

Andrey V. Martynenko

CURRICULUM VITAE

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EDUCATION

- Ph.D.** in **Mathematics**, December 2004
University of Houston, Houston, TX
Thesis title: "Numerical solution of advection-diffusion equations on locally refined grids." Adviser: Yu. A. Kuznetsov
- M.S.** in **Mathematics**, June 1998
Novosibirsk State University, Novosibirsk, Russia
Thesis title: "On the solvability of the boundary value problem for the equation of vibrating string with the condition on the entire boundary."
Adviser: M. V. Fokin
- B.S.** in **Mathematics**, June 1996
Novosibirsk State University, Novosibirsk, Russia
Thesis title: "On normal solvability of one functional equation."
Advisor: M. V. Fokin

PROFESSIONAL EXPERIENCE, OCCUPATIONS

Sep 2008 **Postdoctoral Fellow**

– present Department of Mathematics, University of Houston

Research Area: Optimal image matching. Development of mathematical algorithms and associated numerical implementations for optimal matching of 2D and 3D-movies of deformable solids or surfaces, 3D-medical image analysis, and dynamic elasticity models for soft shapes

Sep 2008 **Internship**

– May 2009 Apache Corp., Houston, TX

Research Area: Seismic modeling. Modeling of acoustic wave propagation in solid media

Jan 2005 **Research Assistant Professor**

– Jan 2009 Department of Mathematics, University of Houston

Research Area: Atmospheric aerosol modeling. Numerical constrained optimization. Inorganic aerosol model software development: <http://uhaero.math.uh.edu>

2001 – 2003 **Research Assistant**

Department of Mathematics, University of Houston

Research Area: Numerical solution of partial differential equations. Finite element, finite volume and finite difference methods for advection–diffusion equations. Iterative solvers. Domain decomposition methods

1996 – 1998 **Researcher**

Novosibirsk State University, Novosibirsk, Russia, 1996–1998

Research Adviser: Dr. M. Fokin

Research Area: Solvability of the ill-posed hyperbolic problem. Sobolev’s problem. Functional equations

TEACHING EXPERIENCE

- *Probability*, Undergraduate course, University of Houston, Fall 2007
- *Introduction to Probability and Statistics*, Undergraduate course, University of Houston, Spring 2006, Fall 2006, Spring 2007
- *Elementary Mathematical Modeling*, Undergraduate course, University of Houston, Fall 2005
- *Elements of Calculus*, Undergraduate course, University of Houston, Fall 2000
- Graduate Teaching Assistant, University of Houston, 1999 – 2004:
Teaching Assistant for Calculus, Tutor at Center for Academic Support and Assessment, CASA: <http://casa.uh.edu/casa/>

THESES

1. *Numerical solution of advection-diffusion equations on locally refined grids*. Ph.D. Thesis. University of Houston, Houston, TX, USA, 2004
2. *On the solvability of the boundary value problem for the equation of vibrating string with the condition on the entire boundary*. Master Thesis, Novosibirsk State University, Novosibirsk, Russia, 1998
3. *On normal solvability of one functional equation*. Bachelor qualification work, Novosibirsk State University, Novosibirsk, Russia, 1996

LIST OF PUBLICATIONS

1. R. Azencott, A. Jajoo, S. Jain, J. He, A. Martynenko, S. Ben Zekry MD, G. Lawrie MD, S. Little MD, W. Zoghbi MD. *Comparative Evaluation of Mitral Valve Strain by Deformation Tracking in 3D-Echocardiography*. Submitted.
2. R. Azencott, R. Glowinski, J. He, R. Hoppe, A. Jajoo, Y. Li, A. Martynenko, S. Ben Zekry, S. Little, W. Zoghbi. *Optimal Diffeomorphic Matching in Biomedical Image Processing*. Institut für Mathematik: Preprint, 14, 2010.

3. R. Azencott, R. Glowinski, J. He, R. Hoppe, A. Jajoo, Y. Li, A. Martynenko, S. Ben Zekry, S. Little, W. Zoghbi. *Diffeomorphic Matching and Dynamic Deformable Surfaces in 3D Medical Imaging*, Comput. Meth. in Appl., Math. 10, pages 235-274, 2010.
4. N. R. Amundson, A. Caboussat, J. W. He, A. V. Martynenko, C. Landry, C. Tong, and J. Seinfeld. *A new atmospheric aerosol phase equilibrium model (UHAERO): organic systems*, Atmos. Chem. Phys., 7, pages 4675–4698, 2007
5. N. R. Amundson, A. Caboussat, J. W. He, A. V. Martynenko, C. Landry, C. Tong, and J. Seinfeld. *A new atmospheric aerosol phase equilibrium model (UHAERO): organic systems*, Atmos. Chem. Phys. Discuss., 7, pages 8709–8754, 2007
6. N. R. Amundson, A. Caboussat, J. W. He, A. V. Martynenko, and J. H. Seinfeld. *A phase equilibrium model for atmospheric aerosols containing inorganic electrolytes and organic compounds (UHAERO), with application to dicarboxylic acids*, J. Geophys. Res., 112, D24S13, 2007
7. N. R. Amundson, A. Caboussat, J.-W. He, A.V. Martynenko, V.B. Savarin, J.H. Seinfeld, K.-Y. Yoo, *A new inorganic atmospheric aerosol phase equilibrium model (UHAERO)*, Atmos. Chem. Phys., 6, pages 975–992, 2006
8. N. R. Amundson, A. Caboussat, J.-W. He, A.V. Martynenko, V.B. Savarin, J.H. Seinfeld, K.-Y. Yoo, *A computationally efficient inorganic atmospheric aerosol phase equilibrium model (UHAERO)*, Atmos. Chem. Phys. Discuss, 5, pages 9291–9324, 2005

PRESENTATIONS

1. *Development of a new inorganic atmospheric aerosol phase equilibrium model (UHAERO) for CMAQ*. 6th Annual CMAS Conference, Chapel Hill, North Carolina, October 1–3, 2007
2. *Thermodynamic modeling of atmospheric inorganic aerosols*. Poster. AAAR 2007 Annual Conference, Reno, Nevada, September 24–28 2007

3. *A phase equilibrium model for atmospheric aerosols containing inorganic electrolytes and dicarboxylic acids (UHAERO)*. Poster. AGU 2006 Fall Meeting, San Francisco, California, December 11–15, 2006
4. *UHAERO-inorganic module: a new thermodynamic equilibrium model for multicomponent inorganic aerosols*. Poster. AAAR 2005 Annual Conference, Austin, Texas, October 17–21, 2005
5. *Overlapping domain decomposition for advection-diffusion-reaction equations with application to air quality simulation*. SIAM Conference on Mathematical and Computational Issues in the Geosciences (GS03), Austin, Texas, March 17–20, 2003
6. *Boundary value problem for the equation of vibrating string with the condition on the entire boundary*. XXXV International Scientific Student Conference "Students and Technical Progress", Novosibirsk, Russia, April 1997

COMPUTER SKILLS

- Programming languages: C++/STL, C, Fortran
- Working knowledge: MPI, Python, Java, Unix Scripting, Perl
- Publishing: L^AT_EX, HTML/CSS/JavaScript, PHP
- OS: Linux, MS Windows, Mac OS X

LANGUAGES

English fluent, Russian native