

Nazia Tasnim

PhD. Student in Computer Science (September'23 - Present), Boston University.

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RESEARCH INTEREST

Currently, I am focusing on developing efficient and robust methods for adapting deep neural networks, particularly parameter-efficient fine-tuning approaches and model editing techniques. My research also investigates adversarial vulnerabilities in these systems and explores solutions for selective model unlearning. A key theme of my work is advancing responsible AI development through bias mitigation, fair representation learning, and robust domain adaptation. Additionally, I have explored knowledge integration in AI systems and leveraging ML for social impact applications.

TECHNICAL SKILLS

- **Languages** Python, Java, JavaScript, SQL, SPARQL
- **Framework** Android, Django, React, Flask
- **Machine Learning** PyTorch, Keras, OpenCV, pySpark
- **Research** Large-scale dataset curation, Controlled experiments and ablation, Literature review and Meta-analysis, Interdisciplinary research collaboration and communication

SELECTED PUBLICATIONS

1. [RECAST : Reparameterized, Compact weight Adaptation for Sequential Tasks](#) | *ICLR'25*
 - Proposed a novel method that reduces the number of task-specific trainable parameters to fewer than **50**. We empirically demonstrated that RECAST outperforms the state-of-the-art by up to **3%** across various scales, architectures, and parameter spaces
2. [Right Side Up? Disentangling Orientation Understanding in MLLMs with Fine-grained Multi-axis Perception Tasks](#) | Under Review
 - Developed a novel extensive benchmark to evaluate the object orientation perception of MLLMs, across **4** core dimensions encompassing **7** tasks curated from **11** datasets with **67** object categories across synthetic and real-world scenarios. The benchmark includes **33K+** Q&A pairs in MCQ format, revealing critical limitations of **17** closed/open-source VLMs.
3. [Vision-LLMs Can Fool Themselves with Self-Generated Typographic Attacks](#) | *NeurIPS'24*
 - Introduced **two** novel self-generated attacks that prompt the LVLM to generate an attack against itself. Our benchmark reveals that Self-Generated attacks can reduce LVLM's classification performance by up to **33%**
4. [OOD-Speech: A Large Bengali Speech Recognition Dataset for Out-of-Distribution Benchmarking](#) | *INTERSPEECH'23*
 - **1177.94** hours of audio data collected and curated from 22,645 native Bengali speakers from different regions, with additional **23.03** hours of speech collected and manually annotated from 17 OOD sources. This is jointly the largest and only OOD dataset for Bengali.
5. [VISTA: Vision transformer enhanced by U-Net and image colorfulness frame filtration for automatic retail checkout](#) | *IEEE/CVF Conference on CVPR'22*

- Implemented an end-to-end pipeline achieving **46%** accuracy in real-time multi-class product recognition, the *3rd* highest score for the cross-modality dataset.
6. [On leveraging data augmentation and ensemble to recognize complex Named Entities in Bangla](#) | *The International Workshop on SemEval'21*
- Implemented 3 different model ensembles and generated 6 augmented datasets splits. The final framework obtained **60%** f1-score, the *8th* highest performance in the dataset.
7. [Exploring the Scope and Potential of Local Newspaper-based Dengue Surveillance in Bangladesh](#) | *KDD Workshop on Applied Data Science for Healthcare'21*
- Developed a novel multi-source dataset combining aggregated newspaper reports with official disease reports, and demographic information.
 - Designed and implemented a semi-automated classification pipeline for analyzing dengue intervention patterns, leveraging seed-guided algorithms to quantify disparities between news coverage and actual disease risk zones across different socioeconomic regions

CURRENT RESEARCH

IVC-ML Group, Boston University

Sept'23 - Present

Graduate Researcher

- Working on **model decomposition, reconstruction, and compression** to support resource-bounded settings.
- Developed efficient **Reparameterization Schemes** for incremental learning that increases image classification performance by up to 3% with $< 2 * 10^{-6}$ tunable parameters.
- Building evaluation frameworks to assess **spatial reasoning of LVLMS**
- Developed novel **probes and attacking techniques** to analyze vulnerabilities in *LVLMS*

