MAKSIM ZHDANOV | Curriculum Vitae

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RESEARCH INTERESTS

- **Geometric Deep Learning**: equivariance, geometric algebra, graph neural networks.
- **AI4Science**: PDE modeling, physics & molecular simulations.

EDUCATION

UNIVERSITY OF AMSTERDAM
Ph.D. in Machine Learning
05/2023 - ongoing
Amsterdam, the Netherlands
Topic: Learning PDEs from data,
supervised by Max Welling, Jan-Willem van de Meent & Alfons Hoekstra,
sponsored by Microsoft Research.

TU DRESDEN
M.Sc. in Computer Science, GPA: 1.4.[excellent]
10/2019 - 3/2022
Dresden, Germany
Thesis: Analyzing Generative Factors of Functional Connectivity with VAEs,
supervised by Nico Hoffmann.

SAINT PETERSBURG STATE UNIVERSITY
B.Sc. in Physics, GPA: 4.8/5.0.[with honours]
9/2015 - 7/2019
Saint Petersburg, Russia
Thesis: Computer Simulations of Model Stratum Corneum Lipid Bilayers,
supervised by Andrei Gurtovenko.

EXPERIENCE

RESEARCH ASSISTANT
Helmholtz AI @ Helmholtz-Zentrum Dresden-Rossendorf
04/2022 - ongoing
Dresden, Germany
- Worked on generative modeling approaches for experimental physics data.
- Developed a normalizing flows-based architecture for likelihood-free inference of scattering data that is orders of magnitudes faster than a baseline (arXiv page).
- Proposed a simple yet efficient way to parameterize convolutional kernels of steerable CNNs with group equivariant MLPs (arXiv page).

STUDENT ASSISTANT
Helmholtz AI @ Helmholtz-Zentrum Dresden-Rossendorf
09/2020 - 03/2022
Dresden, Germany
- Created an explainable graph neural network-based framework for automatically diagnosing EEG data (arXiv page).
- Investigated the influence of brain disorders on EEG data with causal representation learning (arXiv page).
- Participated in developing a neural network-based solver for partial differential equations and inverse problems (GitHub page).

STUDENT ASSISTANT
The Institute for Medical Informatics and Biometry, TU Dresden
05/2020 - 12/2020
Dresden, Germany
- Performed data analysis and developed statistical models of clinical treatment of leukaemia.

INTERN
Joint Institute for Nuclear Research, Laboratory of High Energies
07/2018 - 08/2018
Moscow, Russia
- I used computational modeling to develop the experimental design for studying the cellular response to light-ion beams produced by the LHEP nuclotron.

CONFERENCE PROCEEDINGS

- **Zhdanov, M.**, Hoffmann, N. & Cesa, G. (2022). Implicit Neural Filters for Steerable CNNs, NeurIPS 2023.

- **Zhdanov, M.**, Steinmann, S., & Hoffmann, N. (2022). Investigating Brain Connectivity with Graph Neural Networks and GNNExplainer, ICPR 2022 (Oral).

WORKSHOP CONTRIBUTIONS

- **Zhdanov, M.**, Randolph, L., Kluge, T., Motoaki, N., Gutt, C., Ganeva, M. & Hoffmann, N. (2022). Amortized Bayesian Inference of GISAXS Data with Normalizing Flows, Machine Learning and the Physical Sciences @ NeurIPS 2022.
- **Zhdanov, M.**, Steinmann, S., & Hoffmann, N. (2022). Learning Generative Factors of EEG Data with Variational auto-encoders, Deep Generative Models workshop @ MICCAI 2022 (Oral).

MASTER THESIS

- **Zhdanov, M.** (2022). Analyzing Generative Factors of Functional Connectivity with Variational Autoencoders.

SKILLS

PROGRAMMING LANGUAGE	Python **|** C++ **|** R
FRAMEWORKS & TOOLS	Git **|** GROMACS **|** AutoDock Vina
LIBRARIES	PyTorch **|** JAX **|** escnn **|** PyTorch Geometric **|** NumPy **|** Pandas
CONTRIBUTED TO	Neural Solvers
LANGUAGES	**Native:** Russian **| Fluent:** English **| Intermediate:** German

COMMUNITY SERVICE

MACHINE LEARNING AND THE PHYSICAL SCIENCES WORKSHOP @ NEURIPS 2023 reviewer	09/2023 online, USA	
SYMMETRY AND GEOMETRY IN NEURAL REPRESENTATIONS WORKSHOP @ NEURIPS 2023 reviewer	09/2023 online, USA	
TAGML @ ICML 2023 reviewer	05/2023 online, USA	
SYNS & ML @ ICML 2023 reviewer	05/2023 online, USA	
MACHINE LEARNING AND THE PHYSICAL SCIENCES WORKSHOP @ NEURIPS 2022 reviewer	09/2022 online, USA	
SYMMETRY AND GEOMETRY IN NEURAL REPRESENTATIONS WORKSHOP @ NEURIPS 2022 reviewer	09/2022 online, USA	
ICPR 2022 reviewer	05/2022 online, Canada	

EXTRACURRICULAR ACTIVITIES

GEOMEDIA WORKSHOP participant	11/2022 Amsterdam, Netherlands
SNI 2022 CONFERENCE poster presentation	09/2022 Berlin, Germany
LONDON GEOMETRY AND MACHINE LEARNING SUMMER SCHOOL	07/2022

poster presentation + project   online, UK

SWISS EQUIVARIANT WORKSHOP
participant

07/2022
Lausanne, Switzerland

MACHINE LEARNING SUMMER SCHOOL
poster presentation

07/2022
Krakow, Poland

HZDR MACHINE LEARNING JOURNAL CLUB
active participant

09/2020 - ongoing
Dresden, Germany

HELMHOLTZ AI CONFERENCE
poster presentation

06/2022
Dresden, Germany

INTERNATIONAL AI ARCHEOLOGY CHALLENGE
3rd place

04/2022
online, Israel

5. WORKSHOP BIOINFORMATICS MEETS MACHINE LEARNING
Talk: "Investigating Brain Connectivity with Graph Neural Networks and GNNExplainer"

12/2021
online, Germany

MACHINE LEARNING SUMMER SCHOOL
participant

08/2021
online, Taiwan

CASUS WORKSHOP
Talk: "Investigating Brain Connectivity with Graph Neural Networks and GNNExplainer"

09/2021
Gorlitz, Germany

HIDA COVID-DATA CHALLENGE
participant

04/2021
online, Germany