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Education

Aug. 2003 – Present, Ph.D., Dept. of Math., Penn. State Univ., Advisor: Prof. Jinchao Xu
Sept. 2000 – Jun. 2003, M.S., Dept. of Math., Southeast Univ. (China), Advisor: Prof. Chong Li
Sept. 1996 - Jun. 2000, B.S., Dept. of Math., Southeast Univ. (China)

Academic Experiences

May. 2007 – Aug. 2007, Summer Intern, CSRI Dept., Sandia National Lab
Sep. 2003 – Present, Teaching Assistant, Dept. of Math., Penn. State Univ.
Sept. 2000 – Apr. 2003, Research Assistant, Dept. of Math., Southeast University

Awards

- Pritchard Dissertation Fellowship

Research Interests

- Numerical Approximation of Partial Differential Equations
- Theory and Application of Adaptive Finite Element/Volume Methods
- Design and Analysis of Robust Multilevel Methods
- Compatible Discretization and AMG Solver
- Efficient Solver for $H(\text{curl})$ and $H(\text{div})$ equations

Research Objects and Work in Progress

Objects: Design and analysis the adaptive finite element/volume methods for second order elliptic equation and Maxwell equations. Combine with Multigrid / Multilevel technique, design robust and fast solver for these equations.

Work In Progress: Design and Analysis robust solver for Maxwell's equations with large jump coefficients

Publications

- *Compatible Gauge AMG, Auxiliary Space Preconditioner and Applications*, P. Bochev, C. Siefert, R. Tuminaro, J. Xu and Y. Zhu, In preparation, 2007.
- *Compatible Gauge Approach for $H(\text{div})$ Equations*, P. Bochev, C. Siefert, R. Tuminaro, J. Xu and Y. Zhu, SNL-CSRI Summer Proceeding, 2007.
- *Uniform Convergent Multigrid Methods for Elliptic Problems with Strongly Discontinuous Coefficients*, J. Xu and Y. Zhu, To appear in M^3AS , 2007
- *Domain Decomposition Preconditioners for Elliptic Equations with Jump Coefficients*, Y. Zhu, To appear in NLA, 2007
- *Robust Multilevel Preconditioners for Elliptic Problems with Strongly Discontinuous Coefficients on Adaptive Grids*, J. Xu and Y. Zhu, Preprint, 2007.
- *Convergence Analysis of Adaptive Finite Volume Element Methods for General Elliptic Equations*, J. Xu, Y. Zhu and Q. Zou, Submitted to Numer. Math., 2006.
- *The Basic Constraint Qualification (BCQ) and the Best Restricted Range Uniform Approximation*, Y. Zhu, Master thesis, Nov. 2002.

Talks

- *Efficient Solvers for Problems with Variable Coefficients*, CCMA Luncheon Seminar, Nov. 2, 2007
- *Robust Multilevel Methods for Problems with Strongly Discontinuous Coefficients*, Finite Element Circus, Cornell Univ., Oct. 19, 2007
- *Convergence Analysis of Adaptive Finite Volume Methods*, Thirteenth Copper Mountain Conference on Multigrid Methods, March 2007.