

## CGAL-mesh

The talk will give an overview of the theoretical tools and design choices which are at the basis of simplicial mesh generation in the library CGAL. The meshing tools of CGAL are based on Delaunay refinement and use the notion of restricted Delaunay triangulation to approximate bounding surfaces. The Delaunay refinement is followed by an optimisation phase to ensure the mesh quality. Sharp edges of bounding surfaces are handled through the method of protecting spheres. As a result, the library can generate quality simplicial 3D meshes for domains or multidomains bounded by smooth or piecewise smooth surfaces. The CGAL mesh generator interacts with the input domain through an oracle gathering in a generic and abstract concept all types queries required by the mesh generator. Such a level of abstraction yields a flexible mesh generator, able to handle various descriptions of input domains ranging from polyhedral domains to grey-level or segmented 3D medical images or even implicitly described domains.