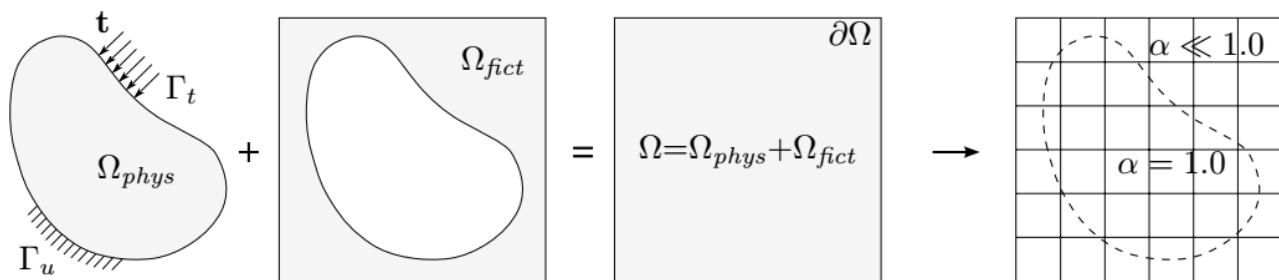


Master's Thesis

APPLICATION OF FINITE CELL METHOD IN SOLID MECHANICS PROBLEM

Supervisor: MSc. Hoang Giang Bui

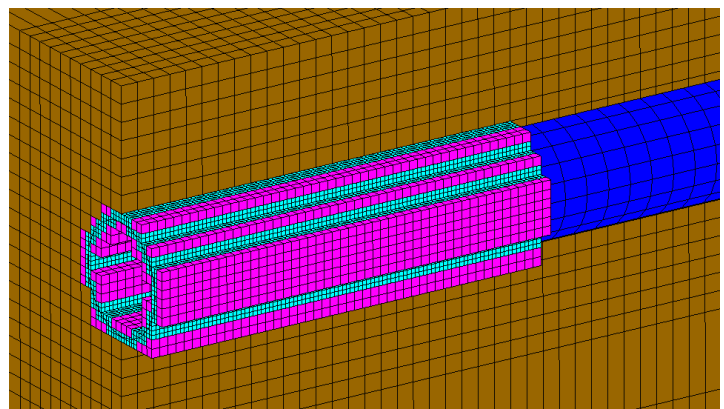
Background: Finite cell method (a.k.a immersed boundary method) emerges as a versatile numerical method to solve a broad class of problems with complex boundary interface. The idea is to embed a physical domain into a structured background mesh and incorporate the boundary information into the weak form by using the weakly enforced constraint method (i.e. Nitsche method). To improve the accuracy of the integration along the boundary, an adaptive quadrature method based on quad-tree



is typically employed. Finite cell method is successfully applied to fluid dynamics problem. In the solid mechanics domain, its application is still under active development.

Tasks:

- + Familiarize with the method by running classical benchmark problems.
- + Implement the weakly enforced boundary constraint by Nitsche method.
- + Implement an efficient quadrature scheme for integration of cut-cell defined by implicitly defined surface.



Contact:

Bui, Hoang Giang

Room: IC 6/163, Lehrstuhl für Statik und Dynamik, Ruhr-Universität Bochum.

Tel: 0234-32-29056. Email: giang.bui@rub.de