

SAMIN YEASAR ARNOB

LLM+RL @ Cohere, Ph.D. candidate @ McGill University, Mila

[Webpage](#) [LinkedIn](#) [Github](#) [Google Scholar](#)

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RESERCH INTEREST

Currently working with **Cohere** on improving LLM reasoning (RLVR, RLHF).

Previously worked with **Microsoft Research** on developing *Sparse Adapters* for LLM efficient model merging, an alternative for parameter-efficient training and model merging.

General interest: Reinforcement Learning, RLVR, RLHF, LLM Reasoning, World-model, Parameter-efficient finetuning in LLM, Improving mergability of a mixture of experts.

EDUCATION

McGill University

Jan. 2020 – Dec 2025

Ph.D. Candidate, Computer Science, Advised by [Doina Precup](#)

Montreal, Canada

- **Research Focus:** Enhancing the learning capacity of neural networks, with a focus on Reinforcement Learning (RL) and Large Language Models (LLMs) [COLM 2025](#).
- Exploring innovative network architectures inspired by the human brain, specifically through the use of multiple specialized pathways within a single network to optimize task-specific performance. [NeurIPS 2024](#) , [NeurIPS 2021 -offlineRL](#)
- Worked on improving sample complexity and learning capacity in offline RL. [NeurIPS 2021-offlineRL](#), [RLDM 2025](#)

McGill University

Jan 2018 – Dec 2019

M.Eng. in ECE, Advised by [Aditya Mahajan](#)

Montreal, Canada

- **Research Focus:** Imitation learning and Inverse Reinforcement learning algorithms. Improving robustness of the performance in imitation learning and transfer learning using domain-independent reward learning. [ICML 2020-LifeLongML](#)

RESEARCH EXPERIENCE

Cohere

September 2025 - Present

Intern of Technical Stuff

Paris (remote)

- I'm working on a controlled synthetic data-generation pipeline for reasoning-trace to improve LLM reasoning performance for 100B+ model (RLVR) at Cohere for its next release.

Microsoft Research

March, 2024 - May, 2025

Student Researcher

Montreal, Canada

- Advised by [Alessandro Sordoni](#), an early version of the research is presented at [ICLR 2025, Workshop on Modularity - Paper](#) , extended version is accepted in [COLM 2025](#).
- **Research Focus:** Sparse Adapters: developed a simpler and more effective building block for modular, parameter-efficient architectures, demonstrating superior model merging performance at scale.
- **Application:** Building parameter efficient a library of experts for M365 Copilot.

Microsoft Research

May, 2023 - August, 2023

Applied Research Scientist Intern

New York, USA

- Advised by [John Langford](#) and [Alex Lamb](#).
- **Research Focus:** Developed Agentic approach for an efficient system exploration. Developed an algorithm to build a world model through self-play using Hierarchical Planning in latent space, which enables efficient large-scale exploration for Windows applications.
- **Application:** Collaborated with the Microsoft Windows team to implement agentic approach for automated software bug detection.

Ubisoft-La forge

Sept. 2021 - Aug, 2022

Research Intern

Montreal, Canada

- **Research Focus:** Advised by [Joshua Romoff](#), conducted research on large map navigation for bots using preference learning, experimented with the GPT-2 model to enhance performance and generalization in automating bot navigation for future games.
- **Application:** Developed an internal Reinforcement Learning (RL) library to support and advance research in bot navigation.

- Advised by [Doina Precup](#), we explore learning transferable skills over multiple environments from *MineCraft gaming environment* using imitation learning.

