

Andrey V. Pyatigorets

Senior Software Engineer

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| <i>Expertise</i> | Project Management, Software Development, Numerical Modeling, Computational Solid Mechanics, Geomechanics, Drilling & Subsurface Engineering |
| <i>Education</i> | PhD (Civil Engineering), 2010 University of Minnesota, Minneapolis, MN, USA MS (Geological Engineering), 2009 University of Minnesota, Minneapolis, MN, USA MS (Laser Physics), 2005 Novosibirsk State University, Novosibirsk, Russia BS (Physics), 2003 Novosibirsk State University, Novosibirsk, Russia |
| <i>Professional Affiliations</i> | American Rock Mechanics Association |
| <i>Honors</i> | Sommerfeld Fellowship Award (2008-2009) Sommerfeld and Minnesota Supercomputer Institute Travel Awards (2007) 2 nd Place Award, Best Research Project of the Year, Institute of Laser Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia (2005) |
| <i>Professional Experience</i> | |
| <i>2019 – Present</i> | <i>Itasca Consulting Group, Minneapolis, MN Senior Geomechanics Software Engineer II, Product Manager (FLAC2D, Griddle)</i> |
| <i>2015 – 2019</i> | <i>Software Engineer</i> |
| <i>2010 – 2015</i> | <i>ExxonMobil Upstream Research Company, Computational Science Function / Drilling & Subsurface Division, Houston, TX Engineering Specialist</i> |
| <i>2005 – 2010</i> | <i>University of Minnesota, Department of Civil Engineering, Minneapolis, MN Research Assistant</i> |
| <i>2004 – 2005</i> | <i>Institute of Automation and Electrometry, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia Software Engineer</i> |
| <i>2001 – 2005</i> | <i>Institute of Laser Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia Research Assistant</i> |

Project Experience

Software Development and Management: Itasca. (1) Manage *FLAC2D* software development and lead a team of engineers working on the project. (2) Lead and manage the full cycle of code development for *Griddle* meshing software. For both projects, conduct code design, development, reviews, communications with users, technical support, and marketing and software related business decisions.

Software Development: Custom paid projects, Itasca. By the request of ExxonMobil Upstream Research Company created a custom version of *Griddle* meshing software to implement requested capabilities. Designed and implemented additional tools in Rhino CAD environment for full automation of the process of geometrical model creation and meshing. The software tools are used by ExxonMobil engineers to create complex large-scale meshes; the developed software allowed for reduction in model creation time from the typical several weeks to hours/days.

Software Development: ExxonMobil. Conducted research and development of new drilling technologies for ExxonMobil proprietary simulation software EM^{wells}. Was involved in the development of such technologies as Wellbore Stability, Torque&Drag, Hydraulics and Hole Cleaning, Surge and Swab, Wellbore Uncertainty and others. Provided support and consulting regarding various drilling technologies to ExxonMobil engineering teams worldwide. Reviewed patents related to modeling of drilling and subsurface processes. Develop and delivered training material with respect to new technologies. Advised company interns.

QA/QC: Tubular Connections, ExxonMobil. Coordinated projects regarding quality assurance of premium tubular connections used in drilling and subsurface operations by ExxonMobil. Arranged and managed physical testing of tubular connections according to EMCEP and ISO standards in various laboratory facilities worldwide. Coordinated communications between drill teams, tubular goods' manufacturers and labs. Conducted and managed FEA of premium connections and provided reports to ExxonMobil drill teams regarding connections qualifications and operational safety.

R&D: Numerical Modelling of Composite Materials. Conducted research on thermo-mechanical behavior of elastic and viscoelastic composite materials and structures. Developed new mathematical formulation for thermo-mechanical behavior of composites. Developed computer codes for efficient and precise numerical simulations of strain/stress fields at any moment of time for fiber-reinforced composites. Developed algorithms and codes for predictions of effective transverse mechanical properties of fiber-reinforced composites. Designed and conducted physical experiments for the evaluation of effective properties of porous materials.

R&D: Geophysics. Conducted research and development of numerical procedures and computer codes for processing and analysis of large continuous arrays of geophysical data, temporal and spectral analysis of data, and data filtering (experimental data were obtained using various instruments, including laser interferometers, barometers, and gravimeters).

R&D: Electromagnetic waves distribution in optical waveguides. Conducted research and development of mathematical formulation and computer codes for simulations of light intensity distribution in planar optical waveguides for predictions of reflection/antireflection coefficients in layered optical systems.