Computational Mathematics Seminar Series

A C0 Interior Penalty Method for an Optimal Control Problem Governed by the Biharmonic Operator

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Lockett Hall 233
December 02, 2013 - 02:30 pm

Abstract:

In the recent past, C0 interior penalty methods have been attractive for solving the fourth order problems. In this talk, a C0 interior penalty method is proposed and analyzed for distributed optimal control problems governed by the biharmonic operator. The state equation is discretized using continuous piecewise quadratic finite elements while piecewise constant approximations are used for discretizing the control variable. A priori and a posteriori error estimates are derived for both the state and control variables under minimal regularity assumptions. Theoretical results are demonstrated by numerical experiments. The a posteriori error estimators are useful in adaptive finite element approximation and the numerical results indicate that the sharp error estimators work efficiently in guiding the mesh refinement and saving the computational effort substantially.

Speaker's Bio:

Neela Nataraj works as an Associate Professor in the Department of Mathematics, Indian Institute of Technology Bombay. She completed her Ph.D. from Department of Mathematics, Indian Institute of Technology Delhi in the year 1998. After working in IIT Delhi for 3 years, she joined as an Assistant Professor in IIT Bombay in the year 2003. Some of her areas of research interest are finite element methods, finite volume methods and discontinuous Galerkin methods for elliptic and parabolic problems. She has around 30 publications in international journals. She has been the recipient of the *IIT Bombay Excellence in Teaching Award* in the years 2008 and 2012.

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