Clinical research with CADIAS[®] 3D: Discover the developer features of the software

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INTRODUCTION

GAMMA carries out research in a constant effort to improve the quality and reliability of its products and to contribute to the advancement of occlusal medicine.

To this end, the CADIAS[®] 3D module of GAMMA Dental Software[®] is continuously evolving.

In this poster, we provide an overview of the tools currently available in the developer version of CADIAS[®] 3D, intended for manipulation and analysis of articulated dental models in the

EXACT OBJECT TRANSFORMATION



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In honor of Prof. Rudolf Slavicek

To simulate the repositioning of jaw models or individual teeth in 3D space, an extended user interface allows specifying the desired transformation parameters numerically.



Figure 5: 1. Lower jaw model in original position; 2. After translation along X/Y/Z axes; 3. After rotation around a custom axis through the object center; 4. After rotation around a custom axis through the global coordinate system origin.

SYNTHETIC TEST DATA GENERATION



Simple surfaces and condylography curves can be generated based on given parameters.



Figure 1: 1. Simplified representation of upper and lower jaw models; 2. Collisions and guidance paths between contacting teeth (highlighted red).

INTERNAL ALGORITHM CONFIGURATION

The software algorithms of CADIAS[®] 3D are configurable beyond usual requirements for patient clinical analysis. In the user of need, case interface can be extended to provide additional functions.





Figure 6: Manual three-points alignment of RP and ICP models for virtual condylar position measurement (CPM).

AUTOMATION OF MANUAL TASKS

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Data analysis or augmentation of existing data for scientific studies often involves repetitive and time-intensive manual tasks. Thus, several functions have been automated to reduce time investment



Figure 2: Artificial condylography curve with predefined condylar angle, length, and movement speed.

Figure 3: Artificially generated cuboid of known size with performed point and line measurements.

DATA EXCHANGE WITH 3RD PARTY APPS

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The software allows 3D transformations (translation & rotation) which parameters can be imported from or exported to other software for 3D data manipulation.





while ensuring perfect reproducibility.



Figure 7: Automated measurement of contact point coordinates X/Y/Z in static occlusal protocol.





Figure 9: Automated repositioning of jaw models to positions equally distributed around the hinge axis.



transferred suitable Internal object transformations third-party for Figure 4: applications (such as Amira, Geomagic, MeshLab).

Figure 8: Superimposition of multiple lower jaw positions, derived from condylography animation.

GAMMA welcomes your research ideas and is determined to support you in the realization of promising projects by making available technical and human resources.

We look forward to active and successful collaboration!



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