Egor Chulkov

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Citizenship: Moldova, Republic of

Education

- **Skolkovo Institute of Science and Technology** 2023 – 2025
  Master of Science in Mathematics and Computer Science *GPA: 5.0/5.0*
  - Thesis: Adaptive Constructive Solid Geometry with constant evaluation complexity for modeling complex implicitly defined objects
    1. Developed and implemented memory-efficient storage of CSG trees in reverse Polish notation using bit masks
    2. Designed and implemented an algorithm of pruning CSG trees composed of implicit shapes and set-theoretic operations using Rvachev's theory and interval analysis
    3. Implemented a robust CPU ray-tracer leveraging the interval bisection method to visualize spatial representation of CSG trees
  - **Relevant Coursework:** Numerical Methods for Applied Science and Engineering, Numerical Linear Algebra, Numerical Methods for Conservation Laws, High Performance Computing and Modern Architectures, Advanced Fluid Mechanics: Multiphase Flow Modeling in Energy Transition
- **Moscow Institute of Physics and Technology** 2019 – 2023
  Bachelor of Science in Applied Mathematics and Physics *GPA: 4.5/5.0*
  - Thesis: Optimization of the characteristics of fiber optic distributed seismic sensors

Experience

- **Moscow Institute of Physics and Technology** 2023 – 2024
  Full-stack Developer, Telecommunications Research Center *Moscow, Russia*
  - Developed backend and frontend architectures for four websites, completing projects within a three-month timeline
  - Implemented custom marker styles using Yandex Maps API, enhancing map visualization capabilities
- **Moscow Institute of Physics and Technology** 2022 – 2024
  Research Engineer, Laboratory of Wellbore Exploration *Moscow, Russia*
  - Conducted fiber deformation modeling using ABAQUS finite element analysis software
  - Performed analytical studies on spirally twisted optical fiber deformation under plane wave influence
- **Geomechanics Research Project** 2023 – 2024
  Research Engineer *Moscow, Russia*
  - Developed a novel mathematical algorithm for calculating pore pressure field dynamics in producing wells
  - Engineered a calculation module to determine sand occurrence intensity based on well operation modes
  - Implemented inverse Laplace transform using Gaver-Stehfest algorithm for pressure field analysis

Internships

- **Thermal Radiation Spectral Model** 2024
  Tesis *Research Project*
  - Engineered a C++ solver for computing equilibrium temperatures in convex enclosures
  - Implemented VRML file parsing functionality for geometry import
  - Implemented an analytical method based on Narayanaswamy's algorithm, which improved accuracy up to 99%

Publications & Presentations

- Tikhotskiy S., Ciulcov E., "On the possibility to design fiber optic seismic with the prescribed angular sensitivity diagram," BalticPetroModel 2022, St. Petersburg
- Ciulcov E., Tikhotskiy S., Dubinya N., "Design of seismic sensors on DAS principle: analysis and numerical modeling," GeoEurasia-2023, Moscow

Technical Skills

- **Computer Graphics:** F-rep, SVO, R-functions, OpenVDB
- **Scientific Computing:** Python (NumPy, SciPy, Pandas), MATLAB, C++, CUDA, OpenMPI
- **Simulation & Analysis:** ABAQUS, R-functions, F-Rep, Wavelet Transform, Gaver-Stehfest Algorithm
- **Development Tools:** Git, Docker, Django
- **Languages:** English (Upper-Intermediate), Russian (Native), French (Elementary)

Honors and Awards

- Academic Excellence Award, Skolkovo Institute of Science and Technology (2025)
- Prize winner of Phystech Olympiad (2018) and Phystech International Olympiad (2019)

Hobbies

- Table tennis and board games