

Aunabil Chakma

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Research Interests

Large language models and agentic systems, with a focus on improving reasoning and in-context learning capabilities.

Education

University of Arizona

Ph.D. in Computer Science

Working with Prof. Eduardo Blanco and Prof. Mihai Surdeanu

Tucson, AZ

Aug 2024 – Expected May 2029

Bangladesh University of Engineering and Technology (BUET)

B.S. in Computer Science and Engineering

Dhaka, Bangladesh

Feb 2015 – Apr 2019

Ongoing Research

Research Assistant, Political Science, University of Arizona

Fall 2026 – Present

- Co-managing the pretraining of ModernBERT on **400+ GB** of political-domain text for an NSF-funded political-science project.

Ongoing Ph.D. Research, University of Arizona

Jul 2026 – Present

- **Efficient LLM Reasoning** Investigating token- and chunk-level importance scoring and reinforcement-learning reward design to shorten reasoning traces while preserving accuracy, with potential applications to efficient long-context processing.

Selected Publications & Previous Research Experience

- **Aunabil Chakma**, Mihai Surdeanu, Eduardo Blanco. *Structured Semantic Information Helps Retrieve Better Examples for In-Context Learning Applied to Few-Shot Relation Extraction*. [ACL 2026 (Oral)]
 - Developed a hybrid method combining semantic-rule retrieval, clustering, and LLM-generated demonstrations; achieved state-of-the-art FS-TACRED performance.
- **Aunabil Chakma**, Aditya Chakma, Masum Hasan, Soham Khisa, Chumui Tripura, Rifat Shahriyar. *ChakmaNMT: Machine Translation for a Low-Resource and Endangered Language via Transliteration*. [WMT 2026]
 - Built machine-translation resources for an **extremely low-resource language** by collecting and curating **15K** Chakma–Bangla parallel pairs and **42K** monolingual samples; trained and fine-tuned sequence-to-sequence models and evaluated LLM-based in-context learning.
- **Aunabil Chakma**, Mihai Surdeanu, Eduardo Blanco. *Two-Stage Prompt Optimization for Few-Shot Relation Extraction: From Reasoning-Guided Search to Gradient-Guided Refinement*. [arXiv 2026; preparing for ICLR/NAACL 2027 submission]
 - Designed GradPO, a gradient-guided plug-in refiner using context-aware multi-span, multi-token edits and beam search; it was the most consistent among the evaluated refiners.
- **Aunabil Chakma**, Masum Hasan. *LowResource at BLP-2023 Task 2: Leveraging BanglaBERT for Low Resource Sentiment Analysis of Bangla Language*. [BLP Workshop @ EMNLP 2023]
 - Fine-tuned BanglaBERT with random token dropping, placed **3rd of 30 teams**.
- **Research Assistant**, Narrative Reframing, University of Arizona Jan 2025 – Dec 2025
 - Developed graph-informed and social-science-theory-guided prompting strategies for narrative rewriting in a DARPA-funded project; worked with Eduardo Blanco and Joshua Garland.

Industry Experience

Software Engineer II (promoted twice), Therapservices

Nov 2020 – Jul 2024

Dhaka, Bangladesh

- Built HIPAA-compliant Java SaaS systems serving **500,000+ individuals** for U.S. government and private organizations. Primary contributor to the External Data Transfer and Automatic File Transfer modules, replacing DevOps-managed manual scripts with scalable automated workflows.

Technical Skills

Python, Java; PyTorch, Hugging Face Transformers, vLLM, TensorFlow; Git, FAISS

Awards & Academic Service

- **TA of the Month** in Dec 2024 and Apr 2026; Teaching Assistant during Fall 2024, Summer 2025, Spring 2026, and Summer 2026.
- **3rd place out of 30 teams**, BLP 2023 Shared Task on Sentiment Analysis of Bangla Social Media Posts.
- **4th place out of 39 teams**, BUET Intra CSE-14 Programming Contest, 2016.
- Solved **1,000+ programming problems**; Codeforces maximum rating: **1706**.
- **Reviewer:** EACL Demos 2026–2027; ACL-IJCNLP Demos 2025–2026; NeurIPS 2025 Reliable ML Workshop.
Ad-hoc reviewer: AAAI–2027; ARR 2025–2026; EMNLP 2025 Demos.