ViennaMesh

Quick User Guide
v0.2.0

Institute for Microelectronics
Gußhausstraße 27-29 / E360
A-1040 Vienna, Austria

Copyright © 2011, Institute for Microelectronics, TU Wien.

Developers:

Josef Weinbub
Johann Cervenka
Karl Rupp

Institute for Microelectronics
Technische Universität Wien
Gußhausstraße 27-29 / E360
A-1040 Vienna, Austria,Europe

Phone	+43-1-58801-36001
Fax	+43-1-58801-36099
Web	http://www.iue.tuwien.ac.at

Contents

1 Introduction

To provide applications with the utmost flexibility in the generation and adaptation of meshes, the generic and high-quality meshing library, ViennaMesh, has been developed. ViennaMesh provides a unified interface for various mesh related tools. These tools cover mesh generation, adaptation, and classification of multi-segmented (aka. multi-material) meshes and geometries for unstructured two- and three-dimensional meshes. The goal is to provide applications with an additional back-end layer for mesh generation, allowing to seamlessly exchange mesh tools, for example, mesh generation kernels.

2 Building

Although ViennaMesh provides several dependencies within its external folder, additional requirements are necessary.

- CMake [1]
- Boost [2]
- GMP [3]
- CGAL [4]

Typically `CMake`, `CGAL`, and `GMP` are provided by the distributions, for example, Ubuntu. However, CGAL maybe has to be installed manually.

An exemplary build script is provided within the root folder of ViennaMesh.

```
build.sh
```

Note that `Debug` and `Release` builds are available, by utilizing the appropriate `CMake` configuration parameter.

```
-D CMAKE_BUILD_TYPE=Release
-D CMAKE_BUILD_TYPE=Debug
```

The `CGAL` include and library paths have to be provided via the respective `CMake` configuration parameters.

```
-D CGAL_INC_DIR=$CGALINC
-D CGAL_LIB_DIR=$CGALLIB
```

Note that the build script expects the parameters `CGALINC` and `CGALLIB` to be provided by the environment. Certainly these paths can be entered statically within the build script.

After the build process is finished, an application executable is available within the build folder.

```
build/vmesh
```

This executable is capable of producing volume meshes of high quality of `bnd` and `hin` input files.

Example input files can be found in the input/ folder.

3 License

ViennaMesh is published under the GNU LESSER GENERAL PUBLIC LICENSE (LGPL) [5]. The complete license text can be found in the file

```
LICENSE
```

located in the root folder of the ViennaMesh package.

ViennaMesh ships several external libraries located in the external/ folder. These libraries are equipped with their own license, which is explicitly available within the respective root folders as a LICENSE file.

References

[1] “CMake.” [Online]. Available: http://www.cmake.org/

[2] “Boost C++ Libraries.” [Online]. Available: http://www.boost.org/

[3] “GMP - The GNU Multiple Precision Arithmetic Library.” [Online]. Available: http://gmplib.org/

[4] “CGAL - The Computational Geometry Algorithms Library.” [Online]. Available: http://www.cgal.org/

[5] “GNU Lesser General Public License.” [Online]. Available: http://www.gnu.org/licenses/lgpl.html