Radek Tezaur

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Education

Ph.D., Applied Mathematics, University of Colorado at Denver, 1993-1998; Advisor: Jan Mandel. Thesis title: *Analysis of a Lagrange Multiplier Based Domain Decomposition.*

M.S., Mathematical Modeling in Physics, Charles University, Prague, 1988-1993. Advisor: Miloslav Feistauer. Thesis title: *The Method of Boundary Elements and Integral Equations in Mathematical Physics.*

Fields of Interest

Wave propagation, acoustic scattering, domain decomposition methods, numerical analysis, finite element and boundary element method, parallel computations, scientific computing, mathematical software development.

Professional Experience

- Senior Research Engineer at Stanford University (2011-present)
- Research Associate at Stanford University (2004-present)
- Senior Research Associate at the University of Colorado at Boulder (2001-2004)
- Research Associate at the University of Colorado at Boulder (1998-2001)
- Research Assistant/Teaching Assistant at the University of Colorado at Denver (1993-1998)

Awards and Honors

Charles University Scholarship – 1990-1993
Graduation with Honors – Charles University - 1993

Journal Articles

J. Brousek, P. Frankova, H. Kopincova, R. Kuzel, R. Tezaur, P. Vanek, and Z. Vastl, *An overview of multilevel methods with aggressive coarsening and massive polynomial smoothing,* Electronic Transactions on Numerical Analysis (ETNA), (2015) in print.

D. Wang, R. Tezaur, and C. Farhat, *A hybrid discontinuous in space and time Galerkin method for wave propagation problems*, International Journal for Numerical Methods in Engineering, 99 (4) (2014), pp. 263-289.

R. Tezaur, I. Kalashnikova, C. Farhat, *The discontinuous enrichment method for medium-frequency Helmholtz problems with a spatially variable wavenumber*, Computer Methods in Applied Mechanics and Engineering 268 (2014), pp. 126–140.

U. Hetmaniuk, R. Tezaur, and C. Farhat, *An adaptive scheme for a class of interpolatory model reduction methods for frequency response problems*, International Journal for Numerical Method in Engineering, 93 (10) (2013), pp. 1109–1124.

U. Hetmaniuk, R. Tezaur, and C. Farhat, *Review and assessment of interpolatory model order reduction methods for frequency response structural dynamics and acoustics problems*, International Journal for Numerical Method in Engineering, 90 (13) (2012), pp. 636–1662.

J. Li, C. Farhat, P. Avery, R. Tezaur, *A dual-primal FETI method for solving a class of fluid-structure interaction problems in the frequency domain*, International Journal for Numerical Method in Engineering, 89 (4) (2012), pp. 418–437.

D. Wang, R. Tezaur, J. Toivanen, and C. Farhat, *Overview of the discontinuous enrichment method, the ultra-weak variational formulation, and the partition of unity method for acoustic scattering in the medium frequency regime and performance comparisons*, International Journal for Numerical Method in Engineering, 89 (4) (2012), pp. 403–417.

I. Kalashnikova, R. Tezaur, C. Farhat, *A discontinuous enrichment method for variable-coefficient advection-diffusion at high Péclet number* , International Journal for Numerical Methods in Engineering, 87 (1-5) (2011), pp. 309–335.

P. Massimi, R. Tezaur, and C. Farhat, *A discontinuous enrichment method for the efficient solution of plate vibration problems in the medium-frequency regime.* International Journal for Numerical Methods in Engineering, 84 (2) (2010), pp. 127–148.

C. Farhat, I. Kalashnikova, and R. Tezaur, *A higher-order discontinuous enrichment method for the solution of high Péclet advectiondiffusion problems on unstructured meshes*, International Journal for Numerical Methods in Engineering, 81 (5) (2010), pp. 6048–636.

C. Farhat, R. Tezaur, J. Toivanen, *A domain decomposition method for discontinuous Galerkin discretizations of Helmholtz problems with plane waves and Lagrange multipliers*, International Journal for Numerical Methods in Engineering, 78 (13) (2009), pp. 1513–1531.

I. Kalashnikova, C. Farhat, R. Tezaur, *A discontinuous enrichment method for the finite element solution of high Péclet advection-diffusion problems*, Finite Elements in Analysis & Design 45 (4) (2009), pp. 238–250.

S. Petersen, C. Farhat, R. Tezaur, *A space-time discontinuous Galerkin method for the solution of the wave equation in the time domain*, International Journal for Numerical Methods in Engineering 78 (3) (2009), pp. 275–295.

