Anna Rudenko

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EDUCATION

Skolkovo Institute of Science and Technology (Skoltech) — Moscow
Ph.D. in Data Science, Advisor: Ivan Oseledets — 2022–

Skolkovo Institute of Science and Technology (Skoltech) — Moscow
M.Sc. in Data Science, Advisor: Ivan Oseledets — 2019–2021

University of Information Technologies, Mechanics and Optics (ITMO) — Saint-Petersburg
M.Sc. in Applied Mathematics and Informatics with honours — 2016–2018

Peter the Great St.Petersburg Polytechnic University — Saint-Petersburg
B.Sc. in Technical Physics — 2012–2016

WORK EXPERIENCE

Lenta — Moscow
Intern — Summer 2019

EPAM SYSTEMS — Saint-Petersburg
Java Developer Intern — 2018–2019

ITMO UNIVERSITY — Saint-Petersburg
Assistent Engineer — 2017–2018

Skoltech — Moscow
Junior Research Scientist — 2021–2023

Skoltech — Moscow
Numerical Linear Algebra and Intro to Recommender Systems, Teacher Assistant — 2021–2023

Karpov Courses — Moscow
Introduction to Machine Learning, Teacher Assistant — 2021

MIPT — Moscow
Optimization methods, Teacher Assistant — 2021–2022

Dubna State University — Dubna
Mathematics for Machine Learning, Course Instructor — 2022

MSU — Sarov
Optimization methods, Course Instructor — 2022

MIPT — Moscow
Machine Learning Teacher Assistant — 2023

MIPT — Moscow
Machine Learning (digital department), Course Instructor — 2023

Harbour Space — Bangkok
Introduction to Machine Learning, Course Instructor — 2023

Research projects

- Sparse Gradient Project 2023-2024
  We proposed new parameter-efficient fine tuning method for Transformer models. We provide basis in which only about 1% of the layer's elements remain significant. By converting gradients into a sparse structure, we reduce the number of updated parameters.

- BERT block pruning, 2023
  Block pruning of linear layers of BERT.

- CLIP embedding analysis. Semantic extraction and synthesis, 2021
  CLIP embedding clustering with DEC model was proposed. Also latent representation of various VAE were interpreted with Invertible Interpretation Network.

- Efficient preconditioning for direct problem solvers via machine learning.
  BPX preconditioner is considered for the Poisson equation with Dirichlet-Neumann boundary conditions. We interpret the problem of optimizing the BPX preconditioner as the neural network training process.

- Deep Clustering of Event Sequences (Sequential Data Course final project, 2020)
  Clustering of Hawkes processes and random process that can be approximated with Hawkes processes with differentclustering techniques (CAE, DirichletHawkes, Deep Clustering)

- Brain Differences Between Men and Women (Machine Learning Course final project, 2020)
  Application of 3D CNN to investigate the difference between man and woman brains and interpretation of the results with Meaningful perturbation Resulted in a paper https://arxiv.org/abs/2006.15969

Skills

- **Programming:** Python, Java, Spring, HTML, JS
- **ML libraries:** Pytorch, Pytorch Lightning, Sklearn, JAX, Flax, Hugging Face, Optuna

Languages

- **English** C1

- **French** A2-B1