

Zhu Wang

CONTACT INFORMATION

Department of Mathematics
University of South Carolina
Columbia, SC

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EDUCATION

Virginia Tech, Blacksburg, Virginia, USA

Ph.D., Applied Mathematics, May 2012

- Dissertation Topic: “Reduced-Order Modeling of Complex Engineering and Geophysical Flows: Analysis and Computations”
- Advisor: Traian Iliescu

Sichuan University, Chengdu, Sichuan, China

M.S., Computational Mathematics, June 2006

- Thesis Topic: “Research on Finite Element Method Applied to the Reissner-Mindlin Plate”
- B.A., Information & Computational Mathematics, June 2003

PROFESSIONAL EXPERIENCE

University of South Carolina, Columbia, South Carolina, USA

Assistant Professor, Department of Mathematics, August 2014 - present

University of Minnesota, Twin Cities, Minnesota, USA

Industrial Postdoc, Institute for Mathematics and its Applications, August 2012 - August 2014

Argonne National Laboratory, Argonne, Illinois, USA

Givens Associate, Mathematics and Computer Science Division, summers of 2010 and 2011

TEACHING EXPERIENCE

University of South Carolina

Teaching Evaluation Score

Math 141 Calculus I, Fall 2014

Math 520 Differential Equations, Fall 2014

Virginia Tech

Teaching Evaluation Score

Math 1205 Calculus, Fall 2011

3.4/4.0

Math 2015 Elementary Calculus with Trig II, Spring 2010

3.3/4.0

Math 1224 Vector Geometry Recitation, Fall 2009

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RESEARCH INTERESTS

Scientific Computing, Numerical Analysis, Reduced-Order Modeling, Climate Modeling, Large Eddy Simulation, Numerical Solutions to PDEs

PUBLICATIONS

REFEREED JOURNAL ARTICLES

1. *Z. Wang*. Nonlinear Model Reduction Based on the Finite Element Method With Interpolated Coefficients: Semilinear Parabolic Equations. **Numer. Meth. Partial. Diff. Eqs.** (arXiv:1304.0279), in revision, 2013
2. T. Iliescu and *Z. Wang*. Are the Snapshot Difference Quotients Needed in the Proper Orthogonal Decomposition? **SIAM J. Sci. Comput.**, vol. 36 (3), 2014, pp. A1221-A1250

