPS

9 EXTRUDERS

SOFTWARE

1 CAD

2 CAM

3 FIRMWARES

Application

- Education New learning material: often you must want new teaching materials but may not be able to afford to budget for them. Now their resources can be made using a 3D printer, saving money on your department budget.
- Apparel 3D printing has spread into the world of clothing with fashion designers experimenting with 3D-printed bikinis, shoes, and dresses

- Construction With the help of 3D printers, we are able to build civil models like prototype of building or plan structures. So that the customers can easily visualized the models.
- Dental With the help of 3D printers, we are able to print jaws it can be a prototype or it can be a jaw bone which can be transplanted as per the needs.
- Domestic Use The domestic market of the 3D printing was mainly practiced by hobbyists and enthusiasts and was very little used for many of the practical household applications which are inapplicable.

Conclusion

The outcome of this project was to build a portable 3D Printer which has been successfully completed. The design of the frame is made robust and compact using aluminium sections. The material selection of the various elements is economical. Using a single motor for vertical movement along with a proximity sensor makes bed levelling easy and the bed movement is monitored with resolution in microns. The drawback in few of the 3D Printer which uses bed movement in Y axis has distortion of the printed layer at high rates of printing. To overcome this drawback, a new mechanism has been developed which uses bed movement in Z. The control of the mechanism becomes easy because of less number of motors and good synchronization can be achieved using this new 3D printer technique.