

PolyGen : Polyhedral mesh generator

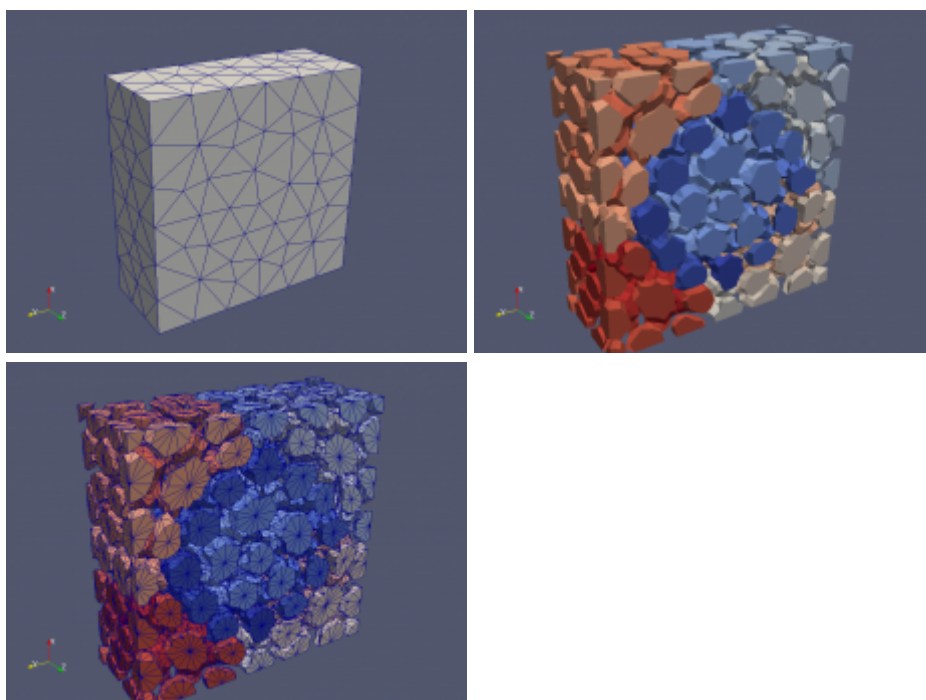
This page presents the results of a project aiming at building a polyhedral mesh generator. The generated polyhedral decomposition of a domain will be subsequently used as the basis for discretisation in a simulator based on generalized Finite Element Method. Thus one of the requirements for the representation of the polyhedral cells is the ability to calculate volume and surface integrals for them. To meet this requirement, the polyhedral cells are build on the basis of a mesh that is barycentric dual to the primary tetrahedral mesh. While barycentric dual meshes generate cells with more vertices than circumcentric duals, and also often non-convex cells, they are much easier to build.

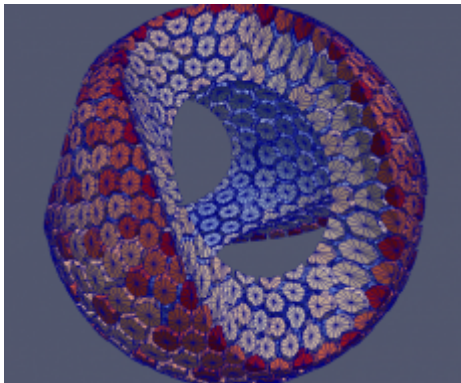
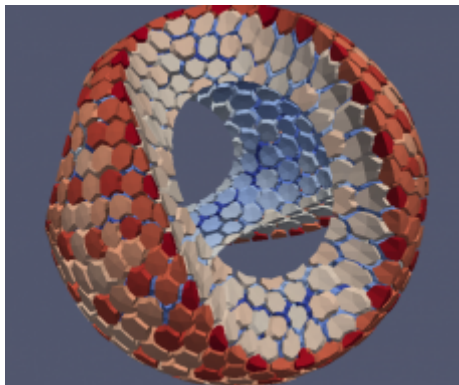
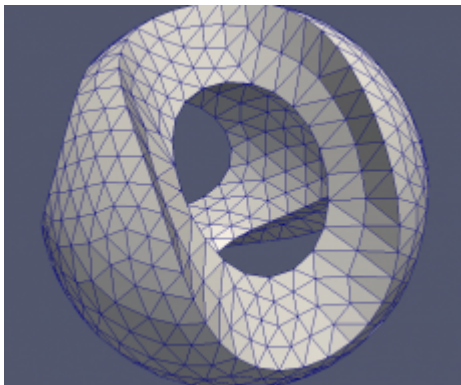
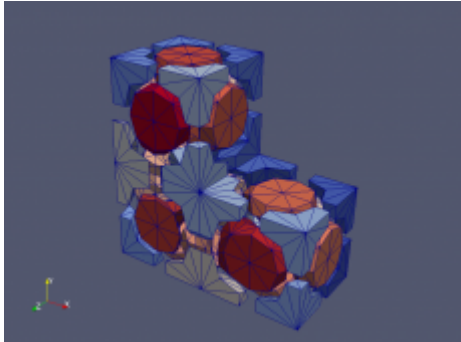
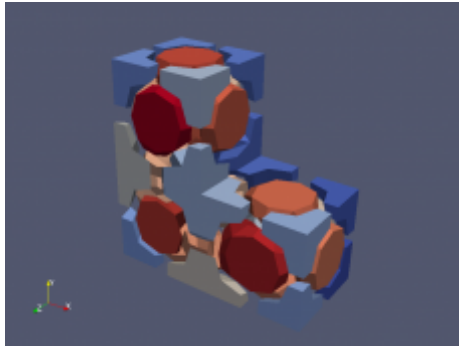
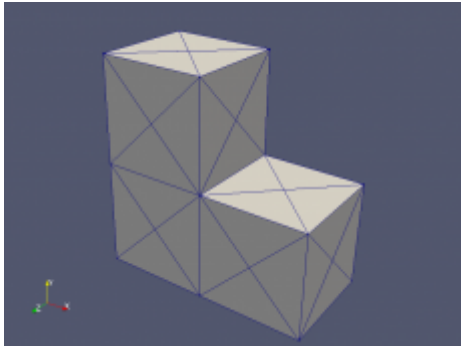
Implementation

The generator is implemented in C++ and uses MOAB and VTK libraries. The input to it is a file with tetrahedral mesh. On the output it is able to generate VTK file with polyhedral cells or VTK file with triangulation of the polyhedral cells.

Screenshots

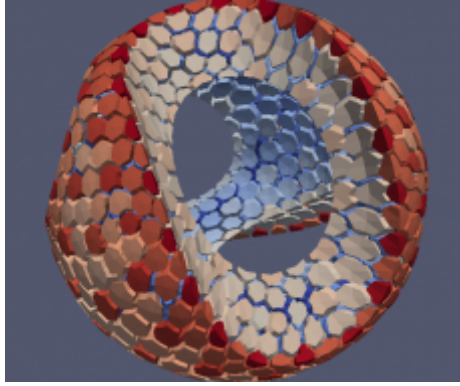
Click on image to see it in the original size.





Movies

Some animations. Click on the image to start the movie.



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