

S M (Rifat) Rafiuddin

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EDUCATION

Oklahoma State University

Ph.D. in Computer Science

Stillwater, OK

August 2022 – Expected July 2027

- **Advisor:** Dr. Atriya Sen
- **Dissertation (provisional title):** *Efficient, Interpretable, and Controllable Language Models through Representation-Guided Adaptation and Intervention*

Rajshahi University of Engineering and Technology

B.Sc. in Computer Science and Engineering

Rajshahi, Bangladesh

January 2012 – October 2016

RESEARCH PROFILE

I develop efficient, interpretable, and controllable language models through representation-guided adaptation and targeted intervention. My research connects parameter-efficient learning, mechanistic analysis, causal and counterfactual reasoning, and multimodal representation learning, with peer-reviewed work at ICLR, EMNLP, ACL/EACL Findings, IJCNLP-AAACL, PAKDD, and ASONAM.

ACADEMIC APPOINTMENTS

Oklahoma State University

Graduate Teaching Assistant, Department of Computer Science

Stillwater, OK

August 2022 – Present

Graduate Research Assistant, Reasoning and Artificial Intelligence (rAIson) Lab

Summers 2025 and 2026

Graduate Research Assistant, Complex Systems Lab

Summers 2023 and 2024

University of Asia Pacific

Lecturer, Department of Computer Science and Engineering

Dhaka, Bangladesh

October 2018 – July 2022

Uttara University

Lecturer, Department of Computer Science and Engineering

Dhaka, Bangladesh

February 2017 – October 2018

PUBLICATIONS

My name is bolded. Publications are grouped by type and listed in reverse chronological order.

Peer-Reviewed Conference and Findings Papers

- [1] **S M Rafiuddin** and Atriya Sen. “C³T: Counterfactual Causal Reasoning for Sentiment Shifts in Social-Media Conversation Trees.” Accepted at the *2026 Conference on Empirical Methods in Natural Language Processing (EMNLP 2026)*, Main Conference; to appear.
- [2] **S M Rafiuddin** and Rafae Abdullah. “Context-Conditioned Masked LoRA: Dynamic Rank Routing for Compute-Efficient Parameter-Efficient Fine-Tuning.” In *Findings of the Association for Computational Linguistics: ACL 2026*, pp. 26670–26689. Association for Computational Linguistics, 2026. **[Paper]**
- [3] **S M Rafiuddin** and Muntaha Nujat Khan. “Emergent Discrete Controller Modules for Symbolic Planning in Transformers.” In *International Conference on Learning Representations (ICLR 2026)*, Rio de Janeiro, Brazil, 2026. **[Paper]** **[Presentation]** **[Poster]** **[Video]**
- [4] **S M Rafiuddin**. “MaskLoRA: Low-Rank Subspace-Induced Token Masking for Efficient and Faithful Language Models.” In *Findings of the Association for Computational Linguistics: EACL 2026*, pp. 5678–5692. Association for Computational Linguistics, 2026. **[Paper]** **[Presentation]** **[Poster]** **[Video]**

