



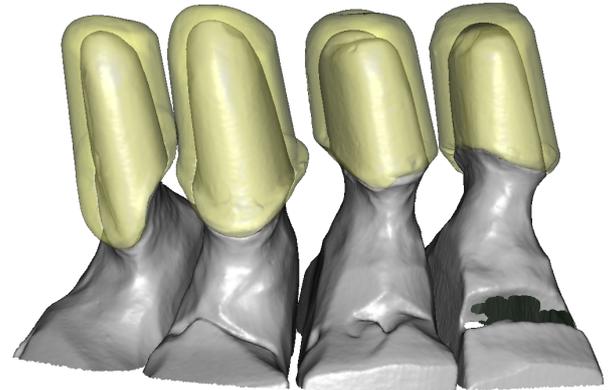
CAD/CAM technology has been state of the art in the automotive and consumer goods industry for a long time and in recent years has found its way into the dental world. After generating an optical impression of the preparation using a 3D camera, the restoration can be virtually constructed on the computer screen. The software module **Dental CAD/CAM** contains numerous powerful dental CAD/CAM functions for the computer aided construction of dental restorations.

Applications

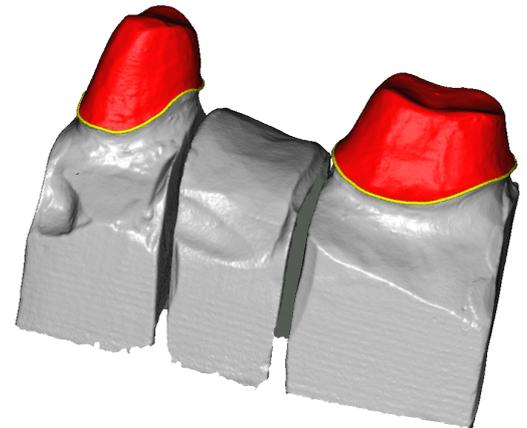
- Dental CAD/CAM processing of crowns, bridges, inlays

Features

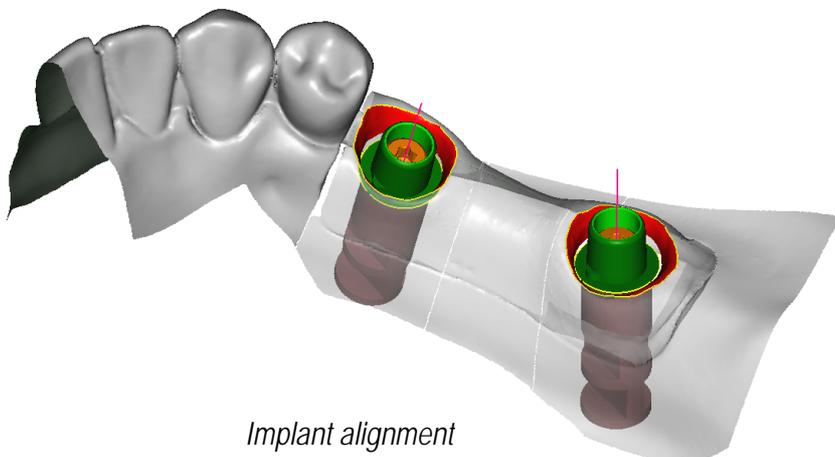
- High-level functions for filtering and correcting noisy and distorted 3D scans
- Matching of various optical scans combined with adaptive triangular meshing
- Automatic detection and correction of preparation margins for crowns, inlays and onlays
- Calculation of optimal insertion direction
- Visualization and correction of undercut areas
- Detection of equator and fissures
- Calculation of caps with given margin thickness
- Anatomical reduction of crowns and pontics
- Processing of wax-up scans
- Implant alignment
- Milling simulation including visualization and load test
- Fully automated, consecutive alignment of scans done by a handheld intraoral scanner
- Alignment of upper jaw and lower jaw using mushbite or vestibular scans