EXPERIENCES

Wikimedia Foundation

Sept'22 - June'23

Research Developer

- Collaborated with Wikimedia's research team to **develop NLP tools** that support 300+ languages across 100+ wikiprojects, with an *emphasis on efficiency and lowering resource requirements*
- Created research pipeline to **curate community resources** from wiki projects, developed assets through analysis, built models and off-the-shelf tools to be used in internal research

Giga Tech Limited

Aug'21 - June'22

Machine Learning Engineer

- Developed NLP submodules and pipelines for **Part-of-Speech (PoS), Named Entity Recognition (NER)** and **language model training** associated with the **Bangladesh National Syntactic Treebank** project
- Assisted in establishing annotation guidelines for diverse downstream tasks

Bengali.AI

Sept'21 - Present

Research Affiliate

- **Coordinated teams, lead research projects** and published multiple research papers focused on alleviating the low-resource status of Bengali
- Launched **Google-funded Kaggle competitions** and inter-university DL contests with 600+ participants
- Developed some of the **largest benchmarking datasets for Bangla NLP**

Newsroom Lab, BRAC University

Sept'22 - June'23

Research Assistant

- Led a team of undergraduate students in building tools for **social science data analysis**
- Developed an end-to-end pipeline to **identify primary speakers in news clusters** and establish their geopolitical affiliations
- Curated a dataset to generate **ontology of geopolitical association** by combining metainformation from Wikipedia and Wikidata.

SELECTED PROJECTS

mwtokenizer [\[Package\]](#)

A multilingual **Python tokenization package** for Wikimedia Projects focusing on non-whitespace delimited languages. Analyzed large-scale wikicorpora through **PySpark** to optimize pattern recognition in diverse writing systems and curated essential module assets.

mwparserfromhtml [\[Package\]](#)

A **Python** library to parse and extract metadata from Enterprise HTML Dumps. The module is part of the core components of the **Mediawiki Utilities Project**.

VISTA [\[Code\]](#)

Developed an end-to-end pipeline for real-time retail checkout, combining **UNET**-based segmentation with *entropy masking* for domain bias reduction. Implemented multi-class product classification using **Vision Transformers (ViT)**. Designed a **custom metric** for frame selection, optimizing object detection efficiency in video streams.

Shaako [\[Code\]](#) [\[Demo\]](#)

A mobile application to provide rural people with Emergency Medical Care support through community health workers. Built the frontend in **Android Framework**. The backend portal is **Django** and uses both **Firebase** and **Azure CMS** for database.

SUSTCast [\[Code\]](#) [\[App\]](#)

Created and launched the pioneering SUST campus online radio platform, featuring fully automated streaming via an **IceCast server** accommodating concurrent engagement of *2000+ listeners*. Designed the app interface using **Firebase** real-time database, while collaborating on the development of *data collection, processing, and music recommendation*.

HONORS AND AWARDS

- Recipient of **WiCV Mentorship Grant** | CVPR'25
- Recipient of **CRA GradCohort Fellowship** | Cohort 2025
- Recipient of **Dean's Fellowship**, Boston University GSAS. | Fall'2023 - Summer'2024
- **Outreachy Internship** at the Wikimedia Foundation (top 1.4% applicant) | Summer'22
- Second Runner-up at **Microsoft Imagine Cup** - SEANM | 2022
- Second Runner-up, **CVPR AI City Challenge** Track-4 (3rd globally) | 2022
- **Grace Hopper Scholar** | 2021

LEADERSHIP AND COMMUNITY SERVICE

- Research Instructor | **NSF REU Program, 2025**
- Reviewer | **IJCV, ACM ARR**
- Judge | **BDOSN - NLP Hackathon, 2023**
- Founding Member & Membership Chair | **SUST ACM Students' Chapter, 2019-2020**
- Organizing Committee | **IEEE International Conference on Bangla Speech and Language Processing (ICBSLP), 2019**