# Ulyana Piterbarg

https://upiterbarg.github.io/
up2021-at-nyu.edu
*Last updated November 12, 2024*

## Research Interests

**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

| | | |
|---|---|---|
| New York University | 2021– | **Ph.D. Student**, Courant Institute of Mathematical Sciences |
| Microsoft Research | 2024 | **Research Intern**, AI Frontiers / GenAI |
| Google Research | 2021 | **Research Intern**, Accelerated Sciences |
| Massachusetts Institute of Tech. | 2017–2021 | **B.Sc.**, Mathematics with Computer Science |
| Climate Modeling Alliance | 2020–2021 | **Researcher**, Ocean Processes |
| 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 |
| **CliMA**, MIT + Caltech + NASA JPL | *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

| | |
|---|---|
| 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 (*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 Research (Applied Science)* | 2021 |
| Flexible Transfer in Physical Problem Solving, *Google Research (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.