Bedřich Sousedík

(vita as of February 2009)

CONTACT INFORMATION

Department of Mathematical & Statistical Sciences
College of Liberal Arts and Sciences
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RESEARCH INTERESTS

Numerical solution of partial differential equations, finite element method, domain decomposition and multigrid methods, high-performance computing, nonlinear elasticity, biomechanics, automatic control, a-posteriori error estimates.

EDUCATION

University of Colorado Denver, USA
College of Liberal Arts and Sciences, Department of Mathematical & Statistical Sciences

Ph.D. (2005 – present)

- Dissertation topic: *Adaptive-Multilevel BDDC*
- Advisor: Jan Mandel

M.S. (December 2008)

Czech Technical University in Prague, Czech Republic
Faculty of Civil Engineering, Department of Mathematics

Ph.D. (December 2008)

- Dissertation title: *Comparison of some domain decomposition methods*
- Advisors: Ivo Marek, Jan Mandel

Czech Technical University in Prague, Czech Republic
Faculty of Mechanical Engineering, Department of Automatic Control

Ing. (M.Eng. equivalent) (August 2001)

- Thesis title: *Mathematical model of the contractile apparatus of a cardiac cell* (in Czech)
- Advisor: Jan Soukup

PROFESSIONAL EXPERIENCE

Academy of Sciences of the Czech Republic
Institute of Thermomechanics
Visiting Researcher **October 2007 – December 2007**

Academy of Sciences of the Czech Republic
Institute of Computer Science
Research Assistant **July 2004 – December 2008**

University of Colorado Denver, USA
Department of Mathematical and Statistical Sciences
Professional Research Assistant **February 2004 – September 2004**

OTHER POSITIONS

Edinburgh Parallel Computing Center, Scotland
University of Edinburgh
Visiting Researcher **April 2003 – June 2003**

PUBLICATIONS

Refereed Journal Publications and Conference Proceedings

- Bedřich Sousedík, Jan Mandel: *On the equivalence of primal and dual substructuring preconditioners*, to appear in Electronic Transactions in Numerical Analysis, October 2008
- Jan Mandel, Bedřich Sousedík, Clark R. Dohrmann: *Multispace and Multilevel BDDC*, Computing 83, pp. 55-85, 2008
- Jan Mandel, Bedřich Sousedík: *BDDC and FETI-DP under minimalist assumptions*, Computing 81, pp. 269–280, 2007
- Jan Mandel, Bedřich Sousedík, Clark R. Dohrmann: *On Multilevel BDDC*, In: Proceedings Domain Decomposition Methods in Science and Engineering XVII, 2006, Lecture Notes in Computational Science and Engineering 60, pp. 287-294, Springer, 2007
- Jan Mandel, Bedřich Sousedík: *Adaptive coarse space selection in BDDC and FETI-DP iterative substructuring methods*, Comput. Methods Appl. Mech. Engrg. 196, No. 8, pp. 1389–1399, 2007
- Jan Mandel, Bedřich Sousedík: *Adaptive coarse space selection in BDDC and FETI-DP Iterative substructuring methods: Optimal face degrees of freedom,* In: Domain Decomposition Methods in Science and Engineering XVI, Lecture Notes in Computational Science and Engineering 55, pp. 421–428, Springer-Verlag, 2006
- Bedřich Sousedík: *Simulation study of cardiac cell contractility*, In: International Congress in Computational Bioengineering, Zaragoza, Spain, September 2003
- Pavel Burda, Jaroslav Novotný, Bedřich Sousedík, Jakub Šístek: *Finite element mesh adjusted to singularities applied to axisymmetric and plane flow.* Feistauer, M. (ed.) et al., Numerical mathematics and advanced applications. Proceedings of ENUMATH 2003, the 5th European conference on numerical mathematics and advanced applications, Prague, Czech Republic, August 2003 Berlin: Springer, pp. 186–195, 2004.
- Pavel Burda, Jaroslav Novotný, Bedřich Sousedík: *A-posteriori error estimates applied to flow in a channel with corners.* Math. Comput. Simul. 61, No. 3–6, pp. 375–383, 2003
- Pavel Burda, Jaroslav Novotný, Bedřich Sousedík: *Adaptive mesh refinement based on a-posteriori error estimates for Stokes flow in a 2D problem.* Brezzi, Franco (ed.) et al., Numerical mathematics and advanced applications. Proceedings of ENUMATH 2001, the 4th European conference, Ischia, July 2001. Berlin: Springer, pp. 681–690, 2003

Other publications

- Marta Čertíková, Jan Tuzar, Bedřich Sousedík, Jaroslav Novotný: *Stress computations of the hip joint replacement using the finite element method*, In: SANM 2005 Software and algorithms of numerical mathematics, Srní na Šumavě, September 2005
- Bedřich Sousedík, Pavel Burda: *Finite element formulation of the three-dimensional non-linear elasticity problem*, In: Seminar in Applied Mathematics, Czech Technical University in Prague, April 2005
- Bedřich Sousedík, Jaroslav Novotný: *Parallelization of the BICG-STAB algorithm for finite element computations*, In: Software and Algorithms of Numerical Mathematics, Hejnice, September 2003
- Pavel Burda, Jaroslav Novotný, Jakub Šístek, Bedřich Sousedík: *Comparison of a-posteriori and a-priori error estimates of FEM for Navier-Stokes equations near singularity*, In: Industrial Mathematics and Mathematical Modelling IMAMM 2003, Rožnov pod Radhoštěm, 2003
- Pavel Burda, Jaroslav Novotný, Bedřich Sousedík: *The algorithm of finite element mesh refinement adjusted to corner singularities and applications to fluid flow problems,* Mathematics of Finite elements and applications MAFELAP, June 2003, Brunel University, London, 2003
- Pavel Burda, Jaroslav Novotný, Bedřich Sousedík, B: *Application of a-posteriori error estimates for Navier-Stokes equations to fluid flow in a channel with corners,* GAMM 2002 Conference, Augsburg, March 2002, Book of Abstracts, p. 23, PAMM **2**, Issue 1, pp. 314–315, 2003

Teaching Experience	**University of Colorado Denver**, USA Department of Mathematical & Statistical Sciences *Calculus I, II - recitations, College Algebra, Linear Algebra and Differential Equations, Numerical Analysis II*	**2005 – present**
	Czech Technical University in Prague, Czech Republic Faculty of Civil Engineering, Department of Mathematics *Calculus I, II, III, Numerical Analysis*	**2002 – 2005**
Honors and Awards	*Lynn Bateman fellowship* Department of Mathematical and Statistical Sciences, University of Colorado Denver	**2006**
	Master thesis awarded by Zvoníček foundation Faculty of Mechanical Engineering, Czech Technical University in Prague	**2002**
Contracts and Grants	*Application of a-posteri error estimates in numerical solution of blood flow* *FRVŠ Grant G1 1960 (Czech Republic), CO-PI Prof. Pavel Burda.*	**2004**
Society Membership	*Society for Industrial and Applied Mathematics (SIAM)*	
Referees	*Available on request.*	