

# : visi reverse

next generation reverse engineering

VISI Reverse is a high level software solution at an affordable price for 3D reverse engineering, 3D geometry reconstruction, topography, medical applications and many other disciplines. The 3D point cloud used to construct the 3D model can come from any measurement system or technology including 3D scanners, digitizer, CMM, laser point, laser trackers, laser plane (laser triangulation), time-of-flight laser (lasergrammetry), photogrammetry or stereophotogrammetry.

Using VISI Reverse it is possible to enter millions of points without limitation and create a meshed model in a very short time frame. VISI Reverse implements new technologies such as mesh refinement and automatic edge detection to provide high quality 3D geometry reconstruction and accurate meshed models even with poor quality point cloud input.

VISI Reverse is the latest solution in this market with a focus to provide the fastest and most accurate tool for points, meshes and simultaneous geometry management. It combines the powerful versatility of point cloud management with the speed of automatic curve and surface creation, providing a complete solution for free-form designers, product engineers, modellers, prototype specialists and inspection analysts. The models generated from VISI Reverse can be used directly for rapid prototyping, tool path generation, animation, simulation, finite element analysis, control and inspection, sectioning and many other downstream processes.

## Powerful point clouds processing

VISI Reverse imports both point-cloud and polygon-mesh data acquired from various 3D scanners and measurement device types. A 3D point cloud obtained from any measurement system can be easily and quickly processed and transformed into a watertight meshed model valid for any purpose. There is also a special tool that allows the registering and merging of different clouds or meshes into a single model. Point cloud processing is very powerful and it is possible to apply tools for smart point number reduction; such tools include noise and redundancy cleaning, filtering, smoothing and many others. There are also functions for point number increase including refinement and point addition which allows geometry to be rebuilt even from a lesser number of points.

