Lehrstuhl für Baustatik und Baudynamik

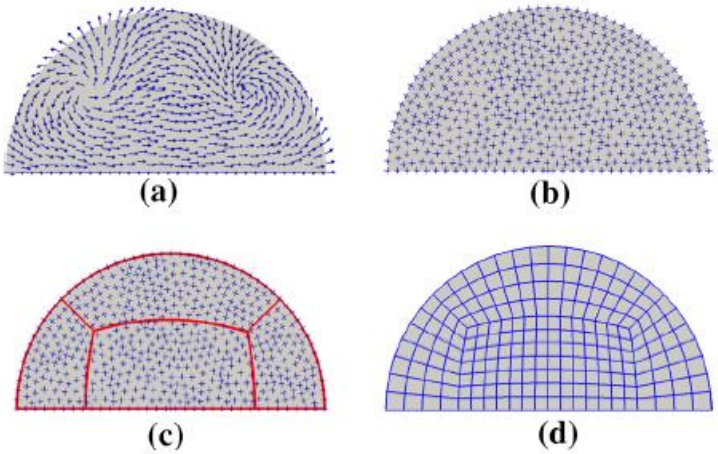
RWTH AACHEN UNIVERSITY

Master Thesis

Automatic multidomain partitioning for quadrilateral meshing

Background

Structured quadrilateral meshes have significant advantages over fully unstructured meshes in numerical simulations but automatically generating these meshes is considerably more difficult. State-of-the-art mesh generation algorithms for structured quadrilateral meshes first compute a vector-field which is then used to identify mesh singularities. Finally, the domain is partitioned into quadrilateral patches based on these singularities and the vector-field. Those quadrilateral patches can then easily be further subdivided.



Kowalski, Nicolas, Franck Ledoux, and Pascal Frey. "Automatic domain partitioning for quadrilateral meshing with line constraints." *Engineering with Computers* 31.3 (2015): 405-421.

Aim

The aim of this thesis is the implementation of a state-of-the-art quadrilateral mesh generation algorithm in Python which can identify mesh singularities and create a quadrilateral mesh based on streamlines.

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