1_basic info

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2_education

MSc:
2021 – 2023: Skoltech, Advanced Computational Science program

Current average grade: B (4.44)

The main field of research: machine learning and data-intensive modeling

Thesis: not chosen yet

Advisor: Vladimir Palyulin, Assistant Prof.

BSc:
2017 – 2021: Lomonosov Moscow State University, Faculty of Physic, Department of Applied Mathematics, Chair of Mathematics

Average grade: 4.94/5.00

The main field of research: numerical methods and mathematical modeling

Thesis: Accuracy control in stiff system integration

2019 – 2020: 2 publications in Preprints of Keldysh Institute of Applied Mathematics:

- Belov A.A., Vergazov A.S., Kalitkin N.N. Numerical solution error of stiff Cauchy problems on geometrically adaptive meshes // Preprints of Keldysh Institute of Applied Mathematics. 138 (2019), p. 23 DOI: 10.20948/prepr-2019-138
- Belov A.A., Vergazov A.S., Kalitkin N.N. Accuracy control in stiff system integration // Preprints of Keldysh Institute of Applied Mathematics. 2020. № 88, p. 27 DOI: 10.20948/prepr-2020-88

The publications above were supported by the following grants:

- Russian Fund for Basic Research, project No. 18-01-00175
- the President grant MK-1780.2019.1

2018 – 2019: coursework “Tools for constructing artificial neural networks for classification problems in particle astrophysics” (at the Chair of Nuclear Physics and Quantum Collision Theory)

2019: a course in C# Software Development in CROC

3_work experience

Feb 2020 – u. t. d.: student intern at Fracture Geomechanics group at Schlumberger Moscow Research (SMR)

Project involvements:

- Development of new competitive computational tools for hydraulic fracture simulation after the end of treatment
- Hydraulic fracture closure on heterogeneous proppants and channels for one of fracturing simulators in Kinetix with application to HiWAY (channeling fracturing technology) and Acid frac jobs
- Development of elastically open fracture model for Kinetix simulator
- Development of Boundary Integral Equation Solver for solving problems of non-local elasticity
- Displacement Discontinuity Method (DDM) with Higher-Order Approximation of DD elements for improved accuracy in fracture width computation
- Development of computationally effective numerical schemes and algorithms for geomechanics models in MATLAB, C++, and Python
- Unit & system tests in Visual Studio C++ projects
- Code profiling for speedup using Intel VTune/Advisor
- Advising other team members on the theory of numerical methods and consulting on C++ software development techniques

Achievements:

- Development of the computationally effective method of high-resolution hydraulic fracture closure modeling
- Implementing highly accurate quadratic DDM
- Revision and speed up of existing model
- Presenting results of the work at 2 company internal workshops

- Mentioning in the acknowledgements in the paper in Engineering Fracture Mechanics Magazine for contribution to elastically open fracture model development: https://doi.org/10.1016/j.engfracmech.2020.107071

4_competency

Programming languages and software:

- C/C++/C# (Visual Studio, Code::Blocks) - advanced
- Python (PyCharm, Anaconda) - advanced
- MATLAB - advanced
- Eigen: linear algebra library for C++
- Intel VTune/Advisor
- Deep Learning frameworks: TensorFlow, PyTorch, Keras

Hydraulic fracture closure modeling:

- displacement discontinuity method
- fast multipole method
- higher-order displacement discontinuity method

Other numerical methods:

- finite differences method
- boundary elements method
- method of stiff lines
- explicit and implicit Runge-Kutta schemes
- solving stiff systems of ODE
- solving systems of linear equations using direct and iterative solvers
- solving systems of nonlinear equations using iterative methods
- numerical integration methods
- numerical interpolation and approximation algorithms

Level of English fluency: C1 (advanced), confirmed by CAE and IELTS

5_extracurriculars and hobbies

2017 – u. t. d.: hold Moscow government scholarship for ₽65K/year for passing Unified State Exam with 100 scores both in Physics and Mathematics and helping organizing important student events (such as Donor's Day, Spring and Labor Day, Victory Day)

2018 – volunteering in FIFA World Cup in International Broadcast Center in Crocus City

Regular blood donations and participation in Donor's Day (2 times per year)

Playing piano and guitar (graduated from musical school with excellence)