Stanislav Y. Polishchuk

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aion-synch

Education

Ph.D. in Mathematics — **Melbourne, Australia**
Monash University — *2017 – 2022*

M.S. in Applied Mathematics and Computer Science — **Novosibirsk, Russia**
Novosibirsk State Technical University — *2015 – 2017*

B.S. in Applied Mathematics and Computer Science — **Novosibirsk, Russia**
Novosibirsk State Technical University — *2011 – 2015*

Teaching Experience

Teaching Associate — **Melbourne, Australia**
Monash University — *07.2023 – current*

- Tutoring MTH3310 (applied mathematical modelling), MTH2051 (computational linear algebra);
- Supervision of group projects;
- Preparation for classes, presentations of concepts, etc;
- Marking of tests, exams;
- Mathematics Learning Centre: providing help to students in a variety of mathematical and mathematics related units in Engineering, Computer Science, Physics, etc.

Research Experience

Research Officer — **Melbourne, Australia**
Monash University — *03.2023 – 04.2023*

- Perfoming multi-level Monte Carlo simulations;
- Writing a research paper on the multi-level Monte Carlo method.

Research Officer — **Melbourne, Australia**
Monash University — *02.2022 – 05.2022*

Investigated and developed the homotopy method and its application to the multilevel Monte Carlo methods which resulted in a new method being approximately 10 times faster than the alternative approaches for solving stochastic eigenvalue PDEs (C/C++).

Postgraduate Researcher — **Melbourne, Australia**
Monash University — *11.2017 – 11.2022*

- Developed and implemented new computational methods based on multi-level and multi-index Monte Carlo methods integrated into the finite element methods such as SUPG and DG.
- Developed a new multi-index Monte Carlo method for quantifying uncertainties in PDEs.
- Investigated optimization-based transport approaches for inverse problems.

Graduate Research Assistant — **Novosibirsk, Russia**
Trofimuk Institute of Petroleum-Gas Geology and Geophysics of the SB RAS — *03.2016 – 06.2017*

Developed and implemented a new multiscale discontinuous Galerkin method for 3D gas-hydrate problems with moving front (C/C++).

Graduate Research Assistant — **Novosibirsk, Russia**
Novosibirsk State Technical Univeristy — *09.2015 – 12.2015*

Developed and implemented a multilevel solver for the 3D parabolic problems in heterogeneous media.

Publications

Journal of Scientific Computing — **Submitted**
T. Cui, H. De Sterck, A. D. Gilbert, S. Polishchuk, R. Scheichl — *2023*

Multilevel Monte Carlo methods for stochastic convection-diffusion eigenvalue problems

Monash University, PhD thesis — **Published**
Advanced multi-level and multi-index Monte Carlo methods for uncertainty quantification — *2022*

Proceedings

SIAM Conference on Computational Science and Engineering (CSE19) — **Published**
Polishchuk S.Y. — *February 25 – March 1, 2019*

Multi-Level and Multi-Index Monter Carlo Discontinuous Galerkin Methods for Uncertainty Quantification of Nonlinear Hyperbolic Problems

- **SIAM Conference on Computational Science and Engineering (CSE17)** **Published**
  Polishchuk S.Y. *February 27 – March 3, 2017*
  Computing of the Effective Coefficients via Multiscale Discontinuous Galerkin Method
- **XVII Russian Conference of Young Scientists on Mathematical** **Published**
  Polishchuk S.Y. *October 31 – November 03, 2016*
  Mathematical modeling of heat-transfer problems with phase transitions on the basis of multiscale discontinuous Galerkin methods, *8th International Youth Scientific Conference "Theory and Numerical Methods of Solution of Inverse and Ill-posed Problems*
- **8th IYS Conference** **Published**
  Polishchuk S.Y. *September 01–07, 2016*
  Research and Computation of the Effective Thermal Characteristics, *8th International Youth Scientific Conference "Theory and Numerical Methods of Solution of Inverse and Ill-posed Problems*
- **54th ISSC** **Published**
  Polishchuk S.Y. *2016*
  Mathematical Modeling of Processes with Phase Transitions via Multiscale Discontinuous Galerkin Method, *Proceeding of the 54th International Students Scientific Conference. Mathematics / Novosibirsk State University.*

Awards and Scholarships

- **ACEMS International Mobility Programme** **Heidelberg, Germany – Melbourne, Australia**
  Travel grant to perform research at Heidelberg University *October, 2019*
- **Monash University** **Melbourne, Australia**
  Monash Graduate Scholarship *2017 – 2022*
- **Novosibirsk State Technical University** **Novosibirsk, Russia**
  Research grant *2016 – 2017*

Skills

- **Programming languages:** C/C++, Python, FORTRAN, MATLAB, Asm x86, Julia, R.
- **Technical knowledge:** Numerical modelling, scientific computing, statistics, high-performance computing, finite element methods, Monte Carlo, Bayesian inference, Markov Chain Monte Carlo, inverse problems, unit testing, OOP.
- **Software skills:** Unix, Linux, Visual Studio, Qt Creator, Git, etc.

Memberships

- Member, Society for Industrial and Applied Mathematics (SIAM).
- Member, Australian Research Council (ARC) Centre of Excellence for Mathematical and Statistical Frontiers (ACEMS).
- Member, Australian Mathematical Society.
- Member, Australia and New Zealand Industrial and Applied Mathematics.

Workshops

- Optimization-based Transport Approaches for Inverse Problems, Heidelberg, Germany, October, 2019.
- MATRIX: On The Frontiers of High Dimensional Computation. Creswick, Australia, 4 – 15 June 2018.
- Functional algorithms and organization of inter-actions in parallel computers, Institute of Computational Mathematics and Mathematical Geophysics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia, July, 2012.