

Kinetic

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1 Introduction

2 Tools

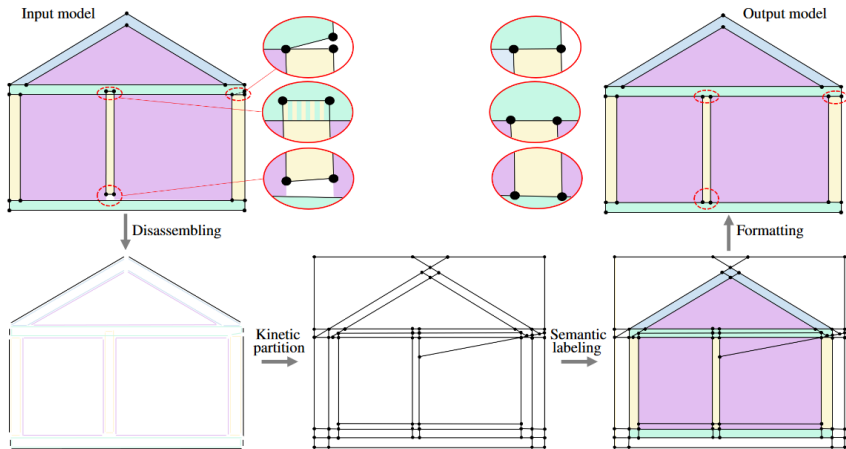
3 roadmap

To be able to solve equations on a mesh, we need it to be watertight.
During our project, we will address this issue using an algorithm from the CGAL library

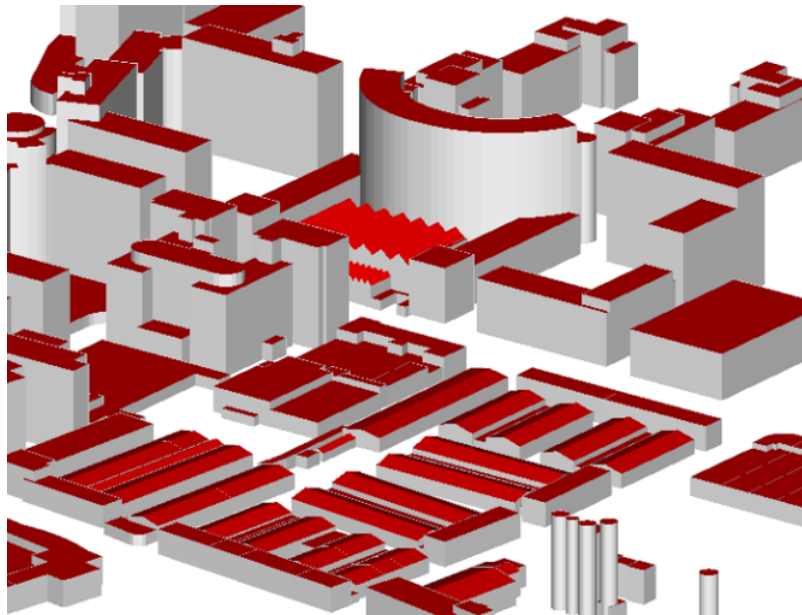
The objectives of the project are:

- Repair mesh to make them watertight
 - watertight building model
 - watertight urban model

watertight building model



watertight urban model



Tools



Geometry Kernels

2D and 3D Linear Geometry Kernel



Hervé Brönnimann, Andreas Fabri, Geert-Jan Giezeman, Susan Hert, Michael Hoffmann, Lutz Kettner, Sylvain Pion, and Stefan Schirra

This package contains kernels each containing objects of constant size, such as point, vector, direction, line, ray, segment, circle as well as predicates and constructions for these objects. The kernels mainly differ in the way they handle robustness issues.

[User Manual](#)

[Reference Manual](#)

dD Geometry Kernel



Michael Seel

The dD Kernel contains objects of constant size, such as point, vector, direction, line, ray, segment, circle in d dimensional Euclidean space, as well as predicates and constructions for these objects.

[User Manual](#)

[Reference Manual](#)

2D Circular Geometry Kernel



Pedro Machado Manhães de Castro, Sylvain Pion, and Monique Teillaud

This package is an extension of the linear CGAL kernel. It offers functionalities on circles, circular arcs and line segments in the plane.

[User Manual](#)

[Reference Manual](#)

3D Spherical Geometry Kernel



Pedro Machado Manhães de Castro, Frédéric Cazals, Sébastien Loriot, and Monique Teillaud

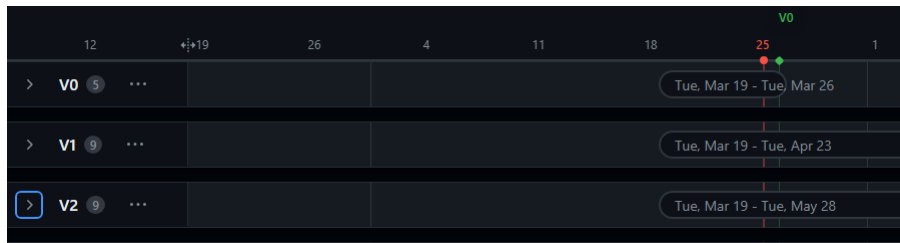
This package is an extension of the linear CGAL Kernel. It offers functionalities on spheres, circles, circular arcs and line segments, in the 3D space or restricted on a reference sphere.

[User Manual](#)

[Reference Manual](#)

- learn how to use CGAL package
- learn how to read structure mesh to use it in CGAL code
- learn how to use KINETIC package to fill the structure mesh

roadmap



reference



Mulin Yu, Florent Lafarge, Sven Oesau, and Bruno Hilaire.

Repairing geometric errors in 3D urban models with kinetic data structures.

ISPRS Journal of Photogrammetry and Remote Sensing, 192, October 2022.



Jean-Philippe Bauchet and Florent Lafarge.

Kinetic Shape Reconstruction.

ACM Transactions on Graphics, 2020.



The CGAL Project.

CGAL User and Reference Manual.

CGAL Editorial Board, 5.6.1 edition, 2024.