- [5] **S M Rafiuddin** and Muntaha Nujat Khan. “A Formal Analysis of Chain-of-Thought Prompting via Turing Reductions.” In *Proceedings of the 14th International Joint Conference on Natural Language Processing and the 4th Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (IJCNLP–AAACL 2025): Short Papers*, pp. 87–98. Asian Federation of Natural Language Processing and Association for Computational Linguistics, 2025. [**Paper**]
- [6] Sadia Kamal, Lalu Prasad Yadav Prakash, **S M Rafiuddin**, Mohammed Rakib, Atriya Sen, and Sagnik Ray Choudhury. “A Detailed Factor Analysis for the Political Compass Test: Navigating Ideologies of Large Language Models.” In *Proceedings of the 14th International Joint Conference on Natural Language Processing and the 4th Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (IJCNLP–AAACL 2025): Short Papers*, pp. 284–303. Asian Federation of Natural Language Processing and Association for Computational Linguistics, 2025. [**Paper**]
- [7] **S M Rafiuddin**. “Edu-EmotionNet: Cross-Modality Attention Alignment with Temporal Feedback Loops.” In *Proceedings of the 24th International Conference on Machine Learning and Applications (ICMLA 2025)*, pp. 200–205. IEEE, 2025. [**Paper**] [**Presentation**]
- [8] Md. Sohanuzzaman Soad, Mahady Al Hady, **S M Rafiuddin**, and Sudip Ghose. “Cross-Domain Adversarial Augmentation: Stabilizing GANs for Medical and Handwriting Data Scarcity.” In *Proceedings of the 2025 IEEE 4th International Conference on Robotics, Automation, Artificial-Intelligence and Internet-of-Things (RAAICON 2025)*. IEEE, 2025. [**Paper**]
- [9] **S M Rafiuddin** and Muntaha Nujat Khan. “Learning What to Remember: Adaptive Probabilistic Memory Retention for Memory-Efficient Language Models.” In *Findings of the Association for Computational Linguistics: EMNLP 2025*, pp. 3969–3981. Association for Computational Linguistics, 2025. [**Paper**]
- [10] **S M Rafiuddin**, Sadia Kamal, Mohammed Rakib, Arunkumar Bagavathi, and Atriya Sen. “AdaptiSent: Context-Aware Adaptive Attention for Multimodal Aspect-Based Sentiment Analysis.” In *Social Networks Analysis and Mining: Proceedings of the 17th International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2025)*, Part I, Lecture Notes in Computer Science, vol. 16322, pp. 133–141. Springer, 2025. [**Paper**] [**Presentation**]
- [11] **S M Rafiuddin**, Mohammed Rakib, Sadia Kamal, and Arunkumar Bagavathi. “Exploiting Adaptive Contextual Masking for Aspect-Based Sentiment Analysis.” In *Advances in Knowledge Discovery and Data Mining: Proceedings of the 28th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD 2024)*, Part VI, Lecture Notes in Computer Science, vol. 14650, pp. 147–159. Springer, 2024. [**Paper**] [**Presentation**]
- [12] Md. Abdul Karim, **S M Rafiuddin**, Md. Jahidul Islam Razin, and Tahira Alam. “Isolated Bangla Handwritten Character Classification Using Transfer Learning.” In *Proceedings of the 2nd International Conference on Computing Advancements (ICCA 2022)*, pp. 11–17. Association for Computing Machinery, 2022. [**Paper**]
- [13] **S M Rafiuddin**. “High Cursive Complex Character Recognition Using GAN External Classifier.” In *Proceedings of the 2nd International Conference on Computing Advancements (ICCA 2022)*, pp. 466–472. Association for Computing Machinery, 2022. [**Paper**]
- [14] Md. Jahidul Islam Razin, Md. Abdul Karim, M. F. Mridha, **S M Rafiuddin**, and Tahira Alam. “A Long Short-Term Memory (LSTM) Model for Business Sentiment Analysis Based on Recurrent Neural Network.” In *Sustainable Communication Networks and Application*, Lecture Notes on Data Engineering and Communications Technologies, vol. 55, pp. 1–15. Springer, 2021. [**Paper**]
- [15] **S M Rafiuddin**. “Estimation of Phylogenetic Tree Using Gene Sequencing Data.” In *2019 4th International Conference on Electrical Information and Communication Technology (EICT)*, pp. 1–5. IEEE, 2019. [**Paper**]
- [16] **S M Rafiuddin**. “Ranking of Bangla Word Graph Using Graph-Based Ranking Algorithms.” In *2017 3rd International Conference on Electrical Information and Communication Technology (EICT)*, pp. 1–5. IEEE, 2017. [**Paper**]
- [17] Sadia Zaman Mishu and **S M Rafiuddin**. “Performance Analysis of Supervised Machine Learning Algorithms for Text Classification.” In *2016 19th International Conference on Computer and Information Technology (ICCIT)*, pp. 409–413. IEEE, 2016. [**Paper**]

Peer-Reviewed Workshop Papers

- [18] **S M Rafiuddin**, Vamsi Krishna Pavuluri, and Atriya Sen. “Constraint-Aware Counterfactual Editing for Aspect-Based Sentiment Analysis.” In *HHAI-KEML 2026: 2nd International Workshop on Informing Machine Learning with Knowledge Engineering*, Brussels, Belgium, 2026. [Paper]

RESEARCH EXPERIENCE

Reasoning and Artificial Intelligence (rAIson) Lab

Graduate Research Assistant; Advisor: Dr. Atriya Sen

Oklahoma State University

Summers 2025 and 2026

- Developed **MaskLoRA**, a representation-guided token-retention method that delivered $1.3\text{--}2.6\times$ end-to-end speedups on encoder benchmarks and $1.5\text{--}3.6\times$ on long-context tasks while preserving near-baseline quality; published in *Findings of EACL 2026*.
- Co-developed **CCM-LoRA**, an input-conditioned rank-routing method that matched or improved static LoRA while using 61% fewer adapter FLOPs and increasing training throughput by approximately 8%; published in *Findings of ACL 2026*.
- Developed methods for symbolic planning and causal analysis in transformers, resulting in a main-conference paper at *ICLR 2026* and an accepted main-conference paper at *EMNLP 2026*.
- Designed constraint-aware counterfactual editing for aspect-based sentiment analysis and mentored its experimental development through a peer-reviewed HHA-KEML 2026 workshop paper.

Complex Systems Lab

Graduate Research Assistant; Advisor: Dr. Arunkumar Bagavathi

Oklahoma State University

Summers 2023 and 2024

- Developed adaptive contextual masking for aspect-based sentiment analysis, with controlled ablations and error analysis; published at *PAKDD 2024*.
- Developed context-aware attention and text–image alignment methods for multimodal aspect-based sentiment analysis; published at *ASONAM 2025*.
- Built reproducible PyTorch and Hugging Face pipelines for representation analysis, multimodal fusion, and robustness evaluation under controlled experimental settings.

