

SYEDA NAHIDA AKTER

mobile: +1 (646) 894 9222 | user ID: sakter@andrew.cmu.edu | website: snat1505027.github.io |  [google scholar](#) |  [github](#)

RESEARCH INTEREST

Large Language Model, Pretraining, Reinforcement Learning, Reasoning

WORK EXPERIENCE

Research Scientist at NVIDIA

June 2026 - Present

- Working on enhancing reasoning ability of large generative models during pretraining.

Research Intern at NVIDIA

May 2024 - May 2026

- Working on enhancing reasoning ability of LLM during pretraining.

Graduate Research Assistant at Language Technologies Institute, Carnegie Mellon University

Fall 2021 - Present

- Social Intelligence** - Proposed a novel self-supervised learning procedure on top of the pretrained model that performs two new auxiliary tasks to learn the features of social interactions specifically in low resource setting.
- CLIRES: Cross Lingual Relation Extraction with Structured information** - Proposed a framework for zero-shot cross-lingual relation extraction using only structured information and no additional data which provides an average improvement of **1.5** and **2.5** points in F1 score for in-domain and zero-shot transfer settings.
- Automated VQG** - Automatically generated **2.5M** VQA pairs along with Scenegraps covering all kinds of reasoning from the Visual Genome dataset. The dataset contains complex questions that focus on the relationship, similarity and differences between objects and object features.
- MAC-R: Pretrained Models are Not All You Need** - Proposed an end-to-end differentiable reasoning module MAC-R that outperforms the baseline R2C model by **7.9%** on the Q→A task on VCR dataset. [\[Slides\]](#) [\[Report\]](#)
- Answering Visual Questions Through Representation Learning** - Proposed three new architectures (a. Coarse to fine reasoning, b. Prompt Tuning, c. New pretrained model with two new tasks) to improve spatial reasoning using the GQA dataset which provide **2%**, **3%** and **3.17%** improvement, respectively, over the state-of-the-art models. [\[Poster\]](#) [\[Report\]](#)
- Improving Cross-lingual Factual Retrieval** - Proposed a multilingual typed querying method to improve retrieval performance along with a back-probing method to generate more relevant outputs. The method shows using a weighted sum of forward and backward probabilities on the raw dataset improve accuracy on both high and low resource languages. [\[Poster\]](#) [\[Report\]](#)

Research Intern at Language Technologies Institute, Carnegie Mellon University

May - Aug (2021, 2022)

- Devised a novel framework for social interaction modeling using self supervised techniques focusing on the low resource setup.
- Developed a new model for multimodal QA task along with a dataset, developed ACAI framework for automatic training and evaluation of QA models.

EDUCATION

PhD student in Language Technologies

Carnegie Mellon University

August 2023 - May 2026

Pittsburgh, PA

Research Area: Multimodal Question Answering, Social Intelligence Modeling, Commonsense Reasoning

Masters in Language Technologies

Carnegie Mellon University

August 2021 – May 2023

Pittsburgh, PA

Research Area: Multimodal Question Answering, Advisor: [Professor Eric Nyberg](#)

QPA: 4.00

Bachelor of Science in Computer Science and Engineering

Bangladesh University of Engineering and Technology

January 2016 – February 2021

Dhaka, Bangladesh

Research Area: Geo-Distributed Machine Learning, Natural Language processing

Introspective X Training: Feedback Conditioning Improves Scaling Across all LLM Training Stages

Authors: Brandon Cui, Ximing Lu, Jaehun Jung, [Syeda Nahida Akter](#), Hyunwoo Kim, Yuxiao Qu, David Acuna, Shrimai Prabhumoye, Yejin Choi, Prithviraj Ammanabrolu

Keywords: LLMs, Pretraining, Reasoning
Under Submission at NeurIPS 2026 [\[Paper\]](#)

Front-Loading Reasoning: The Synergy between Pretraining and Post-Training Data

Authors: [Syeda Nahida Akter](#), Shrimai Prabhumoye, Eric Nyberg, Mostofa Patwary, Mohammad Shoeybi, Yejin Choi, Bryan Catanzaro

Keywords: LLMs, Pretraining, Reinforcement Learning, Supervised Finetuning, Reasoning
The Fourteenth International Conference on Learning Representations, 2026 [\[Paper\]](#)

RLP: Reinforcement as a Pretraining Objective

Authors: Ali Hatamizadeh*, [Syeda Nahida Akter](#)*, Shrimai Prabhumoye*, Jan Kautz, Mostofa Patwary, Mohammad Shoeybi, Bryan Catanzaro, Yejin Choi

Keywords: LLMs, Pretraining, Reinforcement Learning, Reasoning
The Fourteenth International Conference on Learning Representations, 2026 [\[Paper\]](#)

