

TITRE: Solid representation and reconstruction based on Morse theory

EQUIPE/THEME: Image et sons, MVI3D

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MOTS-CLES: Geometric modelling, boundary representation, laser scanner acquisition pipeline, homology groups, Reeb graph

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Description

Based on our experience with solid reconstruction from laser scanner acquisition we are working with solid boundary representations encoding topology and geometry of the acquired objects.

Our objective is to maintain the topological integrity of the representations in order to ensure the physical validity of the reconstructed objects using the Morse theory as mathematical tool for interpreting local shapes with singularities.

References

[1] Boissonnat,JD &co "Manifold Reconstruction in Arbitrary Dimensions Using Witness Complexes" Discrete & Computational Geometry, V42, N 1, 2009, 37-70

[2] Peltier,S. &co "Computation of homology groups and generators" C&Graphics,2006, V30, N1, 62-69

[3] Desbarats,P. and Gueorguieva,S. "CW Complexes: Topological Mainframe for Numerical Representations of Objects" ICCSA, 2003