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3D Printer

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3D printing is a revolutionary technology that has recently caused a stir due to its ingenious concept used in its invention and its enormous potential to influence the current manufacturing process. An incomparable device that is used to create a 3D object from a digital file; 3D printers have created wonders in the digital printer world. The practice of creating a 3D object uses a chemical approach and additive processes in which an object is manufactured by arranging a series of coatings on top of each other until an intact object is formed.

What is a 3D printer? 3D printers are used to create 3D objects and objects by printing. This process is also called additive manufacturing [1]. How Do 3D Printers Work? 3D printing is part of the additive manufacturing family and uses techniques similar to traditional inkjet printers, albeit in 3D. 3D Modeling Software. The first step in any 3D printing process is 3D modeling. With the ability of 3D modeling software to create precise designs, 3D printing is considered a true game changer in many industries [2]. This modeling software is especially important in an industry like dentistry, where laboratories use 3D software to design dental aligners that are precisely tailored to the individual. The 3D Printing Process. With the modeling and slicing of the 3D object completed, it is time for the 3D printer to finally take charge. In direct 3D printing, the printer generally acts like a traditional inkjet printer, with the nozzle moving back and forth, spreading layer by layer of wax or plastic-like polymer, waiting for that layer

to dry, and then adding the next layer. Basically, it adds hundreds or thousands of 2D prints on top of each other to create a 3D object. There are many different materials that a printer uses to recreate an object to the best of its ability. Here are some examples: Acrylonitrile butadiene styrene (ABS): a plastic that is easy to form and difficult to break. The same material that LEGOs are made of. Carbon fiber filaments: Carbon fiber is used to create objects that need to be strong yet extremely lightweight. Conductive filaments: These print materials are still in the experimental stage and can be used to print electrical circuits without the need for wires. This is a useful material for wearable devices. Flexible threads. Flexible filaments create flexible yet durable prints. Anything from wristwatches to phone cases can be printed with these materials. Metallic thread: Metallic threads are made from finely ground metals and polymer glue. They can be in steel, brass, bronze and copper to get the true look and feel of a metallic piece. Wood filament: These fibers contain finely ground wood powder mixed with polymer glue. They are obviously used for printing wood objects and can appear as lighter or darker woods depending on the temperature of the printer.

How to make a 3D printer with your own hands:

1. 2D design.

2. Design in 3D.

3. Part Creation - This is how all parts are created: Print a drawing of the part to be manufactured; Take a pencil, caliper, tape measure and something to draw the details; Draw a top view on the tree; Saw the part to the desired shape; Drill holes where necessary; Measure detail.

4. Purchased parts.

5. Assembling the Printer - Start assembling the frame with most of it at hand. 2 of the bottom threads were used to mount the Y-axis stepper motor. Another 2 were used to mount

the Y-axis belt bearings. Next comes the heated bed. A thermistor should be placed at the bottom of the heated bed to control the temperature. A 20cm x 20cm mirror or glass should be placed on top of the bed, which is used to create a smooth FLAT printable surface.

6. Power - The printer used 12v, a lot. You can use an old ATX power supply, cut off all 5V and 3.3V wires, link two buses (12V and 12V 1).

7. Printer Connection - The next task was to connect ALL wires to the correct pins.

8. Software - There are 2 main firmwares for Ramps. Merlin, Sprinter.

9. Setting up the steppers - To do this: Turn on your printer; Use "Printrun" to move the axis; Move one of the axes back and forth; Simultaneously move the potentiometer on the driver clockwise until the stepper motor starts to run abnormally (make strange noises, vibrate violently); Turn it back slightly until it starts running smoothly again; Move to next driver / step / axis.

10. Testing – The next step is to check the printer and its settings. Heating of parts. Stay with your printer. If something goes wrong, it is important that you can turn off the printer [3].

References:

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