



“SIMPLICIALIZATION” OF DIGITAL VOLUMES



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INTRODUCTION

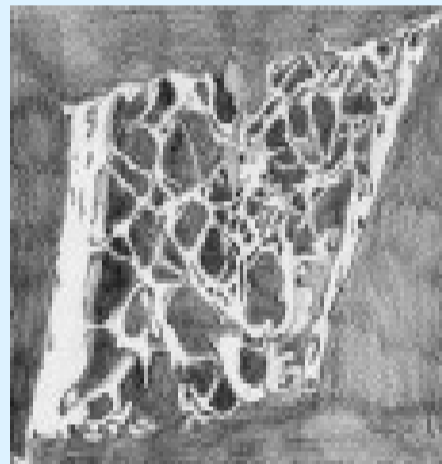
We present the first step of the ongoing project “Análisis Topológico de Imágenes Digitales” financed by Junta de Andalucía.

The purpose of our research is to obtain an Algebraic Topological Model (González-Díaz & Real) of an existing binary digital volume, and ultimately apply algorithms for calculating different topological features on it.

This algorithms aims to increase the number of topological features which can be effectively calculated in digital volumes.

OBTAINING A SIMPLICIAL COMPLEX

Our starting point will be a digital binary volume (i.e. a CT or μ -MR image of a trabecular bone). We will calculate a simplicial complex topologically equivalent to this volume:

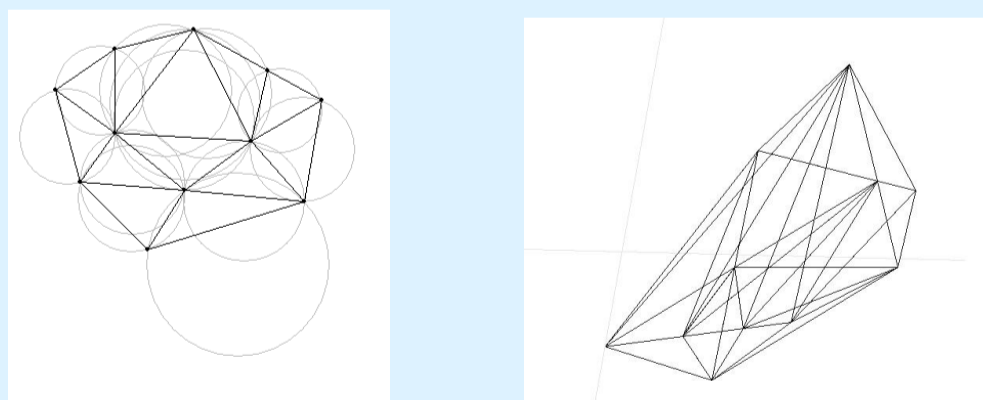


•Using the sequence of the 2D-images configuring the 3D architecture.

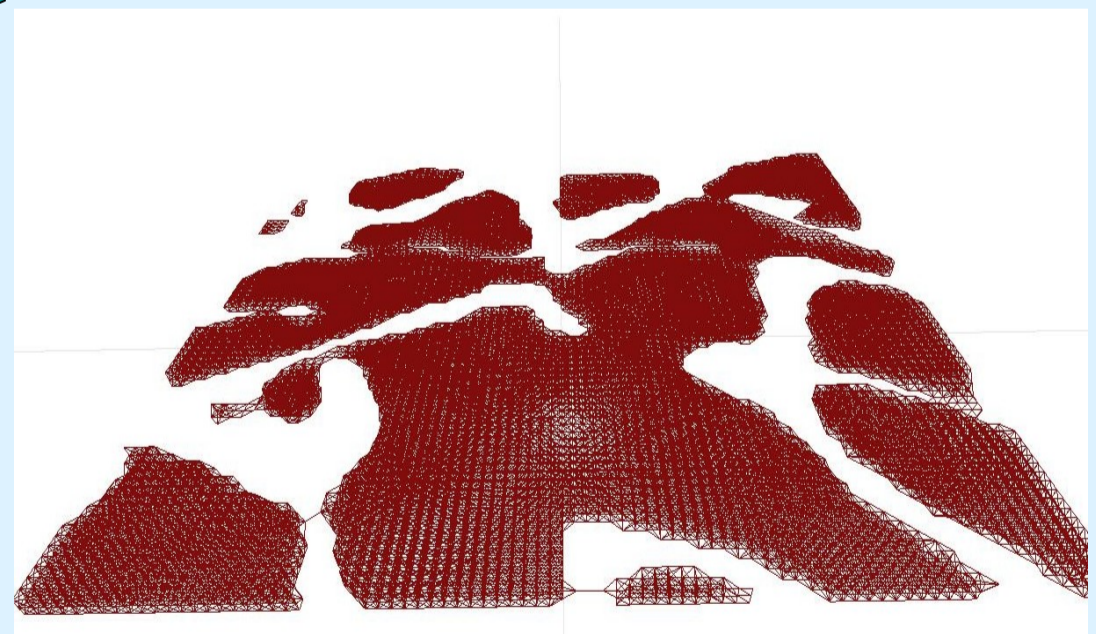
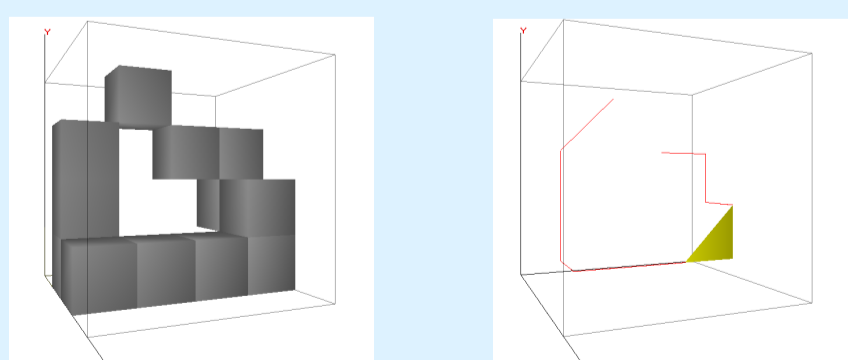


•Directly using the 3D structure:

- Modifying Delaunay (P.Real & J-L.Mari).



- Modifying 14-adjacency “simplicialization.



CONCLUSIONS

We are developing a visualization software tool calculating simultaneously, a simplicialization of a 3D volume, and its AT-model, so we will be able to completely analyze the topology of the volume.