Kirill Nikitin, Ph.D.

Software Developer / Computational Scientist

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Summary

Sep 2007 to current

I am a C++ software developer and a computational scientist with 17 years experience in:

- Mathematical modeling and numerical methods in geosciences;
- Mesh generation, computational geometry;
- Computational fluid dynamics;
- Reservoir simulation;
- Optical character recognition.

Skills

Programming	C, C++.
Experience	Algorithms, STL, Git, Linux, Visual Studio, ParaView, LaTeX.
Languages	Russian (native), English (advanced).

Experience

Nov 2023 current

C++ Software Developer,

ABBYY, Belgrade, Serbia.

As a Developer on the FineReader Engine (FRE) team, I contributed to the development of the FRE OCR SDK (C++ code with inclusions on Bash, CMD, Python, Java and C#) that integrates ABBYY's recognition and data extraction technologies into user products. My responsibilities included implementing new features, debugging across multiple operating systems, configuring build processes for distribution, and collaborating with cross-functional teams on enhancements of the technological core.

A key personal achievement was conducting a significant code refactoring that involved migrating recognition, synthesis, and export operations to a new internal engine. This enhancement improved overall product performance and brought our product closer to the technology core, making it more maintainable.

Dec 2010 Aug 2023

Junior Researcher → **Researcher** → **Senior Researcher / Developer**,

Institute of Numerical Mathematics of Russian Academy of Sciences (INM RAS), Moscow, Russia.

I developed a nonlinear finite volume discretization scheme for convection-diffusion and two-phase flow numerical models (algorithms, methods, C++ code), conducted both serial and parallel numerical tests, and prepared comprehensive reports. I actively participated in multiple INM RAS projects with ExxonMobil URC (Houston, USA), leading research teams in developing methods for near-well correction, numerical solutions of black oil equations, and validating novel discretization schemes, with six business trips for collaboration with the client.

I created the first version of a simulator for incompressible free surface flows, combining the projection method for Navier-Stokes equations with the particle level set method on adaptively refined octree meshes (C++ with OpenMP). I prepared initial simulation data, conducted result visualizations (GMV, Paraview, Houdini, and POV-Ray), and supervised a Ph.D. student. Project URL: http://dodo.inm.ras.ru/research/freesurface.

I developed algorithms and software modules in C++ for adaptive mesh generation and non-isothermal reservoir simulation, and maintained full communication and reporting cycles within several INM RAS projects with Gazpromneft (Saint Petersburg, Russia) and Rosneft/UfaNIPIneft (Ufa, Russia).

I also led and successfully completed six research projects as a Principal Investigator.

I wrote 32 **publications**, h-index: 9 (Scopus ID 25924498000).

I delivered **presentations** at 35+ international and 15+ Russian conferences and workshops. Additionally, I represented Russia at the APEC Young Scientists Workshop on Effective Science Communication in the 21st Century (Kuala Lumpur-2015).

Mar 2014 **Developer / Researcher**, *Nuclear Safety Institute RAS, Moscow, Russia.*

Jan 2020 I participated in the development of the GeRa hydrogeological code, used for the assessment of radioactive waste deposit facilities' safety (C++ code with Qt interface). I implemented the nonlinear monotone finite volume scheme for the flow, advection-diffusion and Richards equations, developed a comprehensive two-phase gas-water flow and transport model, conducted code parallelization and benchmarking for enhanced performance, approbated the two-phase flow model on a real deep disposal facility.

Jul 2022 **Part time Associate Professor**, *Sirius University, Sirius / Sochi, Russia.*

Jun 2023 I guided the development of a two-phase flow model for fractured media in the Digital Rock Physics research project and supervised one master's student.

Sep 2017 **Assistant Professor**, *Lomonosov Moscow State University, Moscow, Russia.*

Jun 2021 I conducted two practical courses for students at the Faculty of Computational Mathematics and Cybernetics:
- *Modern Computing Technologies*,
- *Computer Science Practicum*.

Awards I won the Medal of the Russian Academy of Sciences with a prize for young scientists in 2011.

Hobbies Board games, video games, LEGO building, biking.

Education

2007-2010 **Ph.D. in Mathematical Modeling, Numerical Methods and Software Systems**, *Institute of Numerical Mathematics of the Russian Academy of Sciences*, Moscow, Russia.

2002–2007 **M.S. in Applied Mathematics**, *Lomonosov Moscow State University*, Russia. GPA 4.9/5.0. Department of Mechanics and Mathematics, Chair of Computational Mathematics.