3D Scanning

Sense Scanner

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Sense (2nd Gen)   Sense (1st Gen)

NOTE: The Sense 1 and Sense 2 scanners have been discontinued and are no available for sale. Hardware support ended on December 31, 2020, and software support will end on December 31, 2022. This page is only to provide the Sense 1 and Sense 2 software.

Source: https://support.3dsystems.com/s/article/Sense-Scanner?language=en_US

Pass Code is Written on the Box

MakerSpace PC has full setup in Ready to Use state.

3D scanning is the process of analysing a real-world object or environment to collect data on its shape and possibly its appearance (e.g. colour). The collected data can then be used to construct digital 3D models. A 3D scanner can be based on many different technologies, each with its own limitations, advantages and costs. Many limitations in the kind of objects that can be digitised are still present. for example, optical technology may encounter many difficulties with shiny, reflective or transparent objects. For example, industrial computed tomography scanning and structured-light 3D scanners can be used to construct digital 3D models, without destructive testing.

Procedure

1. Install the Sense software in laptop and plug the 3D scanning device
2. In the 3D sense scanner, select the appropriate object size
3. Hold the scanner at about 15 inches away from the object and keep moving it around the object slowly and steadily
4. Repeat the process to collect more data and fill the gaps. The scanner may lose track in between, then keeping it steady will help regaining the track
5. Once satisfied with scan, click next to finish
6. We can now use tools to crop, trim and touch up the scanned object
7. Save the object.

1. *It is important to keep the scanner as steady as possible*
2. *It is better to use a camera stand for better scan*
3. *Different light conditions and colors may affect the scan quality*
4. *Create a boundary using smaller objects helps the scanner in defining the focus*

<u>PHOTOGRAMMETRY SMART PHONE APP BASED:</u>

Using Smartphone App based is illustrated in Assignment webpage, however, the steps involved for typical application is hinted below.

Unlike dedicated scanning softwares like "SENSE" where specific equipment is required to be used to scan the object concerned. Photgrammetry uses basic equipment like a camera/ videocam to take a series of pictures/videos of any object. These are then used to reconstruct the object.

There are various softwares available for undertaking 3D scanning and Photogrammetry. 3DF Zephyr is a free version available to develop 3D scanned models capable of being 3D printed.

In general, pictures of the object need to be taken from various angles rotating the camera gradually to develop a database of pictures of the object. These pictures are then imported into the software, and the type of object and pictures taken is indicated. FOr e.g. Human Face, Close Range.
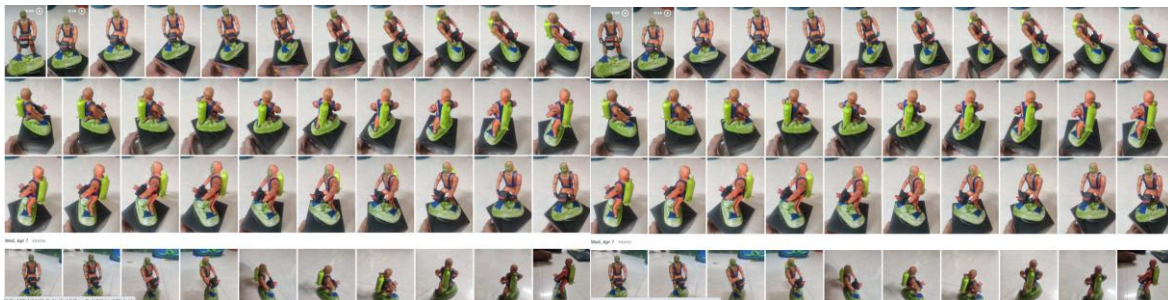
Using features of software the wanted and unwanted areas shall be processed and flawless image shall be prepared for generating GCode.

MORE PHOTOS MORE ACCURATE MODEL

3D PRINTING

3D Model created using CAD software or 3D scanner or Photogrammetry method has to be converted into 3D printer compatible format. Idea Maker is one of the free software available to bridge the 3D models to 3D printer.

Model can be reoriented, scaled, modified and density/intensity of filling rate and accuracy of model, number of passes and even many number of extruder to be used can be controlled by using the software. Even the accurate estimation of entire operation is also calculated and intimated prior printing.

Use Ideamaker software for printing

-Open the .stl file in Ideamaker -Make adjustments for size and scale and preferred printer-Orient the model appropriately-Set in-fill rate-Temperature of BED & Nozzle shall be set as well-Preview the print duration-GCODE is generated which shall be taken in Pendrive to load in 3D Printer.
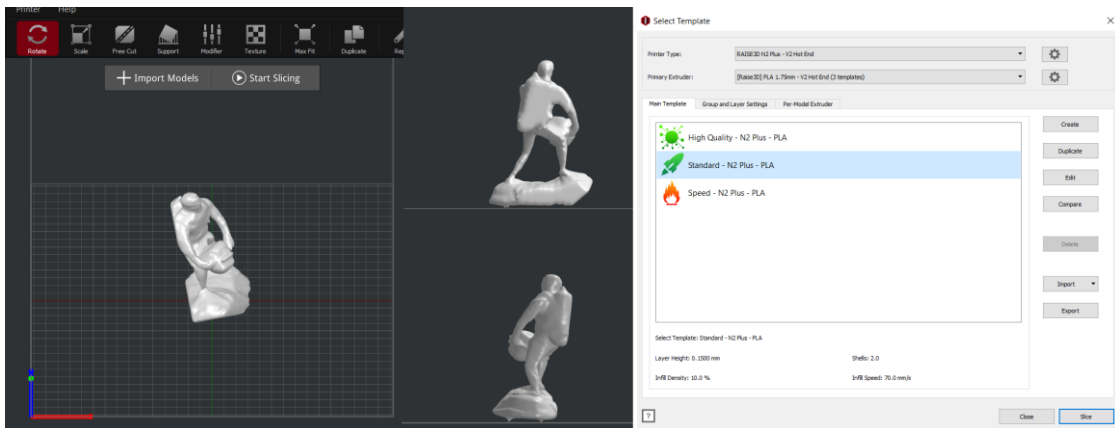
Common Terminology Used:

Supports:

3D printing processes create the object layer by layer, down to up, with the layer under construction being deposited over the previous one. Adjacent layers are dependent on previous layer and hence overhanging layer causes faulty production resulting in cantilever effect. The slicer automatically can add supports for it. The support touch the object in a way that is easily detachable from it at the finish stage of the object post printing.

Infill: Based on functional usage and strength requirement the object can be made lighter or hollow or harder based on users requirement. The amount of volume filled/filling rate is called infill. Generally it is asked in %.

Rafts, skirts and brims: Region/element built in-between object and printer bed. Base preparation for printing the first object layer. The slicer can automatically add some detachable structures to minimize these problems.

In recent 3D printing, printer automatically gives auto supports to the hanging parts and a bed for the base of the object. To avoid this, the 3D model should be sliced into individual parts and printed seperately and joined together

Ensure Nozzle heads are clean and to clean nozzle, 'Utilities' tab > Unload of the L-Nozzle > wait for the temperature to reach desired value > PLA comes out > Edge has to be cut in an angle > Load the material.

Finished Model and actual model are presented below.

Thank you for the Opportunity to Learn.