

Anastasia Razdaibiedina

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EDUCATION

University of Toronto

2018 - Present

Ph.D. Machine Learning & Computational Biology (GPA: 4.0)

Research areas: Representation Learning, Natural Language Processing, Biomedical Machine Learning, Continual Learning

Kyiv National University of Taras Shevchenko

2013 - 2017

B.S. Applied Mathematics with Honors (GPA: 4.0)

RESEARCH EXPERIENCE

Meta (Facebook) AI, Seattle, US

Jun - Sep 2022

Research Intern, Natural Language Processing and Machine Learning

- Developed a continual learning method for language models 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.
- Submitted a research paper to ICLR 2023, gave talk at FAIR.

Technologies: pytorch, huggingface, numpy, pandas, jupyter, matplotlib, bash, slurm, git

Amazon Research, remote

May - Aug 2021

Applied Scientist Intern, Natural Language Processing

- Developed a regularization method for language models fine-tuning, which avoids representation collapse.
- Achieved +2.6 points improvement over standard fine-tuning on 13 NLP tasks with BERT model.
- Submitted a research paper to EACL 2023, gave talk at Amazon Science.

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

Recursion Pharmaceuticals, remote

May - Aug 2020

Data Science Intern

- Developed computer vision algorithms for drug discovery using ResNet and DenseNet architectures.
- Improved existing CNN pipeline accuracy by 8% via data augmentation techniques (CutMix and MixUp).

Technologies: pytorch, determined, scikit learn, numpy, pandas, seaborn, plotly, jupyter notebook, bash, git, google cloud

University of Toronto / Vector Institute

Jan 2018 - Present

Graduate Student Researcher

- Developed a self-supervised method to predict protein function from microscopy data, and validated on a novel dataset of 3,000,000 single-cell images. Discovered aging-related functions of 7 previously unknown proteins.
- Developed an image restoration method for microscopy data using GANs (Generative Adversarial Networks), effective in few-shot conditions. Published in NeurIPS 2019 medical imaging workshop and rated in top-15 submissions.

National Academy of Sciences of Ukraine, Kyiv, Ukraine

Nov 2016 - Mar 2017

Bioinformatics Research Intern

- Performed statistical analysis of the biomedical data to identify single-nucleotide polymorphisms (SNPs) in three gene families.
- Identified two SNPs responsible for the development of miscarriage; published findings in *Obstetrics and Gynecology International* journal.

PUBLICATIONS

1. A. Razdaibiedina et al. Progressive Prompts: continual learning for language models without forgetting. Submitted to **ICLR, 2023**. [OpenReview link](#).
2. A. Razdaibiedina et al. PIFiA: a self-supervised approach for protein functional annotation from single-cell imaging data. In submission to **Nature Methods**.
3. A. Razdaibiedina et al. Improving language models fine-tuning with representation consistency targets. Submitted to **EACL**, 2022. <https://arxiv.org/abs/2205.11603>
4. 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>
5. 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>
6. A. Razdaibiedina et al. Effects of single-nucleotide polymorphisms in cytokine, toll-like receptor, and progesterone receptor genes on risk of miscarriage. In **Obstetrics and Gynecology International**, 2018. <https://pubmed.ncbi.nlm.nih.gov/30116270/>
7. A. Razdaibiedina et al. Biomolecular modeling on iOS devices: review and software comparison. In **RJBSCS**, 2016. [Link](#)

TEACHING EXPERIENCE

1. **Bias and Fairness in Machine Learning, Vector Institute** (Winter 2022). Developed and conducted two tutorials on bias and fairness in pre-trained language models (BERT, T5).

2. **CSC384: Intro to Artificial Intelligence** (Winter 2021). Developed 5 quizzes and conducted 3 tutorials on knowledge representation and deep learning fundamentals.
3. **Deep Learning 2, Vector Institute** (Fall 2020). Developed two machine learning assignments on computer vision (segmentation with UNET, object detection with YOLO) and interpretability (CNNs, Gradient Maps, SmoothGrad) in Google Colab.
4. **CSC311: Intro to Machine Learning** (Fall 2019) Developed and conducted two tutorials that cover linear algebra basics and singular value decomposition, corrected homeworks.

INVITED TALKS

<i>Facebook AI Research talk</i>	Sep 2022
Continual learning for language models without forgetting	
<i>Toronto Bioinformatics User Group</i>	Mar 2022
Self-supervised approach for protein functional annotation from single-cell imaging data	
<i>Temerty Center for AI Research and Education in Medicine</i>	Aug 2021
Discovering gene-disease relationships with Deep Learning	
<i>York University × Vector Institute invited panelist</i>	Oct 2019
Panel discussion: AI in Healthcare and Future	

HONORS AND AWARDS

School of Graduate Studies travel award (1000\$)	2022
Ontario Graduate Scholarship (15,000\$)	2021-2022
Vector Institute PGA Fellowship (6,000\$ × 3)	2021, 2020, 2019
NeurIPS travel award (500\$)	2019
School of Graduate Studies travel award (1000\$)	2019
NVIDIA GPU grant program	2018
Ph.D. Merit entrance scholarship (2000\$)	2017
Augmented academic merit scholarship (top-10% of the class)	2015-17
Total: 40,000\$	