P. Massimi, R. Tezaur, and C. Farhat, *A Discontinuous Enrichment Method for Three-Dimensional Multiscale Harmonic Wave Propagation Problems in Multi-Fluid and Fluid-Solid Media*, International Journal for Numerical Methods in Engineering, Volume 76, Issue 3 (2008), pp. 400–425.

R. Tezaur, L. Zhang, and C. Farhat, *A discontinuous enrichment method for capturing evanescent waves in multiscale fluid and fluid/solid problems*, Computer Methods in Applied Mechanics and Engineering, 197 (19) (2008), pp. 1680–1698

I. Harari, R. Tezaur, and C. Farhat, *A study of higher-order discontinuous Galerkin and quadratic least-squares stabilized finite element computations for acoustics*, Journal of Computational Acoustics, 14 (1) (2006), pp. 1–19.

R. Tezaur and C. Farhat, *Three-dimensional discontinuous Galerkin elements with plane waves and Lagrange multipliers for the solution of mid-frequency Helmholtz problems*, International Journal for Numerical Methods in Engineering, 66 (2006), pp. 796–815.

L. Zhang, R. Tezaur, and C. Farhat, *The discontinuous enrichment method for elastic wave propagation in the medium frequency regime*, International Journal for Numerical Methods in Engineering, 66 (2006), pp. 2086–2114.

C. Farhat, P. Avery, R. Tezaur, and J. Li, *FETI-DPH: A dual primal domain-decomposition method for acoustic scattering*, Journal of Computational Acoustics, 13 (3) (2005), pp. 499–524.

J. Mandel, C. Dohrmann, and R. Tezaur, *An algebraic theory for primal and dual substructuring methods by constraints*, Applied Numerical Mathematics, 54 (2005), pp. 167–193.

C. Farhat, P. Weidemann-Goiran, and R. Tezaur, *A discontinuous Galerkin method with plane waves and Lagrange multipliers for the solution of short wave exterior Helmholtz problems on unstructured meshes*, Wave Motion, 39 (2004), pp. 307–317.

R. Tezaur, C. Farhat, and R. Djellouli, *Three-dimensional finite element calculations in acoustic scattering problems using arbitrarily shaped convex artificial boundaries*, International Journal for Numerical Methods in Engineering, 53 (2002), pp. 1461–1476.

C. Farhat, R. Tezaur, and R. Djellouli, *On the solution of three-dimensional inverse obstacle acoustic scattering problems by a regularized Newton method*, Inverse Problems, 18 (2002), pp. 1229–1246.

R. Djellouli, C. Farhat, and R. Tezaur, *A fast method for solving acoustic scattering problems in frequency bands*, Journal of Computational Physics, 168 (2001), pp. 412–432.

J. Mandel and R. Tezaur, *On the convergence of a dual-primal substructuring method*, Numerische Mathematik, 88 (2001), pp. 543–558.

R. Tezaur, A. Macedo, and C. Farhat, *Iterative solution of large-scale acoustic problems with multiple right hand sides by a domain decomposition method with Lagrange multipliers*, International Journal for Numerical Methods in Engineering, 51 (2001), pp. 1175–1193

R. Djellouli, C. Farhat, A. Macedo, and R. Tezaur, *Finite element solution of two-dimensional acoustic scattering problems using arbitrarily shaped convex artificial boundaries*, Journal of Computational Acoustics, 8 (2000), pp. 81–100.

J. Mandel, R. Tezaur, and C. Farhat, *A scalable substructuring method by Lagrange multipliers for plate bending problems*, SIAM Journal on Numerical Analysis, (1999), pp. 1370–1391.

D. Rixen, C. Farhat, R. Tezaur, and J. Mandel, *Theoretical comparison of the FETI and algebraically partitioned FETI methods, and performance comparisons with a direct sparse solver*, International Journal for Numerical Methods in Engineering, 46 (1999), pp. 501–534.

P. Vaněk, M. Brezina, and R. Tezaur, *Two-grid method for linear elasticity on unstructured meshes*, SIAM Journal on Scientific Computing, 21 (1999), pp. 900–923.

J. Mandel and R. Tezaur, *Convergence of a substructuring method with Lagrange multipliers*, Numerische Mathematik, 73 (1996), pp. 473–487.

Book Chapters and Refereed Proceedings Articles

C. Farhat, U. Hetmaniuk and R. Tezaur, *An adaptive interpolatory model reduction method for vibroacoustic problems*, Eleventh World Congress on Computational Mechanics (WCCM XI), Barcelona, Spain, July 20-25 (2014).

