THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Numerical Analysis Seminar

Iterative energy minimization and variational adaptivity

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Abstract

We present a general Galerkin discretization framework for the numerical approximation of nonlinear elliptic variational-type boundary value problems, i.e., whose solutions appear as (local or global) minimizers of an underlying energy functional. Our approach relies on two components: (1) a linearized iterative energy reduction procedure, which allows to minimize the energy on a given space, and (2) a novel adaptive methodology that exploits the local energy structure of the PDE (instead of a posteriori error indicators) in order to improve the approximate solution on a sequence of hierarchically enriched discrete spaces. In addition to the theoretical foundations, a series of numerical experiments in the context of finite element methods will illustrate our approach.

Date:	April 24, 2024 (Wednesday)
Time:	3:00 – 4:00pm
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 913 6532 3891 Password: 310656

All are welcome