

CATIA Reverse Engineering

The use of numerous systems to develop digital products from physical prototypes is complex and costly, leading to delays in product development. Companies require intuitive environments that are ergonomic and fully-integrated to ensure their investment pays off quickly.

CATIA Reverse Engineering makes it possible to quickly capture and enhance physical prototype shapes, making the 3D virtual model the design reference. It also provides powerful technologies embedded within CATIA that allow the easy manipulation of clouds of points or meshes, while quickly transforming them into high-end 3D surface shapes.

Key capabilities

Import and export clouds of points in various standard formats

The user can import almost all native measuring machines' data. Data can be of different types, for example, meshes, grids, scans, and clouds of points. Imported data can be of different formats, for example, standard formats (IGES, free ASCII, STL, etc.) or formats from native measuring machine makers, such as GOM, HYSCAN, KREON, STEINBICHLER, etc. The user can preview, scale, trim, or change the measuring units of the imported data.

Robust alignment and deviation checking for control processes

CATIA Reverse Engineering provides several robust strategies for the alignment of digitized data with other digitized data or in relation to CAD models. It also provides extensive and associative diagnosis commands such as: Deviation checking between digitized data,

surfaces or curves Annotations and reporting on deviation checking

Connect checker between surfaces allows the visualization of eventual deviations during the joining of several surfaces in passage, tangency and curvature Thanks to these alignment capabilities and diagnosis commands, CATIA Reverse Engineering covers control processes such as: Alignment Control between digitized data Deviation Control between a rebuilt CAD model and the master digitized model Control of an object as manufactured and the CAD mock-up as designed

Smart and advanced tools to manipulate clouds of points and meshes

Thanks to several 2D and 3D computation methods, the user can create watertight meshes that can be: Used in the CATIA V6 DMU product, rendering, etc. Directly manufactured

Customer benefits

- Benefit from full integration within the CATIA design environment
- Learn and use the reverse engineering environment easily
- Experience extended compatibility with standard data formats
- Use multiple strategies for surface reconstruction
- Manage large volumes of data
- Reduce project costs and streamline design iterations

in CATIA V6 manufacturing product Exported in STL format for rapid prototyping machines CATIA Reverse Engineering also provides a set of smart and advanced edition tools to manage and improve clouds of points and meshes such as: Working on sub-areas Removing, cleaning, filtering, smoothing, hole filling and shape improvement Mesh segmentation in pertinent surface domains

Wireframe creation

CATIA Reverse Engineering provides tools to create wireframe (scans/polylines or curves) and curve networks: Planar sections Interactive creation of free curves or curves on support Curve creation by smoothing scans/polylines Curve projection Curve network management Automatic characteristic lines detection

Surface creation

CATIA Reverse Engineering allows easy surface creation (mechanical shapes or free-form shapes) from digitized data. Several approaches to recover surfaces depending of the shape's type are available: For free-form shapes by fitting on a domain delimited by N-sides 3D curves networks and constraints on boundaries For mechanical shapes by identifying and preserving editable features (plane, cylinder, sphere, cone) Recovering virtual sharp edges by extending and trimming primary surfaces For sweeping surfaces using a loft command Automatic surface creation from a mesh according to a given accuracy

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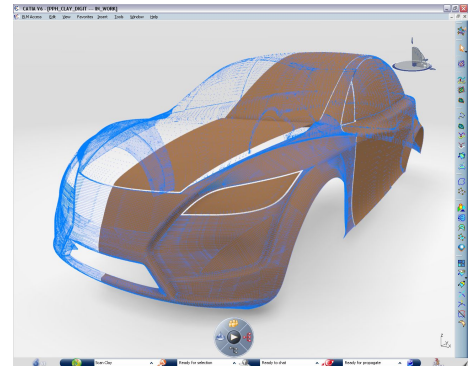
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Polygon modeler for virtual clay modeling

CATIA Reverse Engineering provides a set of intuitive polygonal modeling and sculpting tools that work like clay modeling. It is particularly well suited to shape designs when surfacing becomes complex.

Rapid prototyping

CATIA Reverse Engineering also covers the rapid prototyping process through surfaces and solid tessellation capabilities to get watertight meshes.



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