Md Rifat Arefin

Montreal, Canada

📞 +15148023515 • ✉ rifat.arefin515@gmail.com

🖝 rarefin.github.io/

Research Interest

Deep Neural Networks have shown impressive performance in different real-life applications and tend to improve performance while growing model size providing more data and computes. They are very useful in compressing data and learning useful abstract representations, especially in self-supervised manner. Yet these models fail when data distribution shifts, where human beings are much more robust. My research interests lie in learning better representations across modalities for out-of-distribution generalization and improving reasoning in LLMs.

Education

Ph.D. Student	**Probable Graduation Year**
MILA - Quebece AI Institute & University of. Montreal,	*December 2026*
CGPA 4.3 (out of 4.3)	
Masters in Computer Science & Engineering	**Passing Year**
Department of Computer Science & Engineering, Kyung Hee University,	*February, 2019*
CGPA 4.3 (out of 4.3)	
B. Sc. in Software Engineering	**Passing Year**
Institute of Information Technology, University of Dhaka,	*February, 2017*
CGPA 3.89 (out of 4)	

Achievements

- IVADO PhD Excellence Scholarships

- 1st Runner up in PROBA-V Super Resolution Competition organized by European Space Agency
  Competition website- Team "rarefin", Open Source Code

- IEEE BDS best paper award in International conference on Computer and information Technology 2015

- Obtained Govt. scholarship in class V, VIII and X standard

- Obtained President Scholarship during the study of Masters

Mentorship and Reviewer Experience

- Reviewer of ICLR 2025

- Internship Mentor of Mila professional Masters Student (May 2024 to December 2024)

- Served as reviewer NeurIPS 2024

- Served as reviewer of AISTATS 2024

- Served as reviewer of ICLR 2024 Workshop on Reliable and Responsible Foundation Models

- Reviewer of ICML 2024 Workshop on Foundation Models in the Wild

Work Experience

Applied Scientist Intern:

Amazon, Seattle, USA

October 2024 to December 2024

Visiting Researcher (part-time):

ServiceNow, Montreal, Canada

May 2024 to September 2024

Working on LLM reasoning

Research Intern (part-time):

Recursion Pharmaceutical, Montreal, Canada

June 2023 to December 2023

Worked on a project related to learning representations from images of human cells that have been manipulated by CRISPR/Cas9-mediated gene knockouts, compounds, or other reagents to predict trillions of relationships across biology and chemistry.

Visiting Researcher:

Eberhard Karls University of Tübingen, Tübingen, Germany

January 2021 to June 2021

Deep Learning R&D Engineer:

UpStride, Paris, France

December 2019 to November 2020

Worked on a project related to exploring alternative algebra like complex numbers, quaternions, etc. for deep networks.

Research Internship:

MILA - Quebec AI Institute, Montreal, Canada

August 2018 to February 2019 (7 months)

I did a research internship under the Supervision of Professor Yoshua Bengio during my masters and worked on a satellite image super-resolution competition organized by the European Space Agency and got the 1st runner-up prize. Competition website (https://kelvins.esa.int/proba-v-super-resolution/leaderboard/results)- Team "rarefin".

Internship :

Orion Informatics Limited, Dhaka, Bangladesh

January 2016 to June 2016 (6 months)

As per the requirements of my Bachelor I did 6 months internship at a software company in Bangladesh

Research Works

[1] Does Representation Matter? Exploring Intermediate Layers in Large Language Models; Oscar Skean, **Md Rifat Arefin**, Ravid Shwartz-Ziv, Accepted at Compression Workshop @ NeurIPS 2024

[2] Seq-VCR: Preventing Collapse in Intermediate Transformer Representations for Enhanced Reasoning; **Md Rifat Arefin**, Gopeshh Subbaraj, Nicolas Gontier, Yann LeCun, Irina Rish, Ravid Shwartz-Ziv, Christopher Pal, (Submitted at, ICLR 2025)

[3] **Md Rifat Arefin**, Zhang Y, Baratin A, Locatello F, Rish I, Liu D, Kawaguchi K. Unsupervised Concept Discovery Mitigates Spurious Correlations. arXiv e-prints. 2024 Feb:arXiv-2402. (Published at, ICML 2024, presented poster)

[4] Hu, Shell Xu, **Md Rifat Arefin**, Viet-Nhat Nguyen, Alish Dipani, Xaq Pitkow, and Andreas Savas Tolias. "AvaTr: One-Shot Speaker Extraction with Transformers." arXiv preprint arXiv:2105.00609 (2021).

[5] Ostapenko, Oleksiy, Timothee Lesort, Pau Rodríguez, **Md Rifat Arefin**, Arthur Douillard, Irina Rish, and Laurent Charlin. "Foundational Models for Continual Learning: An Empirical Study of Latent Replay." arXiv preprint arXiv:2205.00329 (2022).

[6] **Md Rifat Arefin**, Vincent Michalski, Pierre-Luc St-Charles, Alfredo Kalaitzis, Sookyung Kim, Samira E. Kahou, and Yoshua Bengio. "Multi-Image Super-Resolution for Remote Sensing Using Deep Recurrent Networks." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, pp. 206-207. 2020.

[7] Deudon, Michel, Alfredo Kalaitzis, Israel Goytom, **Md Rifat Arefin**, Zhichao Lin, Kris Sankaran, Vincent Michalski, Samira E. Kahou, Julien Cornebise, and Yoshua Bengio. "HighRes-net: Recursive Fusion for Multi-Frame Super-Resolution of Satellite Imagery." arXiv preprint arXiv:2002.06460 (2020).

[8] **Md Rifat Arefin**, Farkhod Makhmudkhujaev, Oksam Chae, and Jaemyun Kim. "Background Subtraction based on Fusion ofColor and Local Patterns." 2018 Asian Conference on Computer Vision (ACCV), 2-6 December, 2018, Perth, WA, Australia.

[9] **Md Rifat Arefin**, Farkhod Makhmudkhujaev, Oksam Chae, and Jaemyun Kim. "Aggregating CNN and HOG Features for Real-Time Distracted Driver Detection." IEEE International Conference on Consumer Electronics - January 11-13, 2019, Las Vegas, Nevada, USA.