3. T. Iliescu and Z. Wang. Variational Multiscale Proper Orthogonal Decomposition: Navier-Stokes Equations. **Numer. Meth. Partial. Diff. Eqs.**, vol. 30, 2014, pp. 641-663
4. T. Iliescu and Z. Wang. Variational Multiscale Proper Orthogonal Decomposition: Convection-Dominated Convection-Diffusion Equations. **Math. Comp.**, vol. 82, 2013, pp. 1357-1378
5. E. Foster, T. Iliescu, and Z. Wang. A Finite Element Discretization of the Streamfunction Formulation of the Stationary Quasi-Geostrophic Equations of the Ocean. **Comput. Meth. Appl. Mech. Eng.**, vol. 261-262, 2013, pp. 105-117
6. J. Huang, Z. Wang and R. Zhu. Asymptotic Error Expansions for Hypersingular Integrals. **Adv. Comput. Math.**, vol. 38 (2), 2013, pp. 257-279
7. Z. Wang, I. Akhtar, J. Borggaard and T. Iliescu. Proper Orthogonal Decomposition Closure Models for Turbulent Flows: A Numerical Comparison. **Comput. Meth. Appl. Mech. Eng.**, vol. 237-240, 2012, pp. 10-26
8. O. Roderick, M. Anitescu and Z. Wang. Reduced Order Approximations in Uncertainty Analysis of Nuclear Engineering Applications. **Trans. Am. Nucl. Soc.**, vol. 106, 2012
9. I. Akhtar, Z. Wang, J. Borggaard and T. Iliescu. Jacobian Based Nonlinear Closure for Reduced-Order Models. **J. Comp. Nonlinear Dynamics**, vol. 7 (3), 034503, 2012
10. P. Cheng, J. Huang, Z. Wang and G. Zeng. Nyström Methods and Extrapolation for Solving Steklov Eigensolutions and its Application in Elasticity. **Numer. Meth. Partial. Diff. Eqs.**, vol. 28 (6), pp. 2021-2040, 2012
11. P. Cheng, X. Luo, Z. Wang and J. Huang. Mechanical Quadrature Methods and Extrapolation Algorithms for Boundary Integral Equations with Linear Boundary Conditions in Elasticity. **J. Elasticity**, vol. 108 (2), pp. 193-207, 2012
12. W. Feng, X. He, Z. Wang and X. Zhang. Non-Iterative Domain Decomposition Methods for a Non-Stationary Stokes-Darcy Model with Beavers-Joseph Interface Condition. **Appl. Math. Comput.**, vol. 219 (2), 2012, pp. 453-463
13. Z. Wang, I. Akhtar, J. Borggaard and T. Iliescu. Two-Level Discretizations of Nonlinear Closure Models for Proper Orthogonal Decomposition. **J. Comput. Phys.**, vol. 230 (1), 2011, pp. 126-146
14. J. Borggaard, T. Iliescu and Z. Wang. Artificial Viscosity Proper Orthogonal Decomposition. **Math. Comput. Model.**, vol. 53 (1-2), 2011, pp. 269-279
15. O. Roderick, Z. Wang and M. Anitescu. Dimensionality Reduction for Uncertainty Quantification of Nuclear Engineering Models. **Trans. Am. Nucl. Soc.**, vol. 104, 2011
16. O. San, A. E. Staples, Z. Wang and T. Iliescu. Approximate Deconvolution Large Eddy Simulation of a Barotropic Ocean Circulation Model. **Ocean Modelling**, vol. 40, 2011, pp. 120-132
17. P. Cheng, J. Huang and Z. Wang. Mechanical Quadrature Methods and Extrapolation for Solving Nonlinear Boundary Helmholtz Integral Equations. **Appl. Math. Mech. (Eng. Ed.)**, vol. 32 (12), 2011, pp. 1505-1514
18. B. Hu and Z. Wang. Combined Hybrid Method Applied in the Reissner-Mindlin Plate Model. **Finite Elem. Anal. Des.**, vol. 46 (5), 2010, pp. 428-437
19. J. Huang and Z. Wang. Extrapolation Algorithms for Solving Mixed Boundary Integral Equations of the Helmholtz Equation by Mechanical Quadrature Methods. **SIAM J. Sci. Comput.**, vol. 31 (6), 2009, pp. 4115-4129
20. Z. Wang and B. Hu. Research of Combined Hybrid Method Applied in the Reissner-Mindlin Plate Model. **Appl. Math. Comput.**, vol. 182 (1), 2006, pp. 49-66

21. I. Akhtar, Z. Wang, J. Borggaard and T. Iliescu. A Novel Strategy for Nonlinear Closure in Proper Orthogonal Decomposition Reduced-Order Models. ASME ECTC October 1-2, 2010, Atlanta, GA
22. I. Akhtar, Z. Wang, J. Borggaard and T. Iliescu. Large Eddy Simulation Ideas for Nonlinear Closure in Model Reduction of Fluid Flows. 5th Flow Control Conference June 28-July 1, 2010, Chicago, Illinois, **AIAA 2010-5089**
23. I. Akhtar, J. Borggaard, T. Iliescu and Z. Wang. Residual-Based Closure for the Stability of Reduced-Order Models. 48th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition January 4-7, 2010, Orlando, Florida, **AIAA 2010-1276**
24. J. Borggaard, A. Dugleby, A. Hay, T. Iliescu and Z. Wang. Reduced-Order Modeling of Turbulent Flows. **In Proceedings of MTNS**, 2008

