Chapter 1

Existing (unstructured) meshes: Wrappers to third-party mesh generators

oomph-lib does not provide its own unstructured mesh generator but has several mesh classes that generate unstructured meshes from the output of third-party unstructured mesh generators.

Notes:

- 1. The unstructured tet and triangle meshes listed below can **not** be used with <code>oomph-lib's</code> mesh adaptation or node-update procedures. A suitably fine mesh has to be generated offline by the third-party mesh generator. If required, node-updates (in response to changes in the domain boundaries) have to be performed manually.
- 2. For some element types, the mesh generation process is not particularly efficient (yet!). A suitable warning message is issued in such cases.
- Since the third-party mesh generators tend to triangulate the domain with simplex elements, curvilinear boundaries are not resolved more accurately by using higher-order elements unless some post-processing is performed.
- 4. The meshes have not been tested as extensively as <code>oomph-lib's</code> structured meshes, described <code>elsewhere.</code>

1.1 Mesh list

Mesh	Representative Mesh plot	
TriangleMesh <element></element>		
• This class creates oomph-lib meshes based		
on the output from J.R.Shewchuk's Delau- nay mesh generator Triangle		
• The mesh can be used with all Finite↔ Elements that are derived from the geometric finite element TElement<2, NNODE_1D>.		
Example driver codes:	* 0 0 io	12
• The use of Triangle and the Triangle↔ Mesh class are explained in a separate tutorial.		
• In another tutorial we demonstrate how the code fig2poly.cc may be used to gen- erate input files for Triangle based on the output from the open-source drawing program xfig.		
TetgenMesh <element></element>		
 This class creates oomph-lib meshes based on the output from Hang Si's open-source mesh generator Tetgen . The mesh can be used with all Finite↔ Elements that are derived from the geometric finite element TElement<3, NNODE_1D>. Example driver codes: The use of Tetgen and the Tetgen↔ Mesh class are explained in a separate tutorial. 		



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1.2 PDF file

A pdf version of this document is available.