Feature Line Extraction

Pagoda Systems
Software Solutions

The most critical part in reverse engineering is the segmentation of digital point clouds, where data points are grouped into sets to which an appropriate single surface can be fitted. For the modeling of freeform geometry, four-sided surface patches with NURBS representation are commonly used. In order to get a compound of smooth surface patches, the patch boundaries must be located along edges of the measured part. The software module ***Feature Lines*** offers the possibility to extract feature lines from point clouds, essential for the creation of a network of boundary curves.

Applications

- Detection of object edges
- Surface reconstruction

Features

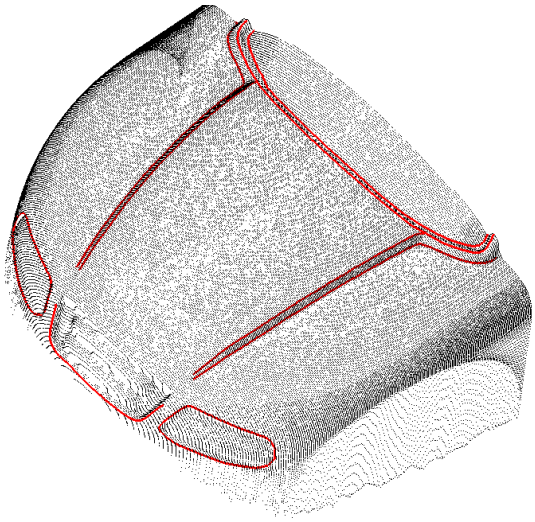
- Feature lines from unstructured or meshed points
- Extraction of sharp edges
- Extraction of fillet end lines and theoretical edges
- Applicable to special tasks, e.g. detection of preparation lines in digital tooth models

Methods

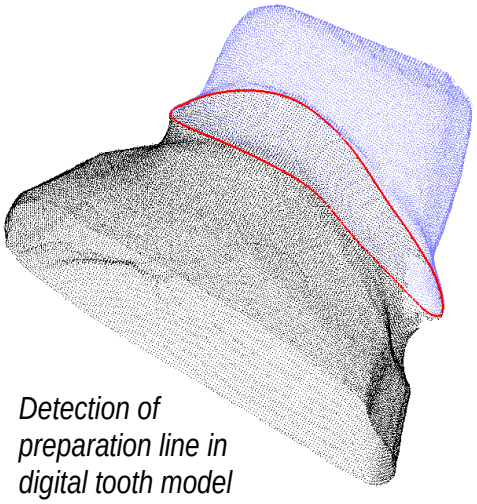
- Efficient neighbor search in unstructured point clouds
- Approximation of the tensor of curvature
- Point cloud segmentation based on geometrical features, e.g. point curvature values
- Optimized tracking of feature lines
- Correction of feature lines using sub-pixel methods

Implementation

- Programming language C++
- Modular design either for the integration into existing software systems or as stand-alone application including visualization (OpenGL)
- Support of multi-core architectures and 64-bit platforms



Sharp edge extraction from unstructured point cloud



Detection of preparation line in digital tooth model

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