

# Ulyana Piterbarg

<https://upiterbarg.github.io/>

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## RESEARCH INTERESTS

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### Main Threads

1. Training recipes with better scaling properties for settings at the frontier of foundation model capabilities, such as code editing, long-context reasoning, agentic decision-making, and physical modeling
2. Algorithms for improving foundation models at scale with self-generated data

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

## EXPERIENCE

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

## ACADEMIC GROUP AFFILIATIONS

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<b>CILVR @ NYU</b>	<i>Rob Fergus, Lerrel Pinto</i>	2021–
<b>Microsoft Research New York</b>	<i>Jordan Ash, Dipendra Misra</i>	2024
<b>ML for Physics</b> , Google Research	<i>Dmitrii Kochkov, Stephan Hoyer, Michael P. Brenner</i>	2021
<b>CLiMA</b> , MIT + Caltech + NASA JPL	<i>Andre Souza, Raffaele Ferrari</i>	2020–2021
<b>MIT CoCoSci</b>	<i>Kelsey R. Allen, Kevin A. Smith, Josh Tenenbaum</i>	2018–2020

## PUBLICATIONS

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

[6] Paglieri, D., Cupiał, B., Coward, S., **Piterbarg, U.**, Wolczyk, M., Khan, A., Pignatelli, E., Kuciński, Ł., Pinto, L., Fergus, R. and Foerster, J.N., 2024. BALROG: Benchmarking Agentic LLM and VLM Reasoning on Games. *arXiv preprint arXiv:2411.13543*. (In Submission).

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

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National Science Foundation 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 ( <i>Finalist</i> )	2016
New Jersey Research Science Fair ( <i>1st Place</i> , Chemistry & Materials Science)	2015

## INVITED TALKS

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( <i>Upcoming Talk</i> ) Workshop on Self-Improving Foundation Models Without Human Supervision, <i>ICLR 2025</i>	2025
NetHack is Hard to Hack, <i>CILVR @ NYU Seminar</i>	2024
Structured Losses for Neural Simulators of Turbulent Flows, <i>Google Research (Applied Science)</i>	2021
Flexible Transfer in Physical Problem Solving, <i>Google Research (Brain)</i>	2021

## TEACHING

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Lecturer & Teaching Assistant, <i>Introduction to Robot Intelligence (CSCI-UA 480-072)</i> <i>New York University</i> Department of Computer Science	2023
Teaching Assistant, <i>Seminar in Analysis (18.104)</i> <i>Massachusetts Institute of Technology</i> Department of Mathematics	2021
Teaching Assistant, <i>Computational Cognitive Science (6.804/9.66/9.660)</i> <i>Massachusetts Institute of Technology</i> Department of Computer Science, Department of Brain and Cognitive Sciences	2019

## PROFESSIONAL SERVICE

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

Volunteer & Member, <i>Westport Astronomical Society</i>	2015–2017
Contributor, <i>International Occultation Timing Association</i>	2015–2017

## ADVISING

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Carla Garcia Medina (now Research Engineer at <i>Google</i> )	2022–2023
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## LANGUAGES

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**Programming:** Python, GoLang, Java, Julia, MATLAB, Javascript/CSS/HTML

**Spoken & Written:** English (native), Ukrainian (native), French (DELF B2)

## REFERENCES

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Available upon Request.