


**Portfolio of the academic advisor of the participants of the International Olympiad
of the Global Universities Association
on the track of postgraduate studies in 2022-2023**

	<p>Maksim E. Frolov, Doctor of Science (Peter the Great St.Petersburg Polytechnic University) Director of Physical-Mechanics Institute</p>
<p>University</p>	<p>Peter the Great St.Petersburg Polytechnic University</p>
<p>English proficiency</p>	<p>Upper-Intermediate (B2)</p>
<p>Field of study on which the postgraduate student will be enrolled</p>	<p><u>MATHEMATICS & ARTIFICIAL INTELLIGENCE</u> 1.1.8. Solid Mechanics</p> <p><u>COMPUTER & DATA SCIENCE</u> 1.2.2. Mathematical modeling, numerical methods and software tools</p>
<p>List of research projects of a potential supervisor (participation / supervision)</p>	<ul style="list-style-type: none"> • A posteriori error estimates for approximate solutions to elliptic boundary value problems • Guaranteed functional error estimates for the Reissner-Mindlin plate problem • Estimates for deviations from exact solutions to plane problems in the Cosserat theory of elasticity
<p>List of possible research topics</p>	<ul style="list-style-type: none"> • Implementation of Finite Element Methods and a posteriori error control for reliable solution of PDE's • Comparison of adaptive algorithms for solving problems in solid mechanics
<p>Field of study</p>	<p>Numerical Mathematics</p>
<p>Supervisor's research interests</p>	<ul style="list-style-type: none"> • Finite Element Method • Computational Solid Mechanics • Reliable Modeling • Numerical Methods for Partial Differential Equations
<p>Research highlights</p>	<ul style="list-style-type: none"> • Research is planned in cooperation with Prof. Sergey Repin (PDMI RAS, Russia); • Resources of SCC Polytechnicheskiy (http://scc.spbstu.ru) can be utilized for implementations
<p>Supervisor's specific requirements</p>	<ul style="list-style-type: none"> • Strong mathematical background including • Mathematical Analysis and Numerical Methods • Good programming skills in Matlab, C++ or Fortran

Supervisor's main publications	<ul style="list-style-type: none"> • Churilova, M. A., & Frolov, M. E. (2019). A posteriori error estimates for linear problems in cosserat elasticity. Paper presented at the Journal of Physics: Conference Series, 1158(2) doi:10.1088/1742-6596/1158/2/022032 Retrieved from www.scopus.com • Churilova, M. A., & Frolov, M. E. (2017). Comparison of adaptive algorithms for solving plane problems of classical and cosserat elasticity. Materials Physics and Mechanics, 32(3), 370-382. Retrieved from www.scopus.com • Frolov, M., & Chistiakova, O. (2017). A functional-type a posteriori error estimate of approximate solutions for reissner-mindlin plates and its implementation. Paper presented at the IOP Conference Series: Materials Science and Engineering, 208(1) doi:10.1088/1757-899X/208/1/012043 Retrieved from www.scopus.com • Frolov, M., & Chistiakova, O. (2016). A new functional a posteriori error estimate for problems of bending of timoshenko beams. Lobachevskii Journal of Mathematics, 37(5), 534-540. doi:10.1134/S1995080216050048 • Frolov, M., & Chistiakova, O. (2019). Adaptive algorithm based on functional-type A posteriori error estimate for reissner-mindlin plates doi:10.1007/978-3-030-14244-5_7 Retrieved from www.scopus.com
Results of intellectual activity	The Grant of the President of the Russian Federation MD-1071.2017.1.