NANYANG TECHNOLOGICAL UNIVERSITY
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SEMINAR ANNOUNCEMENT

Direct and Inverse Algebraic Approximation and Application to the p and h-p Version of Finite Element Method

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Time: 10.30am – 11.30am
Venue: MAS Executive Classroom 2 #03-07,
School of Physical and Mathematical Sciences

Abstract

We present an important progress in past two decades on direct and inverse algebraic approximation theory in the framework of the Jacobi-weighted spaces. The direct and inverse algebraic approximation are investigated in various functional spaces, e.g., the Sobolev spaces. Comparing algebraic approximation with trigonometric approximation, we conclude that Sobolev spaces are appropriate tools to establish the trigonometric approximation theory, but not for the algebraic approximation. In late 1990s we introduced the Jacobi-weighted Sobolev and Besov spaces and have investigated algebraic approximation in framework of these weighted spaces, which leads to the optimal direct approximation errors as well as the sharpest inverse results for algebraic approximation. The match-up between the direct and inverse results of algebraic approximation was achieved for the first time. Applying the new algebraic approximation theory in framework of the Jacobi-weighted spaces, we have been solving some important issues in approximation theory of the p and h-p version of the finite element method in two and three dimensions.

Speaker Biography

Benqi Guo is the professor of Mathematics Department at University of Manitoba, Canada and the Special Professor at Shanghai Normal University. He graduated from Mathematics Department of Fudan University at Shanghai in 1968, and got his MSc and PhD in University of Maryland at College Park, USA under supervision of Professor Ivo Babuska in 1983 and 1985, respectively. He served the Editorial Boards of several prestigious journals such as SIAM. J Numer.Anal, AiCM, Int.J Numer.Anal.Mod, and Communi. Appl. Math. Comput. His research interest is in computational and applied mathematics, including regularity theory of PDE on non-smooth domains, algebraic approximation theory, the p and h-p FEM and applications, parallel and iterative solvers for large-scale linear system resulted from the p and h-p FEM/BEM discretization, modeling and computing of heterogeneous materials with micro structures. He has made influential contributions in the above fields and published in prestigious journals such as Numer. Math., SIAM. J Numer.Anal, SIAM. J Math.Anal. SIAM. J Sci. Comput., AiCM, Comp. Appl. Math., Compt. Meth. Mech. Engrg.. His research has been supported by NSERC of Canada, NSF, US Army Research Office and EPSRC of UK and others.

Host: Associate Professor Wang Li-Lian
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