AWARDS AND RECOGNITION

DeepMind Graduate Award

Jan. 2020 – Present

McGill University

Spot Light Presentation

RLDM 2019

Graduate Excellence Fellowship Award

Jan. 2018 – Dec. 2018

McGill University

Honorable Mention

2016

IEEE Signal Processing Cup

[Report](#)

[Github](#)

TECHNICAL SKILLS

[Python](#)

[Java](#)

[bash scripting](#)

[Linux environment](#)

[PyTorch](#)

[Tensorflow](#)

PROJECTS AND PUBLICATION

- "Exploring Sparse Adapters for Scalable Merging of Parameter Efficient Experts".
 - **SY Arnob**, Z Su, M Kim, O Ostapenko, D Precup, L Caccia, A Sordoni
 - **ICLR 2025, MCDC Workshop**
 - **COLM 2025**- [Paper](#)
- "Efficient Reinforcement Learning by Discovering Neural Pathways".
 - **SY Arnob**, R Ohib, Amy Zhang, A. Sordoni, Doina Precup
 - **NeurIPS 2024** - [Paper](#)
- "Sparse-Reg: Improving Sample Complexity of Offline Reinforcement Learning using Sparse Regularization."
 - **SY Arnob**, Scott Fujimoto, Doina Precup
 - **RLDM 2025** - [Paper](#)
- "Importance of Empirical Sample Complexity Analysis for Offline Reinforcement Learning".
 - **SY Arnob**, R Islam, D Precup
 - **NeurIPS 2021**- Offline Reinforcement Learning Workshop - [Paper](#)
- "Single-Shot Pruning for Offline Reinforcement Learning".
 - **SY Arnob**, R Ohib, S Plis, D Precup
 - **NeurIPS 2021**- Offline Reinforcement Learning Workshop - [Paper](#)
- "Offline Policy Optimization with Variance Regularization".
 - R Islam, S Sinha, H Bharadhwaj, **SY Arnob**, Z Yang, Z Wang, A Garg, L Li, D Precup
 - **NeurIPS 2020**- Offline Reinforcement Learning Workshop [Open Review](#)
- "Off-policy adversarial inverse reinforcement learning".
 - **SY Arnob**
 - **ICML 2020**- [Lifelong Learning Workshop](#) [Open Review](#) — [Github](#) — [Project Page](#)
- "Doubly Robust Estimators in Off-Policy Actor-Critic Algorithms".
 - R Islam, **SY Arnob** and D Precup
 - **RLDM-2019: Spot Light Presentation**, Montreal, Canada. Extended version available online - [Arxiv](#)
 - **NeurIPS 2019**- Safety and Robustness in Decision Making Workshop

- "Power File Extraction Process from Bangladesh Grid and Exploring ENF Based Classification Accuracy using Machine Learning".
- **SY Arnob**, R. Ohib, M. Muhaisin, T. Bin Hassan.
- *IEEE Region 10 Humanitarian Technology Conference 2017*. [IEEEExplore](#)
- "ENF Based Machine Learning Classification for origin of Media Signals: Novel Features from Fourier Transform Profile".
- R. Ohib, **SY Arnob**, M. Muhaisin, R. Arefin, T. Reza and MR. Amin
- Accepted at [:ICEECS 2018](#) and presented on 13-14 Nov, 2018.

TEACHING EXPERIENCE

Teaching Assistant

COMP 551 - Applied Machine Learning

Fall 2020, Winter 2020

- I was a teaching assistant (TA) in Winter 2020 and Fall 2020 for the Applied Machine Learning course, one of the most popular courses taught at McGill to about 300 graduate and undergraduate students per semester.
- I have designed projects and graded them along with helping students with their class projects in both of the terms.

COMP 424 - Artificial Intelligence

Winter 2021

- I was in charge of the final project, where proposed solving pentago-twist, a variant of popular pentago boardgame.
- The competition lasted for a month, during which I advised about 400 undergraduate students. All of the students individually were pitted against each other over multiple rounds and the challenging part was to debug the submissions and auto-mate the evaluation.
- see the [GitHub](#) link

GRADUATE COURSE

- IFT 6760C - Reinforcement Learning and Optimal Control
- COMP 767 - Reinforcement Learning
- COMP 652 - Machine Learning
- ECSE 509 - Probability and Random Signals 2
- COMP 551 - Applied Machine Learning
- ECSE 506 - Stochastic Control and Decision Theory