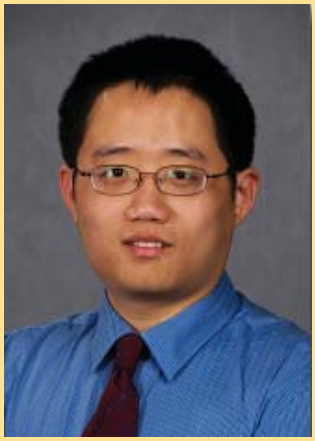
Mathematics Faculty Search
Computational Math

Candidate interview for assistant professor

February 7-8, 2012



Li Tian

Penn State

www.math.psu.edu/tian/

Li Tian is the Chowla Research Assistant Professor with the Department of Mathematics at Penn State University. Tian received his PhD from USC in 2009.

Research interests include finite element/volume methods for PDEs; numerical schemes and analysis for peridynamic models; adaptive methods; spline finite element methods; and numerical analysis for stochastic differential equations.

IOWA STATE UNIVERSITY

TEACHING DEMO
401 Carver
Wednesday, February 8 at 9:30 a.m.

HOSPITALITY
404 Carver
Tuesday, February 7 at 3:45 p.m.

COLLOQUIUM
268 Carver
Tuesday, February 7 at 4:10 p.m.

Adaptive Finite Element Method for Peridynamic Models

Peridynamics is a continuum mechanics based on integral equations for nonlocal material modeling. It extends the classical continuum mechanics by allowing long-range forces, therefore can be used to describe deformations with discontinuities like fractures and cracks.

Peridynamics is also an effective alternative of molecular dynamics, with lower computational cost. One of the speaker's current research areas is the adaptive finite element method (FEM) for such nonlocal problems, since large error may arise around discontinuities during numerical approximations. In this presentation, the speaker will first give a brief introduction to the peridynamic theory, as well as the finite element discretization and error analysis for peridynamic constrainedvalue problem. Then the speaker will present the a posteriori error analysis for the nonlocal diffusion problem, which is the scalar version of the general peridynamic model. Based on the nonlocal a posteriori error analysis, a convergent adaptive FEM is derived for the model problem, which means we do get reduced numerical error by using adaptive refinement. Various numerical experiment will be presented to support the theoretical conclusions.