

Alexey Miroshnikov

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Education:

- Ph.D., Mathematics (expected in 2008), Virginia Polytechnic Institute and State University, August 2002-Present. Current GPA: 4.00/4.00.
- M.S., Mathematics, Virginia Polytechnic Institute and State University, May 2004, GPA: 4.00/4.00.
- M.S., Computer Science (“Computer Analysis and Data Interpretation”), School of Information Technology, Moscow State University of Technology “Stankin,” Moscow, Russia (1996-2002), Diploma with honors, GPA: 4.00/4.00.
- B.S., Industrial Engineering (“Technology, Equipment and Automation of Machine-Building Plants”), School of Physics and Engineering, Moscow State University of Technology “Stankin,” Moscow, Russia (1996-2000), Summa Cum Laude, GPA: 3.96/4.00.

Honors/Awards:

- Awarded Stipend of the President of Russian Federation, received one out of three university-wide awards, Moscow State University of Technology “Stankin”, Russia (1998, 2000).
- Awarded Stipend of the Government of Russian Federation, received one out of three university-wide awards, Moscow State University of Technology “Stankin”, Russia (1999).
- National Mathematical Contest for engineering students (1999-2001, Russia, Ekaterinburg, UPI).
- National Programming Contest for engineering students (1999-2001, Russia, Ekaterinburg, UPI).
- Winner of the local computational mathematics contest in Moscow State University of Technology “Stankin,” Russia (1999).
- Best presentation in the mathematical section 2nd *International Conference of the Young Scientists and Students “Actual Problems of Modern Science,” Russia, Samara (2001).*

Experience:

- August 2002 - Present: Graduate Teaching Assistant (Teaching Vector Geometry), Department of Mathematics, Virginia Tech.
- June 2005 – August 2005: Graduate Research Assistantship (Development of Finite Element Implementation of Passive-Active Scalar Model in a Turbulent Flow, Boussinesq Approximation), Department of Mathematics, Virginia Tech.
- June 2004 – August 2004: Thesis Part Position, (Development of Finite Element Implementation of LES Models and Computation of Sensitivities with Respect to LES Parameters Using Automatic Differentiation), MCS department, Argonne National Laboratory, Chicago, Illinois.
- June 2003 – August 2003: Graduate Research Assistantship (Development of Finite Element Implementation of the Navier-Stokes Equation by Using PETSc), Department of Mathematics, Virginia Tech.

- September 2000 - June 2001: Research Assistant, Center of Mathematical Research, MSTU “Stankin,” Moscow, Russia (Code Development of Wavelet Tools for Data Processing).
- August 2001 - July 2002: Software Engineer, Center of Mathematical Research, MSTU “Stankin,” Moscow, Russia.
- January 2001 - July 2002: Research Assistant, Computer Center, Institute for Mathematical Modelling of Russian Academy of Science, Moscow, Russia (Code Development for the Compression of Mesh Functions in Large-Scale Computations by Using Wavelets).

Research Interests: Theory of Partial Differential Equations, Mathematical Theory of the Navier-Stokes Equation.

Related Interests: High-Performance Scientific Computations, Finite Element Method.

Computer Skills:

- Programming Languages: C, Pascal, Borland Delphi.
- Parallel programming: MPI, PETSc.
- Operating Systems: UNIX, Windows.
- Software: MatLab, TecPlot, Maple

Publications:

- “Automatic Differentiation of LES Closure Models,” J. Borggaard, P. Hovland, T. Iliescu, A. Miroshnikov and B. Norris, in preparation.
- Miroshnikov A. 2001 “The Compression of Mesh Functions with Wavelets,” in *Proceedings of the 2nd International Conference of the Young Scientists and Students “Actual Problems of Modern Science,”* Natural science, vol.1, Samara (2001, in Russian).
- Miroshnikov A. "Computation of the Fourier-Walsh-Stieljes Coefficients and Uniqueness Problem for Cantor Set," in *Transactions of Moscow State University of Technology “Stankin” and Institute of Mathematical Modelling of Russian Academy of Science, “Fundamental Problems in Physics and Mathematics and Modelling of Technological System and Process”* vol.4, Moscow (2001, in Russian).
- Miroshnikov A. "Walsh series. Computer Analysis of the Fourier-Walsh-Stieljes Coefficients for Lebesgue Function of the Cantor set," in *Proceedings of the Student Scientific Conference devoted to the seventieth anniversary of MSTU “Stankin,”* Moscow (2000, in Russian).

Presentations:

- “Applications of Automatic Differentiation (AD) to Nonstationary Turbulent Flow Modeling Using LES Models,” *Seminar on Computational Aeroacoustics,* Institute for Mathematical Modelling of Russian Academy of Science, Moscow, Russia, March, 2005.
- “Automatic Differentiation in Developing LES Models,” *SIAM Conference on Computational Science & Engineering,* Orlando, Florida, February, 2005.
- “Wavelets and Their Use for the Compression of Mesh Functions in Large-Scale Computations,” Institute for Mathematical Modelling of Russian Academy of Science, Moscow, Russia, 2002.

- “The Compression of the Mesh Functions with Wavelets,” *2nd International Conference of the Young Scientists and Students “Actual Problems of Modern Science,”* Russia, Samara, 2001.
- “Computation of the Fourier-Walsh-Stieljes Coefficients and Uniqueness Problem for Cantor Set”, 2000, annual conference of *Moscow State University of Technology “Stankin.”*

Languages: Russian (native), English (fluent).

Professional Memberships: Student Member of American Mathematical Society, the Society for Industrial and Applied Mathematics.