ARTEM VYSOGORETS

AI Research Scientist

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Recent Ph.D. graduate with extensive deep learning / CV / NLP research background, coding experience, and proven math skills.
U.S. citizen since 2021.

EDUCATION

2019– 2024   *Ph.D. in Data Science (GPA 3.9)*
New York University
Thesis topic: efficient deep learning

2015– 2019   *B.S. in Mathematics (GPA 4.0)*
University of Massachusetts Amherst
Thesis topic: polynomials over matroids
Commonwealth Honors College Scholar

WORK EXPERIENCE

Summer 2023   *Senior Marketing Data Science Intern (IBM, New York, NY)*
In a team of three, predicted client conversion based on a history of interactions with the company's assets. Responsibilities included R&D, data retrieval with SQL and processing with Pandas, modeling with XGBoost, and business interpretation.

Summer 2022   *Quant Machine Learning Intern (Bloomberg LP, New York, NY)*
Developed a PyTorch codebase (approx. 3,000 lines of code) for benchmarking active learning methods with LLMs such as BERT on internal text classification datasets. Authored a publication that proposes an efficient active learning protocol leveraging pre-trained embedding spaces.

Summer 2021   *Research Intern (Samsung AI Center, New York, NY)*
Assisted in research on optimal robot navigation based on the pre-learned cost-to-go function and image feed. Collected training data in a physics simulator and trained several neural network architectures, including hypernetworks, in PyTorch.

PUBLICATIONS

2024   [Robust Data Pruning: Uncovering and Overcoming Implicit Bias](). *DMLR Workshop @ ICLR 2024.*
Vysogorets, A., Ahuja, K., Kempe, J.
TL;DR: We conduct the first systematic study of data pruning within a fairness framework and propose a novel, theoretically justified protocol that significantly improves worst-case accuracy through random pruning with appropriate class priors.

2023   [Deconstructing the Goldilocks Zone of Neural Network Initialization](). *ICML 2024.*
Vysogorets, A., Dawid, A., Kempe, J.
TL;DR: We analyze the geometric properties of loss landscapes by studying configurations with excess positive curvature of the loss Hessian (known as the Goldilocks zone), previously believed to be related to the initialization norm, and indicate suitable initial points for training.

2022   [Towards Efficient Active Learning in NLP via Pretrained Representations](). *DMLR Workshop @ ICLR 2024.*
Vysogorets, A., Gopal, A.
TL;DR: We use embedding spaces of pre-trained LLMs within the active learning loop for efficient and delay-free data labeling. This method is validated using BERT on standard NLP benchmarks and is found to produce high-quality labeled datasets transferable across architectures.

2021   [Connectivity Matters: Neural Network Pruning Through the Lens of Effective Sparsity](). *JMLR, 24 (99).*
Vysogorets, A., Kempe, J.
TL;DR: We introduce a sparsity measure that accounts for inactivated neurons after pruning and reevaluate popular pruning algorithms within this framework. We design an optimal method for distributing sparsity across layers to obtain a state-of-the-art random pruning strategy. We conduct over 3,000 GPU-powered experiments, including training ResNet-50 on ImageNet.

2021 [ImpressLearn: Continual Learning via Combined Task Impressions](#). *Preprint.*
Bhardwaj, D., Kempe, J., **Vysogorets, A.**, Teng, A., Ezekwem, E.
TL;DR: We leverage supermasks to design a lifelong learning method that allows for knowledge transfer, incurs zero forgetting, and scales favorably with the number of tasks compared to similar baselines.

2020 [Kazhdan-Lusztig Polynomials of Matroids Under Deletion](#). *Electronic Journal of Combinatorics, 27(1).*
Braden T., **Vysogorets A.**
TL;DR: We developed new matroid constructions that provably relate the Kazhdan-Lusztig polynomial of a matroid to that of its deletion. This result yields a closed formula for the Kazhdan-Lusztig polynomials of a particular family of graphic matroids.

OTHER EXPERIENCE

2021 *Teaching Assistant*, NYU.
Course: Introduction to Data Science for PhD Students.
TL;DR: Led weekly lab meetings covering my own materials ([Jupyter notebooks](#)) and assisted with curating and grading homework assignments.

2019 *Student Researcher*, RIPS @ Institute for Pure and Applied Mathematics, UCLA
Project: [Automating Artifact Detection in Video Games](#) (sponsored by AMD)
TL;DR: In a team of four, we developed a model for detecting visual artifacts in video games. The work involved reverse-engineering the most common graphics glitches, reproducing them, curating a synthetic dataset, and training a final mixture of experts model.

2018 *Student Researcher*, REU in Mathematics, San Diego State University.
Project: [Predicting Riemann Zeta Function Zeroes with Machine Learning](#).
TL;DR: Formulated the prediction of Zeta function zeros as a time-series problem and solved it with neural networks.

2018 *Teaching Assistant,* UMass Amherst.
Course: Fundamental Concepts of Mathematics
Led three weekly discussion seminars and graded homework.

AWARDS

2018 William F. Field Alumni Scholarship, UMass Amherst Alumni Association.

2017 Member of the UMass Amherst Putnam Exam team (47th / 575).

2017 Jacob-Cohen-Killam math competition, UMass Amherst, 3rd place.

2017 Research Assistance Fellowship, Honors College, UMass Amherst.

2015 Moscow Institute for Physics and Technology (MIPT) math olympiad, 3rd prize.

2012 Winner of the Moscow State University (MSU) math olympiad.

SKILLS

Programming: Python (PyTorch, TensorFlow, Scikit-Learn), Java, C/C++, HPC, Git, Singularity.

Languages: English, Russian

Other: Competitive coding, math competitions / olympiads, problem-solving, teaching.