

Matching of Point Clouds



Pagoda
Systems
Software Solutions

Digitization of physical parts with optical sensors usually requires scanning from different views, resulting in one point cloud per view. Mechanical inaccuracies and calibration errors might lead to gaps or steps in the overlapping region of the point clouds. The software module **Matching** offers the possibility to correct calibration errors fully automated and is applicable to an arbitrary number of overlapping clouds.

Applications

- Meshing of point clouds
- Measuring and feature detection in point clouds
- Inspection of unstructured or meshed point clouds
- Surface reconstruction

Features

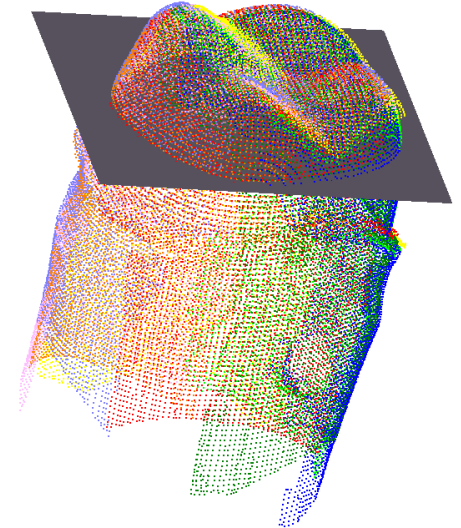
- Independent from scanning devices
- Matching of unstructured or triangulated point clouds (STL)
- Fully automated process
- Automatic calculation of overlapping regions
- No determination of registration points required
- Runtime and memory optimized, therefore applicable to large point clouds

Methods

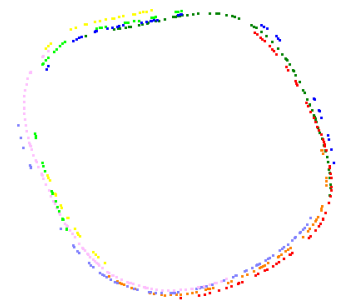
- Isosurface calculation
- Minimization of orthogonal distances by Gaussian least squares
- Registration by generalized multi-view iterative closest point method (ICP)

Implementation

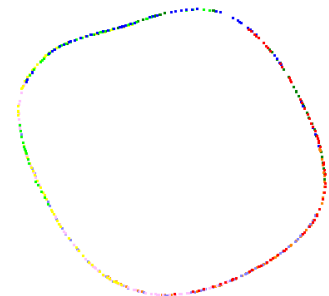
- Programming language C++
- Modular design either for the integration into existing software systems or as stand-alone application including visualization (OpenGL)
- Support of multi-core architectures and 64-bit platforms



8 views of a digitized tooth model



Cross section before matching



Cross section after matching