MAKSIM ZHDANOV

email · website · github · google scholar · twitter

research: long context in physics; hardware aligned architectures; weather forecasting

EDUCATION

PhD in Machine Learning 2023 – 2027
University of Amsterdam, AMLab

· Advisors: Max Welling & Jan-Willem van de Meent

MSc in Computer Science 2019 – 2022
TU Dresden

· GPA: 1.4 (excellent)
· Thesis: analyzing brain connectivity with generative modelling

BSc in Physics 2015 – 2019
Saint Petersburg State University

· GPA: 4.8/5.0 (with honours)
· Thesis: simulating skin with molecular dynamics

WORK EXPERIENCE

Intern Feb 2026 – May 2026
CuspAI, Amsterdam

· Agentic search for material discovery

Research Assistant Apr 2022 – Apr 2023
Helmholtz AI, Dresden

Research Student Sep 2020 – Apr 2022
Helmholtz AI, Dresden

Research Student May 2020 – Dec 2020
TU Dresden

TEACHING

Machine Learning I Sep 2023 – Dec 2023
University of Amstedam, with Erik Bekkers

Deep Learning II Feb 2024 – May 2024
University of Amstedam, with Erik Bekkers and Stratis Gavves

Deep Learning II Feb 2025 – May 2025
University of Amstedam, with Erik Bekkers and Stratis Gavves

TECHNICAL SKILLS

Code: Python, C++, MATLAB **ML:** JAX, PyTorch, Triton, HPC

PUBLICATIONS

MSPT: Efficient Large-Scale Physical Modeling via Parallelized Multi-Scale Attention
Pedro Curvo, Jan-Willem van de Meent, Maksim Zhdanov
CVPR 2026 arxiv

AdS-GNN – a Conformally Equivariant Graph Neural Network
Maksim Zhdanov, Nabil Iqbal, Erik Bekkers, Patrick Forré
ICLR 2026 arxiv code

Erwin: A Tree-based Hierarchical Transformer for Large-scale Physical Systems
Maksim Zhdanov, Max Welling, Jan-Willem van de Meent
ICML 2025 arxiv code blog

Adaptive Mesh-Quantization for Neural PDE Solvers
Winfried van den Dool*, Maksim Zhdanov*, Yuki Asano, Max Welling
TMLR arxiv code

Clifford Steerable Convolutional Neural Networks
Maksim Zhdanov, David Ruhe, Maurice Weiler, Ana Lucic, Johannes Brandstetter, Patrick Forré
ICML 2024 arxiv code blog

Implicit Convolutional Kernels for Steerable CNNs
Maksim Zhdanov, Nico Hoffmann, Gabriele Cesa
NeurIPS 2023 arxiv code blog

Investigating Brain Connectivity with Graph Neural Networks and GNNExplainer
Maksim Zhdanov, Saskia Steinmann, Nico Hoffmann
ICPR 2022 (Oral) arxiv code

WORKSHOP SUBMISSIONS

Conditional Clifford-Steerable CNNs with Complete Kernel Basis for PDE Modeling
Bálint Szarvas and Maksim Zhdanov
AI4Science @ NeurIPS 2025 arxiv code

BSA: Ball Sparse Attention for Large-scale Geometries
Catalin E. Brita, Hieu Nguyen, Lohithsai Yadala Chanchu, Domonkos Nagy, Maksim Zhdanov
LCFM @ ICML 2025 arxiv code

Amortized Bayesian Inference of GISAXS Data with Normalizing Flows
Maksim Zhdanov, Lisa Randolph, Thomas Kluge, Motoaki Nakatsutsumi, Christian Gutt, Marina Ganeva, Nico Hoffmann
ML4PS @ NeurIPS 2022

Learning Generative Factors of EEG Data with Variational Auto-Encoders

Maksim Zhdanov, Saskia Steinmann, Nico Hoffmann

DGM @ MICCAI 2022

PREPRINTS

(Sparse) Attention to the Details: Preserving Spectral Fidelity in ML-based Weather Forecasting Models
Maksim Zhdanov, Ana Lucic, Max Welling, Jan-Willem van de Meent

INVITED TALKS

AI4Science Reading Group Aug 2025
Mila, Quebec
Triton & Flash Attention Workshop Dec 2025
ELLIS' Deep Thinking Hour