Curriculum Vitae

Personal information

SERGEY ALYAEV

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Nationality(-ies) Russia

Gender Male

Mother tongue(s) **Russian**

Other languages(s) English, Norwegian

Researcher unique identifier(s) `https://scholar.google.no/citations?user=PadtBoUAAAAJ`

URL `http://www.iris.no/about-iris/employees/431609952/SEAL`

Personal description

Sergey Alyaev grew up in Saratov (Russia) where he finished diploma in mechanics at the Saratov State University. He moved to Bergen in 2008 to pursue education in applied mathematics and completed MSc and PhD degrees at University of Bergen. Currently Alyaev works as a researcher at IRIS where he applies mathematical models to solve problems of drilling and well modelling.

Occupational field **Research in applied and computational mathematics**

Responsibilities
– Conducting research, writing reports and presenting results of projects
– Networking, securing funding and writing applications for grants
– Software development in C#

Research interests
– Multi-scale methods and homogenization for fluid flow
– Inverse modelling and optimization
– Integration of real-time data with physical models

Work Experience

2013 ⟶ International Research Institute of Stavanger, Bergen, Norway.

- Drilling Data Hub: a framework for data streaming and aggregation. [3]
  Preparation of data model suitable for drilling automation.
  Development of a complete prototype for reference server-client implementation.
  Demonstration of core functionality in real-time virtual environment.
- PressureAhead: Reduced uncertainty in overpressures and drilling window prediction ahead of the bit (DrillWell).
  Analysis of indirect measurement to predict overpressures and related uncertainties.
- Pre-project for CFD-based calculation and risk analysis for medical applications. [6]
- DrillScene. Improvement of usability of drilling monitoring system. (Sekal)
  Focus on automated trending and system calibration.
- Drilling solutions for improved recovery (DrillWell). [8]
  Development of a complete ensemble-based geosteering workflow
  Software integration
  Successful application for a follow-up project ”Geosteering for IOR” (NFR 268122)
- Advanced drilling fluid processing. [9]
  Development of simulator of top side processing equipment
  Modelling for drilling fluids processing advisory.
  Drilling fluid composition optimization

2010 – 2013	PhD Research Fellow, University of Bergen, Norway.
2009 – 2010	Summer student, Statoil Research Center, Bergen, Norway. – Heuristics-based modeling of fracture generation and growth in oil reservoirs (C++). – 3D visualization of the modeling results.
2008 – 2008	Intern, Mirantis/Grid Dynamics, Saratov, Russia. Investigation of databases for cloud computing. (Java)
Education and training	
2010 – 2017	Ph.D., Applied Mathematics, University of Bergen, Norway. **Disputation date: 03.02.2017** [7] – Mathematical analysis of fractal structure formation in freezing brine. (Matlab) [4] – Semi-analytical solution for micro-mechanics of agglomeration forced by capillary bridging. (Maple) [2] – Development and analysis of control volume HMM for non-linear flows in porous media. (Python) [1],[10]; with focus on near-well modeling [5].
2008 – 2010	M.Sc., Applied Mathematics, University of Bergen, Norway. Credits: 150. Grade: A. [11]
2004 – 2010	Specialist Diploma, Mechanics, Saratov State University, Russia. With honors. Major in Mechanics of gas liquid and plasma. [12]
Fellowships and awards	
2014	Good results (2nd in Bergen) in The 2014 Nordic Collegiate Programming Contest
2011	Best Poster Award at the international workshop ”Numerical Analysis of Multiscale Problems & Stochastic Modelling” (RICAM, Linz, Austria)
2009	Support grant for participation in the International Conference on Non-linearities and Upscaling in Porous Media (NUPUS, Stuttgart, Germany)
2009	12th place (1st in Bergen) in IDI Open
2005-2007	Diplomas of 3rd and 2nd degree in ACM Russian Southern Regional team programming contest (ACM, Saratov, Russia)
2006	1st place in All-Russian Team Mathematical Battle (Ural State Pedagogical University, Ekaterinburg, Russia)
Mobility	
2011	Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austria. Awarded by Austrian Academy of Sciences.
Teaching activities	
2010	Lecturer - Special topics in homogenization, Department of Mathematics, University of Bergen, Norway
Organization of scientific meetings	
2016	IRIS Energy Science Day, 85 participants, Stavnger, Norway. Role: arrangement of technical program and brainstorming sessions.
Commissions of trust	
2016-2017	External examinator at Western Norway University for Applied Sciences
2017	Reviewer for International Conference of Computational Methods In Sciences and Engineering
2013	Reviewer for the Journal of Applied Mathematics and Computation
2011-2012	Reviewer for Vadose Zone Journal
Professional membership	
2015-2017	Member of the Society of Petrophysicists and Well Log Analysts (SPWLA)