R. Tezaur, I. Kalashnikova, and C. Farhat, *Discontinuous enrichment method for smoothly variable wavenumber medium-frequency Helmholtz problems*, Proceedings of the 11th International Conference on the Mathematical and Numerical Aspects of Waves, Gammarth-Tunis, Tunisia, 2013, pp. 353-354.

C. Farhat, R. Tezaur, and U. Hetmaniuk, *Recent developments in high-performance computational vibro-acoustics in the medium frequency regime*, IN12-362, Proceedings of the Internoise 2012/ASME NCAD meeting, New York City, New York, August 19-22 (2012).

C. Farhat, R. Tezaur, and J. Toivanen, *A domain decomposition solver for the discontinuous enrichment method for the Helmholtz equation*, Proceedings of the 20th International Conference on Domain Decomposition Methods, 7-11 February 2011, UC San Diego

in La Jolla, California; Springer, 2013, pp. 207-214.

C. Farhat, U. Hetmaniuk, and R. Tezaur, *A simple adaptive scheme for a class of interpolatory model reduction methods for frequency response problems*, Proceedings of the 10th International Conference on the Mathematical and Numerical Aspects of Waves Vancouver, Canada, 2011, pp. 327-330.

C. Farhat, R. Tezaur, and J. Toivanen, *A hybrid discontinuous Galerkin method with plane waves for Helmholtz problems and a domain decomposition method*, Proceedings of the 10th International Conference on the Mathematical and Numerical Aspects of Waves Vancouver, Canada, 2011, pp. 229-232.

C. Farhat, R. Tezaur, and J. Toivanen, *A domain decomposition method for Helmholtz problems discretized using the discontinuous enrichment method*, Proceedings of Waves 2009 - The 9th International Conference on Mathematical and Numerical Aspects of Waves Propagation, INRIA, Pau, France, 2009, pp. 166-167.

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R. Djellouli, R. Tezaur, and C. Farhat, *On the solution of inverse obstacle acoustic scattering problems with a limited aperture*, Mathematical and Numerical Aspects of Wave Propagation, P. J. G. C. Cohen, E. Heikkola, and P. Neittaanmaki, eds., Springer, 2003, pp. 625–630.

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C. Farhat, R. Tezaur, and R. Djellouli, *On the solution of three-dimensional inverse obstacle acoustic scattering problems by a regularized Newton method*, Proceedings of the Second Conference on Inverse Problems, Control, and Shape Optimization, J.J.T. Ha Duong and M. Jaoua, eds., 2002, pp. 105–110.

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C. Farhat, A. Macedo, and R. Tezaur, *FETI-H: a scalable domain decomposition method for high frequency exterior Helmholtz problems* , in Proceedings of the 11th International Conference on Domain Decomposition Methods, 1999, pp. 231–241.

A. Macedo, R. Djellouli, C. Farhat, and R. Tezaur, *Finite element solution of two-dimensional acoustic scattering problems using arbitrarily shaped convex artificial boundaries*, Proceedings of the XX CILAMCE - 20th Iberian Latin-American Congress on Computational Methods in Engineering, R. M. L. R. F. B. P. M. Pimenta and E. S. A. N. eds., Polytechnic School of Sao Paulo, 1999, pp.284.1–284.20.

P. Vaněk, R. Tezaur, M. Brezina, and J. Křížková, *Two–level method with coarse space size independent convergence*, in Domain Decomposition Methods in Sciences and Engineering, R. Glowinski, J. Périaux, Z. Shi, and O. Widlund, eds., John Wiley & Sons Ltd., New York, N.Y., 1997. Proceedings of the International Conference on Domain Decomposition (8th : 1995 : Peking, China).

S. Ghosal, J. Mandel, and R. Tezaur, *Automatic substructuring for domain decomposition using neural networks*, in Proceedings of IEEE International Conference on Neural Networks, vol. 6, Orlando, June 28 - July 3, 1994, pp. 3816–3821.

M. Feistauer, G. C. Hsiao, R. E. Kleinman, and R. Tezaur, *Analysis and numerical realization of coupled BEM and FEM for nonlinear exterior problems*, in Inverse Scattering and Potential Problems in Mathematical Physics: Proceedings of a Conference held in Oberwolfach, December, 1993, R. Kleinman, R. Kress, and E. Martensen, eds., 1993, pp. 47–73.