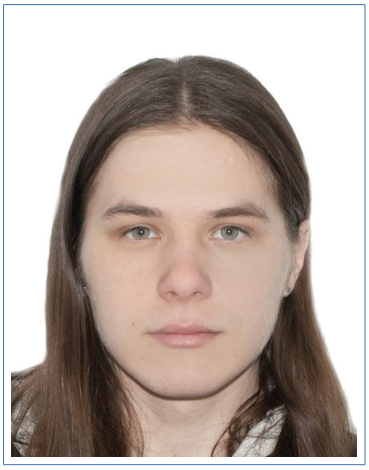

Egor Pluzhnikov

CV

Education

2017–2019 School №2086, Moscow
- Science class program with MSU Department of Mathematics and Mechanics.

2019–2022 Department of Space Research, Moscow State University
- Bachelor in Fundamental and Applied Mathematics (3rd year out of 6).

2019–2022 Independent University Of Moscow, IUM MCCME
- Mathematical courses auditor

2020–2022 Scientific and Educational Center at Steklov Mathematical Institute
- Participant of the «Quantum mathematical physics» seminar

2020–2022 Moscow Institute of Physics and Technology
- Participant of the «Algebro-geometrical methods in integrable systems and quantum physics» seminar

Scientific and practical interests

- Image analysis and processing algorithms.
- Computational geometry.
- Spectral (Wavelet and Fourier) data analyses –
  analysis of audio, image, telemetry etc.
- Image segmentation algorithms.
  Application of PDE in computational geometry and image processing.
- Mathematical and theoretical physics:
  BRST and AKSZ-formalisms, cohomological physics in common.

Contacts: GitHub — InjectiveSheaf
+7 (915) 196 0422 • ✉ pluzhnikov.egor@student.msu.ru

Scientific projects experience

May 2020 Image segmentation: An application with a graphical interface on QT that performs median filtering and image segmentation based on the use of graph algorithms. The result was tested on space and x-ray images, and showed accuracy comparable to currently existing solutions.

Sep-Dec 2021 Wavelet analysis: Participation in the project on wavelet analysis of telemetry of satellites and space modules. An application in Matlab that visualizes the presence of anomalies in the telemetry of spacecrafts.

Aug 2022 Poisson blending: Implementation of seamless blending of photos using a numerical solution of the problem of restoring an image from a gradient field.

Dec 2022 Raytracing and mathematical modeling: C++ application that models an interaction of systems of orbital satellite constellations using CPU ray tracing as the graphical shell, Qt as the interface and the comparison with SGP4 model predictions by energy norm.

Commercial and speaking experience

- Lecturer and assistant at mathematical schools and olympiad circles («Malyy MechMath» of MSU, School of the Young Space Researcher at MSU Department of Space Research).
- Speaking: «Equilibrium states of open quantum systems in the strong coupling regime» at «Quantum mathematical physics» seminar in Steklov Institute - February 2021.
- Working as a Software Engineer at pho.to. I was doing tasks from the classical software-engineering tasks to research tasks in the field of ML and implementation of new algorithms. September-december 2021.
- Speaking: «BRST complex of gauge theories. Longitudinal differential. Koszul differential.» on ITMP MSU winter school - February 2022.

Mathematical skills

- Calculus, complex and functional analyses, algebra and group theory.
- Differential geometry and topology.
- Numerical methods in Matlab/Octave or C++: linear systems, splines, numerical integration, PDE.

Programming skills

- C++17, general understanding of language facilities (pointers, containers, OOP), STL, Boost, OpenCV and Qt, have an experience in C and Python.
- Knowledge of design patterns and code refactoring experience.
- Environments: vim+make, QT Creator, git, valgrind, cmake, Visual Studio Code.

Other skills

- English language — B2. Fluent reading of technical literature, which therefore means fluent understanding. Experience in translating scientific articles.
- Excellent layout skills in LaTeX.
- Quick learning, unproblematic informational search, thorough consideration of problems from different angles.

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