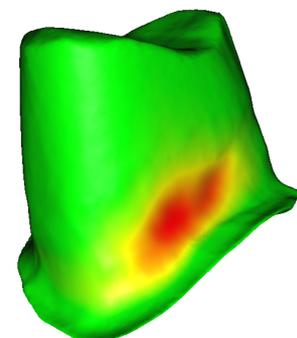
Processing of wax-up scans



Detection of preparation margins



Implant alignment



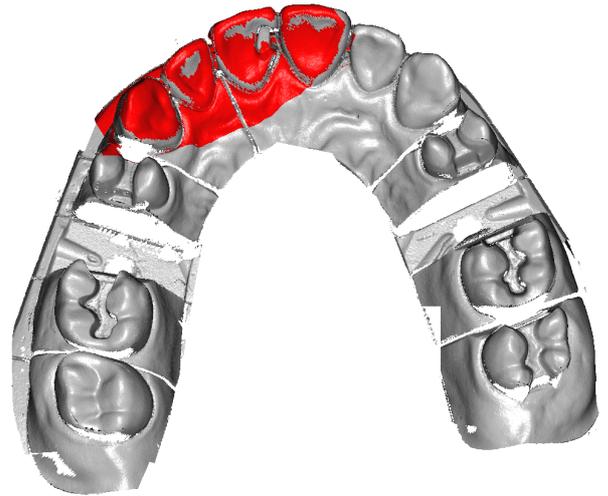
Visualization of undercut areas

Methods

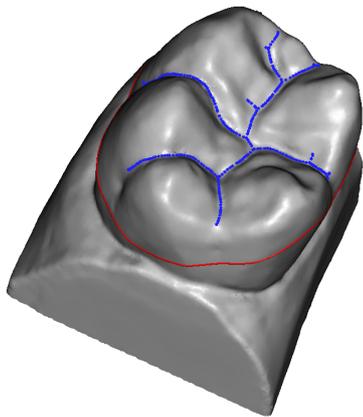
- Optimized algorithms for 3D scan data
- Meshing: incremental surface reconstruction
- Matching: multi-view iterative closest point algorithm (ICP)
- Preparation margin: 3D feature extraction
- Toolbox containing powerful CAD functions

Implementation

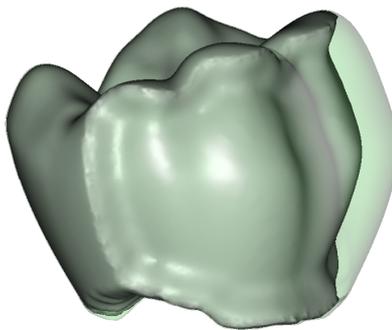
- Programming language C++
- Modular design either for the integration into existing software systems or as stand-alone application including visualization
- All tools optional as separate modules
- Support of multi-core architectures and 64-bit platforms



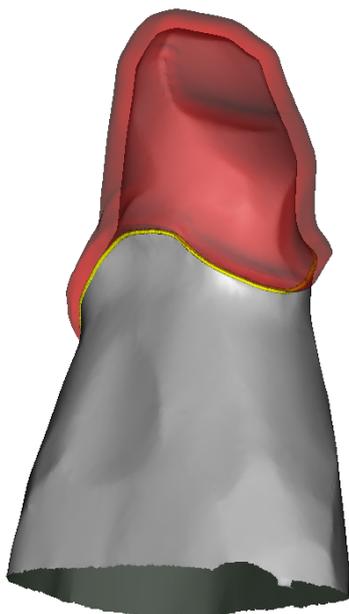
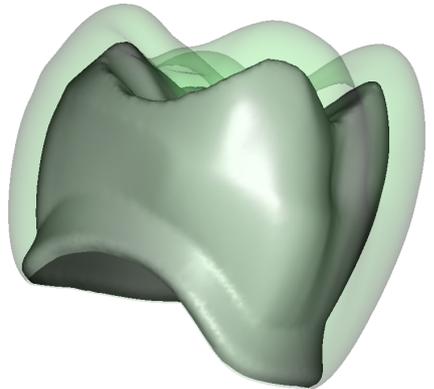
Automated alignment of intraoral scans



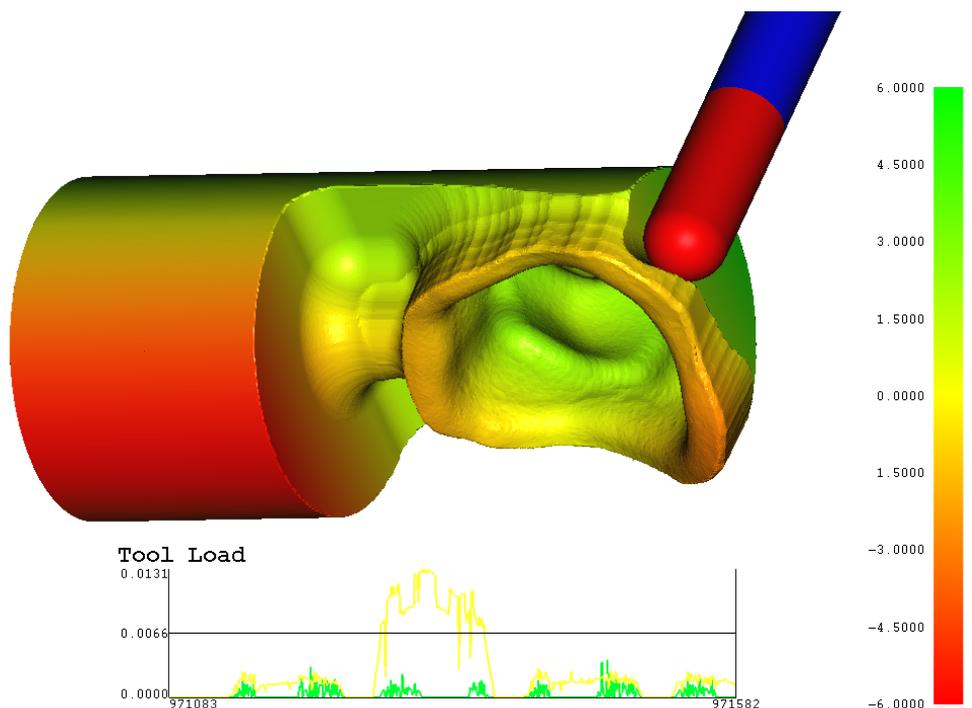
Detection of equator and fissures



Calculation of anatomical reduced pontics and crowns



Calculation of cap with given margin thickness



Milling simulation including load test