



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 6.078

(Volume 6, Issue 2)

Available online at: www.ijariit.com

Three-dimensional additive manufacturing

Jayasangeetha J.

jsangeet1998@gmail.com

Animalar Institute of Technology, Chennai, Tamil Nadu

Marlapati G. Pravallika

prava7854@gmail.com

Animalar Institute of Technology, Chennai, Tamil Nadu

Swarna Pragna

pragnaswarna99@gmail.com

Animalar Institute of Technology, Chennai, Tamil Nadu

M. Jayashree

jaikrishmahe261214@gmail.com

Animalar Institute of Technology, Chennai, Tamil Nadu

ABSTRACT

The technology we used in this project was once a dream dreamt by several people, wondering whether they could bring their imagination into reality. This report gives us detailed information of using a three-dimensional printer to create an object. The method we have used here is FDM (Fused Deposition Modelling).

Keywords— Three-dimensional printer, FDM (Fused Deposition Modelling)

1. INTRODUCTION

We have all known and are much aware of two dimensional printers than three-dimensional printers. The difference between both the printers is that in two-dimensional printer there will a single layer print out, but in three dimension the print out will be layer upon layer format hence giving us the complete three dimensional object. The method we have used here is FDM to create an object. Which uses plastic like materials to create a object. The material is melted and added layer upon layer to create the design input we have given in a 3d Structure by using 3d model software and Slicer software.

2. RELATED WORK

A Review paper on “3D-Printing Aspects And Various Processes Used in the 3D-Printing” by Vinod G.Gokhare, Dr. D.N.Raut, Dr.D.K.Shinde

This paper gives us the basic information About basic modelling and various types Of printing methods and the method used For printing. They have used methods like A. Selective Laser Sintering B. Fused Deposition Melting C. Stereolithography D. Laminated Object Manufacturing. Selective laser sintering uses a laser as the power source to sinter powdered material (mostly metal), aiming the laser at points in space defined by a 3D model, binding the material to create a solid structure.

In FDM a model is created by using a small beads of material which hardens to form layes. The material used usually is thermo plastic. In stereolithography the model is created by layer by layer fashion by photo polymerization. Laminated object

manufacturing layers of adhesive coated paper, plastic, metal laminates are sucessively joint together and cut to particular shape using laser cutter. This paper also gives us different materials used to create objects, those are, A. Acrylonitrile Butadiene Styrene, B. Poly Lactic Acid C. High impact polystyrene.

3. PROPOSED SYSTEM

In our project we have used FDM (fused deposition modelling) technique to create a specific 3d object. As we already know this technique uses a thermoplastic material in which it melts and forms layers. First we have to create a 3d model, this can either be done using Autodesk 3ds Max, or we can download 3d models which are available open source. Here we use another software named slicer Software (CREALITY).

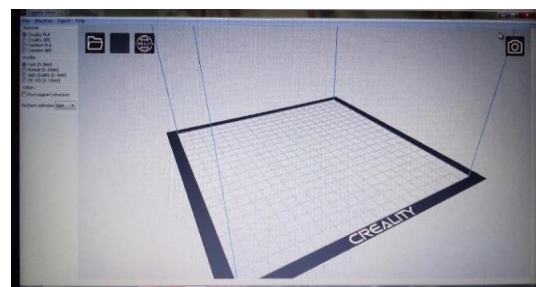


Fig. 1: Creality software

The model we created is a small xyz cube. The model is loaded in this slicer software



Fig. 2: Cube model

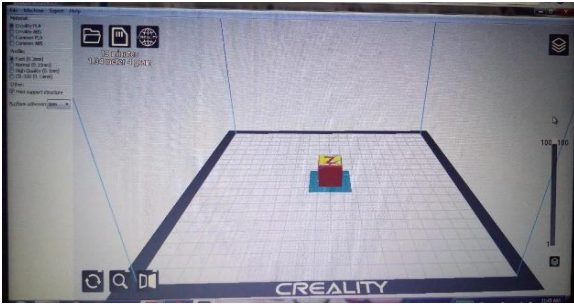


Fig. 3: Model

The duration of completing this model is 19 minutes and length is 1.34 m weighing 4 grams. The number of layers used are 100. The size of a single layer is 0.2 mm. The support structure is also considered in this file. This file is then loaded to the machine by memory card or it can be transferred by using USB cable.

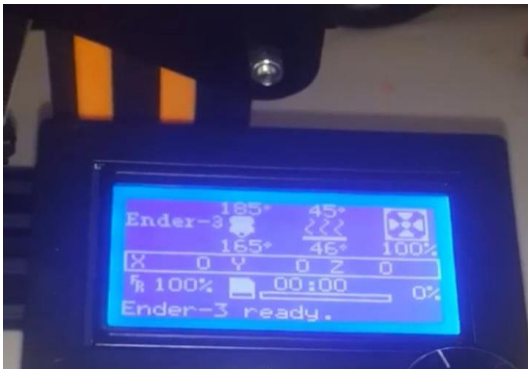


Fig. 4: LCD panel

Is set to 205 degree celsius and bed plate is set to 45 degree celsius. Now the model is saved in .gcode format and loaded in a memory card. This card is then inserted into the machine and the model to be printed is selected. After the completion, the model looks like this:

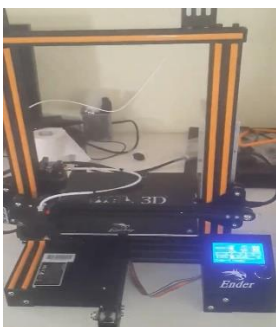


Fig. 5: Machine



Fig. 6: xyz cube

4. REFERENCES

- [1] Study on Design and Manufacture of 3D Printer based on Fused Deposition Modeling Technique Ngoc-Hien Tran, Van-Cuong Nguyen, Van-Nghia Nguyen. International Journal of Engineering and advanced technology (IJEAT).
- [2] Design and development of FDM based portable 3d printer. Ashish Patil, Bhushan Patil, Rahul Patwade, Akshay Shinde, Rakesh Shinde (prof). International Journal of Scientific & engineering research.
- [3] A Review paper on 3D-Printing aspects and various processes used in the 3d printing by Vinod G. Gokhare, Dr. D. N. Raut, Dr. D. K. Shinde. International Journal of eng. and Research and Technology (IJERT).
- [4] Alexandru Pirjan, Dana-Mihaela Petrosanu, "The Impact of 3D Printing Technology on the society and economy", Journal of Information Systems and Operations Management, Volume 7, Dec 2013.
- [5] Siddharth Bhandari, B Regina, "3D Printing and Its Applications", International Journal of Computer Science and Information Technology Research ISSN 2348-120X
- [6] Elizabeth Matias, Bharat Rao, "3d printing on its historical evolution and the implications for business", 2015 Proceedings of PICMET: Management of the Technology Age.
- [7] Leuven Belgium, 2013, "3D Printing A Maturing Technology", The International Federation Of Automatic Control", pp-468-472.
- [8] Jee & Sachs, 1999, "A Visual Simulation Technique For 3D Printing", Elsevier Journal Of Advance In Engineering Software 31, pp-97-106.