Nader Asadi

✉ asadi.nader97@gmail.com | 🏠 naderasadi.github.io | Github | in LinkedIn | M Medium | 🎓 Google Scholar

EXPERIENCE

Huawei - Noah's Ark Lab *Montréal, Canada*
Research Scientist *June 2023 – Present*

- **Focus:** Efficient training and alignment of large language/vision models, including parameter-efficient fine-tuning, decentralized training, and recombing modular skills for systematic generalization.
- Designed and developed a dynamic skill (LoRA) composition method for few-shot adaptation of LLMs and generative diffusion models.
- Developed an AI-generated feedback pipeline for data refinement and reinforcement learning from AI feedback (RLAIF) of LLMs.
- Proposed a new method to reduce inter-node interference in decentralized learning, resulting in significant improvement of the base model.

Borealis AI *Montréal, Canada*
Research Intern *Jan 2023 – May 2023*

- **Focus:** Adaptive regularization technique for asynchronous time-series forecasting in high-noise domains. The technique adapts to the noise level of each sample and effectively deprioritizes noisy and difficult-to-train samples in the training set.
- Conducted research on improving the robustness of Neural Temporal Point Processes (NTPPs) against noisy training data.

Mila - Quebec AI Institute *Montréal, Canada*
Graduate Student Researcher *Jan 2021 – May 2023*

- **Focus:** Research on improving the training stability of large-scale deep neural networks against distribution changes, including the topics of continual and decentralized learning. Collaborated with teams from Meta AI Research and Toyota Research.
- Results of our work were published and presented as four papers at top-tier machine learning and computer vision conferences.

Grokvideo *Montréal, Canada*
Research Intern *Jan. 2022 – Sep. 2022*

- **Focus:** Developing a holistic video understanding framework for prompt-based video retrieval and summarization across diverse domains, including movies, TV shows, sitcoms, and sports events.
- Led the development and training of the proposed joint vision-audio-language transformer encoder for zero-shot fine-grained video retrieval.
- Delivered a highly scalable multilingual video understanding framework with a focus on English and French languages.

Rahpooyan *Tehran, Iran*
Software Engineer *July. 2017 – June 2018*

- Built and deployed a video and message streaming platform utilizing Spring Boot, WebSockets, and Apache Kafka.
- Implemented a native Android client application for an online course platform with offline and online streaming capabilities.

EDUCATION

Mila / Concordia University *Montréal, Canada*
M.Sc. (Research) in Computer Science *Jan. 2021 – May 2023*

- Supervised by Eugene Belilovsky and Sudhir Mudur.
- GPA: 4.22/4.3
- Thesis: *New Insights on Catastrophic Forgetting in Neural Networks*

Shahid Bahonar University of Kerman *Kerman, Iran*
B.Sc. in Computer Engineering *Sep. 2015 – Jan. 2020*

- GPA: 17.53/20

FEATURED PUBLICATIONS

Prototype-Sample Relation Distillation: Towards Replay-Free Continual Learning *2023*

International Conference on Machine Learning (**ICML**)

Nader Asadi, MohammadReza Davari, Sudhir Mudur, Rahaf Aljundi, and Eugene Belilovsky [Link]

Probing Representation Forgetting in Supervised and Unsupervised Continual Learning   *2022*

IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)

MohammadReza Davari*, Nader Asadi*, Sudhir Mudur, Rahaf Aljundi, and Eugene Belilovsky [Link]

New Insights on Reducing Abrupt Representation Change in Online Continual Learning   *2022*

International Conference on Learning Representations (**ICLR**)

Lucas Caccia, Rahaf Aljundi, Nader Asadi, Tinne Tuytelaars, Joelle Pineau, and Eugene Belilovsky [Link]

Tackling Online One-Class Incremental Learning by Removing Negative Contrasts   *2021*

NeurIPS Workshop on Distribution Shifts (DistShift)

Nader Asadi, Sudhir Mudur, and Eugene Belilovsky [Link]

⋆ *To view all of my publications, visit my Google Scholar page.*

Featured Projects

WLoRA

- WLoRA is a package extending huggingface **PEFT** library and enables a trainable composition of several pre-trained adapter modules. It allows few-shot personalization using any type of pre-trained adapter layer (*e.g.* LoRA) for any type of downstream task (*e.g.* text/image generation). [Code coming soon]

CLHive

- A modular python library for **continual learning** research that contains more than nine well-known class-incremental and task-incremental learning algorithms in PyTorch. [Code]

ViTX

- ViTX is a research framework for **vision-language representation learning** on top of PyTorch Lightning and Huggingface Transformers. It offers a modular framework supporting distributed training, logging/profiling, data loading, and reproduction of well-known baselines. [Code]

Technical Skills

Languages	Python, Java, C++, SQL, JavaScript
Tools	Pytorch, JAX, TensorFlow, HuggingFace, ONNX, Triton, Ray, Lightning, MLflow, OpenCV | Spark, Kafka, Airflow, PostgreSQL, Cassandra, Redis | Flask, FastAPI, Scrapy | GCP, AWS, Docker, Kubernetes, Linux
Certificates	IBM Data Science Professional Certificate, **IBM** Data Engineering with Google Cloud Professional Certificate, **Google**

Professional Services and Volunteering

Reviwer	Reviewer for TPAMI, ICLR 2022, CVPR 2023, ICCV 2023, BMVC 2023, WACV 2024, CVPR2024
Blog Posts	On Positional Encoding and Context-Limit of LLMs [Link] What is Apache Parquet? [Link]
Talks	New Insights on Catastrophic Forgetting in Neural Networks, **Mila AMLRT Team** Parameter-efficient Fine-tuning, **Noah's Ark Lab** Prototype-sample Relation Distillation: Towards Replay-Free Continual Learning, **ICML 2023** Tackling Online One-Class Incremental Learning by Removing Negative Contrasts, **NeurIPS 2021**

Honors & Awards

2023	Nominated for the **Best Thesis Award**, Concordia University.
2021	Awarded **Graduate Excellence Fellowship**, Concordia University.
2019	Ranked 2nd among Computer Engineering student of batch 2015.
2018	Exceptional Talent Students Scholarship, Shahid Bahonar University of Kerman.