Numerical Analysis Seminar

Space-time virtual elements: a priori error analysis, residual error estimators, and adaptivity

Prof. Lorenzo Mascotto
University of Milano Bicocca

Abstract: We present a space–time virtual element method for parabolic problems based on a standard Petrov-Galerkin formulation. Trial and test spaces are nonforming in space, so as to allow for a unified analysis in any spatial dimension. The information between time slabs is transmitted by means of upwind terms involving polynomial projections of the discrete functions. After discussing a priori error estimates, we validate them on some numerical examples and compare the results with those of conforming space–time finite elements. Moreover, we introduce and assess numerically several properties of a residual-type error estimator: we verify its reliability and efficiency for h-adaptive refinements; compare the performance of the space–time nonconforming virtual and conforming finite element methods; investigate the quasi-efficiency of the error estimator for p- and hp-refinements.

Date: May 9, 2024 (Thursday)
Zoom Link: https://cuhk.zoom.us/j/9808745156?omn=94078178417

Meeting ID: 980 874 5156
Time: 3:00 pm (Hong King Time)

All are Welcome