dynamic mesh generation  
from point cloud

point cloud merge  
and registration

geometry rebuild from  
limited point data

accurate curvature  
meshing

non manifold  
geometry correction

mesh offset

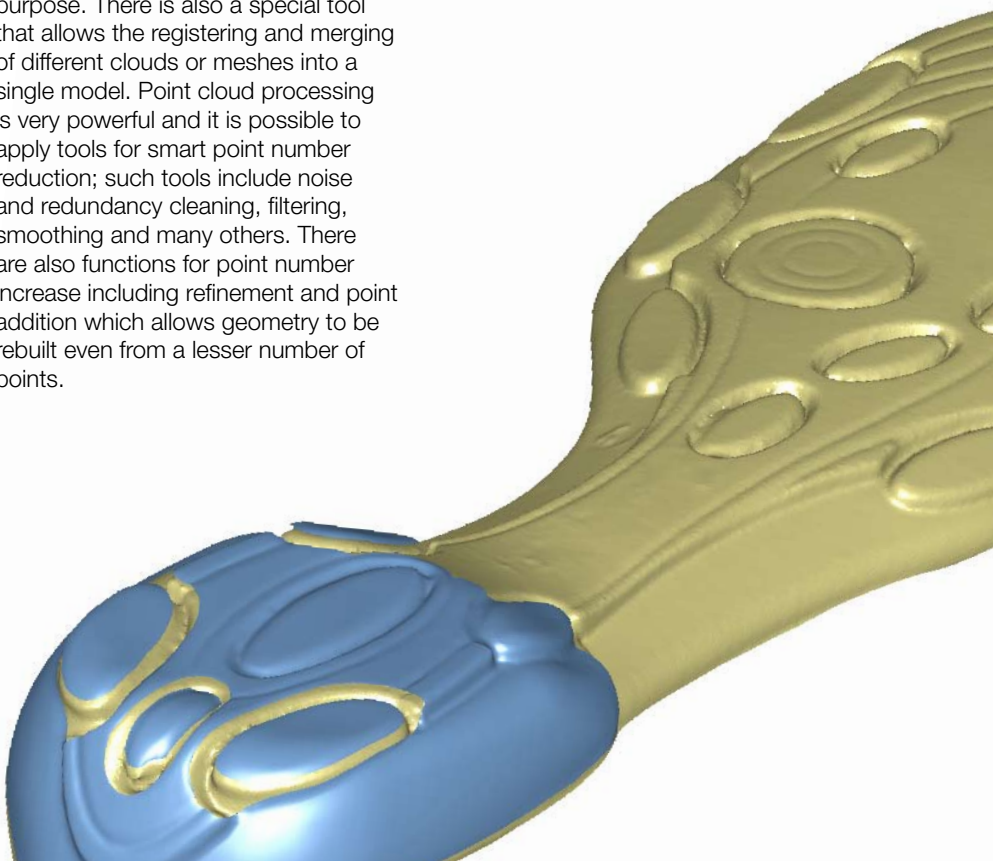
mesh cut with curve

automatic edge  
recognition

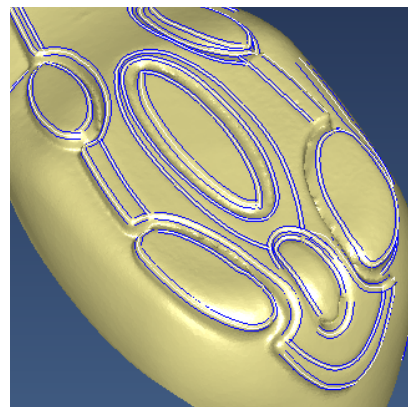
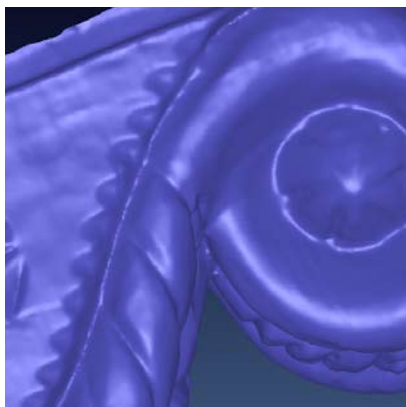
management of edges,  
curves and surfaces

automatic surface  
generation

evaluation of point  
cloud approximation



Thanks to its powerful versatility and its seamless compatibility with VISI and every other CAD/CAM/CAE application, VISI Reverse can be applied in a wide range of disciplines and applications. VISI Reverse customers belong to many different industry sectors including: consumer products (shoes, sporting gear, mobile phones), medical (dental braces, knee/hip prosthesis, scans of jaw or face), entertainment (toys, gaming), automotive (conceptual design, die industry) and others.



#### Fast / accurate mesh management

Starting from a point cloud, VISI Reverse automatically creates a dynamic triangulated mesh. Mesh generation is equally fast and accurate and includes curvature meshing to preserve sharp edges and radii. There are many tools for further mesh processing which include: repairing corrupted STL files, elimination of spike and abnormal and irregular triangles, non-manifold geometry correction, smoothing, normal fixing and decimation, fitting selected mesh parts to planes, cylinders, spheres or cones; partial or complete hole filling that is flat or curvature based, bridge between meshes defeature, and boundary fitting to curves to name only a few. VISI Reverse also considers mechanical digitisation process and provides an offset mesh for probe radius compensation. Once generated and refined it is possible to export the resulting triangle mesh into one of the popular formats for 3D mesh models, such as STL, VRML, OBJ and others.

#### CAD model reconstruction

Upon importation of polygon-mesh data, VISI Reverse acquires all the necessary information useful for CAD model reconstruction, including edges, vertices, fillets, curves and surfaces. The automatic edge recognition tool rapidly generates all the geometry necessary to rebuild the model. Edge fillet radii are automatically determined and every edge is fully editable; the application also checks the wireframe structure and provides the tools for connecting, editing and deleting curves and edges as well as fitting the Nurbs curves to the point clouds. Nurbs surfaces can be created both automatically or manually with dynamic user interaction. During the process it is possible to evaluate and visualize the quality of point cloud approximation against the 3D model.

#### Fully automated or interactive

VISI Reverse covers the entire reverse engineering process, from point cloud management to geometry creation. Depending on the customer requirements VISI Reverse can be used in two ways. The first is completely automatic allowing the user to construct patch surfaces in the shortest time available. The second is interactively from where point cloud data is the starting point for rebuilding the CAD model. In this case, tools are available for correcting and enhancing the point clouds and mesh geometry.

VISI Reverse is easy to learn and use (days not weeks) and it provides rapid and accurate results (hours not days). The flexible control from full automation to a more interactive approach makes VISI Reverse suitable for every kind of user and use, from entry level skills to the most demanding applications.

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