

RESEARCH INTERESTS	Self-Supervised Learning, Interpretable Representation Learning, Generative Models, Numerical Linear Algebra Methods for Learning and Inference
EXPERIENCE	<p>Postdoctoral Researcher, Empirical Inference, Max Planck Institute for Intelligent Systems Tübingen, Germany, Oct 2021 – present Working on the theoretical understanding of self-supervised learning methods; Designing methods for evaluation and practical and interpretable representation learning; Exploring causal inference for gene regulatory networks.</p> <p>AI Resident, Google X Mountain View, USA, Jul 2019 – Jan 2020 Researched tensor network representation for parameters in Transformer architecture for $\sim 2\times$ inference speed-up and model compression (featured in Tensorflow Blog).</p> <p>Junior Researcher, Skolkovo Institute of Science and Technology Moscow, Russian Federation, August 2016 – September 2021 Researched certifiable neural network robustness to semantic transformations, energy-based generative models, optimization in deep learning, approximation in kernel methods.</p>
SELECTED PUBLICATIONS	<p>M. Munkhoeva, I. Oseledets <i>Bridging Spectral Embedding and Matrix Completion in Self-Supervised Learning</i> (preprint) Laplacian-based dimensionality reduction and matrix completion to understand SimCLR-like methods</p> <p>A.Tsitsulin, M. Munkhoeva, B. Perrozi <i>Unsupervised Embedding Quality Evaluation</i> (paper) Matrix incoherence as a representation quality metric indicating highly entangled features Workshop on Topology, Algebra and Geometry in Machine Learning (TAG-ML) at ICML 2023</p> <p>M. Pautov, N. Tursynbek, M. Munkhoeva, N. Muravev, A. Petiushko, and I. Oseledets <i>CC-Cert: A probabilistic approach to certify general robustness of neural networks</i> (paper) AAAI Conference on Artificial Intelligence (AAAI 2022)</p> <p>A.Tsitsulin, M. Munkhoeva, D. Mottin, P. Karras, I. Oseledets and E. Müller <i>FREDE: Linear-Space Anytime Graph Embeddings</i> (paper) International Conference on Very Large Databases (VLDB 2021) [code]</p> <p>A.Tsitsulin*, M. Munkhoeva*, B.Perrozi <i>Just SLaQ When You Approximate: Accurate Spectral Distances for Web-Scale Graphs</i> (paper) Efficient numerical method, stochastic Lanczos quadrature, to handle huge graphs International World Wide Web Conference (WWW 2020), featured in Google AI Blog</p> <p>A.Tsitsulin*, M. Munkhoeva*, D. Mottin, P. Karras, A. Bronstein, I. Oseledets, E. Müller <i>The Shape of Data: Intrinsic Distance for Data Distributions</i> (paper) Efficiently approximate descriptors of data samples to discern synthetically generated data International Conference on Learning Representations (ICLR 2020) [code]</p> <p>M. Munkhoeva, Y. Kapushev, E. Burnaev and I. Oseledets, <i>Quadrature-based Features for Kernel Approximation</i> (Spotlight) (paper) Efficient feature maps via sparse orthogonal matrix factors generalize random Fourier features Neural Information Processing Systems (NeurIPS 2018) [code]</p>
EDUCATION	<p>Skolkovo Institute of Science and Technology (Skoltech), April 2021 Ph.D. in Computational and Data Science and Engineering, Advisor: Ivan Oseledets Thesis: Fast Numerical Linear Algebra Methods for Machine Learning</p> <p>Skoltech, June 2016 M.Sc. in Computational Mathematics Thesis: Deep Learning for Machine Translation with Non-Parallel Corpora</p> <p>Massachusetts Institute of Technology (MIT), Visiting student, Fall 2015</p> <p>National Research University Higher School of Economics (NRU HSE) Bachelor Degree, June 2014, GPA 4.9/5, magna cum laude (top 3%)</p>
RELEVANT SKILLS	<p>Programming Python, JAX, PyTorch, Tensorflow</p> <p>Miscellaneous \LaTeX, Git, Docker, Linux, cluster administration, SQL</p>
SERVICE	<p>Reviewer, ICML, ICLR, NeurIPS, AAAI</p> <p>Interviewer for European Computer Science Ph.D. programmes (IMPRS-IS, ELLIS, CLS)</p> <p>Evaluator for CaCTüS internship programme for young scientists held back by societal constraints</p>
AWARDS	<p>Spring 2019 The Ilya Segalovich Award, Yandex scholarship for young researchers</p> <p>Spring 2019 MLSS in London 2019 Travel Grant</p> <p>Fall 2018 NeurIPS Travel Grant</p> <p>Spring 2014 NRU HSE Scholarship (for best academic performance)</p>