ICEM Surf Scan Modelling

Modelling and Modifying Point Clouds

An add-on module to ICEM Surf Professional, ICEM Surf Scan Modelling allows the user to efficiently handle dense, ordered, or random point clouds generated by automatic laser and photo digitisers. Supporting Reality Modelling** concepts of simultaneously combining facet and surface models with photo-realistic textures*, it is no longer necessary to produce surfaces in all steps of the process chain.

Key capabilities

Scan Data

Formats
Support of multiple data formats; ASCII XYZ-point, STL-facets, Hymarc, Steinbichler and Renishaw.

Import
Import and review capabilities are provided for large amounts of data (several million points) that can be quickly visualised, filtered and separated.

Export
The generated facets can be exported in the standard STL-format.

Scan Management

Filter
Data filtering tools are available to remove redundant points, and to reduce and optimize data size

Trim and Separate
Separation of scans in different zones through selection of plane, triangle, polygon, etc..

Feature Recognition
Edges, sharp bends, deforming edges etc. are located and marked. For further processing with the possibility to convert to smooth curves.

Creation of Facets
To aid visualization, Facet models can be created directly from point data or from surfaces, and with the help of Gouraud-Shading the results can be hardly be distinguishable from surface models. In addition, editing tools are provided to fill holes and to edit the facets.
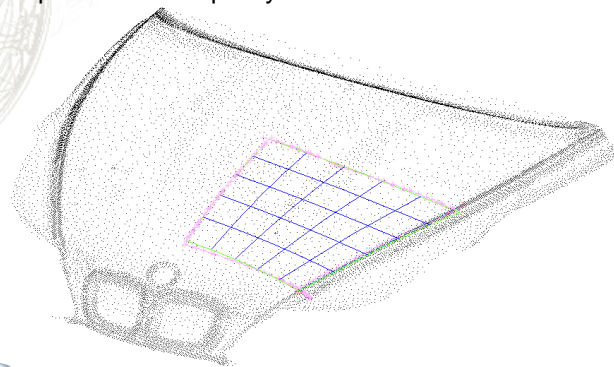
Cuts
Dynamic and incremental cuts can be calculated from both point clouds and from facet models.

Optimisation
The facet models can be re-generated and optimized with regard to bend and equilateral edges with Smoothing and Refining tools whilst retaining the shape characteristics.

Quick Surfacing
Work directly on the scan models to support demand to quickly generate a surface representation of existing scan models, with less emphasis on the quality of these surfaces

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Repair / Replace

Portions of a scan that do not represent the desired shape correctly, can be removed and replaced with alternative facets.

Offset

Offsetting of Facets aid the generation of wall thickness of a component with the option to create side walls.

Align / Register

Multiple scan sets taken from an object with different orientations in space can be relocated to fit together. Based on three master positions specified by the user the system will automatically find the best fit of the overlapping portions.

Modelling

Using the Clay command, the user can perform global and local changes to the facet model and with the aid of reference geometry, it is possible to quickly create many shape iterations.

* Creation of Textures require a Realtime or static Rendering license
** The use of surfaces in addition to scans requires a Magic license

Customer benefits

o Facet models can be modelled directly without having to create surfaces first (Clay Modelling). Supporting Conceptual design or deep Die drawing analysis processes.

o Easy transfer of facet data between ICEM Surf and other CAD- and CAM-systems by import and export in standard STL format.

o Class-A surfaces can be generated from facet data in a very short time.

o Productivity gains are achieved within the design and visualization processes through the combination of surface and facet data in a homogenous work environment.

o Using Quick Surfacing tools, the user can choose between the very fast Push Button approach, and the more interactive method, and if required, a combination of both.

o A complete or selected area of Scan geometry can be used to generate surfaces in one operation.

o User defined control over the refinement settings (Bezier, B-Spline, surface order and segmentation) are offered in order to achieve the desired surface representation.

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