Ulyana Piterbarg

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Research Interests

Main Threads

1. Training recipes with better scaling properties for settings at the frontier of language and vision-language model capabilities (e.g. long-horizon reasoning & decision-making, complex program synthesis, robot manipulation)
2. Algorithms for improving foundation models with self-generated data

Broader Interests: open-ended interaction, memory systems, differentiable simulators, weather & climate modeling

Experience

Microsoft Research	2024	**Research Intern**, AI Frontiers / GenAI
New York University	2021–	**Ph.D. Student**, Courant Institute of Mathematical Sciences
Google Research	2021	**Research Intern**, Accelerated Sciences
Massachusetts Institute of Tech.	2017–2021	**B.Sc.**, Mathematics with Computer Science
Massachusetts Institute of Tech.	2020–2021	**Researcher**, Climate Modeling Alliance
EPFL Summer Research Program	2018	**Research Intern**
MIT Lincoln Laboratory	2017–2018	**Technical Assistant**, Space Systems and Technology
American Museum of Natural History	2017	**Exhibition Design Intern**
Yale University	2016	**Research Intern**, The Clark Lab

Academic Group Affiliations

CILVR @ NYU	*Rob Fergus*, *Lerrel Pinto*	2021–
Microsoft Research New York	*Jordan Ash*, *Dipendra Misra*	2024
ML for Physics, Google Research	*Dmitrii Kochkov*, *Stephan Hoyer*, *Michael P. Brenner*	2021
Climate Modeling Alliance, MIT	*Andre Souza*, *Raffaele Ferrari*	2020–2021
MIT CoCoSci	*Kelsey R. Allen*, *Kevin A. Smith*, *Josh Tenenbaum*	2018–2020

Publications

[7] **Piterbarg, U.**, Pinto, L., & Fergus, R. (2024). Training Language Models on Synthetic Edit Sequences Improves Code Synthesis. *arXiv preprint arXiv:2410.02749*.

[6] **Piterbarg, U.**, Misra, D., & Ash, J. (2024). Rapid Distillation of Reasoning Capability from Black-Box Language Models. (*In Preparation*).

[5] Paglieri, D., Cupiał, B., Coward, S., **Piterbarg, U.**, Wolczyk, M., Khan, A., Pignatelli, E., Kuciński, L., Pinto, L., Fergus, R., Foerster, J., Parker-Holder, J., & Rocktäschel, T. (2024). BALROG: Benchmarking LLM/VLM Reasoning on Games. (*In Preparation*).

[4] **Piterbarg, U.**, Pinto, L., & Fergus, R. (2024). `diff` History for Neural Language Agents. *41st International Conference on Machine Learning (ICML)*.

[3] **Piterbarg, U.**, Pinto, L., & Fergus, R. (2023). NetHack is Hard to Hack. *37th Conference on Neural Information Processing Systems (NeurIPS)*.

[2] Ramadhan, A., Marshall, J., Souza, A., Lee, XK., **Piterbarg, U.**, Hillier, A., LeClaire Wagner, G., & Rackauckas, C. (2023). Capturing Missing Physics in Climate Model Parameterizations using Neural Differential Equations. *arXiv preprint arXiv:2010.12559*.

[1] Allen, K. R., Smith, K., **Piterbarg, U.**, Chen, R., & Tenenbaum, JB. (2020). Abstract Strategy Learning Underlies Flexible Transfer in Physical Problem Solving. In *CogSci*.

Honors and Awards

NSF Graduate Research Fellowship	2022–2025
Google DeepMind Ph.D. Scholarship	2021–2022
NYU Henry M. MacCracken Doctoral Fellowship	2021–2026
MIT Quest for Intelligence Undergraduate Research and Innovation Scholarship	2020–2021
National Merit Scholarship	2017
Moody's Math Modeling Challenge (*Finalist*)	2016
New Jersey Research Science Fair (*1st Place*, Chemistry & Materials Science)	2015

Invited Talks

NetHack is Hard to Hack, *CILVR @ NYU Seminar*	2024
Structured Losses for Neural Simulators of Turbulent Flows, *Google Applied Science*	2021
Flexible Transfer in Physical Problem Solving, *Google Brain*	2021

Teaching

Lecturer & Teaching Assistant, *Introduction to Robot Intelligence (CSCI-UA 480-072)* 2023
New York University
Department of Computer Science

Teaching Assistant, *Seminar in Analysis (18.104)* 2021
Massachusetts Institute of Technology
Department of Mathematics

Teaching Assistant, *Computational Cognitive Science (6.804/9.66/9.660)* 2019
Massachusetts Institute of Technology
Department of Computer Science, Department of Brain and Cognitive Sciences

Professional Service

Reviewer, *Transactions on Machine Learning Research*	2024–
Reviewer, *International Conference on Learning Representations (ICLR)*	2024–
Representative, *MIT Council for Math Majors*	2020–2021
Mentor, *MIT Undergraduate Society of Women in Math*	2019–2021
Mentor, *MIT Society of Women Engineers*	2019-2021
Volunteer, *Rolnick Observatory*	2015-2017

Volunteer & Member, *Westport Astronomical Society* 2015–2017
Contributor, *International Occulation Timing Association* 2015–2017

ADVISING

Carla Garcia Medina (now Research Engineer at *Google*) 2022–2023

LANGUAGES

Programming: Python, GoLang, Java, Julia, MATLAB, Javascript/CSS/HTML
Spoken & Written: English (native), Ukrainian (native), French (DELF B2)

REFERENCES

Available upon Request.