HONORS

SIAM CSE 3rd BGCE Student Paper Prize Finalist, Reno, NV, 2011
 Winner of the 34th SIAM SEAS Conference Student Paper Competition, Raleigh, NC, 2010
 SIAM Student Travel Awards to the SIAM Conference CSE11 and AN10
 C. B. Ling Scholarship, Virginia Tech, 2008-2009
 Excellent Graduate Medal, Department of Education of Sichuan Province, China, 2006
 First Prize of National Post-Graduate Mathematical Contest in Modeling, China, 2004 and 2005

PROFESSIONAL TRAINING

Responsible Conduct of Research Education, 2012

PROFESSIONAL ACTIVITIES

ORGANIZED MINI-SYMPOSIA

Nonlinear Model Reduction of Complex Flows: Modeling, Analysis, and Computations, SIAM CSE13, Boston, February 25-March 1, 2013

CONFERENCE PRESENTATIONS

INVITED TALKS

2014 SIAM Annual Meeting (AN14), Chicago, July 7-11, 2014
 Department of Mathematics, University of South Carolina, December 5, 2013
 The SIAM Conference on Control and Its Applications (CT13), San Diego, July 8-10, 2013
 2013 SIAM Annual Meeting (AN13), San Diego, July 8-12, 2013
 2013 SIAM Applications of Dynamical Systems (DS13), Snowbird, May 19-23, 2013
 2013 SIAM Computational Science and Engineering (CSE13), Boston, February 25-March 1, 2013
 8th International Purdue Symposium on Statistics, Purdue Statistics, June 23, 2012
 36th SIAM Southeastern Atlantic Section Conference, University of Alabama in Huntsville, March 24, 2012
 Computer Science and Mathematics Division Seminar, Oak Ridge National Laboratory, February 22, 2012
 Farhat Research Group Seminar, Stanford University, February 9, 2012
 Mathematics and Computer Science Division Seminar, Argonne National Laboratory, January 31, 2012
 Computing Sciences Directorate Seminar, Lawrence Berkeley National Laboratory, January 20, 2012
 AMS Western Section Meeting, Las Vegas, NV, April 30-31, 2011

35th SIAM Southeastern-Atlantic Section Conference, Charlotte, NC, March 26-27, 2011

SIAM Computational Science and Engineering (CSE11), Reno, NV, March 1-5, 2011

CONTRIBUTED TALKS

IMA Hot Topics Workshop: Mathematical and Computational Challenges in the Control, Optimization, and Design of Energy-Efficient Buildings, June 11-14, 2013

IMA Postdoc Seminar, IMA, University of Minnesota, February 19, 2013

SIAM Student Conference 2012, Virginia Tech, March 03, 2012

2012 Joint Mathematics Meetings, Boston, January 6, 2012

Student Argonne Summer Symposium, Argonne National Laboratory, August 2, 2011

SIAM Student Conference 2011, Clemson University, SC, February 19, 2011

The 30th Southeastern-Atlantic Regional Conference on Differential Equations, Blacksburg, VA, October 1-2, 2010

Student Argonne Summer Symposium, Argonne National Laboratory, Argonne, IL, August 4, 2010

SIAM Annual Meeting (AN10), Pittsburgh, PA, July 12-16, 2010

34th SIAM Southeastern-Atlantic Section Conference, Raleigh, NC, March 20-21, 2010

SIAM Student Conference, Blacksburg, VA, February 20, 2010

The First VT Symposium on Reduced-Order Modeling and System Identification, Blacksburg, VA, February 15, 2010

Fall Fluid Mechanics Symposium, Blacksburg, VA, November 10, 2009

SIAM Conference on Computational Science and Engineering (CSE09), Miami, March 2-6, 2009

The Clemson/Pitt/UTK/VT graduate/postgraduate SIAM Student Conference, Blacksburg, VA, February 21, 2009

Project/NExt/Young Mathematician's Network Poster Session, AMS Joint Mathematics Meeting, Washington, DC, January 5-8, 2009