Olga Doronina

Ph.D. Student
Department of Mechanical Engineering
University of Colorado, Boulder

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Education

07/2020 (Expected) **Ph.D. in Mechanical Engineering**, *University of Colorado, Boulder*,
Research topic: Data-driven turbulence modeling
Advisor: Dr. Peter Hamlington.

07/2014 **M.S. Applied Mathematics and Physics**, *Moscow Institute of Physics and Technology (MIPT, Phystech)*, GPA 3.9.

06/2012 **B.S. Applied Mathematics and Physics**, *Moscow Institute of Physics and Technology (MIPT, Phystech)*, GPA 3.3.

Awards and Honors/Fellowships

Fall 2013 **Special Academic Fellowship (MIPT)**, For academic achivement.

Spring 2013 **Special Academic Fellowship (MIPT)**, For sport achivements as a member of MIPT swimming team.

2009 **Governor of the Moscow Region Fellowship**, For third place in the Moscow region Mathematical Olympiad.

Research Experience

01/2017 – present **Research Assistant**, *University of Colorado, Boulder*, Turbulence and Energy Systems Laboratory (TESLa).
- Applied Approximate Bayesian Computation with Markov Chain Monte Carlo for RANS model calibration[1]
- Applied Approximate Bayesian Computation algorithm to subgrid scale turbulence model calibration [3]

01/2012 – 07/2016 **Reseach Assistant**, *Keldysh Institute of Applied Mathematics (KIAM RAS)*, Computational Aeroacoustics Laboratory.
- Implemented a moving mesh technique for unstructured meshes into in-house code architecture
- Integrated moving mesh to a numerical simulation of moving bodies aerodynamics [2]
- Studied numerically acoustic radiation dynamics of a Rankine vortex.[4]
- Examined numerical scheme (EBR-scheme) behavior on sharp velocity gradients
- Simulated acoustic waves scattering by isolated vortices using linear Euler equations.[5]

Teaching Experience

08/2016 – 12/2016 **Teaching Assistant**, *University of Colorado, Boulder*, Department of Mechanical Engineering.
- Led Matlab labs for an undergraduate Numerical Methods course.
- Led Abaqus labs for an undergraduate/graduate Finite Element Analysis course.

02/2015 – 05/2016 **Instructor**, *Moscow Institute of Physics and Technology*, Department of Numerical Mathematics.
- Taught Numerical Methods course.

09/2012 – 05/2016 **Private Tutor**.
- Tutored middle school, high school, and undergraduate students in math and physics.

09/2011 – 08/2013 **Grader**, *Correspondence school of physics and mathematics*.
- Graded assignments and demonstrated solutions to homework problems in math and physics.

Languages

English Professional

Russian Native

German Basic

Publications

[1] Olga Doronina, Colin A. Towery, Jason D. Christopher, Ian Grooms, and Peter E. Hamlington. Turbulence model development using Markov Chain Monte Carlo Approximate Bayesian Computation. In *AIAA Scitech 2019 Forum*, page 1883, 2019.

[2] I. V. Abalakin, P. A. Bakhvalov, O. A. Doronina, N. S. Zhdanova, and T. K. Kozubskaya. Simulation of aerodynamics of a moving body prescribed by immersed boundaries on dynamically adaptative unstructured mesh. *Matematicheskoe Modelirovanie*, 30(5):57–75, 2018.

[3] Olga Doronina, Jason Christopher, Colin Towery, Peter Hamlington, and Werner Dahm. Autonomic closure for turbulent flows using Approximate Bayesian Computation. In *2018 AIAA Aerospace Sciences Meeting*, page 0594, 2018.

[4] O. A. Doronina, P. A. Bakhvalov, and T. K. Kozubskaya. Numerical study of acoustic radiation dynamics of a Rankine vortex. *Acoustical Physics*, 62(4):467–477, July 2016.

[5] O. A. Doronina and N. S. Zhdanova. Numerical simulation of acoustic waves scattering by isolated vortex structures. *Matematicheskoe Modelirovanie*, 25(9):85–94, 2013.