Igor Timofeev

Machine Learning Engineer with strong math and physics background and 4 years of experience in data science and bioinformatics research.

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Knowledge & Skills

- **Machine Learning:** Classical ML, Deep Learning: VAE, GAN, Diffusion, Transformer, RLHF, LoRa, RAG, etc. Frameworks: PyTorch, TensorFlow, scikit-learn, MLOps: Azure ML, Wandb, Hydra, TensorBoard, DVC.
- **Programming:** Python, C/C++.
- **Math Foundations:** Calculus, Linear Algebra, Probability Theory, Statistics, Numerical Analysis, Algorithms & Data Structures.
- **Physics:** Statistical Physics, Quantum Mechanics, etc.
- **Bio-related:** Bioinformatics basics, differential expression, enrichment, batch effect removal, RNA-seq, Biophysics basics.
- **Data Analysis:** SQL, Hypothesis Testing in R.

Employment

- **Gero** *May 2022 – July 2024*
  - Developed denoising and batch removal techniques in RNA-seq bulk and single-cell data and built embeddings of cellular perturbations to evaluate functional similarities.
  - Utilized advanced VAE techniques (Multi-VAE, SemiVAE, FactorVAE, iVAE,ScVI, DVAE).
  - and classical methods FC1000, DESeq2 and random matrix cross-correlation methods.
  - Conducted enrichment analysis, differential expression, leverage score, and cell-cycle classification based on the Perturb-seq paper.
  - Performed biological noise estimation using novel techniques for its use as a marker of aging.
- **Yandex** *March 2021 – March 2022*
  - Product Analyst for Yandex Search.
  - Improved offline Entity Search metrics by analyzing customer preferences.
  - Tools used: Nirvana, YT, YQL, Nile, Toloka.
- **Data Scientist in Trading (IE Shapiro)** *October 2019 – February 2021*
  - Developed option pricing models using machine learning in Python.
  - Fitting asset prices with options data via FFT, Lewis method and tempered stable distribution.

Education

- **St. Petersburg State University (Sep 2014 – Jun 2019)**
  Specialist degree in Astronomy (equivalent to Bachelor + Master), Department of Mathematics and Mechanics.
  - **Degree Thesis:**
    "The Effect of Close Approach to a Planet on the Rotation of an Asteroid"
    – Developed a program in C++ using Boost library and numerical methods for asteroid trajectory calculations
- **National University Higher School of Economics (Sep 2021 – Apr 2022)**
  Master of Computational Biology and Bioinformatics.
  - Began scientific work on aging clocks.
  - Completed one semester of Molecular Biology, Machine Learning, Algorithms, Clifford Algebras, Numerical Calculus, and Bioinformatics.

Additional Education & Competitions

- **Bioinformatics Summer School 2019**
  Topic: "Bioinformatics in Research of Aging and Biological Development."
- 4th place in SignalNeuroHack hackathon with Huawei research project.
- Completed "Deep Learning на пальцах (Put Simply)" by Computer Science Center and Novosibirsk State University. Reinforcement Learning tasks (DQN, Policy Gradient).
- "Machine Learning and Analysis" Specialization by Yandex on Coursera.
- Stepik courses certificates.
- Other lectures and books: Blastim courses, STAT115 Harvard, Molecular Biophysics (Eric Lindahl), Deep Generative Modeling, Watanabe, David Tong lectures, etc.
- Reading Group "Key Phenomena in AI Risk", EA Serbia Introductory Course.

Hobbies & Motivations

- Organize Effective Altruism (EA) community in Serbia including an AI Safety Fundamentals group.
- Organized a LessWrong community in Saint Petersburg for over a year.
- Gave a lecture on Singular Learning Theory.
- Passionate about applying knowledge and insights from mathematics and physics to solve challenges in biology and AI, particularly in areas that have the greatest potential to benefit people, such as AI safety and aging research.
- I also like board games, climbing and D&D!