

Anastasia Razdaibiedina

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EDUCATION

University of Toronto 2018 - Present
Ph.D. Machine Learning & Computational Biology (GPA: 4.0)
Research areas: Natural Language Processing, Instruction-Tuning for LLMs, Biomedical ML, Parameter-Efficient Training

Kyiv National University of Taras Shevchenko 2013 - 2017
B.S. Applied Mathematics with Honours (GPA: 4.0)

RESEARCH EXPERIENCE

Microsoft Research, Redmond, US May - Aug 2023
NLP Research Intern with Subho Mukherjee, Arindam Mitra, Ahmed Awadallah

- Improved instruction tuning of LLaMA-13B model to match the performance of ChatGPT, GPT4 via imitation learning.
- Developed efficient method for instruction data selection, reducing training set $\times 3$ times without performance loss.

Technologies: pytorch, huggingface, azure ml, fsdp training, accelerate

Meta (Facebook) AI, Seattle, US Jun - Dec 2022
NLP Research Intern with Yuning Mao, Madian Khabsa, Mike Lewis, Rui Hou, Amjad Almahairi

- Developed a continual learning method for LLMs based on prompt tuning, which trains $< 0.1\%$ of total parameters.
- Validated on T5 and BERT models, achieved $+22\%$ improvement over previous state-of-the-art on a standard NLP benchmark.
- Published research papers at ICLR 2023 and ACL 2023.

Technologies: pytorch, huggingface, jupyter, bash, slurm, git

Amazon Research, New York, US (remote) May - Aug 2021
Applied Scientist Intern with Vivek Madan, Ashish Khetan, Zohar Karnin, Vishaal Kapoor

- Developed a regularization method for language models fine-tuning, which avoids representation collapse.
- Achieved $+2.6$ points average improvement over standard fine-tuning on 13 NLP tasks with BERT model.

Technologies: tensorflow, huggingface, numpy, pandas, scikit learn, bash, aws cloud computing

University of Toronto / Vector Institute, Toronto, Canada Jan 2018 - Present
Ph.D. Researcher with Brenda Andrews, Charlie Boone, Jimmy Ba

- Developed a self-supervised method to predict protein function from single-cell microscopy data, and validated on a novel dataset of 3,000,000 cell images. Discovered aging-related functions of 7 unknown proteins (in submission to Nature Methods).

Technologies: pytorch, tensorflow, keras, numpy, matplotlib, plotly, scipy, scikit-learn, bash, cuda

SELECTED PUBLICATIONS

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- A. Razdaibiedina et al. Progressive Prompts: continual learning for language models. *ICLR*, 2023. <https://arxiv.org/abs/2301.12314k>
 - A. Razdaibiedina et al. Residual Prompt tuning, improving prompt tuning with residual reparameterization. Findings of *ACL*, 2023. <https://arxiv.org/abs/2305.03937>
 - A. Razdaibiedina et al. MIREAD: simple method for learning high-quality representations from scientific documents. *ACL*, 2023. <https://arxiv.org/abs/2305.04177>
 - A. Razdaibiedina et al. PIFiA: a self-supervised method for protein functional annotation from single-cell imaging data. In submission to *Nature Methods*.
 - A. Razdaibiedina et al. Representation Projection Invariance mitigates representation collapse. Submitted to *EMNLP*, 2023. <https://arxiv.org/abs/2205.11603>
 - A. Razdaibiedina et al. Learning multi-scale functional representations of proteins from single-cell microscopy data. In *ICLR*, 2022, MLDD workshop. <https://arxiv.org/abs/2205.11676>
 - A. Razdaibiedina et al. Multi-defect microscopy image restoration under limited data conditions. In *NeurIPS*, 2019, Medical Imaging workshop (rated in top-15). <https://arxiv.org/abs/1910.14207>

TEACHING EXPERIENCE

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- Bias and Fairness in ML, Vector Institute (2022W)
 - CSC384: Intro to Artificial Intelligence (2021W)
 - Deep Learning 2, Vector Institute (2020F)
 - CSC311: Intro to Machine Learning (2019F)

INVITED TALKS

Facebook AI Research talk, Continual learning for language models without forgetting Sep 2022
Toronto Bioinformatics User Group, Self-supervised method for protein functional annotation from single-cell imaging data Mar 2022
York University \times Vector Institute invited panelist, AI in Healthcare and Future Oct 2019

SELECTED HONOURS AND AWARDS

Borealis AI Fellowship 2023, 10,000\$	Vector Institute Fellowship 2019-21, 18,000\$	NVIDIA GPU grant program 2018
Ontario Graduate Scholarship 2021-22, 15,000\$	NeurIPS travel award 2019, 500\$	PhD merit entrance scholar 2018, 2,000\$