Marina Munkhoeva

maremun.github.io
Tübingen, Germany

RESEARCH INTERESTS	Self-Supervised Learning, Interpretable Representation Learning, Generative Models, Numerical Linear Algebra Methods for Learning and Inference
EXPERIENCE	**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.

AI Resident, Google X
Mountain View, USA, Jul 2019 – Jan 2020
Researched tensor network representation for parameters in Transformer architecture
for ∼2x inference speed-up and model compression (featured in Tensorflow Blog).

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.

SELECTED PUBLICATIONS

M. Munkhoeva, I. Oseledets
Bridging Spectral Embedding and Matrix Completion in Self-Supervised Learning (preprint)
Laplacian-based dimensionality reduction and matrix completion to understand SimCLR-like methods

A.Tsitsulin, **M. Munkhoeva**, B. Perrozi
Unsupervised Embedding Quality Evaluation (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

M. Pautov, N. Tursynbek, **M. Munkhoeva**, N. Muravev, A. Petiushko, and I. Oseledets
CC-Cert: A probabilistic approach to certify general robustness of neural networks (paper)
AAAI Conference on Artificial Intelligence (AAAI 2022)

A.Tsitsulin, **M. Munkhoeva**, D. Mottin, P. Karras, I. Oseledets and E. Müller
FREDE: Linear-Space Anytime Graph Embeddings (paper)
International Conference on Very Large Databases (VLDB 2021) [code]

A.Tsitsulin*, **M. Munkhoeva***, B.Perrozi
Just SLaQ When You Approximate: Accurate Spectral Distances for Web-Scale Graphs (paper)
Efficient numerical method, stochastic Lanczos quadrature, to handle huge graphs
International World Wide Web Conference (WWW 2020), featured in Google AI Blog

A.Tsitsulin*, **M. Munkhoeva***, D. Mottin, P. Karras, A. Bronstein, I. Oseledets, E. Müller
The Shape of Data: Intrinsic Distance for Data Distributions (paper)
Efficiently approximate descriptors of data samples to discern synthetically generated data
International Conference on Learning Representations (ICLR 2020) [code]

M. Munkhoeva, Y. Kapushev, E. Burnaev and I. Oseledets,
Quadrature-based Features for Kernel Approximation (**Spotlight**) (paper)
Efficient feature maps via sparse orthogonal matrix factors generalize random Fourier features
Neural Information Processing Systems (NeurIPS 2018) [code]

EDUCATION

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

Skoltech, June 2016 M.Sc. in Computational Mathematics
Thesis: Deep Learning for Machine Translation with Non-Parallel Corpora

Massachusetts Institute of Technology (MIT), Visiting student, Fall 2015

National Research University Higher School of Economics (NRU HSE)
Bachelor Degree, June 2014, GPA 4.9/5, magna cum laude (top 3%)

RELEVANT SKILLS

Programming	Python, JAX, PyTorch, Tensorflow
Miscellaneous	LaTeX, Git, Docker, Linux, cluster administration, SQL

SERVICE

Reviewer, ICML, ICLR, NeurIPS, AAAI
Interviewer for European Computer Science Ph.D. programmes (IMPRS-IS, ELLIS, CLS)
Evaluator for CaCTüS internship programme for young scientists held back by societal constraints

AWARDS

Spring 2019	The Ilya Segalovich Award, Yandex scholarship for young researchers
Spring 2019	MLSS in London 2019 Travel Grant
Fall 2018	NeurIPS Travel Grant
Spring 2014	NRU HSE Scholarship (for best academic performance)