Nemotron 3 Ultra: Open, Efficient Mixture-of-Experts Hybrid Mamba-Transformer Model for Agentic Reasoning

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining, Post-Training Reasoning
Technical Report [\[Paper\]](#)

NVIDIA Nemotron 3: Efficient and Open Intelligence

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining, Post-Training Reasoning
Technical Report [\[Paper\]](#)

Nemotron 3 Nano: Open, Efficient Mixture-of-Experts Hybrid Mamba-Transformer Model for Agentic Reasoning

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining, Post-Training Reasoning
Technical Report [\[Paper\]](#)

NVIDIA Nemotron Nano 2: An Accurate and Efficient Hybrid Mamba-Transformer Reasoning Model

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining, Post-Training Reasoning
Technical Report [\[Paper\]](#)

Llama-Nemotron: Efficient Reasoning Models

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining, Post-Training Reasoning
Technical Report [\[Paper\]](#)

Nemotron-CrossThink: Scaling Self-Learning beyond Math Reasoning

Authors: [Syeda Nahida Akter](#), Shrimai Prabhumoye, Matvei Novikov, Seungju Han, Ying Lin, Evelina Bakhturi, Eric Nyberg, Yejin Choi, Mostofa Patwary, Mohammad Shoeybi, Bryan Catanzaro

Keywords: LLMs, Reinforcement Learning, Reasoning
EACL 2026 [\[Paper\]](#)

Nemotron-H: A Family of Accurate and Efficient Hybrid Mamba-Transformer Models

Authors: [Syeda Nahida Akter](#) and NVIDIA

Keywords: LLMs, Pretraining Reasoning
Technical Report [\[Paper\]](#)

MIND: Math Informed Synthetic Dialogues for Pretraining LLMs

Authors: [Syeda Nahida Akter](#), Shrimai Prabhumoye, John Kamalu, Sanjeev Satheesh, Eric Nyberg, Mostofa Patwary, Mohammad Shoeybi, Bryan Catanzaro

Keywords: LLMs, Pretraining, Math Reasoning
ICLR 2025 [\[Paper\]](#)

VISREAS: Complex Visual Reasoning with Unanswerable Questions

Authors: [Syeda Nahida Akter](#), Sangwu Lee, Yingshan Chang, Yonatan Bisk, Eric Nyberg

Keywords: VLMs, Multihop Reasoning
ACL Findings 2024 [\[Paper\]](#)

Self-Imagine: Effective Unimodal Reasoning with Multimodal Models using Self-Imagination

Authors: [Syeda Nahida Akter](#), Aman Madaan, Sangwu Lee, Yiming Yang, Eric Nyberg

Keywords: VLMs, Mathematical Reasoning

LLMAgents @ ICLR 2024 [\[Paper\]](#)

An In-depth Look at Gemini's Language Abilities

Authors: [Syeda Nahida Akter*](#), Zichun Yu*, Aashiq Muhamed*, Tianyue Ou*, Alex Bäuerle, Ángel Alexander Cabrera, Krish Dholakia Chenyan Xiong, Graham Neubig

Keywords: Benchmarking, LLMs, Reasoning

ArXiv [\[Paper\]](#)

Difference-Masking: Choosing What to Mask in Continued Pretraining

Authors: Alex Wilf*, [Syeda Nahida Akter*](#), Leena Mathur, Paul Pu Liang, Sheryl Mathew, Mengrou Shou, Eric Nyberg Louis-Philippe Morency

Keywords: Social Intelligence, Commonsense Reasoning, Video QA, SSL

Findings of the Association for Computational Linguistics: EMNLP 2023 [\[Paper\]](#)

KnowUREnvironment: An Automated Knowledge Graph for Climate Change and Environmental Issues

Authors: Md Saiful Islam, Adiba Prama, Yilin Zhou, [Syeda Nahida Akter](#), Caleb Wohn, Ehsan Hoque

Keywords: Knowledge Graph, Climate Change

2022 AAAI Fall Symposium Series. [\[Paper\]](#)

WeightGrad: Geo-Distributed Data Analysis Using Quantization for Faster Convergence and Better Accuracy

Authors: [Syeda Nahida Akter](#), [Dr. Muhammad Abdullah Adnan](#)

Keywords: Distributed Machine Learning, Convergence

Proc. of the 26th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2020), San Diego, CA, USA, August 23-27, 2020. [\[Paper\]](#)

TECHNICAL SKILLS

Languages: Python, Java, C/C++, SQL (Postgres), JavaScript, HTML/CSS, Shell, Matlab, Intel 8086 Assembly Language

Frameworks: PySpark, MXNet, BERT, XLNet, RoBERTa, ALBERT, OpenGL, Django, Arduino

Libraries: JAX, Pytorch, Tensorflow, Keras, OpenCV, NLTK, Theano, Pandas, NumPy, Matplotlib, Scikit-Learn