UNITS-2- REVERSE ENGINEERING AND CAD MODELING

CAD Software for Reverse Engineering

Here are a few programs that can be used in reverse engineering as well as a few of their benefits.

1. Autodesk Inventor

Autodesk makes an add-in for their AutoCAD software, Inventor, that supports the reverse engineering process. It is compatible with most 3D scanner software so that the data is transferred into the program. Its benefits include the ability to scan point clouds and measurements directly into the software, obtain raw data from the scans that can be converted into real CAD models, and the capability of digitizing parametric models into the feature tree.

2. Point Cloud

This plug-in is compatible with AutoCAD and gives users the ability to reconstruct the geometry of an object. It used point cloud technology to recreate a surface using a draping method. The surface is formed along the drape direction. It claims to be user-friendly for even those new to reverse engineering.

3. SOLIDWORKS 3D CAD

This CAD package includes all the tools needed to recreate an existing product, from importing and evaluating data to creating the models to creating molds, to eventually 3D printing a

prototype. It has tools such as Auto Trace that allow for importing of paper sketches, to surfacing tools that allow for editing the geometry of the object.

4. Geomagic Design X

Formerly known as Rapidform XOR, this software works with existing CAD software to process your scans into information you can manipulate. Rather than creating point clouds or meshes like most scanners, it creates manufacturing-ready models. Because it works with the software you already use, it is easy to learn.

5. Reverse

Aptly named, this software has the tools needed to develop a product from the scan of the original product to the design for the creation of the parts of a new product. It can use mixed modeling techniques to blend meshes, surfaces, and geometrics into a single design.

6. Imagix 4D

Not all products that are reverse-engineered are 3D objects. Computer software is often copied to build other applications or improve upon current ones. When that is the case, the software is needed to reverse engineer code. Imagix 4D can analyze source code so that it can be duplicated or modified.

7. Space Claim

SpaceClaim is also available as standalone software. It creates CAD models from STL files using a direct modeling approach. It's quite good at working with STL files. It is capable of quickly creating complicated solid bodies from scratch. It is capable of tracing the facets of an STL file and generating curves from it. It also aids in the cleanup of sloppy and noisy scans. Worn-out components of scanned components can be repaired.

8. Xtract3D (Plug-in for Solid Works)

It is a specialized and reasonably priced SolidWorks plug-in for reverse engineering. It operates as an Add-in in the SolidWorks native environment, so the interface stays familiar. Using 3D scan data as a guide, a CAD model can be generated by manually extracting features and sketching using accessible tools. This is an error-free method of converting a scan model to a CAD model. Without slowing, Xtract3D can handle big-scan data files quite effectively.

9. Mesh-2 Surface

Mesh2Surface is a Rhino3D plug-in that may be used to generate CAD models from 3D scanned data. It has capabilities for making 2D sketches that are comparable to those found in Photoshop. The main features of Mesh2Surface are 3D drawings for drawing on mesh and the Autosurface tool for extracting freeform organic surfaces.