HONORS AND AWARDS

Competitive Awards and Travel Support

ICLR 2026 Financial Assistance Award, International Conference on Learning Representations 2026

- Awarded complimentary registration and \$1,600 in travel support to present research at ICLR 2026 in Rio de Janeiro, Brazil.

AIRS Travel Fund, Oklahoma State University 2025

- Received institutional support for presenting and disseminating peer-reviewed research.

GPSGA Travel and Research Award, Oklahoma State University 2024–2025

- Awarded \$600 in 2024 and \$300 in 2025 to support conference travel and research dissemination.

TEACHING EXPERIENCE

Teaching Interests: Natural Language Processing; Machine Learning; Deep Learning; Responsible AI; Data Mining; Algorithms; and introductory programming.

Oklahoma State University

Graduate Teaching Assistant, Department of Computer Science

Stillwater, OK

August 2022 – Present

- **Introduction to Computer Security** — Fall 2022.
- **Design and Implementation of Operating Systems I** — Spring 2023, Spring 2024, and Spring 2026.
- **Data Structures and Algorithm Analysis II** — Fall 2023.
- **Discrete Mathematics for Computer Science** — Fall 2024.
- **Social Issues in Computing** — Spring 2025.
- **Introduction to Database Systems** — Fall 2025.
- Led laboratory and discussion sessions, graded programming assignments and examinations, provided individual student support, and assisted with course administration and instructional-material development.

University of Asia Pacific

Lecturer and Instructor of Record

Dhaka, Bangladesh

October 2018 – July 2022

- **Theory Courses:** Machine Learning; Pattern Recognition; Design and Analysis of Algorithms; Mathematics for Computer Science; and Visual and Web Programming.
- **Laboratory Courses:** Computer Graphics; Pattern Recognition; Compiler Design; Algorithms; Object-Oriented Programming II (Java); and Visual and Web Programming.
- Designed and delivered lectures, laboratory exercises, assignments, examinations, and grading rubrics; supervised undergraduate projects and contributed to outcome-based curriculum development.

Uttara University

Dhaka, Bangladesh

*Lecturer and Instructor of Record**February 2017 – October 2018*

- **Courses Taught:** Design and Analysis of Algorithms; Operating System Design; Discrete Mathematics; and Programming Language and Application II (C++).
- Delivered undergraduate lectures and laboratory sessions, prepared instructional materials and examinations, evaluated student work, and supported departmental assessment and result preparation.

STUDENT RESEARCH MENTORING**Reasoning and Artificial Intelligence (rAIson) Lab**

Oklahoma State University

*Research Mentor; Faculty Supervisor: Dr. Atriya Sen**Spring 2026*

- **Vamsi Krishna Pavuluri** — Mentored research on constraint-aware counterfactual generation, experimental evaluation, and manuscript preparation, resulting in a co-authored peer-reviewed paper presented at HHAI-KEML 2026.

Complex Systems Lab

Oklahoma State University

*Research Mentor**Fall 2023*

- **Jake Williams** — Mentored a multimodal aspect-based sentiment analysis project spanning experimental design, representation learning, model evaluation, and technical communication.

University of Asia Pacific

Dhaka, Bangladesh

*Student Research Mentor, Department of Computer Science and Engineering**2018 – 2022*

- **Md. Sohanuzzaman Soad, Mahady Al Hady, and Sudip Ghose** — Mentored cross-domain adversarial augmentation research from problem formulation through manuscript preparation, resulting in a co-authored peer-reviewed IEEE RAAICON 2025 paper.

PROFESSIONAL SERVICE**Peer Review**

ACM Transactions on Internet Technology	2026
Conference on Neural Information Processing Systems (NeurIPS), Position Paper Track	2026
International AAAI Conference on Web and Social Media (ICWSM)	2026
Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)	2025
International Conference on Computational Linguistics (COLING)	2024
International Joint Conference on Neural Networks (IJCNN)	2024

Academic Outreach and Community Service

Competitive Programming Team Coach	University of Asia Pacific; RUET Inter-University Programming Contest	2019
Volunteer	National High School Programming Contest, Rajshahi	2016

TECHNICAL EXPERTISE

Research Areas and Methods	Language-model representation analysis, parameter-efficient fine-tuning, low-rank adaptation (LoRA), representation-guided token masking, mechanistic interpretability, causal and counterfactual intervention, aspect-based sentiment analysis, and multimodal representation learning
Research Software	PyTorch, Hugging Face Transformers, TensorFlow, Scikit-learn, NumPy, pandas, Jupyter, and $\text{\LaTeX}$
Computing and Programming	Python, C/C++, Java, SQL, Linux, Git, Docker, AWS, GPU-accelerated experimentation, memory profiling, and throughput benchmarking