2014,2017	Member of the European Association of Geoscientists and Engineers (EAGE)
2009-2015	Member of international and interdisciplinary cooperation NUPUS: Non-linearities and upscaling in porous media
2016	Member of the Norway Pumps & Pipes initiative
Major collaborations	
Nordbotten J.M. and Keilegavlen E.	Efficient numerical methods for flow in porous media. University of Bergen, Norway
Pop I.S.	Upscaling of flows in porous media and mushy layers, University of Hasselt, Belgium
Balakin B.	Analysis of multiphase flow models; CFD analysis for medical applications. Western Norway University of Applied Sciences, Norway
Daireaux B., and Iversen, F.	Flow modelling and optimization for drilling applications. IRIS, Norway
Luo X., Suter E., and Vefring E.	Ensemble-based estimation and optimization of well placement. IRIS, Norway
Torres-Verdin, C.	Modelling of well logs for geosttering. University of Texas at Austin, USA
Publications	Journal Articles
Alyaev S., Keilegavlen E., and Nordbotten J.M. (2014)	[1] **Analysis of control volume heterogeneous multiscale methods for single phase flow in porous media,** Multiscale Modeling & Simulation. URL `http://hdl.handle.net/1956/15562`
Balakin B.V., Alyaev S., Hoffmann A.C., and Kosinski P. (2013)	[2] **Micromechanics of agglomeration forced by the capillary bridge: the restitution of momentum,** AIChE Journal. URL `http://dx.doi.org/10.1002/aic.14162`
Other publications	
Suter E., Alyaev S., and Daireaux B. (2017)	[3] **RT-Hub: next generation real-time data aggregation while drilling,** in First EAGE Workshop on Pore Pressure Prediction. URL `http://dx.doi.org/10.3997/2214-4609.201700060`
Alyaev S., Keilegavlen E., Nordbotten J.M., and Pop I.S. (2016)	[4] **Fractal structures in freezing brine,** submitted to Journal of fluid mechanics.
Alyaev S., Keilegavlen E., and Nordbotten J.M. (2016)	[5] **Multiscale simulations of non-linear flows in porous media,** submitted to Water resources research.
Alyaev S., Bogdanova A., Farbu E.H., and Balakin B.V. (2016)	[6] **Elucidating empty nose syndrome with CFD,** in VCBM & MedViz.
Alyaev S. (2016)	[7] **Multiscale analysis of selected problems in fluid dynamics,** PhD thesis. University of Bergen. URL `http://hdl.handle.net/1956/15563`
Luo X., Eliasson P., Alyaev S. et al. (2015)	[8] **An Ensemble-Based Framework for Proactive Geosteering,** in SPWLA 56th Annual Logging Symposium. URL `http://www.onepetro.org/conference-paper/SPWLA-2015-KKKK`
Iversen F., Daireaux B., Alyaev S. et al. (2015)	[9] **Towards Closing the Loop on Drilling Fluid Management Control,** in SPE Bergen One Day Seminar. URL `http://dx.doi.org/10.2118/173887-MS`
Alyaev S., Keilegavlen E., and Nordbotten J.M. (2012)	[10] **Multiscale simulation of non-Darcy flows,** in Computational Methods in Water Resources, CMWR XIX. URL `http://hdl.handle.net/1956/15561`
Alyaev S. (2010)	[11] **Adaptive Multiscale Methods Based on A Posteriori Error Estimates,** Master's thesis. University of Bergen. URL `http://hdl.handle.net/1956/13151`
Alyaev S., and Antonenko E.V. (2008)	[12] **Influence of non-uniformity of a thin-walled cylinder on axial critical forces,** Mathematics. Mechanics. (Collection of scientific papers). In Russian.
Technical Reports	
Alyaev S., Suter E., Vefring E. et al. (2016)	[13] **DrilWell P2: Geosteering for Improved Recovery. Report Phase 1 (2011-2015),** Technical report. IRIS.
Alyaev S. (2016)	[14] **Investigation of Reservoir Dynamics Based on Logging While Drilling Data,** Technical report. IRIS.

Iversen F., Petersen J., and Alyaev S. (2014) [15] **Modelling for drilling fluids precessing advisory. Model and application documentation with test and demo results.,** Technical report. IRIS.

Chen Y., Luo X., Alyaev S., and Vefring E. (2014) [16] **On Bias Correction for Parameter Estimation Problems with Applications to Model Updating for Geosteering,** Technical report. IRIS.

Alyaev S., Daireaux B., and Saadallah N. (2014) [17] **ADFP. Simulator of mud and processing equipment.,** Technical report. IRIS.

Iversen F., Petersen J., and Alyaev S. (2013) [18] **Modelling for drilling fluids processing advisory. Starting point, functional requirements and verification plan.,** Technical report. IRIS.