

# PUMLab: MATLAB Implementation of the Partition of Unity Method

## Project Characteristics

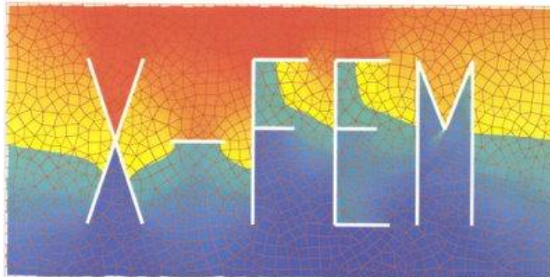
Mechanics: ★★★★★☆  
Mathematics: ★★★★★☆  
Programming: ★★★★★★

### Setting:

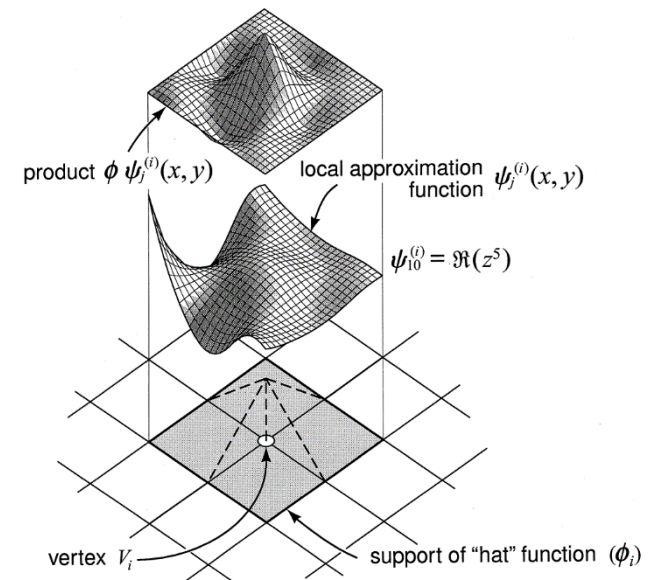
- The Partition of Unity Method (PUM) is a powerful discretization approach well suited for problems featuring internal discontinuities such as **material interfaces** and **cracks**.
- Bases on the idea of **enriching** the standard finite element basis by special functions that take advantage of **a priori knowledge** of the solution
- applied in the eXtended and generalized finite element method (**XFEM**, **GFEM**)

### Your Tasks:

- Getting familiar with PUM and the code structure of FCMLab
- Extend FCMLab for Lagrange basis functions.
- Implement and compare different flavors of the PUM.



[http://amresearch.blogspot.de/2006\\_01\\_01\\_amresearch\\_archive.html](http://amresearch.blogspot.de/2006_01_01_amresearch_archive.html)



T. Strouboulis et. al "The design and analysis of the Generalized Finite Element Method," 2000.