Md Ashraful Islam

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Education

University of Massachusetts Amherst, PhD in Computer Science — Sep 2023 – Current

- **Advisor:** Marco Serafini
- **Project - PRISM: Scalable M-TGNN Training System** PRISM addresses the loss of accuracy in memory-augmented temporal graph neural networks (M-TGNNs) trained with large batch sizes, where stale memory updates lead to temporal inconsistencies. The system constructs a *memory computation graph (MCG)* using custom CUDA kernels and applies a *diffusion-based refinement* over the MCG to update state vectors that would otherwise require sequential execution to preserve freshness. PRISM currently supports single-GPU training, with a related paper under revision at **VLDB**. Ongoing work focuses on extending the system to **multi-node, multi-GPU** distributed training (in collaboration with Prof. Ramesh K. Sitaraman).
- **Project - Relational Deep Learning.** The project focuses on developing an efficient and flexible training system to automate relational database learning utilizing hetreogenous GNN.
- **Project - Intrusion Detection using Provenance Graph.** The project focuses on analyzing provenance graphs to detect stealthy intrusions that evolve over long temporal horizons. It aims to model complex dependencies and subtle propagation patterns within system events to distinguish benign activities from coordinated attacks. The framework integrates dynamic graph learning and anomaly detection techniques (in collaboration with Prof. Pubali Datta's Lab).

University of Dhaka, Master's in Computer Science — Jul 2016 – Dec 2017

- CGPA: 3.81 (Rank 1st)
- **Advisor:** Chowdhury Farhan Ahmed
- **Project: Weighted Substructure Mining from Transactional Graph Database** We created an efficient method for finding important patterns in weighted graphs by using a smart pruning technique to narrow down the search. We also extended it with DewgSpan, a tool that works well with graphs where the weights change over time. Both approaches are faster and more scalable than existing methods.

University of Dhaka, Bachelor's in Computer Science — Jan 2012 – Dec 2015

- CGPA: 3.89 (Rank 1st)
- **Awards:**
  - **Dean's Award 2015** from Faculty of Engineering and Technology, University of Dhaka.
  - **Prof. Dr. Md. Lutfar Rahman Award 2015** from Department of Computer Science and Engineering, University of Dhaka

Experience

Assistant Professor/Lecturer, University of Dhaka – Dhaka, Bangladesh — Sep 2019 – Aug 2023

Lecturer, East West University – Dhaka, Bangladesh — Apr 2018 – Aug 2019

Technologies

Languages: Python, C++, C, Java, SQL, JavaScript

Frameworks/Libraries: Pytorch, PyG, Cuda, DGL

Profiling/Performance Tools: NVIDIA Nsight, PyTorch Profiler

Publications

- Md Ashraful Islam, Hojae Son, Suhass Kiran DG, and Marco Serafini. Prism: A training system to unlock the potential of temporal graph learning through staleness avoidance (under revision). *Proceedings of the VLDB Endowment*, 2026
- Mushahid Intesum, Masud Abdullah, Md Rezaul Karim, and Md Ashraful Islam. Stft-gradtts: A robust, diffusion-based speech synthesis system with istft decoder for bangla. *International Journal of Speech Technology*, 2025
- Md Ashraful Islam, Chowdhury Farhan Ahmed, Md Tanvir Alam, and Carson Kai-Sang Leung. Graph-based substructure pattern mining with edge-weight. *Applied Intelligence*, 54(5):3756–3785, 2024
- Md Tanvir Alam, Amit Roy, Chowdhury Farhan Ahmed, Md Ashraful Islam, and Carson K Leung. Ugmine: utility-based graph mining. *Applied Intelligence*, 53(1):49–68, 2023
- Md Ashraful Islam, Mahfuzur Rahman Rafi, Al-amin Azad, and Jesan Ahammed Ovi. Weighted frequent sequential pattern mining. *Applied Intelligence*, 52(1):254–281, 2022
- Jesan Ahammed Ovi, Md Ashraful Islam, and Md Rezaul Karim. Banep: An end-to-end neural network based model for bangla parts-of-speech tagging. *IEEE Access*, 10:102753–102769, 2022
- Md. Ashraful Islam, Md Towhiduzzaman, Md Bhuiyan, Tauhidul Islam, Abdullah Al Maruf, and Jesan Ahammed Ovi. Banel: an encoder-decoder based bangla neural lemmatizer. *SN Applied Sciences*, 4(5):1–15, 2022
- Md Tanvir Alam, Amit Roy, Chowdhury Farhan Ahmed, Md Ashraful Islam, and Carson K Leung. Mining high utility subgraphs. In *2021 International Conference on Data Mining Workshops (ICDMW)*, pages 566–573. IEEE, 2021
- Shah Mohammed Nuruddin, Md Didarul Islam, Md Shafiqul Alam, Jesan Ahammed Ovi, and Md Ashraful Islam. An efficient approach for sequential pattern mining on gpu using cuda platform. In *2020 4th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT)*, pages 1–9. IEEE, 2020
- Md Ashraful Islam, Chowdhury Farhan Ahmed, Carson K Leung, and Calvin SH Hoi. Wfsm-maxpws: an efficient approach for mining weighted frequent subgraphs from edge-weighted graph databases. In *Pacific-asia conference on knowledge discovery and data mining*, pages 664–676. Springer International Publishing Cham, 2018

Full Publication list (Google Scholar): https://scholar.google.com/citations?user=UD5-rcAAAAAJ&hl