# Katrina Drozdov (Evtimova)

🌐 kevtimova.github.io | ✉ kve216@nyu.edu | ⓞ kevtimova | ⸙ d4xi2HIAAAAJ | in Katrina Drozdov

## SUMMARY

I'm interested in building production AI systems that rely on foundation models. I've developed methods that improve model performance through regularization, especially in self-supervised learning. These fundamental techniques are broadly applicable and form a strong basis for building robust, generalizable systems.

## EDUCATION

**Ph.D. in Data Science**, *New York University*     Sep 2018 - Sep 2024
Thesis: "Representation Learning with Regularized Energy-Based Models".
Committee: Yann LeCun (Advisor), Kyunghyun Cho, Carlos Fernandez-Granda, Brenden Lake, Leon Bottou.

**M.Sc. in Data Science**, *New York University*     Sep 2015 - May 2017
Mentors: Kyunghyun Cho, David Sontag, Yacine Jernite.

**B.A. in Mathematics**, *Harvard College*     Sep 2009 - May 2013

## WORK EXPERIENCE

**Expert Contributor**, *Snorkel AI*     Feb 2025 - ongoing
Created and validated graduate-level problems to test and enhance LLM reasoning capabilities.

**Research Intern**, *Meta - Fundamental AI Research (FAIR)*     May 2020 - Aug 2020
Research Project: Using variance regularization to prevent collapse when training sparse image encoders.

**Research Intern**, *Meta - Fundamental AI Research (FAIR)*     May 2019 - Aug 2019
Research Project: Deep learning methods for learning hierarchical and sparse representations of images.

**Research Engineer**, *eBay - Recommendations*     Jul 2017 - Aug 2018
Developed scalable machine learning algorithms for item recommendations, deployed in production.

**Research Assistant**, *New York University - CILVR Lab*     Oct 2016 - Mar 2017
Implemented Markov Logic Networks for clinical data. In collaboration w/ Yacine Jernite and David Sontag.

**Data Science Intern**, *Comcast*     Jun 2016 - Aug 2016
Analyzed large-scale user metrics for program viewership.

**Research Associate**, *Columbia Business School*     Jul 2013 - Jul 2015

## PUBLICATIONS

**Video Representation Learning with Joint-Embedding Predictive Architectures**
**K. Drozdov**, R. Shwartz-Ziv, Y. LeCun. Preprint, 2024.
We develop a neural architecture that encodes object dynamics through self-supervised learning from video data. We incorporate variance regularization, which leads to improvements across multiple evaluation metrics.

**Variance-Covariance Regularization Improves Representation Learning**
J. Zhu, **K. Evtimova**, Y. Chen, R. Shwartz-Ziv, and Y. LeCun. Preprint, 2023.
We show that our regularization framework which encourages data representations to have high variance and low covariance enhances transfer learning in both the image and video domains.

**Sparse Coding with Multi-layer Decoders using Variance Regularization**
**K. Evtimova**, Y. LeCun. TMLR 2022.
ISTA is a classic algorithm for extracting sparse representations of data. We extend ISTA to work with deep neural networks, applying variance regularization to avoid collapse. Sparse image representations extracted with our method boost one-shot learning performance.

**Emergent Communication in a Multi-Modal, Multi-Step Referential Game**
**K. Evtimova**, A. Drozdov, D. Kiela, K. Cho. ICLR 2018.
We use reinforcement learning to train a multi-agent neural network architecture where agents cooperate to predict the class of an input image. The architecture is adaptive, using more computation for complex images.

# Katrina Drozdov ✉ [kve216@nyu.edu](mailto:kve216@nyu.edu)

## SELECTED INVITED TALKS

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| "Towards Building Intelligent Systems", *Apple MLR* | Oct 2024 |
| "Deep Leaning", *Leif Weatherby's course "Theory of the Digital"* | Jan 2023 |
| "Self-supervised Learning & Sparse Overcomplete Representations of Visual Data", *CILVR at NYU* | Jan 2020 |

## MEDIA MENTIONS

**"From Academia to Industry: How a 2018 Paper Foreshadowed OpenAI's Latest Innovation"**
Medium, Oct 2024. Discusses my research on emergent communication and its connection to OpenAI's o1 model.

## TEACHING & MENTORSHIP

**Mentor**, *New York University* — Fall 2020
O. Che. Independent study on non-linear sparse coding.

**Teaching Assistant**, *New York University* — Spring 2020
Introduction to Machine Learning taught by Kyunghyun Cho at the Courant Institute.

**Teaching Assistant**, *New York University* — Spring 2019
Deep Learning taught by Yann LeCun at the Center for Data Science.

**Teaching Assistant**, *Harvard College* — Fall 2011
Linear Algebra and Applications taught by Vaibhav Gadre at the Math Department.

## PROFESSIONAL SERVICE

**Conference Reviewing**: ICML '21, '22, '23, '24; NeurIPS '21, '22; ICLR '21, '22, '23, '24. AISTATS '24.

**Additional Reviewing**: TMLR (since 2024), WiML Workshop at NeurIPS '17.

## AWARDS & DISTINCTIONS

**Highlighted Reviewer**, *International Conference on Learning Representations (ICLR)* — Apr 2022

**Best Deep Learning Project Recipient (Jointly with A. Drozdov)** — Feb 2017
*NYU Center for Data Science. Award selected by Yann LeCun.*
Project Title: Understanding Mutual Information and its Use in InfoGAN.

**Ena Blyth Scholarship**, *Harvard College* — Sep 2011 - May 2013
Selected as one of the two recipients of this annual award in the Math Department.

## ACTIVITIES

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| **Organiser**, *NYU AI School* | Sep 2021 - Jan 2022 |
| **President**, *NYU Center for Data Science Leadership Circle* | Sep 2018 - May 2019 |

## SKILLS & INTERESTS

**Technical**: Extensive experience with Python and PyTorch for developing custom deep learning pipelines.

**Personal Interests**: I enjoy singing and was a member of The Noteables, a Broadway show choir at Harvard. I also experiment with art and baking. My mixed media piece "Junk Mail" was featured at NYU's 4th Annual World Tour Pop-Up Gallery. Outside of my creative pursuits, I practice yoga and Tai Chi, and enjoy outdoor activities such as hiking and cycling.