Yingpei Wang

Personal Information

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Education

Rice University, Houston, TX, USA

Ph.D. Candidate, Computational and Applied Mathematics   05/2014 (Expected)

- Advisor: Dr. Liliana Borcea & Dr. Béatrice M. Rivière

- Expected Dissertation Topic: "On the approximation of the Dirichlet to Neumann map for high contrast two phase composites and its applications to numerical methods"

M.A., Computational and Applied Mathematics   05/2013

- GPA: 4.09/4.33 (A or A+ for all courses)

- Advisor: Dr. Liliana Borcea

- Dissertation Topic: "On the approximation of the Dirichlet to Neumann map for high contrast two phase composites"

University of Science and Technology of China, Hefei, Anhui, China

B.S., Mathematics and Applied Mathematics   07/2009

- Major Grades: 95/100 (Top 2%)

- Advisor: Dr. Zuchi Chen

- Dissertation Topic: "Semigroup Theory"

Research Interests

- Asymptotic approximation of transport properties, for example effective conductance and DtN maps, in high contrast conductive media.

- Domain decomposition methods for problems in high contrast and heterogeneous media.

- Finite element methods, discontinuous Galerkin methods, homogenization theory and multi-scale methods for problems in heterogeneous media.

Honors and Awards

- The Computational and Applied Mathematics Department Stipend   2009-2010

- National Scholarship of China (Top 0.03% undergraduate students all over the China)   2008

- First Prize of Chinese Mathematical Olympiad in Senior (0.01%)   2005

Publications

- L. Borcea, B. Riviere and Y. Wang, A nonoverlapping domain decomposition method with approximated preconditioner for problems in high contrast conductive media, in preparation.

- L. Borcea, Y. Gorb and Y. Wang, Asymptotic approximation of the Dirichlet to Neumann map of high contrast conductive media, submitted to Archive for Rational Mechanics and Analysis, 2013.

Computer Skills

- Languages: C/C++, MPI, Matlab, Mathematica.

- Operating Systems: Unix/Linux, Windows.

Experience

Rice University, Houston, TX, USA

- Teaching Assistant,   Fall 2013

    - Instrcutor: Dr. Richard Rankin
    - CAAM 336, Differential Equations in Science and Engineering.

- Research Assistant,   07/2013 - Present

    - Advisors: Dr. Liliana Borcea & Dr. Béatrice M. Rivière
    - Combine asymptotic results and numerical methods to develop efficient solvers for problems in high contrast media. For example, construct the preconditioner from asymptotic approximation of the DtN map in a nonoverlapping domain decomposition method.

- Research Assistant,   01/2011 - 07/2013

    - Advisor: Dr. Liliana Borcea
    - Asymptotic approximate the Dirichlet to Neumann map for problems in high contrast two phase composites. The method is based on constructions of trial functions for primal and dual variational principles in order to obtain tight upper and lower bounds for the energy in the domain. The result comes from rigorous analysis for problems with arbitrary boundary conditions.

- Research Assistant,   05/2010 - 12/2010

    - Advisor: Dr. Timothy Warburton
    - Use adaptive discontinuous Galerkin method and perfectly matched layer approach to solve the time harmonic electromagnetic scattering problem.
    - Implement the bisection algorithm by using longest edge strategy for 3D mesh in adaptive numerical methods.

- Graduate Student with Fellowship from CAAM of Rice University   08/2009 - 05/2010

University of Science and Technology of China, Hefei, Anhui, China

- Chief Editor of Magazine "Wa Ming" in Department of Mathematics   2009

    - Review and publish papers from undergraduate students in the department magazine.

- Organizer of seminar for undergraduates in Department of Mathematics   2006-2008

    - Lead discussions on problems from all mathematical courses.

Conferences and Presentations

1. February 28, 2014. "A Nonoverlapping domain decomposition method with approximated preconditioner for problems in high contrast media", Finite Element Rodeo, ICES, UT Austin, Austin, TX.

2. January 18, 2014. "Nonoverlapping domain decomposition methods with approximated preconditioners for problems in high contrast media", Joint Mathematics Meetings, Baltimore, MD.

3. November 6, 2013. "Nonoverlapping domain decomposition methods for problems in high contrast media", CAAM Graduate Seminar, Rice University, Houston, TX.

4. April 29 - May 1, 2013. Thematic Workshop on Multiscale Modeling, ICES, UT Austin, Austin, TX.

5. July 30 - August 03, 2012. International Conference on Inverse Problems and PDE Control, Department of Mathematics, Sichuang University, Chengdu, China.

6. June 18-29, 2012. Summer School on Recent Advances in the Theory of Homogenization, Department of Mathematics, University of Chicago, Chicago, IL.

7. March 28, 2012. "Imaging in high contrast media—approximate the DtN map", CAAM Graduate Seminar, Rice University, Houston, TX.

8. January 18, 2012. "Curved elements in the finite element method", Math Sciences VIGRE Seminar, Rice University, Houston, TX.

9. May 23-27, 2011. Applied Inverse Problems Conference, Texas A&M University, College Station, TX.

10. April 04, 2011. "Array imaging using intensity-only measurements", Math Sciences VIGRE Seminar, Rice University, Houston, TX.

11. March 25-26, 2011. Finite Element Rodeo 2011, Texas A&M University, College Station, TX.

12. October 20, 2010. "Discontinuous methods and perfectly matched layer technique for time-harmonic electromagnetic scattering problems", CAAM Graduate Seminar, Rice University, Houston, TX.

References

1. Dr. Liliana Borcea, borcea@umich.edu
   Peter Field Collegiate Professor of Mathematics, University of Michigan.

2. Dr. Béatrice M. Rivière, riviere@caam.rice.edu
   Professor of Computational and Applied Mathematics, Rice University.

3. Dr. William W. Symes, symes@caam.rice.edu
   Noah Harding Professor of Computational and Applied Mathematics, Rice University.

4. Dr. Robert Hardt, hardt@math.rice.edu
   W. L. Moody Professor of Mathematics, Rice University.